



ALLTO-LITE Resistor SPARK PLUG

Here's what it is

The many benefits which can be obtained through a wider than standard spark gap setting are well known to the automotive industry. Up to this time the rate of spark gap increase due to electrode erosion has been such that the desired wide setting has not been generally used. Auto-Lite, working with leading car and truck manufacturers, has Ignition Engineered a built-in 10,000 Ohm Resistor which reduces electrode erosion so that Auto-Lite Spark Plugs can now be given this wider gap setting desirable for improved operation and economy.

Advantages So Significant They Are Expected To Affect

The Entire Industry

A complete line of Auto-Lite Resistor Spark Plugs with the built-in Resistor will soon be available for original equipment and replacement on popular makes of cars, trucks and tractors. The regular line of ignition engineered Auto-Lite Spark Plugs, which has won such an enviable reputation for dependability of performance, will continue to be manufactured. Ask your favorite dealer.

THE ELECTRIC AUTO-LITE COMPANY

Toronto 1, Ontario

Toledo 1, Ohio

Here's what it does

PROMOTES SMOOTHER IDLING, because the wider spark gaps help eliminate occasional missing.

REDUCES MISFIRING due to lean spots in carburetion.
ASSISTS IN BURNING OF LEANER MIXTURES for improved engine economy at idle and throughout the speed range.

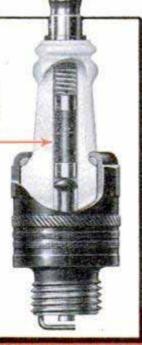
REDUCES RING AND CYLINDER WEAR when lubrication is washed away by gasoline not burned as a result of occasional misses.

INCREASES ELECTRODE LIFE up to 200% and more.

SUPPRESSES SPARK PLUG INTERFERENCE with radio, radio-telephone, radar and television reception.*

BUILT-IN RESISTOR

Auto-Lite Ignition Engineers, working with leading automotive manufacturers, have developed the new Auto-Lite Resistor Spark Plug with this built-in resistor. As a result, improved operation and economy will be possible for the owners of cars, trucks and tractors everywhere.





Typical example: user's experience with B. F. Goodrich tires

J. C. HINRICHS, JR., of Waterbury, Conn., right above, points to a tire he says he drove "across the continent to Texas and return plus almost two years of civilian driving which entailed 360 miles per week in addition to my regular business driving."

"To my knowledge," his letter continues, "this B. F. Goodrich tire has never been off its original mounting on the left front wheel. It shows considerable wear, but there is still tread visible on the entire circumference. Need you ask if I am satisfied?"

Mr. Hinrichs has an exact

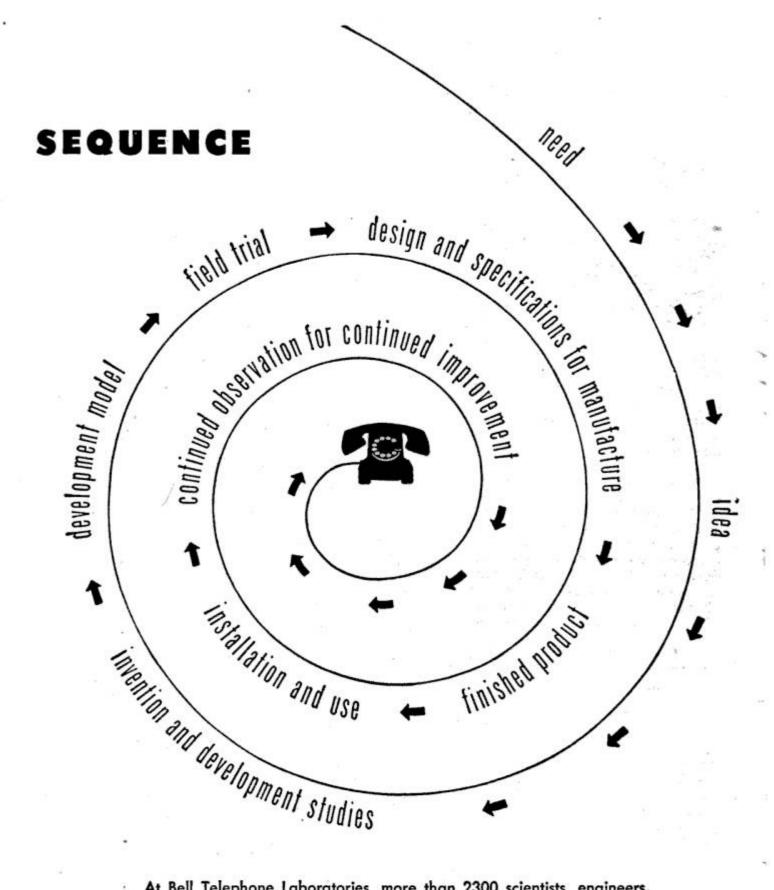
record of the mileage at the time this picture was made, and it proves he takes exceptional care of his tires. This tire replaced one that had been damaged while he was away in the army. At that time his speedometer read 8560. "At this writing," he says, "my speedometer shows 72,057 miles and they have really been rough ones." That leaves a tire mileage of 63,497. No tire, no matter how good it is, ever goes that far unless it is kept at the right air pressure, with the wheel balanced and in correct alignment.

But B. F. Goodrich Silver-

towns do outwear others—and outwear prewar tires. The tread is wider and more level. This means more tread-to-road contact, better weight distribution, more even wear. A double breaker cushions shocks.

Now is a good time to buy. Your B. F. Goodrich dealer will give you a good allowance for the unused mileage in your present tires. If you don't know his name look under tires in the yellow pages of your telephone book. The B. F. Goodrich Company, Akron, Ohio.

B.F. Goodrich



At Bell Telephone Laboratories, more than 2300 scientists, engineers, and their associates are continually exploring and inventing, devising and perfecting for improvements and economies in telephone service.



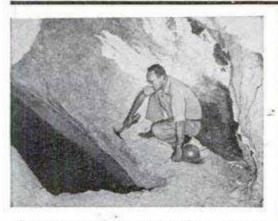
BELL TELEPHONE LABORATORIES

Popular Mechanics Magazine

Registered in U. S. Patent Office and Canada

H. H. WINDSOR, Founder

H. H. WINDSOR, Jr., Editor and Publisher



WHEN Tom Stimson, our western editor, was gathering material for "Weekend 49ers" (page 164) he kept an alert eye for samples of stuff like gold and silver ore. He is shown above exploring an abandoned mine.

THERE are some eye-opening revelations in our opening feature, "Uncle Sam Weighs His Resources," on page 89. A recent government survey shows that although there's enough coal underground to last us 4386 years we have only enough copper for 19 years and our known reserves of lead will be gone in a decade.

SHRUB planting in the gardener's book is just another name for spring, and next month a special feature in the Craftsman section offers expert advice on plantings for corners, terraces or in rows, for lots large or small. Another April feature lists preventive treatments for common car illsthose little things that every car owner should do periodically to avoid big repair bills. Then there's another practical story on the construction of a small cement mixer that has most of the laborsaving features of a much larger machine. One how-to-make-it article in April concerns hard-to-get novelty hardware for handbags, glove boxes or small chests.

JUNIOR radio students and experimenters will find a tappedcoil crystal set combined with a 2-tube battery-operated amplifier in the April Radio section.

Volume 89	MARCH 1948		N	umber 3
Assistant Managing E Shop Notes and Craft Radio and Electronics Aviation Editor	anaging Editor		Vhitfaker R. Ward L. Brittin man, Jr. B. Hicks ill Reiche nson, Jr.	
Art Director	Assistant Editors		trank	Beatty
Donald R. Brooks		Ar	thur R	. Railton
	t Editors, Shop Notes ar yne C.Leckey Frank N.Ste			ungquist
T]	In This Issue	3		
Uncle Sam W	eighs His Reso	urces		89
Bigger Than	Texas		•	96
	s That New Lo			107
	deo			116
경에게 되자 보기 통하는 그렇게 없었다고 하게 보기 없었다.	it in a Needle's			122
시민생물 보조 하겠다. 시민에 반안 화장을 하였다.	an Game -	0.000		126
	ng Highway En			133
	for Your Hom	Control of the Control		138
	Trail Into Space		-	144
1983 July 1 (1984)	ounties Patrol I		е	153
	rs			164
	nsects Forbidde			170
¹ 7.3	or the Craftsmo			83
Arbors Frame	Entrance Gate	es -		186
	red Legs -			191
	in Farm Photo			
1000	vood Flooring			
777 17750	-a 25-ft. Cabin			
	lectronics .			
	memakers -			

Published monthly by POPULAR MECHANICS COMPANY, 200 East Ontario Street, Chicago 11, Ill. H. H. Windsor, Jr., president; Paul H. Dunakin, vice president and general manager; D. F. Windsor, vice president and secretary-treasurer; William Harrison Fetridge, vice president and assistant to the publisher: Clover L. Perkins, advertising manager; Alan M. Deyoe, circulation manager. Single copy in the United States and Canada, 25 cents; subscription rates in United States and possessions, Canada, Philippines and countries of the Pan-American Postal Union, 1 year, \$2.50; 2 years, \$4.50; 3 years, \$6.00. To all other countries add \$1.00 a year over United States prices for overseas postage. If you plan to move, notify us at least 30 days in advance so you will not miss an issue. Give both old and new addresses. Entered as Second Class Matter, September 15, 1903, at the Post Office at Chicago, Illinois, under Act of March 3, 1879. Entered as Second Class Matter at Post Office Dept., Canada. Copyright 1948 by Popular Mechanics Company, Copyright under International Copyright Union. Copyright in France. All rights reserved under Pan-American Copyright Union. Printed in the United States of America.

Table of Contents continued on page 8



You're looking at a "rotary beam parasitic array antenna." What it does is big as its name. By high-frequency continuous-wave transmission, the Air Force can talk to planes anywhere on earth.

Here's an instance. Recently, 8 Superforts departed Tokyo on a non-stop flight to the nation's capital. Air Force—in Washington—made contact a few minutes after their departure, stayed in communication with its winged offspring right to their destination.

This wizard antenna and its witch-wife—a supersensitive receiving antenna—are a joint accomplishment of Signal Corps and Air Force. It is typical of technical advances that are the daily business of our Armed Services.

And YOU might have played a part in that development!

Our peacetime Army and Air Force offer unlimited adventure on the frontiers of science.

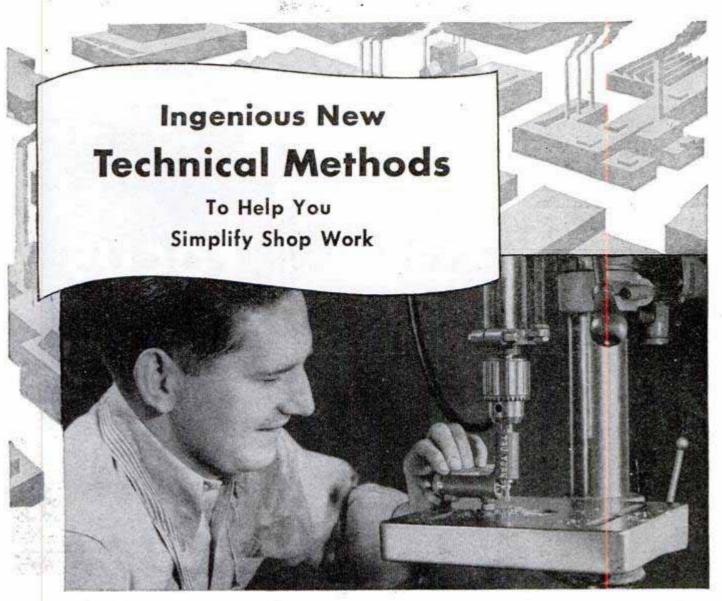
YOUR ARMY AND AIR FORCE SERVE THE NATION
AND MANKIND IN WAR AND PEACE

They want men like you—men with natural technical ability, men with a burning desire to get ahead. If you are 17 to 34 and a high school graduate, for example, you may choose the technical training you want before enlisting.

Add other advantages of an Army or Air Force career: highest pay in history... free board and shelter and medical care... broad educational opportunity... travel... retirement income for life. Get all the facts now from your nearest U.S. Army and U.S. Air Force Recruiting Station.

U. S. Army and U. S. Air Force Recruiting Service





Metal Turning Made Easy with New Simplified Tool!

A new tool called "Tru-Turn" makes possible the conversion of drill presses, woodturning lathes, or grinder stands into tools that will turn and cut-off steel, bronze, copper and aluminum. The "Tru-Turn" tool shown above is mounted on a Buffalo Drill Press, Spindle Size.

The "Tru-Turn" tool is easy to operate and cuts and turns bar stock of steel, bronze, copper and aluminum measuring 1/4", 3/8" and 1/4". Its built-in micrometer permits adjustments that give tool-room accuracy to 1/1000 of an inch.

Small tool shops as well as all types of repair shops and garages find the "Tru-Turn" ideal for cutting long pieces of bar stock into desired lengths. Also, home craftsmen are able to produce accurate, highly finished precision-machined parts from metal even without previous training.

Accurate, precision work is also easier to do when tension is relieved by chewing gum. The act of chewing seems to make the work go easier, faster-thus helping on-the-job efficiency. For these reasons Wrigley's Spearmint Chewing Gum is being made available more and more by plant owners everywhere.

> You can get complete information from Millholland Screw Products Corp., 132 West 13th Street Indianapolis 2, Ind.

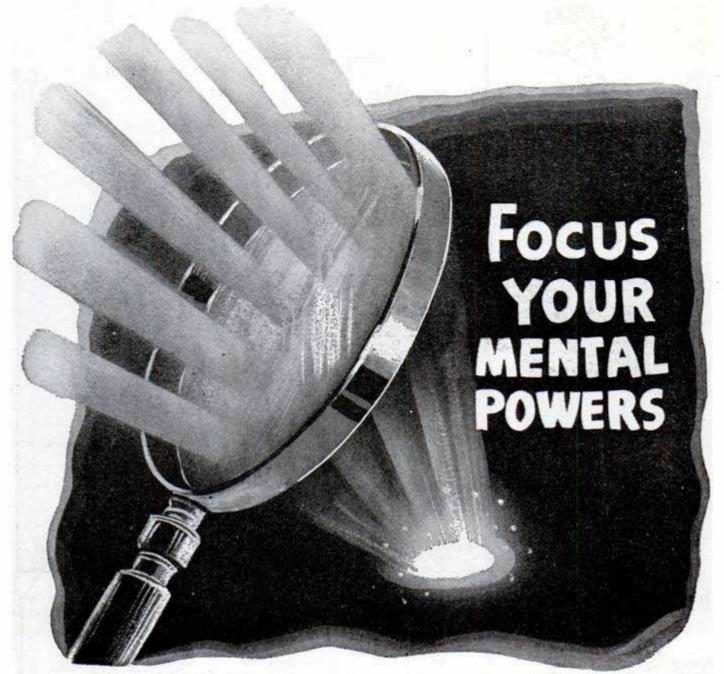


Tru-Turn Tool



AC-59





Do You THINK in Circles?

Do you ask yourself, "How shall I begin; what shall I do next?" Have you a confusion of ideas? Mastery in life, success in any enterprise, comes from the subtle ability to marshal your thoughts, to call to the fore, when an emergency arises, the proper mental powers. Mentally, you are an aggregate of forces. Why dissipate them because of lack of knowledge of how to properly use them? Learn to unite them, and you will have at your command, a tremendous power for accomplishment.

SEND FOR FREE BOOK

The Rosicrucians have preserved for centuries knowledge of the secret method for the development of mind power and the direction of man's unused inner faculties. This wisdom,

not strange or mysterious, has changed the course of life for many men and women throughout the world. Write for the free, sealed book which explains how you may obtain this helpful information. Address: Scribe E.T.C.

The ROSICRUCIANS

(AMORC)

SAN JOSE · CALIFORNIA (Not a religious organization)

	l.T.C. The Rosicrucia , California	ns,
Please of Life,' will call	send me a copy of the s which I shall read a	tealed booklet, "The Mastery is directed. No representative
Name		
Address		N. N.
City	0690 6 8	



If YOU were Boss would YOU promote "YOU"?

valuable asset to any business organization. He never wants for a good job and above average earnings. He gets ahead.

We have helped thousands of men achieve promotion and more money—success sometimes beyond their dreams—a success that was started by a coupon similar to the one below.

Get out of that rut—don't be satisfied with a mediocre job at small pay—be a success in business—this coupon may be your first step.

So send it today—right now—tomorrow never comes for the man who consistently puts things off.

Be honest now-

suppose that a better job had opened up in your company—carrying with it promotion and more money—could you qualify?

If you were boss, would you select "YOU" for that better job?

Consider before you answer.

First of all, could you fill the job? Has your experience fitted you for the step forward—have you been preparing for promotion apart from experience gained on the job?

Or have you just been filling a niche, doing daily tasks well but making no real and intelligent effort to learn and qualify for the job ahead so that if an opening should occur you would be ready to fill it?

The man who gets real promotion makes his own breaks—the man who slaves in the ordinary job at low pay just wishes and dreams of promotion and more money. Which are you?

Business is always willing to pay the man who knows—and pay him well. The man who is ready and willing to take responsibilities—and capable of directing the efforts of other men is a

La S	alle	Exter	ision	Unive	rsity
	-		_	nstitutio	

Dept. 364-R

417 S. Dearborn, Chicago 5

7

If you can help me get the ability and knowledge for real promotion, I want to know it. Please send me your free 48 page booklet telling how I can succeed in the field I have checked below. I understand you will send this without obligation to me,

☐ Accounting ☐ C. P. A. Coaching ☐ Bookkeeping ☐ Business Management ☐ Effective Speaking	□ Law: LL.B. Degree □ Foremanship □ Industrial Management □ Traffic Management □ Business English
☐ Stenotypy (Ma	chine Shorthand)
Name	Age
Posttion	
Address	Zone, if any
City and State	

MARCH 1948



For quick "STARTS" start using PYROIL

Pyroil assures constant lubrication between pistons and cylinder walls by giving oil the property of adhering to metal surfaces. This not only assures easier, quicker starting with minimum battery drain, but also prevents excess wear due to friction of metal against metal. Lubricated surfaces are safe, too, against rust and corrosion.

Ask your gas station attendant to add Pyroil—and add miles to your car.

Pyroil for Aircraft Engines

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

Manufactured and Guaranteed by Pyroil Company, 77 Pyroil Bldg., La Crosse, Wisconsin.

Canadian Distributors: Central Purchasing Agencies, Ltd., Toronto, Ontario, Canada

77 Pyroil Bld	g., La Crosse, Wisconsin
	ar to last and run properly. Please tell me Pyroil, and how it can accomplish this
Name	
Address	
City or Town.	State



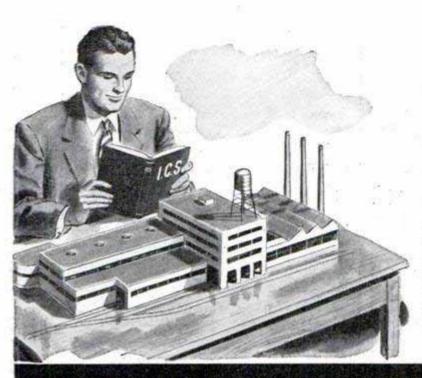
TABLE OF CONTENTS (Continued)

AUTOMOTIVE

"Window shade" radiator cover
Fender bender
Fender bender
Postwar Japanese cars are long on miles per gallon 137
Postwar Japanese cars are long on miles per gallon
Car sprinkles sand on icy pavement
Autoborne boudoir
Rear-window wiper aids driver
AVIATION
Canadian "emoka jumnere" slide to work from plane 04
"Flying motorcycle" 95 Exhaust gases prevent plane fires 102 Eyes that see "invisible" light spoiled wartime plan 143 Exposure to air at 75,000 feet fails to kill animais 169
Exhaust gases prevent plane fires
Exposure to air at 75,000 feet fails to kill animals
"Bomb" on sailplane shows glide angle169
DOLLEG AND DOLLEGE
BOATS AND BOATING
Japanese admiral's flagship to be made into museum132 Airport ferry
Airport ferry
Remote control synchronizes outboard motor's spark and throttle
FARM
Skim-milk processor
Knife-bladed plow chisels the soil in 34-foot strips125
Sterile corn from neated seeds may help broduce hybrids (13)
Suction hose unloads wheat
HOUSE AND HOME
Cartridge-type gun for home calking
bottom120
Wire clips snap on rim of can holding paintbrushes off bottom
Electric bed sheet can be laundered
INDUSTRY
Arm "sweeps" fingers from danger
Recoment will turns out cold
Locomotive clinic
Locomotive clinic. 103 Telescoping drill rig. 104 Wooden jet mockups 113 Mobile scrub cart cleans train panes 115 Baked volcanic ash makes building blocks 121
Mobile scrub cart cleans train panes
Baked volcanic ash makes building blocks
neat forms joint in engless beit
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1060 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for remain parts 132
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric piano-type key-
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric piano-type key-
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for remain parts 132
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric piano-type key-
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1060 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 150 Televise fish at play 160 feet below surface 163 STORE AND OFFICE
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1060 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 150 Televise fish at play 160 feet below surface 163 STORE AND OFFICE
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 137 Sonic aids for the blind permit "seeing" by ear 162 Televise fish at play 160 feet below surface 163
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1060 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 150 Televise fish at play 160 feet below surface 163 STORE AND OFFICE
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 157 Sonic aids for the blind permit "seeing" by ear 162 Televise fish at play 160 feet below surface 163 STORE AND OFFICE "Walking" stylus counts papers 166 "Walking" stylus counts papers 166 STORE AND OFFICE "Walking' stylus counts papers 106 Cash register pays jack pot 131 Indexing device speeds filing 168 TOOLS
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 157 Sonic aids for the blind permit "seeing" by ear 162 Televise fish at play 160 feet below surface 163 STORE AND OFFICE "Walking" stylus counts papers 166 "Walking" stylus counts papers 166 STORE AND OFFICE "Walking' stylus counts papers 106 Cash register pays jack pot 131 Indexing device speeds filing 168 TOOLS
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, piano-type keyboard 157 Sonic aids for the blind permit "seeing" by ear 162 Televise fish at play 160 feet below surface 163 STORE AND OFFICE "Walking" stylus counts papers 166 "Walking" stylus counts papers 166 STORE AND OFFICE "Walking' stylus counts papers 106 Cash register pays jack pot 131 Indexing device speeds filing 168 TOOLS
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace
Stakes for logging trucks reduce highway menace 159 Mixer delivers supply of plaster to trowel continuously 168 LAWN AND GARDEN "Convertible" mower removes leaves or snow 125 Duster worn like knapsack 168 Flower cutter holds the stems 174 Reel assures straight garden rows 175 OUTDOOR RECREATION Hobbyists' workbench folds to suitcase size 143 Trailer provides shelter both on land and sea 150 Score card fits in putter head 174 Spotter marks place where fish bite 176 PHOTOGRAPHY Movies of television show provide permanent record 95 Recon photos at 1000 m.p.h. simulated by U. S. Air Force 120 Darkroom moved into light 121 High-speed camera has no shutter 132 Five flash units for colored action shots 136 No double exposure with this camera 151 RADIO AND ELECTRICAL Radiophone on motorcycle aids traffic police 105 Diamond "insulators" multiply current 112 Logging camps radio calls for repair parts 136 Various instruments imitated on electric, plano-type keyboard 137 Sonic aids for the blind permit "seeing" by ear 162 Televise fish at play 160 feet below surface 163 STORE AND OFFICE "Walking" stylus counts papers 106 Cash register pays jack pot 131 Indexing device speeds filing 168 TOOLS Trip lever releases lock wrench 105 Soldering gun spotlights work 105 Cone holds drills at angle for grinding and honing 166 Curved tool holder for lathes 169 Clastic rod checks bearings 159 Shear notches sheet-metal corners 159 Press seals papers in plastic 158 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159 Press seals papers in 161 Shear notches sheet-metal corners 159
Stakes for logging trucks reduce highway menace

MOUSTRY

GROWS ON TABLE-TOPS



- Trained men make industry grow.
 They have the vision and "know how" it takes to develop new products, new processes. They share the rewards, too. Good jobs. High salaries. Rapid promotions.
- Thousands of today's top-flight industrial leaders got their training at home in their spare time. Their training-grounds were the tables where they studied sound, practical I. C. S. courses; the factories and offices where they applied their new-found learning.
- YOU have the same opportunities for success. In a surprisingly short time, at the cost of a few dollars a week, you can acquire the same, thorough training that helped these men make good. A table in your home can be the training-ground for your successful career in tomorrow's industry.
- You have the ambition and intelligence. I.C.S. has the training. You need all three to get ahead! The coupon below lists a few of the more than 400 business and technical subjects I.C.S. can help you master. Why put off your chances for success? Mark and mail it today.

INTERNATIONAL CORRESPONDENCE SCHOOLS



Refrigeration Steam Fitting Chemistry Courses Chemistry Analytics Chemistry Analytics Chemistry Industria Chemistry Mig. Iron & Steel	□ Structural Engineering □ Surveying and Mapping □ Communications Courses □ Practical Telephony □ Radio, General □ Radio Operating □ Radio Servicing □ Telegraph Engineering □ Electrical Courses □ Electrical Engineering □ Electrical Engineering □ Electrical Engineering □ Electrical Engineering □ Lighting Technician □ Practical Electrician □ Internal Combustion □ Engines Courses □ Auto Technician □ Aviation □ Diesel-Electric □ Diesel-Electric □ Diesel Engines □ Gas Engines □ Aeronautical Engineer's, Jr. □ Aircraft Drafting □ Flight Engineer	which I have marked X: Industrial Engineering Industrial Metallurgy Machine Shop Mechanical Dratting Mechanical Engineering Mold-Loft Work Patternmaking—Wood, Metal Reading Shop Blueprints Sheet-Metal Orafting Sheet-Metal Worker Ship Drafting Tool Designing Tool Designing Tool Designing Welding—Gas and Electric Railroad Courses Air Brake Diesel Locomotive Locomotive Engineer Locomotive Engineer Locomotive Fireman Railroad Section Foreman Steam Engineering Courses Boiler making Combustion Engineering Engine Running Marine Engineering Steam Electric Steam Engines	Textile Courses Cotton Manufacturing Rayon Weaving Textile Designing Woolen Manufacturing Business and Academic Courses Accounting Arithmetic Business Administration Business Correspondence Certified Public Accounting Commercial Commercial Commercial Cost Accounting Federal Tax First Year College Foremanship Good English Higher Mathematics Motor Traffic Salesmanship Sign Lettering Spanish Traffic Management Stenography Traffic Management
Name		Home Address	
Sity		State	* " " "

MARCH 1948



Everything in Radio at Lowest Prices

Get ALLIED'S new Catalog-biggest and most complete in Radio! Tremendous values in new Television receivers, home radios, latest Amateur receivers and station equipment, new builders' Kits, Sound Systems. Thousands of parts, tubes, test instruments, tools, books and diagrams—the world's largest stocks -all at money-saving low prices! Send for your FREE ALLIED Catalog today.

HERE'S A TYPICAL ALLIED VALUE! ----



A Quality Electric Drill Kit at a Big Savings

A wonderfully handy tool for light-duty, intermittent service in every shop. This sturdy 1/4" drill comes complete with 14 popular size drills for wood, plastics, iron and steel. De-pendable AC-DC motor operates efficiently at 1100 rpm. Has

self-lubricating oilite bearings; heavy chuck; built-in on-off switch and 7 foot cord and plug. Entire unit is balanced for easy, non-tiring work even in close quarters. For 115 volts AC-DC. An outstanding value. 46-027 (FOB Chicago)

GET THESE VALUABLE ALLIED RADIO BOOKS!



Radio Formulas & Data No. 37-752....10c Dictionary of Radio Terms No. 37-751 ... 15c Radio Circuit Handbook No. 37-753....25c Radio Builders' Handbook No. 37-750...15c Simplified Radio Servicing No. 37-755...10c Radio Data Handbook No. 37-754......25c ALL 6 BOOKS above No. 37-799.....\$1.00 Parallel Resistance and Series Capacitance Calculator, No. 37-960....25c R-F Resonance and Coil Winding Calculator. No. 37-955......25c

ALLIED RADIO CORP. 833 W. Jackson Blvd., Dept. 5-CC-8 Chicago 7, Illinois

Catalog

....enclosed

☐ Send FREE New ALLIED Catalog
☐ Send Drill Kit No. 46-027
☐ Send 6 Books No. 37-799
☐ Send Calculator No.

City......Zone....State.....

8.	
(Continued from page 8) TRANSPORTATION	,
Hand-powered tricycle. 102 Sectional buses. 114 Quick-loaded body rolls off truck 115 New combination of old ideas makes lever-pedal bicycle useful again 137 Room service by tricycle 162 Rail-cycle in mine tunnel cuts transportation time 169	
- MISCELLANEOUS	
Salty flavoring. 105 Shaver 'rocks' away whiskers. 131 Palomar mirror makes trip in insulated box. 158 Silent sound shows its muscle. 160 Race-track judges up in air over their work. 163 Muffler silences model-plane engines. 174 Colored egg whites. 175	
Craftsman and Shop Notes Index	
#17 SEE FOR THE PROPERTY OF TH	
AUTOMOTIVE Baffle directs flow of water to increase heater output184 Guard repairs crack in car bumper	
FARM	
Motorcycle wheel with lugs makes simple plant spacer194 Sectional fence dismantled to facilitate mowing 194 Homemade orchard sprayer has shielded deck215 Self-raising gate permits passage of small animals	
HOUSE AND HOME	
Easy-to-make kitchen step stool has variety of uses. 180 Solving home problems. 182 "Fire tube" aids starting fire in stove or furnace 184 Twin gables give lift to shed-type dormer 190 Putty colored before applying eliminates painting 194 Valve converts sill cock into mixing faucet 198 Water softener 199 Glass jar on clothesline post keeps pins at hand 200 Radiator warms baby's bottle 200 Hangers support planks when replacing floor beams 227	
METAL WORKING	
Hand-wrought plant stand	
PHOTOGRAPHY	6
Adhesive tape protects emulsion in processing	
RADIO & ELECTRONICS	
Foundation units for amateur transmitters	
TOOLS	

TOYS AND NOVELTIES

Tower-of-Benares puzzle fascinates	
Twin-duck shoofly gives youngsters r Block house erected on storage box	
Easter novelties	

WOODWORKING

Turned candlesticks in new styling
Wooden wheels "turned" with hand drill
Glued furniture joints dry quickly under infrared lamp184
Novel magazine rack is made with hand tools185
Our feathered friends need houses too201

MISCELLANEOUS

Blowtorch solves outdoor-cooking problems
Nonfray tips for rope
Guy hitch holds fast in marshy or sandy ground
Fountain brush to clean floors in shops and garages228 Chamfered edges help start fine threads
Die improvised from nut

IMPORTANT NOTICE—It is the intention of this mazazine to provide its readers with information regarding the latest developments in the mechanical arts. We take no responsibility as to whether the disclosures contained in our articles are covered by patents and advise readers to investigate this subject before making, using, or selling any of the products, machines, or processes described in order to avoid possible liability for patent infringements.

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE . \$4

New from Cover to Cover—1280 Pages, Fully Illus, Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users. AUDELS CARPENTERS & BUILDERS GUIDES—4 Vols.

A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations, flexible covers. Pocket size, Each volume sold separately \$1.50 a vol. AUDELS AUTOMOBILE GUIDE \$4

A practical quick ready reference book for auto mechanics, service
men, operators & owners. Explains theory, construction & service
ing of modern motor ears, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A

standard book for mechanics. New fluid drive covered.

AUDELS DIESEL ENGINE MANUAL \$2 A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines including General Motors 2 cycle Diesel. 384 pages, fully illus, flexible binding, pocket size. All details plainly brought out, this book is of extreme value to engineers, operators & students.

210 Pages. Illustrated, Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion. AUDELS WIRING DIAGRAMS

AUDELS PLUMBERS & STEAMFITTERS

GUIDES—4 Vols.

A Practical Trade Assistant & Ready Reference, Explains in plain language & by clear fillustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams. Pocket size. Each Vol. Sold Separately \$1.50 a Vol.

AUDELS SHEETMETAL WORKERS
HANDY BOOK. \$1

Practical inside information. Fundamentals of Sheet Metal Work.
388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Bef. Index.

AUDELS SHEETMETAL
PATTERN LAYOUTS

Developed by Experts for Sheet Metal Workers, Leyout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2-1125 Pages—359 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS ANSWERS ON
BLUE PRINT READING \$2
For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS NEW MACHINIST & TOOLMAKERS HANDY BOOK...\$4

Covers modern machine shop practice in all its branches, 5 practical books in 1. New from cover to cover. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses and all other machine tools, 1500 pages, fully liustrated, 5 x 6½ x 2. Indexed, 5 sections, 1—Modern Machine Shop Practice, 2—Blue Print Reading & How to Draw, 3—Calculations & Mathematics for Machinists, 4—Shop Physics, 5—How to Use the Slide Rule, 60 chapters, Easy to read and understand. A shop companion that answers your questions.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS \$2

Mathematics for home study or reference. 700 pages, 550 filus.
Practical mathematics from beginning. How to figure correctly.
Easy, correct methods covering complete review. Illus. & Indexed.

AUDELS HANDY BOOK OF

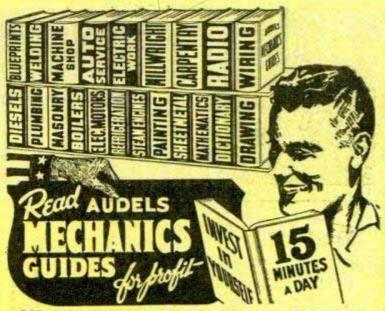
AUDELS RADIOMANS GUIDE \$4

A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio, For radio engineers, servicemen, amateurs, 914 Pages, 633 Illustratrations & Diagrams. Photos. Review Questions & Answers, Reference Index, Authentic, clear, concise.

AUDELS ELECTRONIC DEVICES. \$2
Tells What You Want to Know About Electric Eye. Easily Understood. Covers photo-electric cells & their applications. Amplifiers, illumination, frequencies, voltage, photocell, tubes, Ohm's Law, wiring diagrams, etc.

A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDEL, Publishers, 49 W. 23 St., N. Y. 10 Employed by _____



AN AUDEL GUIDE IS A GOOD FRIEND!

Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

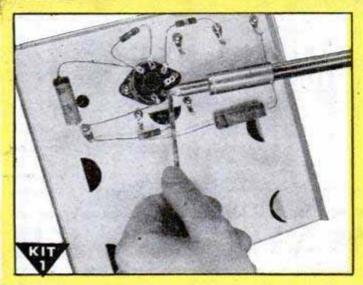
MINIMUM DECUT HERE MAN AND MAN

THEO. AUDEL & CO., 49 W. 23 St., New York 10, N. Y. Please mail me for 7 days' free examination the books

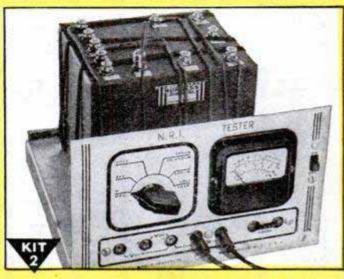
marked (X) below. I agree to mail \$1 in 7 days on each book or set ordered, and to further mail \$1 a month on each book or set ordered until I have paid purchase price. If I am not satisfied with Guides I will return them.

- A A A T T T T T T T T T T T T T T T T
Audels ELECTRIC MOTOR GUIDE
Audels OIL BURNER GUIDE
□ Audels OIL BURNER GUIDE
Audels POWER PLANT ENGINEERS GUIDE 4.
Audels PUMPS, HYDRAULICS & AIR COMPRESSORS 4.
Audels BLUE PRINT READING
Audels SHEET METAL WORKERS Handy Book 1.
Audels SHEET METAL PATTERN LAYOUTS 4.
Audels SHEET METAL PATTERN LAYOUTS 4.
□Audels AIRCRAFT WORKER
Audels MATHEMATICS and CALCULATIONS
Audels MACHINISTS & TOOLMAKERS Handy Book 4.
Audeis MACHINISIS & IOULMAKERS Handy Book 4.
□Audels MECHANICAL Dictionary 4.
Audels AUTOMOBILE GUIDE
DAUGAL DIFFEE ENCINE MANUAL
Audels MARINE ENGINEERS Handy Book 4.
Audels MECHANICAL DRAWING GUIDE 1.
Rogers MECHANICAL DRAWING and DESIGN 2.
The series in the series of th
□ Audels MILLWRIGHTS and Mechanics Guide 4.
Audels CARPENTERS and Builders Guides (4 vols.) . 6.
Audels PLUMBERS and Steamfitters Guides (4 vols.) 6.
☐ Audels MASONS and Builders Guides (4 vols.) 6.
Master PAINTER and DECORATOR
Audels GARDENERS & GROWERS GUIDES (4 vols.) 6.
Audels ENGINEERS & FIREMANS EXAMINATIONS 1
Audels ENGINEERS and Mechanics Guides
Nos. 1, 2, 3, 4, 5, 6, 7 and 8 complete
Audels Answers on Practical ENGINEERING 1.
Audels ELECTRICIANS EXAMINATIONS 1.
□Audels WIRING DIAGRAMS
Audels Handy Book of PRACTICAL ELECTRICITY . 4.
Audels ELECTRICAL POWER CALCULATIONS 2.
Audeis ELECTRICAL POWER CALCULATIONS
□Audels ELECTRONIC DEVICES
Audels ELECTRIC Dictionary
TANAL DADIOMANE CHIDE
Audels NEW ELECTRIC LIBRARY at 51.50 a Volume
Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII
DATE OF THE PARTY
Name
Address
Occupation

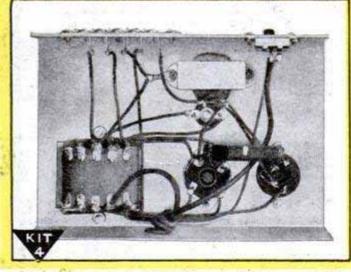
I Will Show You How to



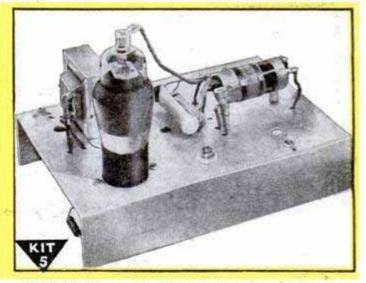
1 send you Soldering Equipment and Radio parts; show you how to do Radio soldering, how to mount and connect Radio parts; give you practical experience.



Early in my course I show you how to build this N.R.I. Tester with parts I send. It soon helps you fix neighborhood Radios and earn EXTRA money in spare time.



You get parts to build this Vacuum Tube Power Pack; make changes which give you experience with packs of many kinds, learn to correct power pack troubles.



Building this A. M. Signal Generator gives you more valuable experience. It provides amplitudemodulated signals for many tests and experiments.

Made \$612, in 12 Months, Spare Time

"Soon after I finished my experimental kits lessons I tackled my first Radio service job. The neighbors were very cooperative. I soon had the repair jobs I could handle spare time. I have made \$612 the past 12 months in spare time—J. W. CLARK, Wilmington, N.

Minister Makes \$10-\$20 Weekly **Spare Time**

"I am a minister. I am in a county soat now trying to serve the people in my church, also trying to keep their Radios playing. I have been making from \$10 to \$20 per week in spare time."—L. H. SMITH, Benton, Tenn.

Knew Nothing

Radio when I enrolled.
At oresent I am doing spare time work. I have been getting receivers to repair right along lately, and by using the methods taught me in the NRI for my Course and I have about \$200 worth of equipment which has paid for itself."—RAYMOND N. STRICKLAND. 10."—STAINGLICAMP, Vandalia, III.



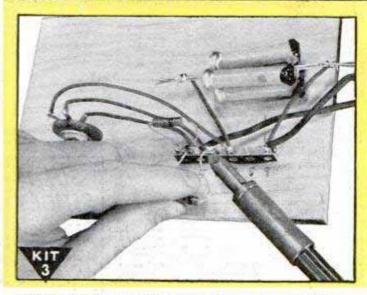
Doing Good Spare

time on any of them."-STANLEY N. STRICKLAND, 191 Dale Homes, Portsmouth, Va.

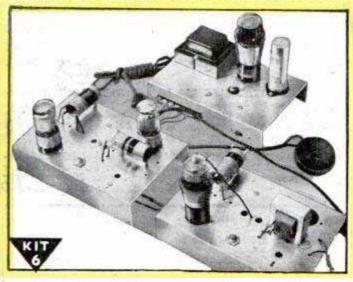


by Practicing Big Kits of Radio Parts





You get parts to build Radio Circuits; then test them; see how they work; learn how to design special circuits, how to locate and repair circuit defects.



You build this Superheterodyne Receiver which brings in local and distant stations—and gives you more experience to help you win success in Radio.

My Radio Course Includes TELEVISION . ELECTRONICS FREQUENCY MODULATION

GETTING ACQUAINTED WITH RECEIVER SERVICING

NOW RAD Win Success Vill Train You at Home

You can get this training

in your own home under

G.I. Bill. Mail

coupon for

full details.

Do you want a good-pay job in the fast-growing Radio Industry — or your own Radio Shop? Mail the Coupon for a Sample Lesson and my 64-page book, "How to Be a Success in RADIO — Television, Electronics," both FREE. See how I will train you at home — how you get practical Radio experience building, testing Radio circuits with BIG KITS OF PARTS I send!

Many Beginners Soon Make Extra Money in Spare Time While Learning

The day you enroll I start sending EXTRA MONEY manuals that show how to make EXTRA money fixing neighbors' Radios in spare time, while still learning! It's probably easier to get started now than ever before, because the Radio Repair Business is booming. Trained Radio Technicians also find profitable opportunities in Police, Aviation, Marine Radio, Broadcasting, Radio Manufacturing, Public Address work. Think of even greater opportunities as public demand for Television, FM and Electronic devices continues to grow. Send for FREE books now!

Find Out What NRI Can Do For You

Mail Coupon for Sample Lesson and my FREE 64-page book. Read the details about my Course, letters from men I trained; see how quickly, easily you can get started. No obligation! Just MAIL COUPON NOW in envelope or paste on penny postal. J. E. SMITH, President. Dept. 8CP; National Radio Institute, Pioneer Home Study Radio School, Washington 9. D. C.

How to Be a

State.

Our 34th Year of Training Men for Success in Radio

Mr. J. E. SMITH, President, Dept. 8CF National Radio Institute, Washington 9, D. C.

Mail me FREE, your sample lesson and 64-page book. (No salesman will call; Please write plainly.)

Name. Address.

City.

(Please include Post Office zone number)

Approved for Training under GI Bill

MARCH 1948



A once in a lifetime opportunity

AN OFFER THAT CANNOT BE REPEATED

AN OFFER THAT CANNOT BE REPEATED WHEN THE PRESENT SUPPLY IS GONE!

In acquiring publication rights to this famous E. S. Lincoln APPLIED ELECTRICITY series from Essential Books, Inc. we also purchased their entire remaining stock consisting of several hundred copies of each book. These books are beautifully printed and bound. They are fully authoritative and practical. The only thing wrong is that they contain the imprint of the previous publisher and not our own. Consequently, we have

decided to sell the entire lot on the basis of the same bargain price we paid for it. Later, we will reprint the entire series under the Murray Hill name — but with prices readjusted to match today's much higher production costs.

Meanwhile, as long as the present limited supply lasts, you can buy the books at the bargain prices shown below — prices which probably can

below - prices which probably can never again be repeated!

THE MURRAY HILL MANUALS IN

ΔPPLIED

Practical Guides to Industrial Equipment Installation — Operation — Repair — Maintenance

These famous handbooks are just the thing for all who have anything to do with the installation, maintenance or repair of modern electrical equipment—or for students or apprentices who know that the best way to qualify for a better job is to improve their working knowledge of modern electrical equipment and procedure.

COMPLETE . . . DEPENDABLE . . . EASY TO UNDERSTAND

Each book is written so you can easily understand it. Each covers its subject completely, both in text and in dozens of pictures, diagrams and tables. E. S. Lincoln, the author, is a Fellow of the American Institute of Electrical Engineers and has

Fellow of the American Institute of Electrical Engineers and has served as consulting engineer for many of the largest U. S. firms. His 'Lincoln's Electrical Reference' is one of the most popular, widely used books in the entire electrical industry. Now, in these Applied Mectricity manuals, he makes it possible for you to obtain authentic, intensely practical handbook and on-the-job information on a broad range of vital electrical subjects. Our special bargain offer brings them to you at amazingly low prices which may never again be repeated. Our 5-Day Money-Back Guarantee protects you absolutely. If not more than satisfied, return the books you have selected within 5 days. Your money will be refunded cheerfully and no questions asked! fully and no questions asked?

the numbers of the books you want to order.

USE COUPON

INDUSTRIAL ELECTRIC WIRING-Construction, operation and maintenance data on a-c and d-c wiring systems. 336 pp., over 100 illus. Was \$3, Now only \$2.75

CONDUCTORS AND WIRING LAYOUTS-A handbook of wires, conduits, insulations, etc. with instructions for wiring motors, switchboards, lighting systems and other industrial equipment. 342 pp., over 175 illus., etc. \$2.75

INDUSTRIAL ELECTRIC CONTROL - All about control equipment for all industrial electrical apparatus, pp., over 200 illus. Was \$3, Now only \$2.75

SWITCHBOARDS AND PANELBOARDS — Construction, operation and maintenance "know how" for all types in common industrial use. 150 pp., profusely strated. \$2.25 illustrated.

INDUSTRIAL ELECTRICAL HEATING and ELECTRICAL 5. FURNACES—Resistance, infra-red and induction heating principles with complete data on selection, installation, and operation. 192 pp., profusely illustrated.

Was \$3, Now only

\$2.25

6. FACTOR CORRECTION—A handbook of electrical protective and power factor correction circuits with handy tables and codes. 242 pp., over 200 illus.

Was \$3, Now only

\$2.50

PRIMARY AND STORAGE BATTERIES-Selection, use, maintenance of all types; also details of charging generators, rectifiers and control equipment. 168 \$2.25 profusely illustrated. Was \$3, Now only profusely illustrated.

ELECTRICAL MEASURING INSTRUMENTS — (Measure ments and surveys). Operating principles and details of all industrial types including quick reference guides to instrument selection and use. 284 pp., over 200 \$2.50 illus.

Only a few hundred of

each book available at these low prices

INDUSTRIAL ELECTRIC LAMPS AND LIGHTING - An on-the-job handbook covering all types, including fluo-rescent, black light and bactericidal. 342 pp., \$2.75 over 200 illus. Was \$3, Now only over 200 illus.

10 ELECTRIC MOTORS AND GENERATORS and Re-lated Drives — Completely covers both d-c and a-c motors of every type. 382 pp., over 200 Was \$3, Now only \$2.75 illus.

Dept.	PM-38,	Murra	ay Hi	II Boo	ks,	Inc	.,
232 1	Madison	Ave.,	New	York	16,	N.	Y.

☐ Enclosed find \$______for which please rush me the Applied Electricity Manuals checked below; or ☐ send C.O.D. for this amount (no foreign C.O.D.'s) and I will pay the postman this amount plus a few cents postage when he delivers books to me.

3 5 7 6 8

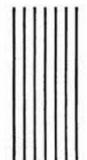
(Just circle the numbers of the books you want)

If, for any reason, the books are not what I want it is understood I have the privilege of returning them in 5 days and you will refund my money.

Name	
Address	
	100

GII

City and Zone



INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the U. S. Patent Office. For that reason, the Patent Office advises the inventor, unless he is familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

> Registered Patent Attorneys

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON

81-C District National Building + Washington 5, D. C.



Learn Fast . . . Earn Fast

HOME TRAINING Planned For Your Needs

You Build All These TESTERS... and MORE!

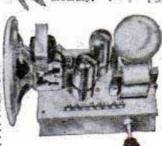


I give you a fine, mov-ing-coil type Meter Instrument on Jewel Bearings — with parts for a complete Analyz-er Circuit Continuity Tester. You learn how to check and correct Receiver defects with professional speed and accuracy.

Practice Does It!

Soldering, wiring, connecting Radio Parts
. building
circuits with
your own hands
- you can't
beat this method of learning.
When you construct this Rectifier and Filter Resistor
and Condenser
Tester, etc., you

Tester, etc., you get a really practical slant on Radio that leads to a money-making future.





It's the most suc-cessful of Home Training methods.

My perfected Radio Training prepares you to start your own Radio Service Shop—or to land a big pay Radio job. With my help you get neighborhood Radio jobs while learning—for extra cash and rich experience. I train you RIGHT—by putting you to work with your hands in your own home during spare hours. You get 8 big kits of real professional Radio Parts and Equipment—and use them to build, test and trouble-shoot a powerful 6 tube superhet receiver, a 16 range test meter set-up and over 175 fascinating, instructive Radio experiments. My Training is down-to-earth, really PRACTICAL—it's the Training you need

HABIO ELED

to make money in Radio. Theory is cut to the bone—you don't need any previous schooling or experience. Sprayberry Training starts you out at the very beginning of Radio—the lessons

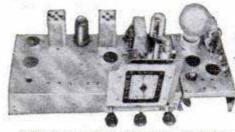
You'll find out how to build countless Radio Circuits. You'll learn a new,

fast way to test Radio Sets without

mfg. Equipment.

out at the very beginning of Radio—the lessons are completely illustrated, simply written and easy to understand.

Get the facts about Sprayberry Training NOW. Find out what it can do for you—prepare for amazing opportunities in Radio Servicing, Television, FM, Radar and Industrial Electronics. Fill out and mail coupon for my two big Books—FREE. No obligation—and no salesman will call. Mail coupon TODAY!



Building this Signal Generator and multi-purpose Tester will give you the kind of valu-able experience and practice that is so impor-tant as a foundation for making good money in Radio. It makes a breeze out of fixing Radios, and you don't have to spend money on ready-made Equipment.

VETERANS:

Approved for G.I. Training under Public Laws 16 and 346



"How to Read Radio Diagrams and Symbols" and "How to Make Money in Radio, Electronics and Tolevision." Immense, practical value to you — and they're yours FREE! ----

F. L. Sprayberry, Pres., SPRAYBERRY ACADEMY OF RADIO, 1038 Sprayberry Bldg., Pueblo, Colo.

Check here if a Veteran

(Mail in envelope or paste on penny postcard)

INVENTORS

Patent Laws Encourage The Development of Inventions

The Rules of Practice of the U. S. Patent Office advise—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims.

The firm of McMorrow, Berman and Davidson is registered to practice before the U. S. Patent Office. Additionally, it maintains a staff of attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims for filing with the Patent Office.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

135-F VICTOR BUILDING, WASHINGTON 1, D. C.

Registered Patent Attorneys 135-F Victor Building, Washington 1, D. C.

Send me further particulars as to patent protection and procedure and "Invention Record" form at once. I understand that this request does not obligate me.

Name.....

Address.....

City_____State____

-----(WRITE OR PRINT NAME CLEARLY)-----

8





APPROVED FOR VETERANS UNDER G.I. BILL

LEARN MONEY- CARTOONING
IN SPARE TIME — by Easy PICTURE
CHART METHOD! Teaches originality—
the big need today.
Same Simplified Method that has helped
train creators of "Steve Canyon," "Winnie
Winkle," "Out Our Way," "Secret Agent
X-9," "The Neighbors," "Reg"lar Fellers,"
"Strange As it Seems," and many other successful strip, sport, and editorial cartoonists.
Earn while vou learn. Don't wonder whether
you have talent—rush name, address and 10c
for Picture Chart (to test your ability), samples of successful students' work, and full
details. Please state age.

LANDON SCHOOL OF CARTOONING.

details. Please state age.
LANDON SCHOOL OF CARTOONING
4803 Cleveland Transit Bldg.
Cleveland 14, Ohio

Illustrated Lesson and Grapho Analyst

shows you how to make money at home, full or spare time.
Opportunities everywhere. FREE Analysis Offer for immediate answer. Must be over 21.
A.I.G.A. Inc., Wilhoit Bidg., Dept. 120-M, Springfield, Mo.



AT HOME. By our modern and original sys AT HOME. By our modern and original sys-tem of instruction you can learn every part of the WATCH REPAIRING TRADE AT HOME, Prepare yourself for a well-paying position or start in business after completing our course of instruction. Good watch re-pairers are in demand and generally earn very good salaries. For particulars apply to the Wisconsin School of Watch Repairing 759 North Milwaukee St., Milwaukee 2, Wis.

This new 128-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stut-tering—successful for 47 years. Benj. N. Bogue, Dept. 4824, Circle Tower, Indianapolis 4, Ind.

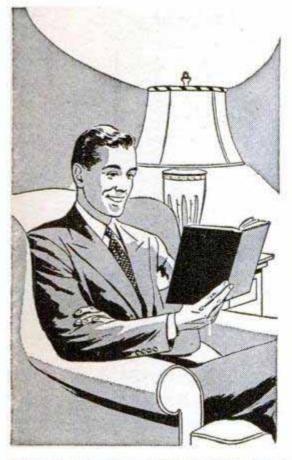


Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh-press heavily on hips and spine-enlarge openingfail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening-follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing FREE book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

CLUTHE SONS, Dept. 31, Bloomfield, New Jersey

DON'T READ ANOTHER WORD OF THIS ADVERTISEMENT



unless you're interested in a better job, a larger salary, greater responsibility! I. C. S. messages are not addressed to the idly curious—they're for the man who is curious with a purpose.

If you want to know how to start achieving advancement and success, we have important information for you.

We want to tell you that I. C. S. Courses covering more than 400 subjects are available for spare-time study at surprisingly low cost.

We want you to know that pay increases and job betterments are consistently reported to us by I. C. S. students in a volume as high as 600 and more letters a month.

Note, too, that successful I. C. S. graduates are numbered in the thousands and include presidents, production and research heads, superintendents, foremen in almost every branch of industry.

If you're truly curious, you'll want to know the details of what I. C. S. did for these men—and what it can do for you. The coupon brings you this full information. Mark and mail it right now!

INTERNATIONAL CORRESPONDENCE SCHOOLS BOX 5624-K, SCRANTON 9, PENNA. Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X: | Mechanical Drafting | Mechanical Engineering | Mold-Loft Work | Patternmaking—Wood, Metal | Reading Shop Blueprints | Sheet-Metal Drafting | Sheet-Metal Worker | Ship Drafting | Ship Drafting | Tool Designing | Too | Welding—Gas and Electric Railroad Courses | Air Brake | Car Is Radio Servicing Telegraph Engineering Chemistry Courses Business and Academic Courses Arithmetic Bookkeeping Business Administration Business Correspondence Certified Public Accounting Commercial Art Cost Accounting Federal Chemistry Courses Chemistry Analytical Chemistry, Analytical Chemistry, Industrial Chemistry, Industrial Chemistry, Industrial Chemistry, Mrg. Iron & Steel Petroleum Refining Pulp and Paper Making Civil Engineering, Architectural and Mining Courses Architectural Drafting Ruilding Estimating Academic Cours Accounting Arthmetic Business Administrat Business Correspond Certified Public Accounting Commercial Commercial Commercial Commercial First Year College Foremanship Good English Higher Mathematics Motor Traffic Salesmanship Sign Lettering Spanish Traffic Management Air Conditioning Electrical Courses Electrical States Electrical Engineering Electrical Engineering Electric Light and Power Lighting Technician Practical Electrician Power House Electric Ship Electrician Ship Fitting tural and Mining Courses Architectural Drafting Building Estimating Colvi Engineering Contracting and Building Highway Engineering Lumber Dealer Reading Structural Blueprints Sanitary Engineering Structural Orafting Structural Engineering Flight Engineer Surveying and Mapping Communications Courses Electronics Ship Electrician Internal Combustion Electrician Internal Combustion Engineer Diesel-Electric Diesel-Electric Diesel-Electric Diesel-Electric Mochanical Courses Aeronautical Engineer's, Jr. Flight Engineer Foun Hual Treatment of Metals Industrial Engineering Industrial Engineering Railroad Courses Air Brake Car Inspector Diesel Locomotive Engineer Locomotive Engineer Locomotive Fireman Railroad Section Foreman Steam Engineering Courses r's, Jr. Boilermaking Combustion Engineering Engine Running Foundry Work Marine Engineering Etals Steam Electric Steam Engines g Cotton Manufacturing Rayon Weaving Textile Designing Woolen Manufacturing ☐ Postal Service ☐ Secretarial ☐ Stenography Forging Foundry Work Forging Foundry Work Heat Treatment of Metals Industrial Engineering Industrial Metallurgy Machine Shop Machine Shop Inspection Air Conditioning and Plumbing Courses | Electronication | Electronication | Practical Telephony | Plumbing | Radio, General | Steam Fitting | Radio Operating Air Conditioning Heating Refrigeration Home Address City State Present Position Working Hours Special tuition rates to members of the Armed Forces. Special discount to World War II Veterans, diap residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

MARCH 1948 19

PATENT PROTECTION for INVENTORS

A PATENT IS A VALUABLE RIGHT

On the basis of a constitutional provision Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent from the United States Patent Office.

THE UNITED STATES PATENT OF-FICE RECOMMENDS in its Rules of Practice that "an applicant is advised, unless familiar with such matters to employ a competent registered patent attorney or registered patent agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims." WE RECOMMEND that you authorize us to conduct a search through the U. S. Patents pertinent to your invention and submit a report setting forth our opinion regarding its patentability.

Victor J. Evans & Co. has a staff of experienced registered patent attorneys, available to represent inventors in the preparation and prosecution of their cases before the Patent Office. Detailed information and the steps to be taken in obtaining patent protection will be furnished upon request.

FORM BELOW FOR MAILING CONVENIENCE

•	· · · EVANS & Co. · ·	•
•	1. 1. 1. —	•
•	Merlin M. Evans	•
•	REGISTERED PATENT ATTORNEY 330-C MERLIN BUILDING, WASHINGTON 6, D. C.	•
•	Please forward to me detailed information regarding procedure to	•
•	obtain Patent Protection, together with your convenient "Evidence of Invention" form.	•
•	Name	•
•	Address	•,
٠	City and State	•
•		•
PA	TENTS TRADEMARKS COPYRIGHT	ГS

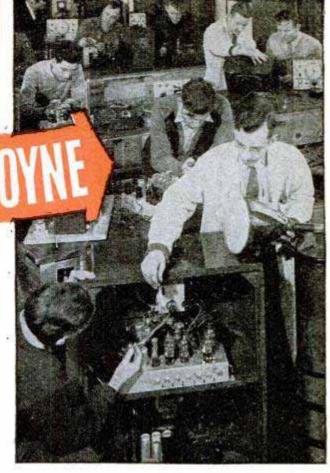
IN A FEW SHORT WEEKS

THE GREAT SHOPS OF CO

48 Years of Successful Training

Work on Actual Radio, Sound, **Television Equipment! Expert Instructors Train You by Famous** COYNE SHOP METHOD

Get ready quickly for YOUR FUTURE. Big opportunities are waiting for properly trained men in Radio Manufacturing, Radio Sales and Service, Television, Sound, Public Address. With COYNE "All Around" Training, many branches of Radio are open to you.





NOT A "HOME-STUDY" COURSE

Learn Radio Fast!

As a Coyne student you work on real equipment in our great shops in Chicago — the Ra-

B. W. COOKE World. We do not teach by mail. All Coyne training is given right here in our big

Shops in Chicago. You make rapid progress at Coyne because it's a shop course.

COYNE GRADUATES IN DEMAND

Whether you have had any actual Radio experience or not, we can train you in a few weeks for a

First we train you for a good Radio job, then help you get it. Coyne graduates may use our Lifetime Employment Service as often as they wish.

Easy to Start Own Shop

If your ambition is to be your own boss, COYNE makes it easy! We include special training in how to start your own Radio Shop, how to get business, keep records, etc., right along with our course. Then we have Free Merchandising Service for graduates to solve many problems.

We'll Finance Your Training

Non-veterans who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation. You may earn while learning, to help defray living expenses. COYNE works with you to enable you to get the training you need.

VETERANS!

Coyne is authorized to train those who qualify under the G. I. Bill of Rights.

Physical Disabilities

Men with physical disabilities may qualify for training at no cost for tuition and subsistence. Coupon brings

better job, steady work and a real future in the Radio field.

SEND FOR BIG FREE BOOK!

Our new, fully illustrated Coyne Radio Book tells all about our great Chicago shops and our plans to help you. Packed with facts and pictures. No salesman will call. No obligation.

ELECTRIC REFRIGERATION ADDED This valuable training now included

with our Radio course. B. W. COOKE, President, RADIO SCHOOL

500 S. Paulina Street Dept. 38-3H, Chicago 12, III. ESTABLISHED 1899



B. W. COOKE, Pres., Coyne Electrical & Radio School 500 S. Paulina St., Dept. 38-3H, Chicago 12, III.

details.

Dear Mr. Cooke: Send me your Big Free Radio Book and all the facts . . . also full details of your "Student Finance" plan.

NAME.....

ADDRESS.....

CITY.....STATE.....

RAINING

L FOR BIG Free

AUDELS Carpenters Ruilders Guides

inside Trade information for Carpenters, Builders, Joiners, Builders, Joiners, Builders, Joiners, Builders, Johnson, State Woodworkers. These Guides give you the short-cut instructions that you want-including new methods, ideas, solutions, plans, systems and money awing sugestions. An easy progressive governe for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, nimply Milin and mail the FREE COUPON below.

Inside Trade Information On:

How to use the steel square—How to file and set caws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint interior trim--How to paint



AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y. Audels Carpenters and Builders Guides, 4 vols., on 7 days free If OK I will remit \$1 in 7 days and \$1 monthly until \$6 is paid, rwise I will return them. No obligation unless I am satisfied,

Address	JA.	
Occupation		
	1.9	98

Learn this Profitable



IN 90 DAYS AT HOME

Money-Making Career Open to Men and Women, 18 to 50

Hundreds of men and women between 18 and 50 make \$10 to \$20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.



Anatomy Charts & Booklet FREE

Enroll now and we will include, at no extra cost, many needed supplies. Fit yourself to help meet growing demand for Scientific Swedish Massage. Send the coupen at once for complete details. Anatomy Charts and 32-Page Illustrated Booklet, FREE, postpaid.

THE	COLLEGE	OF SWEDISH	MASSAGE
The second second		The second secon	

Dept. 864C, 100 East Ohio St., Chicago II, Illinois

Please send me FREE and postpaid, Anatomy Charts, 32-page Booklet and complete details on Home Training.

Name	
Address	
City	State



sufficient Chromium, Nickel, Silver, Gold, etc., money making trade secrets Learn at home in spare time Send postcardl today for FREE electroplating idea booklet.

PLATER HYDE

432 F Street

Room 520

San Diego 1, California

Buy Direct From Factory Write for free booklet O up and price list INDEPENDENT IRON WORKS 2416 East 23rd Street, Dept. B Los Angeles 11, Calif.



WANTED

DISTRICT PURCHASING AGENTS

No experience or money required. Exceptional opportunity for those who want to establish themselves in a steady, year 'round, well paying business.

For details: Write

PURCHASING MANAGER, DEPT. C

City.

CHICAGO 25, ILL.



PLEASURE or PROFIT

Learn at home, Spare time, Practical basic training. Long-established school. Many have earned while learning. Send coupon below for free booklet, "Opportunities in Modern Photography" and full particulars.

AMERIC 315 Michigan Avenue Send booklet, "Opportun	Dept. 1353		Illinois
iculars and requirement			un par-
i u mec		Age	-

State

Zone

WHICH OF THESE O INTERESTS You MOST?

Accounting Air Conditioning Architecture & Building **Automotive Engineering Aviation**—Practical **Aviation Drafting & Design Better Foremanship** Bookkeeping **Business Management**

Contracting Diesel Engineering **Drafting & Design Electrical Engineering Electricity—Practical Electronics, Industrial** High School Courses **Machine Shop Operations Mechanical Engineering**

Plastics Engineering Plumbing—Practical **Private Secretary** Radio Operating & Servicing **Railway Training** Refrigeration Sheet Metal Pattern Drafting Shop Management **Tool Making**

THINK! LOOK FORWARD!

Business is making big, new plans Men and Women are preparing for the future WHAT ARE YOU DOING ABOUT YOUR TOMORROWS?

 Today, choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training now for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

Invest part of your spare time in more rapid progress. Start training now, in spare time in your own home. Be ready to grasp your opportunity and step out ahead of those who lack the ability you have attained.

American School, founded in 1897 as an educational institution not for profit, can help you to reach your goal just as it has helped others during the past fifty-one years. Give serious thought to the list above. Pick one or more subjects that interest you. Then check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

ME - STUDY TRAINING SINCE 1897

Take This First Easy Step

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G-345, Drexel at 58th, Chicago 37, III.

Without obligation, Please send FREE and postpaid, bulletin and details of the Subject checked.

- ☐ Accounting
 ☐ Electrical E
 ☐ Electricity-PLASTICS ENG'R
 Refrigeration
 Architecture and
 - Electrical Engr. Electricity-Pract. Electronics, Industr.
 - Bookkeeping Private Secretary ☐ Diesel Engineering
 ☐ Sheet Metal
- Architecture and
 Building
 Contracting
 Practical Plumbing
 Automotive
 Engineering
 Aviation Drafting
 Aviation
 Business Mgnment
 Railway Training Pattern Drafting
- ☐ Drafting and Design for Men and Women ☐ Radio
- High School Air Conditioning Mechanical Eng.
- Shop Management Tool Making Better Forema Machine Shop Operations

..... Occupation

AMERICAN SCHOOL

Dept. G-345, Drexel at 58th Street, Chicago 37

YOUR steppingstone to a BETTER-PAYING



MACHINIS

Master shop work quickly with these books

This big home-study and reference course gives you the practical facts on machines and methods you need to advance in machine shop work. Take advantage of the other man's experience as found in books, to solve your problems, increase your efficiency, with

The AMERICAN MACHINISTS' LIBRARY

volumes-2368 pages-2516 illustrations (A combined home-study course and reference library)

This library of machine shop practice was written for practical men. It gives you the best methods for every kind of machine shop work. It fully explains lathes, drills, and other machine tools and their operation, automatic screw machines, speeds and feeds, gear design and production, jigs and fixtures, punch and die work, metal surfacing, etc., etc. Plainly written—completely illustrated—the best kind of help to the machine shop man who wants to advance himself.

No money down-special price-easy payments.

	001011
McGraw-Hill Book Co., Inc., 330 W Send me for ten days' examination th Library. If satisfactory I will send you \$4.00 monthly until the price of \$20.00 I will return the books postpaid.	e American Machinists'
Name	
Home Address	-12/-10/-5H
City and State	
Company	
Position	PM-3-48

Do you want

.. to go to College?

.. or to enter a Profession?

(Such as Accounting, Architecture, Nursing, Dentistry; Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

.. or get an Office Position?

To get anywhere, you practically MUST finish High School FIRST. You can complete our simplified High School Course in SPARE time at home, as FAST as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry, Standard texts furnished. Diploms. Credit for H. S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education NOW, Write TODAY!

School

American School,	nehr.	H349,	Diezei	A46. 31	20III	ar" Puicako	3/, 111.
Gentlemen:	Send	me	FREE	inform	ation	covering	specia

		information covering special low. No obligation on my part
High	School Course itecture and Building	Diesel Engineering
☐ Busin	motive Engineering ness Management	for Men & Women
☐ Elec.	rical Engineering and Gas Refrigeration Conditioning	Private Secretary Mechanical Engineerin Aviation
Raily	vay Training ronics, Industrial	Salesmanship

ame	• • • • • • • • • • • • • • • • • • • •	 	

SEND FOR THIS HOW to BREAK and TRAIN HORSES Make money with horses. Every farmer, every lover of horsesses should have a copy of this booklet. If you want to know how to break, train and make money with horses, write today for full information FREE, together with my special offer of a course in with my special other of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse check here. Do u today—now. You'll never regret u.

SCHOOL OF HORSEMANSHIP Dept. 1103 Pleasant Hill, Ohlo

ZE Handwri

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

A.I.G.A. Inc.

Wilhoit Bldg., Dept. 120 Springfield, Mo.



SHOE REPAIR OFFERS BIG

LEARN IN 12 WEEKS TIME

In 12 weeks time you can own your own shop or earn big income as skilled shoe repairman. Growing demand everywhere at top wages for men who know how. We teach you quickly by actually working on shoes and modern machines. Costs nothing under G.I. Bill of Rights. We help you get big pay job or start your own shop in 12 short weeks. School open to all from 18 to 60 years of age. FREE BIG 16 PAGE BOOK explains everything. Send for your copy today.

MODERN SHOE REBUILDING SCHOOL
ESTABLISHED 1927
2937 Belmont Ave., Chicago, III. RUSH POSTCARD TODAY

THERE'S MONEY

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS at home that you may SELL! Course contains 26 lessons and over 600 illustrations. All for Only...

RAYE BURNS SCHOOL, Dept. M, Box 3583, CLEVELAND, OHIO

LANDSCAPI

Profitable, healthful career—absorbing hobby, for men, women. Thorough 45-lesson home-study course takes 8-12 months spare time. Hundreds of successful graduates all over the world. 31st year. Send for FREE catalog.

American Landscape School, 6481 Grand Ave., Des Moines, Iowa

Learn BAKING At

Baking is one of America's high industries in wages.

Nearly depression-proof. Thorough basic home course
lays sound foundation. If you have aptitude, write fo

FREE BOOKLET, "Opportunities in Commercial Baking. National Baking School, 1315 Mich. Ave., Dept. 1353, Chicago 5



SAY YOU SAW IT IN POPULAR MECHANICS



STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF L Dept. 87-M, 646 N. Michigan Ave., Chicago 11, III.

KLUTCH holds them tighter

KLUTCH forms a comfort cushion; holds dental plates so much firmer and snugger that one can eat and talk with greater comfort and security; in many cases almost as well as with natural teeth. Kutch lessens the constant fear of a dropping, rocking, chafing plate. 25c and 50c at druggists . . . If your druggist hasn't it, don't waste money on substitutes, but send us 10c and we will mail you a generous trial box. © I. P. INC.

KLUTCH CO.

Box 4893-C

ELMIRA, N. Y.

RADIO FIRCTRONICS A BUSI

As a HOME STUDENT, you receive a modern Home Lobaratory that provides the practical experience you need — including 16 mm, HOME MOVIES to speed your progress.



If you choose to get your training in our new, modern Chicago Lebarotory, you will work with lots of Radio-Electronic equipment under the personal supervision of some of the finest instructors in the field.

VALUABLE EMPLOYMENT SERVICE. When you complete either training, our effective Employment Service helps you get started toward a real Radio-Electronic future. Mail the coupon below today . . . do not delay.

DeForest's Training, Inc.

Associated with the DeVry Corporation Builders of Electronic & Movie Equipment

Do You Want More Money

A GOOD JOB or

BUSINESS OF YOUR OWN ...

... Then You Can't Afford to Pass Up This OPPORTUNITY

For more than sixteen years we have been helping men like yourself... men who sought opportunity ... men who wanted to get ahead. We believe we understand your problem as we have understood the problems of thousands of others.

NO ADVANCED EDUCATION . . . NO EXPERIENCE NECESSARY

Fill in the coupon below and you will get, absolutely FREE, facts concerning our work, as well as information showing how we prepare YOU to get started in America's great opportunity field of Radio and Electronics. You'll see HOW you can tie in your future with a field that includes Television, FM Radio, Aviation Radio, Pre-Radar, Industrial Electronics, Broadcast Radio, 2-Way Train Radio, etc. You'll see HOW you may cash in on a grand opportunity to have your own business, or a real job—doing really interesting work!

TAKE YOUR CHOICE

- Our new, modern Chicago Training Center offers some of the finest RADIO-ELECTRONICS-TELEVISION training facilities in the nation. We will find comfortable living quarters for you.
- You can get similar practical training in your spare time at home. You use 8 big kits of Radio parts and assemblies giving you valuable practical experience at home from working out dozens of fascinating Radio-Electronic circuits. You also get instructive MOVIES RIGHT IN YOUR HOME.

VETERANS! Both our (1) Chicago Laboratory and (2) Home Training are accepted under the "G. I. Law."



MAIL THIS OPPORTUNITY COUPON NOW

	Mr. E. B. DeVry, President
	Deforest's Training, Inc.
M	2533 N. Ashland Ave., Dept. PM-E3 Chicago 14, III,
	Please show me how I may get started toward a good job or a busi-
	ness of my own in Radio-Electronics.
=	Name Age
-	Address Apt
81	
=	If under 16, check here for special information. If a discharged veteran of World Wor II, check here.

MARCH 1948 . 25

a small investment will establish you in . . . Write for FREE Your OWN Booklet Business We are NOW enlarging our organiza-tion of U.S.A. and Canadian DURA-CLEAN dealers, in territories still open. Here is an opportunity to BE YOUR OWN BOSS . . . to become financially independent with a business of your own! You become a fabric specialist, providing the proper cleaning and moth protection upholstery and coverings. You use the proven, suc-cessful methods of of established dealers. Service is rendered right in the home, office or public build-ings without remov-

DURACLEAN Service was established 17 years ago as an improved method for cleaning and revitalizing rugs and furniture. No brush machine rubbing, soaking or shrinking. No inconvenience for your

DURAPROOF makes fabrics and rugs repellent to moths, carpet beetles and mildew. You give a 4-YEAR Warranty of Protection.

These services have a waiting market . . . a big repeat business. Profits up to \$20 a day on EACH of your service men. Write today! A letter and 16 page illustrated booklet will explain everything.

- No Overhead Expense
- · No Shop Necessary

ing furnishings.

- No Experience Needed
- · You Learn Quickly, Easily
- · Short Hours . . . Large Profits

Patented

Service Nationally Advertised

Don't delay! Territories are limited. Remember, just a moderate payment, easy terms, and the opportunity to become financially independent in YOUR OWN BUSINESS!

DURACLEAN CO., 16-3 Ct., Deerfield, Illinois

MAXIMUM TRAINING IN MINIMUM TIME

CAL-AERO TECH TRAINING will add dollars to your pay check all the rest of your life. Specializing in AERONAUTICAL ENGINEER-ING and MASTER AVIATION MECHANICS since 1929, Cal-Aero Tech training is carefully designed for just one thing—TO MAKE MORE MONEY FOR YOU. An alumni of over 6000 successful graduates proves our career training is unsurpassed.

VETERANS -Write us about Aviation Training, as provided under "G.I.Bill of Rights."



GRAND CENTRAL AIR TERMINAL GLENDALE 1, CALIFORNIA

MAIL THIS COUPON TODAY	4
------------------------	---

	m, Grand Ceatral Airport, Utandale 1, Colifornia Irmetion on Arietica Training FREE—without obligation. Dept.	РМ-3
Name	Birth Date	

EASY TO MAKE Profitable to Sell!

Become a manufacturer of Novelties! Enjoy continuous business filling orders from chain stores, gift shops, etc. Regular orders amounting to thousands of dollars come from these customers. A business easy to get into. You need no experience. Make merchandise that has sold steadily and profitably for years. Now, the demand for it is amazingly increasing. Gives you opportunity to enjoy splendid business right now.

START YOUR OWN THRIVING **BUSINESS ON LITTLE MONEY**

Successful manufacturer shows you how. Start in garage, basement, etc. No machinery needed, no priority on materials. You make large profits. Surprisingly easy and quick to learn. And, it doesn't matter what your age may be or what kind of work you have previously done, you'll find this a business made to order for you. Why not write at once for illustrated and descriptive folio enclosing 10c stamps or coin.

PLASTEX PRODUCTS

711-M LAGUNA ST.

SAN FRANCISCO 2, CALIF.

FREE

THE LAW TRAINED

Write today for FREE 48-page book, "THE LAW-TRAINED MAN," which shows how to learn law easily in spare time at home through the Blackstone course prepared by 60 well-known law authorities. We furnish all material including 18-volume Modern American Law library. Many successful attorneys among our graduates. LL.B. degree. Moderate cost; easy terms: Money-Back Agreement Money-Back Agreement.

BLACKSTONE COLLEGE OF LAW 225 N. Michigan Ave., Dept. 53, Chicago 1, III.

A Correspondence Institution Founded in 1890

rite Stories

Mrs. Grace Blanchard had an IDEA for a story. We criticized her story, gave

an IDEA for a story, we criticized her story, gave it a new title and told her where TO SEND IT. She got a substantial check THE FIRST TIME OUT. That is a THRILL many of our graduates have each month. Let 30 years of experience guide YOU. Endorsed by Jack London, FREE BOOKLET "THE ART OF STORY WRITING" with explanation of our personal criticism and manuscript sales service. No obligation. Writel HOOSIER INSTITUTE, Dept. 143, 120 S. La Salie St., Chicago 3, Ill.

Exciting, new book tells about "ATOMIC ENERGY"

and "THE WONDERS OF CHEMISTRY"

Also shows how to amaze friends with Chemcraft magic and do many exciting home experiments. Free. Send today! THE PORTER CHEMICAL CO., 12 Prospect Ave., Hagerstown, Md.



ARTISTS MAKE MONEY

Do you like to draw? Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, Inc.

3138 ART INSTRUCTION BLDG., MINNEAPOLIS 15, MINN.

SAY YOU SAW IT IN POPULAR MECHANICS

AGENTS 300% SIGN

For Store Fronts and Office Windows. Anyone can put them on. Free Samples. Liberal Offer to Gen-Agents.

METALLIC LETTER CO., 430 N. Clark, Chicago 10



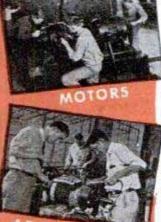
682 BAR ST., AKRON, OHIO



in the

GREAT SHOPS OF

ACTUAL SHOP SCENES AT







ELECTRICAL AND RADIO SCHOOL 500 S. Paulina St., Dept. 38-72 Chicago 12, Illinois

NOT A "HOME-STUDY COURSE"

For nearly 50 years, the Great Shops of COYNE in Chicago have been training men to step into the better-paying jobs in ELECTRICITY. Here in just a few short weeks YOU can quickly prepare for amazing opportunities.



B. W. COOKE

As a Coyne student you work on real equipment — just like you'll use later on the job. We do not teach by mail. You get actual shop work plus necessary theory. Coyne training is practical. You make rapid progress at COYNE because it's a shop course.

GET ALL-AROUND TRAINING in a Few Short Weeks

Why be satisfied with a "one-operation" job? At Coyne you learn Motors, Armature Winding, House and Factory Wiring, Appliances, Power Plant Work, Illumination, Electrical Maintenance-plus the fast-growing branch of Industrial Electronics. Whether you're experienced or not, we train you for a good job, then help you get it! Coyne graduates may use our Lifetime Employment Service as often as they wish.

INDUSTRIAL ELECTRONICS and REFRIGERATION Included

Added training in Electric Refrigeration-principles, testing, repairing-is included with this course. Industrial Electronics given as part of our "all-around" Electrical Training.

VETERANS! Coyne is authorized to accept veterans for G. I. Training. Coupon brings special G. I. Bulletin.

NON-VETERANS who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation.

ANY MAN WITH A PHYSICAL DISABIL-ITY whether a Veteran or not may qualify for Coyne training at no cost to himself for tuition or subsistence. Mail coupon for details,

MAIL COUPON for Big FREE Book

Find out NOW what Coyne offers in training for your future. Coupon brings big book filled with fascinating pictures of our great shops and our plans to help YOU. Get your

copy FREE. No cost or obligation. and no salesman will call. Rush the coupon TODAY.



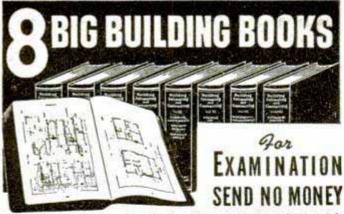
B. W. Cooke, President, Coyne Electrical and Radio School, Dept. 38-72, 500 S. Paulina St., Chicago 12, Ill.

Send me your Free Book and tell me about your plans to help me—including Student Fianance and added Training in Industrial Electronics and Electric Refrigeration.

NAME.....

CITY.....STATE.....

ESTABLISHED 1899



Learn to draw plans, estimate, be a live-wire builder, do remodeling, take contracting jobs. These 8 practical, profusely illustrated books cover subjects that will help you to get more work and make more money. Architectural design and drawing, estimating, steel square, roof framing, construction, painting and decorating, heating, air-conditioning, concrete forms and many other subjects are included.

BETTER JOBS - BETTER PAY UP-TO-DATE

The postwar building boom is in full swing and trained men are needed. Big opportunities are always for MEN WHO KNOW HOW. These the most un-to-books supply quick easily understand the most un-to-books supply quick easily understand the most un-to-books. books supply quick easily understood training and handy, permanent reference information that helps solve building problems.

These books are the most un-to-date and complete we have ever-pub-lished on these many subjects.

Coupon Brings Eight Big Books for Examination

AMERICAN TECHNICAL SOCIETY Vocational Publishers since 1898 Dept. G319 Drexel at 58th Street Chicago 37, 111.

Drexel at 58th Street Chicago 37, 111. You may ship me the Up-to-Date edition of your eight big books, "Building, Estimating and Contracting," without any obligation to buy, I will pay the delivery charges only, and if fully satisfied in tendays, I will send you \$2.00, and after that only \$3.00 a month, until the total price of only \$34.80 is paid. I am not obligated in any way unless I keep the books.

Name			
Address	-154-15-1	DESTRUCTED	

City-State. Please attach a letter stating your age, occupation, employer's name and address of at least one business man as a reference. Men in service, also please give home address.

& BUILDERS GUIDES



Inside Trade Information for Bricklayers, Cement Workers, Plasterers, Tile & Stone Setters.

Covering: BRICK LAYING 4 vols. tools, materials, bonding mortars,

designs, setting Frames, Foundations, Arches, Chimneys and Repairing old brick work. GLASS BRICK and TILE SETTING, hollow tile, walls, roofing. Placing re-inforced work, stucco, water-proofing, Plastering in all its branches, wall board. Stone Masonry, Mosaic and Steel Construction. INCLUDING CONGRETE MIXING— CONCRETE BLOCK CONSTRUCTION

1100 Pages, 2067 illustrations, Handy Size. HIGHLY ENDORSED. ASK TO SEE THEM! TO GET THIS ASSISTANCE FOR YOURSELF FILL IN AND



__MAIL ORDER. AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y. Mail Audels Masons and Builders Guides, 4 vols. on 7 days' free trial. If O.K. I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. Otherwise I will return them. No obligation unless I am satisfied.

(ame
lddress
Occupation
THE STATE OF THE S

Do You Make These Mistakes in English?

MANY persons say "between you and I" instead of "between

MANY persons say "between you and I" instead of "between you and me"—or use "who" for "whom"—or don't know whether to spell certain words with one or two "c's" or "m's" or "r's," or with "ie" or "ei," etc. Every time you speak or write you show what you are. Mistakes in English reveal lack of education, refinement, lack of language power prevents you from presenting your thoughts in the strongest way. Real command of English will help you reach ANY goal. Stop making mistakes in spelling, punctuation, pronunciation, grammar, Increase your vocabulary.



SUBSCRIBE

TODAY

WONDERFUL INVENTION

Only 15 minutes a day with Sherwin Cody's new invention—and you can actually SEE your English improve. It teaches by HABIT—makes it easier to do the RIGHT way. Wonderful self-correcting lessons.

PREE BOOK ON ENGLISH Lack of language power may be costing you friendships, income, every year. See what Mr. Cody can do for you; it costs nothing to find out. Write this very minute for free book, "Bow You Can Master Good English in 15 Minutes a Day." It will prove a revelation. WILTE NOW. SHERWIN CODY SCHOOL OF ENGLISH, 53 B & O Bidg., Rochester 4, N. Y.

Be A MASTER PLUMBER

■Earn \$15 To \$50 A Day•

DON'T ENVY THE PLUMBER -- BE ONE

Every skilled workman will tell you that Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job-compare his opportunities with any trade, plus the opportupities of having your own shop. We teach you Plumbing with TOOLS (not books) under Licensed Master PLUMBERS in one of the finest equipped schools in America. We make you a Plumber, every branch is taught thoroughly—Lead Work—Blueprint for plan reading—all other tricks.

LEARN IN 30 WEEKS WITHOUT PREVIOUS

If you like to work with tools you owe it to yourself to investigate. No need to ever work as an apprentice. Get free bulletin, Write now! G.I. APPROVED. Our 24th year.

UNIVERSAL PLUMBING SCHOOL KANSAS CITY, MO.

HORSE MASTERY!

A FINE HOBBY - A GREAT VOCATION !

"The EXPERT HORSEMAN"

PREE BOOK —Tells how You can learn to:

BREAK COLTS, GAIT SHOW HORSES, TRAIN

RODEO, STOCK and RACE HORSES, BREAK BAD HABITS,

HAMBLE ANY HORSE. TRAIN CIRCUS TRICK MORSES, WRITE TODAYS.

ANIMAL LOVERS ASSOCIATION TARZANA, CALIFORNIA

PROFIT! If you have an inventive turn of mind, write for free 28-page booklet explaining how the Institute of American Inventors is helping inventors pre-test the profit possibilities of proposed devices to fill today's unprecedented demand for useful new inventions.

INSTITUTE OF AMERICAN INVENTORS

Dept. 4, 1926 Eye St., NW, Washington 6, D. C.

RUPTURE!

An amazing Air-Cushion Invention allows body freedom at work or play. Light, neat, cool, sanitary.



Durable, cheap. Day and night protection helps Nature support weakened muscles gently but surely. No risk. Sent on Trial! Write NOW for free Booklet and Proof of Results. All correspondence confidential.

Brooks Company, 161-A State St., Marshall, Mich. *



AUTOMOTIVE & TRACTOR

Covers all phases of mechanical traincovers all phases of mechanical train-ing, tune-up, service, general trouble shooting, and repair. Includes latest types of cars, motors, and equipment for thirty-four weeks of work projects.



ELECTRICITY Basic principles, magnetism, current electricity, residential and industrial wiring, appliance repair,



SHOE REPAIR From simplest repairs on boots and shoes to the finest details of reconditioning and rebuilding under expert craftsmen. 39 Weeks.

Be Sure of your Futu

MASTER A TRADE NATIONAL TRADE SCHOOL

KANSAS CITY, MISSOURI

Choose 1 of these 5 Important Trades

and Learn it the RIGHT way-

- In the most modern shop—with every facility and the latest scientific equipment.
- Under the instruction of Technicians with years of actual experience in the Trade.
- With both theoretical training and practical application.

You will be equipped to handle the most difficult job-or go into business for yourself. You will ALWAYS be able to earn a good living. You need NEVER have to be "laid off" or retired for-

These 5 Trades are Lifetime Trades

They are Essential to All Living—Boom—Depression—or Normal Times . . . and You'll be Happy in them, because you'll know you're Efficient in a real service. Classes 6 Hours daily—5 days a week—well ventilated classroom and shop every convenience.

VETERANS We are fully approved for Veterans' Training. You owe it to yourself to get complete information regarding our schools before you make a decision. We challenge comparison.

Enroll with NATIONAL TRADE SCHOOL and be prepared for a money-making career all of your life. Take advantage of the advice of our counsellors.

Write For Full Details WRITE TODAY

State

PLUMBING From pipe cutting, threading, and lead work to home and industrial installations, every step is worked out in our most modern shops, 34 Weeks.

DRAFTING Elements and technique, drafting geometry, construc-tion plans and specifications, auxelevations, every phase. 32 iliary Weeks

National Trade School, Dept. A, 2610 Grand, Kansas City 8, Mo.

Without	obligation	to	me	please	send	full	information	on
the cours	es checked			-				

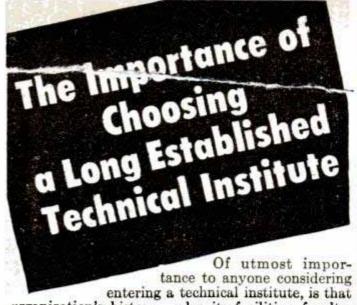
Automotive and Tractor Technician Plumbing _____Electricity

Shoe Repairing Name_ Age_

Address_ City_

Veteran?

Drafting



organization's history - also its facilities, faculty, and record of successful alumni. The Milwaukee School of Engineering, for 44 years has been training men for specific and substantial careers in industry. More than 35,000 former students now in industries the world over attest the career-building value of the Milwaukee School of Engineering, through its exceptional facilities in buildings, shops, laboratories, classrooms — and the comprehensive, practical technical courses under the supervision of its faculty of 72 specialists.

SPECIALIZE IN 6 MONTHS TO 3 YEARS

COURSES

SERVICE

- 6 to 12 Months
- Electricity Welding
- Refrigeration
- Heating TECHNICIAN
- 1 to 2 Years
- Electricity
- Radio
- Electronics
- Refrigeration, Heating and Air Conditioning PROFESSIONAL

3 Years

Electrical Engineering Bachelor of Science Degree

Major in Machinery or Electronics

Our time-tested CON-CENTRIC SYSTEM enables you to build your career step by step. Each 6-month course is complete in itself, yet prepares you for advanced courses. You train as long as circumstances permit — until you reach the "top step" in your desired occupational objective. 1,538 students now enrolled from 48 states and 13 overseas countries.

Terms Start April, July, September

MILWAUKEE CHAL OF ENGINEERING A Technical Institute

MAIL COUPON TODAY!

•	Milwaukee School of Engineering, Dept. PM-348 N. Broadway and E. State, Milwaukee, Wisconsin
1	Without obligation, send me free booklet "Career Building"
•	and more details on course in
ı	Name
	Address
•	. City



WHY DON'T YOU

PLASTI-LINER CO., Dept. 43C Buffalo 2, N.Y.

Writing short stories, articles on business, sports, homemaking, gardening, shop crafts, local and club activities, etc., will enable you to earn extra money. In your own home, on your own time, the New York Copy Desk Method teaches you how to write—the way newspaper men learn, by writing. Our unique "Writing Aptitude Test" tells whether you possess the fundamental qualities essential to successful writing. You'll enjoy this test. Write for it, without cost or obligation.

Veterans: This course approved for Veterans' Training.

NEWSPAPER INSTITUTE OF AMERICA SUITE 5598-C, ONE PARK AVENUE, NEW YORK 16, N. Y.





MAKE MAGIC YOUR HOBB

BE A MAGICIAN FOR FUN OR PROFITI



Sensational MONEY MAKING MYBRID. Customers re broilers 8 weeks, laying 4 1-2 mos. Disease Hardy Layers. 50,000 chicks weekly. ts. Profit Sharing Plan. FREE Book, Writ BERRY BROS, FARMS, Box 592. ATCHISON, KANS.

FREE MRS. BERRY'S POULTRY BOOK BABY CHICKS or STARTED, Champion-Mated, Licensed-Inspected, B.W.D. TESTED, S2 BREEDS, 6 HYBRIDS, Sexed or straight. Mature fowls, Hatching Eggs and Rem-Sexed or straight. Mature fowls, Hatching Sego and edies LOW PRICES. The ORIGINAL Berry's Farm— over 50 years service. LARGE BEAUTIFUL BOOK PREE, Stamps appreciated.
BERRY POULTRY FARM, Bx. 29, CLARINDA, IOWA

FIBRE ARMS AND LEGS!

BUCHSTEIN-MEDCALF

Light, correctly fitted, strong and com-fortable. Natural appearance. Braces for all deformities. Scientific design. Fair Terms. 223 S. 6th St., Minneapolis, Minn.



Let this Great School qualify You!

LEARN AT HOME IN YOUR SPARE TIME

With National Schools' tested and proved Master Shop Method of Home Training, you can become a qualified Diesel and Automotive technician equipped to step right into a good paying job. One of America's great trade schools, established in 1905, stands behind your training!

National Schools-trained Diesel and Automotive Technicians Are Welcome Everywhere

Our files are filled with facts of National Schools-trained men who have reached success in their chosen field because of the thorough, practical and up-to-date instruction we of the tho

Diesel is becoming more and more important in transporta-tion, industry and agriculture all over the world. Trained men who really know Carburetion, Ignition, Fuel-Injection, Motor Tune-up, etc., are in constant demand to fill interest-ing, good pay jobs. Opportunity is here now for you!

Every Word and Picture in Your Home Study Course Comes Out of the Great National Schools Training Shops

Behind all National Schools training is our permanent faculty of experienced instructors and engineers who will teach you about Diesel-electric. Internal Combustion Engines, including Diesel, Gasoline and Butane Types, Highotane fuels, Automotive Drive Systems, etc. National Schools instructors are daily teaching resident students in our modern, fully equipped Shops and Classrooms, using the same instruction methods and lessons you study at home in your spare time. These instructors know how to guide your home study!

OPPORTUNITIES IN DIESEL, AUTOMOTIS AND ALLIED MECHANICS

G. I. APPROVED

FREE BOOKS

TOUR FUTURE

It will cost you nothing to learn how you can grasp opportunity in the great Diesel industry. Send the coupon below for a sample lesson from National Schools' Home Study Course, and your big Oppor-tunity Book giving further infor-

NATIONAL SCHOOLS

MAIL OPPORTUNITY COUPON FOR QUICK ACTION (Mail in envelope National Schools, Dept. PMD-3 4000 South Figueroa Street Los Angeles 37, California Mail me FREE the book, YOUR FUTURE IN DIESEL, together with the Sample Lesson. I understand I may keep and use the information with no obligation. Name Address Zone State ☐ Check here if Veteran of World War II

SAY YOU SAW IT IN POPULAR MECHANICS

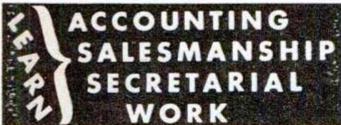
Master Watchmakin

The life-long profitable trade of thousands as taught by the Sweazey System.

"FAMED THE WORLD OVER"

CHICAGO SCHOOL OF WATCHMAKING

Founded in 1908 by Thomas B. Sweaz 1608 N. Milwaukee Ave., Dept. 138 Chicago 47, III.



found and how you can qualify for them by study at home or in our resident school. We have thousands of successful graduates and maintain nationwide employment service. G. I. Approved.

V) WORK	0
ssure Your Future Now!	n
ll's, one of America's outstanding Business Schools, lers you the opportunity to enter one of the three	
lds acknowledged to hold substantial earnings and secure future. Our FREE book, "Through Hill's to	
ccess." tells how and where the best positions are	1

HIS HANDY COUPON

619 W. Main St., Oklahoma City 2, Ok Please send me your Free book, "Thro	
NAME	
(AADIE	
ADDRESS	



UDELS PLUMBERS & TEAM FITTERS GUIDES. This valuable set explains in practical concise language the principles, advances and shortcuts of the tradebased on good practice. Includes careful detailed instructions on how to figure & calculate various jobs. A quick reference; saving time & money. A complete Trade course.

Over 1,670 Pages 3,642 Trade Illustrations

PRACTICAL TRADE INFORMATION ON:



Soldering, tinning, Joint wiping, bending, beating Pipe—iron—steel, threading, Mathematics, tables, physics, Materials—iron, steel, copper, brass, lead, tin, antimony; etc. Sheet metal—galvanized—plate. Sanitation, syphonage, tanks, Drainage, sewage, purification, Fixtures—bath—kitchen, Pipe fittings, soil pipe, tools, Laying out work, Roughing, Screwed fittings, flanges, joints, Pipe bending, examples, Elbows, Heating, ventilation, air conditioning, refrigeration. Water supply, mains, weils, tanks, Gas-fittings, Sheet metal work, problems, methods, Brazing, heating, lead burning, Weiding, various welds, methods, Blacksmithing, forges, tools, Copper Tubing, Marine Pice Fitting & Oil Burners, HIGHLY ENDORSED—ASK TO SEE THEM. TO GET THIS ASSISTANCE FOR YOURSELF, FILL IN AND



MAIL ORDER

AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y. Mail Audels Plumbers' Guides, 4 vols, on 7 days' free trial, If O. K. I will remit \$1 in 7 days and \$1 monthly until \$6 is paid. Otherwise I will return them, No obligation unless I am

4 50
VOLS.
COMPLETE
DAY ONLY

\$1 A MO. Employed by_____



Trained Artists Are Capable of Earning \$60-\$75 AND MORE A WEEK

engraving, or in art studios where you can be-come your own boss. For

34 years our graduates have been "making good"

WHY NOT YOU

Write for FREE BOOK, "Art for Pleasure & Profit"—tells about our course, instruction service, material furnished, what our graduates say, and commercial opportunities for you. TWO ART OUTFITS and other features included with training.

Veterans! Course "G.I." Approved

FREE BOOK gives details! Washington School of Art, Studio 123M 1115-15th St., N.W., Washington 5, D. C. Please send me full information and your Free Book, "Art for Pleasure and Profit."

Name Street

Zone_State_ I am entitled to training under the GI Bill City



NEW BALL BEARING LIVE CENTER

Designed for maximum strength and rigidity, the Ball Bearing Live Center is recommended for high speeds, heavy



Center with No. 2 taper shank \$11.50

With No. 3 shank . 13.50

SOUTH BEND LATHE WORKS South Bend 22, Ind.

Catching Crooks Through Finger Prints!

A Steady, Regular-Pay Profession Can Be LEARNED

For over thirty years we have taught this exciting, fascinating work which may be learned at home in your spare time. Over 800 of America's Identification Bureaus employ I. A. S. students or graduates. As new Bureaus are established and old Bureaus grow Bureaus are established and old Bureaus grow larger, more trained men are needed. Prepare yourself to fill a responsible, well paid position in this important field. Cost is low. Pay as you learn. Write today.

FREE: "The Blue Book of Crime," full of information, Send today, State age, " full of interesting

INSTITUTE OF APPLIED SCIENCE Dept. 1353, 1920 Sunnyside Ave., Chicago 40, III.

LEARN NEW PROFITABLE PROFESSION At Home in 60 Days, Men & Women, 18 to 70!

Earnings of men and women in this profession Farnings of men and women in this profession run as high as \$5,000-\$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for FREE BULLETIN.

FRANKLIN CREDIT SCHOOL

Dept. 75-C ROANOKE 7, VIRGINIA



How to Make Money With Simple Cartoons

A book everyone who likes to draw should have. It is free; no obligations. Simply address CARTOONISTS' EXCHANGE

Dept. 93D

Pleasant Hill, Ohio

DEGREE IN 27 MONTHS

COLLEGE

Aeronautical, Chemical, Civil, Electrical, Mechanical, and Radio Engineering (inc. television).
Drafting, 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center.
Students from 48 states, 18 countries. Demand for graduates. Enter March, June, Sept., Dec.

538 E. Washington Blvd., Ft. Wayne 2, Ind.

APTETUDE TESTS

discover the kind of work or studies

cess! You get a personal report—a guide for life—more happiness—more prosperity. For men, women, boys and girls. Write for complete facts.

VOCATIONAL COUNSELING INSTITUTE 956 Maccabees Bidg., Detroit 2, Michigan

SECRET OF CONTENTMENT, HAPPINESS!

Free book tells how to solve mental worries, gain peace of mind thru META-PHYSICS, PSYCHOLOGY. Win the degree of Ps.D. or Ms.D. Experience the revelation of truth. Chartered college. Write

COLLEGE OF UNIVERSAL TRUTH, 5153-V North Clark St., Chicago

GOLDEN HAMSTERS Raise 1

The new wonder animals from Syria. Look like Toy Red Bears, Delightful pets. Everybody wants them. Thousands needed by laboratories. Make money, Thousands needed by laboratories. Make money, get started now, Write for illustrated literature, or send \$5 for a pair of hamsters and literature. GULF HAMSTERY, 1536 BASIL ST.,



MOBILE 17, ALA.



Pascinating vocation learned at home by the with aptitude, Thrilling pastime. National meth brings out life-like colors. Free booklet. NATIONAL PHOTO COLORING SCHOOL 1315 S. Michigan, Dept. 1353, Chicago S



HOW TO BUILD BETTER

JUST MAIL COUPON If You Are Undecided Whether You Should Build or Buy—
If You Are Leery of 'Chean' Ruilding St. If You Are Leery of 'Cheap' Building, Shoddy Work or Poor Design-If You Are Fed-Up With DREAMING About Your New House and Want to Get STARTED—Then This Will Prove a GOD-SEND to YOU!

HERE is the answer to how to build your own home. Here is the WORKS - how to plan, how to construct, how to supervise—simply, clearly explained step-by-step. Jampacked with everything you need to know about building your own home yourself, or having a contractor build it for you. Dozens of clear-cut, complete diagrams. You will be able to build a home that will amaze everyone!

Everything You Need to Know to Get Started

Some of the Things This Book Explains:

Some of the Things This Book Explains:

Here at Your Fingertips, the Secrets that
Produce Fine Small Homes — Completely
Revealed in this Great-Easy-Reference Book!
How to Get Started; Deciding Upon
Home Ownership; How to Select Professional Service: How to Finance Your
Home; How to Select a Building Lot;
How, to Plan the Home; How to Fill Out
Contract Documents; How to Obtain
Good Construction; How to Prevent Termites; How to Prevent Decay; How to
Prevent Corrosion; How to Prevent Termites; How to Prevent Gende; Monolithic
Concrete Construction; Masomry Construction; Footings for Foundation
Walls, Chimneys, Piers; Bow to Build
Piers, Foundation Walls; Basement Construction; How to Waterproof Basements and Foundation Walls; How to
Build Chimneys and Fireplaces; How to
Select the Proper Species and Grades of
Wood; House Framing Methods and Details; Finish Carpentry and Millwork;
How to Insulate; Sheet-Metal Work,
Roofing, Stucco, Lath and Plaster; How
to Paint and Finish; Tile Work, Electrical Work, Plumbing, Heating; List of
Publications for the Home Builder (Most
of these are free or cost only a few
cents); Where to Get Stock Plans;
Taxes, Insurance, Interest, Maintenance, Assessments; How to Choose a
Bank, Real Estate Dealer, Contractor;
Locating Lot, Tax Searches, Comparative Costs, Design: Prefabricated
Houses' Bungalows, List of Usual Mistakes; Architectural 'Don'ts' and over
300 additional paragraphs of important
information.

QUICK REFERENCE INDEX TO SPECIAL

QUICK REFERENCE INDEX TO SPECIAL PAGE SIZE-PLATES (HUNDREDS OF ILLUSTRATIONS)

PAGE SIZE-PLATES (HUNDREDS OF ILLUSTRATIONS)

Footings—foundation walls—basements; Garage floor, footings, etc.—septic tank—grease trap—area for basement window! Concrete porches, steps, automobile runways and driveways and walks; Brick steps, walks and terraces; Brick, tile and stone wall details—flagstone and stepping stone walks; Masonry dwellings—brick veneer walls; Chimney and fireplace details: Balloon framing details (minimum-shrinkage type); Balloon framing details; Basement columns and girders—framing of openings—bridging; Miscelianeous framing details; Watertables—exterior sidewalls of siding or shingles—cornices—porch columns; Double-hung wood window details; Door frame details—points for millwork—stock doors and windows—sash details; Paneling—stairwork—baseboard details; Termite shields—miscellaneous flashings; Flashing details; Gutters and leaders (downspouts); Roofing details.

Nothing Like It Before! One Simple Fact May Repay you a HUNDRED Times Its Small Cost. A Book You Will Refer to for Years to Come!

Provides you with all the facts. Whether you are going to spend \$2,000 or \$20,000 for your home--whether your home—whether
you are going to employ an architect or
use stock plans—or
whether you are going
to buy a house instead
of building, this book
will help you. Before you
build you should know the
difference between good and
bad construction. same bad construction.

Now—in these days of shortages—just one of the dozens
of diagrams can save you hundreds of dollars. You will get a
thrill out of being "in the know,"
being "wise" to the game, being
able to talk to building people in
their own language. You'll be respected, admired, and get better
workmanship on your home. You'll
get a feeling of pride as your friends
admire the home being built. Here, in
one clear-cut volume is all the basic
information you will need!

Where to Begin bad construction.

Where to Begin

No matter what your building problem may be, you will find the answer in this amazing volume. No truth is kept from you. You are told the disadvantages of home ownership as well as the advantages. You are told of the precautions you will need to safeguard your investment. You are shown how to select a lending institution, a lawyer, a real estate dealer, an architect, a contractor. Your questions on methods of buying are fully answered. Just a quick glance at the partial table of contents on this page will show you some of the thousands of facts on building which this complete volume contains. Those who have bought a copy write that they have never seen so thorough a work on this subject for any price, anywhere! Where to Begin any price, anywhere!

Hundreds of Construction Details
Explains all the "mysteries" of permits, contract forms, and construction. Tells you how to build the right kind of home, how to avoid "cheap," cracker-box construction, how to get a house that is suitably located, beautiful to look at and priced within your means—a house you will be proud to call your home.

from Plans to Paint

Not one important step is missing from this volume. See for yourself. Every conceivable thing you would want to know about building will be found in this wonderful new book!

Read What Great Building Authorities Say About This Amazing Book (names on request)

Excerpts from typical letters of praise:

". . the best book on the subject that has been published to date." . "was thrilled" . . "valuable information for the new home-builder."

". . an excellent piece of work" . . "helped us decide our building plans" . "well worth price."

". . very much impressed . . an excellent reference book." Excerpts from typical letters of praise:

book."

". the writing is clear and compact . . . complete and unbiased information."

". . most interesting and complete." "You are to be congratulated. Contains more information than any volume seen . . Everything you said."

". . One of the best works of its kind I have ever seen. Send me 10 more for presents."

And from an amateur:
"From this book, I did the plans myself! Had never done
anything like it before . . . A neighboring architect said
I was an up-and-coming designer and he found not one
fault with my plans . . . The building is now finished
and everyone says it's beautiful! . . I saved \$1900!"

SEND NO MONEY Examine It For 7 Days FREE!

FREE!
You don't even risk a cent to examine "How to Build a Better Home." Just mail coupon. Study book for a week, FREE! See how easy it is to supervise or build a better home, YOURSELF—even if you know nothing about construction NOW! Then, if you are THRILLED with this amazing volume, send only \$3.98 (plus postage). If you are not thrilled, return book and pay nothing! This is your chance to build not just a house, but a BETTER HOME! Mail FREE EXAMINATION COUPON NOW, to The Westport Publishing Company, Dept. M, Westport, Conn.

FREE Examination Coupon - Mail Now

Westrated throughout!

Dozens 1

diagrams step basy

How to Build

A Better Home

by HOWARD R. MORRIS

The Westport Publishing Company, Dept. M Westport, Conn.

Picase send me, for one week's FREE EXAMI-NATION, a copy of "How to Build a Better Home." After 7 days I will either return this book and owe you nothing, or I will keep it and send you 83.98 (plus shipping charges).

Name	701500000000000000000000000000000000000	Age
	(please print)	
Address		

Save postage on 2 lb. package. Check here if you enclose full payment of \$3.98 (check or money order) WITH coupon. WE will then pay shipping charges. If not thrilled with book, return it and we will refund your money by AIR MAIL!

PLASTICS



This student is learning to operate a hydraulic press used to mold thermosetting plastics. Plastic Institute's modern laboratories and shops provide training facilities which are thoroughly practical!

PLASTICS AND YOUR FUTURE!

Decide to make vour future career in some branch of Plastics. Then you've hitched your future to a young, growing industry. Why? Because more and more products are being made successfully from some type of plastic. Fabrics, poker chips, toys, kitchenware, lamp shades, radio cab-

inets, fly rod containers, golf clubs and thousands more—useful, everyday products. This means a bigger industry, more jobs, more opportunities for men to operate their own business—MORE OPPORTUNITIES FOR TRAINED PLASTICS MEN AND WOMEN.

PLASTICS INSTITUTE is the oldest and largest training school devoted entirely to Plastics education. Headed by widely known leaders in the Plastics Industry, the complete training program, both HOME STUDY AND RESIDENT SCHOOL, has been carefully designed to equip men and women to enter the Plastics Industry with the knowledge necessary to get ahead.



GET KIT OF PLASTIC MATERIALS

You receive practical experience making useful, attractive articles as part of your Home Study training. Many students have earned money selling articles of their own manufacture. It's creative and exciting.

GET FREE LITERATURE. MAIL COUPON TODAY.

See what Plastics Industries Technical Institute offers you and read what many successful graduates say about their training. Mail coupon below for complete information. Be sure to indicate whether you are interested in HOME TRAINING or desire to come to Los Angeles, California, for resident training.

Approved for Veterans—Non-Veterans

Plastics Industries Technical Institute Dept. PM-4-3-8, 1601 S. Western Ave., Los Angeles 6, Calif.
Gentlemen: Please send me free literature and information on your practical courses. I am interested in Home Training attending school in Los Angeles [].
Name (Peint)
StreetAge
City
VeteranNon-Veteran

WATCHMAKING

What TIMEdo you get up?

What TIMEdo you go to work?

What TIMEdoes your train leave?

What TIMEdo you eat lunch?

What TIMEdoes the game start?

What TIMEdo you have dinner?

What TIMEdoes the movie start?

Everyone is guided by TIME. That is the reason why it is important for you to seriously consider WATCHMAKING as your career. This interesting field demands trained minds and hands. You can get this training at American School of Watchmaking.



At American School of Watchmaking students get the best of training under the careful supervision of expert instructors,

YOUR OWN BUSINESS

Trained men and women in Watchmaking can get into business for themselves, or work for good pay in pleasant surroundings. Many students of AMERICAN SCHOOL OF WATCHMAKING are achieving success in this profitable field.

STUDY IN GLAMOROUS CALIFORNIA

Enroll in American School of Watchmaking and combine your serious training program with all that Southern California offers you.

> Member of: United Horological Association National Council Technical Schools

Approved for Veterans-Non-Veterans

American School of Watchmaking Dept. PM-4-3-8, 5145 W. San Fernando Rd. Los Angeles 26, Calif. W.
Gentlemen: Please send me free booklet and information on your training.
Name (Print)
StreetAge
CityState
VeteranNon-Veteran



THAT FITS

DIESEL



A typical modern Diesel plant,

If you are mechanically inclined and ambitious to get into a field offering a great future—then LEARN DIESEL THE HEMPHILL WAY! Many successful Hemphill School graduates have positions of responsibility operating, installing, repairing, and servicing Diesel engines in trucks, ships, power plants, logging operations, construction jobs and other fields. The scope and future of the trained Diesel man is broad and offers opportunities to specialize. If you want to see the world, remember, Diesels are used in transportation, mining, construction and drilling operations in distant countries. Perhaps you like agriculture or railroading or shipping-in almost every field you find Diesels. And remember, trained Diesel men are required to operate and maintain them. YOU CAN BE A TRAINED DIESEL MAN. You can learn quickly and easily the famous HEMPHILL WAY!

STUDY AT HOME

Learn Diesel at home in your spare time, without interfering with your present activities. Easy-to-understand HOME STUDY course result of years of Hemphill Schools' successful teaching. Or take practical resident school training at Los Angeles, New York or Memphis. INDICATE YOUR CHOICE ON COUPON BELOW.

> Hemphill Specialized Automotive Engine, Carburetor, Electrical and Ignition Tune-up Course offered at Los Angeles and Memphis. Check coupon.

Approved for Veterans-Non-Veterans

	Hemphill Diesel and Automotive Schools Administrative Office: 1601 South Western Ave. Dept. PM-4-3-8, Los Angeles 6, Calif.
	Gentlemen: Please send me FREE BOOKLET and information on your Diesel Courses. I am interested in Home study Resident School at New York Memphis Los Angeles Send information on Auto Tune-up at Memphis Los Angeles
	NameAge
ı	Street
	CityState
н	Water the second of the second

AIRCRAFT INSTRUMENTS

After overhauling a Rate of Climb Indicator, student tests it for proper range deflection, maintaining very rigid tolerances, on a special test unit.



This student is testing for accuracy a Turn and Bank Indicator against time, using a stop watch, and against another instrument of known accuracy.



FLASH! C-54 four-engined Skymaster, known as "The Big Push" flies Atlantic without a hand on the controls!

Delicate INSTRUMENTS made this feat possible! TRAINED AIRCRAFT INSTRUMENT TECHNICIANS manufactured, installed and serviced these instruments. Such men are essential to the continuing progress of Aviation!

GET INTO THIS IMPORTANT FIELD!

American Schools of Aircraft Instruments teaches you in 34 short weeks to qualify as an Instrument Technician. Hundreds of successful graduates employed in the industry or have own business.

HERE'S WHAT YOU LEARN

At A.S.A.I. you study instruments in pressure, mechanical and gyroscopic groups. Installation, service, repair and line maintenance. Aircraft instrument training also applicable to many industrial fields.

Come to American Schools of Aircraft Instruments in Los Angeles where much Aviation history begins and where you can enjoy all else that Southern California offers you.

Approved by National Council of Technical Schools. C.A.A. approved Instrument Repair Station License No. 1028.

Approved for Veterans-Non-Veterans

American Schools of Aircraft Instruments Dept. PM-4-3-8, 5145 W. San Fernando Rd. Los Angeles 26, Calif.					
	Gentlement Piease send me FREE and WITHOUT OBLIGATION, Ulustrated booklet describing Aircraft Instrument field.				
ı	Name (Print)				
l	Street				
l	CityZoneState				
l	Veteran				

MARCH 1948 35

And to think they used to call me

Give Me 15 Minutes A Day And I'll Give You A NEW BODY

PEOPLE used to laugh at my skinny 97 lb. body. I was ashamed to strip for sports or for a swim. Girls made fun of me behind my back. THEN I discovered my muscle-building system—"Dynamic Tension." It turned me into such a complete specimen of MANHOOD that today I hold the title "THE WORLD'S MOST PERFECTLY DEVELOPED MAN."

That's how I traded in my "bag of bones" for a barrel of muscle! And I felt so much on top of the world in my big new, husky body that I decided to devote my life to helping other fellows change themselves into "perfectly developed men."

What's My Secret?

When you look in the mirror and see a healthy, husky, strapping fellow smiling back at you—then you'll be astonished at how short a time it takes "Dynamic Ten-sion" to GET RESULTS! "Dynamic Tension" is the easy, NATURAL method and you can practice in the privacy of your own room—
JUST 15 MINUTES EACH DAY—while
your scrawny shoulder muscles begin to
swell . . . those spindly arms and legs of yours bulge . . . and your whole body starts to feel "alive," full of zip and go!

Thousands are becoming marvelous physical specimens — my way. I give you no gadgets or contraptions to fool with. With "Dynamic Tension" you simply utilize the dormant muscle-power in your own bodyratch it increase and multiply into real, solid LIVE MUSCLE.

FREE Book

Mail coupon right now for my illustrated ook, "Everlasting Health and Strength." all about my "Dynamic Tension" method. Shows actual photos of men I've made into Atlas Champions. It's a valuable book—and it's FREE. Mail coupon to me personally. CHARLES ATLAS, Dept. 8C, 115 East 23rd St., New York 10, N. Y.

CHARLES ATLAS, Dept. 8C

115 East 23rd Street, New York, N. Y.

I want the proof that "Dynamic Tension" will help make a new man of me — give me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength". Strength.

Name	(Please print	or write plainly)	Age
Address			
		38	±1
City		State_	

CONFIDENTIAL LOAN SER Borrow \$50 to \$30

Need money? No matter whe you live you can borrow BY MAIL \$50.00 to \$300.00 this easy quick confidential way.

IT IS EASY TO BORROW BY MAIL!

Completely confidential and private CONVENIENT MONTHLY

NO ENDORSERS NEEDED EMPLOYED MEN and women of good character can solve their money problems quickly and in privacy with loans MADE BY MAIL. No endorsers or cosigners. We do not contact employers, friends or relatives. Convenient monthly payments. Send us your name and address and we will mail application blank and complete details FREE in plain envelope. There is no obligation.

NATIONAL LOAN PLAN, INC. 521 Temple Court Bldg., Dept. C-107, Denver 2, Colorado

HI-SPEED EQUIPMENT

High Compression Heads—Dual Manifolds
Dual Air Cleaners For VB's
Use these simple conversions to increase horsepower, speed acceleration, and increase top speed of your car. Write today for prices and full information.

SANDEE MUFFLER CO. 7523 S. Western Ave. Los Angeles, Calif.



MUFFLERS STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels \$5.50, Aluminum \$7.00. Chry., Olds., Buicks, etc., Steels \$7.50, Aluminum \$9.00. V-8 and MERCURY DUALS, Steel \$17.50, Aluminum \$21.00. Split Manifold Sets, Steels \$35.00, Aluminum \$45.00. Aluminum \$45.00. Aluminum \$45.00. Aluminum \$45.00. are guaranteed for life of your car.

MUFFLER SANDEE BOX 296 LA TIJ., OX 296 LA TIJ., LOS ANGELES 43 CALIF. 2624 W. SLAUSON AVE., LOS ANGELES, CALIF.

Lathes, Milling Machines, Drill Presses, Sawing equipment, Motors and thousands of miscellaneous items, Also information on Helicopters, Sleeper Trailers, Garden Tractors, Power Lawn Mowers, Welders, Jet Impulsion for Cars and Tractors etc. Rush name for free literature, THE WAYNE ENGINEERING CO., DEPT. 1135, GREENVILLE, OHIO

A REAL ESTATE

pown business quickly. Many graduates report making up to \$1000 a month. Course of study covers Sales, Property Management, Appraising, Loans, Mortgages and hundreds of related subjects. Course offered in home study or residential classrooms.

FREE Big new illustrated catalog from this nationally known school. Send Post Card Today. G. I.

WEAVER SCHOOL OF REAL ESTATE Dept. KA-4, 15 E. Pershing Road

OLD GOLD JEWELRY WA

Dental gold teeth, plates and bridges with metal attached. Any broken pieces of gold jewelry. Immediate payment and free mailing container to you or your friends upon request. free mailing container to you or LOWES, DEPT PM Hol

HAVE FUN! MAKE MONEY! Cash in on your sense of humor at HOME-BY MAIL. No experience needed to start. Write today FOR FREE TRIAL LESSON and full particulars.

MooN Gag Cartoon School, Dept. M. Fall Creek, Wis.





The New COMB-A-TRIM Quick Trimmer

Something New! Trim your hair without any experience. It's easy! The excess hair comes off smoothly and easily by just pulling trimmer through hair like an ordinary comb. Save on hair-cut bills. . . . Trim your own hair or the whole family's. Send 59c and your Comb-A-Trim will be sent at once, postpaid.

2 C o m b - A - 2 for \$1 SPECIAL 5 Extra Blades (Year's Supply) COMB-A-TRIM CO., CAREW TOWER, Dept. R-25, Cincinnati, Ohio



Learn

ELEVISION, ELECTRONICS

SHOP METHOD HOME TRAINING

Let NATIONAL SCHOOLS, of Los Angeles, a practical Technical Resident Trade School for over 40 years, train you for today's unlimited opportunities in Radio

these two FREE books will tell you how



You are needed in the great, modern Radio, Television and Electronics industry! Trained Radio technicians are in constant and growing demand at excellent pay—in Broadcasting, Communications, Television, Radar, Research Laboratories, Home Radio Service, etc. National Schools Master Shop Method Home Study Course, with newly added lessons and equipment, can train you in your spare time, right in your own home, for these exciting opportunities. Our method has been proved by the remarkable success of National Schools-trained men all over the world.

You Learn by Building Equipment with Standard Radio Parts We Send You

Your National Schools Course includes not only basic theory, but practical training as well—you learn by doing. We send you complete standard equipment of professional quality for building various experimental and test units. You advance step by step until you are able to build the modern superheterodyne receiver



shown above, which is yours to keep and enjoy. You perform more than 100 experiments—build many types of circuits, signal generator, low power radio transmitter, audio oscil-lator, and other units. The Free Books shown above tell you more about it—send for them today!

WE NEW PROFESSIONAL MULTITESTER INCLUDED



This versatile testing instrument This versatile testing instrument is portable and complete with test leads, batteries and tubes. Simple to operate, accurate and dependable. You will be able to quickly locate trouble and adjust the most delicate circuits. You can use the Multitester at home or on service calls. It is designed to measure AC and DC volts, current, resistance and decibles. You will be proud to own and use this valuable professional instrument. instrument.

GET THE DETAILS-SEND THE COUPON

LESSONS AND INSTRUCTION MATERIAL ARE UP-TO-DATE, PRACTICAL, INTERESTING

National Schools Master Shop Method Home Training gives you basic and advanced instruction in all phases of Radio, Television and Electronics. Each lesson is made easy to understand by numerous illustrations and diagrams. All instruction material has been developed and tested in our own shops and laboratories, under the supervision of our own engineers and instructors. A free sample lesson is yours upon request—use the coupon helow.

Here's Just a Few of the Inter-esting Facts you Learn with the

FREE MANUAL

- 1. Routine for diagnosing Radio Troubles.
 2. Preliminary inspection of Receivers.
 3. How to Test and Measure Voltages.
 4. How to Test Speaker in Audio Stages.
 5. How to Trace the Circuit and Prepare Skeleton Diagram.
 6. Complete Reference Table for Quickly Locating Receiver Troubles.



RADIO/

MANUAL

to their atterns

SCHOOLS

If you are a veteran, quali-fied for training under the G.I. Bill, check the cou-pon for a Special Bulletin.

2011111

G. I. APPROVED

NATIONAL SCHOOLS

National Schools, Dept. PM-3

(Matl in envelope or aste on penny postened.) 4000 South Figueroa Street Los Angeles 37, California Mail me FREE the books mentioned in your ad including a sample lesson of your course. I understand no salesman will call on me.

NAME ADDRESS ZONE STATE CITY.

Check here if veteran of World War II



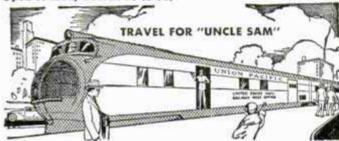
Start As High As \$3,021 a Year

Get Ready Now for Next Examinations In Your Locality

Veterans Get Preference

City Mail Carriers, Post Office Clerks

Clerks and Carriers now get \$2,100 the first year on regular and automatically increase \$100 a year to \$3,100. Open to men, women 18 to 50.



Railway Postal Clerks

Railway Postal Clerks get \$2,300 the first year regular, being paid on the first and fifteenth of each month. (\$95.83 each pay day.) Their pay is automatically increased yearly to \$3,400. Advance may be had to Chief Clerk at \$5,400 a year. (\$225.00 each pay day.) Male veterans only.

3 Days On-3 Days Off-Full Pay

Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with

a pension.



Many Other Positions

Many other positions are obtainable. Rural Carriers — Stenographers—Typists—Assistant Statistical Clerks-Customs Inspectors-Office Machine Operators - etc. Those wishing these positions should qualify at once.

Get Free List of Positions

the following coupon. Tear it off and mail it Fill out today--NOW, at once.

This investment can result in your getting a big paid government job.

FRANKLIN INSTITUTE, Dept. W86, Rochester 4, N. Y.

Rush to me, entirely free of charge (1) a full description of U. S. Government Jobs; (2) Free copy of illustrated 32-page book, "How To Get A U. S. Government Job"; (3) List of U. S. Government Jobs; (4) Tell me what to do to qualify for one of these jobs.

Name		 	 ×		_
AUXION -					
				22-0:55	

Famous BAILEY DIESEL SCHOOLS

Now Accepting

CIVILIAN STUDENTS!

Bailey has a national reputation for "finest training methods." Bailey teaches you training methods." Bailey teaches you fundamentals, plus the practical application of theory in plenty of actual shop work. Bailey is approved by industry. Bailey graduates get the jobs!

Civilian men and boys over 17 who are ambitious to get ahead will act now. Send for FREE catalog. No salesman will call.

BAILEY TECHNICAL SCHOOLS

1655 So. Grand Blvd., St. Louis, Mo.



LEARN

training. Send today for SkitME literature. No obligation. NATIONAL SCHOOL OF MEAT CUTTING. Dept. 39. Teledo 4, Ohio



It's FUN to do MAGIC

Amaze — mystify — entertain. Be Popular, You, too, can enjoy this fascinating hobby which has swept America. Only 10c brings you our famous Catalog of 500 TRICKS, profusely Illustrated, containing all the intest in easy-to-de magic for pocket, parlor, stage, Join in the fun! Send 10c today. Douglas Magicland, Dent. C. Dallar. Douglas Magicland, Dept. C, Dallas 1, Texas mmmmmm

Be an Investigator — Study Modern Crime Detection at home. FREE Literature.

NATIONAL DETECTIVE INSTITUTE

Dept. M-4, 601 S. Vermont Ave., Los Angeles 5, Calif.

NAME.

ADDRESS.

SHORT CUT Be an expert. Learn

or Radio Operator, Thousands of men needed. Intensely interesting good pay. Learn at home or wherever you are, quickly, easily he famous Candler Speed System. Book of particulars Free. CANDLER SYSTEM CO., Dept. 5-C. Box 928, Denver 1, Colo., U.S.A.

TRI-STATE COLLEGE

B. S. Degree in 27 months in Civil, Electrical, Mechanical, Chemical, Aeronautical, Radio Engineering; Bus. Admin., Acc't and Sec. Science. Graduates successful. 64th year. Enter March, June, Sept., Catalog. 438 College Ave., Angola, Ind.

Patented or unpatented inventions, all types needed by manufacturers. Write for free booklet "MARKETING YOUR INVENTION" and Protective Disclosure Form, We have a tremendous list of firms who may pay cash or royalties for good inventions. For full particulars, write today.

NATIONAL INVENTION SERVICE Oakland 1, Calif.



FIND OUT ABOUT TRAINING AND OPPORTUNITIES FOR YOU IN BUILDING

Established in 1904, Chicago Technical College offers you thorough, practical training in Building, by home-study. Mail coupon for free information. See what this Course has done for others, what it can do for you. Read what Chicago Tech graduates say about their work, earnings, success. Learn the rewards awaiting you as a trained builder — and how quickly, easily you can get started. Simply MAIL COUPON TODAY in an envelope or paste on a penny postcard.

CHICAGO TECHNICAL COLLEGE

C-152, Tech Building, 2000 South Michigan Ave. Chicago 16, Illinois

LDING

AT HOME . All Blue Print Building Plans, Specifications, Lessons Furnished

Earn more money as a building tradesman. Prepare for advancement and increased pay as a building foreman, superintendent, inspector, estimator, material buyer or salesman. Train to be a building contractor, have your own money-making business in this busy, prosperous building field.

More than 19 million new homes needed in U. S., say experts. New building now at rate of one million homes a year, plus 200,000 commercial buildings. plus expanding farm building construction.

Mail coupon today. FREE book tells how you learn Building Construction — How to Read Blue Prints, and Estimate Building Costs — at home in your spare time. Learn modern construction methods and materials, how to lay out work and direct all building operations. This is the training needed for rapid advancement to higher-paid jobs, or your own successful building business.



COUPON NOW

CHICAGO TECHNICAL COLLEGE C-152, Tech Bldg., 2000 So. Michigan Ave. Chicago 16, Illinois

Mail me FREE building Lesson with information about big opportunities in BUILDING and how I can train

Name		Age	
Address		0.0	_
City	Zone_	State	



If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal . . Gold, Silver, Chromium, Nickel, Copper or Cadmium, Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. By doing a bit of work for others, your machine can pay for itself within a week. So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature, ACT AT ONCE! Mail Coupon.

WARNER ELECTRIC CO., DEPT. R-25 1512 Jarvis Avenue, Chicago 26, III.

Details & Sample

WARNER ELECTRIC CO.	1512 Jarvis Avenue, Chicago 26, Dept. R-25
	Sample and Details to:

Address

"Just think! A few short days ago I knew nothing about music and now, thanks to you, I can actually play the piano!"

That's just one of hundreds of success stories received from users of TEACH YOURSELF TO PLAY THE PIANO. You can do it too—even though you've never touched the keyboard—by this brand-new tested method. In no time at all you'll be mastering intervals, chords, score-reading, and keyboard technique! It's easy to



TEACH YOURSELF TO PLAY THE PIANO famous concert artist and teacher

Never dull, never dry, you'll have fun as you learn—you'll save hours of practice and the cost of lessons—and find it easier than learning to type! It's the ONLY method with these three features:

Tested in manuscript and proved successful before becoming a book.

Includes patented KEYBOARD CONCEALER to help you play at sight.

Contains set of KEY BLOCKS which teach you how to play by touch.

9x12. Boxed. Free Keyboard Concealer and Key Blocks. \$3.50

Deluxe Edition. Bound in Linen Finish Cloth. Free Keyboard Concealer and Key Blocks. \$5.00

1	0	-D	į	ľ	ľ	
	F	RI	į			
É	i	RI.	A	L	e de	
ğ	ş	Ŧ	è	ij	ĕ	Ķ

THOMAS Y. CROWELL COMPANY,
46-M East 29 St., New York 16, N. Y.
Please send me Teach Yourself to Play the
Piano, & the free Key Blocks and Keyboard
Concealer, on approval. Within 10 days I'll
send \$3.50 Plain Edition; \$5.00 Deluxe
Edition, plus few cents postage or return the
book postpaid. (Postage paid on prepaid orders.)

Name..... Age..... Age.... Address.... City......Zone...State.....

ight!Wrestle!Jiu·Jitsu!



Plus Weight Lifting! Strong Man Stunts!

Be prepared to protect your fannily, friends, yourself in any emergency! Be aimired! George F.
Jowett, Champion of Champions, gives you free
his "SMASHING CHAMPION SECRETS." Contains many "HOW-TO-DO-IT" pictures that
quickly and simply show you how to powerfully
deliver a knockout, how to break any hold, how
to overpower any opponent plus weight lifting
and strong man stunts! Inside professional
"Tricks of the Trade" proved successful by
police, armed
forces, fighters,
wrestlers, etc.!
Free for a limited time with this
sensational offer!

You Need He-Man Fitness to Handle Any Situation!

NOW! All 5 Famous Jowett Courses

IN 1 COMPLETE MUSCLE BUILDING

Let Me Prove



VOLUME! I Can Make You

OR IT WON'T COST YOU A CENT!

says George 7. Jowett WORLD'S GREATEST BODY BUILDER

Give Me 10 Minutes a Day

Learn My Time Tested Secrets of Strength

I'll teach you the "Progressive Power Method" that rebuilt me from a physical wreck condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! Has proven it builds the strongest, handsomest men in the world. Let me prove on a money back basis—that no matter how flabby or puny you are I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a rock-like back—in fact power pack your whole body so quickly it will amaze youright in your own home! I'll bring to life new power in you inside and out, until YOU are satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT

I am making a drive for thousands of new friends fast-REGARDLESS OF COST!

All in 1 Great Complete Volume

Packed With How-To-Do-It Pictures!

ow, this "get-acquainted," stremely low price of only Sc is your chance to build body you'll be proud off Follow Jowett's easy method muscle building NoW!

How TO BECOME A

MUSCULAR HE-MAN

Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume, "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles. SO GET NOW MY 5 Muscle COURSES (Valued at \$5 each)

10 DAY TRIAL!

Think of it - all five of these fafive of these famous courses now
in one picturepacked volume
for only 25c. If
you're not delighted with this
famous musclebuilding guide—if
you don't actually
FEEL results within ONE WEEK, send
it back and your
money will be
promptly refunded!
Photo Book of Fa-

Photo Book of Fa mous Strong Men!



that in-spire you to might and mu cle. Fre with order.

Jowett Institute of Physical Culture 230 Fifth Avenue, New York I. N.Y. Dept. PM83A

George F. Jowett: Please send by return mail, post-paid, FREE "Smashing Champion Secrets" and FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses. 1. Molding a Mighty Chest. 2. Molding a Mighty Arm. 3. Mold-ing a Mighty Grip. 4. Molding a Mighty Back, 5. Molding Mighty Legs-Now ail in One Volume "How to Become a Muscular He-Man," Enclosed find 25c. NO C.O.D.'s.

(Please Print Plainly, Include Zone Number)

MAKE ₩ \$59%HOUR In Your Own YEAR Business!

ONLY A FEW DOLLARS PUTS YOU IN BUSINESS!

Many Clearing as High as \$20 to \$30 a Day NET Renewing Rugs, Carpets, Upholstery, New Method Now Used for Auto Upholstery. Write for Facts About Quick, Easy Way to Get Started

Here is the chance you've been looking for to step into a pleasant, dignified, big-pay business of your own that offers you a steady, year 'round income. Start on "a shoestring," full or spare time, right from your own home. Equal opportunities for men and women, young or old, in small towns or big cities. No experience needed. Many making big money with new Americlean System just cleaning auto upholstery. Easy to learn. We send you complete instructions and quick-cleaning supplies so you can start making money the very first day! Quick method cleans upholstery, rugs and carpets like new without taking off floor! Tremendous demand in homes, apartments, hotels, stores, office and public buildings. Steady repeat business. Territories going fast. Write today for full FREE facts. No cost or obligation. Rush letter or postcard now to AMERICLEAN CO., Inc.; Dept. G-15; 211 North 7 St.; St. Louis 1, Mo.

North 7 St.; St. Louis 1, Mo.

FOR FREE



Be a Taxidermist. Double your hunting fun. We teach you at Home. Mount Birds, Animals, Fish, leads, common specimens, Fun and profits. Decorate home and den MAKE MONEY. Mount game, tan for others. Big profits in spare time. WRITE TODAY.

ern. Big profits in spare time. WRITE TODAY. 1 0 0 game pictures in FREE BOOK Hunters, get your copy. It's Now Free. Send post card. State your AGE. FREE BOOK NORTHWESTERN SCHOOL OF TAXIDERMY Dept. 9373 Omaha, Nebraska

earn LANDSCAPE GARDENING

A thorough, constructive, interesting home-training, ing your regional conditions, for those who wish to become LANDSCAPERS, DESIGNERS, GARDENERS, etc., for profit or pleasure. Write today for FREE INFORMATION, without obligation. APPROVED FOR VETERANS.

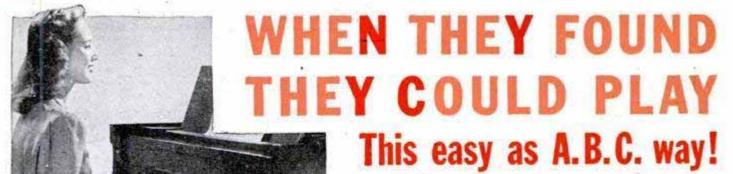
NATIONAL LANDSCAPE INSTITUTE Dept. P-3, 310 So. Robertson, Los Angeles 36, California

Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against maissince dusts, lint, coal, eement, grain dust, hay fover pollen, Has 9 sq. in. filter, For EYE protection against paint spray, dusts, gnases, tunce, smake, order our Fog-Proof Enbber GOGGLES.

GOGGLES \$2.00 p.p.
JERRY BRYANT, Dept. PM
919 N. Michigan Ave. Chicago 11, III.







FUN TO LEARN

"Your lessons are everything you said they would be. Never before have I seen such an easy way to learn music. It's easy, encouraging and fun. I thank you with all my heart for introducing me to your wonderful course."

"G. M., Berlin, N. H.



A THOUSAND FOLD

"Anyone with musical ability should make good with your course. My little investment paid back a thousand fold. I have been playing for 4 years now. Today I play in one of our top bands."

*J. M., San Juan, P. R.



PLAYS AT DANCES

"I have completed your course and your lessons have been most satis-factory. I can play all of the popu-lar songs. I have also earned money playing at dances."

*E, N. J., New York.

Have Learned Thousands

THAT instrument would you like to play? We'll show you how you can learn to play it — quickly, easily, in spare time at home for only a FEW CENTS A DAY! Never mind if you don't know one note of music from another—don't worry about "special talent."

The truth of the matter is that thousands now play who never thought they could! Yes, men and women everywhere are enjoying the thrilling satisfaction of playing the plane, violin, guitar, saxophone or other favorite instrument. Some of them are playing in orchestras and over the radio; others are teaching music, making

money in spare or full time. And thousands are playing for their own enjoyment and the entertainment of their friends.

It all came about when they wrote to the U. S. School of Music for the Free Booklet that shows you how EASY it is to learn music at home this modern way. No tedious scales, no tiresome exercises. You learn to play by playing—start right in almost at once with the melody of a simple tune! It takes only a few minutes a day and the cost is triffing; you save the expense of a private teacher, Mail coupon and get FREE PROOF! (Instruments supplied when needed, cash or credit.) U. S. School of Music, 73 Brunswick Bldg., New York 10, N. Y. (Est. 1898—50th Anniversary)

NOTICE

Please don't confuse our method with any systems claiming to teach "without music" or "by ear." We teach you easily and quickly to play real music, any music, by standard notes . . . not by any trickornumbersystem.

SEND TODAY FOR COMPLETE DETAILS

· You'll open your eyes when you find how quickly and easily you can learn to play your favorite instrument. Don't doubt; don't hesitate. Send for the fascinating illustrated booklet that answers all your questions; let the free Print and Picture Sample show you how this method actually works. If interested, mail the coupon NOW.

*Actual pupils' names on request. Pictures by professional models.

FREE! Print and Picture Sample

U. S. SCHOOL OF MUSIC

73 Brunswick Bldg., New York 10, N. Y.

I am interested in music study, particularly in the instrument checked below. Please send me your free illustrated booklet, "How to Learn Music at Home."

Piano Violin

TAKES THIRD COURSE

"The piano course is the third course with your school over 20 years ago I took saxophone and clarinet. Since then I've played a lot of dance jobs."

Lake View, Iowa.

Saxophone Trumpet, Cornet Hawaiian Guitar Reed Organ Tenor Banio Piano Accordion

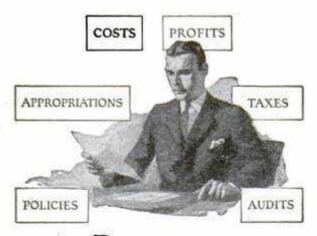
Modern Elementary Clarinet
Practical Finger
Control
Other Instrument

Have you Instrument?. Name

(Please Print)

Address State_

NOTE: If you are under 16 years parent must sign coupon. Save 2c-Stick coupon on penny postcard.



Become an Expert Accountant The Profession That Pays

The demand for skilled accountants-men who really know their business—is increasing. National and state legislation is requiring of business—both big and small-much more in matters relating to Auditing, Cost Accounting, Business Law, Organization, Management, Finance. Men who prove their qualifications in this important field are promoted to responsible executive positions—given an opportunity to earn real salaries. The range is from \$3,000 to \$10,000 a year, even to higher income figures.

Send for Free Book-"Accountancy, the Profession That Pays"

Why let the other fellow walk away with the better job, when thru home-study you can equip yourself for

a splendid future in this profitable profession?
Knowledge of bookkeeping unnecessary. We train you from ground up, or according to your individual needs. Low cost; easy terms.

Send for free 48-page book describing the LaSalle accountancy training and the opportunities in this highly profitable field.

If you have the urge, the will to increase your income, mail the coupon NOW.

LASALLE EXTENSION UNIVERSITY A CORRESPONDENCE INSTITUTION

Dept. 364-HR, 417 S. Dearborn St., Chicago 5, Ill.

Please send my copy of "Accountancy, the Profession hat Pays," without obligation.

Higher Accountancy

Other LaSalle Opportunities:

If interested in the fields below, check and mail now.

- Business Management
 Business Correspondence
 Expert Bookkeeping
 C. P. A. Coaching
 Business Correspondence
 Expert Bookkeeping
 Business Management
 Sale
- □ Sales Training
 □ Law—LL.B. Degree
 □ Business English

Street....

YOUR OWN PROFITABLE BUSINESS!

Here are 3 amazing, new opportunities to get into your own highly-profitable, dignified business—without previous experience—regardless of your age or sex. 1. LIQUIB Synthetic MARBLE—Easy to make and install beautiful synthetic Marble Slabs—pourning from diouse state. Big Demand for kitchen and bathroom walls, etc. 2. FBRE-TITE FLOORING—Easy to make and install—in any color or color countration. Many years wear. Dustroof. Sound-proof. Verminproof. 3. FLEXIBLE MOLDS—for Plaster Casting. S1.00 in raw materials makes up to \$25 worth finished products. F. B., Iowa, writes: "Am on job that will net me \$150 for 4 days work." Get PREE details. No obligation. Write today!

COMPOSITION PRODUCTS CO.

5853 Delmar Blvd.

Dept. 31

St. Louis 12, Mo.



Poultry is providing many trained men and women with a good, comfortable living, either part or full time. You, too, can enjoy country life, home-grown food, increased income, if you have the specialized knowledge that is so important.

For 27 years our Home Study Course has been helping thousands to greater success. Proper knowledge and "Know How" mean extra income from the start. Don't delay—write today for prospectus describing courses, methods, opportunities, service.

NATIONAL POULTRY INSTITUTE

DEPT. 50 - ADAMS CENTER, N. Y.

YOUR permanship can be improved in 3 hours or OUTLINE corrected to your satisfaction in 10 hours' practice with my DEFINITE HAND CONTROLS. New way. WRITE OZMENT 34-S ST. LOUIS, MISSOURI



Fiercest fighting technique known. trick knock-outs, police tactics, and the art of Defense and Attack. Expert instructions in THREE volumes with 200 photographs and illustrations. Complete...only \$2.25

VARIETY HOUSE

A GOV

START AS HIGH AS \$3.021

Many Permanent Appointments Being Made

VETERANS GET SPECIAL PREFERENCE

Many Government Jobs. City and Rural Carriers-Postoffice Clerks — Meat In-

> spectors-Accountants-Stenographers — Typists-etc. Prepare now for next Examinations. ADDRESS.

FRANKLIN INSTITUTE,

Dept. W85, Rochester 4, N. Y.

Sirs: Rush to me, without charge, copy of 32-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

NAME.

VET?



H. T. ARMSTRONG General Manager

Learn

ELECTRIC APPLIANCE

I'll Train You AT HOME in your spare time



YOU LEARN

how to repair electrical appliances such as washing machines, vacuum cleaners, ranges, lamps, irons, motors, etc.—HOUSE WIRING and also

REFRIGERATION

which we now include at no extra cost. Our lessons are understandable and easy to grasp.

REPAIRING & SERVICING

This is an ELECTRICAL WORLD! Every home is a customer for the man who knows how to service electric appliances. It's a wide-open, expanding field for men of all ages who are handy with tools . . . who seek the independence, happiness and rewards that come to the man who owns his own business. Our practical, thorough course teaches you this interesting well-paid business AT HOME—during your spare time. A grade school education is all you need. Without obligation, I'd like to send you our new booklet telling about our method of instruction—about today's money-making possibilities in this field—and why I believe this business offers you the depression-proof security, happiness and opportunity you seek.

EARN WHILE LEARNING

Pay For Your Course With Part Time Work

You can actually start making money before your course is finished. With your first set of lessons, I show you easy jobs that can be done in your spare time, at home. Remember—ONE GOOD REPAIR JOB will pay for your entire training. You can also start this business AT HOME, in your garage or basement, with the tools I send you, also in your SPARE TIME, if you like. Or, you can take a well-paid job . . . as there's always a big demand for trained men.

I Send
You a
BIG KIT
of Refrigerator
and Appliance
TOOLS
AT NO EXTRA
COST



A Business That Gets Better Every Year!

Every year, more and more new electrical appliances are being developed. Hundreds of thousands of new homes being built . . . and others wired for electricity for the first time—through gigantic government electrification projects. Thus, this business gets better every year. And, when you own your own business, YOU get the profits when times are booming. If depression comes, you can't lose your job. It usually IMPROVES the service and repair business. Let's talk it over by mail!

NEW BOOK "HOW TO START YOUR OWN BUSINESS"

Sent if you act promptly

This valuable book covers locating your shop, contains drawings of how to build and wire work-benches, where and how to advertise, what to charge, how to hire solicitors, etc. Sent without charge to students who enroll promptly.

		ALC: UNKNOWN				Statement of the last	
	7 67 5			FAW V			A' 48
SS /			SE S	4 - 4 -	TC		
	A F and Y	1000					

H. T. ARMSTRONG, General Manager,
PACIFIC TRAINING SCHOOL, Dept. P-83
7217 So. Broadway, Los Angeles 3, Calif.

Dear Sirs: Please send me, without obligation, your FREE BOOKLET, "Today's Big Opportunity, Appliance Servicing" and full details.

Name	S 2 00 10
Address	
City	State



Don't be a fellow who "never had a chance",

-for your big chance is right here now-in
Drafting. The fie'd for draftsmen is bigger
now than ever before, for drafting is the
basic profession and all new products start
with the draftsman.

Get into Drafting now. I will train you at home, in your spare time and give you actual experience on actual work—the same kind of jobs you will do for the best paying firms. I will train you until you are competent, fully experienced and holding a position that will bring advancement and pay raises as deserved. Write me today!

WORKING TOOLS You get drafting in-struments, table and other equipment

when you start, Nothing for you to buy.

EXPERIENCE WHILE

Don't forget! I train you through practical jobs—I give you experience. And I list this experience as a reference to employers when you are ready to go to work. Lack of starting knowledge or higher education should not hold you back. Low cost—and monthly payments, if desired,

ACT NOW!

Mail coupon to me today! No salesman will call, but you will get my big book and all details. Give your age to get reply.

IAIL COUPON FOR VITAL FACTS

Engineer Dobe, Div. 13, Libertyville, Ill.

Send me the Vital Facts on Drafting and Industrial Designing, your Free Book and advertised list of positions for Draftsmen and Designers wanted.

Name	Age
Address	



Zone___

PLIAN

RON REPAIR



Contains a complete assortment of terminals, pins, porcelain insulators, mica, etc. that will fit most "flat" irons and appliances. Practically every part necessary in the ordinary repairing of flat irons in one handy kit. Additional supplies obtainable so that your kit can be kept replenished. Entire kit sent postpaid for only \$3.10 plus 18c postage.

Electrical Appliance Repair Parts

HELD TO THE CONTROL TO SELECT THE CONTROL OF THE C
Lead wire. Asbestos covered heater hook-up wire. 10 ft\$1.00
Heating element wire, 10 ft. coiled 1/4" O.D. #20 2.55
Heating element wire, 10 ft, coiled 3/16" O.D. #22 1.77
Ribbon element heating wire. Std. size 100 ft
Christy Electric Heating Element Welding FLUX for repairing
flat Irons, toasters, electric stoves, etc. Enough for 50 elements 1.00
Hot plate bricks 534" diameter, 6 for 1.62
Carbon brush set, Assorted, 104 brushes, 15 Springs, Complete 3.00
Kerosene to Electric Lamp conversion adapters. 5 for only 1.00

Repair Elements for Electrical Appliances

불지가 하나 나가 가지 않는데 얼마가 하면 하면 하면 되었다. 그는 일이 되었다면 하면 하면 하는데	
Electric Range Elements. Fit all makes. Latest Super-high speed	_
units. Each	6.30
Renuall Iron element. Guar. 1 year. Package of 6	
irons. Porcelain shoes for 500-600 watt. Set of 4	1.00
Percolator elements. Universal flat type. 1 Yr. guar. 2 for	1.20
Percolator Element, Porcelain for new glass types, 2 for	1.80
Element cement. Withstand 3000° F. 1 lb, backage	1.00
Toaster element forms. Clear Mica. Fits most toasters. 10 for.	1.80

How To Fix It Rooks

Modern Electric & Gas Refrigeration-928 pages	5.00
Armature & Magnet Winding-270 pages	1 50

Here is your opportunity to save on repairing your own appliances and to earn extra money repairing appliances for friends and neighbors.

CHRISTY SUPPLY CO.

2835 N. Central Ave.

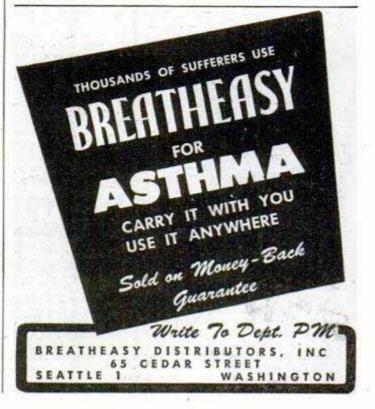
Dept. T-1450

Chicago 34, III.



The Motion Picture Theatre Business offers big or portunities for trained men. Get into a fascinatin field with a promising future. Train at home i spare time. Free Catalog. Established 20 years THEATRE SCHOOL, 370 Washington St., Elmira, New York

SAY YOU SAW IT IN POPULAR MECHANICS



Town

Now Any AUTO REPAIR JOB Can Be "Duck Soup" For You!

MoToR's New AUTO REPAIR MANUAL Shows You How to Service and Repair ANY Part of ANY Car!

NOW you can "polish off" the HARDEST jobs the EASI-EST way! MoToR's AUTO RE-PAIR MANUAL is ready to show you how to repair any-thing from carburetor to rear end — with the *least* possible, amount of time and effort!

Suppose plain-talking car engineers from every auto plant in America got together and showed you all the things you needed to know about repairing and servicing the cars they had designed and manufactured! That's really what you get in this big manual! Right at your fingertips, the main "dope"

Same FREE 7-Day Offer Applies on MoToR'S TRUCK REPAIR MANUAL

Applies on MANUAL
TRUCK REPAIR MANUAL
For mechanics, truck specialists, service stations, fleet owners. Covers EVERY job on EVERY truck made since 19361 1400 pictures, 252 pages. 300,000 facts, 352 pages. 300,000 facts, 352 pages, 352

tors, contributions equipment, sta-bullding equipment, sta-tionary power machinery etc. (on all parts de-scribed in Manual.) Check box in coupon at right.

from 150 Official Factory Shop Manuals, covering every make car built since 1935!

Easy to use, too! Quick-in-dex leads you to right page in jiffy! Just follow simple instructions step-by-step.

SEE HOW MUCH YOU GET!

856 pages, 81/2 x11 inches bound in sturdy covers, 200,000 service, repair, adjustment, re-placement, tune-up facts on all makes and models, 1935 through 1946. More than 1000 cut-away photos, diagrams, drawings show you exactly WHAT to do and HOW to do it. Used by U. S. Army, trade and tech-nical schools everywhere, thousands of auto servicemen.

Now YOU - without cost can see for yourself what wonderbook MoToR's Auto Repair Manual really is. TRY it-FREE for 7 days! Learn first-hand how it can pay for itself the first few times you use it.

SEND NO MONEY 7-Day Free Examination

Just mail coupon at right, without money! When the postman brings your book, pay him nothing. First make it show you what it's got! Unless you agree this is the gratest time-saver and work-saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today! Address: MoToR Book Dept., Desk IC. 572 Madison Ave., New York 22, N. Y.

Published by MoToR, The Leading Automo-tive Business Mag-azine, MoToR's manuals assure high standards of repair work.



American Auburn Austin Buick Cadillac Chevrolet Chrysler Cord Crosley De Soto Dodge Ford Graham Hudson Hupmobile Studebaker

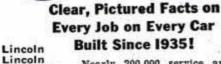
Lafayette

La Salle

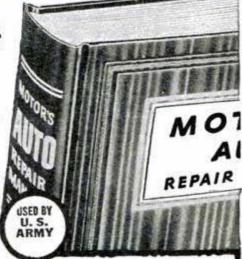
Nash

Reo

Willys



Nearly 200,000 service and repair facts on all 31 makes. 856 big pages; including 50 pages of carburetor, text, charts, illustrations, covering all models. Over 500 charts, tables; Tune-up Chart; Valve Measurements; Compression Pressure; Torque Wrench Reading; Starting Motor; Engine Clearances; Generator; Clutch & Brake Specifications; Front End Measurements, etc., Engines; Electric, Fuel, Cooling, Lubricating Systems; Transmissions: Universals: Front Ends; Wheels; Rear Ends, etc. Zephyr Mercury Overland Oldsmobile Packard Pierce Arrow Plymouth Pontiac Terraplane missions: Universals: Pront Ends: Wheels: Rear Ends, etc.



MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR Book Dept., Desk IC, 572 Madison Ave., New York 22, N.Y. Rush to me at once: (check box opposite book you want). MoToR's AUTO REPAIR MANUAL. If O.K. I will reunit \$1 in 7 days. (plus 35c delivery charge), then \$2 monthly for 2 months with a final payment of 95c one month later. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$8 cash with order.) MoToR's TRUCK REPAIR MANUAL. (Described at left.) If O.K. I will remit \$2 in 7 days, and \$2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$10 cash with order.)	
Print Name	

BEAUTIFUL MIRROR-LI Guaran FINISH THAT LOOKS LIKE NO MASKING

You're SURE

You are SAFE When You Paint

With WYPE

TESTED by

U. S. Testing Co., Inc.

Leading Scientific Testing

Laboratory — Report No. 87496, Jan. 5, 1948—and found to conform to the claims and guarantee of the Wype Corporation. U. S. Testing Co. conducts scien-

Testing Co. conducts scien-

tific tests for world's foremost organizations and is accepted as the leading

authority on such tests.

Wype is ONE product you can TRUST to renew and

protect the beauty of your

SPRAY JOB! ONE QUART MEEDED DOES ENTIRE JOB! LOOKS

At last-you can paint your car with WYPE for \$3.95 and LIKE SPRA)

car with WYPE for \$3.95 and get a beautiful, high-gloss finish that rivals an expensive, professional spray job. With WYPE you need NO BRUSH, NO SPRAY, NO MASKING! You just WIPE ON with Powder Puff furnished. Takes about an hour to apply. No streaks, no lap-marks, WYPE dries dust-free in one hour. Guaranteed for TWO years not to peel, chip, crack or fade, if simple directions are followed. Goes on over any other color, enamel or lacquer.

Dries to Glistening PROFESSIONAL Finish

WYPE is a new Miracle Enamel for autos. It is NOT a wax or polish but a hard, high-lustre ENAMEL finish. With WYPE, anyone can do a beautiful job! Get a quart to paint your carl

SEND NO MONEY! Order WYPE Today!

8 POPULAR COLORS: Brewster (dark) Green Jewel (light) Green Washington (dark) Blue Monticello (light) Blue Black Red Maroon Gray

All \$3.95 per Quart

car! SEE YOUR DEALER or ORDER DIRECT

If your dealer can't supply you, just send us a postcard. We'll ship C.O.D. Just pay mailman for Wype, plus postal charges. Or send remittance with order and WE pay postage.

THESE FINE STORES
SELL WYPE

Akron: M. O'Neil Co.; Baltimore: May Co.; Cleveland: May Co.; Cincinnati: Fair Store; Co.; Kansas City, Mo.: Jones Store Co.; Louisville: Kaufman-Straus Co.; Memphis: B. Lowenstein & Bros.; Milwaukee: Ed. Schuster & Co.; Montgomery: Montgomery Fair; New Orleans: Maison Blanche Co.; Philadelphia: Lit Brothers; St. Louis: Famous-Barr Co.; San Antonio: Joske's of Texas; Tampa: Maas Bros.; Toledo: Lion Dry Goods Co.; Youngstown, O.: Strouss-Hirshberg Co., and many other leading merchants. Phone or visit your favorite today! chants. Phone or visit your favorite today!

WYPE CORP., Dept. 16-C, 2214 Dolman, St. Louis 4, Mo.

PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY
If you want a REAL GUN for PRACTICAL USE inside or
outdoors get a SAFE - CLEAN - ECONOMICAL - BENJAMIN with Adjustable Power and Amazing Accuracy. For BEST RESULTS use BENJAMIN H-C PELLETS. WRITE AT ONCE BENJAMIN AIR RIFLE CO.. 812 MARION ST.. ST. LOUIS 4. MO.

GAR STUDY AT HOME

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics tistics; Agriculture.

ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering.

Complete Professional Law Course includes 18 Hornbook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence.

McKinley-Roosevelt Incorporated, 4610-K, Sheridan Rd., Chicago 40, III.

LEARN AT HOME TO



Animals, Heads, Fishes, Pets; to TAN. Be a Taxidermist. Profit and FUN.

Hunters, save your valuable TROPHIES. Mount ducks, squirrels, everything. Lesro to TAN for leather and furs. Wonderful HOBBY Have a HOME. MUSEUM.—BIG PROFITS mounting for others. INVESTIGATE NOW. FREE BOOK With 100 fine

NOW absolutely FREE, Write TODAY.

Send Postal TODAY for FREE BOOK. State AGE. N. W. SCHOOL OF TAXIDERMY, Dept. 3373. Omaha, Neb.



RELEASE the Full Power of YOUR MIND

Send for free booklet telling how you can achieve success and reach your personal goals. Find out how to remove frustrations, inferior feelings and worry thru PSYCHO-MENTALISM. Learn how to make your subconscious mind work for, not against, Write today. No obligation. PSYCHO-MENTALIST INSTITUTE, Administration Building, Dept. 38C, Covina, California

for re-plating articles in the home and shop. No tanks necessary. Free particulars.

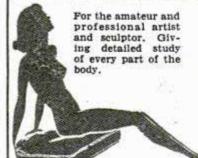
GUNMETAL CO.,

AVE. M.

DECATUR, ILLINOIS



You can easily make EXTRA MONEY casting Bookends, Statues, etc. Complete "Cast-Kit" contains everything needed: 1 Qt. best Latex: 5 lbs. Marblite Casting Clay; 3 Modelers: Scraping Knife, and Full instructions. Only \$4.50 postpaid (or COD, plus fee). Valuable 40-page Craft Catalog FREE. (W. Va. Orders add 9c Sales Tax.) DWINNELL CRAFT SHOP, Dept. P83, Elm Grove, Wheeling, W. Va.



"The Book They're Talking About"

MALE AND FEMALE, POSED AND IN ACTION (Sent in plain wrapper.) Outside of U. S. A. Send \$1.25

MAJOR BOOK CO., Dept. 420-B, Lynbrook, New York

ONLY



GET INTO DRAFTING

Important Part in INDUSTRY

DRAWING OUTFIT INCLUDED with Drafting courses

All the tools you need including folding drawing table. With them you can put your ideas on paper quickly and with ac-curacy. With training you are all set to master Drafting in months, - not years at home.

Learn in Spare Time—At Home!

(or at the College in Chicago)

A few hours of pleasant home study every week — that's all. With Chicago Tech's help, you train yourself step by step. This tested method — developed over 44 years of C.T.C. progress — prepares men for good positions in industry.

Practically everything that's built or manufactured these days is constructed from blue print drawings prepared by the draftsman. He is the KEY man in industry. No new machines can be built, no bridges erected, no buildings constructed until the draftsman has completed his work.

Drafting is clean, interesting, professional-type work. The draftsman is paid well to start. And he has real opportunities for advancement to high-pay jobs in Engineering. The tremendous production programs ahead in industry will require more draftsmen than ever before.

Send today for free information. See what this training has done for others, what it can do for you. Simply MAIL COUPON TODAY in an envelope or use a penny postcard.



AIL COUPON NOW

Chicago Technical College C-211 Tech Bidg., 2000 So. Michigan Ave. Chicago 16, Illinois

Mail me FREE Drafting Lesson with information about big opportunities in DRAFTING and how I can train at home.

- ☐ Architectural Drafting ☐ Ele
 ☐ Machine Drafting ☐ Str.
 ☐ Builders' Course
 - ☐ Electrical Drafting
 ☐ Structural Drafting

CHICAGO TECHNICAL COLLEGE

C-211 Tech Building, 2000 South Michigan Ave. Chicago 16, Illinois

ELECTRICAL SCHOOL

Address

Intensive 32 weeks residence course in funda- in communications, power, manufacturing, oratory, shop work, drafting. Prepares for 7628 TAKOMA AVENUE, electrical technician and engineering aides

mentals of industrial electrical engineering, business machines, sales, service. 54th year. including radio and electronics. Extensive lab- Classes begin March 22; July 26. Catalog. WASHINGTON 12, D. C.



AMAZING NEW ALL-PURPOSE BALL-BEARING DRILL PRESS ARBOR

Sturdily built, precision tooled, lifetime ball bearing arbor, driven directly from your drill press chuck, handles scores of operations otherwise impossible. Designed for heavy or light work in unlimited ways.

Variety of jobs can be done with convenience, speed and accuracy. Indispensable in

and many more / home or commercial shops.

Locks tightly in chuck. Can't damage spindle taper, even against heavy pressure. Can't slip, detach or run out.

Uses all standard 1/2-inch hole tools. Sturdy shaft prevents vibration; no side to side action. Tools ean't detach or fly off.

THE MOST TOOL EVER DESIGNED

Repair Shops, Mechanics Maintenance Men!

Here's the most practical tool for hundreds of jobs . . . safely, accurately and inexpensively. Its simplicity will amaze you.

DEALERS! AGENTS!

SEND NO MONEY!

Just your name and address for immediate delivery. Pay postman on arrival, plus postage. Or send \$4.95 and we pay postage. Money back in 10 days if not satisfied.

Rush your order today!

COMPLETE, with full instructions

NORTHWEST TOOL CO. 2459 University Avenue t. A Soint Paul 4, Minn.

√CHECK THESE FEATURES!

Portable, easy to attach and adjust. Tools ready for use always. • No extra motor; just slip in chuck and run. • No parts to wear out . . . never needs oiling. • Lifetime durability . . . quality workmanship. Smooth, accurate performance on any job. Safest, most versatile tool anywhere. Comes complete, ready to operate-nothing else to buy.

Saves You Valuable Time

You'll be amazed how much time and money this tool will save you. Use it once and you'll never be without it. Just a few repair jobs will pay for itself.



Learn A Trade NOW!

C The Control of the	
AUTO MECHANICS	DIESEL ENGINES
REFRIGERATION	MACHINIST
── WELDING—ARC and GAS	PIANO TUNING
Above Trades Approved fo	or G.I.'s and Civilians
☐ BODY and FENDER	☐ TOOL and DIE
America's Leading School	
7 Floors of Fully Equippe	d Shops
Over 45,000 Graduates	191)
Expert Individual Instruct	
Learn by Doing — Low Liv	175 (A1) 15 (A5) DAY
Established 1902 — Day	and Evening Classes
CALL IN PERSON OR I	MAIL THIS AD TO——
GREER SHOP (Dept. 238) 460 South Stat Please send without obligation ing trade checked above. (Spe Veteran or Civilian)	te St., Chicago 5, III. free information regard-
Name	Age
Address	
City	State

When you are satisfied that you have invented a matter of value-write me, without obligation, for full information as to what steps you should take to secure a Patent or Trademark.

The usual first step is to have a search of the prior U. S. Patents conducted, so that I can report to you on the question of Patentability.

PATRICK D. BEAVERS

(Formerly RANDOLPH & BEAVERS)

Registered Patent Attorney

934 Columbian Building

Washington 1, D. C.

PATRICK D. BEAVERS, Registered Patent Atty. 934 Columbian Bldg., Washington 1, D. C.

Please send me full information on how to secure Patent Protection.

Name	
Street	
City	State



COMPLETELY SAFE

Here is the gun that will thrill every boy. When you pull the trigger, it cracks out like a real gun and smoke puffs out of the muzzle. The American Rangers Automatic is a out of the muzzle. The American Rangers Automatic is a quick acting, repeating pistol that never misses. It shoots 60 to 75 shots without re-loading. Looks like a real gun. Absolutely SAFE. Contains no explosives. Each gun comes boxed with 10,000 shots of smoke powder or enough ammunition to last a full year. This smoke powder is harmless. Will not hurt the eyes and may even be eaten. Only \$1.00 each or 3 guns for \$2.00. Only limited quantity available. Write for yours NOW.

SEND NO MONEY Try 10 Days - At Our Risk

Just send name and address. On arrival deposit only \$1.00 plus C.O.D. postage for one gun or \$2.00 plus C.O.D. postage for three guns. If not completely satisfied return and your money refunded. Save money. If you send cash with order, we pay postage. Write TODAY.

SPECIALTIES MFG. CO., Dept. 508 1367 N. Sedgwick Chicago 10, III.

STAY HOME AND MAKE MONEY!

—Men! Women! Get into profitable, uncrowded profession you can operate from your home or small office after short home training course. No capital required. No goods to buy. No age limit. Others earn \$50.00 to \$100.00 per week making famous Stephenson corrective foot devices to order. Foot sufferers everywhere pay gladly for relief. Send today for FREE BOOKLET.

STEPHENSON METHOD, Established 1894, 12-28 S. Market St., Boston, Mass.

"Proof of Invention" Folder mailed without obligation.

VROOMAN, Registered Patent Atty. 871 Woodward Building, Washington 5, D.C.



REGISTERED PATENT ATTORNEYS WRITE FOR INFORMATION TO

SHOW BUILDING.

WASHINGTON



If you wish to protect your invention, you should take steps to protect it by a U. S. Patent. Write me for steps to protect it by a U. "Record of Invention" Form

CARL 八個 國 國 國 海 八 REGISTERED PATENT TORNEY

Woolworth Bldg., 35t	h Floor.	Dept. 38A,	New York City
Please send me "Record	of Inventi	on" form.	

NAME.				



Here's the Help You Need For Best Paying Jobs Right NOW!

FREE TRIA IN YOUR OWN HOME

Used by Army, Navy, Other Government Depts., 200 Schools and Industrial Firms.

Do it now! Get the better pay that goes to men with specialized knowledge. Get into one of these big opportunity fields. Big money and many other advantages await you if you prepare now. Here is the help you need—EASY—QUICK—AT LOW COST. Thousands of men have already used these famous books. Beginners and experienced men alike have doubled and tripled their earnings with this help. You too, can now get the special knowledge you need for top pay, better jobs, or a business of your own. This is your GOLDEN OPPORTUNITY.

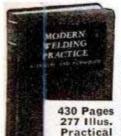
AIR CONDITIONING

Hot

and Will Refund Amount Paid if

Satisfactory.

Big air conditioning boom interrupted by war now bigger than ever and alive with new opportunities! Get this non-technical book by international authority and be ready for your share of millions to be spent. Covers whole field. 450 pages. Illustrated. \$4.00.



MODERN WELDING PRACTICE

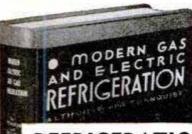
Newest book
on all types of
welding and
heattreatment
of metals,
Written by
recognized
specialists in
training men
for production
jobs. Practical and NonTechnical,
need to know.

Covers everything you need to know. Prepare for best pay jobs now. Price \$4.00.

and Non-Technical

SHEET METAL LAYOUT

Makes sheet metal layout work so simple that anyone can learn. Get this new instructor and get into the easiest, cleanest and best paying part of all sheet metal work. 143 jobs worked out in drawings and carefully explained. Gives standard for all sheet metal fittings. \$3.50.



HOUSE WIRING LATEST EDITION

Get this sixth edition of this standard and practical electrical wiring book. It gives complete practical instruction on every phase of house wiring in one handy volume. Goes further than most books on subject. Hand-book style. Gives National Electric Code. 400 pages, 669 illustrations. Electrical work will reach a new high with millions of new homes to be built. Get started now. \$3.00.

DYKE'S FAMOUS CARBURETOR BOOK

This famous book has been the standard guide in the best paying auto work for a generation. It has helped thousands of men make money. New edition covers engine tune-up, compression, ignition, carburetion, fuel pump valves, etc. Use this book to specialize in this big field. 244 pages, 549 illustrations. \$3.50.



AUTO **BODY** and FENDER REPAIR

Owners will spend big money to keep their good older cars looking like the new ones coming out. This is a practical moneymaking guide, ideal for shop owners and every man who wants a share of the millions to be spent in keeping old cars looking new. Tells how to get a good job or start business of your own with small capital. 325 pages, 232 illustrations. \$3.50.

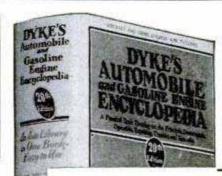
15 Million Refrigerators **Need Service and** Repairs

REFRIGERATION—Book of the Hour! Biggest Opportunity in Many Years!

NEW PRINTING-ALMOST 1000 PAGES

408 Pictures-17 Diagrams in Colors Makes All Refrigerator Service Maintenance, Repairs Simple as A. B. C.

Thousands of Refrigerators need repairs! Owners will pay big for competent service which will be needed more and more. Get MODERN GAS AND ELECTRIC REFRIGERATION, the non-technical guide to all types of refrigerators and get your share of this new profit. Get a job or start your own service business. This book will help you make money anywhere. Price \$5.00.



BIG

EDITION

Leading Auto Book for Over 36 Years

World's AUTO BOOK

New Material on Transmissions, Trucks, Tractors, Diesels, Aircraft and Auto Engines

Now with millions of cars needing repairs and thousands of men needed to do the work, you need the famous DYKE Auto Book more than ever before. This big 20th Edition covers all principles, construction, repair, adjustments, testing, troubles and remedies of all cars. Over a half million copies of 20 editions of Dyke's have been sold. Gives specifications of old and newer cars. World's biggest book value. \$7.00. This big book, a complete auto library in one volume, has 1483 pages—4600 illustrations and diagrams—weighs 6 lbs.—equal to 4 ordinary books.

BAILEY'S HANDBOOK

For Engineers and Firemen

World famous handbook of universal questions and answers for Stationary, Marine and DIESEL engineers and firemen. Prepares for any license examination. This is the one book that men should have if they want to reach the top in installation, maintenance and operation of Diesel and steam plants. Pocket size, \$2.00.

Goodheart-Willcox Co., Inc. 2009 S. Michigan Ave., Dept. 13, Chicago 16, III.

SEND NO MONEY! Mail Coupon

GOODHEART-WILLCOX CO.,

15.0

Chical

2009 S. Michigan Ave., Dept. 13, Chicago 16, III.

Send books checked, C.O.D. I will pay postman, plus few cents charges. If not satisfactory I will return books in 5 days and you will refund money paid. (Outside U.S. or possessions remit with order.)

0	Gas &	Electric Refrigera-
	Dyke's	Auto Book \$7.00
	Dyke's	Carburetor Book . \$3.50
		Welding\$4.00
		e Welding 53.50

☐ Air Conditioning\$4.00

Sheet Metal Layout....\$3.50 If remittance accompanies order we will pay all postage charges under same return privilege.

Name	
Address	3
City	State

Play a Saw Quickly produce saw music of amazing, voicelike beauty. Without knowing one note from another, without using music, soon play such songs as "Long, Long Trail," "Till We Meet Again," and other favorites old and

new. No notes to read, no dreary practicesuccess guaran-

the Musical Saw

amazed themselves and friends . . . many have starred in shows and broadcasting orchestras. This is your opportunity to gain quick popularity, and to make money entertaining at parties, dances, lodges, clubs, church entertainments, everywhere.

You Play or NO PA Since 1921. thousands of our students have

If you can sing, whis-tle or hum a tune then you can play the Musical Saw. To the Musical Saw. To prove how quickly and easily you can learn, we allow you FIVE DAYS TRIAL.

Play at the next party! Write TODAY for details to . . .

MUSSEHL & WESTPHAL

Musical Saws to the Profession since 1921 13 Fort Street Fort Atkinson, Wis.



BOOKS ON APPROVA



make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 RIG. THICK VOLUMES

4 BIG, THICK VOLUMES

over 2700 pages, 2000 illustrations, wiring dia-grams, etc., including Diesel engines. Beauti-ful modernistic, wash-able cloth binding.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 26th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the JIFFY INDEX to find easily understood answer to any auto reference method. Csc the JIFF I INDEA to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile en-gineers. Many hundreds of valuable filus-trations. Send the coupon TODAY.

A year's consulting privileges with our engineers now given with these books without extra charge. Vocational Publishers Since 1898

AMERICAN TECHNICAL SOCIETY, Dept. A319
Drexel Ave. at 58th St., Chicago 37, Ill.
I would like to examine your 4-Volume Set of Auto Books. I will pay the delivery charges only, but it I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you \$2 and pay the balance at the rate of only \$3 a month until \$24.80 has been paid. Include consulting service as offered above.

Name

Address City.

_State.

Please attach letter stating age, occupation, employer's name and address and name and address of at least one business man as reference. Men in service, also please give home address.

HOUSE AND COMMERCIAL WIRING . MOTOR REPAIR

AND REWINDING . ELECTRIC REFRIGERATION

Approved for Veterans Training

PENNSYLVANIA INSTITUTE

PHILADELPHIA 4, PENNA,



Diploma.

BEGIN NOW! Write for my FREE BOOK, "How to Become an Expert Penman," which contains valuable information and many specimens of penmanship that show what others have learned by taking my Courses. If you enclose 10c, I will send you one of my Favorite Penpoints suitable for plain or shaded writing, and your name with a beautiful flourished bird written on a card. Write TODAY,

T. M. TEVIS, BOX 25K, CHILLICOTHE, MO,

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert in-struction—over 108,000 students enrolled. I.L.B. Degree awarded. All texts furnished. Easy pay-ments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW Dept. 87-M, 646 N. Michigan Ave., Chicago 11, III.



Plugs into any convenient AC-DC Socket WELDS - BRAZES - CUTS - MELTS - SOLDERS - HEAT TREATS

CORRESPONDENCE COURSES IN RADIO and ELECTRICAL ENGINEERING

ELECTRICAL ENGINEERING: Get good grasp of wide electrical field, Modern, Very understandable. Theory made easy trical field. Modern. Very understandable. Theory made easy.
RADIO ENGINEERING. Extra fine course in radio, public
address, photo-electric work. Trains you to be superservice man, real vacuum tube technician. Tuition ONLY \$25, either
course. Deferred payment plan. Servicemen needed badly.

FREE Write for free copies of school catalogs, student magazines, etc.
LINCOLN ENGINEERING SCHOOL, Box 931-P111, Lincoln, Nebr.

OWEST PRICE HISTORY! Sensationally New WELDRITE Electric Welding-Cutting Torch



countless commercial and amateur users, is now offered direct to you at the amazingly low price of only \$12.00. No Gas—No Gauges—No Spark Lighter needed. Always ready for immediate use—Just plug WELDRITE into any 110 AC or DC outlet. Uses standard welding and brazing materials available at all welding supply

The WELDRITE Torch-tested and proven by

stores. WELDRITE furnished complete with Converter Unit, Single Holder with attached Alligator clip, for Welding metal up to 3/16" thickness, using up to 3/32" rod, and Double Holder with Carbon-Tipped Dual Copper Electrodes for Cutting, Brazing, Heat Treating,

Soldering, etc. Supply of welding ma-

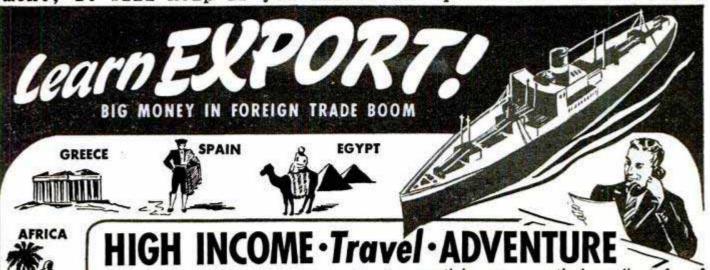
FULLY GUARANTEED terials included free. Ideal for home workshop. In-valuable for body and fender shops, garages,

repair and machine shops, manufacturers, etc. SEND NO MONEY. Order your WELD-RITE Electric Welding-Cutting Torch today. Pay postman \$12 plus postage charges (wt. 4 lbs.) or send \$12 and we pay postage. Either way, if not satisfied, return WELDRITE in 5 days, and money will be refunded. California orders please add sales tax.

CALIFORNIA TECHNICAL PRODUCTS COMPANY 8510 Warner Drive . Culver City, California . Dept. A-3



NOTICE: As many replies will result from this announcement, it will help if you answer the questions below. B.L.M.

















A STATE OF THE STA

If you are tired of looking forward to a life of humdrum, low-paid work in overcrowded fields, THIS IS FOR YOU! COMPARE World Trade's 18 BILLION DOLLAR VOLUME with anything else you've considered. LOOK in any telephone book under "Exporters and Importers" and see how few you find, compared to the "struggle to live" lines. You have room to prosper and opportunities for World Travel in Export-Import.

SALARIES UP TO \$1000 A MONTH

... are common in World Trade. But—the sky's the limit in your own business. Commissions of \$10,000 to \$20,000 a year are quite possible. World Trade is almost three times that of the prewar thirties and now ready to break all records. Export-Import men and women are in big demand.

Buy For Others

Your customers in other lands tell you by mail or cable what they want. You buy it for them and ship at their expense. My course shows you how to get customers and how to find the goods they want.

Past Experience Unimportant

No previous experience or special schooling is necessary—only common school education. I teach you at home in your spare time by simple methods based on my own 25 years of practical experience. You use my experience. You can operate a World Trade business on a mountain top in Virginia or on the plains of Nebraska—in your own home—anywhere. You don't have to live in a city. Your customers are all over the world in this practical, profitable business.

I TEACH YOU AT HOME

I have trained others in as little time as one

B. L. MELLINGER, Director

THE MELLINGER CO., Exporters—Importers
1416Z Westwood Blvd., Los Angeles 24, Calif.

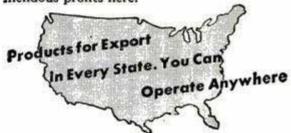
MANUFACTURERS with extra production capacity!
Write for proof of how you may get profitable
export sales. Describe products and volume available. Address Manufacturers' Division.



month because my methods are direct, free of non-essentials and red tape. You can start your own mail order World Trade business at home —on practically no investment.

Big Profits In Import Too

As you export, you receive opportunities to import. I give you practical lessons on how to handle this profitable business too. Many imported articles bring fabulous prices and tremendous profits here.



Practical — No Theory

I give you a BIG KIT of actual export documents and many other helpful guides—and a full year's consultation service even if you finish my course in one month. I even give you a list of 150 proven foreign representatives to help get you started earning fast. A World Trade Certificate will be awarded you on successful completion. Other very special features I'll tell you about when you write me.

Start Today — Get FREE Details

Expansion of World Trade is at fever heat. Rush the coupon to me today for free details. The low cost of this course will surprise you. (No Salesman will call.) Air Mail reaches me over night.

MAIL COUPON NOW

B. L. Mellinger, Director, The Mellinger Co. 1416Z Westwood Bivd., Los Angeles 24, Calif. Please send FREE LITERATURE showing how I may enter the profitable career of World Trade.

Name		
Address		
City		State
Veteran?	Occupation?	Age?

CAPITOL RADIO ENGINEERING INSTITUTE

Pioneers in Radio-Engineering Instruction Since 1927



RCA Photo

The radio - electronics industry seeks technicians and engineers to man hundreds of new FM, AM and television stations now on the air or under construction . . . mobile communication units, commercial aircraft and ground radios. New applications for eleccommercial aircraft and ground radios. New applications for electronics are being developed rapidly in practically every industry. Radar navigation is a reality. Vast expansion in the electronics field has already taken place. More is in view. Electronics is an uncrowded field — crowded only with opportunity for careertrained technicians and engineers. repaired by the school to help you do it. Prepare for a Well-Paid Future.

Get into this fast-growing indus-try. Prepare with CREI, an Ac-credited Technical Institute that starts with fundamentals, gives you home study training you can understand, and can take you all the way to a career. Twenty-one years of teaching background and years of teaching background and experience are at your service. Practical engineers and technicians in hundreds of key positions throughout the field of electronics owe their successful training to CREI. Our graduates are eagerly sought by industry—

CAPITOL RADIO **ENGINEERING INSTITUTE** Dept. 13, 16th & Park Rd., N. W. Washington 10, D. C.

Branch Offices: New York 7: 170 Broadway San Francisco 2: 760 Market St.

MAIL COUPON FOR FREE BOOKLET

as large numbers of letters in our files prove.

CREI Starts At the Beginning

If commercial radio is a new field for you, CREI's step-by-step method provides all neces-sary fundamentals. Then you pro-ceed into the more advanced study of radio engineering prin-ciples and practice. Finally you may elect training at career level in highly specialized applications of broadcasting, television, and aeronautical radio.

Begin Training Now_At Home

Make yourself a secure future in electronics. You can do it — if you're willing to put your spare time to use. Send for FREE book with complete information and see for yourself how you can train for a high-income career with one of America's foremost technical institutes.

VETERANS: CREI Home Training is available under the GI Bill.

NON - VETERANS: Easy terms at pre-inflation prices.

(For an intelligent answer to your inquiry, please complete the coupon in full.)



CAPITOL RADIO ENGINEERING INSTITUTE, DEPT. 13 16th & Park Read, N. W., Washington 10, D. C.

Gentlemen: Please send me your free booklet, "CREI Training For Your Better Job in Radio-Electronics" describing oppor-tunities and CREI home study courses in Radio-Electronics and Television.

2 CIC I STOIL
NAMEAGE
STREET
CITY ZONE STATE
OCCUPATION

☐ I AM ENTITLED TO TRAINING UNDER G. I. BILL

Check field of greatest interest:

☐ RADIO-ELECTRONICS
☐ BROADCAST AND TEL

BROADCAST AND TELEVISION AERONAUTICAL RADIO ENGINEERING

RECEIVER SERVICING ☐ INDUST. ELECTRONICS

SAY YOU SAW IT IN POPULAR MECHANICS

"The Supreme Authority

in courts, schools, homes, newspapers and Government offices

The Merria

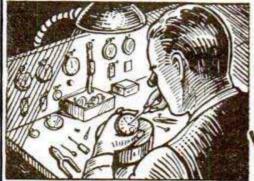
WEBSTER

You may have had to wait for a copy of WEBSTER'S NEW IN-TERNATIONAL DIC-TIONARY, Second Edition. However, more and more copies are reaching your dealer. See him now. The MERRIAM-Webster contains 3,350 pages, illustrations for 12,000 terms, and a to-tal of 600,000 entries— 122,000 more than any other dictionary. It is the only unabridged dictionary completely revised and rewritten in three decades. G. & C. Merriam Co., Springfield 2, Mass.

GIVE-A-BOOK CERTIFICATES AT YOUR BOOKSELLERS

WEBSTER'S NEW INTERNATIONAL DICTIONARY • Second Edition





LEARNING

Spare Time Home Training Prepares You For Big Pay

FREE WATCH working tools and watch included as part of our Watch Repairing Course

The demand for skilled watch repairers—men and women—is increasing with the step-up in the manufacture of watches. Now is the time to prepare yourself in this fascinating profession with the aid of our highly practical ROME TRAINING COURSE—in your spare time at home. Start your own business or accept a big pay position.

WRITE TODAY FOR FREE DETAILS

Earn while you learn with an "approved" school. Get the facts—then judge.

ILLINOIS SCHOOL OF WATCH REPAIRING 2870-BG Elston Ave. Chicago 18, Illinois



CLASSIFIED Advertisements

Advertisements in this section 75 cents per word, each insertion, minimum 10 words, payable in advance To be inserted under proper classification, copy must be in our office the 22nd of the second month preceding date of issue

F. W. Johnson, Manager, Classified Advertising

Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Illinois

CLASSIFIED 1270 ADVERTISEMENTS

1270

OPPORTUNITIES FOR YOU

AUTOMOBILES, MIDGET CARS

FREE Trial in your car: Order Gane Air Flow Needle today: \$1.50 postpaid. Ten day money back guarantee, if not satisfied. For all cars, trucks, tractors; state make of car, truck, tractor; make of carburetor. Advanced Automotive Products, 563-2 Lake Road, Webster, N.Y.

BRITISH Sports cars. New book. 96 makes described. Fine illustrations, specifications. \$2.00, deluxe edition \$3.00 postpaid. Clymer, Dept. A-37, 2125 W. Pico, Los Angeles 6, Calif.

KAISER-FRAZER. Floyd Clymer's new book (no connection with Kaiser) gives uncensored, impartial report 3000-mile test including Pikes Peak, Kansas City-Denver record runs, economy test. Part by part equipment analysis. Good, bad comments, no punches pulled. \$1.50 postpaid. Clymer, Dept. A-31, 2125 W. Pico, Los Angeles 6, Calif.

BURN Water in your car. Costs less than gas. More power, cleaner motor. Mail card for data on \$17.50 Octa-Gane Water Injecting Carburetor. Advanced Automotive Products, 563-2 Lake Road, Webster, N. Y.

ANTI-FREEZE. Change alcohol to permanent. Information, Al Burnetto, Box

ANTI-FREEZE. Change alcohol to permanent. Information. Al Burnetto, Box 171, Hartford, Michigan.

171. Hartford, Michigan.

CLYMERTONE, Twin muffler sets, beautiful sound, complete with necessary welded pipes, E-Z installation. Ford V-8, \$20.00. Chevrolet set with split manifolds, \$37.50. Specify car model. Clymer, Dept. A-34, 2125 W. Pico, Los Angeles 6, Calif.

PENDER Undercoater—Brush it on yourself. 5-gal. pail \$8.75, delivered. Becker Paint & Varnish Co., P.O. Box 54, Bay City, Mich.

WELDING Bodies, repairing fenders pays good profits. Easy with Hobart A. C. Welders. Catalog free. Write Hobart Welders, Box M-382, Troy, Ohio.

1947 INDIANAPOLIS Race History. En-

Box M-362, Troy, Ohio.

1947 INDIANAPOLIS Race History, Enlarged, 56 pages, 125 photographs, charts, complete details cars, drivers, specifications, \$1.00 postpaid, 320-page Indianapolis history book 1909 to now \$3.50, deluxedition \$5.00 postpaid, Clymer, Dept. A-30, 2125 W. Pico, Los Angeles 6, Calif. "CUSTOM Styling" Manual Easily make car look Hollywoodized, custom built, ultra-beautiful! Latest customizing, restyling, streamlining methods simplified for all cars, 100 photographs, illustrations, instructions, Also model changes, accessories, mufflers, Engine "hop-up" specifications! \$2, Alinquist Engineering, Milford 1, Pennsylvania. ns! \$2. Almq Pennsylvania

RACE Driver History. Complete information every driver competing Indianapolis "500." 1911 to present. 313 drivers performance records every year alphabetically arranged. \$1.50 postpaid. Clymer. Dept. A-RD. 2125 W. Pico, Los Angeles 6, Calif.

A-RD, 2125 W. Pico, Los Angeles 6, Calif.

"SPEED & Mileage." Manual. Obtain
greater speed, mileage, racing performance
from any automobile! Shows simplified
methods! "Speed Tuning Secrets"! Gas
saving tips! Instructions on building speed
equipment, economizers, mufflers, water
injection, manifolds, superchargers, fuels,
heads, "hot-rods," fast conversions, engines! Streamlining, customizing suggestions, photographs! Includes parts lists!
\$1.98. Almquist Engineering, Milford 1,
Pennsylvania.

HOT-ROD Enthusiasts. Get a reflecting license plate emblem. Replica of hot rod in red, yellow, or blue, \$1.00 ea. postpaid. Speed Specialties, Box 5983, Indianapolis, red.

AUTO Repair manuals, by Victor Page. Complete non-technical data all mechanical features, operation, repair. Ford V-8 cars, trucks, 823 pages, 369 illustrations, \$3.50 postpaid. Chevrolet six and truck, 896 pages, 363 illustrations, \$3.50 postpaid. Clymer, Dept. FC-1, 2125 W. Pico, Los Angeles 6, Calif.

Angeles 6, Calli,

DRIVE A new King Midget, world's lowest priced automobile. We supply all parts ready to bolt together. 45 miles per hour, 90 miles per gallon. Beautiful racerroadster body. Full accessories, including ski adapters for snow and ice. 24-page assembly book, drawings, photos, blueprints plus detailed illustrated circular \$1 (refunded first order). Circular only 25c. Midget Motors Manufacturing, Athens, Ohio.

RACING Car Builder Book, 22 drawings. Racing rules. Contains information on cams, compression, balance, midgets, big cars, roadsters. V-8 speed data. \$2.00 postpaid. Clymer, Dept. A-RB, 2125 W. Pico, Los Angeles 6, Calif.

DRIVERS That smoke—Avoid dangerous cigarette fumbling, "Pres a lite" automatically hands you a lighted, ready to
smoke cigarette; easily clamped to steering column; compact yet holds 23 cigarettes; complete only \$6.95 prepaid or
c.o.d. plus postage. Literature 10c.
Robert Theis, Rydal, Pennsylvania.

Robert Theis, Rydal, Pennsylvania.

BUILD Automatic clutch, scooters, midget autos, tractors, shop machines. Catalog free. Nichols Equipment Co., Dept. 811. Purvis, Miss.

DUESENBERG Catalog reprint. Complete data. 32 photographs various body styles, views. Complete engine specifications, includes supercharger information. \$1.00 postpaid. Clymer, Dept. A-36, 2125 W. Pico. Los Angeles 6, Calif.

FORD-MERCURY Owners 1941-1947, operate your dome lights from both front doors. \$2.50. Free literature, Danby Manufacturing Company, Portland, Michigan.

GREATLY Increase gas mileage! Latest

GREATLY Increase gas mileage! Latest copyrighted "Economy Tuneup" tells how. No gadgets. Proven, simple facts, \$1.00, Huff Engineering, 10230 San Carlos, South Gate, Calif.

AUTO Racing magazine subscriptions. Pacific Speedway News, \$6.00 yearly. National Speed Sport, \$4.00. Illustrated Speedway News, \$4.00. All give complete data midget, big car race results. Sample copy each 50c. Specify publication wanted. Clymer, Dept. A-32, 2125 W. Pico, Los Angeles 6, Calif.

BRITISH Motor industry. A review 1896 to 1946. 176 photographs, charts, drawings. Names, addresses all British manufacturers. Contains everything pertaining to British auto industry. Old and new cars shown, 52 large pages. \$1.50 postpaid. Clymer, Dept. A-BM, 2125 W. Pico, Los Angeles 6. Calif.

SPEED Equipment. Marine and automotive. We have only the best, made by leading southern California manufacturers including — Edelbrock, Meyers. Weiand, Winfield, Jahns. Offenhauser, etc. Complete line of high compression heads, dual manifolds, racing pistons, camshafts. dual ignitions, etc. Send 25c for illustrated catalog. So-Cal Speed Shop, 1104 S. Victory, Burbank, California.

BRITISH Cars. New, unique book illustrates, describes 34 British postwar cars, all makes, models. 67 beautiful photographs. A real catalog. Just out. \$2.00, deluxe edition \$3.00 postpaid. Clymer, Dept. A-PW, 2125 W. Pico, Los Angeles 6, Calif.

FORD And Mercury owners, Attention! Give your car that knee-action ride. Re-store arch to flat springs. Eliminate side-sway. Free literature. Supertone Muf-flers, 2470 E. Slauson, Huntington Park 3, Calif.

Calif.

"VAPO-STEAMATIC" — Water injection. Thousands already using this famous automatic system. Easily constructed (for less than \$1.00). Saves gasoline. Engineering triumph—gets up to 33 miles per gallon! Reduces wear. Eliminates carbon. Greatly increases horsepower. Prevents knocking, overheating. Smoother performance. Completely illustrated "Installation Handbook." Also. "Injection Instructions"—lightplanes, trucks, motorcycles, tractors, including "Mileage Secrets"—gas savers, devices, fuel tricks, economizers. \$1.98. Newhouse Industries, 5941-B Hereford, Los Angeles 22.

NO. 4 Clymer Historical Scrapbook, En-

NO. 4 Clymer Historical Scrapbook, Entirely new, different. 224 pages, advertisements, photographs 250 early automobiles, motorcycles. \$1.50, deluxe edition \$2.50 postpaid. Clymer, Dept. A-38, 2125 W. Pico, Los Angeles 6, Calif.

CALIFORNIA Speed equipment, doll'em-up accessories, dual and single mufflers, all cars, Fender skirts, etc. Save freight cost from California. Midwest warehouse. 25c for catalog. Von Esser's, 2840 No. Kedzie, Chicago 18, Ill.

REX MAYS Racer \$3.00. Kun's Auto Racing Book 6th edition just out \$2.00 postpaid. Clymer. Dept. A-39, 2125 W. Pico, Los Angeles 6, Calif.

R & R Mfg. Co., Robert M. Roof, Anderson, Ind., Auto and Marine Division. Complete line of speed and power equipment for hydroplanes, race cars, and midgets, Motor rebuilding instructions and price list \$1.00

BUILD Speedy midget track racer from castoff parts! Plans, specifications, con-struction information, \$1.00. Motor Sup-ply, Box CS-1682, Toledo. Ohio.

HIGH Compression heads. V-8. More speed, acceleration, power. Offenhauser or Edlebrock \$75.00 complete set. Dual manifolds complete with throttle kit, fuel lines, Edlebrock \$49.00. Offenhauser \$55.00. Give make, model V-8. Catalog 10c. Clymer, Dept. A-33, 2125 W. Pico, Los Angeles 6, Calif.

12½"x4½" AIRPLANE Tire, tube, wheel. Others. Department Two B, Post Office Box 89, Merced, California.

HOT-ROD Manual, fast Fords, photos, instructions, \$1.50, Airmailed \$1.75, Racing parts list 25c. Hollywood Hot-Rod, Los Feliz, Box 9626P, Hollywood 27, California.

DUALTONE Chrystaline packed, California mufflers, single or twin for all automobiles. Carburetor velocity stacks. Compression cylinder heads. Dual manifolds. Large double or single chromed tailpipe extensions. Chromed station wagon stacks. Fender skirts. Request catalogue. Dualtone Mufflers. 2636C India Street. San Diego 1, California.

AUTOMOBILE Racing, Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget, California roadster, Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 m.p.h. rear engine four-wheel drive car. Interesting information for fans, drivers, mechanics, \$2.00 postpaid; \$2.25 c.o.d. Ray Kuns, Department 63. Cincinnati 27, Ohio.

CUSTOMIZE Your automobile! Revised, enlarged book, latest restyling, complete, sharp. 50 photographs! \$1 pp. Post Publications, Box 723-SE, Arcadia, California fornia.

CUSTOM-CAR Photograph album. Fascinating automobile style classics. Coachcraft, Summers, independents, photopacked! \$1 pp. Post Publications, Box 723-AE, Arcadia, California,

MAKE Your Ford fast! Complete details, photographs. How to construct 120 m.p.h. Hotrod. \$1 postpaid. California Bill, Box L-1, Eaglerock, Los Angeles 41, Calif.

AUTOMOBILE Racing book, fifth on, well illustrated. Instructions AUTOMOBILE Racing book, fifth edition, well illustrated. Instructions on building bodies, frames, engines. Ford A and B conversions. Plans. AAA rules, specifications. Roadster racing. Indianapolis cars. \$1.00 postpaid, \$1.30 C.O.D. Ray Kuns. Dept. 47. Madisonville. Cincinnati Kuns, D 27. Ohio.

USED-CAR Buyer's Handbook. Save dollars, grief. Photographs, dealers' tricks, complete tests, \$1 pp. Post Publications, Box 723-TE, Arcadia, California.

PROFESSIONAL Midget racer, motor-scooter, midget roadster, and midget mo-torcycle. Plans, specifications for all four contained in illustrated handbook, 25c, Big list bargain priced used motors, mo-torscooters, servicycles, etc., included free! Midwest, 3839 Drummond, Toledo, Ohio.

Midwest, 3839 Drummond, Toledo, Ohio.

INSTALL V-8 engine in your Model A for extreme acceleration, more top speed, smoother performance. Complete details, photographs. \$1 postpaid. A-V-8, Box L-1, Eaglerock, Los Angeles 41, Calif.

MAKE Your Model "A" do 100 m.p.h. Lightning acceleration, breath-taking top speed. Complete details, photographs. \$1 postpaid. Four Barrel, Box L-1, Eaglerock, Los Angeles 41, Calif.

1948 SUPERIGNITIONITES.

1948 SUPERIGNITIONITER starting, pep, mileage, EG Mfg., Elms-ford, N. Y.

AUTO SUPPLIES AND EQUIPMENT

GASOLINE Saving vacuum supercharger \$12.50. Self addressed stamped envelope for pamphlet. McDowell, 2000 NE. Union, Portland 12. Ore.

AUTO Parts. New or rebuilt, Prompt shipment. Write requirements. Save money, buy direct. Factory Warehouse, Mechanics Auto Parts, 3807-PM North Ashland Ave., Chicago 13.

AUTO Parts for all cars, transmissions, motors, differentials, fenders, carburetors. Security Auto Parts, 1923-PM Grace, Chicago 13.

Chicago 13.

GRILLES For all cars. Meyers Auto
Parts. 820 Dryades. New Orleans, La.

NEW And used automobile and truck
parts. Lowest prices. Complete stock.
Prompt reply. Babbitt Auto Parts, 2833
W. Chicago Ave., Chicago 22.

PLATING Outfits for auto parts. Connect to a battery. No tanks used. Free particulars and proofs. Gunmetal Co., Ave. J. Decatur. III.

MOTORISTS Save gasoline by Vacumating overrich mixtures. Fits all cars. For free particulars write Vacumatic, Dept. 1311. Wauwatosa, Wis.

CAR Trouble? Million new used parts. Describe needs. Automotive, 2928A North Western, Chicago 18.

STEPHEN'S Cement, "seals cracked car batteries"! Can \$1.00. Postpaid! Guaran-teed! Batteryman, Grand Junction, Colo-

SPEED Handbook. How to obtain racing SPEED Handbook, How to obtain racing performance from any automobile without special knowledge or gadgets! Easiest methods! Speed tuning! Racing secrets! Instructions on building speed equipment, fast engines, "hot-rods," mufflers, heads, water injectors, fuel formulas, superchargers, stock conversions, body restyling, customizing information, photographs! Includes parts lists! \$2. Almquist Engineering, Milford 1, Pennsylvania,

BLINKING Turn indicator plans for any make car. Send \$1.00. Box 623, Oak Lawn, Illinois.

ACCELERATOR Control for automobiles, trucks, holds gas pedal any speed, no more pushing. Dealers wanted, Send \$2.98—c.o.d. Automatic Accelerator Control, Inc., Monroe, Michigan.

PROTECT Automobile tires against flats. Avoid accidents. Save lives, The Tiresignal does it. Every automobile needs them. Five for \$2.00. Tiresignal, Dept. A. P.O. Box 1667, Los Angeles 28, California.

SPRAY Paint your automobile. Complete rofessional instructions, \$1.00. 155 Tasso, Palo Alto, California.

SPECIAL! Genuine rubber floor mats, Jute backed, tailor fitted "hi-ribbed" surface. Fords-Chevrolet 1933-47, \$3.75 post-paid! Others available. Write requirements, automobile glass, shock absorbers. Immediate quotations! Cooper's, 3135 Lawrence, Chicago 25.

RADIATOR Overheating? Eliminate trouble, simple easy method, do work yourself, gives real satisfaction, inexpensive. Instructions \$1.00. C. Jourdin, Box 1553 Henderson, Nevada.

UNUSUAL. Gov't. surplus item—Airplane lights. New. Ideal for boats, for path clearance, signalling. Excellent for road trucks, busses, construction night work. Has powerful beam, operates on 27 volts or 110 volts with transformer, complete with powerful motor to oscillate beam. A value of a lifetime! Two complete units to a set. Now! \$19.50 set. three for \$50. "Amazing Bachman's." 25 Herman Street, Rochester 5, New York.

"SPEED & Power Handbook"—Construct your own superchargers, water in-

"SPEED & Power Handbook"—Construct your own superchargers, water injectors, compression heads, fuel saving devices! Get racing speed, acceleration, dynamic power increases from any automobile. Mileage tips. Speed secrets. Formulas. Ignition tuning. Hotrods. Carburetion tricks, Fuels, Including "Restyling Ideas;" streamlining, model revising. Customizing. Sport changes, Accessories. \$1,98. Newhouse Industries, 5941-B Hereford Los Angeles 22. cessories. \$1.98. Newhouse Inc 5941-B Hereford, Los Angeles 22.

AUTO TRAILERS

COMPLETE Foundation for your trailer home. Chassis frames, tor-q-les axles with springs, wheels, hitches parking jacks. Literature on request. General Trailer, 412 South Barstow, Eau Claire,

TRAILER Plan booklet-House, sport, etc. with complete parts, accessory cata-logue and book, "Trailer Building" \$1.00. Marine Mart. Buffalo 7b, N. Y.

AIRPLANE Tires 6, 8 ply. Department E. Post Office Box 89, Merced, California.

BE. Post Office Box 89, Merced, California.

TRAILERCOACHES—Learn about all types: sports, living or travel. Approximately 100 pages monthly; magazine teils all. Special rate, \$1 the year in U. S. \$1.50 to Canada, \$2.00 foreign. Trail-R-News, Box 431-A. Glendale, California.

BUILD Your own trailer! Save money! Have every feature you want! Plans for house, sport, camp and utility trailers. Catalog describing 9 models 10c. 15c in Canada and overseas. Jim Dandy, Box 125-A. Wausau. Wisconsin.

MODERN 20 Foot trailercoach Designed.

MODERN 20 Foot trailercoach, Designed for building in average garage, Blueprints, assembly instructions \$2.00, Simpson Trailers, Box 7789, Essex, Md.

NEW Book "Modern Trailer Coach." How to design and build trailers to 30 ft. \$4.00. New circular illustrating ten designs 20c. Craftsmann Books, Box 1153, Milwaukee, Wisconsin.

ELECTRIC Refrigerator kits. Make your trailer icebox into an electric refrigerator. Time tested machines. Simple and rugged. Detailed directions for installing and servicing. Write B-L-M Electric Co., 812 D St., San Bernardino, Calif.

ATTENTION Trailer builders: Ready to roll house trailer assemblies — all steel frame. tor-Q-les axle, bulldog hitch and jack, U. S. Royal tires. Complete information on request. Wausau Trailer Co., Box 351. Wausau, Wisconsin.

mation on request. Wausau Trailer Co., Box 351. Wausau, Wisconsin.

END Your travel worries and cares—
"Home of a Thousand Addresses." Build it yourself. It features complete house-keeping facilities and will sleep four comfortably. Inside dimensions are 7' 6" x 17' x 6' 4". Any car will tow it. All-steel chassis and rugged framework permit it to roll along safely on the roughest roads. Send \$1.50 for complete set of blueprints and material lists. Popular Mechanics, Room 604, 200 E. Ontario St., Chicago 11, Ill.

MOTORCYCLES, BICYCLES MOTORSCOOTERS AND SUPPLIES

CUSTOM Motorcycle accessories. Picture folder free! New seat covers, all colors, molded cushions. Chrome muffler-loudspeaker. Finest leather jackets; sidestand; seat springs, etc. Pacific Cycles, Dept. A4, 1208 Pine, Seattle. Wash.

SCHWINN Bicycles. All sizes. Whole-sale. Retail. Send dime for list. Century Cycle. 3447 Lawrence, Chicago 25, Ill.

CLOSING Out sale, 400x7 4-ply tire, tube and wheel complete with Timken bearings. 7/16" axle. 7" hub length. 88.95 plus 5% Fed. excise tax. Only 87 available at this price. American Moto-Scoot Co., 630 W. Lake St., Chicago, Ill.

NOW Available for all 1945-46-47 American Moto-Scoots. Bendix lighting system—generator, sealed beam headlight with atachments. Give model when ordering. Genuine Moto-Scoot parts also in stock. American Moto-Scoot Co., 630 W. Lake St., Chicago 6 III TII

MOTORCYCLE News—Monthly. Latest worldwide information. Yearly subscrip-tion \$1.00. Sample 10c. Motorcycle News, 5424-A Sawyer, Chicago 25.

BICYCLE Supplies, wholesale, retail. List. 10c. Universal, 4713 Virginia, St. Louis, Missouri.

CHROME Plating on all motorcycle parts. Doll up your bike. Free literature. Master Silverplaters, 2033 Caniff, De-troit 12, Michigan.

MOTORCYCLE Cams ground for speed and power. Write Harold Schaller, Box 31, Turlock, Calif. SLIGHTLY Used American moto-scoots

SLIGHTLY Used American moto-scoots with Briggs and Stratton engine in excellent condition. T. Bullock, 4864 N. Magnolia. Chicago 40, Ill.

INDIAN And Harley parts catalog 15c. Pistons, motor parts, batteries, tires, chrome accessories. Bootz, 622 East Grand. Des Moines 9, Iowa.

MIDGET Automobile \$15, Cushman motorscooter \$20, Indian motorcycle \$30, tires 75c. Send 25c for Spring catalog #940 listing sensational bargains in motorscooters, Servicycles, midget cars, used motors, parts, Associated, Box CS-1764, Toledo, Ohio.

EXPERT Rebuilding of racing and stock motorcycle engines. Largest stock of parts and accessories in middle west. Write for details. Bernardi Cycle Co., 1214 Jackson Blvd.. Chicago 7, Illinois.

HARLEY-DAVIDSON Supplies, parts, accessories, oil service, tires all sizes, repaired 45" motors. Send \$2.25 for Army Motorcycle Manual, 10c for bulletin. Knuth's (Harley-Davidson Dealers), 2491 Fonddulac, Milwaukee, Wis.

MIDGET Racer \$40. Cushman motor-scooter \$15, motorbike outfit \$15, Harley-Davidson motorcycle \$35. Send 25c for new catalog #12 listing amazing bargains in motorscooters, motorbikes, midget cars, motors, parts, Gail, 538 Erie, Toledo, Ohio,

HARLEY-DAVIDSON Parts, accessories, batteries, and tires. 24 hour service. Authorized factory dealer. Philadelphia Harley-Davidson Company, 857 North Broad Street. Philadelphia 23, Penna.

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages, 4" to 16". Free list, Truisen Mfg. Co., 811 E. 31, Kansas City, Mo.

TIRES And industrial wheels, suitable for scooters, wheelbarrows, farm equip-ment, etc. All sizes. Bicycles and acces-sories. Largest assortment in America. Send dime for list. Cycle Transport Com-pany, 1241 So. Michigan Ave., Chicago 5, pany, I

BUILD America's lowest priced motor-scooter speedster! Complete plans, speci-fications, \$1.00. Big list bargain priced used motors, etc., included free! Motor Supply. Box 1682-CS, Toledo, Ohio.

ENGLISH Magazines: Yearly rates Bicycle weekly \$4.50, Cycling weekly \$4.50, Motor Cycling weekly \$5.50, Motor Cycling weekly \$5.50. The International News Company, 131 Varick St., New York 13,

CHROME Dual pipes for Harley Big Twins \$24.50 complete, Von Esser's, 2840 North Kedzie, Chicago 18, Illinois,

SCHWINN Bicycles, new and slightly used. Send dime for pictures. Atlas, 3002 Broadway, Chicago 14, Illinois.

MOTOR Scooters, bicycle engines, 120 miles gallon. Dime for catalog. Clymer, Dept. A-35, 2125 W. Pico, Los Angeles 6, Calif.

FLAT Rate Repair Manual for Har-ley-Davidson. Gives flat rate charge for every operation. Every dealer, owner, me-chanic needs this new book, \$2.00 post-paid. Clymer, Dept. A-FR, 2125 W. Pico, Los Angeles 6, Calif.

T. T. Racing. New exciting, accurate book of world famous English road racing history. Just printed, \$3.00 postpaid. See our advertisements under autos. Clymer, Dept. TT-1, 2125 W. Pico, Los Angeles 6, Calif.

MOTORCYCLISTS Chromium accessories. New and reconditioned motors. Complete stock Indian parts. Expert motor rebuilding. Indian Motorcycle Sales, Kansas City 1, Missouri.

BICYCLES, Tricycles, parts, accessories, Send 10c for bulletin. Propp's, 2202 Fond-dulac, Milwaukee, Wis.

CUSTER Car \$25, Ner-A-Car \$35, other midget cars as low as \$12; motorscooters \$10 up; Briggs Stratton engines \$3 up; motorbike conversion \$5; Whizzers \$30 up. Over 5000 tires \$1 up. Mailorder only. Send 25c for Big War-Bargain Catalogue No. 24, just out, listing the above and almost 400 other bargains in new and used motors, motorscooters, midget racers, parts, plans, etc. (35c by first class mail.) Midget Motors Directory, Athens, Ohio.

MOTORCYCLE Pistons and parts, new, used. Harley, Indian, Henderson, Super-X, List 10c. Ballak, 811 N. 9th, St. Louis 1,

AVIATION

AVIATION Quiz Book, (by Zweng) two books in one—Prepares for private and commercial rating; contains new examinations not available elsewhere. Only \$3.00 postpaid; also Mechanics Manual \$3.00. Pan-American Navigation Service, 12021-C Ventura Blvd., N. Hollywood, ice, l

GIANT Kites. Only \$20. Fraction government's cost. 10x14 ft. double tier. This monster tows cars, skiers, skaters, canoes. Lifts light persons, antennas, advertising, cameras. Pleasure. Profit. Great-Northern Mart, North Adams, Mass.

AIRFORCE Sextants, marine or air navigation, Fairchilds \$12.50; Bausch-Lomb \$29.75. Aerial cameras \$175; Elgin stop watches \$12.75. (Free bulletin.) Pan American Navigation Service, 12021-C Ventura Blvd., N. Hollywood, Calif.

PROPELLERS—2 And 3 blade for snow-ice sleds, boats, Catalog, Standard Aero-craft, Box 387, Ft. Worth, Texas, VETERANS; Flight training under the

Q. I. Bill. Tuition paid. Private, commercial, flight instruction, instrument and multi-engine ratings. Opportunities to work for living expenses or tuition, if not a veteran. Write Gottschalk School of Aeronautics, Adrian, Mich.

STERLING Identification bracelets with wing. Every AAF pilot had one. Were \$10.00. Clearance \$4.45. VanDusen Aircraft, Minneapolis, Minnesota.

raft, Minneapolis, Minnesota.

JET Propulsion experiments. New design. Drive bicycle. Circular on plans. Rush name. Maupin, Tipp City 7, Ohio.

AVIATION "Quiz System" famous "Zweng" books with authentic "Multiple Choice Examinations" include: Flight instructor \$3.00; private and commercial (two books in one) \$3.00; A & E mechanic \$3.00; flight engineer \$4.00; Our "war surplus" releases include: Airforce Fair-child sextants \$12.50; Bausch-Lomb \$29.75; aerial cameras \$175.00; Elgin stop watches \$7.50; Astro Compasses (good) \$8.75, new \$12.50. (Free folder.) Pan American Navigation Service, 12021-C Ventura Bivd., N. Hollywood, Calif.

ELECTRICAL SUPPLIES

D.C. Meters, new, 3\(\frac{1}{2}\)". \\$1.39 each, 5 for \\$5.00, send for list B2. Boutwell Electric, 203 Gilbert, Kirkwood 22, Mo.

LAMPS—Build own originals, parts wholesale any amounts. Catalogue 10c, Brown Lamp Co., Box 501, Wellston, St. Louis 12, Mo.

CAPSULE Thermostats—40 watt capacity, high voltage, opens circuit on temperature rise, 3 for \$1.00, D. E. Kitchen, Logan, Ohio.

ELECTRIC Heater — Wonderful value — Regular \$12.95, only \$6.95 delivered, Un-derwriter's approved, 1225 watts, 115 volts. Vogt Mfg. Co., Box 1122, Louisville, Ken-tucky.

ELECTRIC Pencil—Writes, engraves all metals, 110 volts, complete \$2.95 or two for \$5.00. Battery model \$1.00. Reb In-dustries, Dept. 265-DG, Elmhurst, Illinois.

LAMP Sockets, mogul sockets, three way switches, tumbler switches, receptacles, cord sets, electrical repair parts, lamp parts, etc. Catalog 10c. Gearon Company, 6405 North Oakley, Chicago.

LAMPS-If you build or repair and have trouble finding parts—your search is end-ed! We carry practically every part neces-sary. Harps, finials, vase caps, etc. Illus-trated catalog 10c. Gyro Lamps, 5416P Clark, Chicago 40.

TATTOOING Machines, outfits, Free atalogue, Jensen, 120 West 83rd Street, catalogue. Jer Los Angeles 3

FREE Catalog—Motors, welders, welding supplies, generators, fencers, electric mowers, freezers, other electrical items. LeJay Company, Minneapolis,

ALNICO Magnets, free list, Terry Sales Company, 3726 South Detroit Avenue, To-ledo 9, Ohio.

AMAZING Communication unit! Remote controlled to send messages house to barn, to shop, etc. Communicate with dad in garage or jurior in attic. Contains two identical set-ups with buzzers, lights, remote control transformers and dial with codes. Operates on regular house current, ready to operate, simple to connect. Unlimited uses. Only \$14.95; three sets for \$40. "Amazing Bachman's." 25 Herman Street, Rochester 5. N. Y.

MAKE Electric welder, also pencil. In-formation free. Write "International," 6347 Parnell-X2, Chicago 21, Illinois.

ELECTROPLATING Has a thousand and one uses when working with electrical supplies and equipment. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. ES-3, 1512 Jarvis Avenue, Chicago 26, Ill.

GUNNERS Training table New the

cago 26. III.

GUNNERS Training table. New—the greatest value offered yet. Ideal for clubs, shooting galleries, automatic checking, counting, burglar alarms. Can be operated as a very profitable business. Comes complete with 7 a.c. 110 volt motors, sensitive electric eye, powerful amplifier, rotating mechanism; maple top table, etc. All parts can be used individually. Worth the investment for parts and mechanism alone. Limited time; \$300. "Amazing Bachman's." 25 Herman Street, Rochester 5. N. Y. Bachman's,' ter 5, N. Y.

WELDING, SOLDERING, PLATING

WELDERS!—New portable Champion special transformer welder; 110/120 volts, a.c. 8. heat stages. Welds, brazes, solders, cuts all metals. Complete with electrode holder, helmet, rods, carbons, fluxes, cables. Also special flame weld torch. Easy to use. Full directions. Splendid for shop, farm and home repairs. Guaranteed. Only \$27.50. Money back guarantee. Also resistor model, now \$14.95. Magic Welder Co., 239 MP Canal St. New York, N. Y. "BUILD-UR-OWN" Portable arc welder. Save \$300. Easy with Hobart generator plus auto engine. Free instruction book. Write Hobart Welders, Box M-383, Troy, Ohio.

BUY Direct from factory. Welding out-fit \$48.36, Soldering outfits \$7.76 to \$10.16 complete prepaid. Box 331, Hamilton, Ohio,

AIRPLANE Wheels complete assembly with tires as used on plane. Department One B, Post Office Box 89, Merced, Cali-

One B, Post Office Box 89, Merced, California.

WELDING Supplies—Electric and gas. 1/16" rod 15c doz., 3/32" 25c doz., ½" 30c doz. Carbons ¼" 15c ea., ¾" 25c ea. Welders gauntiet gloves \$1.95 pr. 110 volt welder complete \$17.85. New govt. surplus helmets with 3 lenses. \$3.85 ea. Gas welding outfit, complete \$57.00. Complete stock welders clothing. Sweeney. 7241 S. Halsted, Chicago 21, Ill.

OXY-ACETYLENE Welding outfit including: Full oxygen and acetylene cylinders. \$72.95 complete, f.o.b. Cleveland, Ohio. New, supply limited. Check or deposit with order. balance c.o.d. Cylinders can be refilled anywhere. Ideal for hobbyists, garages. repair shops, etc., includes supply of rod. The Burdett Oxy-Weld Equipt. Co., 3399 Lakeside Avenue, Cleveland 14. Ohio.

OXY-ACETYLENE Welding and cutting outfit complete with cylinders and carrying case. Designed especially for hobbyshops, small repair shops, refrigeration and electrical service men. You own the cylinders. Free literature. A-A Welding Supply Co., C9228 S. Ada St., Chicago 20, Ill.

111.

30 AMP. Selenium plating rectifiers with Powerstat control, \$85.00. Lead lined tanks, geared motors for agitation. Complete line of bronzed baby shoe mounts. Hollywood Bronzed Supply, 1770 N. Vermont. Hollywpod 27. Calif.

ELECTROPLATING Has a thousand and one uses. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. WS-3, 1512 Jarvis Avenue, Chicago 26, Ill.

ACETYLENE Welding outfits, complete.

ACETYLENE Welding outfits, complete, brand new, \$45.00. Eagle Welding, Dept. PM, 5085 Broadway. Chicago 40.

WELDERS—Govt. surplus tested gasoline driven. Save up to 50%, Iowa Machinery Co., Des Moines.

HEAVY-DUTY, 110/220V. a.c. arc welders. R.E.A. approved outfits. Williams Sales, Box 4100, Portland 8, Oregon.

PREHEAT Guns and generators. Preheating for welding, annealing. Gun complete \$39.50, burns natural gas. Generator \$59.50, uses gasoline. Write Goodwin Mfg. Co., Crab Orchard, Ky.

A.C. Welders, 110 v. welds ½" steel, \$29. Morris Welding Service, 1850A State St., Schenectady 4, N. Y.

MACHINERY, TOOLS, SUPPLIES

MICRO Switches, three different, \$2.75. Aircraft switches, fine assortment, \$2.25. Self-oiling bushings, four lb. assortment, \$4.00. Aluminum spacers, 5 lb. assortment, \$2.00. Aluminum rivets, 4 lb. assortment, \$1.50. Columbia Salvage Co., 173-3rd Ave. No., Nashville 3, Tenn. C H U C K S, Independent, Universal, threaded 1½"-8 for South Bend, Atlas. Logan, Clausing, Craftsman lathes. Top value. Free literature. Westcott Chuck Co., 3600 Walnut, Oneida, N, Y.

WAR Surplus special: Big 50 lb. box popular size bolts, nuts, washers, screws, clamps, etc. \$6.85. War Surplus Co., Box 910. New Brunswick, N. J.

GRINDERS, Drills, vises, clamps, punches, taps, dies, tool boxes, micrometers, indicators, Catalog 10c, refunded, Precision Tool Service, Dept. M, 55 E. Washington, Chicago 2, Illinois.

LATHES, Saws, grinders, sanders, hand tools. Bottom prices. Kalder Engineering, Grand Rapids 6, Michigan.

WAR Surplus in small tools for machine shop. Send 15c for bulletin, Travers Tool Co., Dept. P, 5 Court Square, Long Island City, 1, N. Y.

LATHE Boring and threading done fast and accurate with America's newest low priced bar holder. Free literature. Miles Products, 2532 Wabash, Chicago 16, Ill. ELECTRIC Motors, all sizes, also fan parts, build your own. Universal Fan Co., Peru, Indiana.

HOME Lathe owners — Build your own attachments. Send for picture, sample of work and list of blueprints. Cut gears, ratchets, etc. Make neat screws easy way. The Home Shop, 415 Raymond Ave., Glendall Calif. dale 1. Calif.

FOOT Switch—Operates all power tools. Guaranteed, \$3.95 or two for \$6.50. Reb Industries, Dept. 265-DF, Elmhurst, Illi-

Guaranteed, \$3.95 or two for \$6.50. Reb Industries, Dept. 265-DF, Elmhurst, Illinols.

MECHANICS, Hobbyists—New war surplus bargains. Dual-drive assembly, geared 7 to 1 reduction, driven by powerful 1/5 h.p. a.c. or d.c. motor, operates on 6-27 or 110 volts with transformer. Simple attachments adapt this unit to countless uses, Used as individual drill, sander, etc. by detaching flexible drive shaft. Complete with stepdown transformer, worth half the investment; which can be used to convert nearly all aircraft motors to regular house current. \$300 value! Special! \$19.50. All new flexible drive cables. 10". 25" or 72". Combination three sizes, \$1.75. Precision-built right angle drives, complete with flexible drive cables. \$3.50. Magnet wire. ½ lb. coils No. 22, 10 rolls for \$3.00. 27 volt geared head (120 r.p.m.) motor, \$30.00 value; special \$2.95. New aluminum and steel bushings and spacers, variety assortment, 5 lbs. minimum, \$4.75. Rivet assortment; copper, steel, aluminum, over 250 varieties. Extra special, 5 pound minimum \$4.75. Micro switches, 6 variety assortment, only \$4.75. Ranger engine, new, in original case, 570 h.p. 12 cyl. V type, Engine Spec. No. 177. Complete with spark plugs. Original cost over \$12,000 each. Special, \$200. Crated weight 1200 lbs. Selsyns; new! Transformers; GE Model 2J1G1, 57.5-57.5V 400 cy.; Generators GE Model 2J1F1, 113-57.5V 400 cy. With gears, \$1.50 each. Quantity lots, \$15.00 dozen. Amplidyne motor-generators; GE-5AM 31Ni9A. Output 60 v.d.c. input 27 v.d.c., 530 watts \$120 value, now \$6.95 each, three for \$20. Order today! No c.o.d. "Amazing Bachman's." 23 Herman Street, Rochester 5, New York.

V-BLOCKS At low prices, new type with clamps, rust-proof, home or factory write Milles Products 2532 Walaesh

V-BLOCKS At low prices, new type with clamps, rust-proof, home or facto-ry. Write Miles Products, 2532 Wabash, ry. Write a Chicago 16.

REGULAR \$4.25 Set. Six open end wrenches. Forged. Cadmium plated. Not surplus. Only \$2.95, Sizes \$\frac{3}{6}\$ inch to 1 inch. 26 North 11th Street. Toledo. Ohio.

DRILL Grinder for twist drills \$2.95. See ad on page 250. MACHINE Plans catalog 25c. Vanbur-leigh, 157 State, New Haven, Conn.

MARCH 1948

CASTINGS. Blueprints, materials for woodworking and metalworking machine tools. Suitable for commercial or home shop production. 23 items, catalog 10c. Lewis Machine Tool Co., 3217 Union Pacific Avenue, Dept. M, Los Angeles 23, California. California.

A.C. Arc-welders, bench sanders, power owers. Bargains. Holgerson's Service, vers. Barsas.

Canton.

Canton, Kansas,

MACHINE Shop tools released for private industry; South Bend 9" lathe \$225.

11" Barnes lathe \$150, 16" x 6' Quick Change lathe \$440. 4 spindle automatic screw machine \$300. 16" x 5' geared head lathe \$560. 16" crank shaper with motor \$660. 20" drill \$180. 5 h.p. Single phase motor \$100. 24" x 12' lathe \$480. Small gear hobber \$240. 36" band saw \$225. Money back guarantee. Conversion Parts Co., 278 Adams St., Boston 22, Mass.

VOUR Drill press a lathe! Write Ed-

R Drill press a lathe! Write Ed-Specialties, Box 687B, Alhambra,

METALWORKING Saws, end mills 25c. Circular 10c. Machinery, Newfane 2, Ver-

mont.

HARDWARE, Tools, pattern supplies, castings, electrical equipment, belts, pulleys, drills, brass, steel, drill rod. Catalog 5c. Terek, 6304 Patterson, Chicago 34.

CONVERT Your electric hand saw into a portable belt sander, only \$39.95. Write for details. A & P Equipment Company, 2337 American Ave., Long Beach, Calif.

ASSORTED Scissor screws, free list.

ASSORTED Scissor screws, free list. verland Saw Service, Independence,

ELECTROPLATING Has a thousand and one uses when working with machinery, tools and supplies. Warner Electroplaters permit you to easily plate chromium, permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit, Write today for free sample and literature. Warner Electric Co., Dept. MT-3, 1512 Jarvis Avenue, Chicago 26, Ill.

ANGLE Surface and sine plates. Free terature. Mathis Machine Corp., South literature.

Bend, Indiana.

TAPS, Dies, tools and supplies. Buy direct by mail. Free catalog. King Tap & Tool Co.. North Attleboro, Mass.

AIR Compressors. Dealers wanted to introduce the new Betco line for service stations, garages, shops and paint spraying. For particulars, write Betco, 619 North Broadway, Oklahoma City, Oklahoma.

Broadway, Oklahoma City, Oklahoma.

BALL Bearings one-fourth list price, Free list, Burgess, Box 168, Ferguson, Mo.

MODERATELY Priced. Available now. Portable electric sander, woodworking power tools, shaper, bandsaw, etc. Paint sprayers, Armand grinder for schools, home work-shops, cabinet-makers, farmers, garages, repair shops, others, Post-card brings free bulletin. H. Saltzman Co., 118-14 33rd Ave., Kew Gardens 15, N. Y. Dept. S.

N. Y. Dept. S.

SHEBEL Saw filer. Files all saws. Circular. A. P. Shebel, 730 B. So. 2nd St., Milwaukee 4, Wis.

DRILLS—Taps reconditioned, up to seventy-five percent off list. Send for free circular just published. Perry Screw and Bolt Corporation, 4250 Grand-River. Detroit 8. Michigan.

CONCRETE Block machines \$39.50 up, Catalog free. Concrete Machine Company, 5466 Gravois, St. Louis 16, Missouri.

DRILL Grinder-Grinds drills to factory accuracy. Calipers with direct reading scales. Circle cutters. New Tool grinder. Lowest prices. Free literature. Factory, 811-B East 31st, Kansas City 3, Mo.

ENGINES, MOTORS, DYNAMOS

GAS Drive arc welders. "Build your own." Portable, goes everywhere after profitable jobs. Free instruction book. Write Hobart Welders, Box M-384, Troy, Ohio

INVALUABLE Collection of diagrams and instructions for motor winders. Jed-nak, 107 Island Ave., McKeesRocks. nak, Penna.

WINDING Data, listing 225 motors, single and three phase, \$1.00. Motor Data Co., Box 7631, Kansas City 3, Mo.

BARGAINS In war surplus hydraulic transmissions, switches, motors, geared reducers, aviation instruments, etc. Delta Sales, P. O. Box 968, Shreveport, Louisi-

ARMATURE Winders, send for bulletins on motor winding tester and a.c. motor winder. Motor Industries, Quincy, Illinois,

MOTORS! ½ h.p. d.c. converted to a.c. All new, High speed 110 volt, 25 or 60 cycle, single phase, ball bearing motors. Actual value about \$75.00. Now \$15.00 each or 3 for \$40.00. Can be used in any position. Immediate delivery! No c.o.d. "Amazing Bachman's," 27 Herman St., Rochester 5, N. Y.

ler 5, N. 1.

1/3 H.P. Rebuilt 110 volt repulsion induction motors \$21.50. List 10c. Larger sizes, new motors. A. C. Motors, 3101 N. 32nd St., Philadelphia 32, Penna.

WELDING Generator, 150 ampere \$47.50.
1/2 horse 1725 r.p.m. a.c. motor, \$24.50.
Butler, 1885 Milwaukee, Chicago, Ill.

SIMPLEX Duplex rotary water motors. Adapted to air or steam pressures, 125 lbs. or less. Sizes ½ to 1 h.p. Larger sizes to order. March specials while they last. No. 30-A (3") ½ h.p. \$5.00; No. 40-A (4") ½ h.p., \$7.50; No. 60-A (6") ½ h.p. \$12.50; No. 80-A (8") 1 h.p., \$16.50, Also double driven vertical or horizontal duplex motors, ½ to 3 h.p. Duplex Motors, Burlington to 3 h.p. Duplex Motors, Burlington,

BOATS, OUTBOARD MOTORS

BOAT Building plans: Runabouts, cruisers, sail boats. Wood, plywood, and welded steel construction. Illustrated book, "Modern Designs For Boats And Yachts" \$1.00. John B. Clark, Yacht Designer, 329 Kenmore Drive, Bay Village, Ohio.

BUILD—10' plywood boat Complete

BUILD-10' plywood boat. Complete plans and building illustrations \$1.00. Lockhaven Marina, 3030 Commodore Way, Seattle 99, Washington.

ATTENTION Sportsmen! Assemble kayak kit. Complex. from easy-construction kit. Nothing additional needed. Dedham, Mass.

P-38 BELLY Tank speed boat. Com-plete plans, instructions \$1.00. Twintank Boat Company, 1032 62nd St., Oakland, BELLY

BOAT Steer wheels, windshield brackets \$8.95. Modern hardware kits, bargains ga-lore, folder. Marine, Box 681, Mendota, Minnesota.

BUILD Your own boat by the Welch System with knock down kits. Save 3/2 cost. Rowboats to cruisers. Illustrated cat-alog 25c. Midwest Boat Company, Menom-onee Falls, Wisconsin.

SIGNALLING Light SIGNALLING Light — New — Gov't surplus. An exceptional value for boats, construction work, scouting, etc. Powerful light with three filters and case. At a fraction of cost. Operates on 27 volts or 110 volts with transformer. While they last, \$7.95, three for \$20. "Amazing Bachman's," 25 Herman Street, Rochester 5, Naw York New man's," 25 New York.

CATALOG; Sixty best designs, full size patterns, blue prints — outboard, sail, power; with book "Boat Building" \$1.00. Marine Mart, Buffalo 7b, N. Y.

AIRPLANE Jettison tanks — Streamlined. 10½ foot, tear drop shaped. 165 gallon. Of light weight lead coated steel,
weighs 75 pounds. Floats over 1200 pounds.
Ideal for making trim, inexpensive boats,
canoes, kayaks, dinghies, duck boats, powered catamarans and runabouts. Prices
\$12.50. \$9.75 each for three or more. U. S.
freight prepaid. General Sales, 205 Market,
Grand Rapids 3, Michigan.

BUILD A boat with knock down kits. Simple and enjoyable. Outboards, inboards, sail and racing. Send dime for literature. Brooks Boat Company, Dept. PM, Carroll-

13' OUTBOARD Utility high performance 15-20 m.p.h. with 6 h.p. Learn boat con-struction, follow simple economical detailed plans, stem and rib outline full scale. \$10.00. Steinau, 109 Elk Ave., New Ro-chelle. New York.

BUILD Your boat from paper patterns, forty years careful designing. Send 10c for folders. Latest manual, small boat construction \$1.50 postpaid. Germain Boat Company, Dept. 3, Saginaw, W.S., Michten

MARINE Catalogue—15,000 deliverable items; pictured \$1.00. Marine Mart, Buf-falo 7b, N. Y.

MARINE Power—Easily convert any Jeep or Ford motor (domestic or foreign) with Convo parts and kits, Complete cat-alog 25c (coin). Osco Motors Corporation, 2020B East Orleans Street, Philadelphia

PACKAGED Boats—Complete moulded and sheet plywood kits; \$39.50 up. All sizes. Literature 25c. Marine Mart, Buffalo 7b, N. Y

OUTBOARD Motors—Good values, used motors. Also used parts for most makes and models. Crandall-Hicks Co., 911 Com-monwealth, Boston, Mass,

P-38 BELLY Tanks, new, steel, 10 ft 2 in. 165 gallon \$9.95. Anzio Boat Co., Box 89H, Merced, Calif.

Box 89H, Merced, Calif.

BARGAIN \$20. Make your own boat now with readymade streamlined laminated one piece hull as developed for Navy. Light, sturdy, leakproof. Anyone can convert into dinghy, outboard scooter, cartopper, other craft, 9'x4'. Write Warwood, 480 Lexington, New York 17.

BELLY Tanks—75 gallon, new, steel. 4 ft. 4 in. \$7.50. Anzio Boat Co., Box 89H, Merced. Calif.

NEW, Used, rebuilt marine motors. Marine conversions, fittings, Free catalog, Stokes Marine Supply, Dept. 24, Coldwater, Michigan.

ter, Michigan.

ALL Copper water jacketed exhaust manifolds for marine conversions of auto-mobile and aviation engines and marine engine replacements; any make, model or age. Joseph Van Blerck & Son, 391 Wood-cleft Ave., Freeport, N. Y.

BOATS And all about them. How to select, build, repair and operate. For 40 years the leading practical boating magazine. Half price trial subscription. 12 issues for \$1.00. Motor Boat, 62 Gold Street, New York 7.

BOAT Designers are highly paid profes-sionals. Complete course by mail. Catalog. Westlawn. Montville, N. J.

ATHLETIC EQUIPMENT, BODY **BUILDING COURSES**

BARBELLS, Exercise equipment, Courses, Free booklet, Good Barbeil Co., Reading, Penna,

SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

INCREASE Your catch. Ten indestructi-ble synthetic minnows \$1.00 prepaid. Dixie Synthetic Bait Company, 189 Jefferson, Memphis 3, Tennessee. SUPERB Quality casting rods, reels. Moderately priced, Write Ken. Smith, Fos-toria, Ohio.

toria. Ohio

SEND 10c For list 100 used guns. Fray-seth's, Willmar, Minn.

FREE! Klein's Sporting Goods famous "Trick Fisherman's Ruler"! Write for your free ruler today! Measures the "Pish That Got Away!" Flash! Klein's big new 1948 "Fishing & Hunting Handbook" is hot off the press! Shows thousands of new and used guns, hunting, fishing and camping values. The handbook is only 25c (coin or stamps—refundable with your first oretr.) Rush order for trick ruler (free) and der). Rush order for trick ruler (free) and or stamps—refundable with your first order). Rush order for trick ruler (free) and catalog (25c) to Klein's Sporting Goods, Dept. CTO-3, 227 W. Washington St., Chicago 6, Illinois.

SENSATIONAL New lure, circular free, sample 50c. Dealers, salesmen wanted, Flinson, Box 4333-B, Kansas City, Missouri

FLAT Sinker mold, Price \$1.00 postpaid, ircular free, Langholz Machine Works, Circular free. Lar Oak Harbor, Ohio,

U. S. Patent No. 2289767 removes hook from fish in a split second, even if deeply imbedded, without touching fish with hands. Stainless steel, ten inches long. Floats. Postpaid \$1.00 U.S.A. and Canada. Sold and guaranteed as advertised or money back. Unkatcher Tackle Co., Orange Park. Florida. Park, Florida.

AMMUNITION, 75 Sizes in stock. Dime for list. Central Sports, Delphos 5, Ohio.

ARMY Tents, covers, hammocks, clothing, paints. G. Jarashow, 10-19 Jackson, Long Island City, N. Y.

SEND 10c For price list on guaranteed dye work. We specialize on army shirts and pants. Rhodes Dyers, Hesston, Kansas,

SKI-TOWS. Portable, auto-powered. 500 ft. long. Pulls you both ways. Up, level or downhill. Set up in 20 minutes. Only \$125. Send card for particulars. Great-Northern Mart. North Adams. Mass.

FTREARMS—Ammunition, complete list 25c. Frank Farish, Vicksburg, Mississippi, U. S. A.

FISHERMEN—Handmade split bamboo (tonkin) rods, any type or to your specifications. Rod building supplies. Free literature. Aaron G. West, 4144 Marion Street, La Mesa, California.

TENNIS Players—Improve your game, save your racket. Fawcett Products, 3808 Strandhill Rd., Cleveland, Ohio.

START Business yourself. Send for list of spinner blades, shafts, beads, rudders and parts for constructing lures that will catch fish, Spinner Specialties, Inc., Lewiscatch fish, S ton, Idaho.

BOOKS On gunsmithing. Catalog 10c. W. Joseph O'Connor, Baker, Oregon,

FLY Tiers: One of the leading commercial manufacturers of files offers you the same materials he uses. Buy only what you need. Save money. Free catalog. Bennett Millard Fishing Tackle, Inc., 130 Washington, Binghamton 17, N. Y.

SHOOT For fun, shoot to kill. Make a powerful, accurate, "folding crossbow pistol." Complete plans \$1.00. Louis P. Loutrel, Box 266P, Jamaica 1, N. Y.

5000 BARGAINS, Firearms, binoculars, war relics. Catalog 40c. Smith Firearms, Runnemede, New Jersey.

FIELD GLASSES, TELESCOPES, MICROSCOPES, MAGNIFIERS

TELESCOPE: Newly designed 2%"
100x. Mogey design. Free literature. Janan
Instrument Company, Box 89, Plainfield,

GOVERNMENT Surplus — Telescopes, oinoculars, lenses, and prisms. Send 3c stamp for "bargain" list H3. Hobbyist lens set—magnifiers, reducing lenses, positives, negatives, etc. 10 piece set, \$1.00. A. Jaegers, 123-26 Rockaway Boulevard, South Ozone Park 20, N. Y.

TELESCOPES, Rangefinders, aiming circles, optics. Lowest prices. List free. Donn Surplus, Dept. M, Box 27, Norwalk, Obio.

PORRO Prisms for 6x30, 7x50 binoculars. 50c each. Ross. Section C, 68 West Broadway, New York, N. Y.

ASTRONOMICAL Telescopes, binoculars, microscopes; bought, sold, repaired. Books. Lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

POWERFUL Astronomical telescopes

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions, 100 power \$3.00. 100 and 200 power \$4.00, 100, 200 and 400 power \$6.00. Clear vision and full power guaranteed. Instructions alone 10c. Suffolk Science Service, Manorville, N. Y.

Service, Manorville, N. Y.

TELESCOPES, Binoculars, microscopes, big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

Telescopes. complete.

Pany, 24 West 45th Street, New York.

REFLECTING Telescopes, complete, 3½" diameter, equatorially mounted. View planets, stars, \$19.75. Write Skyscope Company, 475-P 5th Ave., New York.

BINOCULARS, Telescopes, watches. Buy, sell, trade, Paul Schweer, Donnellson, Iowa.

TAXIDERMY

FINEST Glass eyes; taxidermy supplies. Catalog free. Elwood Company, Depart-ment 234, Omaha 2, Nebr.

DOGS, PETS, BIRDS, RABBITS

RAISE Guinea pigs. Make money at home. Big demand. Booklet free. Taylor, Box 426A. Hapeville, Georgia.

RAISE Hamsters. Write post card. Free literature. Hamster Farms, 1713½ 9th St.

literature. Hamster I Wichita Falls, Texas.

\$3000 YEARLY Raising Angoras Steady income from wool and stock, Particulars free. Vaughn's Rabbitry, Otley, Iowa.

NEW Reptile catalogue 10c. Biological hobby catalogue 10c. Current reptile bulletin 5c. Quivira Specialties, Topeka, Kan-

NEW Zealand red rabbits, registered, edigreed, Free circular. Daniel McIlrath, Montezuma, Iowa.

REGISTERED Chinchilla Giants—
Whites. Breeders supplied, pay with
youngsters. Literature, 25c. Booklet, beginners greatest opportunity free start
plan, hutch plans, \$1.00. (Refundable.)
Behrens Farms, Pearl River 4. New York.
GOLDEN Hamsters—Novel Easter pets.
\$5 brings breeding age pair including two
metal cages, instructions. Hathaway's
Hamstery, 609 Deerfield, Silver Spring,
Maryland.

REALUTION.

BEAUTIFUL. Useful Collie-Shepherd ups. \$14. Paul Schultetus, New Liberty,

\$50.00 WEEKLY Raising Angoras for us.
Free literature. Angoraville, 1215-34th
Northeast. Cedar Rapids, Iowa.

Northeast, Cedar Rapids, Iowa.

RAISE Rabbits, market provided.
Breeding stock furnished on production
pay plan. Literature 25c, with hutch
plans \$1. Hansen's Rabbit Institute, 1347
Miller Avenue, Salt Lake City 6, Utah.

PROFITABLE Industries. Raise rabbits,
cavies, etc. See our display advertisement
on page 30. Small Stock Farmer.

GUARANTEED Chin-Chin Giant Chinchilla rabbits. Greatest amount of deli-

chilla rabbits. Greatest amount of deli-cious meat. Largest, finest, most valuable furs, Tremendous demand for breeding stock. We buy youngsters. Contact world's largest breeder. Willow Brook Farm, R15, Sellersville, Penna.

MONEYMAKING Opportunity raising Giant Chinchilla Rabbits. Waters Rabbit Farm, Glennville, Georgia.

ANGORAS, Giant Chinchillas. Heavy-producing prize winners. Literature free, Grinsteads, Edwardsville, Illinois.

INCREASE Your income by raising domestic rabbits. Small space needed. Ready market for delicious meat, fur and wool. Largest magazine in the industry tells you how. \$1.50 per year. Sample 15 cents. No stamps. Small Stock Magazine, Lamoni 50, Iowa.

50, Iowa.

RAISE Hamsters. New wonder animals from Syria. Delightful pets. Laboratories need thousands. Profitable. Free information. Hamstery, 1519 Basil, Mobile, Ala.

\$2000 PER Year raising Angora rabbits. We buy your output. Contract particulars free. Wilsons, 1065 Shryer, St. Paul 8,

SEEDS, NURSERY AND GARDEN SUPPLIES

GLADIOLUS — Finest quality bulbs. Rainbow assortment, fifty, \$5.00 postpaid. Satisfaction guaranteed. Price list. Don Allen, Box 327. Hopewell, N. J.

GINSENG. Goldenseal. Dozen seed bearing plants, \$1.50. Hundred seed, \$1.50. Thousand, \$5.00. Complete instructions included. F. M. Collins, Viola, Iowa.

SOILLESS. Gardening. Complete illus-

SOILLESS Gardening. Complete illustrated book \$1.00. Send card for details. Malcolm Tabor, Park Hills, Huntington, W. Va.

FARMS, FARM LANDS, REAL ESTATE

HITCH Your future to a farm! Security unlimited may await you on any one of the hundreds of bargains described in United's exciting new Spring catalog. Farms, ranches, orchards, tourist courts, country homes, resorts, retirement havens—covering mid-west to west coast! Here's your invitation to independence—write for your free copy today! United Farm Agency, 1408-PM Consumers Bldg., Chicago 4, Illinois.

CANADA—For full details regarding any phase of agriculture, such as general farming, ranching and fruit lands, write H. S. Williams, Department of Immigration & Colonization, Canadian Pacific Railway, Vancouver, B. C.

STROUT'S Big farm catalog—mailed

STROUT'S Big farm catalog — mailed free. Describes over 2800 outstanding bargains. Coast to coast. Time-money saver. Write today. Strout Realty, 255-P 4th Ave., New York 10, N. Y.; 20 W. 9th St., Kansas City 6, Mo.; 453 S. Spring, Los Angeles 13, Calif.

WEST'S Latest catalogue: Over 1000 farm and business bargains. 180 representatives, 16 states. Free. Write West's Farm Agency, HE-14, Pittsburgh 17,

\$5.00 MONTHLY Buys 40 acres near town; price \$200.00. Free list. Box 425-P, Carthage, Mo.

CANADIAN Tax sale lands for two dollars an acre and up. Small monthly payments. Farms, timber, hunting and fishing camps, minerals. Limited number of properties. Write at once for free catalogue. Tax Sale Service, Room 613, 72 Queen St. W., Toronto 1, Canada.

OZARK Magazine, Eureka Springs 3, Arkansas. For homeseekers, tourists. Year, \$1.50.

MISSOURI—20 Acres, \$85; total. First remittance buys outright. Unencumbered, unimproved. Immediate possession; war-ranty deed; abstract or title certificate. Frederick Calvert, Winter Haven, Fla.

GOVERNMENT Lands \$2.00 acre up. Information all states twenty-five cents. National Tax Service, 834-A Majestic Bldg., Detroit.

GOOD Farms-Ranches Washington, Minnesota. Montana, Idaho, Oregon, North Dakota. Dependable crops, favora-ble climate. Write for literature, lists de-scribing typical farm opportunities. Spe-cify which state. J. W. Haw, 119 Northern Pacific Ry., St. Paul 1, Minn.

OZARK Lands for all purposes. Actual river frontages. 5 acres \$90.00 and upwards. Free list and literature. Hubbard, 424-I Minnesota Ave., Kansas City 4,

FARMS. Ranches. All kinds, sizes. Choice of location, climate, production. Information on irrigation projects Columbia and Missouri River Basins. Resorts. summer homes. Milwaukee Railroad territory; Washington, Idaho, Montana. Dakotas, Wisconsin, Upper Michigan, Central corn belt. Free folders, price lists. L. H. Robbins, 604 Union Station, Chicago 6, Illinois. Illinois.

HOMESITES \$450—Convenient payments. California's finest garden section. On Morro Bay's scenic shores. Wonderful fishing, hunting, boating, bathing. Fertile soil, softest water, temperate climate, congenial community. Free literature. Richard Otto, Department M, San Luis Obispo, California

FARM MACHINERY AND SUPPLIES

FREE—Big 1948 new and used tractor parts catalog. Satisfaction guaranteed. Write Irving's Tractor Lug Company, Fargo, North Dakota.

MAKE Your own tractor, saw mill, home freezer, and scores of other farm devices. Amazing new book. "Popular Mechanics Farm Manual." 284 Pages packed with hundreds of illustrated plans and farm workshop ideas, Descriptive circular free. Popular Mechanics Press, Room 603, 200 East Ontario Street, Chicago 11, Illinois.

POULTRY, FARM SUPPLIES

RAISE Poultry for profit! Learn how others succeed. Read America's leading poultry magazine. 24 months only \$1.00. Subscribe today! Poultry Tribune, Dept. S. Mount Morris, Ill.

MONEY-MAKING Experimental MONEY-MAKING Experimental farm turkey raising helps yours at bargain price. Six big issues only \$1.00. Increase profits with latest reliable information. Act today! Turkey World, Dept. 20, Mount Morris, Ill.

WHITE Guineas—Chicks, eggs, stock, Catalogue free. Goshen Poultry Farm, Goshen, Indiana.

BABY Chicks, champion mated, 25 varieties, 6 hybrids, licensed inspected, blood-tested, Rush postal, large colored book free, low prices, Berry's Farm, Route 12, Clarinda, Iowa.

RAISE Fryers new easy way. One-man home plant earns \$500 monthly. Booklet free. Poultry Guild, 1046-A So, Olive, Los Angeles 15, California.

Olive, Los Angeles 15, California.

RAISE Turkeys the new way. Write for free information explaining how to make up to \$3000.00 in your own backyard, Address National Turkey Institute, Dept. 3, Columbus, Kansas.

KNOW How to raise poultry for profit. Read Northeastern Poultryman. Every issue packed with helpful hints and practical suggestions. Latest articles on breeding, feeding and management. Subscribe now. 1 year 65c. 2 years one dollar, foreign subscriptions \$1.00 a year. Northeastern Poultryman. Dept. P.M., 376 Boylston St., Boston 16, Mass.

PROFITABLE OCCUPATIONS

MECHANICALLY Inclined men — Own and operate general appliance repair shop. Complete, illustrated course shows you how. Welding, refrigeration, motor repair, how to get business, etc., all phases covered. Free literature. Christy Supply, Dept. 479, 2835 N. Central Ave., Chicago.

MAKE Flexible molds! Few cents each! Cast plaques, novelties, bookends! Free sample! H. Tooker, Hamilton 9, Ohio.

sample! H. Tooker, Hamilton 9, Onio.

MUSHROOMS Grown. Boxes. Barrels.
Instruction 50c. spawn \$1.00. Gordon's,
553 William, Winnipeg, Manitoba.

EXTRA Money? Free details. Trable,

EXTRA Money? Free details. 101812A Elm Street, Dallas, Texas.

QUALIFIED For better job? Let us help you get it. Free details, Salaried and Pro-fessional. Job Center, Highland Park 3,

1947-1948 LEATHERCRAFT Supply cat-alog 10c. Art Craft Supply, 1205 Throck-morton, Fort Worth, Texas.

EARTHWORMS—For soil building, and better composting, Write for free booklet, Coolville Earthworm Farm, Coolville, Ohio.

UNLIMITED Possibilities. Successful plan turns spare time into money. Quality products used in every home. Ten easy formulas, \$1.00. Pringle, Box 1185-M, Kingston, Penna.

START Lamp factory, Profitable, fascinating, easy to learn. Illustrated course teaches you. General instructions, wholesale catalog \$1.00. Gearon Company, 6405 North Oakley, Chicago.

PERFUME Is profitable! Manufacture at home exotic perfume — "Bouquet de Orient." No equipment. Sample and instructions prepaid \$1.00. Schneider Pharmacy, 2643 Kinnickinnic, Milwaukee 7, Wis.

GETTING A start in the trade through a mail order plan, \$2.00, postpaid. Satis-faction guaranteed. A. L. Marks, 540 Blaine Avenue, South Bend 16, Indiana.

MAKE Money with hobbies. Details free. Book Headquarters, 632 19th St., South Arlington, Virginia.

MAKE Beautiful mirrors from inexpensive window glass. No special equipment required. Details free. Tes-Co. Box 189-MP. Wilkes-Barre. Penna.

TYPISTS—Profitable business at home. Complete copyrighted information, 50c. Gaunt, 3521A Broadway, Chicago 13, Ill.

MAKE Perfume. Profitable sparetime home business. Men, women, write "In-ternational," 6347 Parnell-X3, Chicago 21, Illinois.

BE The Popular Mechanics representa-

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408R. 200 E. Ontario St., Chicago 11.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. PO-3, 1512 Jarvis Avenue, Chicago 26, Ill.

"FROG-RAISING"—New book teaches

"FROG-RAISING"—New book teaches everything! Marlboro, 1035 Marlborough, Detroit 15. Michigan.

"MOST Everybody likes candy." Learn to manufacture in a professional manner. (Our 38th year). Ragsdale Candies, #107, East Orange, N. J.

East Orange, N. J.

NO Selling, operate vendors, amazing profits, details free. Silver-King, 622 Diversey, Chicago 14, Ill.

YOU Can make real money raising Golden Hamsters, the new amazing tiny animal. Food costs less than 10c month per animal. Breeds in 16 days! Easily raised in basement, attic, garage, barn, or shed. Write for convincing details, Hudson Hamstery, R.F.D. #1, Newfoundland, N. J.

FOREIGN Employment? Brief directory, companies with foreign projects or branches \$1 or c.o.d. Foreign Service Institute, Box 3934. Miami 24. Fla.

PROFITABLE Business in making and building with interlocking blocks. Delaware Industries, Dept. 10, Muncie, Indiana.

"ALASKA" The last frontier offers unlimited opportunities. \$1 brings official government map and copyrighted report with listing of firms: Fishing, construc-tion, mining, aviation, homestead lands, tion, mining, aviation, homestead lands, prospecting business. Alaska Opportunist, P.O. Box 883, Hollywood 28, Calif.

PERMA-FLEX Molds, made from B. F. Goodrich Company's Koroseal flexible molding compound. Stock or custom built molds. Send 25c for catalog and sample mold. The Perma-Flex Mold Company, Columbus 15. Ohio.

INTERESTED In Latin American and foreign employment? \$1 brings copyrighted Foreign Service Directory listing firms with interests in construction, oil, mining, aviation, manufacturing by personnel ex-pert. Hot list of companies hiring. Global Reports, P.O. Box 883, Hollywood 28,

WOULD You pay 3%—first \$350 made?
Color-illustrated book "505 Odd, Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific, Oceanside, Calif.

HOW To set up and run a mirror shop! Resilver mirrors. For price w Sprinkle V50, Marion, Indiana.

TYPEWRITER Repairmen urgently needed. Earn \$40 to \$50 weekly spare time. Our easy to learn home study course teaches how to repair typewriters. Write for free information. Houston Typewriter Repair Service, P.O. Box 5357A, Houston 12 Texas

ELECTRIC Clocks are every where you go, buildings, homes, parking lots, factories. Repairs increasing. Our easy to learn course with pictures and drawings teach you how to repair these clocks. Electronic Supply Co., P.O. Box 2350A, Houston 1, Texas.

\$40.00 WEEKLY Made growing mush-rooms, fresh, dried. Dominion patent 331583. Free spawn. North American, 169P Yonge. Toronto, Canada.

BOOKS, PERIODICALS, PICTURES, **POSTCARDS**

MAGAZINES-Business, vocational, diversion. Current single copies. All fields. Price list free, Commercial Engraving Publishing Co., 34C North Ritter, Indianapolis 19, Indiana. A BOOK Of great value for every home, 1001 household hints, personal hints, and interesting data, \$1.00. James Cooper, Box 815, Augusta, Georgia.

WE Can supply you with almost any ook, magazine subscription. House of ilroy, (Booksellers), Box 772, Detroit 33, Mich

80 COLORED Postcards western states \$1.00 postpaid. E. Hall, Box 3660, San Francisco 19.

BOOK Bargains, free information. Wood, 921-P So. Jackson, Tulsa, Oklahoma

ART And craft books. Send for free catalog of 500 titles of leading art and craft books selected from the stocks of all publishers. Painting, drawing and sketching, printmaking, advertising and commercial art, cartoons and caricatures, costume and fashion, architecture, sculpture, leathercraft, pottery, jewelry, metalcraft, plastics, woodcraft, puppets and dolls, masks, weaving, home decoration, etc. Watson-Guptill Publications, Inc., 341 Hudson Street, New York, N. Y.

BOOKS, Novelties and advertising specialties. Price list 10c. A. T. Miller, 1100 Lansing, Detroit 9, Mich.

SEPTIC Tank hand book. Compiled

SEPTIC Tank hand book. Compiled from fifteen years experience. Drawings showing correct and incorrect installations. Order now. Only \$5.00. Dept. M, Reuben Selfridge, Septic Tank Engineer, Clymer, N. Y.

BOOKS On antiques, silver, porcelain, glass, etc. Write for catalog. Bernard Payne, 710 St. Louis St., New Orleans 16, Louisiana

BACK-DATE Magazines, books, Specific issues—years, Arkell's, Tarzana, Calif.

2,000 ENGLISH Magazines make real money! Lists, literature, details, Get-started outfit 25c, BCM Publications, Lon-don, W. C. 1, England.

BACK Date magazine file service popular, trade, technical, most 1860-1948 dates.
Try "Corey's" for hard to find magazines, books, sheet music. "Corey's," 402 North Clark St., Chicago 10, Ill.

BACK Issues magazines, reasonable. Reedmore, 240 East 9th, New York, N.Y. BOOKHUNTERS! All subjects, Send wants! Jaher Book Service, 620-P East 178 Street, New York 57.

BE Your own long range weather fore-caster. New scientific method, 50c. W. C. Ewert, 4411 Greenview Ave., Chicago 40,

VIEW Cards "Cradle of Confederacy," 3-25c, 15-\$1.00, Remailed free, Wilson, 26 Morgan, Montgomery, Alabama.

ART Anatomy of the Human Body \$1.00. ree catalogue, interesting books. A. aller Company, 201 Dewey Street, Newark 8. New Jersey.

EXTRAORDINARY Books. Free catalogue. Abbott-Dunhill, 752-B Northwest 66th. Miami 38, Florida.

BOOKFINDERS! (Scarce, out-of-print, unusual books.) Quickly supplied. Send wants. Clifton Company, Box 1377pm, Beverly Hills, Calif.

SELF-EXPLAINING Bible: Illustrated circular free, Box 446-P, Minneapolis,

PICTURE Stories from the Bible. Designed to provide religious background for children. 232 pages. Illustrated in color. \$1.00. Austin Specialties, 818 Waller, Chicago 51, Ill.

VIEWS Of the hereafter. For copy of the remarkable book by Emanuel Sweden-borg "Heaven and Its Wonders and Hell." send 5c to cover mailing. Swedenborg Poundation, Room 1649, 51 East 42nd St., New York 17, N. Y.

BIG Sparetime profits taking magazine subscriptions. Complete supplies, confi-dential catalog free. Cassell Publishers Service, Westfield, New Jersey.

MAGIC TRICKS, PUZZLES, JOKER NOVELTIES

COIN And ring trick! Mystifies, amuses! 35c with descriptive list of fun and magical items. Gift for promptness. Powell's. P.O. Box 2155A, Potomac Station. Alexandria, Virginia.

MAGICIANS' Headquarters. 400-page professional catalogue, pocket, parlor, stage tricks. World's finest magic. Send \$1.00 for catalogue (refunded first \$5.00 order). Kanter's, M-1311 Walnut, Philadelphia 7. Penna.

MAGIC Has vast opportunities, Illustrated catalogue 25c, Hall Magic Co., 345 John R. Detroit 26, Michigan.

MAGIC Monthly, Year 25c. Sample and 1948 magic catalogue free, Magic Shop, Minneapolis 2, Minn.

MAGNETIC Trick, free coin trick, \$2. eath, 104 Hale Pl., Bellmore, N. Y. HINDU Mystic trick 10c. "Marean,"

HINDU Mystic trick 10c. 2200 Gordon Street, Hopewe Hopewell, Virginia,

AMAZE And mystify your friends with magic cards. Tell their age, birthdate, any number to 100. Based on mathematical laws, they are baffling until their secret is known. Send 25c coin for full set and instructions to Lynn Nevelties, Box 541, Oshkosh, Wis.

Inexpensive pocket 5c. Postways, Box REMARKABLY tricks! Catalogue, 5c. 5325-B, Philadelphia 42

TRICKSTERS! Vanishing magic wand, \$1.00 bill. Bowles, 102 Archwood, Annap-olis, Maryland.

FREE! Large catalog of magical apparatus if you remit 25c for "Magic Is Fun" magazine. Robbins Co., 152-F West 42nd Street. New York.

GUARANTEED Magic tricks! Catalogue, 10c. Newton Magic Company, Dept. A4, Bonham, Texas.

MAGICIAN'S Pin ghost illusion Mag.

A4. Bonham, Texas,

MAGICIAN'S Pin, ghost illusion. Magic book, giant catalog. Everything complete 35c. Magic Wand-M, 9 W. Colorado, Pasadena, Calif.

LARGE 160 Page catalog, just published, 35c. We have supplied the best tricks to beginners and professionals for 38 years. Chicago Magic Company, 2300 No. Mason Avenue, Chicago 39.

PERFORM Magic over telephone. Amazing. Complete. Guaranteed. \$1.00. Half & Half, Box 29P, New York City 24.

MASTER Cigarette vanisher—Will fool

MASTER Cigarette vanisher—Will fool even your wife! 25c, including catalogue. Scheetz's, Sellersville, Penna.

LARGE Catalogue of the best magic for professionals and amateurs. Send 25c, Mazda Magic Co., 1135 Westgate Ave., Oak Park. Ill.

Scheetz's.

PENNY That nails to floors, bars, 25c (Wholesale). Scheetz's, Sellersville, Penna.

LEARN Magic, ventriloquism, mind-reading. Write for particulars, Quacken-bus, Big Flats, N. Y.

200 ELECTRIC Stunts, 110 volts, \$1. Kutting Sons, Campbell, Calif.

BIG Magic magazine, trick and price lists—25c. Lloyd M. Jones, 4064 39th Avenue, Oakland 2, California.

BE A magician. Large professional magic catalog of latest tricks, 25c, Ireland, C-109 North Dearborn, Chicago 2.

VENTRILOQUISM Taught. 3c stamp bring particulars. Smith, 801 Bigelow. Peoria 5, Ill.

VANISHING Half dollar trick and cat-og 25c. Sterling Magic Co., Royal Oak,

WORLD'S Largest professional magic shop, keeps you in touch with latest tricks. To receive mailings, send 35c for new catalog. Holden's, M220 West 42nd

MAGIC Tricks, puzzles, books, cards, punch boards. Catalog 10c. Specialty. Box 671, St. Louis 1. Mo.

500 TRICKS. Send only 10c for Douglas' famous 112-page catalog 500 tricks. New magic for amateur, professional. America's fastest service for 25 years. Douglas Magicland, Dept. 1. Dallas, Texas.

PROFESSIONAL Catalog, 112 pages, c. Williams, 900 Plymouth, Ellwood 25c. Williams, City, Penna.

COINS, TOKENS, CURRENCY

COLLECT Coins! Start right, stly mistakes. \$3 brings compl costly mistakes. \$3 brings complete structions, modern numismatists' kit, big surprise coin packet. Satisfac guaranteed. Kirkham's, Glens Fr New York.

OLD Money wanted. Will pay \$100.00 for 1894 dime, S. mint. \$50.00 for 1913 Liberty head nickel (not buffalo). Big premiums paid for all rare coins. Send 4c for large coin folder. May mean much profit to you. Numismatic Co., Dept. 20, Fort Worth, Texas.

25 COINS And bills, 25c. Oddehon, Box 482, St. Louis, Mo.

20 COINS From 20 countries, \$1.00. 20 different Indian cents, \$1.00. 3-legged buffalo nickel, \$1.25. 12 wooden nickels, \$1.00. 4 Whitman coin albums, \$1.00; handbook, 75c. Our large retail catalogue, 15c. Entire lot, \$5.45. Bebee Coin Company, 1180 East 63rd, Chicago 37, Illinois.

FOREIGN Bills—10 different, 15c. Bills and coins, lists. Oliver Arnold, Macon, Mo.

12 DIFFERENT Coins. 25c, 32 diff. \$1.00. Bischop, Box 2201, Kansas City, Mo.

COIN Collectors—We sell the best literature and accessories available. Descriptive price list free. "U. S. Rare Coin Value Guide" 30c — send money order (not stamps). Hobby Helpers, Dept. S, Box 665. Washington 4, D. C.

FREE Foreign coin, bill and catalog to approval applicants. Nassau Hobby Center. Freeport, New York.

FOR Sale: 1893 Columbian World's Fair half dollar, 75c; U. S. 2-cent pieces or 3-cent pieces, 25c each; 50 assorted Indian head cents, \$1.25; large 50 page U.S. coin catalog, listing thousands of coins for sale at reasonable prices, 25c; Giant 72 page foreign copper-silver-gold catalog listing over 10,000 coins for sale, 25c. Ben's Coin Company, 72 West Washington, Chicago 2, Illinois. Illinois.

UNUSUAL Worldwide collection twelve different foreign coins and bills only 25c. Webb, Box 473, San Bruno, Calif.

50 WORLD Coins \$1.00. Harry Elsholz, Box 9014. Pittsburgh 24, Penna.

FREE! Foreign coin, banknote and coin collectors illustrated catalog to approval service applicants. Send 3c postage. Tatham Coinco. Springfield-125, Mass.

GET Profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl. 370 Mehl Bldg., Fort Worth, Texas. Largest rare coin establishment in U. S. Esjablished. rare coin establ

lished 48 years.

BARGAINS! Rare collection contains United States large cent before 1848, flying eagle cent, white Indian cent. 2c piece. 3c silver, 3c nickel, half dime, shield nickel, liberty seated dime. Civil War cent, fractional currency note, confederate bill, foreign coin, foreign bill and our complete buying, selling catalogue, all for \$3.00. Catalogue alone, 25c. 25 dates Indian cents \$1.00. 50c before 1840-\$1.00, Pilgrim or Lexington 50c-\$1.25, half cent before 1810-75c, large cents 1826 to 1856-35c each, colonial coin before 1790-\$1.00, \$100.00 confederate bill \$1.00. 1780 foreign silver dollar \$1.00. Worthy Coin Corporation, 152-D Washington, Boston, Mass.

COMMEMORATIVE \$\frac{1}{2}, Oregon, Texas, Kentucky, Cleveland, Long Island, \$2.00 ea. Illustrated catalogue 25c. Norman Shultz, Salt Lake 9, Utah.

COINS Wanted, will pay up to \$2000 for certain coins, send 25c for catalogue, Burton's, 111 So. Third, Columbus, Ohio.

OLD STAMPS WANTED

I WILL Pay \$100.00 each for 1924 1c green Franklin stamps, rotary perforated eleven (up to \$1,000.00 each unused). Send 10c today for large illustrated folders showing amazing prices paid for old stamps and coins. Vernon Baker, PM-83, Elyria, Ohio.

STAMP COLLECTING

POSITIVELY Greatest free offer—latest Scott's International \$6.00 stamp album—covering entire world, contains 36.000 illustrated descriptive spaces; Scott's 1948 Standard \$7.00 catalogues "Philately's Encyclopedia"—absolutely free to applicants for foreign approvals becoming customers, "Approval Service," Box 1700, San Francisco, California.

HISTORICAL Collection! Cavalry Charge! (Bulgaria) — Flaming Sword! (Ireland)—Big She-Wolf! (Italy)—Fort! (Dominican Republic)—Field Marshal! (New Zealand)—Pitcairn Mutiny Island!—Commemoratives! Pictorials! Only 3c. Approvals. Star Stamp Company, 11 East 15th Street, Jamestown, New York.

ILLUSTRATED Album with space for 2000 stamps, plus stamps cataloging over \$1, hinges, gauge; all only 10c to approval applicants. Moumblow, 740 Hegney, Bronx 56.

BIG Money in stamps. Buy at low cost. Sell at big profit. New book "How to Sell Stamps by Mail" reveals startling stamp secrets. Write: Donald Kelly, 9544 Whitcomb, Detroit 27, Michigan.

GIBRALTAR Packet free—Nice collection Gibraltar, New Zealand Centennial, British Uganda, French Colonials, early British Colonial, West Indies, South American, war stamps plus Philatopic Monthly Magazine. All for 5c postage. Empire Stamp Company, Dept. PM, Toronto 5, Canada.

FREE—Our illustrated magazine featuring stamp news and price lists. Approvals by countries on request only. Special—Lithuania C47-50 airmails, catalogs \$1.50, just 50 cents. Gannisia Enterprizes, 1566 58th Street, Brooklyn 19, N. Y.

FREE! Canadian sets, royal visit. George VI, George V, coronation, jubilee, others, to approval applicants. Ensign, Box 118-M. South Orange, N. J.

BET You haven't these! South Georgia, South Orkneys, Grahamland, South Shetlands, shortlived Falkland dependencies. Everything 3c with approvals. Viking, 130-Z Clinton St., Brooklyn, N. Y.

AMAZING Bargain, 25 different vaticans, only 10c. Approvals, Wilhelm, 14646 58th Road, Flushing, N. Y.

AGENTS Wanted, sell stamps, no investment. William Waugh, 2140 N. St., NW. Washington 7, D. C.

77 DIFFERENT United States. Many commemoratives included, 17c to approval applicants. Standard, 3817 Sackett, Cleveland 9, Ohio. al applicants. Sta Cleveland 9, Ohio.

STAMP Remover 25c. Free with approvals. L. White, Box 922, Pittsfield 3,

Mass.

25 ALL Different stamps 10c. Tunis, Wakeman Ave., Newark 4, New Jersey.

WORLDWIDE, Fifty different, free. Additional fifty, up to 1,000 different, 10c per fifty, Approvals included. Jack Dudak. Streator 3B, Illinois.

MIXTURES, Worldwide, 1,500, \$1.00. Missions Outlet, Reverend Marshall, Paterson 1, New Jersey.

FREE! Famous Formosa map set! Com-plete, unused, commemorative. Request approvals. Riedell, Greensburg, Pennsyl-

HITLER Heads cataloguing \$1.05, Monaco Roosevelt 25c, Hungary 25c, Ap-provals, Miller, Box 600-A, Palo Alto,

FRENCH Colonies, 50 different only 25c, Approvals sent if requested. Ployd Frederick, 513½ Green Street, Lancaster, Penna.

FIRST Day covers on approval. Kno-el, 1918 S.W. 12 Street, Miami 35, Fla. UNITED States stamps on approval.

Bargain prices. Metropolitan, 140-B Nassau, New York 7.

FREE: Beautiful bi-colored triangles, bargain approvals, McMartin, R.R. 1, Ladner, B.C., Canada.

bargain approvals, McMartin, R.R. 1, Ladner, B.C., Canada.

400 WORLD Wide 47c; 200, 27c. Pacific, P.O. Box 5704, Los Angeles, Calif.

MINT Hitler heads, 18, Scott's #506-523 for only 25c. Blocks of four \$1.00.

Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill. Dept. M16.

FREE 300 Different stamps to approval applicants. Superior Coin & Stamp, 6900 Bayliss, Cleveland 3, Ohio.

EVERYTHING For the stamp collector: Albums, catalogues, cello-mounts, hinges.

Albums, catalogues, cello-mounts, hinges, tongs, Smith Specialty Co., Box 645, Grand Rapids 3, Michigan.

EXCHANGE Stamps universe. Particulars free. "Exchangers," Bry 126, Seine,

FREE Illustrated bulletin showing new

FREE Illustrated bulletin showing new recent issues. Penny approvals on request. Reed Company. Box 980, Chicago 90.

DETAILS: Free stamp exchange; Swappers, Box 102, Rochelle Park, N. J. COLLECTORS Tools — Perforation gauge, watermark detector, tongs 5c. Approvals. Chase, 1026 Walker Ave., Oakland 10, California.

25 DIFFERENT India—3c with approvals. Premiums with purchases. Brandwein Stamp Co., Box 92-H, Bayonne, N.J.

HOW To Gain Pleasure and Profit from Stamp Collecting—New book tells all. Send \$2.75 or c.o.d. Refund if not satisfied. Dept. PM348, Funk & Wagnalls Company, 153 E. 24th St., New York 10, N. Y.

1000 DIFF. World \$1.50, Free list of packets. Florman, 2401 Davidson, Bronx 53, N. Y.

NETHERLANDS, "Crow" airmail, mint, only 6c to approval applicants. GeeKay, 13 Overlea Ave., Baltimore 6,

FREE. Valuable illustrated stamp price list. Bob Stovall, Detroit 3, Michigan.

200 DIFFERENT Stamps—Cataloging up to 15c each, only 3c to approval applicants! Littleton Stampce, Littleton 42, N. H.

TOPS, Tops in value, priced to please. United States approvals. Jarr. Box 217-M, Madison Square, New York 10, N. Y.

SPECIAL! Bicolor Vatican set; catalogs 90c. Only 3c. Rostamps, 1921 Schiller, Little Rock, Ark.

MAP Stamps, 15 different plus world's smallest triangle, scarce, only 5c with approvals. R. George, Box 2774, Phoenix, Arizona.

GOOD U. S. or foreign approvals. Rock bottom prices. Panther Stamps, Dorches-ter Center, Mass.

YOU'LL Like our American and Brit-ish Colonial approvals. Write now. Ches-apeake Stamps, 748 Overbrook, Balti-more 12. Maryland.

25 UNUSED Stamps. Pictorials, airmail, triangle, etc., only 3c with approvals. Paul Bauer, 31 Wilkshire, Lancaster, N. Y.

U. S. Price list free. Slikes, 1831 E. Allegheny, Philadelphia 34, Penna.

FREE U. S. price list. Postage 3c. Mark Hanna, 335-5th Avenue, Pittsburgh 22,

Penna.

GERMANY "Army commemoratives;" assaultboats, warplanes (13), free to approval applicants. William Deems, Ravenswood 1, W. Va.

WOW! \$10.00 Worth of fun. Only 10c1 What a treasure hunt! Big package 500 foreign stamps from foreign missions, other sources. Includes stamps from Africa, South America, Free French, Somali, Palestine, etc. Includes airmails, commemoratives and stamps worth up to 50c. This offer sent for 10c to approval applicants only. Jamestown Stamp Co., Dept. 22. Jamestown, N. Y.

UNEQUALLED Bargain. Stamps from over 25 countries including Fiji, Swaziland, Pitcairn, Tonga, Trinidad, etc., everything 10c to approval applicants. Bennett's, Box 252, Terminal A, Toronto, Canada.

NICARAGUA, New triangles; China 3449 airmail set; Austria prisoners of war. Only 10c with approvals, Huffman, Box 331, Miami 3, Fla.

MONTENEGRO Set, catalogs 40c, only 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Illinois.

South Fairfield, Chicago 29, Illinois.

FREE Beautiful new issues, airmails, eight countries. Approvals enclosed, Green and Company, Norwood 12, Ohio.

UNUSUAL Item of interest for your collection, Italian bombed monuments. Complete set of 15 elegant mint stamps, 10c. Approvals. Stampco, Stanley, N. Y.

BEAUTIFUL Mint pictorials included in our France collection of 120 different. Only 25c with approvals, Fields, 1939 E. 85. Cleveland 6. Ohio.

50 DIFFERENT Belgium stamps and our price list, one silver dime. Stamp-sales, Box 1649P, Oakland 4, California. 25 GREECE Free, Approvals, Country Stamps, R. 76, B. 795, Tacoma, Washing-

ton

FREE! 10 Diff. foreign with approvals, Tower, 7910 S.E. Cooper, Portland 6,

ARABIA: 1000 \$3.45; Approvals \$1.00 deposit; Circular free; Arshak Movsessian, B.R.N., Baghdad, Iraq.

SELECTED Penny approvals to build your collection. Henry Jay Service, 15 Park Row, New York 7, N. Y.

GRAND Value packet, 5 sets, free with approvals, Stoll Stamp Service, 2631 Burnett, Louisville 10, Kentucky.

INITED States unused Complete set

UNITED States unused. Complete set 13 flag stamps plus 5c China commemo-rative only \$1.00. Fine approvals. Willett Stamps, Box 507, Port Chester, N. Y.

FREE: Magnificently illustrated price list. Stamps, packets, supplies. Resch, 3131 Lincoln, Chicago, Illinois.

"GOYA Nude" Set complete, mint, 35c. Approvals. Royal Stamp Company, Tamaqua, Penna.

TRIANGLES! Diamonds! Midgets! Roosevelts! Hitlers! U. S. \$1.00-\$5.00! Big stamp magazine! Everything 6c! Approvals. Thrifty Stamps, Silver Spring. Maryland.

DIME Packets: 15 Argentine; 30 Canada; 25 England; 25 France; 45 Germany; 24 Italy; 50 mixed; bargain approvals. George, 220 Orizaba, San Francisco 25.

YIPPEE, Free, 25c worth from first U. S. selection. Village Stamp Co., 90-39 214th St., Queens Village 8, N. Y.

SAVE More. Attractive approvals, generous discount. Rheaume, 8949 Routhier, Montreal 12, Canada.

FREE Catalog U. S. mint sheets. Kenda, 82 New Jersey Avenue, Brooklyn 7, New York.

FREE—World's only octagonal (eight-sided) stamp and Turkey set to approval applicants. Charles Cleaveland, 806 North Humphrey, Oak Park, Illinois.

UNPICKED! 5000 U. S. \$2.00; 3000 foreign \$2.00; 1000 Australia \$1.00. Satisfaction guaranteed. Kuhn, 3315 80th, Jackson Heights, New York.

· 15 DIFFERENT U. S. over 40 years, 10c. Special with bargain U. S. approvals, Bill Portney, 1806 E. 22 St., Brooklyn 29, N.Y.

6,000 STAMPS Collected by British hospital, weight 2 lbs., \$1.00. Canadian, 1 lb., (2,500) 95c. Netherlands, 1 lb., (3,000) \$1.50. British Empire, 40 Colonies represented, 1,500, \$4.00. Treasure packet catalogued \$4.00, only 25c. Princess Elizabeth wedding cover only 5c. 100 beautiful Canadian pictorials. commemoratives petn wedding cover only 5c. 100 beautiful Canadian pictorials, commemoratives \$1.00. Catalogue sent free, Price & Company, London, Canada.

COMPLETE Victory commemoratives from China (catalog value \$2.30), only five cents with approvals. Charles Ernest, 64 Wayne Terrace, Staten Island 10, New York.

GOYA Nude (2) 5c. Approvals, Hannay's, 310 Quail, Albany 3, N. Y.

FREE: Twenty different foreign commemorative stamps to new approval applicants, Modern Stamp Service, Box 12B, Wakefield Station, N. Y.

Wakefield Station, N. Y.

CIPEX Sheet, commemorating 100th anniversary 1847 issue with 30 different U. S. containing early issues, commemorative, airmail, envelope, revenue. Catalog value exceeds 65c; all for 10c to approval applicants only. Curhan Stamp, Gloucester, Mass.

COLLECTORS Outfit, album, hinges, gauge, detector, 50 different stamps, 2 mint sets. All 10c, approvals, Cornett, 228 West 25th, New York 1.

START Your own stamp business.

START Your own stamp business, Write for free circular. Donald Shepard, Box 5139, Chicago 80, Ill. ILLUSTRATED Stamp Magazine, 26

25c. Stamp Journal, Kalamazoo, Michigan

CHOICE Of 35c worth of stamps from our first U. S. selection free to applicants enclosing 3c postage. Large selection to choose from. Act now! S. C. Engel & Co., 38 Park Row, New York.

APPROVALS, Discount, and gift. Write to Russell, 519 Crystal, Findlay, Ohio, 200 DIFFERENT, Including Roosevelt

200 DIFFERENT, Including Roosevelt triangle, 5c to approval applicants. H. Avalon Stamp Co., Springfield, Mass.

WORLD'S Largest stamp (7¹2x14 inches), A real curiosity! Retails for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 30, Mass.

Co., Springfield 30, Mass,

FREE Costa Rica triangle set, Approvals,
Herman, 539C East 54th, Brooklyn 3, N.Y.
FREE! 25 different stamps — Russia,
Manchukuo, Vatican, etc. Sent approval
applicants enclosing 3c postage, Standard,
Box 1616, Miami Beach, Florida,
FREE — The Stamp Finder. Big new
edition — 32 pages profusely illustrated,
Identifies all difficult stamps immediately,
Given free with 319 different stamp from
Vatican City, Palestine, Cyprus, San Marino, etc. All sent to approval applicants
for only 10c. Price lists. Garcelon Stamp
Company, Box 800, Calais, Maine.

GENERAL Collection, breaking up, Ap-

GENERAL Collection, breaking up. Approvals. Lion, 200 W. 81 Street, New York 24.

PENNY Approvals, that satisfy. Neil Gronberg, Box 5441-P, Philadelphia 43, Penna.

DANDY United States approvals. Write amediately. Sullivan, Endicott Building, immediately, Sullivan St. Paul, Minnesota,

NICARAGUA "Tin Pan Alley" diamond, Ecuador showing George Washington, and American flag in natural colors, Fezzan, Trieste, "American Army" stamp, first U. S. commemorative, \$100.00 Shanghai, Corsica, Anzac, Antique, others, All 5c. Approvals, Capital Stamp Co., Dept. 2, Little Rock, Ark.

FREE Fascinating airmail collection, including obsolete Liberian issue, with approvals. Raymax, 123-Z William St., New York City 7.

3 DIFFERENT United States \$5.00 stamps and large illustrated catalog 10c to approval applicants. Tatham Stamp, Springfield-125, Mass.

Springfield-125. Mass.

OLD Scarce U. S. seconds on approval. Slightly defective. Specially priced. Hernfield, 551 Clinton, Newark 8, N. J.

50 DIFFERENT United States 10c. No approvals. Seidenberg, Cassopolis, Mich. GIANT Bicolored royal visits, Malta pictorials, gorgeous Guianas, Goose airmail, Scandinavian packet and illustrated stamp publication. 10 cents with approvals, Crown Stamps, Box 331, Toronto, Canada.

SUPER Value penny approvals. None

SUPER Value penny approvals. None higher. Arthur Terreson, Box 479, Bell-

GIVEN Free-Roosevelt-Churchill, Hitler-Mussolini with approvals. Imperial, Box 1491. Tampa. Florida,

WORLDWIDE Packet 50 Stamps 5c with approvals. Carlin's Approval Service, 1832 Thomas. Fresno, Calif.

300 DIFFERENT Given free with approvals. Postage 3c. Windsor Stamps, 1435 East 67th Place, Chicago 37.

FREE—Famous Americans set, plus Flag Set, plus the National Parks Set, plus the Presidential Set to the \$5. A total of 90 stamps absolutely free to customers for our unsurpassed U. S. or foreign selections. Send 3c postage for 15 of the above men-tioned stamps and full particulars. Tri-boro Stamp Company, 145 Nassau St., Dept. 112. New York.

\$1.00, \$2.00, \$5.00 U. S., Roosevelt, Hit-ler, airmails, free with approvals, Tami-ami Stamps, Box 2188, Miami 13, Florida, CANADA—75 Diff. 25c. Approvals, Lists, Victoria Stamp Co., London 4, Canada, FREEL Triangle, Roosevelt, Vatican

FREE! Triangle Roosevelt, Vatican, Ethiopia, Hitler heads. With approvals, Florida Stamp Company, Box 807, Miami

5. Fla.

FREE! 100 Worldwide different stamps to approval buyers. Big U.S. and illustrated bargain lists sent with approvals. Bookman, Maplewood, N. J.

FLAG Stamp free with U. S. approvals. Wenigman, 929 Oakdale, Chicago.

55 DIFFERENT United States, 5c. Approvals. Utechts. 1143-C North Keeler, Chicago 51.

provals. U Chicago 51.

128-PAGE United States catalog-1000 lustrations, 10c. Harris & Co. 202 illustrations, 10c. Hi Transit Bldg., Boston.

50 DIFFERENT Stamps, triangle, airmails, etc., 5c with approvals. Cariton's, 10243 Silverton, Tujunga, California.

BRITISH, Spanish and French Colonies, Vatican, Hitler heads, and airmail packet, free with approvals. Pan-American Stampco, Box 145. New York 33, N. Y.

STAMP Collections wanted. Complete collections, duplicate lots, surplus stock, mint and used. Prefer trade for printing or other items, buy outright if priced right. What have you, what's wanted? Vanroy Shirk, Lebanon, Penna.

U. S. Price list. Send postage. State Stamp Service, 1225 Park Building, Pitts-burgh 22, Penna.

DEALERS—Wholesale list. Postage 3c. rank, 5031 Queensberry, Baltimore 15,

ZOWIE-E! A barrel of fun for only a dime. 500 United States stamps—absolute-ly unpicked and unsorted—just as received from church missions. Many varieties, in-Irom church missions. Many varieties, including large commemoratives, airmails, high denominations up to \$5.00! Stampdom's biggest package of fun—and you might find something really valuable! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Company, Dept. 80, Camden. New York.

U. S. Price list. Send rostoge. Standard.

U. S. Price list. Send postage. Stanley Gibbons, 38-P Park Row, New York. FREE! Crystal-mount samples! Har-risco; 202 Transit Bldg., Boston.

UNITED States approvals complete coverage, fine quality, attractive prices. Seminole Stamps, Box 1138-P, Coral Gables,

WHOOPIE! Wowie! 25c worth of U. S. stamps free! No obligations! Write M & N Co., 742A Sheffield Ave., Brooklyn 7, N. Y.

ANTIQUES, RELICS, INDIAN GOODS, CURIOS

10 ANCIENT Indian arrowheads \$1.00. List free, Lear's, Kirby, Arkansas. SWORDS, Rapiers, daggers, pistols, armor. Illustrated catalog 50c. Robert Abels, 860-A Lexington Ave., New York.

HOBBIES AND COLLECTIONS

NEW-15 Different match covers 10c, Box 202, Rochester 1, N. Y.

COLLECTORS, Craftsmen! Read "Hobbyists" magazine. Introductory three months, 25c. Hobbyists, Box 3425-A, Richmond Heights, Missouri.

WORLDWIDE Hobby magazine, twelve issues \$1.00; sample 10c, Klings', Blue Island, Illinois.

U. S. Army, marine, soldier patch insignia. Send \$1.00 for assortment of 10, \$5.00 for 75 patches, Fox Dept. Store, 593 Third, San Bernardino, Calif.

WANTED Old cigarette cards. Charles Bray, East Bangor, Penna.

UNUSED Match book covers. 100 a different \$1.00. Free catalog. Charles Ede man, 1311C East 84. Cleveland 3, Ohio.

INVENTING Can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 40-E. 1926-Eye St. N. W., Washington 6. D. C.

FOREIGN Campaign ribbon packet, and illustrated book \$1.00. Insigniacrafts, 236 28th Avenue N.W., Calgary, Canada.

PRECIOUS STONES, MINERALS

BEAUTIFUL Arizona agates, jaspers, petrified woods, chrysocolla with blue agate and green malachite. Listings and polished samples, \$2.00, unpolished samples, \$1.00. Arizona Agate Mines, Cave Creek, Arizona.

Creek, Arizona.

GEMSTONES Available, rough or cut.
Precious, semi-precious. Custom cutting and polishing. Plummer's, 5068 Brighton, San Diego 7, Calif.

GENUINE Jade: Four square inches.
Different colors. Black, forest, clover and apple green \$1.00. Ten square inches \$2.00. "Jade," Box 166, Casper, Wyoming. ing.

COLLECT Minerals and gems as a hob-by. Free list. Elbert McMacken, Route 2, Box 177, Escondido, Calif.

MINERAL Specimens, rough gems. Sapphire 10c. List free. Mission Mart 818 Fort Stockton Drive, San Diego 3, Calif.

METAL Detectors. The very latest circuit. Free literature. Hedden Metal Detectors, 538 N. Homewood Ave., Pittsburgh 8, Penna.

CAMERAS, PHOTO SUPPLIES

WESTON Master II with case \$30.00. DuPont Kinolux, Weston 50-40, 8mm., \$2.16 25 ft., 16mm., \$5.40 100 ft. Ansco Color 16mm., \$9.95 100 ft. Lamps: 750W-T12-2 \$5.90; 1000WT12-2 \$8.90. Postpaid, Bicbro Photo, 2876H Jerome Avenue, Bronx 58. New York City.

TWELVE Different photo novelties. Catalog 10c. F. H. Frey, La Crosse, Wis, TWINLENZ Viewer for any size single picture transparency in a 2" by 2" mount. Vivid 3 dimensional effect. Free information. Byron McCall, Prescott. Arizona.

200 POWER Telephoto camera easily made. Trifling cost. Free details. Suf-folk Science Service, Manorville, N. Y.

folk Science Service, Manorville, N. Y.

OIL Coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School. 1315 Michigan, Dept. 3432, Chicago 5, Ill.

PHOTOGRAPHY For pleasure or profit. Learn at home. Practical basic training. Long established school. Write for booklet. American School of Photography. 1315 Michigan, Dept. 3432, Chicago 5.

PHOTO Printer kit \$1.00. Spada Enterprises, 10 Lexington, Wethersfield 9, Conn.

Conn

BASS Says! At the sign of the old "Horse Trader," 37th year. Thousands of satisfied customers everywhere! Finest brands including Kodak, Bell & Howell. Argus, Zeiss, Leitz, etc. Satisfaction always guaranteed, or your money back! Bass buys 'em. sells 'em. trades 'em. Write or wire, Bass Camera Company, Dept. AG. 179 W. Madison St., Chicago 2.

PHOTO FINISHING

SENSATIONAL Introductory offer! Send snapshot or negative, this ad and 10c. We'll send you a beautiful 7x5" enlargement! Or, Kodak roll developed and printed (with free coupon) only 25c; or 8 giant prints from roll, 30c, Reprints from negatives, any quantity, regular size, 3c; Giant size 4c. Candid rolls—36 exp. 35mm, developed, vaporated, enlarged to 3x4, \$1.00, 18 exp. 50c. Pree mailers. Free premium offers sent on request. American Studios, Dept. 364. La Crosse, Wisconsin.

ENLARGEMENTS, 5x7 15c, 8x10 25c. Glossy or dull. Oil colored, 50c extra. Negatives made 50c. Roll film developed and printed, 25c. L & R, P.O. Box 1476, Milwaukee Wis.

PROFESSIONAL 8x10 Enlargement 50c.

PROFESSIONAL 8x10 Enlargement 50c. hree. \$1.00. Rush negative. Mosher Three, \$1.00. Rush negative. Studios. Vineyard Haven, Mass.

POSTCARD Size enlargements, 5c; 5x7, 2 for 25c. Kobylak, 50 Downs, Binghamton 9, N. Y.

8 BEAUTIFUL Double size pictures and roll developed 30c. 8 hour service. Free mailers. Pacific Photo Service, Box 666, San Francisco, Calif.

TEN Photographic enlargements of typical Mexico, \$1.00. Apartado 2807, Mexico City

typical Mexico City.

8 HOUR Service, eight exposures 30c; 12 exposures 35c; 16 exposures 50c; 36 ex-posures \$1.00, Reprints jumbo or deck-ledge regular 3c. Send for free mailers. Quality Photo Service, Box 468, San Fran-cisco, California.

OVERSEAS And air mail photo service. Only 8 hours in our plant. Eight exp. roll 30c; 12 exposures 40c; 16 exposures 60c; full 35mm. rolls \$1.00. Reprints jumbo or regular deckled 4c each. Air return when postage incl. Send for free mailers. Custom Photo Service. Box 567. San Francisco, California.

GIANT Film offerings, 5c. American Films, 6711 Sunset, Hollywood, Calif. ROLL Developed, 8 prints and two en-largements 25c. Trial offer. Young Photo Service, 405-C, Albany 2, N. Y.

PHOTOGRAPHY For pleasure or profit.
Learn at home. Practical basic training.
Long established school. Write for booklet.
American School of Photography. 1315
Michigan, Dept. 3451, Chicago 5.

8 PRINTS All enlarged to nearly post-card size from your roll or negatives 25c; 16-50c. (Trial offer). Willard Studios, Box 3535A, Cleveland. Ohio.

FINEST Quality. Fastest service guaranteed. Roll developed and 16 Velox prints, 25c. Reprints 2c. 100 \$1.50. Dick's Photos, Louisville, Ky.

"BETTER Photo finishing." Jumbo prints 40c a roll. Reprints 3c. Best by test. Fast service. Sealtone Photo, Box 468, Seal Beach, Calif.

16 DECKLEDGE Prints from any standard 8 exposure roll 25c. Quick service. Professional work. Skrudland, Lake Geneva, Wis.

FREE Price list on quality developing, printing, enlarging. Write for it today, Bryan's Photo Shop, Dept. M. Panama

City, Florida.

2 BEAUTIFUL Hi-Gloss prints each good negative and enlarging coupon with each 6 or 8 exposure roll developed 28c. Owlphoto Co., Weatherford, Oklahoma.

MOTION PICTURES AND SOUND EQUIPMENT

SURPLUS 15MM. F 1.9 projection lens \$7.50 ea. Can be used for 8mm. or 16mm. projectors, display slide projectors, toy microscopes, built in view finders, lab work. Components, 2 spherically corrected doublets and color corrected negative cemented component. Natco, Inc., Chicago 12, Illinois.

ABBOTT Costello 8mm. 50 ft. \$1.75, complete \$5.50; 16mm. 100 ft. \$2.75, complete \$8.75, sound \$17.50. Projector, camera, films, accessories catalogue 10c. Sterling's, 679 Northampton, Easton,

Pennsylvania.

ONLY \$1.00, Eighty-five page book, describes trick titles, dissolves, titler stand, centering, developing, pictures galore.

Westwood Company, 635 Victoria Street, San Francisco, California.

LEARN Professional motion picture technique at home. Approved for veteran training under G.I. Bill. Free catalog. Motion Picture Institute, Birmingham 4, Mich

BARGAINS! Free films-equipment cata-log! Towers, 935 North 40th, Philadelphia

BARGAINS In used 16mm, films, Car-toons, sports, musicals, features. Big list for stamp. Blackhawk Films, Davenport,

COMPLETE Stocks always of Castle, Official, Pictorial films, 8mm., 16mm., sound. Musicals, soundies, free catalogs. We exchange your films and equipment, or buy them for cash. Frank Lane, 5 Little Bldg., Boston, Mass.

35MM. Silent-sound films, supplies. Bed-ner, 5300 So. Talman, Chicago.

ATOMIC Fury (Bikini bomb tests) 8mm., 50 ft., \$1.75, Kodachrome, \$6.50, 16mm., 100 ft. \$3.50, Kodachrome, \$13.00. Big film catalog, 10c. World In Color, Elmira, N.Y.

16MM. Sound western features. Top stars. New prints. Low prices. Write! Grand, 2506M-52nd, Kenosha, Wiscon-

FILM—Movetone is back. It's Weston 12 nonhalation. Free processing 100 ft. 16-mm. \$3.25, 25 ft. double 8mm. \$1.50. Bulk film without processing 100 ft. 16mm. \$2.25, double 8mm. \$2.45. Free circulars. Fromader Genera. Davenport 4, Iowa.

FREE, Catalog, movies; sample films, oc. Goodwill Company, Jackson, Tennessee.

Subscription offer! Amateur Photography Magazine, 3021A PREE Subscription of Screen Photography Ma Narragansett, Chicago 34.

GUARANTEED Fresh anti-halo out-door movie film! Weston 12! Daylight loading! Processing free! Three spools double 8 mm. \$3.45! Six single 8 mm. for Univex. \$4.60! Postpaid! Catalog. Eso-S, 47th Holly. Kansas City 2. Missouri.

8-16 MM. Silent, sound films, cartoons, musicals, comedies. F. Fischer, 2948 N. Albany. Chicago 18, Ill.

Albany, Chicago 18, Ill.

FINEST Movie screens, inexpensive, make them yourself. Free literature. Snow White Screen Company, Danville, Illinois.

White Screen Company, Danville, Illinois.

BARGAINS In 16mm. sound projectors, films, reels, splicers. Harris, 303 West 42nd Street, New York 18.

SURPLUS 16mm. Eastman Super X on 50' cores, 50c postpaid! 12 rolls \$5.00! Outdated but tested and guaranteed! 100' camera spools 25c postpaid! Processing, 75c. Filmcraft, 47th Holly, Kansas City 2. Missouri. camera spo 75c. Filmer 2. Missouri,

16MM. Films, projectors, sound, silent. Lists free. Osborn Films, Lebanon, Ohio.

HOLLYWOOD Films, Color sample, \$1.00 (refunded), Catalogs, 10c (refunded), Stone, Lunenburg 2, Mass.

"THE World's Greatest Passion Play."
State projector. Rent or purchase. Write
Hemenway Film, 33-F Melrose St., Boston 16, Mass.

MAGAZINE 16mm, 50' E.K. Super X panchromatic, Guaranteed, Processing included, \$1.99. Other values, free lists. Fischer Photo, 1731 N. Mobile, Chicago 39, Illinois

RARE 8-16MM. Silent-sound films. International, 2120 Strauss, Brooklyn, N.Y.
I BUY, Exchange, swap movie films.
Rental catalogue 25c Harvey Iris, Box 539,
Brockton, Mass.

DISTRIBUTORS Wanted. Make big money selling our new sensational movies. Send for sample today 16mm. Snd. \$10.00, 16mm. Sil. \$7.50, 8mm. \$2.50, and receive free our wholesale price list. Standard Pictures Corporation, Dept. A. Universal City, Calif.

City, Calif.

PROCESS Your own movie film, Literature, Duro Products, 1519 Eggert, Eggertsville 21. N. Y.

SILENT To sound—Convert your silent 16mm, projector into sound with our guaranteed sound conversion equipment. Fits any silent 16mm, projector, Includes: Sound head kit (easily assembled); radio film adapter (plays sound through your radio) and complete instructions. Total price \$48.95. Send check or money order to Apex Video Co., 12209P Branford St., Roscoe, Calif. to Apex Vide Roscoe, Calif.

oscoe, Calii.

SOUND, Silent movie film, 8mm, carcomedies, 35mm, shorts. toons, 16mm, comedies, 35mm, Simpson, 155 High, Dayton, Ohio,

EXCLUSIVE Home movies. Select films. Write for free lists. Home Pix, 1674 Broadway. New York 19, N. Y.

ARMY Surplus 50' 16mm. magazine Super X Weston 50 films, \$1.00. Processing 75c. Guaranteed. Filmcraft, 828 West 39th. Kansas City 2, Missouri.

WE BUY, Sell, rent, exchange home movies. Details for dime, Midland, Box 429. Oak Park 4. Ill.

LEARN Movie projection, management. Free catalog. Theatre Institute, Elmira, Free catalog.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue, (sample film 10c). Garden Film, 317 West 50th. New York 19.

BASS Says! 37 years of leadership means BASS Says! 37 years of leadership means satisfaction to you! Finest equipment, 8 and 16 mm., sound cameras, sound projectors. Bass buys 'em, sells 'em, trades 'em. Satisfaction always guaranteed, or your money back! Bass Camera Company, Dept. A. 179 W. Madison St., Chicago 2.

BEAUTIFUL Kodachrome slide and lists 25c. Slide Supply Service, 3111 West Tuscarawas, Canton, Ohio.

MUSIC AND MUSICAL INSTRUMENTS

LEARN Scientific piano tuning. Piano Technician, 75 Howard, Keene, N. H. 1948 ACCORDIONS — Wholesale, Free

1948 ACCORDIONS — Wholesale, Free catalog, American Accordion Center, 39 So. Kedzie, Chicago.

SONGWRITERS: Honest outstanding music writing offer, Len-Tex Studios, Leonard 2, Texas.

POEMS Wanted for publication consideration, details free, J. Barnes, Publisher, Box 490 Times Sq. Station, New York 18, N. Y.

N. Y.

AMPLIFY Your accordion with our new mike \$22.50. Sounds like organ. Installed in minute. Use any amplifier. Amplifier and mike \$72.50. Write Del Principe. 307 So. Wabash Ave., Chicago.

CHURCH Organist 35 years, composes music, prints music. Reginald Belcher, 14 Harrison Street, Morristown, New Jersey.

ACCORDIONS—Guitars, trumpets and all musical instruments, new and used. Direct from national distributors, cash and terms. Save money. Del Principe, 307 So. Wabash Ave., Chicago. SONG Poems wanted. Music composed, arranged, published. Auto-Litho, Jensen, Florida.

PHONOGRAPH Records 20c. Catalogue. Paramount, MN-313 East Market, Wilkes-Barre, Penna.

GENUINE Hohner harmonicas, Marine Band, \$2.95, chromatics, \$12.50, \$17.50. Sixteen hole chromatic, \$25.00. Prompt service. St. Johns Music Store, Winnipeg, Canada.

TO Get anyplace your song should have a beautiful professional piano arrangement by the arranger of "Open the Door, Richard." We send you twelve copies expertly and beautifully arranged for \$25. Satisfaction guaranteed. Send manuscript and money order to Songwriters Arranging Service, 6406 Sunset Blvd., Hollywood, Calif.

SAMPLE Of prices, New corners with

Blvd., Hollywood, Calii.

SAMPLE Of prices. New cornets with case \$39.50. Full size accordions with case \$259.50. Spinet pianos \$495.00. Trap drum outfits \$185.00, etc., if you are a musician or going to be, you need our showbook catalog. Send 25c for yours today. Harden's Musical Merchandisers, day. Harden's Marion, M. Ohio.

BE Independent, tune pianos, music unnecessary Practical Piano Tuning shows you how. \$2.00 postpaid. Chord-Slide Co., P3122 Lawrence Drive, Corpus Christi,

POEMS Set to music. Experienced composer. Free folder. Moquin, 5333 La Cresta Ct., Hollywood, Calif.

SONGWRITERS! Ethical composing offer. Hibbeler, C5, 2157 N. Avers, Chicago.

GUITAR Beginners: New automatic chord-changer eliminates "fumbling." Home study course teaches quickly. Also popular music supplies. Sell to schools, churches, friends, etc. Guitar Headquarters, Box 886, Ventura, California.

ACCORDIONS, Streamline, wholesale. Request circular. Metro Accordion, 44 North Albany, Chicago.

MUSIC Atrapped Sones printed Frank

MUSIC Arranged. Songs printed. Frank Wildt, Music Publisher, Lancaster. Penna.
SONGWRITERS—Protect your songs.
Get the facts first. Free booklet, attractive offer. Song Service, 331-C West 48th, New York.

POEMS Wanted for musical setting. Send poems for free examination. Five Star Music Masters, 630 Beacon Bldg.. Boston, Mass.

POEMS Wanted for musical setting!
Send poem for immediate consideration,
Hamann Service, 614 Manhattan Building,
Milwaukee, Wisconsin.

POEMS Wanted to be set to music. Free
examination. Send poems, McNeil, Master
of Music, 510-PM S. Alexandria, Los Angeles. California.

SONGWRITERS: Send poems for free

SONGWRITERS: Send poems for free examination and outstanding offer. United Music Service, 150, Salem, Indiana.

WRITE Songs. Big money and reputation. Write for information. J. Gordon Pub Co., 201 N. Hoyne Ave., Chicago.

RADIOS, SUPPLIES, INSTRUCTION

LEARN Elements of radio at home. Ideal course for beginners. \$15.00. Write Waca Radio School, 1421 Sixth St., S.E., Minne-Radio School, 14 apolis 14, Minn.

BARGAINS—Radios, phonographs, kits, supplies. Free list. Al's Radio Service, Sioux City 7, Iowa.

FREE Radio and television catalog!
Money saving prices on radios, hard-toget-parts, record changers, wire and disc
recorders, amplifier systems, tubes, books,
amateur and test equipment. Write today!
Radionic Equipment Co., Dept. 203, 170
Nassau Street, New York 7, N. Y.

BUILD "Loudest" crystal radio. Instructions, loud crystal, catalog: 25c.
Amorose, Route Four, Richmond, Virginia.

MODERN Radio cabinet easy to build

MODERN Radio cabinet easy to build MODERN Radio cabinet easy to build from our simple plans. Console-type radio cabinet with sliding full-panel doors fin-ished in natural wood. It's a beauty. Handsome addition to any room decorated to modern taste. Ask for plan #1100, 25c. Popular Mechanics Press, Room 601, 200 East Ontario Street, Chicago 11, Ill.

24 PAGE Plans "18 Long Distance Crys. al Sets." catalog, "Radiobuilder"—al tal Sets." catalog, "Radiobuilder"—all 25c. Laboratories, Eye-c, San Carlos, California.

WESTERN Electric fixed crystal. No adjusting. Excellent for crystal sets, sensitive. Cost government \$5.00, prepaid 99c with holder. Free list #3. Radio City Labs, 30 Church St., New York 7, N. Y.

EXPERIMENTERS—All wave radio kits. Free circular. Artlin Company, Knickerbocker Station, Box 25, New York

26 YEARS Experience radio repairing at your fingertips. I've repaired 45,000 radios. Have perfected simple system you can follow step by step. No calculations or formulas. Total price \$2.00 postpaid or c.o.d. Moneyback guarantee. Ross Radio, 14615-M Grandriver, Detroit 27, Michigan gan

WIRELESS Record players, changers, Factory direct. 5 inch PM speakers \$1.29, Crystal pickups \$2.25. Tubes, parts less than wholesale. Myles, 3433 Maple, Ber-wyn, Illinois.

wyn, Illinois.

SAVE Money on finest-quality, nationally-known radio parts, electronic equipment. Compact SPDT 110 v.a.c. relay 89c; famous T-17-B microphone with cable and plug, used but in perfect condition 49c; Daco counter model tube tester \$29.50; portable model \$32.50. RG-8/U 52-ohm coaxial cable, 100 ft. \$2.89; order off this ad! Send 25% deposit. Balance c.o.d. And ask to receive up-to-the-minute bulletins listing latest, greatest buys like these; transformers and chokes, 19c; tubes as low as 13c. Mid-America, Dept. CC-10, 2412 S. Michigan, Chicago, Ill. RADIO Controlled garage door opener—

RADIO Controlled garage door opener—works from button in car. Complete plans \$1.00. Radio, Box 3236, Birmingham, Alabama

"RADIO Amateur Newcomer" — 160-page beginner's book. Comprehensive; building, passing license examinations, operating, \$1.10 postpaid. Editors-Engi-neers, 1304 Kenwood, Santa Barbara.

Calif.

SAVE 47',—Order your 1948 professional steel case, long range radio receiver direct from factory. Box 150, Manchester, N. H.

FIX Any radio, Amazing new instrument locates radio troubles double quick. Simple instructions show you how. Thousands in use. Write today for 24-page booklet, "The Inside Story," Feiler Engineering Co., 945 George St., Dept. PM, Chicago 5, Illinois. gineering Co., 945 Chicago 5, Illinois.

MAKE Selective distance getting crystal radios. Also one tube radios. Improved de-signs. Complete instructions and crystal 25c. Radio Leader, La Verne 4, Calif.

MAKE Simple, tubeless, batteryless, distance-getting crystal radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-P. Clinton, Missouri.

U. S. SIGNAL Corps featherweight ear-phones \$1.00. Radio service men and ex-perimenters send stamp for our giant radio catalogue. Save dollars. United Radio Co., (100-V) Newark 1. N. J.

RADIO Technician and radio service courses. Training for federal licenses. American Radio Institute, 101 W. 63 St., New York City. Approved under G. I. Bill of Rights.

SUPERHETERODYNE Radio kit complete with all necessary parts, instruc-tions and soldering iron so anyone can build a high quality set. Box 150, Man-chester, N. H.

BUSINESS OPPORTUNITIES

START Home business making statu-ettes, plaques, artificial marble flooring, liquid marble, flexible molds, metalizing baby shoes, Amazing profits, Folder free, Creative, 236-L. Winnetka, Illinois.

MAKE Big earnings. Operate an S-I-P Mobile Paint Store as our franchised representative. Make your car earn money for you. No experience or capital required. We train you and get you started right. Full time and part time positions now open. A clean, interesting, healthy and profitable business. Write Standard Industrial Products, Inc., Dept. S-1, Evansville 4. Indiana. Evansville 4, Indiana.

BUILD Full rigged ship in a bottle with 14 to 22 sails. Single ship sold as high as \$50.00, materials cost few pennies, Pic-ture and particulars free. Mariner, Box 2095, Wichita, Kansas.

OPERATE America's most popular low priced precision penny vending machine. Big profits, Be independent. Write for bulletin and prices, Stock shipments. Fielding Mfg. Co., Desk 348-PM, Jackson,

DISTRIBUTORS. All territories, new simplified bookkeeping and tax system. Many salable features, \$16.25 profit each sale. Repeats. Money maker. Opportunities, Exclusive franchise. National Accounting Service, Box M-3, Lynbrook, New York counting New York

PLASTIC Tablecloth covers, curtains, drapes, baby pants, bowl covers and other plastic articles selling like wildfire! Make big money now! Free details, Write Plastics, Dept 58-C, 206 N. Fourth, St. Louis,

SIGNS Made easily. Instructions and ten sets modern alphabets, numerals, pat-terns. Sizes up to eight inches. All for \$1.00. Co-operative Business, 7 West Mad-

GOODYEAR Has natural Malaya liquid rubber for mold making. Quart \$3.00, gal. \$10.50, trial pint, \$1.50. Parcel free up to 1 gal. Write for full particulars. Good-year, Lake Geneva, Wis.

COLOR Concrete with chemicals. Formulas, instruction. Sample 10c. Hollywood Cementeraft. 8527-A Wonderland,

FORTIFY The future—Start own business, home or office; no peddling, little or no investment. Collection describes 137 money plans. Full particulars free. Wilson, Box 3272, Chouteau Sta., St. Louis 10, Missouri Missouri

Box 3272, Chouteau Sta., St. Louis 10, Missouri.

UNPAINTED Bookends, plaques, statues, figurines. List. Haverty Products, 1219 8th Ave., Altoona, Penna.

START Home manufacturing business making Cleaning Compounds, Soaps, Insecticides, Cosmetics, Polishes, Food Flavors, No machinery, Literature free, Kemix, Park Ridge, Ill.

CAPITAL Raising made easy; millions available; send for Financing Your Business; large 250 page volume; complete details, only \$2.00. Seminole Publishing Company, Room 9, 317 W. Forsyth St., Jacksonville, Florida.

LEARN Battery repairing, rebuilding, Engineer offers money making methods, Battery Bureau, 2225K North 44th St., Milwaukee 8, Wis.

MECHANICALLY Inclined men — Own and operate general appliance repair shop, Complete, illustrated course shows you how. Welding, refrigeration, motor repair, how to get business, etc., all phases covered. Free literature, Christy Supply, Dept. T-180, 2835 N. Central Ave., Chicago.

UNLIMITED Opportunities offered in cago

UNLIMITED Opportunities offered in mail order. Write for details, Klebing, 60-19 60th Drive, Maspeth, N. Y.

UNPAINTED Plaster plaques and statu-

UNPAINTED Plaster plaques and statuettes. Free illustrated pamphlet, Kalbach's Plastic Arts, Robesonia, Penna.

GENUINE Natural latex for rubber molds. Concentrated 62% solids. Cream viscosity, Make money casting, Trial sample 25c. Write Major Chemical Co., 131D Inman Street, Cambridge, Mass.

25 REALLY Big mails sent to you for \$1.00. Contains many magazines, also plenty adsheets and circulars. Martin's Service. Box 295-P, Bassett, Virginia.

EARN \$200 Weekly installing new amazing "Styron" plastic wall tile in homes, offices. Easily applied. Tile your own kitchen, bathroom, too. Instructions, everything furnished. Literature free. U. S. Tile Co., 30 W, Washington St., Chicago 2, Ill.

VEXKROME, Miracle metal cleaner.

VEXKROME, Miracle metal cleaner. Sell garages, dealers, etc. Exclusive terri-tory, Tiger Products Co., Taunton, Mass.

MAKE Flexible molds! Few cents each! ast plaques, novelties, bookends! Free Cast plaques, novelties, bookends! Free samples! H. Tooker, Hamilton 44, Ohio.

EXTRA Money? Free details, Trable, 1018 2A Elm Street, Dallas, Texas.

NEW Products, ideas wanted, Marran Products, 1442 Faxon, Memphis 5, Tenn.

OPPORTUNITY Knocks, big demand, Different, Easily sold, Belmont, Garrett, Indiana.

MAKE Plastic jewelry, Free informa-tion, Attler Company, 23-60 29th, Long Island City, New York.

"PLASTICS," Trade secrets, Send 3c stamp. Free information. Plastic Research Bureau. 3873 California, San Diego 1, California.

ONYX And plastic mountings for bronzed baby shoes; 15 styles, also hard-ening solution, Wholesale, Box 2095, Wichita, Kansas.

MAKE Profits in mail order business.
Astounding course shows how. Details
free, Jimton Service, Lock Box 1373G,
Mobile 8, Alabama.

EARTHWORM Breeding. Profitable home industry. Write for free booklet, "Successful Earthworm Farming." Earthmaster Farms, Dept. 14-A, Box 488, Roscoe, California.

THE Knack of making money in any job, business or profession. Postal brings details. Adam Krzykwa, 1143 Spring Ave. N.E., Grand Rapids, Michigan.

RUBBER Molds, slightly used, \$1.00 each, big selection, Guaranteed Malaya liquid rubber, \$1.25 pint, \$2.00 quart, \$6.95 gallon with instructions and list of confidential trade secrets for mold makers free. Southern Service, Box 3303-A, Jacksonville, Fla. sonville.

RUBBER Molds, natural liquid rubber, flock filler (for making sectional molds), statuary plasters, felt finishes for novelties. Catalog and "Plastercraft" course free. Blue Rapids Supply, Blue Rapids,

WATCHES, Wholesale. Rebuilt-like-new Elgins, Walthams, Bulovas, etc., \$9.75 up. Catalogue free. Brookings, B-A1975, Little Rock. Ark

MAKE Money spare time. Write for de-tails. American Letter, New Market 3, N.J.

tails. American Letter, New Market 3, N.J.

FREE Details for home business. Acme
Service, 268 C. Rome, N. Y.

ELECTROPLATING! Want a money
making trade or profitable business of
your own? Learn from nationally recognized authority. It's easy when I show
you how! Free particulars. Joseph A.
Kushner, Metal Finishing Consultant,
Stroudsburg 43, Pennsylvania.

WHERE To buy at wholesale 100,000
articles. Free list. Maywoode, 1133 Broadway. New York.

FREE—64 Page mail order magazine.

FREE-64 Page mail order magazine. Viggins, 3928 Fort, Lincoln Park 25, Wiggins,

POPCORN Machines. Potato chip out-fits. Long Eakins Company, 4860 Hi Street, Springfield 99, Onio.

INVENTIONS Protected in 30 days.
Patents for sale. Patent News, 12M
Washington, D. C.

MAIL Order business, start at home
Ideas, plans, many practical formulas.
Details free. Kasdorf, 273 Bridge St.,
Brooklyn, N. Y.

Brooklyn, N. Y.

SAVE Hundreds of dollars, by buying wholesale. Million articles wholesale. Directory 10c. Publishers, Box 1302-P3, Detroit 31.

START Home mailorder business.
Amazing book. 12,000 words, 40 subjects tells how, 25c. Strauss, 1211 S. 114th, West Allis 14, Wisconsin.

EARN Good income in mail order busitails free. Mosley Business Service, Box ness. Proven methods. Small capital. De-3528, Shreveport, La.

OPERATE Profitable mail order busi-

OPERATE Profitable mail order business. Splendid opportunity. For details write V. M. McKinley, 76 Ave. "A," Battle Creek. Mich.

ELECTRICALLY Inclined men. Amazing illustrated literature free, proving \$100-\$250 weekly possible installing, maintaining fluorescent lighting. Rebuild fixtures for excellent profits. Make beautiful lights for 50c each and less. Free sample materials. Write Willis Fluorescent Service, 101 York Street, Brooklyn 1, New York, Dept. C.

MAIL Order beginners! Get Tip Top Salesman! One of the fastest growing magazines in the field! Year's subscrip-tion, \$1.00. Sample, 10c. Browning, Box 4001-B. Miami 25. Fla.

MICA—Large profit possibilities, small investment. Box 439, Atlanta, Georgia.

AGENTS Wanted for Tiresignal, Fast selling device. Eliminates flat tires on automobiles. Sample \$1.00. Tiresignal, Dept. A, P.O. Box 1667, Los Angeles 28, California. California

BALLOONS, Balls, rubber dolls; fire-works; battery powered toy automobiles. Profits plenty. Ellswood Distributors, LaJunta. Colorado.

PROFITABLE Letter shop operation. Details free. Wollard, Box 268-E, Newark,

PLE Copy mail magazine with To Sell By Mail," only 25c, Cox,

SAMPLE Copy mail magazine with "How To Sell By Mail," only 25c. Cox, 14-A Church, Saugus, Mass.

READ "Advance"—The voice of mail order. Offers money-making opportunities, sources of supply, personal guidance, etc. Issued monthly. Sample copy 25c. Yearly subscription \$2.00. American Mail Trade Association, 313 East 21st Street, Suite 450, New York 10, N. Y.

HOME Business plans, golden opportunities, 10c. Holm, 12A, Oaklandon, Indiana.

diana

START Bottled gas business. New, amazing opportunity. Demand enormous. Pays big profits. Literature free. Engineering Services Company, Box 73-U. Pasadena 16. California.

MAKE More money, Be community buyer, Earn to \$5,000 year with "The Wholesaler Plan." Savings to 50%. De-tails free. Cox. 14 Church, Saugus, Mass.

MAIL Order pays off. Vanburleigh, 157 tate. New Haven, Conn.

MONEY In personalized baby record books; sell by mail; use same literature we do. No-Co-Ro, Oakland 6-M, California.

HANDY Men—Make quick, easy profits repairing leaking water faucets with Economy Renewable Seat Tools. Build valuable sales and service business in your spare time. Territories open, literature free. Economy, 3211 N. California, Chicago 18.

YOUR Own plastic business at home. YOUR Own plastic business at home.

A charm to produce costume jewelry, novelties. Use flexible molds, liquid plastic—marble. Write for free book. American Trades, Box 89-A-4, Cincinnati 29, Ohio.

BIG Pay in modern renovating business. Master method makes you expert. Easy, pleasant, permanent. Master, Box 247, Albany, Oregon.

PLASTERING \$3.50 Hour, No experience. Inquire Pozy Plastering Co., 3145
W. Madison St., Milwaukee 4, Wisconsin.

MAKE Perfume Profitable, sparetime

MAKE Perfume. Profitable, sparetime home business. Men. women, write "In-ternational," 6347 Parnell-X4, Chicago Illinois.

FREE Literature describing fifty proven successful, home-operated mail order plans. Reiss, 3017-N Ocean Parkway, Brooklyn 24, New York.

MERCHANDISE Half standard price. Catalog 10c. Solomon Company, 813 Broadway, New York 3.

\$46 FROM Square foot plywood. Jigsaw necessary. Write, Woodarts, X-38, Bridge-water, Mass.

START Real estate business. America's finest profession spare time. Details free. Educational Book Co., 2907 Berwicka Ave., Baltimore 14, Md.

METALLIZE Baby shoes. Excellent profits. New system assures success. Free details. Treasures Forever, 89 Henry Ave.. details. Tre-

OPERATE Profitable mail order busi-ess, Write Walter Service, 4159-A East 12th, Cleveland 5, Ohio.

"COLLECT And Grow Rich" is a free booklet that's yours for the asking. Learn of this opportunity for a life-time, spare or full-time business of your own, where you can make a profit on the work of thousands of others. T. J. Surface, Pres., Dept. 216-C, Roanoke 7, Virginia.

UNPAINTED Wall plagues bookends.

UNPAINTED Wall plaques, bookends, ashtrays, figures, novelties. Illustrated list free. 33 samples \$1.00. Oman, 642 Broadway, Dept. M, St. Paul 1, Minn.

BE A used car dealer, Tested plan \$1, or details. Smith, 17A Rockland, Yonkers, N. Y.

BABY Shoes preserved. Formulas, in-structions \$1.00. Supplies and bases. Nov-elty Bronzing, Box 56, Hyde Park 36,

BUY, Advertise, sell with our monthly New Products Bulletin, copy \$1.00. Twen-ty Ad Plan \$2.00. From Nothing to Inde-pendence, \$2.00. \$4.00 buys the three mail order helpers. Satisfactory guaran-tee. Free details. Educational Book Com-pany, Baltimore, Maryland.

OPERATE Profitable mail order business. Splendid opportunity. Write Underhill & Co., Gormania, W. Va.

DRY Cleaning any 4 garments for \$1.00. Just mail clothes insured. We will reship 2nd day collect. First order entitles you to future agency discount for income. Perk Cleaners, 881 Park Ave., San Jose

BE An employment consultant, intermediary, agent. Easily learned. Many carn \$5000 yearly. Write "Hunt," Box 308, Burlingame, Calif.

BECOME A real estate broker. Spare time. Write free details. Peerless Sales, Box 25, Curtis Bay 26, Md.

ENVELOPE Sealer. Mechanically seals forty a minute. Brass, nickel plated. Sells on demonstration \$2.50. Kendall Company, East Jaffrey, N. Hampshire.

BE A tax consultant. Bookkeepers. etc. qualify quickly. Details free. Smith, 17 Rockland, Yonkers 5, N. Y.

OWN A mail-order paper products business. Sell envelopes, tags, bags, boxes—wholesale. Tremendous demand. Steady prafits. No capital necessary. Omaha Envelope Service, Dept. 244, 4721 California, Omaha 3, Nebraska.

ENTIRELY New method of successfully building real mail order business on small capital. Full information 10 cents. Act at once. Get free copy of regular 25c plan. G. O. Carlson, Hawthorne, N. Y.

MOLD Plastics, compositions, plasters. Simplified methods. Profits tremendous. Investment small. Instructive literature free. Plastics Digest, 2917-B Michigan, Kansas City 3, Mo.

"HOW To Build Your Own Mail Order Business." Idea book for beginners, mail dealers. Quarter postpaid. Satisfaction guaranteed. Edgar Gilchrist, 622-M, Mas-sachusetts Ave., N. E., Washington 2,

D. C.

LIQUID Marble—Make in any color.

Soundproof plastic flooring. Flexible molds. Cast novelties, plaques, statuary.

Big money—your own business. Catalog free. Write—Bing Products, 88-A4M Broad Street, Boston 10. Mass.

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408P, 200 E. Ontario St., Chicago 11.

Mechanics Magazine, Room 408P, 200 E. Ontario St., Chicago 11.

JOB-WINNING Resume developed from your experience record by mail. Details. William Shutly, 124 Cambridge, Dayton 6, Ohio.

STOCK Molds. New original designs. Creative Specialties, 3356 Cullom, Chicago 18

SAWDUST. Turn it into cash. Six ethods. Instructions 25c. Charles, methods. Instructions 12-BC, Norwood. Ohio.

BUYERS Wanted for plaster novelties and religious statuary. Painted, unpaint-ed. Retail, wholesale. Write today for free information. Bing Products, 88-X9A Broad, Boston 10, Mass. GENUINE Natural latex for rubber

moids. Only two coats necessary for thick mold. Make money reproducing statuary, plaques, noveities. Low cost. Write Major Chemical Co., 131A Inman Street, Cambridge 39. Mass.

HOMEWORKERS — \$50.00, \$100.00

HOMEWORKERS — \$50.00, \$100.00
Weekly. Castwood plastic gifts, plaques,
novelties: material, molds, instructions
furnished. (Sample mold kit) complete
with big list supplies \$1.00 postpaid.
Standard Arteraft Products, 1416-R2
Fletcher, Chicago.

Fletcher, Chicago.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. OB-3, 1512 Jarvis Avenue, Chicago 26, Ill.

1001 MONEYMAKING Ideas! Free details. Neuway Institute, Box 5463-M, Chicago 80.

HANDYMEN—Earn money home operating Community "Fix-It" Shop. Write Stafford, 708 Rawlings. Carbondale, Ill.

INCORPORATE Your business, free de-tails. Tax Research Bureau, Inc., Dela-ware Trust Building, Wilmington, Dela-

RAISE Earthworms. Instructions \$1.00, Huffman's Worm Ranch, R.R., Rives Junction, Michigan.

RE-NEW Leather and leatherette—
Make cloth into imitation leather with
plastic discovery called Leather-New. Opportunity to make real profits taking care
of sales resulting from national advertising. Write for free sample of LeatherNew covered material and complete deal.
4723A Troost, Kansas City, Missouri.

MAKE Perfume. Complete outfit \$7.50. Information free. Walter Lawson, 21 Joiner, Saint Augustine, Florida.

FOR An extremely profitable lifetime business operate a collection agency-cred-it bureau, Easily learned. Free folder. Cole & Associates, Syracuse 2, N. Y.

OPERATE Home business that may mean the road to independence. Write Sunray, 4756-A N. Bernard, Chicago 25, Illinois.

MEN And women wanted to place self-selling coin machines in stores, hotels, filling stations, etc. New machine earns up to \$6.00 weekly—costs only \$10.50. We furnish supplies and machines for nuts, gum, candy, stamps, scales and amuse-ments. Free details of tested selling plan. Write Dept. P. Parkway Machine Corp., 623 W. North Ave., Baltimore 17, Md.

PROFITABLE Plans, ideas \$1.00. De-ils. Spada, 10 Lexington, Wethersfield tails. Sp

SEA-SHELLS, Plastics, metal findings, see catalog, "Secors," 238 Bradenton free catalog. Beach. Florida.

FREE Literature des moneymaking plans. Verr ware. Oakmont 11, Penna. Literature describing many ting plans. Verner, 108 Dela-

MAKE Strange plastic—1c pound. Makes durable floors, walls, etc. Build for half. Bays Laboratory, Oklahoma City 9.

STOP Looking further. New combination two-way mail order business. Free information. United Mail Order Bureau, 1310 N. Wells, Chicago 10, Ill.

INCOME From leisure hours—Small investment in coin operated radios you place in cabins, tourist camps, hotels, clubs, YMCA's and hospitals brings steady returns. Box 150, Manchester, N. H.

UP To \$5,000 a year operating one-man home manufacturing business. Splen-did opportunity. Previous experience un-necessary. Descriptive survey free. Write today. Roth Associates, Box 356, Apple-ton, Wisconsin.

ton. Wisconsin.

A FACTORY in your home garage! Mfg. and sales rights, mechanics' waterless hand cleaner. \$500-\$800 monthly. No special equipment necessary. Western Aircraft Mfg., Dept. D. Los Angeles 6, Calif.

DISTRIBUTORS Wanted everywhere.
Large profits, Details, catalog 25c. ReBilt, Manitowoc, Wis.

EXCLUSIVE Distributor. Plasticized
beauty-protection for auto finishes. Used
like polish, Must fin, own stock, Plasticize,
2254 N.W. 62nd St., Miami, Fla. Plasticized ishes. Used

AT Home — Your own manufacturing business; making popular \$1.00 novelties. Cost you 3c to 15c. Everything supplied. Write So-Lo Works, Dept. C-600, Loveland, Ohio.

LEARN Piano tuning, repairing, at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School of Piano Tuning. 606-B East University Ave., Champaign. Ill.

RECAST Old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

PARATOL Supreme "706" Molder—A newly developed compound. The toughest rubber ever made for molding purposes. Supreme molds, precision reproductions, double strength. For the operator who wants the finest. There is no substitute. Direct to consumer prices: \$1.90 per quart, 1 gal. cans \$6.20, 5 gal. cans \$5.60 per gal. Paratol 705 standard grade still available prices as before: \$1.60 per quart, 1 gal. cans \$4.90, 5 gal. cans \$4.45 per gal. On request 4 oz. samples at 25c to cover mail handling. Be sure specify grade. No shipments outside U. S. A. Testworth Laboratories, Inc., 407 S. Dearborn, Chicago 5, Ill. Manufacturers of rubber coating and adhesive compounds. compounds

compounds.

MEN-WOMEN. "Most everybody likes candy." Learn to manufacture professionally at home. (Our 38th year.) Ragsdale Candies, Dept. 4, East Orange, N. J.

MAKE Money casting new 1948 metal toys and novelties. Latest scale model autos, original ashtrays, savings banks, water pistols, etc. Enormous wholesale and chain store demand keeps manufacturers busy. Spare or full time. No experience or special place necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co., Dept. A, 1696 Boston Road. New York 60, N. Y.

LEARN To publicize yourself for increased income in your business or profession. Details free. Publicity Systems, Box 322, Jacksonville, Illinois.

MAIL Order businesses bought, sold, brokered. Write for free buildein.

MAIL Order businesses bought, sold, brokered. Write for free bulletin of exclusive opportunities. Turnipseed, Inc., Box 681, St. Louis, Mo.

START Home plaster novelty business. Amazing course tells how. Literature free. Kemo-Courses, 4862 Catalpa, Chicago 30, 111

LIQUID Marble—Colorful, glossy! Mold, brush, spray. Plastic ivory, flexible molds, composition floors. Particulars free. Mar-bleizing Service, Edwardsville, Illinois.

SPECIAL Rubber for making molds. Literature and sample free. Universal, Box 1076-A. Peoria, Ill.

MAKE Rubber stamps. Metalize baby shoes, silver mirrors, make plaster novel-ties. Catalogue of "20 Ideas" free. Uni-versal. Box 1076-A. Peoria, Ill.

MACHINES Available for making new designs of interlocking concrete building blocks, Delaware Industries, Dept. 11, Muncie. Indiana.

NATURAL Molding Latex. Extra thick, Free sample. W. Wooley, 115-A Donald, Peoria, Ill.

SEX No barrier to success in this un-crowded mail business. Money maker for men and women. Hardinger, Tinley Park 1, Illinois.

DOLLARS To you at home. Write for stails. W. A. Jones, Box 395, Upper details. W. A Darby, Penna.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

START Mailorder bookshop — Every-thing furnished. 25c brings booklet, samples, exciting ideas. General Publica-tions, Ossining, N. Y.

MAKE Liquid marbie, flexible moids, statuary, art goods, novelties, artificial marble flooring, Literature free, Kemico, Park Ridge 50, Ill.

LIQUID Rubber for making flexible moids, Cast novelties, Sample bottle 25c, Free literature, Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

BIG Money in vending machines. Smallest capital start brings immediate profits that build permanent profitable business. Starting instructions free. Becker Vendors, 105-A Dewey, Brillion, Wis.

START Your own electroplating business, highly paid, uncrowded field. Learn at home in spare time. Send postcard for free electroplating booklet and proof. Plater-Hyde, Room 521, 432 "F" Street, San Diego 1, California.

San Diego 1, California,

METALLIZING Baby shoes makes you money! Learn this simple, profitable, low investment business from nationally recognized authority. Get professional results with professional "know-how"! Free particulars. Joseph B. Kushner, Metal Finishing Engineer, Stroudsburg 23, Penna.

GET Hundreds money making deals, business ideas, plans and manufacturing. Amazing folio free. Austin Mail Service, 5538 Lexington, Chicago, Illinois.

RUBACREAM! Natural rubber latex! Makes molds quicker! Thicker! Free sample convinces! Castcraft Studios, 509-P Fifth Avenue. New York 17.

TWO Amazing new typing opportunities.

TWO Amazing new typing opportunities. Earn up to several dollars hour, right at home. New, exclusive, different. Write Schroder, 221 E. Bush, Covington, Ky.

DO It with sea shells. Beautiful jewelry, novelties. Big profit spare time. Free lesson. Werts (P.), 1429 56th Avenue, Oakland 3. Calif.

3. Calif.

BRONZED Baby shoe mountings and supplies. All metal bronze bookends, picture frames, ash trays, etc. Onyx ash trays, desk sets, plaques. Hardening solution. 30 amp. plating rectifiers with powerstat control. \$85.00. Geared motors for agitation, \$15.00. Lead lined tanks. Write for list. Hollywood Bronze Supply, 1770 N. Vermont, Hollywood 27. Calif.

ELITE Collection contains 137 practical money-making plans; local and mail order. New edition. Particulars free. Elite Co., 220 Grand St., New York 13.

QUICK Money! "Repairing car batteries." At home! Easy too! Write, Batteryman, Grand Junction 5, Colorado.

SELL By mail!—Books and novelties! 35 different items! Large profits! Catalog free! Elfco. 432 N. Wells, Chicago 10.

OPERATE Profitable home business sell-ing merchandise by mail. Fast sellers. Large profits. Powell Service, 5713 Euclid, Large profits. Pow Cleveland 3, Ohio.

COPUBLISH Leading m.o. paper. Latest copy Mail Sale Advertiser and proposition, commemorative stamp. Vanroy Shirk, Lebanon. Penna.

START A clock shop. Fascinating, easily learned profitable business requiring little capital. We teach you how to repair all kinds of clocks. Information free. Houston Clock Shop. P.O. Box 5086A. Houston 12, Texas.

HOW And where to obtain capital. Fully explained. Particulars free. Star Service. Wapakoneta. Ohio.

SPECIALTY Manufacturing, the big money business that can be operated anywhere, start on a very small capital; we supply dependable formulas and complete instructions; get interesting free booklet, "Moneymaking Opportunities in Specialty Manufacturing." Howard Robinson, Ph.G., 1300-A South Ohio Street, Sedalia, Mo.

\$25 WEEKLY Working two hours daily.
No canvassing. No manufacturing. Lycke,
Box 2471, Cleveland 12, Ohio.

137 WAYS To make money, in home or office, business of your own. Full particulars free. Elite Co., 220 Grand St., New York 13.

BRUSH Plating outfits connect to a bat-tery. No tanks necessary. Good paying business at home plating autoparts, bath-room fixtures, bicycles, reflectors, silver-ing mirrors. No shop or experience re-quired. Outfits furnished. Free booklet, Gunmetal Co., Ave. H. Decatur, Ill.

GET It for them wholesale. Be community buyer nationally-known merchandise; radios, refrigerators, washers, sweepers, typewriters, etc. Savings up to 50%. This pleasant, easy work can earn up to \$5000 year. Get details today. Kraft, Aurora 8, Missouri.

WHITE Liquid rubber for making flexible molds! Quick drying! Safe! For home, classroom, or industry! Quart \$2.00. Gallon \$5.95. Full instructions! Beginner's booklet on molding and plaster casting 25c. Free with order! Plastercraft Supply Company, 1406 East 43rd Street, Cleveland 3 Objo.

25c. Free with order! Plastercraft Sup-ply Company, 1406 East 43rd Street, Cleveland 3, Ohio.

WOULD You pay 3%—first \$350 made? Color-illustrated book "505 Odd, Success-ful Enterprises" free! Some offer occa-sional "day off." Work home. Expect some-thing odd! Pacific, Oceanside, Calif.

MAILING Postcards selling repeat mer-chandise is profitable. Everything sup-plied. Details free. Gordan Publishers, Box 23. Pawtucket, R. I.

CO-PUBLISH And advertise in The Central Mail Advertiser, Sample copy for stamp. Low rates, Large circulation. Bag-by Printing Co., Georgetown, Ohio.

HOW To set up and run a mirror shop! Resilver mirrors. For price write—John Sprinkle V60, Marion. Indiana.

MAIL Order opportunities. Full or spare time. Hundreds of chances. No charge. Postal brings copy. Blackstone Press, Somerville, New Jersey.

MONEYMAKING OPPORTUNITIES

MEXICAN Feather Bird pictures direct from importer. No import duties to pay. Sample 25c. Importer C. Staff, 14960 Evanston, Detroit 24. Michigan.

RADIOMEN—Laugh at layoffs. Make big money. Become independent. We show you how. Write: Merit, 216-32D 132nd Avenue, Springfield Gardens 13, New York.

READ "The Hamster Manual." Learn everything about the new moneymaking wonder animals from Syria, Tells where to buy and sell these delightful animals. Beautifully illustrated. Copy, \$1.00. Albert Marsh, 1518 Basil, Mobile, Ala.

SEWING Machine repairmen make big

SEWING Machine repairmen make big money lifetime. Start neighborhood shop. Complete repair manual, covering all makes, \$1.98 postpaid. Money back guar-antee. Sewmachine Serviceman, Hamil-ton 9-L, Ohio.

THOUSANDS Articles wholesale. "Sup-y Source Directory" 10c. Ideal Service, ply Source Directory" l Park Ridge 40, Illinois.

Park Ridge 40, Illinois.

MANUFACTURING Costs 9c; finished article \$1. Tremendous demand. Gelloid, Box 6353. Cleveland. Ohio.

EXTRA Money? Free details. Trable, 1018¹2A Elm Street, Dallas, Texas.

SIX (Different) leading mailorder magazines, 25c. American Directory, Calallen, Tayas.

JOIN Moneymakers Club. Many mail order and home work plans. Six months service 10c. Lewis Service, 828-M Carpenter. Oak Park, Ill.

"WHOLESALE Buyers Guide" (copyrighted), articles wholesale, 32 pages, Dept. B, Snook Specialties, 188 N. 21 St., Battle Creek, Mich.

MONEYMAKER, 40% Profit selling metallized baby shoes, Beautiful sample shoe, circular, information, \$3.00. C. Buchanan, Suite 2, 16 Lisle Ave., Binghamton, N. Y.

FREE: Samples imprint circulars of-

hamton, N. Y.

FREE: Samples imprint circulars offering nationally advertised merchandise by mail. Danbros Watch Company, 3530 Hanover, Baltimore 25, Maryland.

PAINT Signs and show cards. Profitable business. All information, instructions \$1.00, postpaid. Monroe Products, 270 Lexington Ave., Rochester 13, N. Y.

WHETHER You're first contemplating or presently in a mail order business. You must read "How To Make The Mail Order Business Pay." A guide to sound profitable mail merchandising. Only 25c prepaid, satisfaction guaranteed or money refunded. Biga Mailway Sales, 4903 W. Cullom Ave., Chicago 41, Illinois.

WINDSHIELD Wiper rebuilding brings big profits. Free particulars. H & H Products. Box 430, East Akron 5, Ohio.

EARN \$10.00 Every hour, Sell "Ever-

EARN \$10.00 Every hour. Sell "Ever-sst." Inquire Stampico, Detroit 4, Michigan.

WHOLESALE Catalog, (illustrated, 10c). Bargains galore, Stafford, Box 5211, Indianapolis 1, Ind.

EARN Up to \$520 month part or full time keeping books for small firms, Sim-plified system. Write Tax-Saver System, Dept. D. Ft. Worth, Texas.

SPRAY Velvet covering on lamps, jewelry, etc. Outfit, instructions \$2.95, V-Sparks, 1145 Queen Ann, Los Angeles 6.

MONEY Making secrets exposed. How to achieve beauty and keep charm. Write for details. L. Saulsberry's Book Agency, 3055 Waco Street, Shreveport, La.

GET Dollar orders by mail. You keep 90c profit! Easy, pleasant, home business. Few dollars starts you off. Begin now. Complete details, free. Hurry! Herriott, Box 953, San Antonio, Texas.

INCREASE Your earnings! Local business opportunities; mail order information; wholesale supply sources; valuable money-making tips; information. Free details, rush name! Wilkin Company, Hillsboro, Ohio.

details, rush name! Wilkin Company, Hillsboro, Ohio.

I CAN Show you how to start a paper-hanging or decorative business, full or part time. Modernistic Decorating Co.,

part time. Modernistic Decorating Co., 1021 Prospect Ave., Toledo, Ohio. MAKE Steady income with alarm clocks. Free booklet. Thies, Genoa 3, Illinois

MAKE Perfume. Profitable, sparetime home business. Men. women, write "In-ternational," 6347 Parnell-X5, Chicago 21. Illinois

FREE Literature describing fifty proven successful, home-operated mail order plans. Reiss, 3017-P Ocean Parkway, Brooklyn 24, New York.

MAKE Manila door mats. Particulars free, or instructions and equipment complete \$5.00. R. E. Wade, Parkville 2, Three Rivers, Mich.

BIGGEST 25c Value ever offered! Three

big issues "Opportunities Preferred." greatest business building magazine ever published; plus big dollar copy of idea "Reference Directory" book; \$1.75 value. only 25c! Order yours today. Hurry! Coates, Publisher. Box 88-P. Dorchester, Massey.

Coates, Publisher. Box 88-P. Dorchester, Mass.

MAKE, Sell, concrete garden furniture. Easy, simple. We supply molds, instructions. Write Lehnert. Norwood, N. J.

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408C, 200 E. Ontario St., Chicago II.

START Your own business! Big money manufacturing novelties, plaques, statuary. Free catalog. Write Bing Products, 88-A4N Broad Street, Boston 10, Mass.

MAIL—Beginners. Look before you leap in 1948! Get big information guide to financial independence. Truly the greatest opportunity of the year! Send 15c to cover costs. Leese, 4718 North Lavergne, Chicago 30, Ill.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. MO-3, 1512 Jarvis Avenue, Chicago 26, Ill.

ANYONE, Anywhere, anytime, can operate this proven mail-order method.

ANYONE, Anywhere, anytime, can op-erate this proven mail-order method. Free details. Eugene Kall, 1209 Highland,

Dubuque, Iowa,

METALLIZE Baby shoes, Further information—3c stamp, Metal Crafts, Box 125-R5, Tampa 4, Florida.

MAKE—Sell new amazing auto paint you simply wipe on. Complete formula \$1.00. Ideal Service, Park Ridge 8. Ill.

UNPAINTED Plaster ornaments: Beau-UNPAINTED Plaster ornaments: Beau-tiful designs, easily decorated with water colors or oil paints, Profit or hobby. Il-lustrated list free. Distributors of new Loxite, a Firestone product, for molds. Midwest Novelty Mfgrs., 108A Cedar, Anaconda, Montana.

PUBLISH Amusement Guide. Profita-ble local business. Details free. Ward As-sociates (J2C). Greendale, Wis.

\$400 MONTHLY Possible by mail. Small investment, free details, R & M Mailing Service, 203 First Avenue, Carbon Cliff, Ill.

START Your own mail order business. Free literature. Schmaltz, Box 335, Mar Vista, California.

WHOLESALE Anything imaginable. New guaranteed list 25c. Refundable. La-salle Novelties. Box 2188. Waterloo, Iowa.

RESILVER Mirrors at home. Formula 25c. Ideal Service. Park Ridge 6. Illinois.

EARN Money at home! Thousands do! "Home Worker Magazine" tells how. Sample, 25c. Sizemore, Box 7, 4917 Kostner. Chicago 30, Ill.

WIN Contest money, General Contest Magazine gives hundreds of tips, Lists current contests and rules, Sample 25c, General Contests, 1609½ East 5th, Duluth,

BIG Profits. Sensationally new. Every home, office, store prospective buyers. No competition. Exclusive dealerships, Sher-wood Products, Erie, Penna.

EARN Money evenings, copying and duplicating comic cartoons for advertisers, Adservice, Argyle 1, Wisconsin

WOULD You pay 3%—first \$350 made?
Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home, office, Expect something odd!
Pacific, Oceanside, Calif.

THERE'S Big money in junk," and re-

THERE'S Big money in junk," and re-airing batteries. Write, Batteryman, pairing batteries. Write, Grand Junction 5, Colorado. Batteryman,

\$246.50 MAKING Unusual secret device without skill, machinery, from former war material costing \$1.50! Simple, baffling invention, unbelievably profitable! Illus-trated proofs free, Rolls Enterprises, 115-D West 16th, New York 11.

FORTIFY The future! Start own business; home, office. Booklet describing "Collection of 137 Tested Plans" free, Elite Co., 220-A Grand St., New York 13.

PUBLISH Your own magazine. Hand-some 52 page format, well edited, illus-trated. Cost low as \$1.00 month. Brings you prestige, profits. 25c brings sample, details. National, Ord. Nebr.

FORMULAS, PLANS, ETC.

WANTED: 20,000 Progressive persons to spend the best 1948 50c they ever spent. Guaranteed or money back. Read "strictly." A "must." Containing over 35 valuable, new, special formulas, plans, moneymaking propositions, information. Don't wait. (No stamps.) Circular free, Teycer, Chemist, Box 128714. Chicago 90, Ill.

FORMULAS. Any purpose or process; auto polish, soaps, lacquers, perfumes. You name it we have it. Any three \$1.00. Hale, 1017 Edgewood Lane, Palisade, N.J.

Hale, 1017 Edgewood Lane, Palisade, N.J.
PRODUCTS Duplicated. Analyses,
Commercial formulas. Consulting Scientific Company, Swarthmore, Pennsylvania.

MANUFACTURE Cleaners, soaps, polishes, flavors, cosmetics. Literature free.
Kemico, Park Ridge 16, Illinois.

10,000 FORMULAS And trade secrets.
Pree literature. Stillman, 555 Kingston
Ave., Brooklyn 3, N. Y.

REAL Manufacturing formulas. Lists
free. Cummings, Chemist, Gordon Ave.,
Syracuse 4, N. Y.

PLASTICS

MOLDS Made to order. Send us your models by insured parcel post. Models returned unharmed. Work guaranteed. Apex Art Plastics, 2126 Marconi, Apex Art St. Louis, Mo.

COLORED Plexiglas. 6 colors. Instructions, cameos, earscrews, pinback to make complete set two tone costume jeweiry. \$1.00. Bradiee, P.O. Box 142, Buffalo 5, N. Y.

LUCITE. Plexiglas, masked sheets. All sizes. Cost square foot (12"x12") 1/16" 90c; %" \$1.16; 3/16" \$1.43; ¼" \$1.68; 5/16" \$2.09. Lucite rod, tubing. Include 10% postage. Almac Plastics, 230 Fifth Avenue, New York 1, N. Y.

LUCITE—Rods, sheets, tubing, fabrica-tors, findings. Catalog dime, Book "Gen-eral Plastics," \$1.50. Mid-West Plastic, 1717 No. 66, Omaha 4, Nebr.

SAMPLER—Contains casting resin, mold, supplies, instructions. Everything to mold several small salable articles \$2. Circular free. Artcrafters, 2917 Michigan, Kansas City, Mo.

LEARN Internal carving of plastics for pleasure and profit. It's easy, exciting to carve flowers, animals, landscapes of colorful, thrilling beauty in solid Plexiglas plaques and cubes. Send 10c for complete instruction folder, jewelry findings catalog and big plastics price list. Plastic Parts, Dept. H-2038, 1157 S. Kingshighway, St. Louis 10, Mo.

PLASTICS Trade secrets. Write for free information, Enclose 25c if you would like plastics samples. Plastics Research, Box plastics samples. Pla 346, Alhambra, Calif.

RENEW Leather and leatherette—Make cloth into imitation leather with plastic discovery called Leather-New. Opportunity to make real profits taking care of sales resulting from national advertising. Write for free sample of Leather-New covered material and complete deal. 4723B Troost, Kansas City, Missouri.

10 ENTIRELY New ideas, plastic projects, \$1.00. Designers Group, Box 363, Pleasantville, New Jersey.

PLEXIGLAS—Masked sheets, 12"x12", 1/16"-\$1.00, ½"-\$1.25, 3/16"-\$1.55, ½"-\$1.85, include 10% postage. Internal carvings, Drills, dyes. Luminous powders, rods, tubes, cements, jewelry findings, Pree catalogue. Craft Plastics, Somerville, N. J.

PLASTIC Injection machines, Plexiglas, dyes, jewelry findings, kits, etc. Free cat-alog. G. Baker Company, River Edge, New Jersey.

FABROS Pre-fabricated plastic kits and supplies. Sample kit 50c. Catalog free, Fabros, Box 156 Station F-1, Buffalo

FORMALIN for lustrous color-castings. Free literature. Complete line plastics casting supplies. Sample kit \$3.00 f.o.b. Formalin, Romeo, Michigan.

Formalin, Romeo, Michigan.

INTERNAL Carved swans, bluebirds, goldfish, butterflies, etc; pins, \$1.50, 2\frac{1}{2}x 2\frac{1}{2}x2 paperweights, \$2.50\; roses, costume jewelry sets, \$1.50 less findings; 2x2x2 paperweights, \$2.00. Crystal Floral Novelty Co., Somerville, New Jersey.

PLASTICS—Sheets, rods, tubes, all colors; dyes, supplies; findings, Illustrated fabricating manual, prices, 10c. Lucite sample, 35c. Gem-O'-Lite, Box 686F, North Hollywood, Calif.

Hollywood, Calif.

PLASTIC—Sheets, rods, tubes, etc. Free list. Plastic Supply Co., 2618 St. Louis Ave., St. Louis 6, Mo.

CHEMISTRY

supply cataios many contains many NEW Laboratory supply catalog of chemicals and apparatus. Contains many thousands of items with illustrations. Send 25c. Standard Science Supply Com-pany, 1232 N. Paulina St., Chicago 22, Illinois

LEARN Chemistry at home, from the house of Winn. Home of supplies for student chemists. New idea chemical and apparatus outfits for home experimenting. Semi-professional microscopes and accessories. Send 10c for retail catalogue. Established 1931. John H. Winn. Dept. 503, 124 West 23 Street, New York 11, N. Y.

CHEMICALS And apparatus for industrial, analytical and private laboratories. Complete supply service for correspondence school students. Send 10c for catalog. Dept. M-43. Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, New York.

FREE Catalog: Chemistry, mineralogy, hysics. biology, Tracey Laboratories, Tracey Evanston, Illinois.

CHEMICALS—LAB. Supplies. New catalog 10c. Mel-Glo Chemical Co., 258 Fourth Avenue. Brooklyn 15. N. Y.

APPARATUS, Chemicals, ounce quanti-ties, catalog 10c. Fleischer's Laboratories, Everett 49, Mass.

HANDBOOK For chemical experimenters, illustrated, hundreds of experiments, 50c. Experiment booklet 15c. Supply catalog 5c. Reading Scientific Company, alog 5c. Readi Reading, Penna.

HELP WANTED

RELIABLE Man with car wanted to call on farmers. Wonderful opportunity now. \$15-\$20 in a day. No experience or capital required. Permanent. Write to-day. McNess Co., Dept. 78, Preeport, Ill.

BOYS Wanted. Over \$50 week! Sell name plates for front doors. Write National, 214-U Summer, Boston, Mass.

AGENTS WANTED

DISTRIBUTOR Salesmen wanted to wholesale guaranteed Reflex Spark Plugs as a sideline to dealers, garages, service stations, fleet owners. Big profit. Repeat orders. Exclusive territory. The Reflex Spark Plug Co., 10902 Madison Ave., orders. Exclusive Spark Plug Co., Cleveland 2, Ohio.

AMAZING Offer—\$25 is yours for selling fifty \$1.00 boxes of entirely different, new deluxe all-occasion cards. Each box sells for \$1.00, your profit 50c. It costs nothing to try. Write today for samples. Cheerful Card Co., Dept. 270, White Plains, N. Y.

SILVER Cleaning, plating, polishing, liquid (NuSilver). Apply with cloth, Renews silverplated ware, articles, pieces, Silverplates brass, copper, bronze. Female, male, agents wanted. Part or full time. NuProcess Products, Aurora, Illinois

MEXICAN Feather pictures. Unusual novelty. \$1.00 (stamps) brings \$2.00 worth samples, details. Refunded if unsatisfied, Aztec Art-P, Apartado 762, Mexico City.

HOT Items. Door name plates, knockers, numbers, etc. Complete line. Catalog available. Hub Stamping. 355 Congress, Boston, Mass.

EXCELLENT Opportunity for men and women, Sell beautiful chromeplated monograms for cars, motorcycles, luggage, purses, wallets, keychains, etc. Contact Charleston Monogram Co., P.O. 1291, Charleston, W. Va.

STRANGE "Dry" window cleaner. Sells like wild. Replaces messy rags, liq-uids. Simply glide over glass. Samples sent on trial. Kristee, 119, Akron, Ohio.

SPOONHOLDER—Clips on cooking pans. Essential kitchen tool. Sells easily. Agents write. Century Products, Dept. P. Box 287, Jackson, Michigan. SPOONHOLDER-Clips

P. Box 287, Jackson, Michigan.

WANT Pleasant outdoor work in a business of your own? Good profits selling over 200 widely advertised Rawleigh home/farm necessities, Pays better than most occupations. Hundreds in business 5 to 20 years or more! Products-equipment on credit. No experience needed to start. We teach you how. Write today for full particulars. Rawleigh's, Dept. C-145-PPM. Freeport, Ill.

DISTRIBUTORS—Automobile accessories. Two new 25c and \$1.00 items. Honestly sell-on-sight. Free details. Lynn, 5710 Bankfield, Culver City, California.

AGENTS—Jobbers; sell Fre-Eze fast penetrant; plasticote permanent type acid-proof, heat-resisting rust inhibitor coating. Fre-Eze Chemical Corporation, 1019 Virginia Ave., N.E., Atlanta, Georgia. Georgia

EARN Money quickly, easily, showing greeting cards, stationery, wrappings, many unusual items. No experience. Up to 100% profit. Send today for everyday assortment on approval. Free display folder. Thomas Terry Studios, 200 Union Avenue, Westfield, Mass.

FREE! Big box actual full size packages foods, groceries, home needs, sent f.o.b. factory. Try them at home and show friends. World beating money making opportunity. Write Zanol, Richmond St., Dept. 6089C. Cincinnati 3, Ohio.

EARN Big money fast! Sell finest-quality advertising work uniforms to ga-rages. factories, filling stations, etc. Free selling kit. Topps, Dept. PM-348, Rochester, Ind.

AT Last! Something new and sensational in everyday cards. New gorgeous satin and velour designs. Get orders fast. Big profits. Imprinted stationery. 14 assortments for year 'round occasions, retail 60c to \$1. Get samples on approval. Puro Co., 2801 Locust. Dept. 840-C, St. Louis 3. Mo.

EXTRA Money fast. Sell friends exclu-EXTRA Money fast. Sell friends exclusive greeting cards, stationery not obtainable elsewhere. 37 boxes. Profits to 100%. Bonus. Quick selling everyday, birthday, gift wrapping assortments: exclusive name imprinted, engraved name stationery. Write for free stationery samples and all-occasion samples on approval. Special offers. Regal Greetings, 19 W. Woodruff, Dept. PM, Hazel Park, Mich.

Mich.

BE Independent, run your own magazine order business. No capital, no experience needed. Helps furnished. Opportunity unlimited. Send today for free wholesale catalog. McGregor Magazine Agency. Dept. 12, Mount Morris, Illipois.

GREETING Card moneymakers. Birthday, Easter, Mother's Day, Descriptive folder free. Greenport Art Company, Dept. 838P, Brooklyn 15, New York.

PROFITS To 100%, selling everyday greeting card assortments. Details and assortment on approval. Glorian, Dept. 22, 515 East 45th Street, Brooklyn 3, New York.

York.

PERSONALIZED Piggy banks. Big profits. Details free. Hall's, Iowa City,

EASY! Fascinating! Profits to 100%. Bonus. 31 new greeting card boxes 30c up. 5c and 10c individual cards, stationery. Request free name imprinted and floral stationery samples, free 32-page catalog and \$1.00 all occasion assortment on approval. Special offers, New England Art Publishers, North Abington 102, Mass.

CALL On friends with greeting card assortments, birthday, get-well, others, Floral stationery. Gift wrappings. Big profits. Experience unnecessary. Samples on approval. Wallace Brown, 225 Fifth Ave., Dept. C-4, New York 10.

QUICK Extra cash. Sell value plus greeting cards. New 1948 line. 30 boxes retailing 60c to \$1.00 each. "Flower-of-month" and initial stationery, first name imprinted remembrance notes. Profits to 100%. Extra bonus. Special offers. Write today for feature all-occasion samples on approval and free name imprinted, floral stationery sample portfolios. Elmira Greeting Card Co., M-57, Elmira, N. Y.

BIG Money selling plastic tablecloths, curtains, aprons. Lowest prices! Durever, 314C Albany Avenue, Brooklyn 13, New

\$1 STARTS You in business. Sell deluxe ties, 100% wool interlining. Costs you only \$7 per dozen, you make \$5.00 dozen. Send \$1.00 for special introductory offer two deluxe ties. Catalog complete line free. Philip's Neckwear, 20 West 22nd St., Dept. K-21, New York 10.

St., Dept. K-21, New York 10.

BACK Again, fast seiling pre-war Adjusto pocket knives also nail files, big profits, exclusive territory, sales plans. Meyer Specialty Co., Granite Bidg., St. Louis 2, Mo.

MORE Money—Quick. Big profits to 100%. Bonus. Show friends complete line greeting cards, gift wrappings, stationery. Experience unnecessary. Send today for free samples name imprinted, floral stationery and money making new 1948 feature all-occasion box on approval. Special offers. Tom-Wat Studios, Dept. PM. Bridgeport, Conn.

A Dress Yours with every 3 you order for yourself and family. Amazing new bonus plan. Everything free. Harford Frocks. Dept. K-9128. Cincinnati, Ohio. BIG Money in selling beautiful solid glass paper weights with flowers, lilies, butterflies inserted in them. Offices, novelty shops, buy on sight. Send for sample, \$2.50. Money refunded if not satisfied. Agents wanted. Smiths Glass Shop, Box 165, Star City, West Virginia.

WANT Twenty to thirty dollar a day lob? Something new. Shure-shot seller to

satisfied. Agence Shop, Box 165, Star City, West Virginia, Shop, Box 165, Star City, West Virginia, WANT Twenty to thirty dollar a day job? Something new. Shure-shot seller to furnished prospects. Sole representative in selected territory, Send two dollars for outfit on our Simplified Memorial, or write for particulars, First come, first accepted. Pyramid Memorial Company, Box 421, State College, Penna.

SELL. Ultra blue stock signs to stores, religious,

7x11, cost 6c, sells 35c. Make money, Sample free. Lowy, 8 West Broadway, Dept. 368, New York City 7.

POCKET Pal; replaces pocket knives. New, safe, beautiful. Always razor sharp. 50c seller. 231% profit. \$15.00 or more daily. Agents, salesmen, distributors. Nel-son Manufacturing Co., 222 W. Kellogg, St. Paul 2, Minn.

St. Paul 2, Minn.

MICRO 16 Pocket camera. Advertised in Life. Look, etc. Free folder, wholesale price list and photo. Pittsburgh Photo Shop. Dept. A-4, 1618 Westmont Avenue, Pittsburgh 10, Penna.

BIG Money! Selling personal stationery, cards, announcements, etc. Raised printing. Andrew Peck, 98 Green, Battle Creek, Michigan.

BIG Money fast! Sell plastic garment bags, curtains, tablecovers, Free swatches. Star, 261 Fifth Avenue, New York.

MAKE Money at home like I do! Write immediately. Duffy, Covington, Ky.

SWEET Smelling beads sell on sight. Low jobbers prices. Mission, 2328P West Pico, Los Angeles 6, Calif.

UP To 122% profit! "Mad-Nets," \$1.00

UP To 122% profit! "Mad-Nets," \$1.00 ovelty magnets. Free bulletin, Freder-k, 4 South, Stamford, Conn. novelty

YOUR Profit, 90c each sale, Sample \$1.00. Esdras Belanger, Plamondon, Al-

AMAZING Invention puts keen edge on old razor blades. Greatest discovery in ages. Whirlwind seller. Enormous profits. Write, Renu-it, 2609A North 61 Street, Write, Renu-it, 2609A N Milwaukee 13, Wisconsin.

DEALERSHIPS. Sweetline No-Rub Refinish, revolutionary cleaner-polisher. Instantly cleans, renews, leaves high gloss finish on hard surfaces without rubbing. For factories, stores, hotels, banks, theates, restaurants, lobbies, bars, etc. Repeat sales. Utilized by Army, now available generally. H. C. Sweet Co., 3727 Fenkell, Detroit, Michigan.

SUBSCRIPTION Representatives wanted, everything free. The Fireside, West Salem,

MAKE Big initial commissions and steady repeat money selling Pronto Sten-cil Duplicators and Pronto Photocopy Equipment. Write for free sales kit, in-dicating interest in one or both lines. Pronto, Inc., 515 Dempster, Evanston, Ill.

EVERYDAY Cards. Earn \$5.00 with every ten \$1.00 assortments you sell. Also wrappings, note paper and personalized stationery. Unusual quality. Send for samples today. Howard P. Ellis, Dept. PM-4. Pitman, N. J.

BIG Easy profits. Sell friends famous Wear Wright nylon hosiery, lingerie, blouses, sportswear. Free sample display cards. Complete line greeting cards. Samples on approval. Special offers. Wear Wright Company, 1709 Arch Street, Dept. B, Philadelphia, Pennsylvania.

SELL Paklite combination cigarette case and lighter. Write for details. Peerless Sales, Box 25, Curtis Bay 26, Md.

COLLECT Advance commissions on phone orders developed by co-operative advertising in your local newspaper. Write for details. Home Products Corporation, 4403 N. Sheridan, Chicago 40, Illinois.

NEW, Exclusive, fluorescent portable and pin-up lamps. Big market, large profits, multiple sales. Nationally known manufacturer. Unusual opportunity. Write Arcturus, Marblehead 4, Mass.

DISTRIBUTO CS: New, exclusive, competes with outfits up to \$1000. Retails \$79.50. Trail-O-Camps, Sacramento 17, California.

SELLS At sight. Stainless steel carving sets \$18 doz. Samples available. 125 other fast sellers. Manufacturers, 264 5th Ave., New York.

CREW Managers, wagon jobbers, agents! Established manufacturer can supply you with top quality floor waxes and polishes all sizes from pint to drum. Write Windsor Wax Co., Inc., Dept. P.M.1. Hoboken, N. J.

MAKE Perfume. Profitable, sparetime home business. Men, women, write "International," 6347 Parnell-X6, Chicago 21 Illinois.

Illinois

EARN Big profits showing advertising calendars, fans, pencils and novelties. Beautiful products sell easily. No experience necessary. Full or spare time. The Geo. H. Jung Co., 1998 Jung Bidg., Cincinnati 2, Ohio.

WHOLESALE! Balloons, novelties, watches, jewelry, premium goods. Collins Co.. Forsyth 3, Georgia.

SELL Ball pens. Three samples \$1. Thomas Pens, Box 3, Williamsburg, Brooklyn 11.

"NEW Car washer"—Eliminates bucket, sponge. Wash car in few minutes. Autoists buy on sight. Great profits, Literature free. Jon Henri Co., 101 Neave Building, Cincinnati 2, Ohio.

Building, Cincinnati 2, Onio.

BE The Popular Mechanics representative in your neighborhood and earn big profits in your spare time. Write Popular Mechanics Magazine, Room 408M, 200 E, Ontario St., Chicago, Ill.

90c PROFIT Each \$1 sale! Sell real mothproofing solution, Employ agents, Experience unnecessary—we tell you how, Kinford, Wayne 3, Penna.

AGENTS, Distributors—Personal name plates for homes, office. Big profits, Al Peterson Associates, Box 822, Providence 1, R. I.

\$3 FIRE Extinguisher; quick sales, wholesale or direct; liberal profits. "Fire-Killer." 109 N. Franklin, Syracuse 1, N. Y.

MAGAZINE And bookmen can increase their income by selling my lawn book. 100% profit. Agents copy 50 cents. Leslie Kerr. 3825-A Tenth Street N.W., Washington 11, D. C.

BIG Money selling tooth powder. Write today. James Walker, 633 Plymouth Ct., Chicago. Ill., Dept. 1.

DEMONSTRATE Vanishing cigarette trick. Working sample, 25c. Scheetz's, Sellersville. Penna.

FREE Sample! Big profit opportunity with amazing glow-in-the-dark house numbers, switch plates, pictures, decais, religious articles. Represent large manufacturer. Madison Mills, 303 Fourth Avenue. New York, N. Y.

STEADY Large earnings; real staple, rubber hose; sell jobber, wholesaler, consumer, industry, automotive; no territory restrictions, no investment. Advertised line, generous, protective deal, full or part time, Ace Hose & Rubber Co., 769 Van Buren St., Chicago 7, Ill.

100% PROFIT, No investment, handle quality Fotostamps. Amazing glossy photographs, gummed stamp form. Business year round. Free samples, particulars. American Foto Stamp Co., 103 East 125th St., Dept. PM1. New York 35.

SCHOOL Seniors: Sell classmates superb Craftcards for super profits. Write Craft-cards, Box 235(AK), Pittsburgh 30, Penn-

MAKE More money selling personal initialed individualized belts, buckles, cap badges, tie holders. 2000 emblems to choose, Big profits, whole or part time. Write today special outfit offer, Hookfast Specialties. Box 1425, Dept. 6, Providence, R, I.

AGENTS. Sell finest food products direct to homes. Successfully sold for 25 years. Big profits. Powerful combination sale plans make sales easy. Permanent repeat business. Samples furnished. Live territories open to distributors. Mother Hubbard Products Co., 4139 Grand, Dept. P.M., Chicago.

FREE Water and our concentrates, makes flavors, lotions, shampoos, 72 products, labels, bottles furnished. Qualco, E-20030 Russell, Detroit.

INFORMATION — Wholesale supply sources, Moneymaking plans, Increase your income! Write Reynard Service, Smithfield 3, Ohio.

QUICK Sure money, Selling Annie Biain avors, New Brunswick, New Jersey, SCHOOL Seniors—Earn 40% commisflavors.

SCHOOL Seniors—Earn 40% commission selling classmates America's most beautiful graduation name cards. Largest selection. Outsells all others. Send for free sample kit. Printcraft, 1425 E. Elm St., Scranton 5, Penna.

SCHOOL Seniors! Your postal will bring our wonder, Kwick-Sell Cardalog of popular graduation name cards. Biggest profits! Only firm giving free souvenir chest and card case. Don't miss out! Hurry that postal! Craftcards, Box 235(L), Pittsburgh 30, Pennsylvania.

AGENTS—Big line including food prod-

AGENTS—Big line including food products. Fast selling premium and bargain deals. Low prices. Send card for big outfit offer with gift. Ho-Ro-Co, 2725 Dodler, St. Louis 7, Mo.

100% PROFIT With new electric gas lighter, eliminates matches, pilot. Write Optical Research Products, Fairview, N. J.

EXCELLENT Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of automobile initials and sign letters. Free samples. "Ralco" XL-Roxbury, Boston 19, Mass.

MAGIC Cleaner and laundry soap deal. Hotter than a firecracker. Big profits, Sample free. Bestco, 5007 Irving Park.

137 COMPLETE Plans for starting own business: local—mail order. Particulars free. Elite Co., 220 Grand St., New York 13.

AGENTS-300% Profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 438-B North Clark, Chicago.

GOLD Lacquered window sign letters. Large sizes penny each, New foils, Absolutely beautiful, Free samples, Atlas, 544 W. 79th, Chicago 20.

HIGH-GRADE SALESMEN

SELL To restaurants — Display cases, menu sheets and covers, paper napkins, guest checks, printed salesbooks, and 1100 other sellers for every type of business. Huge profits, low prices. No experience necessary. Free sales portfolio. David Lionel Press, 312-X So. Hamilton Ave., Chicago 12, Ill.

MAKE Big money selling bronzed baby shoe service. Easy sales—every mother wants them. Big commissions, top producers can earn up to \$100 per week. Get in this big paying business now. Beauty Bronze Company, 226 George St., Alton,

SALESMEN. Here's a natural. New patented tool multiplies man's strength 31 times, Sell retailers, Needed by autoists, farmers, lumbermen, builders, transports, garagemen, public works. Immediate de-liveries from our U. S. plant. Write or wire for attractive proposition. Palcoseel Co., Ltd., Cornwall, Ont., Canada.

LOOK Here! Wanted-Men to start in business on our capital. Sell some 200 farm-home products. Thousands our dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. C-192-PPM, Freeport, Ill.

BUILD Your own local shoe business.
No investment. Free outfit starts you.
Advance commissions plus bonus. Amazing comfort features. Tanners Shoes,
222, Boston, Mass.

BIG Profits daily taking every family's magazines subscriptions. Give unlimited choice of valuable books free. Publishers, 323-5 Hammond. Cincinnati 2, Ohio.

MEN Wanted at once. Full or part time.
Just send name, address for free copy of
Specialty Salesman Magazine giving hundreds of immediate openings with reliable
firms. Sales experience unnecessary as we
also send free 42 page book telling how.
Specialty Salesman Magazine, Dept.
PM-13, 307 N. Michigan, Chicago 1.

LARGE Profits selling letterheads, enmatches, shelf moulding, complete line of restaurant supplies, and 1100 other sell-ers. No experience needed. Free sales portfolio. Willens and Company, 2130-V Gladys Ave., Chicago 12, Ill.

AUTOMATIC Fire extinguishers. Complete line. Sensational new dwelling unit. 50% to 65% profits. Freight paid. Red Ball Co., Box 1552, Salt Lake City.

- ADVERTISING Book matches—Cash in on political campaigns; sell union label matches. Cuts for all businesses, political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. M38, 7530 Greenwood, Chicago.

SELL Delicious candies, nuts, gum. Immediate delivery. Write Casterline, 2031-PE Sunnyside, Chicago 25, Illinois.

AMAZING New zipper shoe sells on sight. Big cash profits for salesmen. Leads line 200 splendid styles, Territory open. Get free sample outfit. Write Consolidated, Dept. S-48, Chippewa Falls, Wis.

MAKE \$100.00 Month on your spare time. Everyone that carries keys is your customer. Sell an article for lost keys service. We will send directions how to get orders. Send us \$2.00 for samples, if you are unable to sell them, return them, we will refund your money. Write today. Lost Keys Service, 111 W. North Ave., Chicago 10, Ill.

Chicago 10, III.

SALESMEN: Big money showing building owners sensational product; cuts essential repair cost up to 75%. Six average orders weekly pay you over \$190.00. Age: 30 or over. Get money-making facts. Write, Zone Co., Dept. C-6, Box 789, Ft. Worth 1, Texas.

Ft. Worth 1, Texas.

\$20 DAILY? Our salesmen make more distributing new breath deodorant. Permanent repeat proposition. Chex, 2910 N. 16th St., Philadelphia 32, Penna.

manent repeat proposition.

16th St., Philadelphia 32, Penna.

WE Manufacture paradiclorobenzine moth blocks. Other chemical products. Guaranteed money makers. Banner, 85 Ludlow, New York 2, N. Y.

AMAZING Screw holding screw drivers! Remove, hold, insert screws inaccessible places! Exclusive distributor; factories, stores buy quantities. Millen Mfg., 798 Miller Bldg., Boston, Mass.

POWER Mower—\$99.50 (Maytag en

POWER Mower—\$99.50 (Maytag engine). Sensation. Agents-dealers. Rotacut, M-2003, Excelsior Springs, Mo.

SALESMEN Will clean up this year selling our electric fans and sump pumps, Write Universal Fan Co., Peru, Indiana,

selling our electric fans and sump pumps.
Write Universal Fan Co.. Peru, Indiana.
ADVERTISING Book matches—World's largest direct selling manufacturer of advertising book matches offers opportunity for profitable year 'round selling; every business a prospect; no experience needed to start; men or women; full, part time. Factory service. Low prices for high quality; repeats; sales kit furnished. Match Corp. of America. 3433-43 West 48th Place, Dept. E-16, Chicago.

AMAZING Discovery, Master Glaze, puts brilliant glass-like surface on cars. Free sample, information. Big commissions. Master Glaze, Dept. 641, 7720 Harwood, Milwaukee, Wis.

YOU Can earn 49%! Salesman wanted to sell nationally advertised desk model portable adding machine. Priced \$12.95, fully guaranteed. Not a toy. Easy to operate and in demand everywhere. You can make 49%! For complete details and full size color illustration, write today to: Lightning Adding Machine Co., Inc., Dept. 801, 543 So. Spring Street, Los Angeles 13, Calif.

REVOLUTIONARY Product! Thousands prospects everywhere. Men earning up to

Angeles 13, Calif.

REVOLUTIONARY Product! Thousands prospects everywhere. Men earning up to \$250.00 week. Placed on free trial—sells itself. Orders financed by factory. Territory available. Special demonstrator offer. John Wilson, 2433 Indiana Avenue, Dept. 305, Chicago 16, Ill.

NEW Magic menu paper, copies without carbon, used from coast to coast. Large profits for restaurant salesmen. Systemat-ic Company, Houston 1, Texas.

CASH Profit—Big earnings; selling personalized buckles, belts, cap-badges, ticlasps, 2000 emblems, caps, shirts, ties Write, Hook-Fast Products, Dept. A Columbus 6. Ohio.

PHOTO-SALESMEN Agents. beautiful hand colored plastic enlarge-ments. Collect deposit, we deliver. Prof-itable sideline. Send card, for free sam-ple kit. Novel Portrait, 3343 North Ave., Chicago, Ill.

WAGON Salesmen—Fast moving carded goods and 10c line. Long profits. Free facts. Peerless, 2720 Dodier, St. Louis 7,

BIG Cash profits daily taking orders; niforms, shirts, ties, personal initialed advidualized buckles, belts, cap badges, uniforms, shirts, ties, personal initialed individualized buckles, belts, cap badges, tie holders, 2,000 emblems. Repeats. Writte today. Special outfit offer. Hook-Fast Compahy. Box 480-PM, Roanoke. Virginia.

JOBS Open in selling! Send name, address for free copy Opportunity Magazine, listing hundreds of companies who need men now, full or spare time. Experience not essential. Opportunity, 28 E. Jackson, Dept. 17, Chicago 4, Ill.

BIG Money taking orders. Shirts, ties, sox, pants, jackets, sweaters, shoes, uniforms, etc. Sales equipment free. Experience unnecessary. Nimrod, 4922-AN Lincoln, Chicago.

SELL Calendars—Every business a prospect. Also wholesale to printers; calendars, sheet pictures. Fleming Calendar Co., 6540 Cottage Grove, Chicago 37.

EDUCATIONAL AND INSTRUCTION

WANT A Government life-time job? \$1,756 to \$3,021 year to start, Civil Servlee offers you choice of many jobs: railway postal clerk, border patrolman, Post Office clerk, mail carrier, deputy income tax collector, accountant, meat inspector, stenographer, typist, office clerk, store-keeper, etc. More than million jobs expected within next few years. Unusual opportunity for advancement. Postmaster General Donaldson started at \$11 week, now gets \$15,000 year. Our new modern study course quickly prepares you for civil service examination. Write for free bulletin: "How to Get A Civil Service Job." Lincoln Institute, Dept. P-1, 7951 Yates Avenue, Chicago 17, Ill.

PRACTICAL Course—Automobile radiators, repairing, recoring, cleaning. Ralph Hendry, Galt, Canada.

GRADUATE Work in all subjects. Degrees available in one year. Resident and extension classes. Golden State University, Hollywood, Calif.

EXPERT Bookkeeping, easily learned.

EXPERT Bookkeeping, easily learned.

15 lesson course \$5, introductory lesson

35c. Bernard Buchalter, 1280 (MP) Ocean

Ave., Brooklyn 30, N. Y.

Ave. Brooklyn 30, N. Y.

MAKE Up to \$30-\$40 week as a trained practical nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-3, Chicago.

NOW You can have an office. Learn credit-collection business by new home study course. Many earn up to \$5000-\$15,000 annually. Free bulletin. Franklin Credit School, Dept. 202C, Roanoke 7, Va.

WELDING—Electric, gas trade training

WELDING—Electric, gas trade training pays at GI approved welding school. Cat-alog free. Write Hobart Welding School, Box M-385, Troy, Ohio.

GET A Government job! Start high as \$58 week. Men—women. Vets get preference. Prepare now for next examinations. Particulars free. Write, Franklin Institute, Dept. W24, Rochester 4, N. Y.

BECOME A Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of Ps.D. or Ms.D. Solve mental worries. Free book. College of Universal Truth, 5153-C North Clark, Chicago.

GOOD Paying jobs. Hotel transcript clerk. Short course prepares you. Hotel Transcript School, P.O. Box 3915, Miami

FAMOUS \$75 Lockwood art course now only \$5 postpaid. Other smashing art bargains. Catalog 10c. Art Book Shop, Arnold 5-A, Missouri.

HIGH Prices paid for used correspond-ence courses. Send yours today with par-ticulars as to original price paid. An es-timate sent by return mail. Talcott, Box 546A, Cortez, Colorado.

BOATING—Learn at home. Seaman-ship and piloting. Prepare for a job on the water. Fairway School, Box 811, Old Greenwich, Conn.

STEP-UP Your brains, income. Amaze with super-memory. Facts, figures, faces stick like burrs. Write for free details. Thor Books. CM-3, Box 1210, Chicago.

USED Correspondence courses and edu-cational books, bought, sold, rented. Cata-log free. Educational Exchange, Summer-ville, Georgia.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details free. No obligation. Ellis, Box 16-C, Cedar Grove, North Carolina.

MATHEMATIC Tutoring. Specify wants, iath Tutor, Box 1214-A, Indianapolis 6, Indiana.

USED Correspondence courses and books bought, sold, rented and exchanged. Catalog free. Lee Mountain, Pisgah, Alabama.

DENTAL Technicians are in demand. Easy study methods in spare time. School Of Dental Crafts And Sciences, P.O. Box 1321, Palo Alto, Calif.

3800 LATEST Used correspondence courses catalog 50c. EG. Elmsford, N. Y.

JOIN The Salesman's Club. Training-placement. Box 1805, Portland 11, Oregon.

STUDY And win. Send \$2 for your copy. John V. Jewett, 19 Craftsland Road, Chestnut Hill 67, Mass.

*LINGUAPHONE Makes languages easy. At home learn to speak Spanish, Portuguese, Italian, French, German, Russian, by quick, easy Linguaphone Conversational Method. Save time, work, money. sational Method. Save time, work, money, Linguaphone correspondence courses are available to veterans under G.I. bill of rights. Send for free book. State if G.I. Linguaphone Institute, 83 RCA Bldg., New York. 20. N. Y.

LEARN Air conditioning at home. Big demand for trained men. Enormous profit opportunities. Write Nelson, Box 8-C, Warner Robins, Ga.

Warner Robins, Ga.

WAKE Up! Investigate your overlooked resources—unsuspected opportunities. New home study course solves mental worries, develops confidence, increases income. Details free (expect something revolution-ary). Jay Dalton, Psychologist, Box 824, Los Angeles 53.

INVESTIGATOR Training, Phillips Se-ret Service, 1917B North Kenneth, Chicret Service, 191 cago 39, Illinois.

NEW Writers needed. Want to cash editors' checks? If you can read, we can teach you how to write for pay. Earn as you learn. First lesson free on request. No obligation. Send postcard today. Comfort Writer's Service, 200 S. 7th St., Dept. 11. St. Louis 2. Mo.

LEARN Photo-engraving at home or in oldest, largest school in America. Work for newspaper or establish own profitable business. New Tasope' Photo-Engraving equipment available soon. Write for information, Veterans ask about G.I. training. The Aurora School of Photo-Engraving. Tasope' Bldg., Aurora, Mo.

HOME Study course, drugless therapy, Free literature. Institute of Drugless Therapy, Tama, Iowa.

MEDICAL Laboratory technicians in great demand. We train you in your spare time, in your own home. You can practice while studying. Write for free catalogue. Imperial Technical Institute, Box 973-E. Austin. Texas.

SECRET Investigation. Experience un-necessary. Investigators particulars free. George Wagner, M 125 West 86th, New

BOOKS—All Kinds—Homecraft. Radio, Plastics, Boat Building, Photography, Model Building, Catalog free, Popular Mechanics Press, 200 E. Ontario St., Chicago 11, Ill.

PLAYS, STORIES, MANUSCRIPTS

I WANT New writers to cash hundreds of checks for \$1 to \$100, offered each month. The easiest way to write for pay. No previous experience necessary. Send for free details. No obligation. Saunders M. Cummings, 467-M Independence Bldg., Colorado Springs, Colo.

BUSINESS SERVICE

MAIL Forwarded, remailed, each letter 25c. Monthly \$2.00, Confidential. Bond, P.O. Box 246, Tacoma 9, Wash.

SWITZERLAND: Watches, anything. Factory prices. Catalog free. Post Sach 954, Solothurn, Switzerland.

SPECIAL SERVICES

WE Buy and sell for our clients, homes, ranches, farms, restaurants, hotels, cab-arets, night spots, cocktail lounges, gaarets, night spots, cocktail lounges, ga-rages, factories, stores, commercial buildings, apartment houses, etc. Any-thing, anywhere, anytime. Licensed and bonded. Complete descriptions on re-quest. Coast to coast service. Write for full particulars. Parkway Realty Com-pany, Silver City, New Mexico.

MFG.-WHOLESALE Sources, Most any em. "Service," 1332D Findlay, New York 56.

PRECISION Watch service. Raymond T. Kahn, 5610 Tillman Ave., Cleveland, Ohio. Write for information.

HOLLYWOOD Postmark, letters forwarded, 25c each. Arr-Dee, Dept. B. P.O. Box 17, N. Hollywood, Calif.

MAILED Forwarded. Confidential. 25c each letter, \$2.00 monthly. Buchanan, Suite 2, 16 Lisle Ave., Binghamton, N. Y.

WASHINGTON, D.C., re-mailing address. Complete service, \$3.00 monthly. Single letters. 25c each. "Hawkins," 1300 Taylor-L N. W.

IF You have a new product to market, use my Sales Promotion Plan to make big money. Details free. Wellington J. Smith. Direct Advertising Service, 9611 Clifton Blvd., Cleveland 2, Ohio.

CARTOONING, COMMERCIAL ART, SHOWCARD WRITING, SIGN PAINTING

"HOW To Make Money With Simple Cartoons"—a book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 93C. Pleasant Hill. Ohio.

LEARN Showcard writing at home in spare time. Free information. Sherwood Publishing Company, Irvington 11-V, N. J.

LEARN Cardwriting. Free details, O'Rourke, P.O. Box 710, Alhambra, California.

FREE! Sign painting ability test. Sign-ways, 4933 Erie St., Chicago 44.

TEST Free to prospective art students, American, Box 8066, Dallas 5, Texas.

MAKE Up to \$100 weekly cartooning, illustrating, designing and lettering at home. No experience necessary. Big, new, simplified method shows you how. Rush name for free trial offer. National Artists Bureau. Box 4248-M, Dallas 8, Texas.

9 ALPHABET 3 Numeral pattern sets

9 ALPHABET 3 Numeral pattern sets and catalog. \$1.00. Sign Letter Distribu-tors, P.O. Box 101. Mineola, N. Y.

SIGN Painting taught at home by an old master. Ben Kerns, Box 812, Greenville, S.C.

CHALK Talks. Laugh producing program, \$1.00. Catalog 10c. Balda The Cartoonist, Oshkosh. Wisconsin.

ADVERTISING AGENCIES, LETTER WRITERS, FOR ADVERTISERS

DIRECTORIES For mailing lists, \$5.00 per county. Over 2,000 farmers in each, 467 Broadway, St. Paul 1, Minn.

ADVERTISING: Placed in any publica-tion, anywhere. Write for mail-order rate sheet "M." LeGrand Advertising Agency (established 1923). Floral Park, N. Y. FREE: Want ad advertising rate bulle-tin covering the southern states. Alabama Advertising Agency, Exchange Building, Birmingham 3, Alabama.

ADVERTISING Art, ideas, layout, copy. Offset. Ads, leaflets, folders, postcards. Fischer, 711 South Boulevard, New York 55, New York.

1,000,000 MAIL Order names available, from original letters, Katter, 153 S. 9th, Brooklyn 11.

ADVERTISING Sensation! Reach 2,100,000 families, \$32.90 inch. Display, classified, ratebook (newspapers, magazines, mailing lists), advertising assistance, free. Chicago Advertising Agency, 20-PM West Jackson, Chicago 4.

FREE! 1948 Advertisers Rate and Data Directory. 52 pages! E. H. Brown Adver-tising Agency. 20 N. Wacker. Chicago 6.

INCH Display advertisement Mailorder forld, year \$24. Wood's Services, Atlantic

World, year \$24. Wood's Services, Atlantic City. New Jersey.

MAILING List, 1000 names, wealthy resort prospects, \$10.00 cash. BMA Co., 5027 Sunderland, Jacksonville, Fla.

ORIGINAL Sales letters \$3.00 per page. Wallace, Box 143, Shebovgan, Wis.

Wallace, Box 143. Sheboygan, Wis.

ADVERTISERS! Reach nearly 18,000,000 readers. 25 Sunday national key newspapers, 18 words, \$47.75, "Terrific pullers." 20 popular newspapers, \$9.75, "Free booklet." Special—One inch display 2, 821,198 circulation, \$42.00. Newmark's Advertising Agency, (Established 1893) 217.718 Ava. New York 11. Advertising Agency, (Est 217-7th Ave., New York 11.

ADS Placed in out of town newspapers magazines. Low rates. Catalogue Ideas that pay. Baker Advertising ncy. Successors Ankrum Agency. 189

MAILING Lists, certified, productive, inexpensive, \$5.00 1000, Homeworkers, agents, buyers, etc. Write Dixie Service,

24 WORDS In 64 weeklies \$4.96. H. J. Darnell, 730 Hays, Jackson, Tenn.

TYPEWRITERS, DUPLICATORS, OFFICE DEVICES

LIGHTNING Portable adding machine now only \$12.95. Dependably accurate. Does the work of higher priced machines. Ideal for stores, offices, homes. Guaranteed. Write now for free particulars. Jung Office Specialties, Box 74M, Westwood, Cincinnati 11, Ohio.

STANDARD Typewriters \$17.50 up; new duplicators \$9.50; adders \$12.50; electric irons \$3.50. Ship anywhere. Typewriter Service, 118 Spruce, Wichita,

3 TYPEWRITER Ribbons and 100 sheets carbon paper 8½x11 \$2.95. Carbon sheets 8½x14, 25c per hundred. Or 2 ribbons \$1.00. Specify make machine. Mailed postage paid. Jobar Typewriter Supply Co., Dept. J. P.O. Box 921 G. P., New York 1, N. Y.

SIMPLEX Typewriters, \$5.00, Peardrop earrings \$1.00, Demeo, Box 64 Elmwood, Providence, R. I.

BABY Adding machine, adds, subtracts, pocket size. Five year guarantee. \$2.95 postpaid. Check or m.o. Jones Company, 33 West Harrison Street, Chicago 5, Ill.

DUPLICATORS \$9.95 Up. (New.) Im-medate delivery. "Free circular." Rucker, 2836-PM Slevin, Louisville 12, Ky.

"PRINTOMATIC" Selffeeding post card stencil printing duplicators \$9.50 up. Office size duplicators, Speedoprints, Hilcos, Excellographs \$33.41 up. Literature free. Pittsburgh Typewriter Supply, 336-WK Fourth Avenue, Pittsburgh 22, Penna,

RECONDITIONED Typewriters, mimeograph, multigraph printing devices, appliances, supplies. Catalog. Dixiegraph Service, King, N. Carolina.

RUBBER STAMPS AND OFFICE SUPPLIES

RUBBER Stamps, all kinds, catalogue 10c. Print and Stamp Co., Box 172, Bos-ton 1, Mass.

RUBBER Stamps, Illustrated litera-ture free, Lee-Vall Press, Dept. 7-A, Box 1242, Indianapolis 6, Indiana.

2 LINES 35c. 3 Lines 50c. Newman, Box 84. Fort Collins, Colo. SELL Rubber stamps, 50% commission, etails 10c. Thorn, Box 2842, Paterson, Details

PRINTING, MULTIGRAPHING, MIMEOGRAPHING, GUMMED LABELS

1000 BUSINESS Cards \$3.00 prepaid. ighest quality Thermograph (raised leters). Impressive \$6.00 value. Free samele. Lynn, 5710 Bankfield, Culver City,

5000 634 ENVELOPES Printed \$2.75 per thousand, price list free. Michel, Box 76F, New York 16.

PRINTED Business stationery, 250 letterheads, 250 envelopes, \$4.00, Norton's Shop, Box 174, Toccoa, Ga.

WAN anstructions. WANT Large runs postcards, envelopes, structions. Low prices, Mail Products, Mendota.

Mendota, III.

PERSONALIZED Stationery, white linen finish paper, name and address printed in blue (3 lines) on paper and envelopes. Style M: 200 sheets, 6x8, 100 envelopes. Style P: 100 sheets, 7½x10½, 100 envelopes. Either style: \$2.00 postpaid. West of Mississippi add 10%. Scripton Press, 260 West Broadway, New York 13, N. Y.

BUSINESS Cards, 1000, \$2.45, Prepaid, Madison Printing Service, Madison, Ohio.

500 HEAVY White envelopes printed, \$3.25. Samples, Rex, 446 East 87th Place, Chicago 19, Ill.

HAMMERMILL Letterheads, envelopes, 100-81.00. Benneville, Box 1931, Pittsburgh 30. Penna.

QUALITY Printing: business, personal stationery. State requirements. Samples. Mero Products, 100 Morrison, Punxsutawney, Penna.

3 LINE Stamp 40c; 500 634 printed envelopes \$2.85 postpaid. Iden Charles, Wauwatosa. Wis.

FREE—Scripto mechanical pencil with 1000 business cards. Raised printing \$3; plain \$2.50 postpaid. Segel, 5214 Spruce, Philadelphia 39.

MIMEOGRAPHING Experts. Samples free. Martin Mimeographing, 3212 Harp-er. Saint Louis 7, Missouri.

500 LETTERHEADS And envelopes \$7.00 prepaid. Prompt service. Raymar Creative Printing, 2214 S. Harvey, Ber-wyn, Ill.

24 HOUR Printing service. Free samples. Mango, 555-A South 20th, Newark 3, N. J.

MIMEOGRAPHING—Any copy, reason-able. Free samples! Topical Emprise, 1527 Highland, Louisville 4, Kentucky.

LETTERHEADS, Envelopes, cards, reasonable, Samples, Hudson, 261 Woonas-quatucket, Centredale, R. I.

500 634 ENVELOPES Printed \$3.25 postpaid). Libby Printing, Independence,

PRINTING: Circulars, booklets, folders, stationery, catalogs, Keith Press, Elizabethtown, New York.

500 34x214 FOUR Line gummed stickers 35c; red border 50c. Moritz Printery, Saginaw, Mich.

1000 BUSINESS Cards, \$2.50, prepaid. Samples free. Reliable Print Shop, 965 E. Jefferson, Louisville 6, Ky.

SEND 10c Now, for our 48 page 1948 price list—refunded first order. McCall Press, 1326 South 27th, Omaha, Nebraska.

BETTER Grade printing reasonable, Estimates on anything. Economic Press, Leonia, N. J.

QUALITY Printing—Reasonable prices, Fast service on catalogs, folders, publications. Write for prices. Bagby Printing Co., Georgetown, Ohio.

MIMEOGRAPHING—Letters, priceusts, ormulas, instructions, Lowest prices, formulas. Lem's Letter Shop, 5710 Stanton, Detroit 8.

PRINTING OUTFITS AND SUPPLIES

SAVE Money! Build own inexpensive, workable printing press with easy to fol-low instructions. Details free. Otanco, Box 114E, Akron 5, Ohio.

NG Presses, type, supplies. Turnbaugh Service, Loysville, PRINTING

PRINTING Presses, type, supplies. Send dime for complete illustrated printer's supply book, details and press samples. Kelsey, Inc., A-11, Meriden, Connecticut.

INEXPENSIVE Home-made printing ress. Details free. Novelty Shop, Downspress. Details fr ville, Louisiana.

MAKE Your own printing cuts. Newly invented plexiplate process. Plexiservice, Argyle 1, Wisconsin.

PATENT ATTORNEYS

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises; unless an inventor is familiar with such matters; that he employ a competent registered attorney or registered agent; as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 1348 Victor Building, Washington 1, D. C.

PATENT Protection—The U. S. Patent Office recommends—"an applicant is advised, unless familiar with such matters, to employ a competent registered Patent Attorney or registered Patent Agent, as the value of patents depends largely upon the skillful preparation of the specification and claims." Preliminary steps to take to obtain patent protection will be sent upon request. Victor J. Evans & Co., 331-C Merlin Building, Washington 6, D. C.

REGISTERED Patent attorney offers services. Sanders, 6430 Evans, Chicago 37.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a patent. John N. Randolph. Registered Patent Attorney, 203 Columbian Bldg., Washington 1, D. C.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure patents or trademarks. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 935 Columbian Bldg., Washington 1, D. C.

935 Columbian Bldg.. Washington 1. D. C.

INVENTORS: Learn how to protect
your invention. The Patent laws afford
inventors protection for the patentable
features of their inventions. The United
States Patent Office advises the inventor,
unless familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys
ready to serve you in the handling of
your patent matters. "Patent Guide"
containing detailed information concerning patent protection and procedure with
"Record of Invention" form will be forwarded upon request—without obligation.
Clarence A. O'Brien & Harvey Jacobson,
Registered Patent Attorneys, 31B-A District National Building, Washington, D.C.

PATENT Practice before U. S. Patent

PATENT Practice before U. S. Patent Offlice. Validity and Infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 411, 815-15th Street, N.W., Washington 5, D. C.

C. A. SNOW & Co.—M-427, Snow Build-ng, Washington 1, D. C. Registered Pat-nt Attorneys. Write for information. ing. Washingto ent Attorneys.

"INVENTOR'S Guide" free on request, Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

PATENTS. "Proof of Invention" folder mailed without obligation. E. E. Vrooman, Registered Patent Attorney, 871 Woodward Building, Washington 5, D. C.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

FOR INVENTORS

HELPFUL. Unusual service. Free in-ormation. Birsh, 712 Manhattan Ave., formation. Brooklyn 22

INVENTORS — Let our graduate engineers solve your difficult engineering problems. Write for details. Dayton Inventors Laboratories, 1941 Riverside Dr., Dayton 5, Ohio.

Dayton 5, Ohio,

INVENTORS—Patent Laws encourage
the development of inventions. The Rules
of Practice of the U. S. Patent Office advises—unless an inventor is familiar with
such matters—that he employ a competent registered attorney or registered
agent, as the value of patents depends
largely upon the skilful preparation of
the specifications and claims. Write for
further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation.
McMorrow, Berman & Davidson, Registered Patent Attorneys, 1347 Victor
Building, Washington 1, D. C.

FREE Service. U.S. Industrial Research

FREE Service. U.S. Industrial Research Committee, 23 Nelson Ave., Staten Island

INVENTORS—Victor J. Evans and Co. has a staff of registered patent attorneys, has a staff of registered patent attorneys, available to assist inventors in the preparation and prosecution of their cases before the U. S. Patent Office. Detailed information and the steps to take to obtain patent protection will be sent to you upon request. Victor J. Evans & Co., 332-C Merlin Building, Washington 6, D. C.

INVENTORS: Reliable patent searches \$6.00. Reports back in five days. All sketches returned. "Record of Invention" and "Certificate of Search" forms free. Write Raymond L. Smith, Patent Searcher, 410-M Bond Building, Washington 5, D. C. (Formerly with U.S. Patent Office). ent Office.)

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 40A, 1926 Eye St. N.W., Washington 6,

INVENTION Record. Patent application and search forms plus invention sales data free. Charles Morton, 11 West 42nd Street, New York.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a patent on your invention. John N. Randolph, Registered Patent Attorney, 202 Columbian Bldg., Washington 1, D. C.

INVENTORS: The usual first step is to have a search of the U. S. Patents conducted, so I can report on patentability. Write, without obligation. Patrick D. Beavers (Formerly Randolph & Beavers), Registered Patent Atty., 936 Columbian Bldg., Washington 1, D. C.

Bidg. Washington 1. D. C.

INVENTORS: Learn how to protect your invention. The patent laws afford inventors protection for the patentable features of their inventions. The United States Patent Office advises the inventor, unless familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. "Patent Guide" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded upon request, without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 81A-A District National Building, Washington, D. C.

FREE Pamphlet! How to develop your

FREE Pamphlet! How to develop your inventions. Elo Development Company, Department P, Chatham Phoenix Building, Long Island City 1, New York.

I SELL Patents. Established in 1900. Charles A. Scott, 773PM Garson Ave., Rochester, N. Y.

FREE, Two months on trial, Patent News, Washington, D. C. 12,

"INVENTOR'S Guide" free on request, Frank Ledermann, Registered Patent At-torney, 154 Nassau St., New York 7, N. Y.

LITTLE Library of Useful Information. 112 different books. Catalog free. Popular Mechanics Press, 200 E. Ontario St., Chi-cago 11, Ill.

INVENTIONS WANTED

INVENTORS! Have you good, patent-able ideas? Write Patent Agent Metzler, 11 W. 42nd, New York.

HIGHEST Royalties—cash, Free literature, Universal Marketing Co., 126 Lexington Ave., New York 16, N. Y.

WHAT Have you for manufacturers? Submit details or request free booklet. Address: Direct Contacts, 11106-A2 Longwood, Chicago 43,

MANUFACTURERS Want patented or patent pending inventions! Write, Univer-sal Guaranty Company, Lakewood, New

INVENTORS: Hundreds of manufac-turers have requested our assistance in locating marketable new products. Com-plete information, free. Institute of Amer-ican Inventors, Dept. 40-D, 1926-Eye St. N.W. Washington 6, D. C.

SMALL Inventions wanted by manufacturers. I'll help you sell your invention. Write for circular. Stanley Hull, 7829 Euclid, Cleveland, Ohio.

INVENTORS, Write for our sales plan. Complete service for inventors. Vision-eering Inc. Security Building, West eering Inc Bend, Wis.

PATENTED, Unpatented inventions wanted. We have tremendous lists of manufacturers who may pay cash royalties. Descriptive booklet free. National Invention Service, 1404-T Mitchell St., Oakland 1, Calif.

PATENTS FOR SALE

PATENT—Inventions, Small cost to make. Best for surgical supply house but not necessary. Small item, plastic. Joseph Hanlon, 20 West Ohio, Chicago 10.

PATENT For sale outright. Small electrical household article. More than twelve uses. Labor-saver. Every woman prospective buyer. Address Box 1274, Detroit 31, Michigan.

TRE-TEX-429,362, 4-29-47. Perfect varnish protection for trees. Fourth year. Testimonials, 43 states, Canada, Mexico. Selling account disability. Box 91, Noblesville, Indiana.

FLEXIBLE Adjustable lever drag, on royalty, Pat. 2347979. Vincent Antal, Brainerd, Minn.

PATENT Pending, auto-air-cooler, easily manufactured, no moving parts; royalty only. Will mail official drawings upon request. H. S. Chambers, 1549 Valencia Ave., Pasadena 7, Calif.

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information. Institute of American Inventors, Dept. 40-B, 1926-Eye St. N.W., Washington 6, D. C.

MANUFACTURING

EXPERIMENTAL Work, models, small lot manufacturing. Halfer Eng. Co., 5238 W. Chicago Ave., Chicago, Ill.

PATENT Models, experimental devices.

Designed, Woodburn, constructed. Oregon. Nelson

SMALL Lot production wanted. Aluminum castings; stampings; screw machine; plastics. J and M Company, Burlington, Kentucky.

MODELS — Small lot manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky.

MODELS, MODEL SUPPLIES

HOBBYIST'S Catalogs! Controlog-engine powered, line control model planes, 100 kit photos, construction, flying instructions 10c. Send large self-addressed stamped envelope for free folder featuring famous English Twin Trix 3-rail trains, 164 page ship model kit-fittings catalog 35c. Booklog—hundreds of model, hobby, craft books 10c. Send coin, stamps, Polk's Hobbies, "World's Leading Hobby House," 314(PM3) Fifth Avenue, New York 1.

SHIP Model kits and fittings, most complete stock in New England, of Boucher, Fisher, marine model, model shipways. Fittings, plans, tools, model yacht equipment. Illustrated catalog 25c coin. James Bliss & Co., Inc., Dept. M. 220 State Street, Boston, Mass.

LIONEL Train sets, accessories available, order today. Roundhouse, Box 273, Newark 1, New Jersey.

MODEL Railroads exclusively—Complete stock scale; Lionel, American Plyer. Send for catalog, 15c, state gauge. Eric Fuchs, 28 Brattle Street, Boston 8,

HAVE Fun building model gas engine
—four cycle, 1½ in. stroke. Ideal for
model planes, boats and racers. Over-all
dimensions only 5 in. high. Castings
available. Three "easy to understand"
prints, only 75c. Ask for #1097 to 1099.
Popular Mechanics Press, Room 602, 200
East Ontario Street. Chicago, Illinois.

SCALE Catalogue 25c (refund coupon
included). Lionel or American Flyer list
of available equipment every month upon
request. Tri-Lor's, State Road, North
Dartmouth. Mass.

BUILD Your own model homes, garages, doll houses, displays, etc. Strong
wood panels milled to faithfully reproduce
shingles, lapsiding and brick in three scale
sizes. Write postcard for free picture
folder. Scale-Built Materials Inc., 4624
Ravenswood Ave., Chicago 40, Ill.

NEW Swedish super detail ship model

NEW Swedish super detail ship model lans. See advertisement on page 250.

RAILWAY Models, complete informative catalog HO and O gauge, 132 pages, 50c. Walthers, 247 Erie, Milwaukee, Wisconsin,

SHIP Models, copper sails, Blinker light house, book ends, Construction sets. Cata-logue 25 cents. Trade Wind Models, Box 171B, Lakewood, N. J.

STEAM Engines, boilers, castings. Cat-alog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

BRASS Gears and model supplies for the inventors. Send 10c for catalog. Pierce Model Works, Tinley Park, Ill.

POWER Models-Steam and gasoline engines, steam traction engine, metals, tools. Catalog 35c. Chas. Cole, Ventura, Calif.

LANDLOCKED Sailors! Here's a beautiful, richly illustrated, fully descriptive catalogue of famous model ships-whalers, slavers, corvettes, etc., authentic in every detail. Send for it today. Only 25c. Halesite Yacht Service, Inc., Halesite, Huntington, N. Y.

FUN Building models—Airplanes, trains, ships. Everything furnished. Giant cata-log 10c. Ben's Hobby Shop, 72 West Wash-ington, Chicago 2, Illinois.

SHIP Models and yacht supplies com-plete. Large 64 page catalogue 30c. Bill Wild's, 510 East 11 St., New York City 9.

SHIP and Yacht model fittings; blue-prints. Send 25c for illustrated catalog No. 20—listing hundreds of items. A. J. Fisher, 1002-1 Etowah Ave., Royal Oak. Mich.

MINIATURE Steam locomotives, 14", 32", 34" scales. Castings, parts, rail! Thorough drawings with instructions. Catalog 25c. Little Engines, Wilmington, Cal.

HOME CRAFTSMEN

AMERICA'S Most complete line of quality handicraft kits, leathercraft, jewelry, shellcraft, wood inlay, plastics carving, cedar chests, metal tapping, and many others. Send dime for most interesting catalog you ever read. Beaver Crafts Incorporated, 11558 S. Wentworth, Chicago 28 Chicago 28.

SOUTHERN Woods: Texas ebony, mesquite, Brazil, catsclaw, Guayacan, Hui-sache, many others. Working supply, \$1.00 each prepaid; sample, dime each; details, stamp. StarCraft 1, Edinburg, Texas.

LEATHERCRAFT—Tools, dies. Made to order. Belt tapers, billfolds, key cases, Louis Jones, 1405 Throckmorton, Ft, Worth, Texas.

LEATHERWORKERS' Bible. Largest illustrated leathercraft catalog, plus valuable instructions and information. \$1 postpaid. Satisfaction guaranteed. Act now! Artcraft Leather, Dept. PM3, 271-12th St., Oakland, Calif. postpaid. now! Art

DO Your own professional felt flock finishing. Complete kit includes flock, un-dercoat, thinner, spray gun and instruc-tions. \$9.25 post paid. Write for free color card and circular. Berott-Ross, Dept. 3A, 411 N. Foothill Road, Beverly Hills, Calif.

MYRTLE Wood, lumber and squares; prices and particulars on request. Ore-gon Craft Woods Company, Grants Pass,

RHINESTONES, Moonstones, pearls, findings. Free literature. Herber, 1360-A Hicks. New York City 67.

ROCKET Rocker, children's delight, atomic end tables, etc. 16 sensational plans \$1.50 postpaid. Modern Plans, Deer-wood. Minn.

LEATHERCRAFT Designs — Handbags \$1.00, billfolds \$1.00, belts \$1.00. All three \$2.50, Lampkin Artcrafts, Box 641-M, Culver City, Calif.

WATCH Bands—Made of genuine calf or pigskin in buckle or snap-on bracelet styles, any size, guaranteed to satisfy. \$3.00 value, bargain 2 for \$1.00 postpaid. Davidson, Box 1418, Wichita, Kansas.

LEARN To make seashell jewelry, pins, earrings, hair ornaments, novelties. Book of instructions and designs free with \$2.00 and \$5.00 kits, postpaid. Herbert Diamond Co., Box 4619. Miami 31, Florida.

SHELLCRAFTERS! Baby cups, \$14.00 gallon. Black's Shells, 601 S. Newport Ave., Tampa 6, Florida.

WHEELS—10" Aluminum disc: 114" semi-pneumatic tires, oil-treated bronze bearings, for 7/16" shaft: perfect light-weight application, attractive, non-corrosive. \$1.25 each. Metalcraft Toy Company, 455 Paul Brown Bldg., St. Louis, Axle's available. Express, c.o.d.

VALUABLE Publication "How and Where to Sell Your Molded Plastic and Plaster Casts Profitably," only \$1.00. Postal brings free details. Banks, 6635-16S. Ave., Kenosha, Wis.

SEA Shells, findings, plastics, Tell-U-How catalogue, stamp, Dixie Shell Serv-ice, Lakeland, Fla.

PATTERNS 40 Pictures of new aw projects. Folder 10c. Joaness erns, P.O. Box 141, Omaha 7, Nebr.

BRAD-DRIVING Device inc profits, saves time, easily made. Reed Brothers, Thomaston, Maine. increases le. Write.

POWER Saw owners, special stand gives your saw the handiness of tilting arbor saw. Plans 50c. P. Hoggard, 10 E. Preston, Hampton, Va.

LEATHERCRAFT! Complete stocks of leathers, tools, supplies. Immediate shipment. Free catalog. Kit Kraft, Dept. PM3, 3203 W. Washington Blvd., Los Angeles 16, California

\$46.00 FROM Square foot plywood, Jig-aw necessary. Write, Woodarts, H-38, ssary. Mass.

saw necessary. Write. Woodarts, H-30, Bridgewater, Mass.

SPECIAL 77 Full sized patterns. Lawn ornaments, toys and novelties \$1.00. Modern Woodcraft, Saginaw, Michigan.

ern Woodcraft, Saginaw, Michigan.

BUILD Your own model homes, garages, doll houses, displays, etc. Strong wood panels milled to faithfully reproduce shingles, lapsiding and brick in three scale sizes. Write postcard for free picture folder, Scale-Built Materials Inc., 4624 Ravenswood Ave., Chicago 40, Ill.

METAL Tooling! Brass, copper, supplies, Immediate shipment. Free catalog, Kit Kraft, Dept. M3, 3203 W. Washington Blyd., Los Angeles 16, California.

JEWELRY — Hobbyists need our ster-

JEWELRY — Hobbyists need our sterling silver in sheets, wire, chains, and finished findings along with rosary kits, chemicals, novelties, ideas, plastic and metal findings. Write today for latest beautiful catalog. Only 25c (refunded, first order). Pittshire, Box 90-E, Pittsfield, Mass

SHELLCRAFT. This fascinating hobby can become lucrative. Sell what you create. Instruction book free or one dollar brings you shells and material to make \$6 worth necklets or brooches or earrings, state which. Shell Company, 202 N.W. 1st Street. Miami 36. Florida.

MAKE Perfume. Profitable, sparetime home business. Men, women, write "In-ternational," 6347 Parnell-X8, Chicago

DRILLS. Cutters, stones, and accesso-ries. Dental drills 3/32" shaft, ideal for internal carving, cutting wood, metal. As-sorted sizes, shapes, four dozen \$2.25, One dozen assorted mounted stones \$2.25, Diamond stones for sale. Postpaid in U.S. Schrader Instrument Company, East Main Independence Iowa. Independence, Iowa.

BASKETRY Kit! Fascinating handi-craft. \$1.00. Homemaker's, 5042 N. St. Louis, Chicago 25, Ill.

HUNDREDS Full size patterns—Easily made plywood novelty furniture for jig and bandsawing, lawn ornaments, plaques, frames, silhouettes, letters, numerals, weathervanes toys, 150 craftshobby books and booklets, hundreds decal transfers, Catalog and folders illustrates 465 articles, 25c. (No stamps please). Refunded first order, Wo-Met Shop, Box 167, Ashburn, Georgia.

FREE Folder—"Amazing New Service."
Materials furnished to build projects
featured in this magazine. Project Headquarters, 1756A Henderson, Chicago 13,

MAKE Your own jewelry! Findings in metal and plastics; earwires, pinbacks, cameos, stones, beads, clasps, sprays, combs, hairbars, plastic and metal chains. Hobby Art Corp., Dept. 7, P.O.B. 276, New York 18. N. Y.

Irving M SWISS Music units \$3.50, kits \$4.75. ving Meyers, 126 Lexington Ave., New ork 16, N. Y.

York 16, N. Y.

SHELLS, Plastics, findings, Beginner's kit \$3.00. Free catalog. Stelle's, 230 Randall Avenue, Trenton 10, New Jersey.

IMITATION Miniatures for jewelry, Look like the real thing. Sample with setting, 15c. Trinity, 2498 65th St., Brooklyn 4, N.Y.

SHELLS, Plastics, Metal findings, Hobby Look, Box 468. Sta. A. St. Petersburg, Lobby, Box 468, Sta. A, St. Petersburg,

35 PATTERNS Toy furniture, action toys, etc. \$1.00. Continental Homecrafters. 907 Birch, Eau Claire 3, Wisconsin.

FAST Selling. Good profits making lawn chairs, furniture, toys. Illustrated folders of popular items, 25c. Refundable. Summercraft Studio, Dept. KN, 42 Vernon Newton 58, Mass.

COPPER Strips, cold rolled, .025 ins. thick. Assortment 5 sizes, 1, 2, 3, 4 and 6 inch widths, 12 inch lengths, \$1.90. 24 inch lengths, \$3.75 postpaid. Groundmaster Company, Box 657, Boulder, Colorado. SHELL Jewelry supplies. Wholesale only. McFarland Plastic Co., Sarasota, Fla.

OREGON Myrtlewood lumber and turn-ing squares for sale. M. Weaver, 3923 SE Tibbetts, Portland 2, Oregon.

BAND And jig saw owners, let your machine and hobby bring you profits, fun. Free details. Nu-Art Designers, 33 Rose-mont Rd., No. Weymouth, Mass.

LEATHERCRAFTERS! Belt kits, projects, leather, supplies. Write for catalog. Art Leather, 411 Joseph Ave., Rochester 5, N. Y.

LEATHER, Retail, mail orders, catalog, tools, lacing, supplies. National Handi-craft Co., 30 Frankfort St., New York City

PLASTIC Jewelry supplies. Free catalog. & M Novelties, Box 464P, Griffith, In-

HOW To set up and run a mirror shop! Resilver mirrors. For price write—John Sprinkle V55, Marion, Indiana.

KNOCKDOWN Cedar chests. Lumber and veneers. Free price list. Giles & Ken-dall Company, Huntsville, Ala.

SPECIAL Offer: 80 full size toy, novelty, and lawn ornament patterns only \$1.00. Lynds, Medway, Mass.

CERAMIC Jewelry supplies, bar pins, ear screws, for ceramic and woodworkers; also glass and seashell assemblers. Free catalog. Philadelphia Badge Co., Dept. B-1, 1007 Filbert St., Philadelphia, Penna.

SHELLS. Plastics, findings, Lowest prices. Free catalog, Frances Jones, Box 251, Sarasota, Fla.

MAKE IT YOURSELF

MAKE Plastic wallets. Everything fur-nished. Details free. Lakeshore Supply, 534 Surf St., Chicago 14, Ill.

BOYS-Build your own soap-box derby racer. A car that will really thrill you.

The exact duplicate of the 1946 Derby championship car. Easy and fun to build, Ask for plan No. 1101, 25c. Popular Mechanics Press, Room 600, 200 East Ontario Street, Chicago 11. Illinois.

BUILD Inexpensive, practical concrete block machine. Motor or hand. New prin-ciple. Write, Clyde Lee, Mountain View Oklahoma.

POWER Lawn mower—Use model "T"
Ford starter and battery. Instant starting, dependable. Complete plans for \$1.00.
Bedwell, 621 W. Hickory, Independence,

HOT Water free—From sunlight. System efficient any locality year round. Standard materials, easily built, low cost, facts free. Solar Water Co., Box 175, facts free, Solar Water Co., Dept. K. Coral Gables, Florida.

BUILD Concrete block machines, portable sawmills, Shop, farm, home machines, 70 plans. Catalog-handbook free, Nichols Equipment Co., Dept. 810, Purvis, Miss,

COOL Your home. Automatic attic fan. Complete plans \$2. Engineering Develop-ment, Box 37 Station C, Lincoln, Ne-

ROTARY Type, power lawn mowers. Complete machines or parts, Modern Mower, Lohrville, Iowa.

ENJOY Soft water, Simple, easy, plans, instructions, \$1.00. Huff Engineering, 10230 San Carlos, South Gate, Calif.

SPECIAL. Full size patterns make over 100 toys. \$1.00. Complete plan for over 20 modern kitchen cabinets \$1.00. Free list. Masterprint, White Building, Buffalo

SEASHELL Workers' supplies. Wholesale. Bargain list free. Shell Novelty, Box 1664. Fort Myers, Florida.

PLAYHOUSES And doghouses, scientifically designed. Plans and material list for 4 sizes of either, \$1.00 postpaid, C. Miller & Wutkee, 253 Conant Hotel, & W Omaha.

"CONCRETE Block homes." 32 page booklet: drawings, instructions on how to build. \$1.00. H. C. Lightfoot, Civil Engi-neer, Richboro 1, Penna.

WATCHES, OLD GOLD, JEWELRY

WATCH Repairing. Now you can get quick service on watch repairing by sending them direct to the Elgin Watch Repair Shop, 108 E. Highland, Elgin Illi-

JEWELERS' Pocket Reference Book— Shipley \$2.76, Most complete on the sub-ject. Free catalog. Engineers' Book Serv-ice, 19 W. 44th St., New York City 18.

WATCHES, Wholesale. Rebuilt; like new. Elgins, Walthams, Bulovas, etc., \$9.75 up. Catalogue free. Brookings, B-1975A, Little Rook, Ark.

WATCHMAKERS: Beginners—Watches, novements, tools, May Present 4421

movements, tools, M. Sheridan, Chicago 40. Max Presant,

PRECIOUS, Semiprecious stones, plastic-metal findings, list 10c refundable with first order. Pickwick Findings, Box 780-L, Stamford, Conn. tic-metal

CASH By return mail for old, broken jewelry. Mail us gold teeth, rings, watches, eye glasses, diamonds, etc. Highest price guaranteed or your merchandise returned. Rywell, Harriman, Tennessee.

SILVER Looks better. Inexpensive tool Sterling chain, wire or sheet for jewelry, name plates, initials, etc. Prices quoted on any amount. Dept. A, Empire Smelting Co., 718 Sansom St., Philadelphia 6, Penna.

JEWELRY Findings, lowest prices, George Sassen, 154 Nassau Street, New York 7.

GOLD \$35.00 Ounce. Mail old gold teeth, diamonds, jewelry, watches—receive cash by return mail. Satisfaction guaranteed. Free information. Dr. Weisberg's Gold Refining Company, 1500-Q Hennepin, Minneapolis, Minn.

Hennepin, Minneapolis, Minn.

WATCH Repairing easy learned by our home study course. Watch repairers are in demand and are among the highest paid craftsmen today. Write for free information. Houston Chronometer & Watch Co., P.O. Box 1140A, Houston 1, Texas.

CASH For old, broken jewelry. Highest prices paid immediately. Mail gold teeth, watches, rings, silverware, diamonds, spectacles. Satisfaction guaranteed. Information free. Rose Smelting Co., 29-A East Madison. Chicago.

GEMS. Precious and semi-precious. all

GEMS, Precious and semi-precious, all genuine, from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7, Salem, Oregon.

PLANS AND BLUEPRINTS

FOOD Cooler without ice, electricity, Plans 25c. Fogwood Company, King, On-tario, Canada.

TOBACCO, SMOKERS' SUPPLIES

REJECTS \$5.00 Pipes 65c. Briar blocks, ts. Literature free. Carvapipe, 2829-H ixie, Hamilton. Ohio.

CIGARETTES—Popular brands \$1.45
per carton delivered postpaid. Minimum
3 cartons, Check or money order. Service
Sales, Dept. X, Box 3146, University City
5, Missouri.

FOR THE HOME

IT'S New! Insulating, weather-proof door-step milk bottle box. Keeps milk cool, clean in summer, helps keep it from freezing in winter. 2 qt. size \$2.00; 4 qt. \$2.50; 6 qt. \$3.00. Send check, cash or money order, for prepaid shipment, Better Box Co., 98 Central St., Ansonia, Conn

INGENIOUS Ever-Level picture hanger. Keeps pictures straight under any condition. 15 cents per set, post paid. Stevins Manufacturing Co., Box 673, Morristown. N. J.

FIREPROOF "Hot iron" rack. \$1.50, Free flower seeds, other offers. T. Mullins, Riverview 2. West Virginia.

WASHING Machine parts and supplies, Lovell wringers, rolls and bearings. Hum-boldt Thor Shop, 3448 W. North Ave., Chicago 47

GIANT Table lighter \$5.00, Donald Eakin, Route One, Harrisville, Penna.

INSULATE Your home yourself. Plans, instructions, illustrations \$1.00. Money-back guarantee, Insulation; 200 S. Arch, Alliance, Ohio.

HULL Automobile compass, value \$4.95, brand new, \$2.50. Prisms for 6x30 or 8x30 binoculars, brand new, \$1.50 each. Offset prisms to be attached to 7x50 B. & L. binoculars, gives double the field of the ordinary 7x50 binocular. Cost \$98.00, special \$25.00. Green sunshades for binoculars, size 6x30 and 7x50, snap on type, value \$7.50, special \$1.25 per pair. Forward money order. No c.o.d. shipments. Send coin \$1.25 for Third Annual Edition of Gun Digest together with our complete catalog of new and used guns, ammunition, rifles, binoculars and powder flasks. Our separate catalog 25c. Public Sport Shops, 11 S. 16th Street, Philadelphia, Penna

8 OZ. Mechanic ballpein hammers 80c, napping hammers \$1.25. Armstrong threading sets, bolt, dies and stock \$14.00. Remington typewriter ribbons 40c each, all new, postpaid. A. Valls, Laredo, Texas.

BARGAINS In (used) dresses. 5 for \$1.35 plus postage. Free family catalogue. Merchandise guaranteed or purchase price refunded. Globe Mail Order Co., Dept. F, 372 Thatford Ave., Brooklyn 12, N. Y.

GET \$1.25 Guaranteed fire extinguishers. Scheall, Box 225X, Duluth, Minnesota

COMPLETE Constructional details on beventeen low-cost boats—power, sail, row. Designed for home builder with limited tools, no experience and little money to spend \$1.25. Popular Mechanics Press, (C-43), 200 E. Ontario, Chicago.

PERSONAL

BORROW By mail. Loans \$50.00 to \$300.00 to employed men and women. Easy, quick. Completely private, confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Write State Finance Co., 320 Securities Bldg., Dept. C-14, Des Moines 9, Lows.

TIE-X-CHANGE, Send six ties and \$1.00. Receive six, 1834 Madison, Eugene,

SAN Antonio, Texas, Box 2037, 5 post-cards \$1.00. Letters remailed 25c. Western style belt and watch band, \$2.50, \$5.00. Area map with complete data 50c.

FALLING Hair, dandruff, dry or oily scalp? Write Opal M. Smith, Hair and Scalp Specialist, 705 Chestnut, St. Louis 1. Missouri.

MORE And better hair for you. All about latest secrets, discoveries. Write immediately. Bruns, 3307-D Fremont, Madison 4. Wis.

LOSING Hair? Have dandruff? Write for free, confidential booklet on care of scalp and hair. Eugene Burt, 1926 State Blvd., Kansas City, Kansas.

WE Mail, receive, forward, letters, 25c. Apartado 2807, Mexico City.

MEXICAN Law. General practice attorney, 1203 Arizona Street, El Paso, Texas.

PRETEND Visiting romantic Lima, Peru, South America, Addressed letters reairmailed, \$1.00; A. M. Irwin, Apartado 1952, Mira Flores, Lima, Peru.

MEXICAN Address. Letters received, forwarded. Photographic postcards 15c. Remailed free. Tillotson, APDO. 1405, Guadalajara, Jal., Mexico.

GLOBAL Picture postcard supply; unusual novelties; worldwide letter remailing service. Free particulars. Travelpost, Box 1436, Brawley, California,

HOW You can find out! Information discreetly developed, any matter, person, problem, anywhere. Personal-business assignments. representations, undertaken. Nation-wide. Officially licensed and bonded service established 1922. Reasonable, Confidential, William Herman, 170 Broadway, New York.

BEAT Inflation with extra income. Samples four leading opportunity maga-zines 25c. Wallace, Box 143, Sheboygan,

SWAP! Trade! Anything, everything. Free information, "Swappers' Gazette-PM" Louisville 12, Kentucky.

RUPTURED? Positive comfort, no un-derstraps, no steel, no elastic. Write Smith Manufacturing Company, Preston, Ontario.

HAIR Falling? Dandruff? Write Trich-ologist 137 Lewis St., Phillipsburg, N. J.

BOOKS—All Kinds—Homecraft, Radio, Plastics, Boat Building, Photography, Model Building, Catalog free. Popular Mechanics Press, 200 E. Ontario St., Chi-cago 11, Ill.

MISCELLANEOUS

"WAKE Up to music." Your radio, alarm clock simply connected. Plans \$1.00. Fred Meyers, 338 S. Broad St., Trenton 9. New Jersey.

MEMORY Gems by Wilson, enjoyable. Instructive. E. S. Shimer, 302 Broadway, Milton, Penna.

Milton, Penna.

HANDMADE Sequin earrings to sell at 50c, \$3.75 doz. Jessie Graydon Fisher, 102 Oak St., Ridgewood, N. J.

ROLLIT Ball point pen, \$1.00. Money back guaranteed! Reading Sales, Box 614-B. Reading, Penna.

RESEARCH Library Congress, reasonable rates, literature free, Harris, Box 4496 Brookland Station, Washington, D. C.

QUALITY Highly buffed, solid stain-les steel knives, forks and spoons. Rust-proof, tarnishproof. No polishing neces-sary. Send postcard for free folder. Kolk Mfg. Co., 363-A Old Falls Blvd., North Tonawanda, N. Y.

Tonawanda, N. Y.

MEN! Large size shoes, large size sox!
We specialize large sizes 10 to 16, width
AA-EEE. Oxfords, hitops, work shoes.
Guaranteed extra quality. Free catalog.
Kingsize, 469, Brockton, Mass.

NOVEL Tie clasp. Illustrated directions 10c, Jo Sponsler, 3030 Belmont Ave.,
Baltimore 16. Md.

"BIG Mails" moneymaking offers,
magazines, samples, Listing 10c, Bentz
Jr., Chatawa 46, Mississippi.

ALNICO Marnets—Easily lifts pound

ALNICO Magnets—Easily lifts pound 50c pair. Edwards Industries, 4268 Shenandoah, St. Louis 10, Mo.

WHIRLWIND Lawnmower shafts, fits automobile hubs, \$6.50, Meyer Mfg. Co., 118 West Hoyt St., Beatrice, Nebr.

FREE Catalog. Shop and household adgets. Lyle Baker, Bismarck, Missouri.

WATCHES—How to take care of them. Send 10c for information. Thousands of satisfied customers. Poynter's, 310 Thir-teenth Street, Richmond, Calif.

SWISS Musical units \$3.25. Musical albums, boxes. 131 West 42nd, New York

RECEIVE Free samples, magazines, catalogues; moneymaking opportunities galore! Lots of interesting mail! Your name in all our "surefire" mailing directories two years, \$1.00. Nine months, 50c; thre months, 25c, Stanford, 6220-M 16th, Philadelphia 41.

BUILD Your house of earth on your lot with clay from cellar, Send today, Il-lustrated instructions mailed for \$1.00, H. B. Lee, Box 171K, Washington, D. C.

DE-ODO-BAC: An amazing new versa-tile disinfectant which also destroys odors of garbage pails, cages, kennels, urinals, cellars, shoes, etc. Kills germs. Intro-ductory offer; send \$1 for enough to make one gallon. Distributors solicited. For-mulas, Box 410, Bloomington, Indiana.

U. S. Surplus clothing, men's, wom-n's. Amazing bargains. Free catalog. Y. Clothing Co., 2079A-Second Ave., en's. Amazin N. Y. Clothir New York 29.

DANCE Instruction in the privacy of your own home. The Engstrom Dance Guide is as simple and easy to understand as moving pictures. Free booklet. Engstrom Dance Studios, Box 358, PM. Grand Island, Nebr.

SQUARE Dance instructions, 25 sets, .00. Rayburn, Eureka Springs 1, Arkansas

MEXICO. Your personal questions about Mexico, answered. Assignments. \$1.00. "Ahora," Apartado 2807, Mexico

SPECIALISTS, Extra large size men's pants. Franch backs, gabardine, worsteds, Order made \$7.95. Samples free, Established 1922, Yale Clothing, Meriden, Con-

FREE—"Amazing New Book"—"Profits From Classified Advertising." Tells how and what to advertise. Be sure to read this book before you invest one cent in advertising. Remember—it's free! Write for your copy now. F. W. Johnson, Classified Advertising Manager, 200 East Ontario Street, Chicago 11, Illinois.

MAKE Perfume. Profitable, sparetime home business. Men. women, write "In-ternational," 6347 Parnell-X9, Chicago 21, Illinois.

BUY Genuine South American, Peruvian Sol De Oro, \$1.00; A. M. Irwin, Apartado 1952. Mira Flores, Lima, Peru.

WATTHOUR Meters. Reconditioned, G.E., West., 115 volts. 1,800,000 to 1 gear reduction alone worth price, \$2.95. Ship. Wt. 13 lbs. T. Price, 310 14th, Raymond, Wash.

MAIL Baskets—Hang outside for mail. Heavy split oak, weather resistant, 11x7x 4½", \$1.50. Mexican roll baskets, heavy bamboo, 8½x2½", 50c; six for \$2.50. All postpaid, no c.o.d.'s. Durham's Basket Market, North Branch, N. J.

PANNING Gold, Learn how, Illustrated booklet-catalogue, mining books, supplies, free. Old Prospector, B-92, Dutch Flat, Calif.

BOOKFINDERS! (Scarce, out-of-print, unusual books) Quickly supplied. Send wants, Clifton Company, Box 1377 pmm, Beverly Hills, Calif.

Beverly Hills, Calif.

TREASURE Finders! Goldak's new 11 pound lightweight, gold, silver and mineral locator, money-back guaranteed superior any other device. Free information. The Goldak Co., 1542 West Glenoaks Blyd., Glendale 1, Calif.

POPPER And hotplate, Ideal for light cooking, \$5.95 f.o.b. Parcell's, 2701 Main, Elkhart, Indiana

MEXICAN Jumping beans. Wholesale, July crop. Mexican Products Co., 126 N. Main, Tulsa 3, Oklahoma.

INQUIRE Now about our Home Plan Service for 24'x26' and 24'x30' one floor, two bed-room homes. Write today for par-ticulars. Columbia Small Home Plan Service, Dept. 10, 1570 Hawthorne Park, Columbus 3, Ohio.

SWITZERLAND: Watches, anything. Factory prices. Catalog free, Postsach 954. Solothurn, Switzerland.

BUY Direct from importers-distribu-tors of Mexican, Indian and western goods. Write for free catalog. Navo-Mex Importers, 2351 East Van Buren, Phoenix, Arizona.

BUILD Your own home-freezer unit. Simple, easy to understand plans. Reaches 30-degrées-below temperature. Freezing compartment size 10x16x28". Storage compartment 24x28x36". Complete plans 50c. Popular Mechanics Press, 200 E. Ontario St., Chicago 11, Ill.

St., Chicago 11, Ill.

FIREWORKS: Don't be disappointed. Get famous Banner Fireworks with all newest and startling effects. Giant cannon salutes that rock you like a crash of thunder. Whistling devils with weird unearthly noises. Skyrockets that burst in majestic colorful display. Gasp in amazement as you watch the battle in the clouds. Genuine Chinese firecrackers. Over 200 pieces including sparklers for little tots. Retail value \$11.25 for only \$4.95. Rush order today. Any quantity. Send money order, bank draft or currency. No c.o.d's. Big new catalog free. Banner Fireworks Mfg. Co., Inc., Dept., 112, 446 Capistrano, Toledo 12, Ohio.

"RECEIVE Mail." Moneymaking oifers.

"RECEIVE Mail." Moneymaking oifers, opportunities, catalogs. Name listed 10c. Ideal Service. 100, Park Ridge, Ill.

TWELVE Alnicov magnets, 100 experiments, \$3.00. Experiments, 25c. Disc magnet, \$1.00. Eljay, Box 891, Newark 1, N. J.

M-SCOPE Metal, mineral locators sensational new electronic lightweight models, immediate shipment. Fisher Research Laboratory, Inc., manufactures some of the finest metal locators for the U. S. Army. Built for Arctic, Tropic use, Unsurpassed efficiency, low prices. Time-payment plan available. Send for free 16-page illustrated booklet. Fisher Research Laboratory, Inc., Palo Alto, Calif.

TATTOOING Outfits, supplies. Illus-trated list free. Zeis, 728 Lesley, Rockford, Illinois.

GLADIOLAS—Some newer, better. List. Robinsons Glad Heaven, Sebastopol, Calif. 70 BIBLE Lessons, 25c. Bulletin, Box 87, Cathedral Station, New York 25.

AGED Wisconsin cheeses. For real cheese lovers. Moderately priced. Write for literature. Peter Lang Co., Box 102-B, Wausau, Wis.

Wausau, Wis.

NOW Ready: New, amazing Classified Advertising Record Book — prepared especially for classified advertisers. Here is a book that tells you instantly whether or not your advertising in any publication is paying you real results. You can tell immediately how many inquiries each publication produced—how much cash received from every ad. Spaces are provided for the name and address of the publication, date of issue, space used, rate, cost of ad, key number, etc. You have a complete record of each publication right before your eyes. Plenty of space to keep accurate record of 28 separate publications. You can have a copy by sending only 10c to cover postage and handling. Send for your copy now. W. F. Johnson, Classified Adv. Mgr., Popular Mechanics Magazine, 200 E. Ontario Street, Chicago 11, Illinois.

Aviation Training Opportunities Open at Northrop School

FOR a limited number of properly qualified men there are openings in the next starting classes of the Aeronautical Institute division of Northrop Aircraft, Inc., according to an announcement by the Institute director. Aeronautical Engineering and Aircraft Mechanics courses are given in the Northrop training program.

The technical institute conducted by this famous builder of the spectacular Flying Wings and war-renowned Black Widow is located in the midst of Northrop's busy center of aircraft manufacturing and aeronautical research and development. The students were among the first to see the great 8-jet Flying Wing and viewed its first take-off - from the Northrop Field runway at the Institute's "back door."

Engineering and Mechanics Training

Over 1000 students from every state and many foreign countries are being trained by Northrop. Many are former servicemen, all courses being approved for veterans. The courses are open to non-veterans, also. A 2-year Aeronautical Engineering course and a 1-year Aircraft and Engine Mechanics course are given, also a Pre-Engineering "refresher" and "prep" course.

The Northrop school is one of the few technical institutes offering an Aeronautical Engineering curriculum approved by the Engineers' Council for Professional Development. The Mechanics course is approved by the Civil Aeronautics Administration.

Besides being employed in Northrop's own plants, Northrop graduates hold important positions with leading aircraft and airline companies throughout the world.

Information on qualifications for enrollment, and on opportunities with Northrop training, may be obtained from the Registrar, Northrop Aeronautical Institute, 1527 East Broadway. Hawthorne, Los Angeles County, Calif.

This coupon may be used for convenience in inquiring.

NORTHROP AERONAUTICAL INSTITUTE, 1527 E. Broadway, Hawthorne, Los Angeles County, Calif.

Please send me the institute Catalog and complete information, including starting dates of classes. I am interested in

☐ Aeronautical Engineering ☐ Aircraft and Aircraft Engine Mechanics (A&E)

Name	[4]	
Address	Contractor.	Age
City	Zone	State
Check one: Veteran	☐ In Service	☐ Civilian

Advertisement

thousands of ambitious men helped

FREE EMPLOYMENT SERVICE EARN THESE TRADES IN THE BI ALLIED SHOPS

. BIG SHOP TRAINING •

Largest School

FREE! BIG

METAL TRADES

X.L. RUBBER MOLDS

its Kind in

Choose one of

- · Machinist Trade
- these 6

LEADING

TRADES

- Tool & Die Making
- . Tool & Die Machine Designing
- . Mechanical Drafting
- Tool Engineering

. Industrial Product Illustration

APPROVED FOR VETERANS

ILLUSTRATED WRITE TODAY: A 1c Postcard will do. BOOK ALLIED SCHOOL OF MECHANICAL TRADES

1338-1340-1342 So. Michigan Ave. - Est. 1928 423 Allied Bldg. CHICAGO 5, ILL



Easy to improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: New Free Book, "How to Become a Good Penman," or check books wanted, \$1.00 each. Dusiness Writing Dartistic Writing Card Writing Engrossing Alphabets Bird and Design Flourishing Complete Set \$4.50 Faclose 10c for your name beautifully written and special penpoint for shaded writing.

5. A. Ziller, President, TAMBLYN SCHOOL OF PENMANSHIP 441 Ridge Bidg. In Business Over 52 Years Kansas City, Mo., U.S.A.



MAKE MONEY CASTING HOLE REE FACTS SENT ..

Make your own perfect rubber molds cheaply. Cast Thousands, of perfect Book Ends, Ash trays, Etc., from every mold. Enormous Profits. Start Small. Grow Big. X. L. Rubber. Pts. \$2.00. Qts. \$3.50. Gallons \$8.95. Models and enough rubber for 3 molds. \$1.00. Foreign \$1.50. Plastic Arts Studio, Rt. No. 2, Dept. 65, Muncie, Ind.

OCKSMITHING & Key Making

PRACTICAL UP - TO - DATE COURSE

Easy-to-learn modern information for self-instruction. How to work on locks, de-code, make master-keys, repair, install, service, etc. For every handyman, home owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 53 plain illustrated lessons. Full price only \$3.95. SEND NO MONEY. Just pay postman plus C.O.D. postage. Or send \$3.95 with order, we'll ship postpaid. Satisfaction guaranteed or refund.

NELSON-HALL CO., 1139 S. Wabash Ave., Dept. CO2, Chicago 5, Illi-

SAY YOU SAW IT IN POPULAR MECHANICS

WORLD'S MOST FASCINATING HOBBY! SEND FOR FULLY ILLUSTRATED BOOK TODAY!



GET THE FACTS on model railroading! Learn how easily you can enjoy the fav-orite hobby of thousands of mechanics, business and professional men. Endlessly fascinating...scale model railroads look, perform amazingly like the real thing!

BOOK SHOWS HOW to get started. Leading authority gives easy steps in com-plete, 32-page beginner's manual. Pro-fusely illustrated with photos, diagrams. Send 10c, coin or stamps, today! Address

MODEL RAILROADER MAGAZINE Dept. 1515, Milwaukee 3, Wis.

9 will teach you... ELECTRICAL APPLIANCE REPAIRING LEARN IN

YOUR OWN HOME BY BUILDING, TESTING, REPAIRING

 Learn this fascinating, big money-making business. Repair all kinds of electrical appliances. Millions now in daily use will eventually require repair. Thousands of new appliances sold daily in all parts of the country! These unlimited prospects mean you will always have places to do profitable jobs. If you are mechanically inclined (can hold and use tools), you can qualify for this big steady-paying field. It is not at all unusual for appliance repairmen to charge on the basis of \$5.00 to \$6.00 an hour! WE TEACH YOU EVERYTHING! What trouble to look for, how to detect it, and how to quickly repair the appliance! Our course is written in simple, easy-to-understand language, is profusely illustrated with photographs and drawings and shows you each and every step! Also shows you how to build the power tools you need. Our FREE advisory service is yours for LIFE! Should intricate technical problems arise or the need for a special repair part, simply call on us! We teach you how to solicit business and how to keep it coming to you! Not a theory course but a practical, honest-to-goodness course written by and used by repairmen the country over. Price of course is so low the repairs on your own appliances should pay for it many times over.



S. T. CHRISTENSEN President & Founder

New Electronic Kit Does All!

AND BEST OF ALL I'LL SEND IT TO YOU

 Knowing how valuable Practical Shop Training Experience is, particularly in the Electrical Field, I will send to you the CHRISTY ELECTRONIC KIT. It will be sent to you completely unassembled, together with detailed instructions on how to assemble this portable all-purpose, electric trouble finder! Read the partial list of its multiple uses listed below and realize how valuable and helpful such a kit will be to you! Every part is sent to you including the lightweight case, precision meter, jacks, etc., etc., even down to the very last screw! In addition to the practical electrical experience just assembling this kit will provide, we also include complete in-structions as to the many, many ways this delicate instrument can be used by you. It took us years of

academic training and years of hard work to obtain the knowledge this kit will give you. The combination of our Course and Electronic Kit will go a long way towards ASSURING YOUR SUCCESS.

RUSH COUPON NOW!

MODEL 390 TESTS

- Current Consumption
- **Heat Controls**
- Electrical Circuits
- Motor Windings
- Shorts

- Refrigerators, Radios
- Irons, Fans
- Washing Machines
- · Motors
- · Hou

se	Wiring,	

Address

CHRISTY SUPPLY CO. 2835 N. Central Ave., Dept. D-5503 Chicago 34, Illinois

Please send me free illustrated literature about America's Fastest Growing Industry — ELEC-TRICAL APPLIANCE REPAIRING.

Name



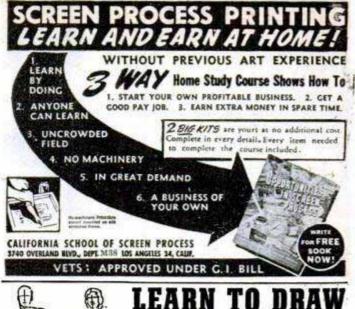




Figure drawing from life is easy with the "ACTION LINE" method most simplified of all methods. Start drawing at once, following amazing step by step directions. You'll thrill at the ease with which you can learn. Rush order today. Send only \$1.00 for 24 page. 9 x 14 inch portfolio "Figure Drawing from Life"—Action Line Method. Money back if not satisfied.

FREDERICK J. DRAKE & COMPANY

600 West Van Buren St., Dept. 13

Chicago 7, Ill.





WITH OUR NEW KIT need to get started in this money making field.
Contains new and complete book, "Modern Watch
Repairing & Adjusting" and QUALITY TOOLS:
TWEEZER, LOUPE and SET OF 6 SPECIAL
SCREW DRIVERS. Book is fully lilustrated, easy
to understand. Shows every step in repair,
adjustment and use of tools. \$5.75 Post
All for only \$5.75 Post TOOLS \$2.95

All for only
OR ALONE: BOOK \$3.25 - ALL TOOLS \$2.
(If C.O.D., plus charges.) MONEY BACK GUARANT MODERN TECHNICAL BOOK & TOOL CO. pt. MMC, 55 W. 42nd Street, New York 18, N.

JUST OUT! NEW ALL INCLUSIVE TOOL CATALOG Over 450 ILLUSTRATIONS AND IDENTIFICATION CHART. NEW REDUCED PRICES. All tools, materials, complete 5ets for STUDENTS, Watch-Clockmakers, Jewelers, Handicrafters. All books in these fields.

SEND 25c — Free with above order.

RADIO ENGINEERING, Broadcasting, Television, FM, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. Engineering course equivalent to 3 years' college radio work. Approved Veteran Training, Catalog free. VALPARAISO TECHNICAL INSTITUTE, Dept. D, Valparaiso, Ind.

Big Money-Makers in a Single Line! Amazing New Fluorescent Lights with Circular Tubes



building trades. Le nipod shops. Approved for Veterans.

MIDWEST SCHOOL OF BUILDING TRADES, Dept. A1-3

I N. Center Street

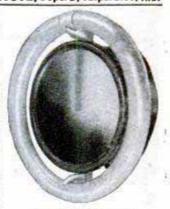
Bloomington, III.

Couffit Don't send a penny. Sample Outfit is FREE. Rush name on penny post card for moneymaking facts about sensational new "CIRCLINE" Fluorescents. Latest scientific development gives you 22 new type circular tube fixtures for kitchens, dinettes, halls, and play rooms. Also Floor and Table lamp for living rooms and pin-ups for shaving and vanity tables. Sells on sight to homes, restaurants, stores, offices. No other fluorescents like CIRCLINE. Salesmen who order samples quickly reorder in large quantities. All fixtures complete with tubes. No waiting. Also immediate delivery on all standard type Fluorescent Fixtures. This is too good to miss. Big, quick profits waiting. Rush name on postcard today for FREE Sales Outfit.

MAXILUME COMPANY

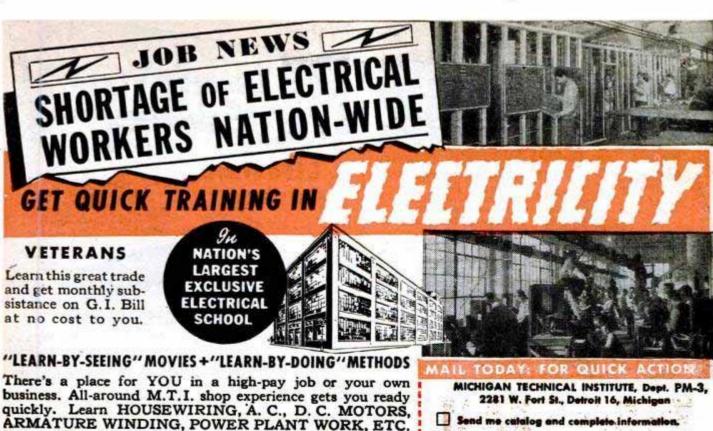
125 W. HUBBARD

DEPT. 83



NEW MAXILUME PIN-UP MIRROR LIGHT

CHICAGO 10, ILLINOIS



There's a place for YOU in a high-pay job or your own business. All-around M.T.I. shop experience gets you ready quickly. Learn HOUSEWIRING, A. C., D. C. MOTORS, ARMATURE WINDING, POWER PLANT WORK, ETC. Not a "Home Study" course. Friendly, skilled licensed instructors. New classes start every few weeks. Part-time work available. Living arrangements made.

MICHIGAN TECHNICAL INSTITUTE

Department PM-3, 2281 West Fort Street, Detroit 16, Michigan

I am a Gl. Send special information. Morried Single. NAME_ ADDRESS ZONE STATE

4 Want Ads in Newspapers in One State in One Month Alone, Show Amazing Big Demand for

TRAINED AUTO BODY, FENDER and PAINT MEN

Here's A BIG OPPORTUNITY to earn more money in a steady, good pay job. This specialized trade taught you thoroughly and quickly the practical, modern way by the SWEENEY SYSTEM of Practical Experience. 87,675 auto and tractor mechanics taught since 1908 in my schools, nationally known. All the latest, modern equipment, expert teachers, tools furnished. YOU LEARN BY DOING—PRACTICALLY. Your future success depends on proper training—and getting into a business that is NOT overcrowded. Get the FREE PROOF, the full particulars about this most amazing opportunity for a quick, BIG PAY JOB. Write today.

APPROVED for VETERANS TRAINING Under P.L. 346 and P.L. 16

SWEENEY AUTO SCHOOL, Inc. Kansas City 1, Mo. Dept. 19, 2901 East 14th St.



MASTER AVIATION MECHANICS, CAA Approved 1 Yr. Airplane &
Engine Mechanics Course, REFRESHER
AIRPLANE & ENGINE MECHANICS. Designed
for veterans with aviation mechanics experience.
Either course is available to veterans under the G. I. Bill
of Rights. Write today for complete information.

LINCOLN AVIATION INSTITUTE

UNION AIR TERMINAL

DEPT. P-3

LINCOLN, NEBRASKA

E. J. SWEENEY 87,675 men hav come to E. J

CAN BUILD A FUTURE IN PHOTOGRAPHY

If you are unhappy in the work you are now doing — this ad may be the turning point in your career. For 38 years the New York Institute of Photography has been training ambitious men and women for success. Harry White says, "Success has come my way — thanks to N. Y. I." Nationally famous Victor dePalma writes from Mexico City, "N. Y. I. training started me on my road to success."

RESIDENT TRAINING AT AMERICA'S LARGEST PHOTO SCHOOL

At our famous resident school, in New York City, you will find busy men and women in training for photographic careers. Our students learn in spacious, well-ventilated studios and laboratories, occupying, 16,000 square feet devoted exclusively to photographic instruction. There are nine studios and 12 laboratories filled with the most modern equipment for every phase of photographic work and training. Our faculty is composed of top photographic "aces" who devote their full time to the instruction of our resident students.

HOME STUDY COURSES LEAD TO SUCCESS

Many ambitious men and women take the N, Y. I. short-cut to success in photography by studying at home in their spare time. The N. Y. I. Home Study Course is clearly illustrated, easy-to-read, easy-to-understand. Staff Instructors supervise your progress — step-by-step. No expensive equipment is needed. In fact, many N. Y. I. Home Study graduates tell us that they made enough money while learning to pay for the cost of the course.

Resident Training is Available Under The G. I. Bill FREE! Plan your future! Send the coupon right now for our big book in color showing the important phases of photography—glamour, commercial, portrait, color, action, pets, children, theatrical shots, news. IT'S FREE!

NEW YORK INSTITUTE OF PHOTOGRAPHY 10 West 33 Street New York 1, N. Y.

Dept. 49, 10 W New York 1, Ne Please send me	w York your beautiful four-color catalog illus-
trating all the	different phases of photography and YEAR N.Y.I. Home Study Course.
- Amining	(Please Print)
	A CONTRACT OF STATES
Address	Manual Control

Keeps Cars Rolling by Making Repairs and Adjustments Easy!

AUDELS AUTO GUIDE For Every Mechanic, Driver, Owner and Repair Shop.

Sent on 7 Days Approval Shows How to Tune Up—Keep Brakes Safe—Batteries Power-ful—Tire Mileage Up—Save Gas—Lubricate Correctly.

ANSWERS YOUR QUESTIONS Contains all you need to know about 1-Construction, about 1—Construction, 2—Operation, 3—Service, 4—Repair of Modern Motor Cars, Trucks, Buses & Diesel Engines in every detail.

NEW FLUID DRIVE TREATED Easy to understand-1540 Pages, 1540 Illustrations. Gives definite directions on

How to handle service jobs. ASK TO SEE IT- Get this information for yourself \$4 COMPLETE . PAY ONLY \$1 A MO.

AUDEL, Publishers, 49 West 23rd St., New York
Mail AUDELS AUTOMOBILE GUIDE (\$4) for free examination, if O. K., I
will send you \$1 in 7 days; then remit \$1 monthly until \$4 is paid.
Otherwise, I will return book promptly.

Kame
Address
Occupation
Reference

Increase your income-train for a successful career at Spartan, internationally famous school, government-approved and industry-recognized. Personalized training under industry-wise instructors on "live" aircraft, the same as you work on after graduation. Complete, thorough

immediately



courses in every phase of aviation. Investigate the many opportunities in this fast expanding field. G. I approved.

State



Street



To Lift Yourself from a Futureless Job

LEARN WATCHMAKING

Training

and earn from the start, higher than average pay . . . easy hours . . . ideal working conditions . . . be prepared to establish your own business.

WATCH REPAIRING - JEWELRY - ENGRAVING **Always in Demand**

Requests for our Graduates from Everywhere. Permanent positions (no layoffs) \$75.00-\$100 per week for trained men. Write today for latest FREE Catalog.

KANSAS CITY SCHOOL OF WATCHMAKING

America's Most Progressive Horological School 617 621 Wyandotte St. Kansas City 6, Mo.



48 complete plans of toys, ash trays, garden ornaments, Dutch boys and girls, what-not shelves, and many other interesting projects. Finest selection available. Novel method allows you to make finished project any size desired. FLUS FREE DeLuxe Plan of corner shelves. Send only \$1 to

© Burn-Rite Wood Burning Detachable Pen

Only one of its kind. Write for complete list of casting Underand wood burning sets. Writers RAPAPORT BROS. INC.
Dept. PM3, 1830 S. Washtenaw Avenue

EACH POSTPAID

Chicago, Illinois

DEVELOP RUGGED



Strong Men's Club of America offers FREE Membership!

Send for your personal membership card and Strength Secrets. No dues! No obli-gations! Many valuable privileges! Send name, address, age, on penny postcard.

JOE BONOMO Strong Men's Club of America Director (Dept.PM3A) 1841 Broadway, N. Y. 23, N. Y.

Amazing discovery permits you to print pictures from any of your snapshot negatives on wood, cloth, leather or paper. Like magic your pictures will show on ties, handof your snapshot negative. Like magic your pictures will show on ties, hand-kerchiefs, purses, cards, and letterheads. Takes only a few minutes in broad daylight. Won't rub off or harm negative. An attractive set with enough material for over 160 pictures. ORDER TODAY. Send \$1.00 postpaid. C. O. D. pay postman a few cents more in addition. (Foreign \$1.50 money order only.) STYLE-ARTS, inc., Dept. PM-14, 2427 Cortland, Chicago 47, III.

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!

Complete Optics! Complete Metal Parts! Save More Than 1/2 Regular Cost



GOVERNMENT'S 7X 50 BINOCULARS

Complete Optics, new and ready for assembly. We supply full instructions. Limit—1 Set of Metal Parts and 1 Set of Optics to a

Limit—1 Set of Metal Parts and 1 Set of Optics to a customer.

METAL PARTS — Set includes all Metal Parts—completely finished—for assembly of 7X 50 Binoculars. No machining required. Bodies have been factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

33.40 Postpaid, plus \$4.80 for Case — Total \$44.20 enses and Prisms you need for

Stock #842-H.

ARMY'S 6X 30 BINOCULARS

METAL PARTS ONLY—Model M-13A1, 6X 30 Binoculars. No Optics. Same Metal Parts as described for Stock #830-H. Stock #832-H 6X 30 Metal Parts......\$25.00 Postpaid

SAME OPTICS AS ABOVE (6X 30), Coated - but slight seconds.
Stock #5124-H 512.75 Postpaid

If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

Optics and Metal Parts are Available for Monoculars (1/2 a Binocular). For Complete Details, Write for Bulletin #14-H

with carrying case. Stock #941-H.....



MOUNTED PROJECTING LENS SYSTEM

F.L. 91.44 mm. (just right for 35 mm, Projectors). Speed of F 1.9. Outside dia, of mount at one end 60 mm. Length of mount 64 mm.

Stock #4033-H \$3.00 Postpaid

THREADED OUTSIDE MOUNT FOR FOCUSING ABOVE SYSTEM (Not Illus.) Stock #715-H\$1.00 Postpaid

SATISFACTION GUARANTEED

EDMUND SALVAGE CO.,

NEVER HAS THERE BEEN SUCH A SENSATIONAL BARGAIN AS THIS!

BUBBLE SEXTANT



We have a Limited Quantity of Condensing Lenses-seconds—ranging from 4½" to 8½" in dia. with various focal lengths. Send for Free Bulletin titled "MISCEL-LANEOUS CONDENSING LENSES—H."

POLARIZING VARIABLE DENSITY ATTACHMENT FOR BINOCULARS



An amazingly effective unit for controlling amount of light reaching your eyes. Cuts down glare in sky and over-water observations. Easily snapped on and off over the eye cups of American-made 7X50 Binoculars. Govt. cost \$8.30 Above Polarizing Attachment also adaptable to Govt. 6X30 Binoculars with substitution of special Eye-cups. Stock #20,010-H, 6X30 Eye-cups 75c pr. Postpaid SCHMIDT OPTICAL SYSTEM. Black plastic body, size 3-15/16" by 5½". F.L. 2.4" with amazing speed of F.O.9. Used in Navy's Infra-Red Sniperscope and Signalling Units, Govt. cost \$134.

Stock #720-H \$6.00 Postpaid

\$200.00 DRIFT METER for \$4.95

These were used for determination of drift and true air speed. You can adapt to other uses or take apart to get 2 mounted Achromatic Lenses.— Mirrors—Field Lens—Pantograph— Engraved Scales - Sponge Rubber Discs-metal parts and other components. Instrument weighs 4 lbs. Stock #936-H. \$4.95 f.o.b. Chicago, III. (Shipping weight 121/2 lbs.)



Same Unit Without Polarizing Attachment Stock #916-H \$2.50 Postpaid

We have literally millions of war surplus lenses and prisms for sale at bargain prices. Write for Catalog "H" Sent Free!

Order by Stock No.

P. O. Audubon, New Jersey

BUILD YOUR OWN LARGE IMAGE TELEVISION

BIG SAVING IN

WITH THE TRANSVISION TELEVISION NO TECHNICAL KNOWLEDGE REQUIRED!

Only about twenty hours of enjoyable work on the easy-to-assemble Transvision Kit-and you have a high-quality large-screen (12") television self Here's a first-row seat at fights, games and plays.

Save 50% of expensive assembled set costs! At only \$289.50, the famous Transvision 12" Kit gives larger, clearer picture and sound than sets selling at \$500.00.

The Transvision Kit comes complete with all tubes, pre-assembled and pre-tuned R.F. (tuning) unit and I.F. coils, antenna even solder!

EASY TO ASSEMBLE. No technical knowledge required. All assemblies requiring test equipment are pre-wired for you. All you do is finish off the assembly with a screw-driver and soldering iron.

FLASH! Brand new 15" kits now available for large groups. Tremendous springs. Transvision 7", 10" and 12".
Kits also ready for immediate delivery.

Write today. Learn how thousands have cut expensive television costs in half. Follow our step-by-step directions and sure as much as \$250. Write for further free details to Dept. P.M.



BEACON TELEVISION, INC

785 THIRD AVENUE

NEW YORK 17, N. Y.,

W! Build Your Future

Opportunities

LOOK around you. See the way tractors, trucks, buses, railroads, ships, power plants and equipment of many kinds are "going Diesel." Every day new opportunities are opening—in industrial and farming communities—for trained men who can install, maintain, operate and repair Diesel engines. Plan now to build your future in this growing field.

Diesel Knowledge is Earning Power

You don't have to give up your present job. Now, you can begin learning DIESEL in spare time at home. UEI practical training teaches you, step by step, how Diesel engines operate, how fuel systems work, repairs, accessories and auxiliary equipment; a world of Diesel "know how." Includes actual practice on Diesel equipment in our shop under expert guidance. UEI training methods are successful. For 20 years they have helped mechanically inclined men better themselves.

Coupon for

NOW IT'S UP TO YOU!

Coupon below brings you all the facts without cost of ebligation. Get going today! MAIL COUPON NOW

ENGINEERING 1997 INSTITUTE 2521 Sheffield Ave. Chicago 14, III.



D. Chicago 14. III.
lesel opportunities and training.
over opportunities and stammer.
Age

ADDRESS

Zone or County STATE Check here for special information if you are under 17.



TURRET TOOL BI

Square turret indexes within .0005". Rocker adjustments provided for tools. Mounts on cross slide. Fits current model South Bend Lathes, adaptable to others. Write for dimension sheet.



	Size athe	Size Sq.	Takes Tools	. Pr	ices
Г	9"	3"	4' x 4'	\$40	\$45
	10"	3"	** x **	40	45
1	13"	3.	*"x *"	-	50
16	145	4"	%" x %"	-	70
1	16"	4-	* x *	70	75

* Double Tool Cross Slide Model * * Compound Rest Cross Slide Model

SOUTH BEND LATHE WORKS 455A E. Madison St.

DON'T DELAY DRAFTING Start QUICK in

Guaranteed Home Training Until You Get a GOOD PAY JOB

Ample Supplies & Tools Furnished

More Pay, Better Job, Pleasant Working Conditions. Start now to invest in a successful, profitable future. Thousands of new positions. ACTIVE JOB PLACEMENT. Write today for facts and FREE information

WEST COAST ENGINEERING
Box 2303, Terminal Annex
Los Angeles 54, California DEPT. 221



ITALIAN ACCORDIONS

All types, all models. Very Best. Hand Made, Lowe prices. Buy direct from Factory representative a Save money. Send name and address for free catalo

ITALIAN ACCORDION MFG. CO. 7600 Cottage Grove Ave., Dept. PM-3, Chicago 19, III.



This new molding compound with 70% natural rubber concentration is easier to use, gives cleaner, sharper, more profitable castings. Order now at these low prices: 53 Qt., \$5 ½-Gal., \$8.50 Gal., \$7.50 per Gal. in 5-Gal. Cans. Send check or m.o. New Molding Manual sent with each order.

FRANCIS RUBBER PRODUCTS CO. Dept. C-3, 1836 E. Fulton Columbus 9. Ohio

to Make ART **OBJECTS** with RUBBER MOLDS

HOW

HOW TO CUT RAFTERS

New vest pocket book gives lengths, side cuts, plumb cuts, deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws, All standard pitches from 1/8 to 5/8. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price one dollar, (\$1.25 in Canada). Builders' Topics, Bept. S. Lock Box 828, Seattle, Washington. CARPENTERS, PLUMBERS, PLASTERERS, ELECTRICIANS, ETC. subscribe for Builders' Topics, the monthly magazine for HE-MAN CONSTRUCTION WORKERS. Only \$1.00 per year, (In Canada—\$1.25). Sample copies 25c.



PURE-BRED CHINCHILLA RABBITS

NO EXPERIENCE REQUIRED. Costs little to start, Just a rew minutes daily and a few feet of backyard space. Several females and one male starts a large herd which can furnish you an income for years. WE SUPPLY ALL INSTRUCTIONS FREE! Tremendous demand for breeding stock, delicious meat and world's most beautiful rabbit fur. Dealers, cut off from imported rabbit pelts, need thousands of these luxurious Chin-Chin furs new. Write today for free, illustrated booklet. The profit possibilities in this fascinating business will amaze you! Satisfaction guaranteed.

LOW BROOK FARM R-36 SELLERSVILLE, PA. WORLD'S LARGEST BREEDER OF CHINCHILLA RABBITS.



Dries in about one hour to smooth, mirror-like professional finish.

GUARANTEED

FOR 2 YEARS not to crack, chip, peel or fade, if simple directions are followed. Lustr-Wipe is NOT a wax or a polish but a marvelous new Auto Enamel.



Brushing Spraying Streaks

Follow the simple instructions and LUSTR-WIPE will give your car that new FACTORY-LOOK. Dries dust-free in about an hour. Goes over any color, enamel or lacquer.

ONE QUART PAINTS YOUR ENTIRE

ANYONE CAN DO A BEAUTIFUL JOB
LUSTR-WIPE is the easy, speedy, economical, yet most successful way
you've ever seen to PAINT YOUR OWN CAR, It's different-works
almost like magic! All you need is ONE QUART of LUSTR-WIPE, the
Miracle Auto Enamel, and the powder puff we send you AT NO EXTRA
COST. Almost ANYONE, can do a magnificent job in about ONE
SHORT HOUR. It seems unbelievable but true, JUST WIPE IT
ON. No brush needed. No spray required. No masking of any kind,
LUSTR-WIPE dries dust-free in about an hour, You'll be amazed—
thrilled beyond words with the results! Your friends will think you spent
\$75 to \$125 for a professional paint job. YOUR CAR WILL LOOK
"LIKE NEW", Rush your order for a quart of LUSTR-WIPE TODAY.

Immediate PER QUART ORDER ONE OR MORE Applicator QUARTS TODAY **Furnished**

SEND	NO MONEY!	ORDER LU	JSTR-WIPE	TODAY!
LACK or	GREY (Gunmetal	Grey-Dark, A	Air Wing Gre	y-

. \$3.95 per Qt. . 3.95 per Qt. . 3.95 per Qt. . 3.95 per Qt. . 3.95 per Qt. Light)
GREEN (Brewster-Dark or Jewel-Light)
BLUE (Washington-Dark or Monticello-Light)
SUN BEIGE (Tan)

MAROON
Order one quart or more today! SEND NO MONEY!
Mail penny posteard. Then pay postman for LUSTRWIPE plus postal charges. Or, if you send money with
order, WE pay postage. See your dealer or order direct.

MAIL COUPON TODAY! SEND NO MONEY

AGENTS WANTED FOR NEW MONEY-MAKING BUSINESS! CAN MAKE GROSS PROFITS UP TO \$275.00 IN ONE WEEK.

Go into business for yourself selling LUSTR-WIPE in cans, or painting cars yourself or having others to do the work. Owners of old cars everywhere (who can't get new cars) are easy prospects. Send now for our MONEY-MAKING PLAN.

DISTRIBUTORS WANTED: A few wonderful territories now available. Write at once for our SPECIAL OFFER,

LUSTR-WIPE CORP. 166 W. Washington St. Dept. 3, Chicago 2, III.

Send for free details of powerful money-making plan. Why wait? The weather is ideal for painting cars. START NOW BY ORDERING ONE OR MORE QUARTS OF LUSTR-WIPE TODAY!

Please send me_	166 W. Washington, Dept. 3 quarts of LUSTR- special price of \$3.95 pe	WIPE AUTO
	id. Full Payment \$ plus Postal charges.	enclosed.
ADDRESS.		
CITY	ZONE_STA	TE
☐ Send informat ☐ Send informat	ion regarding AGENT Pl ion regarding DISTRIBU	LAN. TORSHIP.



NIGHTS AT HOME! L L.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, sim-

plified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you learn by doing-han-

dling legal problems—not by memorizing rules. Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St. Dept. 364-L Chicago 5, ILL.

Send me your two FREE booklets described above, without obligation,

Name_____Age_____A

City, Zone & State ____

AIR CONDITIONING-Trained men paid well to service, install, maincommercial refrigerators. Oppor-ings. Train at home or in our big tunity for full time, spare time earnings. Payment Plan and Pay After Graduation Plan.) Send for FREE BOOK-LET AND FULL INFORMATION. No obligation.

COMMERCIAL TRADES INSTITUTE, Dept. A2-3 1400 W. Greenleaf Chicago 26, Illinois



Great fun for every occasion!! Start this record on any phonograph and NO ONE CAN TELL THE WINNING HORSE—Not Even the Owner! Has all the thrills and sound effects of BIGTIME racing! Comes complete with scoring sheet. Send TODAY sure . . . Safe Delivery Guaranteed. (Write for wholesale prices.)

STAR SPECIALTY CO.

DEPT. PM 1 BUTLER, PENNA.

Postpaid (Tax Incl.) 2 for \$2.50

Get correct answers fast and easy with JOSSELYN'S "QUICK TRIGONOMETRY." Improve your Trig at once! Simple and clear. Concise, reliable Short-cut. Great "Magic Circle" and all basic formulas included. Experts recommend it; so solve fast and easy all your plane Trig problems. You can honestly depend on JOSSELYN'S—it has just what you want. It must satisfy you or 5 day money-back guarantee. Send for JOSSELYN'S C.O.D. plus postal fees. Or just send \$1.00 now and we mail fully paid.

EDCO SCIENTIFIC MFG. CO. P. O. Box 531, Hollywood Station, Hollywood 28, California

New 1948 PLASTICS SUPPLIES CAT

Just off press. Full details on Plexiglas, Lucite, rods, sheets, tubes, Acetates, cements, dyes, buffs, molding sets, tools, carving kits, accessories. Everything in plastics. Gives prices, sizes, colors, etc. Send 6c, stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP. 4707 EUCLID AVE. . CLEVELAND 3, OHIO

World's Finest Sport **Exciting Fun—Harmless**

Just Out! Two 3 ft. Spring Steel Folis with Safety Rubber Buttons. Complete Outnit 2 folis (swords) with hand guards and Free Instruction Book Now Only \$1.98 Postpaid. A healthful and clean sport, makes you Strong and Alert. Instruction Book teaches Quickly—Easily. Mail check or Money Order for \$1.98 Today. Add 28c for Foreign Postage.

LEE PRODUCTS CO., 1613-M First Ave., New York 28, N. Y.

RUPTURE SUFFERERS GET



Get comfortable, safe relief with scientific support. Soft, sanitary material gives natural support with real comfort to active wearers. Satisfaction guaranteed. For free literature write:

WEB TRUSS CO.

Dept. M-8, Hagerstown, Md.



\$200 GROSS IN MY FIRST WEEK!

Some Make More, Some Less . . . Start This Business for YOUR OWN

FREE BOOK! MAIL COUPON

VON SCHRADER MFG. CO. A381, Racine, Wis.

Send at once (no obligation) your FREE booklet con-taining information about your Electric Rug Washer and how I can own my own permanent, profitable business.

Address.

(Zone)___ State City

Would YOU like to own a permanent, year-round business in which it is possible to take in as much as \$200 gross the first week, as did L. A. Eagles? R. E. Traynor says, "I made \$62 gross in one day." R. R. Newlin reports, "I have averaged \$173 gross per week." Others report gross from \$100 per week to \$12.000 per year.

Surely YOU will want to investigate a golden opportunity like that. You need not have any special skill or experience, but if you are ambitious, honest and courteous, we will help you to start and succeed in YOUR OWN money-making business where net profits are high.

No Shop Necessary

Our Electric Rug Washer cleans rugs and carpets like new right on the customer's floor. This quick, thorough and highly efficient method removes dirt and grime, thus restoring the natural, fresh beauty of floor coverings. Anyone can run it. Rugs and carpets are not harmed.

There are hundral harmed.

There are hundreds of possible customers in YOUR vicinity. Most of them have several rugs needing regular cleaning. To get a quick start,

shampoo a few rugs or carpets. These customers tell their friends and soon you should have an independent, prosperous business, and you should be able to keep it growing. Send the coupon RIGHT NOW for booklet that explains everything.

Every Machine Guaranteed and Easy to Own

investment. Don't de-lay your BIG opportu-nity. Send the coupon AT ONCE,



MAIL COUPON TO

VON SCHRADER MFG. CO., A381, RACINE, WIS.

How to build repair—remodel your home . . .

How to do all kinds of wiring and installation jobs—in accordance with the latest National Electrical Code



NATIONAL ELECTRICAL CODE HANDBOOK

By ARTHUR L. ABBOTT

Here is a book that shows you the right way to do all kinds of wiring jobs — quickly and easily. It explains every rule in the 1947 Electrical Code — tells how to apply them in specific situations. Saves delay — helps you avoid violations — and answers your questions on wiring motors, switches, generators, appliances, cable assemblies, transformers,

633 pages 421 illus.



CARPENTRY

for the Building Trades

By ELBERT A. LAIR Contractor, Builder, and Instructor

This helpful manual gives you complete details on how to handle every phase of carpentry work involved in house-building

framing, roofing, siding, lueprint reading, lumblueprint

ber ordering and estimating, etc. Fully illustrated, its step-by-step instructions provide sound guidance from the plan to the finished job. This is your key to better, quicker, more economical construction—in strict accordance with FHA requirements.

SEND NO MONEY

SEE THESE BOOKS 10 DAYS FREE

McGRAW-HILL	воок со.,	Inc.,	330	w.	42d	St.,	N.Y.C	. 18
Send me the boo	k(s) checked	below	for	10	days'	exar	ninatio	on or
approval. In 10					books	or 1	return	then

Abbott's National Electrical Code Handbook, \$4.00 Lair's Carpentry for the Building Trades, \$2.50

Name		
Address		

City and State, Company,

Position. PM-3-48 (For Canadian price, write McGraw-Hill Co. of Canada Ltd., 12 Richmond Street E., Toronto, 1.)



For Men Who are Trained in

Men 18 to 60. Want a future with good pay, perhaps a business of your own later? If you are mechanically inclined, start now to learn to become an auto body mechanic and fender repair man. This fast growing field has great possibilities for trained men with ex-perience. U.E.I. sparetime, home-study training comperience. O.I.I.I. sparetime, nome-study training com-bined with actual shop practice gives you sound, basic knowledge of latest, best methods so you may get the experience which may bring you big pay. Capable instructors supervise your studies and actual prac-tice. Course includes acetylene welding, spray paint-ing, use of hand and power tools, etc.

Thorough, Reliable Training
U.E.I. has trained men for new opportunity fields since 1927
and many students are now making good. Auto body and
fender repairing is one of the best profit-makers in any garage or service station. Little capital required for mechanically inclined men to get into this business. . . employment
placement service, or we'll show you
how to start your own shop. Get facts
FREE. No obligation, Write today.

Training approved
under G.I. Bill

UTILITIES ENGINEERING INSTITUTE

AUTO-CRAFTS DIVISION
2523 Sheffield Ave., Dept. 138-X, Chicago 14, III.
YES! I want to get into profitable Auto Body & Fender
Repair Work, Please send me Free Facts at once.

NAME	 Age
ADDRESS	

Zone or County STATE. Check here for Special Information if under 17.

MAKE \$50 A DAY!

Be INDEPENDENT in your own business



with our TRADE

SECRETS

START your own business in your spare time with 15 private manufacturing processes-like REMOVE-ALL Paint Remover.

In your own home—garage, basement, kitchen, fill the demand for this revolutionary, non-flammable paint and varnish remover and 14 other wanted

We tell you ALL! How to MAKE. Where to BUY simple inexpensive materials. How to Package, Promote, SELL. If you can follow simple direc-tions, here are 15 roads to success. We give you full details on all 15 processes!

The public NEEDS these 15 products. You, yes you, can make them. And you can have OTHERS SELL THEM for you, too.

Lose no time! Write for details! CHEMICAL RESEARCH CO.

214 West 42nd St.

New York 18, N. Y.

Protect your home

A little foresight now may save LIVES and property later! Equip your home, your garage, your boat with AUTOFYRSTOP, the modern fire extinguisher and alarm that is setting new efficiency records. Write for free literature:

AUTOFYRSTOP CO. Dept. PM-348 2035 Washington Av., Philadelphia 46, Pa.

MONEY MAKING OPPORTUNITY

We have openings for high grade salesmen in choice territories. Write for Plan.



SMASH **IN 324 PAGE** Wholesale Book

Dealers, agents, salesmen and jobbers, you will find this book bulging with Tested Money Makers. Latest catalog shows makers. Latest catalog shows average price reductions about 21% on many items. A guarantee of satisfaction stands back of every purchase you make from us. 25c brings you this latest 1948 wholesale catalog of Tested Sellers. You may take credit for the 25c on your first order. In that way the Book will not cost you any money. Get your copy now, before supply is depleted.

SPORS CO.

1-48 Dodge

Le Center, Minn.

Handy Mail Order List

Little Library of Useful INFORMATION

Here at amazingly low cost is the practical help and information you have always wanted. Articles in previous issues of Popular Me-chanics have been classified according to sub-ject and are now available in these handy reprint booklets.

Articles in previous issues of Popular Mechanics have been classified according to subject and are now available in these handy reprint booklets.

How to Use Measuring Tools—Micrometers, Calipers, etc.—106.

Micrometers, Calipers, etc.—107.

Drill Presses, Grinders, Etc.—79.
Wood, Metal Turning-Lathes—81.

Filing Machine, Hacksaw, Cutoff Wheel, Shaper—82.

Lathe Tools You Can Make—101.

Workbenches—Tool Cabinets—47.

Spray Painting—94.

From Pattern to Casting—91.

Tool and Saw Sharpening—92.

How to Read Blueprint—71.

Metal Turning Lathe Kinks—99.

Operating a Metal Lathe—100.
Heat Treating, Herdening—102.

Working With Glass—103.

Servicing Elec. Motors—75.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering and Brazing—17

Arc and Soot Welders—5.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering and Brazing—17

Arc and Soot Welders—5.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering and Brazing—17

Arc and Soot Welders—5.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering and Brazing—17

Arc and Soot Welders—5.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering Electrician—43.

Soldering Electrician—43.

Soldering and Brazing—17

Arc and Soot Welders—5.

Electromagnets & Solenoids—44.

The Boy Electrician—43.

Soldering Brazing—17

Arc and Soot Welders—5.

Flettroplating With Nickel. Chromium. Etc.—86.

Backyard Gardening—39.

Lawn and Garden Furniture—77.

Playground Feningense.

Book Ends—52.

Small Solutes—12.

Cosmetic Formulas—12.

Cosmetic Formulas—12.

Cosmetic Formulas—12.

Cosmetic Formulas—12.

Cosmetic Formulas—3.

Small Looms—37.

Servicing Electrician—43.

Stop Alore Electrician—43.

Stop Alore Electrician—43.

Soldering Electrician—43.

Solder

Check Titles Wanted, Clip, Mail with Remittance to POPULAR MECHANICS PRESS, Dept. 635, 200 E. Ontario, Chicago 11

82



When you are trained by RTA's Hollywood Experts, you too can qualify for big, interesting GOOD-PAYING technicians jobs, or YOUR OWN profitable radio repair business.

can handle.

25 Years of Success
RTA's long years of experience assure you quickest
progress. If you are at all
mechanically inclined, RTA
can teach YOU to MAKE GOOD in Radio-Television.

MAIL TODAY!

GET FACTS! SEND FOR

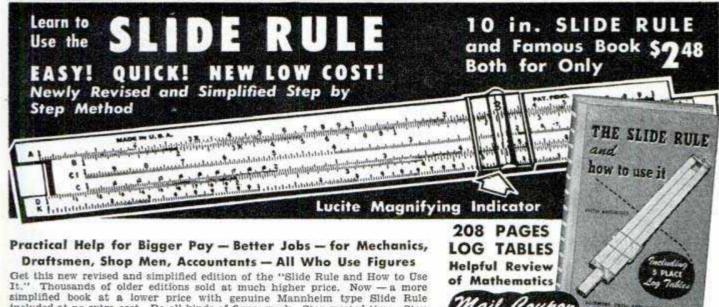
Fill out the coupon TODAY and your FREE 30-page Radio-Television book will go out at once. No obligation, RTA APPROVED FOR VETERANSI

APPROVED FOR

RADIO TRAINING ASSOC. OF AMERICA, DEPT. PMC 5620 Hollywood Blvd., Hollywood 28, Calif.

Send FREE BOOK showing how to make good in Radio-Television through training by Hollywood experts.

NAME	AGE
ADDRESS	
CITY	ZONE STATE
Check b	ox if VETERAN of World War II



included at no extra cost. Do all kinds of figure work. Stop wasted time. Stop pencil errors. Learn quickly to multiply, divide, extract roots, find ratios and percentages, squares, areas of circles, radii, volume, etc. Do it in a flash and learn now with this book and slide rule combination.

Practical Step by Step Guidance

No other book like it. Contains complete instruction and removable work sheets that make the slide rule simple as A.B.C. Also Five Place Logarithm Table, Tables of Trigonometric Functions of Angles, review of Mathematics from simple arithmetic through calculus, and with complete answers to check yourself on every problem. It can easily be worth hundreds of dollars to you in promotions, better pay, saving time and error. It's a book for students, mechanics, business men—everyone should learn to use the slide rule, now that it is so easy.

Learn in a Few Hours to Do Many Calculations

There is nothing mysterious about the slide rule and its use. Just read the book and follow the rules. You'll be amazed at the problems you can solve in just a few hours. Mail the coupon now. Book and slide rule will be sent at once. Use them for 5 days, then if you are not satisfied in every way, return them and your money will be refunded without delay. Use the coupon. Mail now.

AUSTIN PUBLISHING CO., Dept. 13, 165 N. Pine Ave., Chicago 44, III.

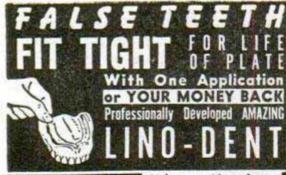
Mail Coupon

Austin Publishing Co., Dept. 13 165 N. Pine Ave., Chicago 44, III.

Send me "The Slide Rule and How To Use It" and 10" Mannheim type Slide Rule. Total cost for both \$2.48. I understand you will refund amount paid you if I return them in 5 days.

☐ Remittance Enclosed ☐ Send C.O.D. Postage and Charges Extra

Name	
Address	
City	State



REAL COMFORT INSTANTLY At last — with no fuss or bother—looseness and slipping vanish—gum soreness

heals and disappears-forever.

NOT MESSY • NOT STICKY

Not a paste-not a powder-Lino-Dent is an amazing development in the field of plastics. It is the same material modern dentures are made of. That's why we can guarantee perfect plate comfort not for just a month but permanently with one application.

ABSOLUTELY SAFE

Line-Dent is pure, non-toxic, non-irritating, harmless, odorless, tasteless, pleasant, simple to use. Needs no heat.

It's professionally developed YOUR MONEY BACK IF NOT COMPLETELY SATISFIED

EASY AS ABC TO USE

A. Apply to Plate. B. Insert in Mouth. C. Bite for Perfect Fit.

We guarantee perfect plate comfort permanently with only one application.

SEND NO MONEY Full size package only \$1 plus postage. Specify upper or lower.

Or send \$1 and we will pay postage.

1199 Broadway

LINO-DENT, Inc. New York 1, N. Y.

	1199 Broadway	New York	1, N. Y.	
ì	Send LINO-DENT		55/1996	1000000
i	Upper Lower			Both - \$2
i	I will pay postmar will be cheerfully	refunded if	. \$2 plus p	ostage, My moi isfied.
ı	NAME			

.... LEARN WATCH and CLOCK REPAIRING

Enclose payment and you save postage!

STATE

Start training now for a better paying job or your own profitable bustness, Qualified Watch Makers are in demand . . Unlimited opportunities. Intensive practical training by experienced watch makers, Approved for Veterans. Write for full details. Indicate if Veteran. SCIENTIFIC SCHOOL OF WATCH MAKING, Dept. PM-3 3923 San Fernando Road

PRINT YOUR OWN COMPLETE OUTFIT

only \$7.50

CITY_

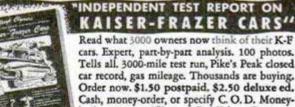


comes complete with all supplies, instructions and 60-page Book of Ideas.

FREE TRIAL OFFER: Try it before you buy it! Write and a GEM OUTFIT will be sent you postpaid. After 10 days, send only \$7.50 or return the GEM, no questions asked.

The GEM must sell itself, you be the judge,

BOND EQUIPMENT CO. . Dept. 135 513 Olive St. . St. Louis 1, Mo. SEND NO MONEY . FREE TRIAL OFFER FLOYD CLYMER'S unbiased book INDEPENDENT TEST REPORT ON



Read what 3000 owners now think of their K-F cars. Expert, part-by-part analysis. 100 photos. Tells all. 3000-mile test run, Pike's Peak closed car record, gas mileage. Thousands are buying, Order now. \$1.50 postpaid. \$2.50 deluxe ed. Cash, money-order, or specify C. O. D. Moneyback guarantee, Clymer, Publisher, Dept. PM3 2125 W. Pico, Los Angeles 6, Calif.

YORK SCHOOL of CHANICAL DENTISTR

Licensed by New York and New Jersev States
Approved for Veterans P.L. 346 and P.L. 16
tors Welcome.
Ask for Free Bulletin "P." Visitors Welcome.

NEW YORK SCHOOL OF MECHANICAL DENTISTRY

America's Oldest School of Daniel Tel 138 Washington St. Also: 125 W. 31 St. oton St. NEWARK 2, N. J. J. 31 St. NEW YORK 1, N. Y. Immediate Enrollment — Day and Eve.



PIANISTS-Send for FREE Booklet show ing how you may greatly improve your technique, accuracy. memorizing, sightreading and playing thru Mentai-Muscular Coordination. Quick results. Practice effort mini-mized. Used by famous planists, organists, teachers and students. No obligation. BROADWELL STUDIOS, Dept. 48-C, Covina, Calif.

Become Good Penman Free Book tells all

Special: 3 Zircons approximate total weight 3-kts. \$3.00. We can supply Zircons in all sizes and mountings of all types. Send order or write for details today. St. Louis, Mo.

B. LOWE, Holland Bidg., Dept. PM



A PENNY POSTCARD MAY

CHANGE YOUR FUTURE . . . Get full information on the coin-operated vending machine industry. Start with a few machines and build to a wonderful future. We'll give you complete advantage of our "know-how." end For Free Booklet Today-No Routes Sold!

PIONEER VENDING SERVICE

Address all mail to Dept

461 SACKMAN ST. . BROOKLYN 12, N. Y.

DUALS & SINGLES

Finest Norman custom-built muffler sets - steel pack - tor-

pedo type – heavy, perforated steel cores – chrome enamel finish – mellow, deep tone (improves with use) — designed to fit — all ways superior — double economy.

DUALS.....\$17.50 V-8 Ford-Mercury

SINGLES...........\$7.50 Buick, Olds., Chrys. ORDER TODAY! Will outlast

SINGLES......\$5.50

Chev., Ford, Plym. three ordinary mufflers.

Dealers—Write Today for Full Details

NORMAN'S MUSICAL MUFFLERS Dept. PM-5, 1216 W. Slauson Ave., Los Angeles 44, Calif.

HOW TO DO SAN A GRE



This is the way we want to live the rest of our lives . . .

This new scientific way of living gives us Robinsons better living, better health, a better environment for our children, more money in the bank, more security and independence-more of just about everything worth living for! We call it our "HAVE MORE" PLAN! If you want to examine our Plan for 10 days, FREE, just mail coupon at right.

MY wife and I would like to send you our "Have-More" Plan for a "little land—a lot of living." Tells how to do wonders with a garden, fruits, poultry, livestock, etc. - all on a small scale - in spare time. Describes many new devices; scientific methods. Presents special house plans and layouts for small acreages. (Perhaps you have seen stories about our 2-acre miniature farm in The Saturday Evening Post, Reader's Digest, Better Homes & Gardens.)

EXAMINE OUR PLAN FREE!

It's a whole wonderful NEW SCIENCE of living-a healthier. happier, more independent life! If you'd like to make the very most of the garden, farm or country home you now have— or hope to have some day—send for our "HAVE-MORE" PLAN

right now! It's only \$1, but first we want you to examine it, absolutely free! 255 illustrations! 43 fascinating chapters! Just mail coupon below to Ed Robinson, Box 2703, Noroton, Conn.

All This and More For Only \$1

All This and More For Only \$1
Simplified Composting—Plowless Gardening
Now To Grow Your Own Fruits, Berries,
Grapes, Dwarf Fruit Trees Now To Do
Wonders With Chickens, Ducks, Geese, Squabs,
Turkeys, Rabbits Broiler Batteries and Laying Cages Bees, to Give You Honey—Increase Your Yield of Fruits and Berries Cold Frames, Hot Beds and Small Greenhouses
How To Landscape Plans For an AllPurpose Small Barn The Miniature Dairy
Concrete Pig Pen A Few Sheep Country Houses Especially Designed Plans For a
''Harvest Kitchen'' Built Around Your Quick
Freezer Rural Water Supply, Sanitation,
Electricity and much more!



SEND NO MONEY

funless vou prefer to!)

Ed Robinson, Box 2703, Noroton, Conn.

Dear Ed: Please send me your "Have-More" Plan postpaid. If I keep it, I'll send you one dellar plus the ten cents it cost you for postage, packing and handling. If it doesn't please me I'll send it back and owe you nothing.

Your Name	-		_	_
Address				

State. If you'd prefer to send one dollar now, that would save me a lot of record keeping and save YOU the ten cents shipping charge. I'll give you DOUBLE your money back if you return the Plan for any reason in 10 days!

WILL SHOW YOU HOW"

Raise chickens at home, in basement, attie or garage. No dirt or odor, Only 12 sq. ft. req'd. 15 broilers every week and fresh eggs every day. Send \$2.00 (no stamps) for simple instructions, easy to build.

THE C&J ENGINEERING CO., Dept. PM-1
MICHIGAN STREET EATON RAPIDS, MICH.

MONUMENTS AND MARKERS are good. We erect anywhere. Write for FREE Catalog. U. S. MARBLE & where. Write for FREE Catalog. GRANITE CO., Oneco, 18, Florida.

DEVELOP RUGGED



Strong Men's Club of America offers FREE Membership!

Send for your personal membership card and Strength Secrets. No dues! No obli-gations! Many valuable privileges! Send name, address, age, on penny postcard.

JOE BONOMO Strong Men's Club of America Director (Dept.PM3B) 1841 Broadway, N. Y. 23, N. Y.

ΕΔΤ CUTTIN **EASILY-QUICKLY** At Home - In Spare Time



City

The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, sellinga complete meat education. For beginner or men with experience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. U-91, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Mer-chandising. No obligation, No Salesman will call.

Name Street

Everything in

RADIO

in ONE book!

OVER 1000 PAGES

All the expert knowledge at your fingertips . . . quick to find . . . easy to read in the

RADIO DATA BOOK

This new radio bible will be your lifelong tool. You will use it every day for every operation in radio and electronics. The RADIO DATA BOOK provides complete information on any radio subject . . . in clear-cut, easy-to-understand, completely illustrated style. It is a complete course in radio for the beginner . . . it is packed with moneymaking knowledge for the professional . . . and it is a complete reference for the master. Advance sale, only 10,000 available—to make sure you get your copy of the RADIO DATA BOOK send in your order now!

12 sections over 1000 pages . . .: completely illustrated

Section 1. THE 150 BASIC CIRCUITS IN RADIO.
Section 2. COMPLETE TEST
EQUIPMENT DATA.
Section 3. TESTING, MEASURING AND ALIGNMENT.
Section 4. ALL ABOUT ANTENNAS.
Section 5. SOUND SYSTEMS,
Section 6. RECORDING.
Section 7. COMPLETE TUBE
MANUAL.

Section 10. 50 TESTED C
CUITS DESIGNED FOR OF
MUM PERFORMANCE.
Section 11. DICTIONARY OF
DIO AND ELECTRONIC TERES
GRAPHY.

Section 12. RADIO BOOK BIE
OGRAPHY. Section 10. 50 TESTED CIR-CUITS DESIGNED FOR OPTI-MUM PERFORMANCE.

ction 11. DICTIONARY OF RA-DIO AND ELECTRONIC TERMS. Section 12. RADIO BOOK BIBLI-OGRAPHY.

Handsomely bound in red and gold.

12 complete books in one, only \$5.00 — less than 42c per book!

Satisfaction guaranteed — or your money back! PM-1

BOLAND & BOYCE, INC. PUBLISHERS 460 Bloomfield Ave., Montelair, N. J. Send me the RADIO DATA BOOK. Enclosed is \$5.00.

ADDRESS. CITY ZONE BOLAND & BOYCE INC., PUBLISHERS

Draw Your Own PLANS





building and care of equipment to painting the farm home and fast freezing fruits and vegetables. It covers farm buildings, the farmhouse and other homes and is of interest equally to the woman looking for home improvement, beauty and convenience and the man striving for easier and more profitable operation.

ORDER TODAY - FOR YOUR-SELF - FOR A GIFT

Use the coupon below. Mail it today. Book will be sent at once, postpaid if you include payment with your order. If you don't think the Farm Manual is worth even more than you paid for it after five days' use, send it back by mail and your money will be re-funded. This may be the best in-vestment you ever made. Rush coupon today.

farm families and homeowners everywhere.

ers everywhere.

Farm Machinery and
Implements
How to make and get the most
out of farm implements.

Farm Workshop Equipment
and Repairs
Ideas that can save hundreds
of dollars.

Poultry and Livestock
How to build equipment, gadgets. Care of farm animals and
poultry.

How to build equipment, gadgets. Care of farm animals and poultry.

Vegetable Storage—Processing Winter storage, home freezing tips, make your own freezer.

Farm Home Improvement Fencing, repairing electrical appliances, plumbing, electrical wiring, saving coal, painting, curing leaky basements, hanging wall paper, making garden tools, garages, working with concrete, painting, etc.

Farm Hints and Kinks
Forty pages of illustrated, practical ideas, short cuts, etc., that will save time, labor and money.

money.

MAIL COUPON . Money Back if Not Satisfied

POPULAR MECHANICS PRESS, Dept. 665 200 East Ontario St., Chicago 11, Ill.

Send	copies of	the Farm	Manual at once.		
☐ Remittance	(\$3.00 each)	enclosed.	Send postpaid.	Add	15%

Send C.O.D. (\$3.00 each) plus delivery charges. U.S.A. only. If sent as a gift to another, send name and address on separate sheet.

Name				
Address				
City	 Zone or Route	State	25	

MICROPHONE HAND



Top quality hand microphone with control button in handle. Highly sensitive. Has rubber covered cord and tel. plug. Fino for use on rubber covera-cord and tel. plug. Fino for use on home recorders, public address systems, etc. Brand new — per-fect. Shp. wgt. 2 ths. Stock No. fect, Shp. wgt. 2 lbs, Stock No. Each. \$1.95

MESS KITS

Regulation twopiece Army Mess Kita with folding handle. Used, but perfect. Weight 2 lbs. No. 69c



CANTEENS

Reg. U. S. issue can-teens. Plastic screw top chained to body. Slightly used but per-fect. Wgt. 1 ib. 117-Metal 118-Piastic-Ea. 69c

CANTEEN CUPS metal. Folding handle, Wgt. b. No. A120-Each....25c



HEAVY DUTY RUBBER GLOVES **Brand New**

Extra heavy—extra long. Brand new, high quality gum rubber for softness and eans in use. Designed for heavy duty indus-trial service—protection in han-dling chemicals, acids, etc. A real bargain at this low price. real bargain at this low price. Stock No. 295—Per 79c

AMMUNITION BOX



Used for 50mm ammunition. Heavy, all metal design with latching top and folding handle. Provides safe, fireproof storage for valuables, etc. Measures 12x 6x7½ laches. Used but in new condition. Shp. Wgt. 8 79c lbs. No. 338—Each. . . . 79c

SUN GLASSES



ARMY CORPS Brand new!

Ideal for driving, sun glure, sports and work, 24 carat gold plate frames with Pyralin sweat bar — adjustable nose bands. Large aviation type lenses. Case included. Shp. wgt. 1 lb. No. 238-Per Pair \$2.95



pieces in lengths from lengths from and average 34 inches wide, 4 lbs. No. R224. \$2.00

POPULAR RECORD ASSORTMENT



No. A300—25 Records, All Dance. Wgt. 14 & A OO Wgt. 14 \$4.88

No. A301 - 25 Records ords, Hillbilly, Race and Blues. Wgt. 14 lbs. Set. . \$4.88

No. 302-25 Records, All Hillbilly numbers, Wgt. 14 lbs. Set... \$4.88

STIRRUP PUMP

Works with any pail or bucket. Shoots a high pres-sure stream up to 30 feet. Use it for spraying garden and trees, for whitewash-ing, fire fighting, drainage, etc. Complete with 10 foot fexible hose. All brand, new, Regular \$3.80 value, No. 244— Each \$1.49



15 JEWEL STOP WATCH



FISHING REEL



Full 100 ft. line capacity. Free acting brass bearings, Ratchet drag. Catalin handles. A real value at this low prace. All metall Shp. 98c wgt. 1 lb. No. F412, Each

ARMY TENTS-16x16 Ft.

A value you can't beat. Big 16x16 ft. pyramid tent with 4 foot drop wall. Used but in excellent condition. Poles not included. Fine for camping out, carnivals, etc. Worth twice this money. Sho. wgt. 100 lbs. Stock No. 521—\$35.00

27 LENSES, ALL NEW, PERFECT.



For experimental work inoptics. Consists of 27 precision ground and polished prisms and lens elements in assorted diameters and focal lengths. Big variety positive, negatives, etc. Actual value over \$100.00. value over \$100.00. \$7.95

McCLELLAN SADDLE



BAYONET BLADE



RUBBER OVERBOARD SUIT



Here is a buy! Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves. Heavy gum rubber over fabric. Fine for those who work in the water, commercial fishermen, sewer diggers, etc. Use it as is or cut it up for waders. All brand new! wet. 14 lbs. Wgt. 14 lbs. \$4.95 No. 183, Each. \$4.95

Please include 75c for postage.

7 LB. EXPERIMENTER PARTS ASSORT, KIT



A "gold mine" for the radio serviceman. Hundreds of valu-able radio parts, new radar and electronic parts and sub-assem-biles, coils, resistors, trim-ming condensers—worth many times this low price. \$1.79

VEEDER-ROOT COUNTERS



Three wheel type
—counts to
999 and repeats, Geared
shaft end may be
replaced with a

shart end may be replaced with a pulley to regulate counting speed. Has hundreds of uses, All brand new, A splendid value. Shipping weight 98c 1 lb, No. 241. Each.. 98c

SATCHEL POUCH



FLEXIBLE NECK FLASH LIGHT

EACH

\$1.69



Officers Watch Compass



Brand new gov't. sur-plus. Army-Navy model. Single jewel mounted needle. Silmounted needle, saver colored dial. A splendid value. Shp. wgt. 1 lb. A174—Each... 98c

MEDICAL STERILIZER



Consists of alcohol burner and sterilizing tray in hinged metal case 1 7/sx11/sx25/s inches. Burner may be used separately. Bright nickel 986 finish. All brand new. A125—Es. 986

DECORATIVE CHROME STRIPS



For your car, boat, furniture, etc. Highly poished chrome finished strips with clinched edges for flush mounting to any surface. The 3 pound kit provides approx. 15 pieces in lengths from

ORDER DIRECT FROM THIS AD

Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than \$5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago, Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

BIG ILLUSTRATED CATALOG FREE

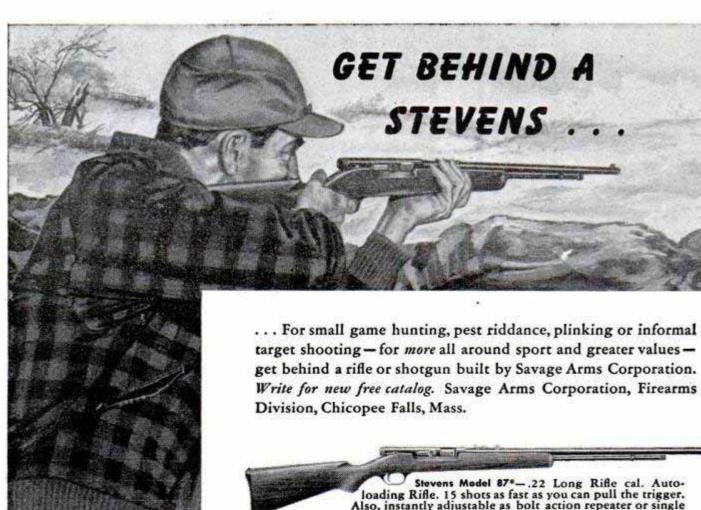
Dept. PM3 509 So. State St. CHICAGO 5, ILL.

11/2 VOLT WILLARD



BATTERY A rechargeable, wet plate battery good for years of service. Brand new. Battery is shipped dry but fully charged—any battery station will add acid. Use singly or in multiples for radio sets, bell circustens, etc. Measures es. Ball floats indivel for filling. Shp. Stock No. 20

MAKANG Inches. Ball floats indi-net proper level for filling. Shp. Ngt. 4 lbs. Stock No. \$2.95



Also, instantly adjustable as bolt action repeater or single shot rifle; shooting .22 long rifle, .22 long and .22 short cartridges.

Stevens Model 84*—.22cal. Bolt Action Repeating Rifle. 5 shot clip magazine. Full pistol grip. Stock designed for steady holding. Shoots .22 long rifle, .22 long and .22 short cartridges.

Stevens Model 15 - .22 cal. Single Shot Bolt Action Rifle - barrel bored and rifled with the same precision which characterizes all Stevens-Savage rifle barrels. Shoots .22 long rifle, .22 long and .22 short cartridges, hi-speed or regular.

Stevens Model 22-410-Over-and-Under. An accurate .22 cal. rifle and .410 shotgun in one gun. Rifle barrel shoots .22 long rifle, .22 long or .22 short car-tridges. Shotgun barrel bored for 2½" or 3".410 shot shells.

Stevens Model 59 — Tubular Magazine Bolt Ac-tion, .410 Gauge Repeating Shotgun. 5 shot (3" shells), four in magazine, one in chamber. 6 shot (2½" shells), five in magazine, one in chamber.



*New Peep Sight - Now these Stevens . 22 caliber rifles are available, at slight extra cost, with a new, specially designed peep sight with eleva-tion and graduated click windage adjustment.







The safe and accurate handling of firearms is an American tradition. It's worth perpetuating and you can help by starting the young or new shooter off right. For advice and special literature on setting up a program, write: Sporting Arms and Ammunition Manufacturers' Institute, Dept. 4, New York 16, N.Y.



Weyerhaeuser Sales Co. photo

HOW BIG is America's bank balance? Our savings account is not the cash in the federal treasury or the total money in circulation; money is only a working symbol of a nation's economic wealth. The bank balance that really counts—that makes the difference between prosperity and depression—is the raw materials in and above the ground.

Nobody knows the exact extent of scores of vital natural resources buried in the earth, without which our civilization would rapidly about face to that of the Stone Age.

Buried treasure—coal and gold, iron ore and oil—and other re-

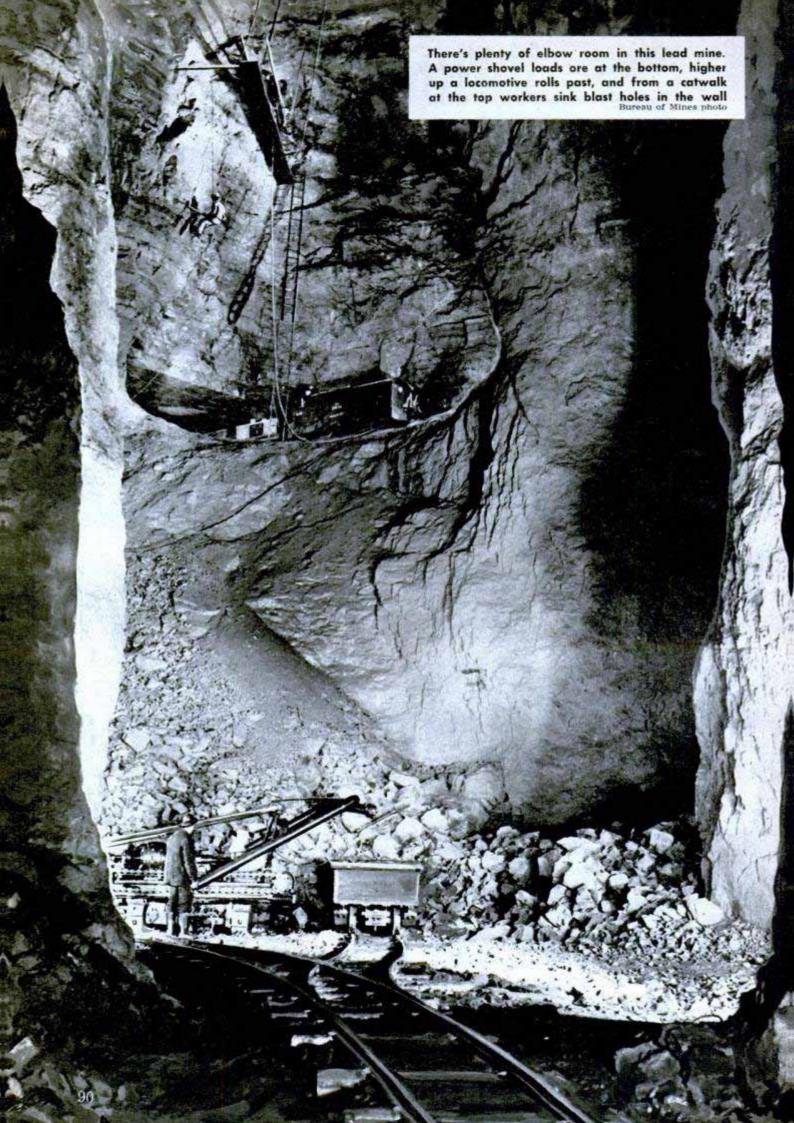
iron ore and oil—and other resources make the U. S. rich. The question is: Will they hold out?

By Bill Reiche

We could find out by means of an exact geological mapping of the nation, of which only 10 percent has ever been adequately surveyed, at a cost ation's of a billion dollars and 20 years' time, accept that cording to Interior Secretary J. A. Krug.

In a recent survey of America's needs and resources by the Twentieth Century Fund, an independent, endowed organiza-

> tion, we are reminded that we are a naturally rich but spendthrift nation. More than any other country, with the possible exception of the Soviet Union, it



states, we have the resources we need within our own borders. But in almost every category we are the world's leading consumer and, in many important categories we use more than the rest of the world combined.

Our national-resources bank balance is important. Shortages of vital materials would mean higher prices and fewer jobs; the exhaustion of first-grade iron ore might result in the employment of three or four times as many men to extract an equivalent amount of the metal from the earth in second and third-rate ores, thereby dislocating our domestic economy through wholesale shifting of labor.

In his recent report to President Truman on national resources and foreign aid, Secre-

tary Krug states:

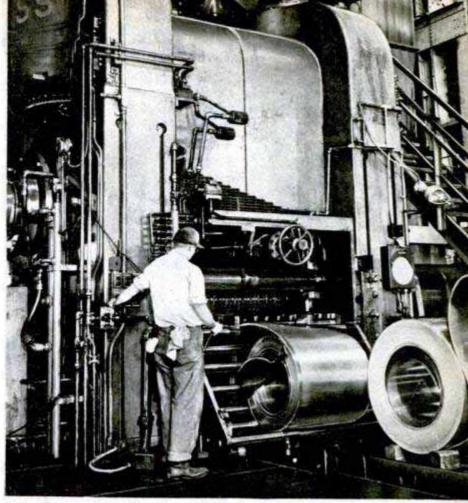
. . . raw-material resources are being put to use at rates that exceed past peacetime records. This unprecedented economic activity has resulted in the attainment of a gross national product, or total value of final goods produced or in progress, of 204 billion dollars in 1946 and a rate of 225 billion dollars annually for the first six months of 1947 . . . "

Against the possibility of another war must be considered the availability of strategic materials. During a war everything from wheat to industrial diamonds is of strategic importance. But in some of the most critical materials we have either very minor reserves or none at all.

It's difficult to estimate the reserves of our natural resources. A figure on how long reserves of a given material will last at a given rate of consumption means very little when we do not know the extent of new reserves which will be discovered within that period. But the Bureau of Mines and the Geological Survey have reported to a sub-committee of the Senate Committee on Public Lands an estimate of our reserves of two score minerals.

The problem children in this family of minerals are petroleum, lead, zinc and copper-they present the most serious scarcity problems.

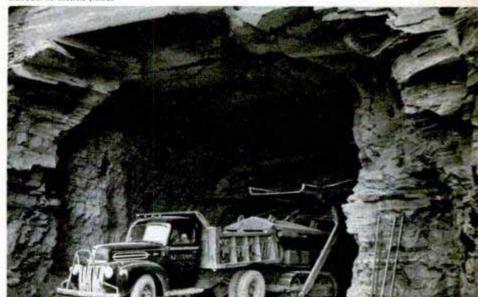
Proved petroleum reserves give us about a 15-year supply.

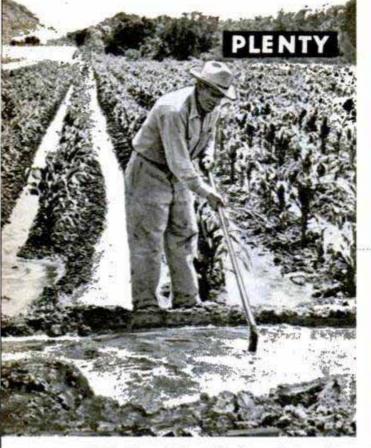


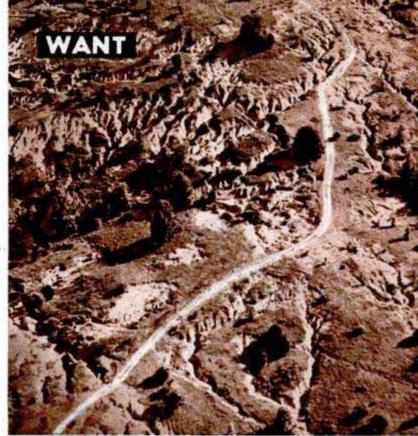
U. S. reserves of bauxite, from which aluminum (being rolled into sheets above) is produced, will last an estimated 23 years



Above, oil derricks laid out on a 40-acre spacing plan for conservation of supply. Below, power loader fills truck with shale from which oil is removed at the government's retorting plant







Contrasting photographs show what can happen to our resources. Left, wasteland becomes fertile when proper steps are taken to irrigate it. Right, a lack of conservation practices brings on erosion and ruined land

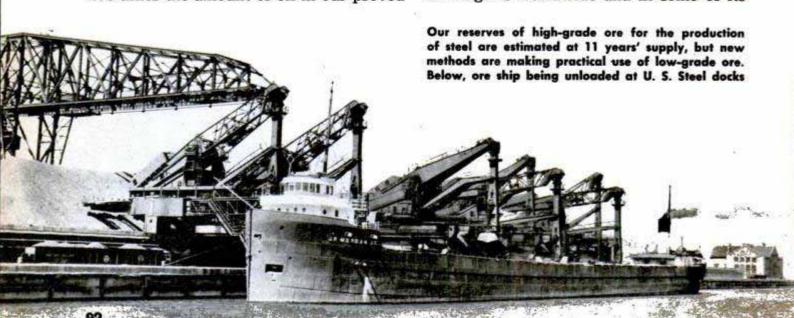
By using the rule of thumb that potential reserves approximate those known, we can estimate that we have enough to last us three decades. Oil has held a leading place in the "easy come easy go" category of raw materials. A Johnny-come-lately among fuels, it was the source of only 4.5 percent of the energy produced here in 1899, but by 1945 it accounted for more than 32 percent.

Large reserves of petroleum may be discovered before we hit the bottom of the barrel, but if not, there are alternative methods of providing liquid fuels. Oilshale deposits in Colorado, Utah and Wyoming are considered potential sources of five times the amount of oil in our proved

petroleum reserves, but production costs might run from 50 to 100 percent higher than at present. In addition, big pipe lines would be required to transport the oil to the Midwest and Eastern markets.

The hydrogenation of coal, an old British and German process now being pioneered in this country by the Pittsburgh Consolidation Coal Company and Standard Oil, is another ace in the drying hole. Production costs by this method would run 50 percent higher than with shale, but transportation costs would be less since coal is more centrally situated.

Lead, with only a 10-year supply in sight, is everybody's headache since the shortage is worldwide and in some of its



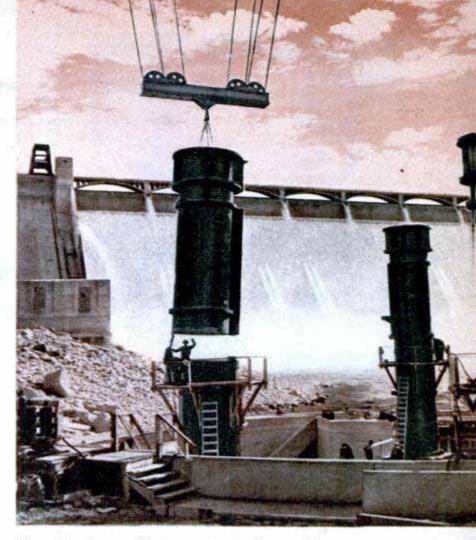
major applications substitution is virtually impossible. These include storage batteries and cable coverings. Consumption of the heavy metal has tapered off from the wartime high but is likely to continue at an advanced level.

All the lead being used today cannot properly be called raw material since much of it is salvaged. Conservation of this material has been practiced to some extent in the paint industry, where titanium, derived from rutile and ilmenite, now is used along with lead. Some authorities say titanium is superior to lead in paints. Thousands of tons of lead are burned up annually, however, in anti-knock gasoline a procedure considered wasteful by persons who believe hightest fuel can be made without consuming a vanishing mineral.

Our supply of zinc, domestically estimated to last 20 years, will probably depend on imports of more than 50 percent. This metal is likely to be replaced by a number of substitutes, such as titanic oxide for zinc oxide, aluminum for castings and steel, plastics and glass for sheet metal.

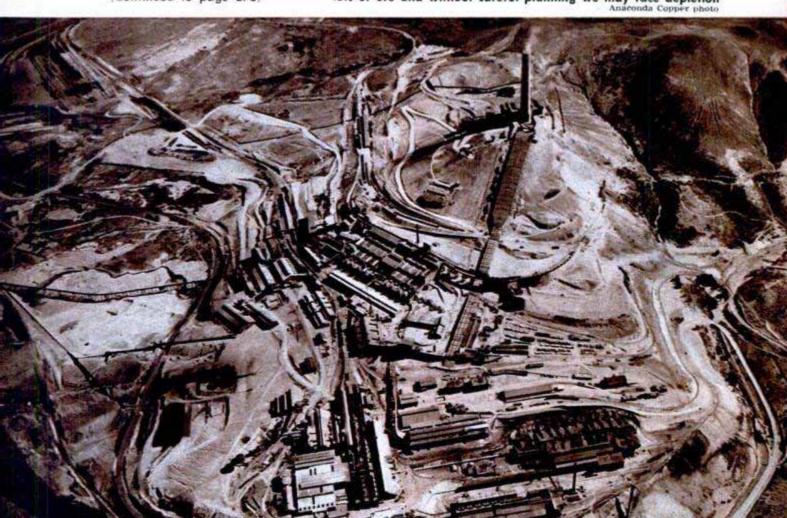
Copper, a work horse known since ancient times, is devoted

(Continued to page 272)



Harnessing rivers adds to our resources by providing power and water for irrigation. Above, men at work at Grand Coulee Dam

Huge plants like this reduction works at Anaconda Copper need lots of ore and without careful planning we may face depletion





Arm 'Sweeps' Fingers From Danger

Riveting machines can't smash the fingers of unwary operators when used with a safety mechanism invented by John Mulligan of New York City. A projecting arm operated by a spring is attached to the working surface of the machine. The arm "sweeps" the fingers away from the work before the machine slams down on the rivet. Riveting machines frequently cause smashed fingers, according to insurance companies.



"Window Shade" Radiator Cover

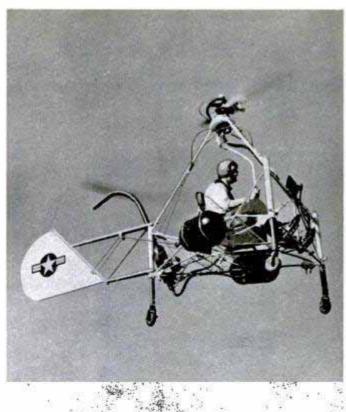
Auto radiators are protected by a combination bug screen and winter cover. The screen is installed permanently on the radiator. The cover is mounted on a spring-action roller much like a window shade. The roller moves up a track along the frame of the screen, covering the bottom of the radiator first. A cable runs from the cover to the glove compartment, permitting the driver to raise the cover without leaving his seat.



Canadian "Smoke Jumpers" Slide to Work From Plane

Parachutist-firemen plummet into space from a "coal chute" to fight blazes in northern Saskatchewan. Scarcity of landing fields in the lake-dotted woodlands has forced the government to drop its "smoke jumpers" from flying boats. The chute carries them clear of the cumbersome pontoons. Jumpers sit in the doorway, with legs dangling down the chute, until the drop signal is given.

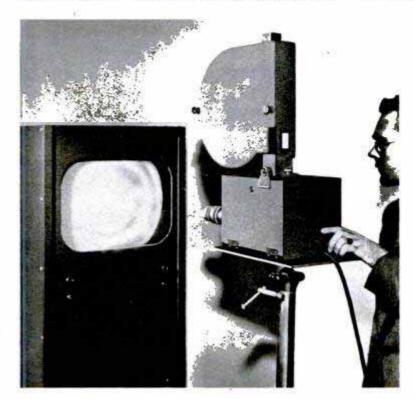




"FLYING MOTORCYCLE"

Two 10-pound engines of the simplest type keep the world's first ramjet helicopter in the air. Dubbed the "flying motorcycle," it was built by McDonnell Aircraft for the U. S. Air Force for artillery spotting, courier service and shortrange observation. The tiny craft weighs only 310 pounds, flies 50 miles an hour and lifts 300-pound loads. Most rotary-wing craft can carry loads equal to only a small percentage of their weight. The athodydtype engines, resembling stovepipes, are

at the tips of the two-bladed rotor. Air rammed into them by the blades' whirling is burned by a fuel mixture injected through the blades and forced out the rear, producing thrust. After initial fuel pressure is built up, centrifugal force keeps the engines fed. Still classed as a "flying test stand," its frame is simple welded steel tubing, with a single seat and a large rudder for directional control. Rotor angle is controlled directly by an arm extending down in front of the pilot. Propane has been used thus far, but engineers are working on gasoline-burning units.



Movies of Television Show Provide Permanent Record

With a 1200-foot magazine that permits continuous recording of a half-hour program, a specially designed movie camera photographs television programs directly from the monitor tube at the broadcasting station. The double-chamber magazine holds both unexposed and exposed film and can be removed in a lighted room. The camera will be used by stations to provide a permanent record of their programs.

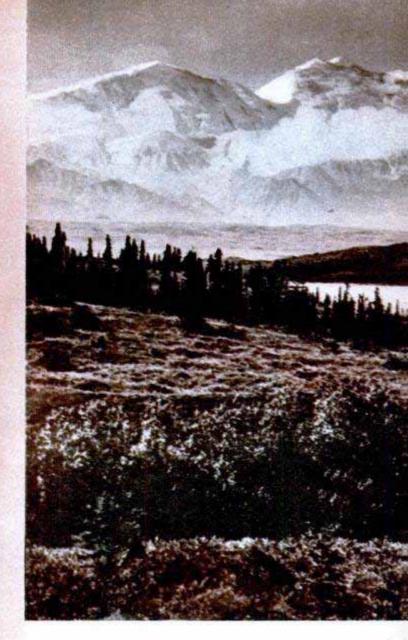
¶Navajo and Hopi Indians in Arizona are given one-day drycleaning service by Wayne L. Troutner, who picks up and delivers ceremonial garments, rugs and blankets in a small plane.

BIGGER THAN TEXAS

By William E. Warne



Ass't Secretary of the Interior Warne presents a first-hand story of Alaskan opportunities and introduces some pioneers of 1948







As seen across Wonder Lake, ice-capped Mt. McKinley typifies the rugged beauty of Alaska—America's last frontier—where there are plenty of opportunities such as small business or farming for the 1948 pioneer

A LASKA, which used to be thought of as a land of perpetual ice and snow, has suddenly assumed great importance to the United States because it is the cross-roads of the air age.

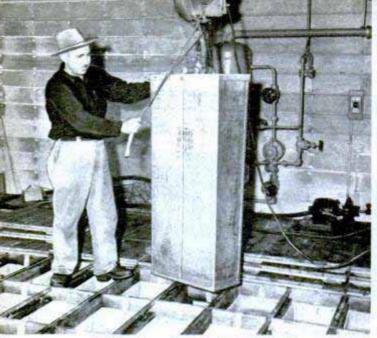
Intercontinental routes, via the Great Circle and over the top of the Pole, are already using Alaska as the hub of their wheel. This giant "hub" covers 586,400 square miles which makes it considerably bigger than Texas which has a total area

of 267,339 square miles.

With eyes focused sharply on Alaska for the first time since the Gold Rush of 1897, the American people have suddenly discovered that their former appraisals of this vast, beautiful, empty land were wrong. It is not a land of perpetual ice and snow, but a land of opportunity, albeit one that challenges even rugged men in the process of making a place for themselves. Strangely enough, the great glaciers and the tremendous winter snows that gave Alaska its reputation are confined largely to the mountains and the

rough coastal areas of the south. The vast heartland of Alaska, stretching from the Kenai Peninsula up Cook Inlet to Anchorage, through the Susitna, Matanuska and other river valleys, down the Nenana and Tanana Valleys to Fairbanks and to the Yukon and out the Alaska Highway to Tok Junction, has many areas of mild summers with long golden days and fair growing seasons for crops.

Alaska is a varied land. Superimpose a map of Alaska drawn to the same scale on a map of the 48 United States and it extends from South Carolina to southern California and from the Mexican border to northern Minnesota. In land area alone, it is one fifth the size of the 48 states. It is readily seen that such a great area spread in peninsulas and islands over so vast a part of the world would not be all alike. Southeastern Alaska is a land of heavy rainfall, great beauty, fiords cutting into high mountains near the sea, entrancing spruce-covered hills and slopes, quiet, protected waters among the islands and





Odd business for Alaska (left) is this artificial ice plant operated by an ex-Texan in Anchorage. Right, McKinley Airways, an independent air-freight line, flies pigs from Dawson Creek, B. C., to hog farm near Anchorage

the shoreland, glaciers that come down to the sea, a land of fishing and hunting where boats substitute entirely for roads, and the airplane is the only means of quick transportation.

Central Alaska, the heartland, is not so very different from the northern plains states. Its climate is colder and it is cut here and there by high mountains. Otherwise, much of it resembles northern Michigan and Minnesota. Here Alaska's only railroad serves its biggest cities—Anchorage and Fairbanks, and the Alaska Highway comes up from the south through Canada to join the territory's only other important road, the Richardson Highway, near Fairbanks where the railroad meets

the great rivers of the north and boats begin to ply the Tanana and Yukon Rivers toward the Arctic. The great airdromes of the future will be located in the heartland, and here most of the farming opportunities will be found.

The Aleutian Islands, of less than fond memory on the part of many a GI, are different again. They are isolated, stormbound, rough, and at times forbidding. Their climate is not extreme, but the grasses that grow lush on their slopes are not pastured because there is no means to get the wool, hides and meat that the livestock would produce out to market.

Bristol Bay, Kuskokwim Bay, Norton Sound and the Kotzebue Sound on the

Picturesque Alaskan salmon cannery does its share of a business that exceeds 50 million dollars a year



western face of Alaska are surrounded by low delta lands. Bristol Bay is famous for its salmon and other fisheries, but except for the short fishing season, the lands that front on the Bering Sea have little activity. The Eskimos trap furs and fish here, and trade with them is important. Mines are in operation in some of the hills for such rare metals as tin. platinum and gold. Other minerals found in the region include iron, nickel, zinc, silver, tin, lead and chromium.

The last region of Alaska is the Arctic slope and Colville River Basin. It is low, bleak and little used,

although traces of oil have sent the Navy scurrying over a vast region, prospecting

on a reserve set up for it.

Alaska's greatest need is population and the biggest opportunity for people who want to go there will be found in connection with businesses and activities that will contribute to the support and comfort of many people in the territory. There are problems to be overcome, transportation facilities need to be increased and improved, good housing is required, much exploration for minerals and testing of soils for agricultural needs to precede the final stage of development. These problems are being studied and worked on by local, territorial and federal officials. They will be solved in time.

Meantime, many sturdy individuals have pitted themselves against this hard land. The population of 75,000 before the war now exceeds 90,000, and Anchorage is among the fastest growing cities in the world.

Here are some thumbnail case histories:

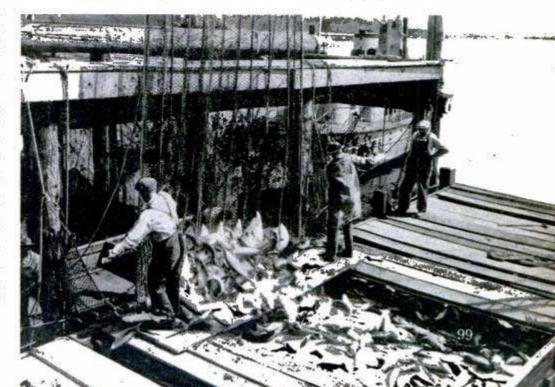
Robert Thompson went to Alaska in 1940 as an officer in "Castner's Cut-Throats." What he saw wasn't so different from his home in Moccasin, Mont. After the war, he and Aden Winkelman, his sergeant in Army days, built themselves Anchorage's most modern restaurant. It has been doing good business since the spring of 1947.



The Alaska Railroad points with pride to such modern equipment as this streamlined Diesel-electric locomotive which pulls an eight-car train

Dennis Fenno went to Alaska first as a fisherman when a young man and spent a summer or two on Bristol Bay. During the war, he served as a bomber pilot in Italy, but went back to Dillingham, a fishing village, and bought a half interest in the Dillingham Air Service—assets, one plane. He and two other former Army pilots now have three planes operating between Anchorage and Dillingham, carrying freight and passengers. There are many such stories of bush-line flying, because the airline is doing the job in Alaska that the covered wagon, the pony express and the early railroad did in opening up the West. Before air travel was introduced in Alaska, the interior was closed to all except the hardiest adventurers who braved sub-zero weather and starvation in their

Fishing is Alaska's principal industry with the catch in a single year exceeding 460 million pounds. Here fishermen are emptying salmon trap





Carcasses of super bison, mastodon, camels and horses have been washed from this ice bank in Cripple Creek. Below, trapper Bill Hawks at right from Kenai Peninsula arrives in Anchorage to sell his winter catch of furs (wolf, fox, mink, otter) to Wally Worth of the Alaska Fur Exchange



search for gold. Dog teams were the principal means of transportation.

In 1945, Vere Savage bought a small cannery at Ninilchik. A series of small disasters put him \$17,000 in debt. He told some young veterans at Anchorage of his trouble, including L. T. Gardner, whose home is Grants Pass, Ore.; Jack Schriber, formerly of Milwaukee; Peter Harris, Alaska-born; Walter Keck of Carter, S. D.; Ralph Mitchel of Craigmont, Idaho; Mike Rogers of Scarsdale, N. Y.; and Bill Fitzgerald of Kalamazoo, Mich. They formed a partnership, moved the cannery to Kasilof, rebuilt it, and late in the season of 1947 commenced packing "Polar Sea Foods." It looked as though their operation would be a success the first year.

Dan Lappala went to Alaska to help build Army facilities during the war and then joined the Seabees. He stayed at Anchorage after receiving his discharge and established a nursery. He bought stock from the Midwest and, though he says the going has been hard, is now receiving orders for Alaska birch and other products to export to "outside" buyers. (Alaskans refer to other parts of the U.S. as "outside.") Lappala says that he is in business to stay.

Jack Conright served two years at Fort Richardson near Anchorage. When he was discharged, he went into the furniture business and persuaded his brother Curly, an experienced furniture maker, to come from Tacoma, Wash. He now makes furniture in the basement of his store and has found a profita-

POPULAR MECHANICS

ble sideline in making seats, cushions and covers for the many jeeps which swarm Alaska.

E. J. Fortier took over the Weekly Times in Anchorage, renamed it The Forty-Ninth Star to emphasize the drive for statehood, and is building up circulation in central Alaska.

In addition, men are finding their livelihood in teaching and the other professions, in flying tourists to fishing lakes, in raising chickens, operating dairies, and scores of other jobs including farming.

Homesteading is occupying increasing numbers. Carving a farm out of the Alaskan woods is not child's play, but many are managing to win

through. There are now 450 successful farms in the Matanuska Valley where the government project that won much comment a dozen years ago established 200 farms. This is one of the best farming areas. There are still some lands available for development there.

In summary, opportunities in Alaska are

Walter Pipple, who has 240-acre farm near Eagle River, is proud of his fine cabbage patch. Right, Ken Britt of Anchorage fish firm stands beside 400-lb. halibut caught in Cook Inlet not far from Anchorage

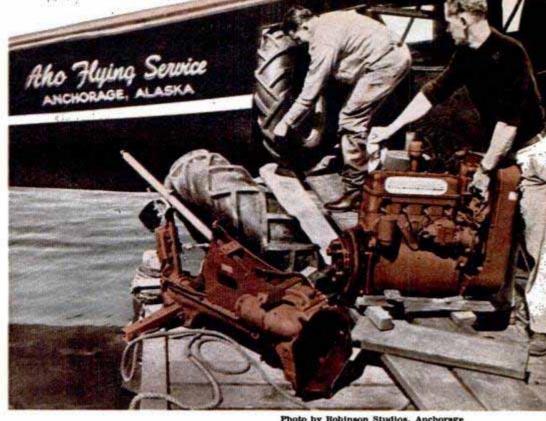
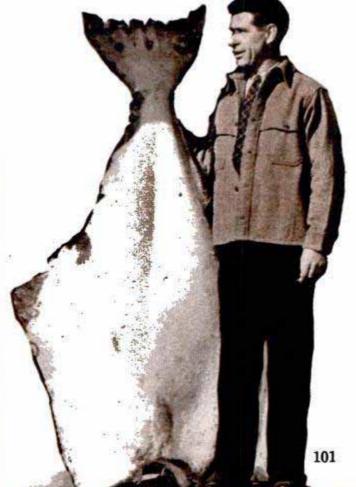


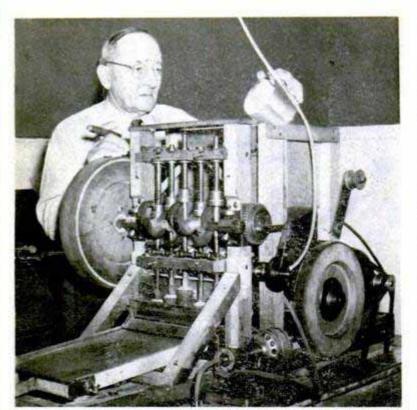
Photo by Robinson Studios, Anchorage

When Bud Branham, ex-Navy pilot who operates a big-game lodge at Rainy Pass, wanted a tractor he had it shipped from Anchorage by float plane

as varied as the land itself, but all of them involve hard work under difficult conditions because Alaska is not an easy land. The people who are required to populate it, however, will be found. Alaska, which has been a U.S. possession since 1867, is on its way to becoming a state and its great growth is immediately before it.







Basement Mill Turns Out Gold

In his leisure hours, Dr. Albert Boeck of Boise, Idaho, literally finds gold in his basement. Dr. Boeck owns a gold mine in the nearby mountains and has built a miniature mill in his basement to separate gold from impurities. The mill determines the richness of a vein with the accuracy of elaborate assays. Ore crushed to the size of coarse sand is fed into a battery of five "stamps." The stamps rise and fall twice each second, a total of 600 impacts per minute, to reduce the ore to the fineness of flour. The heavy gold sinks through the rock to the bottom of a pan. where it comes in contact with mercury to form an alloy of the two metals. In the last step the mercury is driven from the gold by heating the alloy with a blowtorch, leaving pure gold. Each hopper of highgrade ore yields about four ounces of gold. which Dr. Boeck sells to his bank for \$30 an ounce. The mill is more efficient than its 15-ton counterpart at the mine.

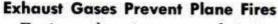
Atomic Boom Town Is Moved 24 Miles

As emergency housing for 16,000 persons, trucks and barges are moving barracks 24 miles to Richland, Wash., site of a big plutonium plant expansion. They had housed workers at Hanford, which boomed from 436 to over 50,000 as an atomic-bomb center.



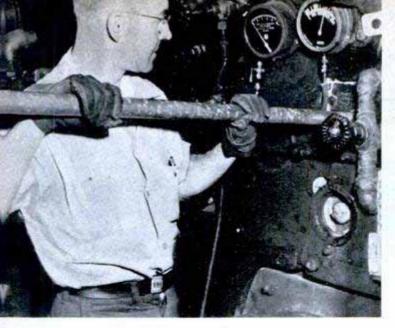
Hand-Powered Tricycle

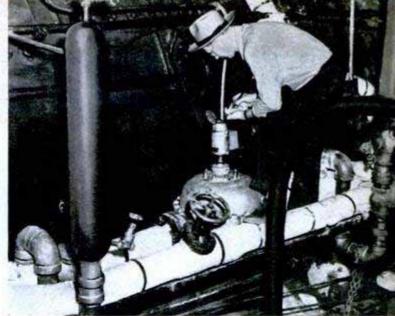
Powered by a hand crank, a homemade three-wheeled vehicle provides transportation for John Hobbs, a legless war veteran who lives in Wise, Va. Hobbs built the vehicle from bicycle parts, sheet metal, a few rods and bolts. He steers it with one hand and cranks with the other.



Engine exhaust gases are being used to prevent fires in Navy planes. Containing too little oxygen to support combustion, they are used to blanket vacant spaces inside and around fuel tanks, after being cooled from 900 degrees Fahrenheit to about 70. The gases have about 9 percent less oxygen than atmosphere normally contains. A relief valve prevents excessive pressure which may build up during a long climb. A check valve stops the backflow of gases.

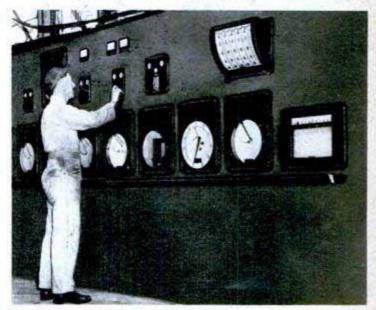






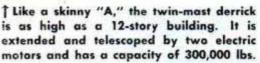
LOCOMOTIVE CLINIC

Despite a roaring fire and a full head of steam, No. 4401 of the Southern Pacific Railroad doesn't turn a wheel. The locomotive is a clinic "patient" being tested to discover how increased steam and power can be obtained with less fuel. Engine streamlining has been removed as has its tender, cab, rods and pistons. The instrument panel (right) shows exactly what's happening in the engine and how efficiently it is performing. Water, injected into the cylinders, cools the steam just as would the work of pulling a heavy train. Excess steam created by the water is drawn off in a large "Y" pipe connected to the steam chests (below) and exhausted into a muffler outside the building. A tube, inserted above the fire door (top left), samples the flue and firebox gases that are tested for combustion quality. A hot-water meter (top right) measures the temperature and amount of water added to the boiler. Tests will bring about improvements in locomotive design

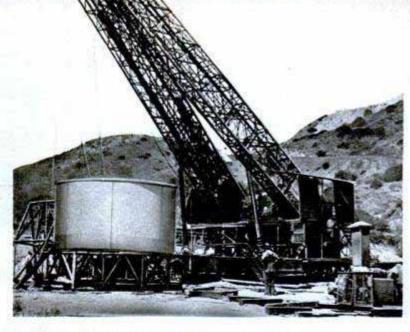






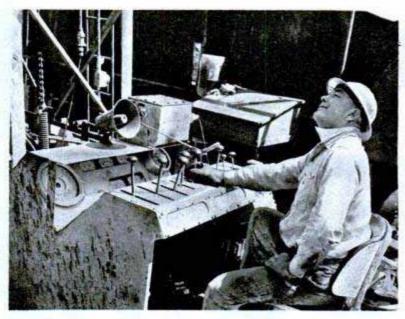


No organist, driller (right) sits at console playing a "tune" by electric controls that guide the drill. The music he wants to hear is the roaring sound of a gusher



TELESCOPING DRILL RIG

Capable of boring two miles into the earth, an electric drill rig for oil wells can be telescoped and hauled away by truck when the job is completed. Erecting the huge derrick and its power and control equipment takes less than a day. Hydraulic rams raise the telescoped derrick (above) into vertical position after which the derrick is quickly extended to its full height



Ready to roll over the road, the derrick telescopes down to 63 feet long and is mounted on a big semitrailer



Skim-Milk Processor

Skim milk can be reduced for marketing to 25 percent of its volume by low-cost machinery developed for the former U.S. War Production Board. Much skim milk at present is fed to livestock or wasted because it is too bulky to transport to markets. In the new machine, rapidly revolving disks agitate the milk while a stream of hot air evaporates the water content. The result is a highly condensed skim milk which can be further processed into a milk powder. The powder is as soluble as commercial dried milk and is acceptable in taste.

Salty Flavoring

People on a salt-restricted diet now can have the flavor of salt by using a chemical substitute. Such people, called "hydrated individuals" by the medical profession, have tissues that store abnormal quantities of water. They are susceptible to cardiac and other diseases unless they stay on a diet of restricted salt and fluids. Designed to meet their flavor requirements, the new product contains no sodium, yet it has a salty taste, flows freely and is used in the same manner as salt. Called Neocurtasal, it will be sold in drugstores.



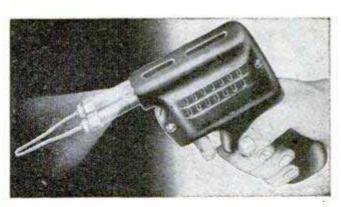
Radiophone on Motorcycle Aids Traffic Police

Three-wheeled police motorcycles equipped with two-way FM radiotelephones are in constant communication with traffic-control headquarters. Designed for use in congested urban areas, the radiotelephone receives and transmits without interference from trolleys, power lines or street lights. The radio weighs only 27 pounds and is mounted in the trunk. It has a range of 15 miles or more.



Trip Lever Releases Lock Wrench

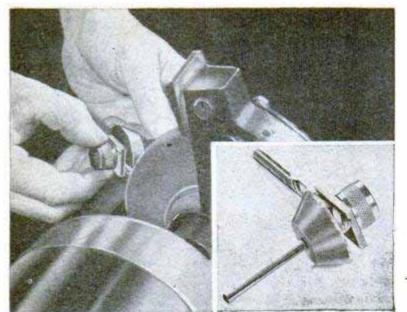
Pushing down on a lever easily releases a lock wrench with a 1000-pound grip. The lever is located just below the pivoting handle and unlocks the wrench by spreading the jaws slightly. The forged-steel jaws have a maximum opening of 1¼ inches and are adjusted by a screw in the handle. The release permits the wrench to be used in places where some other wrenches would be difficult to unlock.



Soldering Gun Spotlights Work

Soldering in dark, hard-to-reach places is simplified by a light beamed at the tip of the gun. The "spot" is between the terminals of the loop tip and lights when current is turned on for the five-second heating period. The gun has a built-in transformer and can be used on 110-volt, 60-cycle a.c. A two-heat trigger switch turns on either normal 100-watt heat or 135-watt heat for short periods.

MARCH 1948 105

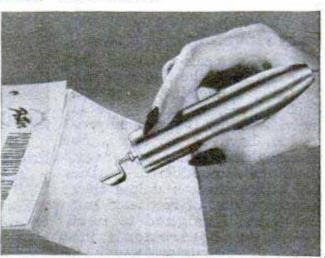


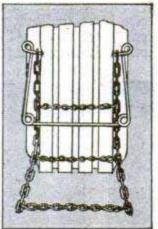
Cone Holds Drills at Angle For Grinding and Honing

Small twist drills are accurately ground and honed with the aid of a holder which keeps the drill at the correct angle to the face of the stone. The holder has a hardened steel cone, a holding plate and an adjusting knob. The drill is inserted in a groove between the cone and the plate and clamped in position. Then the cone, which is at a 59-degree angle, is held parallel with the side or face of the grindstone until the cutting edge is sharp. The holder accommodates drills from Nos. 1 to 60 in size.

"Walking" Stylus Counts Papers

Stacks of paper, cards or envelopes are counted by an electronic stylus that records the total number on an indicator. The stack is riffled to provide a steplike edge and the end of the stylus is "walked" down these steps. Each step generates an impulse which is recorded on the indicator. The stylus may be moved at any desired speed, permitting a single stack to be counted and then checked several times within a few seconds. By moving the stylus slowly, the operator can count off any given number of sheets.



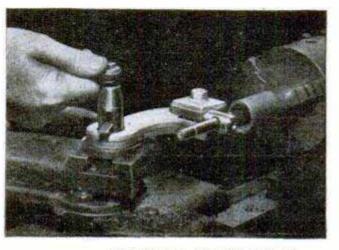


Putting on Chains? Here's an Easy Way

Putting on tire chains, usually an annoying task, is simplified by a pair of wire clips that makes it possible to install both rear chains at once. The clips are clamped to the tires by spring action. With the chains stretched behind the wheels, their connecting links are hooked on the clips and the car driven forward pulling the chains around the wheels.

Curved Tool Holder for Lathes

Designed to fit all lathes with one-inch tool posts, a versatile tool holder can be used for sharpening tool bits, using a boring bar and other operations. Because of its curved shape the holder enables the operator to turn the edge of any disk up to full lathe capacity. A sturdy clamp holds the tool steady without chatter. Especially useful in small workshops where lathes are used for many operations, it can be used to hold a table for a sanding disk and for edge-grooving of V-pulleys.



BRIGHT as a new necktie but not half so loud, No. 500 is the Chesapeake & Ohio's soft and potent answer to the Diesel.

Just out of the laboratory and fresh from a triumphal tour, she has begun a stint of hard labor that may mark a revolution in railway power. For there is nothing like her on American rails—a coal-burning steam engine whose spinning turbine wheels deliver 4,000,000 watts of electric power to 16 drive wheels.

Trackside watchers gape in wonder as the million-pound monster, with a wisp of steam but no strident chug-chug, with a whir of generators but no roar of Diesel engines, responds to the green light and throttle in swift and quiet acceleration.

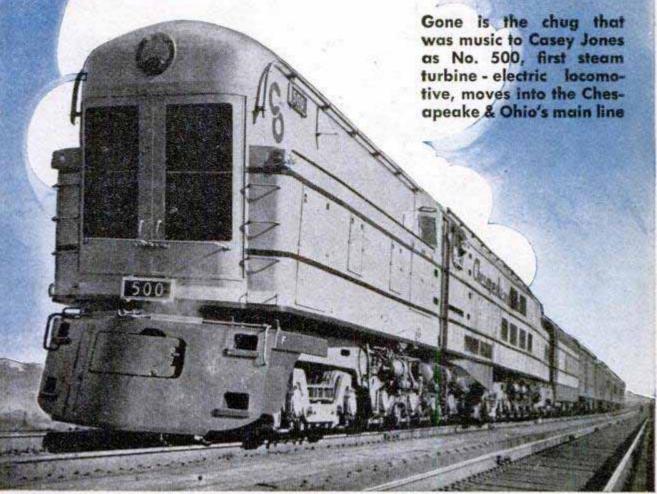
Snaking its burden of freight through the yards, the 500 toots a polite "hello" to an ancient switch engine puffing by on the adjacent track.

The engineer holds the reins on the turbine that spins the 500's four generators

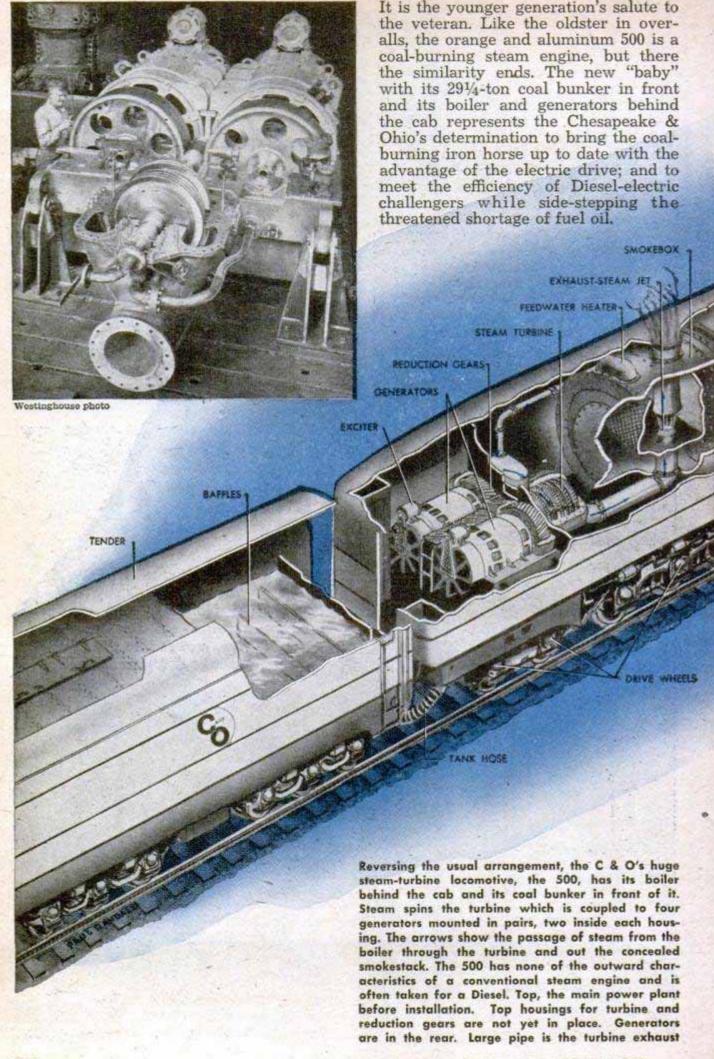


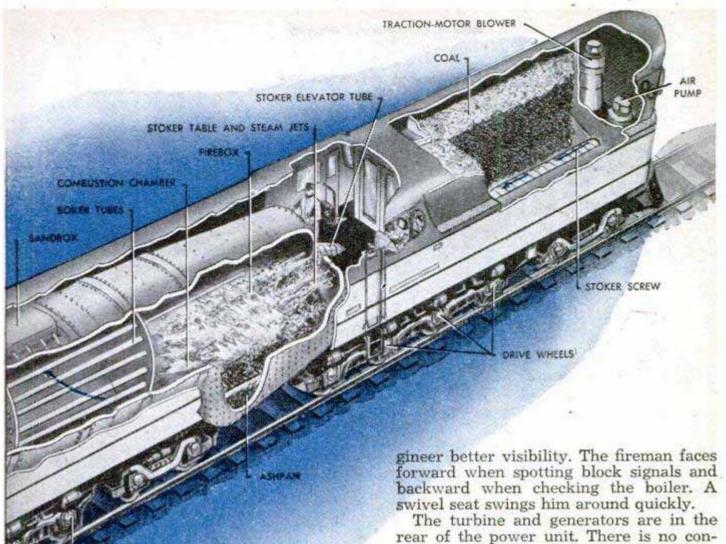
"CHESSIE" Has That New Look

By Arthur R. Railton



MARCH 1948





The C & O is, first of all, one of the leading coal-handling railroads and naturally favors coal as fuel. Second, its engineers point out that our oil reserves may suffice for only 25 to 30 years at present consumption, while our coal reserves are good for 2000 years. So they set about designing a locomotive that was as easy to maintain as a Diesel, as streamlined, as clean and quiet, and with high availability; but one that burned coal. Their answer is the 500.

There's a logical explanation for the reverse arrangement of the 500. The boiler had to be located where it would be adjacent to both the coal supply and the turbine. So, quite logically, it was placed between them. Coal feeds into the firebox by stoker from the front and steam roars out the rear end into the turbine. The boiler, a conventional fire-tube type, is mounted backwards. The firebox is toward the front and the smokestack toward the rear.

With this unusual design the cab could be moved farther forward giving the enThe turbine and generators are in the rear of the power unit. There is no connecting passageway from the cab because there's no reason for going into the generator compartment except during servicing. Gauges in the cab tell the crew exactly what is happening back there and adjustments can be made by cab controls.

Behind the power unit is the water tender—a mighty car in itself, holding 25,-000 gallons of water. Two flexible water

pipes connect it to the boiler.

The longest single-unit locomotive in the world, the 500 measures 154 feet 34 inch from cowcatcher to rear coupler. This iron "race horse" is capable of speeds up to 100 miles an hour. At least that's its rated speed, but nobody knows how fast it will go. With 16 driving wheels powered by eight traction motors producing 4960 horsepower, the streamlined beauty won't take a back seat to anything on rails.

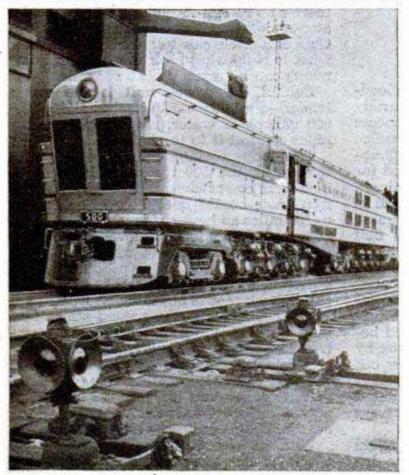
The 500 is really the second steam-turbine locomotive to go to work in this country. The first was the Pennsylvania's direct-drive steam turbine. But the 500 is the first steam locomotive using turbinedriven generators to provide electrical power for its drive wheels. It is steam's answer to Diesel and coal's answer to oil.

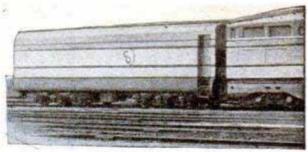
With its electric drive, controlling the 500 is as simple as regulating an electric

DRIVE WHEELS



Above, the fireman opens the butterfly door of the firebox to show how stoker feeds coal onto table. Steam jets spread coal over fire automatically. Three holes in stoker tube enable him to watch flow of coal when door is closed. Below, loading arm is lowered into opened bunker during coaling at Clifton Forge





fan. The single throttle lever has 11 settings from idling to full speed. The 500 cruises along easily at 70 miles an hour with the throttle on the seventh notch.

In addition to regulating the electrical field of the generators, the throttle also controls the number of jets used in the turbine. At idling, steam is forced against the blades through only one jet. At full speed and power, four jets are used. Intermediate speeds use two or three jets.

Not only does electric drive provide better control over power, but it also eliminates heavy, complex gears. The only gears in the driving assembly are the gear coupling of the turbine to the generators and the coupling of the eight traction motors to the axles. If the turbine were coupled directly to the drive wheels, as in direct-drive turbines, a huge gear assembly would be necessary. Also, it would require a variable-speed turbine that is less efficient than the turbine of the 500 that runs at a constant speed of 6000 r.p.m. Only when the load is extremely light or when the engine is idling does the turbine revolve at reduced speed.

The 500 can be run in reverse simply by changing its electrical circuits. By moving a lever on the control box next to his seat, the engineer can run the train just as fast in reverse as in forward speed. On the Pennsylvania direct-drive turbine, a separate, smaller turbine is used to provide reverse motion at slow speeds.

Riding in the cab of the 500 you are amazed at the difference between its action and that of a conventional reciprocal-action locomotive. When the engineer pulls back the throttle there is no deafening chug-chug. There's no



Top, the 154-foot "Chessie" sets a new style in steam engines. Forty wheels are needed to support its tremendous weight

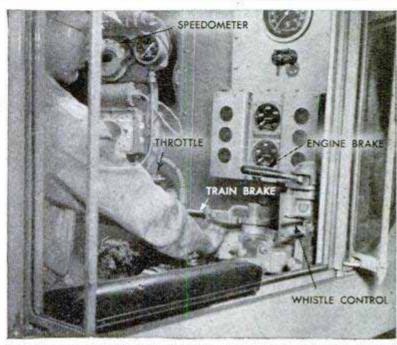
hissing of exhaust steam from the cylinders—there are no cylinders! The turbine transforms the 310-pound steam pressure into mechanical power without the clatter of valves and pistons. No black smoke billows from the stack. Instead, a smooth flow of steam from the turbine shoots into the air and disappears.

As the 500 rolls through the yards, other locomotives appear small and old-fashioned beside this shiny, streamlined beauty that may revolutionize fast passenger service. Here is a steam locomotive that doesn't need frequent trips to the shops for servicing. It will make the 666-mile run from Washington, D. C., to Cincinnati, Ohio, at high speeds without relief—and could turn around and make the return trip without servicing.

Passing the yard limit, you move out on the main line. The speed limit here is 75 miles an hour and the signal board ahead shows green over red—"clear track"; the engineer pulls the throttle back another few notches. Instantly you feel the 500 pick up speed as the 16 drive wheels respond to the increased power.

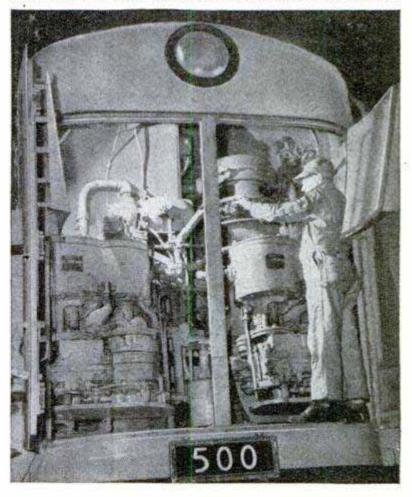
The only noise is the continuous hiss of the stoker jets blasting coal into the fire. The pulverized coal flows continuously from the bunker ahead of the cab through a stoker tube and into the firebox. Looking through three small holes in the stoker tube you see coal pouring over the lip onto the stoker table in a continuous stream like a waterfall going uphill. From the table, coal is spread over the 14-foot firebox by powerful steam jets.

(Continued to page 252)



The Looking at the engineer's control board from outside the cab.

Motor blower and air pumps are located above the cowcatcher.





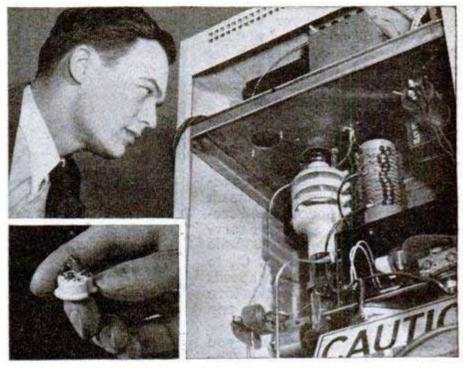
Farmer Builds Light Truck For Price of Engine

When a light truck was needed on his farm, George Samuelson of Chesterton, Ind., built one from old parts he found around the neighborhood. Samuelson's sole investment was for an engine to power the truck. The rear end is from a Ford Model-A car and the front end from a Model-T. Two V-belts connect the engine with the driving mechanism. The truck can travel forward and in reverse and makes 30 miles an hour. The sides of the platform are hinged and can be folded down.

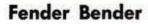
Diamond "Insulators" Multiply Current

Important new types of electron tubes that do not exist today may be developed as a result of a new method of controlling the flow and amplification of electric current. At the Bell Telephone Laboratories scientists have discovered that when a beam of electrons is shot at a diamond chip, electric currents are produced in the chip which are several hundred times as strong as the original beam. Diamond chips are classed as an insulator because ordinarily they will not carry

a current. Yet when they are bombarded with relatively lightweight electrons they multiply the original current as much as 500 times. In preparing the chips for such amplification the scientists deposit gold on



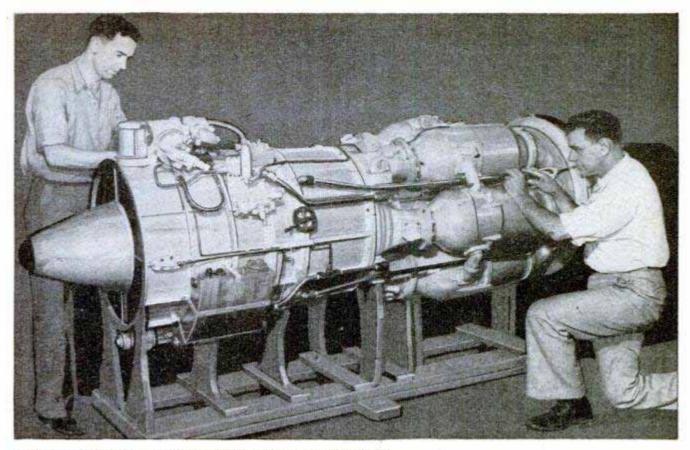
the two flat surfaces to afford electrical connections. The technique opens up a new approach to the design of electron tubes and may be a tool for studying the impact of electrons on matter.



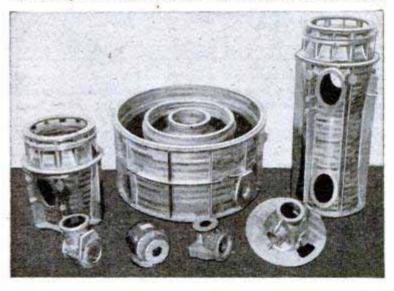
Dented fenders are rolled smooth by a tool that requires no hammering. The tool consists of a C-shaped pipe with a roller on one end and an adjustable backing plate on the other. The roller is fitted behind the dent and the plate on the outside. Manipulation rolls out the dents to renew the fender in as little as 12 minutes. No other tools are required.



Information, including manufacturers' names, concerning products described in this issue may be obtained by writing Bureau of Information, Popular Mechanics, 200 E. Ontario St., Chicago 11, III.



Looking just like the real thing, a pine and mahogany mockup (above) of Canada's first jet engine. Below, wooden parts



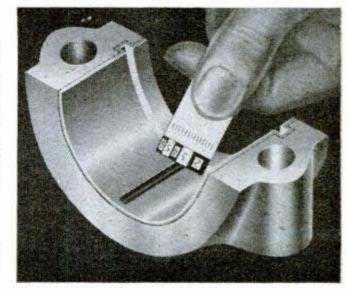
Wooden Jet Mockups

Canadians are saving time and money by making jet-engine mockups of pine, mahogany and cherry wood instead of metal. From blueprints, woodworkers make fullscale patterns of every component part and accessory, except piping, on proposed engines. Completed assemblies are then inspected by designers and engineers for possible changes. Shortcomings or design improvements are more easily spotted with the aid of the threedimensional mockups than with blueprints alone. After approval, the patterns help foundrymen in casting parts for the actual engine.

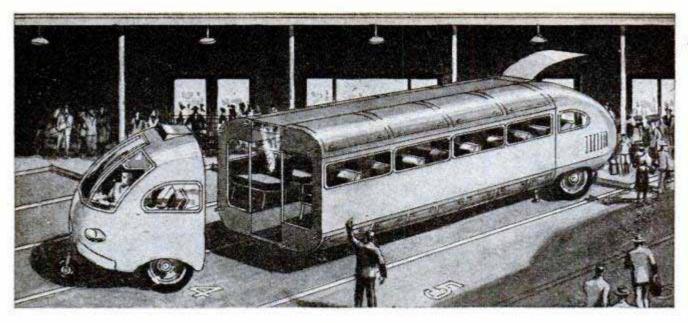
Plastic Rod Checks Bearings

Bearing clearances of engines are checked by a plastic gauge which is flattened inside the bearing. The gauge is a length of extruded plastic packaged in an envelope printed with a scale. The plastic is laid on the bearing shell and then flattened by tightening the bearing cap on the crank. When the cap is removed, the width of the flattened plastic is measured with the printed scale on the envelope to determine the clearance.

¶The year 1887 saw the largest growth in American railroad history with 13,081 miles of new lines completed.



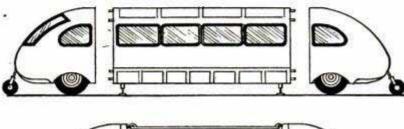
MARCH 1948 113

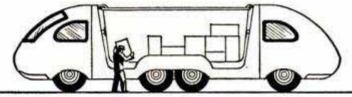


SECTIONAL BUSES

Buses built in sections with the carrying unit independent of the front and rear ends have been patented by Rene Lucien of England. The design includes a forward section containing the driver's compartment, a rear section containing the engine and driving wheels, and a center compartment without wheels which has seats for passengers. The three sections, fastened together by joints at the ends, are taken apart easily. The front and

rear sections drop retractable third wheels to give them support and are wheeled away from the carrying compartment which is kept at the proper height by hy-





Top, driver's cab is backed into position and locked to body of the bus. Diagrams show how body stands on independent legs and how additional wheels support the center section for use as truck

draulic jacks. The design permits quick power-unit changes and the shifting of end sections from short to long passenger sections as traffic demands.



Cartridge-Type Gun For Home Calking

Loading a new, lightweight calking gun is easier than changing blades in a safety razor. You merely snap the loaded cartridge in the gun just as it comes from the store. The cartridge has a nozzle on one end and an opening for the ratchet-operated piston on the other end. The piston moves forward one eighth of an inch each time the trigger is pulled forcing the calking compound out evenly. Ideal for minor repairs around the house, the gun and disposable cartridge eliminate the cleaning of conventional guns.

■While 154 miles of new railway lines were built in 1947, 670 miles of trackage were abandoned.

Jeep-Trailer Truck Can Turn on "Dime"

Combining a surplus American Army jeep and a trailer, Italian mechanics have built a six-wheel truck which can turn on the proverbial "dime." The hindmost wheels are turned at the same degree as the front wheels by the action of a single steer-

ing wheel. A rod connects the trailer's wheels to the plate on which the trailer rests on the jeep. The plate turns as the jeep turns, causing the trailer wheels to

turn in the same direction and at the same degree. The front and hindmost wheels turn in opposite directions when the vehicle is backed up.



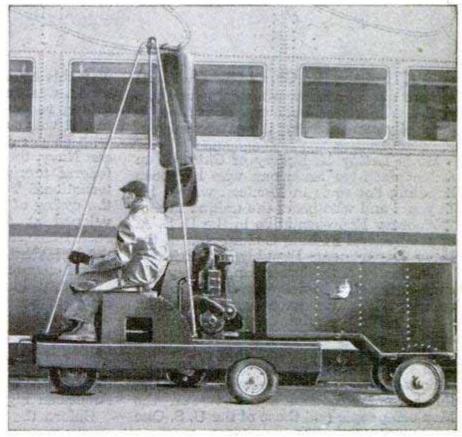
Quick-Loaded Body Rolls Off Truck

Truck bodies on casters slide completely off the truck to save time in loading and unloading. The bodies are shaped like large freight boxes and are rolled on or off the truck by a rearmounted winch. A hydraulic hoist elevates the steel track to clear loading docks. While the truck is in motion the body is locked in place by a safety catch.

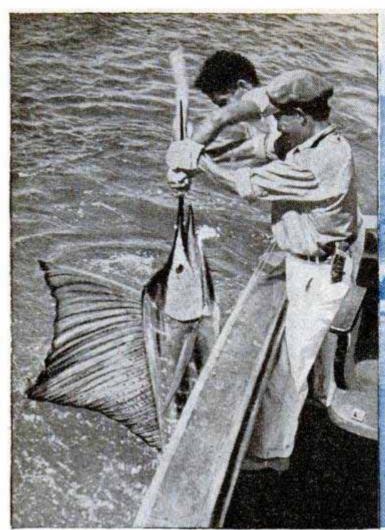
Mobile Scrub Cart Cleans Train Panes

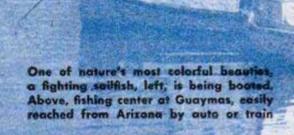
Windows of railway cars are scrubbed by a mobile washing machine at the Pocatello, Idaho, station of the Union Pacific Railroad. Operated by one man, the washer sprays ordinary tap water on the windows and scrubs them with a revolving brush. The machine is fast enough to scoot down one side of a 12-car train and back up the other in eight minutes, washing every window on the way. Thirty gallons of water are used on a 12-car train.

¶In daylight, the human eyes can distinguish more than 17,000 different colors and tints.



MARCH 1948





Copyright by Juan Guzman

Pemex photo

Deep Sea Rodeo

SOUTH of the Rio Grande, where saints are almost as numerous as generals, a genial American business executive is generally recognized as the patron saint of Mexican fishing.

He is LeRoy H. Dorsey of Chicago, an ardent deep-sea fisherman who has been handling hot reels in Mexican waters for 14 years and who bears the unique title of "Honorary Representative in the U. S. A. of the Federal Fishing Commission of the Navy Department, Republic of Mexico."

Originally a fly fisherman, Dorsey became interested in deep-sea fishing in the middle 1930s. He gave away his light, stream-fishing equipment and acquired salt-water tackle. Then he deserted the trout streams and began to explore the blue salt water of the Mexican coast.

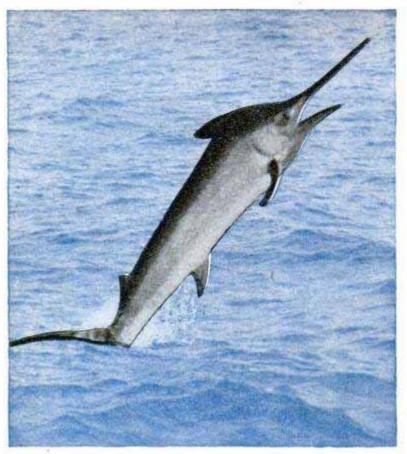
South of the border Dorsey felt the need for better understanding between the Mexican people and those of the U.S. One way this could be brought about, he reasoned, was through international deep-sea fishing rodeos. With world unrest growing, it was suggested and he organized—with cooperation of officials of the Mexican Navy, the Minister of Interior and the federal tourist department—the first International Tarpon Rodeo at Tampico in the spring of 1941. Later, others were developed at Acapulco and Veracruz. At each rodeo, a solid silver cup, put up by the president of Mexico, is awarded the grand champion.

Several hundred American sportsmen compete yearly in these fishing rodeos, conducted under the auspices of local fishing clubs. Some cruise south in their own fishing boats. Others fly down on the four American airlines that serve Mexico. Still others drive their cars over the Pan-American highway or come by train.

Before the war, the average American



MARCH 1948



Marlin abound in most of the popular Mexican fishing waters

extends for about 50 miles and offers excellent robalo (snook) fishing.

Acapulco, where the Fifth Annual Sailfish Rodeo will be held April 1, 2 and 3, is Mexico's largest Pacific port. From here in the 16th and 17th centuries, Spanish galleons sailed to China and the Philippines and returned laden with ivory, porcelains, perfumes, jades, silks and spices. Today it is popular as a winter vacation resort.

One of the first fishermen from the United States to discover Mexico's Pacific waters was Zane Grey, famous novelist and sportsman. Some 20 years ago, after fishing off Acapulco, he wrote:

"When at last we got my fish on board it appeared that I had reason to be proud. All the delicate and exquisite features so remarkable in the other sailfish we had taken appeared intensified in this one. He was 10 feet 1 inch in length, weighed 135 pounds and the spread of his tail was 3 feet."

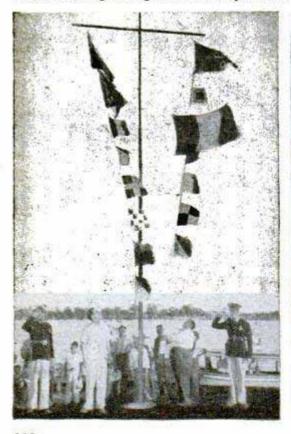
That's good fishing, but Zane Grey's prize catch of two decades ago has been surpassed on several occasions. The present record for the Pacific sailfish is 190 pounds and 10 feet 2½ inches long.

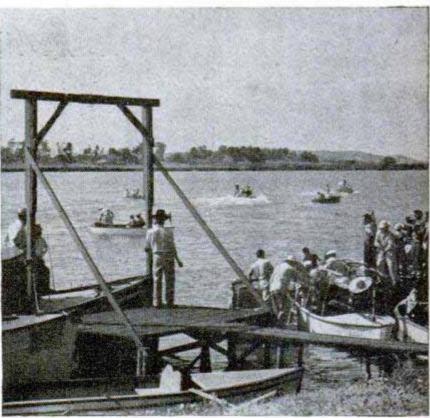
The Third International Veracruz Deep-Sea Fishing Rodeo is April 9, 10 and 11. Veracruz is 281 miles east of Mexico City on the Gulf, where Hernando Cortes

and his whiskered band of Spaniards landed in 1519 and proceeded to conquer what they called "New Spain." Today it is one of Mexico's leading ports.

Both salt and fresh-water fishing are offered here. Best deep-sea fishing is found at Villa Rica and around the banks

Below left, flag-raising ceremonies open the three-day rodeos. Right, starting after giant tarpon at Tampico





and shoals of the Verde, Anton Lizardo, Anegada de Afuera and La Gallega islands. Large tarpon, marlin, kingfish, African pompano and sea bass are taken there. Rivers near Veracruz-especially the Cazones and the Tecolutla-offer bass and rainbowtrout fishing.

No article about Mexican fishing would be complete without mention of the Gulf of California, reached easily by highway or railroad from Arizona. Marlin, sailfish, mako shark, dolphin,

tuna and the giant white sea bass are found in these waters. Dangerous and exciting sport is fishing for giant manta-4000-pound rays that can swamp a boat.

Mexico's fishing rodeos are three-day affairs, starting the night before with a get-acquainted banquet for contestants and rodeo officials. This is a gala occasion, staged with the warmhearted love of fiesta so characteristic of the Mexicans.

The next morning at nine.

flag-raising ceremonies and speeches send the fishermen on their way. The contestants fish under a code as strict as Marquis of Queensberry rules. At the end of the third day, the rodeo is closed with the lowering of the flag and awarding of prizes contributed by Mexican fed-

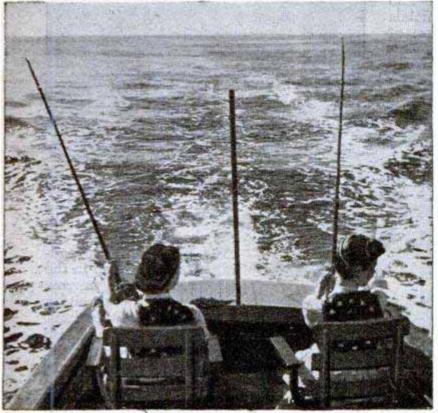


Copyright by Juan Guzman "Dorado" to the native lad who gaffed it, but a dolphin to the American sportswoman who hooked it and fought it to the boat

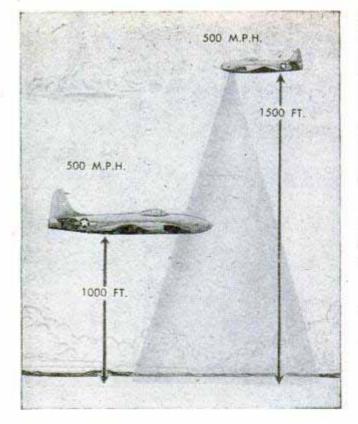
eral, state and city officials, Mexican and American individuals and fishing-tackle companies.

Last year's prize catches were as follows: (1) Tampico—a 6-foot 2-inch tarpon (Continued to page 260)

Deep-sea fishing offers unbeatable combinations of sunny skies, blue water and hungry fish. Right, the 1947 Tampico winner holding his catch, a 151½-pound tarpon 6 feet 2 inches long. They come even bigger than this

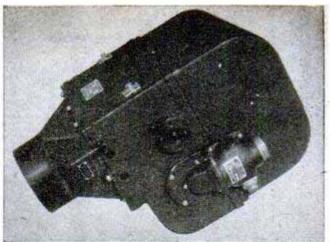






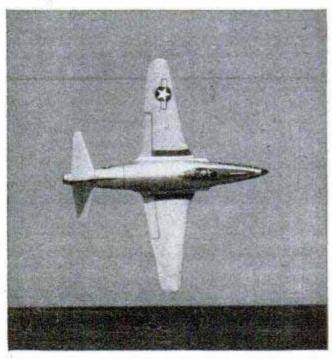
Recon Photos at 1000 M.P.H. Simulated by U.S. Air Force

Actual flight tests have shown the U. S. Air Force what photos taken at 1000 miles an hour and 500 feet above the target will look like. Two P-80s flew in opposite directions at 500 miles an hour, using a runway as the course marker, to simulate the future reconnaissance problem. The upper, or photographing plane, had two strip cameras with focal lengths of 6 and 24 inches. They flew at 1000 and 1500 feet altitudes, respectively, for the tests. The quality of the photos is excellent, officials said, and dimensions in the direction of flight are accurate to within two percent.

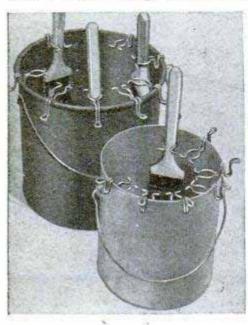


Air Materiel Command photos

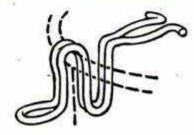
To simulate conditions for taking aerial photos at 1000 miles an hour, two 500-mile-an-hour jets, left, were flown in opposite directions over the same runway so that their paths crossed. Above, high-speed strip camera, specially synchronized, used for test. Below, photo made at simulated 1000 miles an hour



Wire Clips Snap on Rim of Can to Hold Paintbrushes off Bottom







Wire clips that snap on the rim of a can hold paintbrushes safely inside the can during painting and storing. The spring clip grips the brush handle, holding the bristles away from the bottom of the can thus preventing spreading. A double bend in the clip provides a narrow slot for small cans and a wider slot for large cans. The clips can be used also for holding tools in the workshop by slipping them on a strip of wood fastened above the bench.

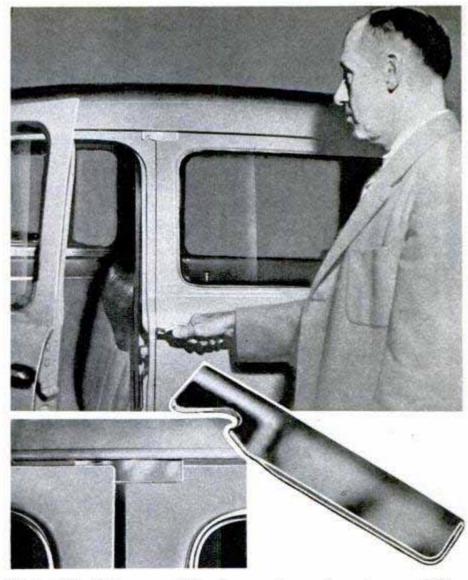
Slip-on Door Lock Protects Children

Automobile doors are held closed by a slip-on device that fits in place without the use of tools. It is a safeguard against children falling out when a door is accidentally opened, and doesn't require permanent attachment. One end of the lock slips over the rear door's top flange; the other fits beneath the front door's flange. The lock also serves as a bottle opener.

Baked Volcanic Ash Makes Building Blocks

Volcanic ash is converted into a building material by baking it in an oven — a process developed by A. L. Burwell of the Oklahoma Geological Survey. Great quantities of the peculiar ash were deposited across Oklahoma prairies thousands of years ago. When the ash is heated it forms a material similar to conventional building brick.

The hardened blocks are filled with tiny bubbles of gas. The material has excellent insulating qualities, is soundproof and fire-



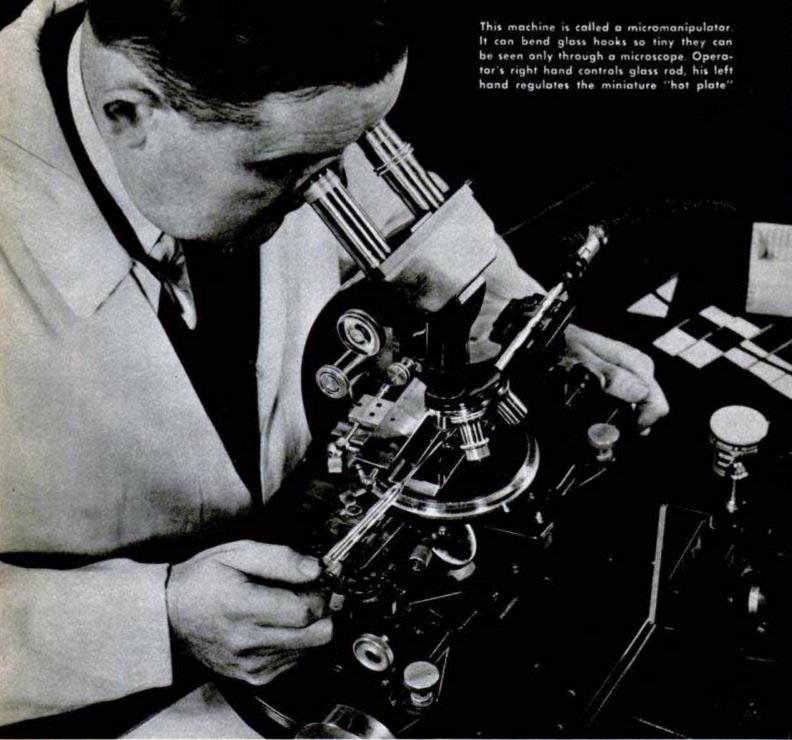
proof, floats on water and can be sawed like wood. Olive drab in color, it can also be made in slabs or strips.



Darkroom Moved Into Light

Darkrooms are moved out into the light for demonstration purposes by the use of a booth made of large sheets of "safelight" filter material. The darkroom is set up in a normally lighted room and the complete enlarging and developing process is carried out in full view of spectators. Used for demonstrating a new enlarging paper, the darkroom has transparent sides and dome. The safe-light material filters the blue, green-yellow and deep red of the spectrum and prevents fogging the enlarging paper without blocking the view from outside.

¶United Air Lines passengers can wire ahead for rental cars to be available on arrival at airports of 50 cities served by the company.



Eastman Kodak photo

Tools That Fit in a Needle's Eye

TOM THUMB tools are the "hands" of science in exploring the unknown under a microscope.

Miniature tools from soldering irons to saws are providing a means of pinning down the mysteries of science. With them scientists can puncture the "skin" and operate on one-celled animals too small to be seen with the naked eye. The tools are used in research fields from medicine to metallurgy. And size is no key to their value, for they are cracking the unknown.

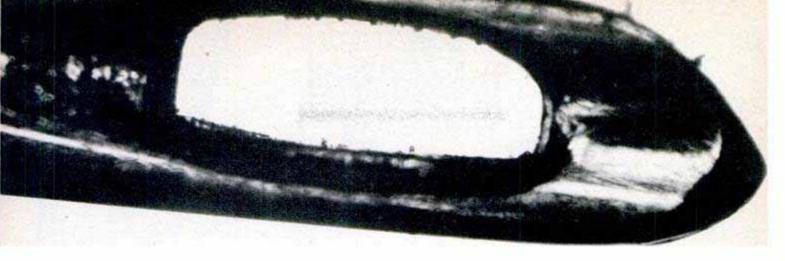
The microscope gave science "eyes" for observing objects of the infinitesimal

By Mack Taylor

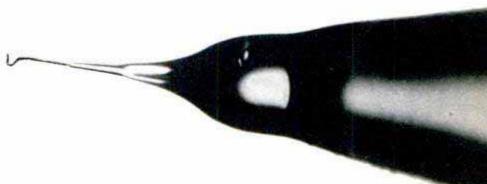
world. Yet scientists have had difficulty probing this world without tiny hands. A new field of science called micromanipulation has given them fingers with which to operate beneath the microscope.

The delicate tools probe scientific secrets under the guidance of a microma-

nipulator, an instrument bristling with pliable shafts. A slight touch of a screwhead



Studies of specks of matter require instruments so small their working ends can't be seen without the aid of a microscope. Magnified eye of the needle is huge compared to the tiny hook on the micro-instrument at right



manipulates the tool attached to one shaft.

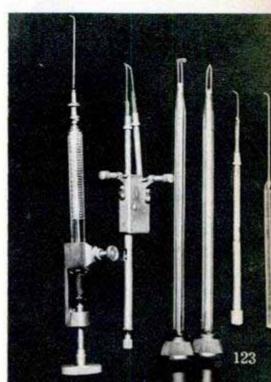
An amazing assortment of hooks and forks are used in a micromanipulator to help examine foreign particles. Other tools such as rakes, glass and steel knives, saws, hammers, files, chisels and scrapers come in handy for performing operations. For lifting objects, there are micro monkey wrenches, tweezers and electromagnets.

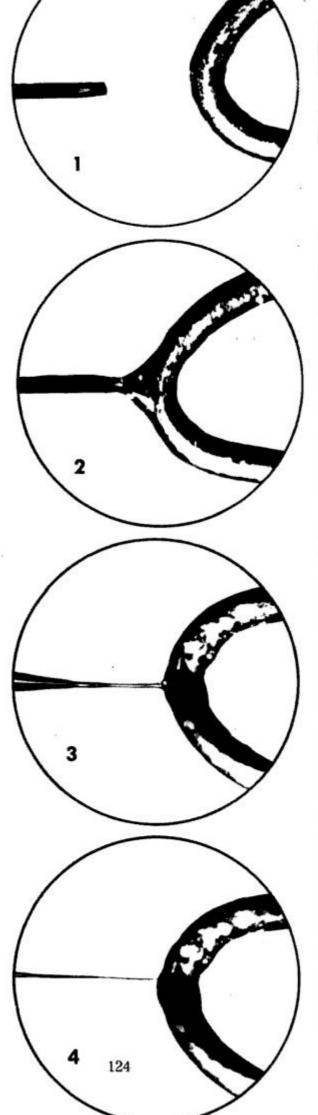
It's hard to draw a line as to just where micromanipulation begins and ends. Some scientists use the word interchangeably with micrurgy, which other authorities insist applies only to operations on germs and cell tissues. Still others maintain that micromanipulation includes any work in which apparatus is moved about in making microscopic observations.

Micrurgists at New York University and other laboratories are working with their Tom Thumb tools to unlock the secrets of a tiny living cell. They have removed the nucleus of the amoeba, the tiny one-celled animal found in fresh water. They've kept the enucleated animals alive for more than 24 hours. Using micro-needles, they have injected droplets of oil into the cells to study action of enzymes, the complex

On the screen is a magnified image of capillary tube. Micrurgist is about to reach into it with tiny pipe. Right, tools include, left to right, a microburette, tweezers, heating unit, soldering iron and two dissecting needles. Pleischmann Laboratories photo









T Micropipette is drawn by holding tube over tiny flame and pulling glass with tweezers. Left, in making a microhook a glass rod is touched against a heated platinum wire, then drawn out much finer

chemicals our bodies manufacture to digest our food.

One micrurgist has made electrodes delicate enough to measure the potential difference between the inside and outside of a living cell, while a team has made thermocouples delicate enough to be embedded in a living cell to measure heat absorption.

All these experiments are directed toward a better understanding of protoplasm. And protoplasm lies at the heart of unanswered questions about many dis-

eases including cancer.

Much of the micrurgist's study is an attempt to learn just how proteins are put together. Scientists would like to produce complex proteins in the laboratory for experimental purposes, but that's out of the question until more is known about their make-up. It's thought that when a virus enters a living cell it converts the protein into a substance similar to itself. Tools of micrurgy are being used in the study of the construction of these proteins.

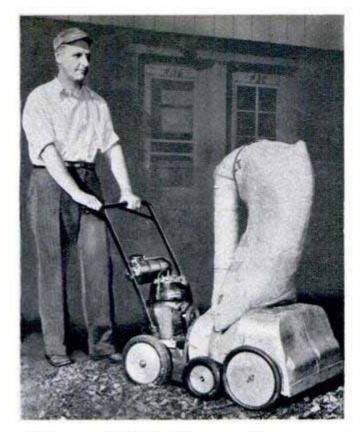
It has been found that certain chemicals of the hydrocarbon family, derivatives of coal tar, can cause cancer in animals. One of them, benzopyrene, may be responsible for one form of cancer in man. If micrurgists can create mutations—changes in structure within a cell that will produce cancer, they will be at

the root of the puzzle of how cancer starts.

In the growing of yeast cells which "raise" our daily bread, micromanipulation is performing miniature miracles. It takes about 15 billion yeast cells to weigh a gram, and that many grown cells are about the size of two aspirin tablets. But at Fleischmann Laboratories, biologists work with tools so minute they can pick up a single cell.

So that bakers will have yeast which doesn't vary, the research is aimed at maintaining uniform quality. Part of this research involves handling very minute quantities. After putting single yeast cells in droplets of solution that will encourage their growth, the biologists can arrange rows of a dozen of the droplets on a

(Continued to page 248)





"Convertible" Mower Removes Leaves or Snow

Bernard L. Larson of Buffalo, N. Y., built himself a tricky "convertible" that will never speed along the highways. It's a gasoline-powered combination snowplow, leaf remover and lawn mower. A blower and revolving brushes pick up leaves and shoot them into an attached burlap bag. Removing the front cover and

exposing the brushes converts the machine into a snowplow. In the spring it becomes a lawn mower with the substitution of two revolving cutting disks for the blower and brushes. As further evidence of the inventor's ingenuity, the 1½-horsepower engine's flywheel is guarded by a former kitchen strainer.

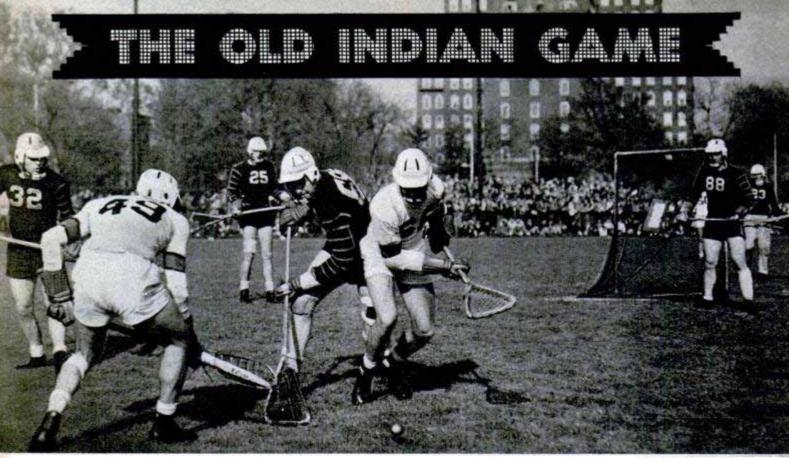


Knife-Bladed Plow Chisels the Soil in 34-Foot Strips

Plowing costs are cut in half while crops are increased up to 100 percent by a 34-foot plow that chisels the soil instead of turning it over in furrows. Narrow, knifelike blades, spaced every 12 inches, crack open the subsoil permitting moisture to enter. The plow is hinged eight feet from

each end to permit simultaneous plowing of three contours. Because it does not turn the soil, the plow leaves weeds on the surface where they furnish shade and mulch and the absence of furrows reduces erosion to a minimum. Ranchers use the plow to loosen root-bound grass in pastures.

MARCH 1948 125



HIS MONTH along the Last Coast a growing number of small fry race for the vacant lots fondling webbed sticks - lethal weapons in a roughand-tumble sport that is pushing baseball out of the sand lots.

The pint-sized athletes are taking after their big brothers in college, who are reviving lacrosse in a

big way. Oddly, until recently only a few high schools and colleges played lacrosse, America's oldest sport. Now the slashing game is spreading west, and teams from the Middle West and West Coast will trot out on the field this year.

Noggin-knockers from Ohio State, Oberlin, UCLA, Loyola of Los Angeles, Franklin and Marshall, Dickinson, Delaware, Washington College (Md.) and William and Mary will enter competition for

the first time.

Lacrosse is the only contact sport played in the spring. It's a game that blends the power of football, dash of basketball, precision of baseball and speed of hockey. As a spectator sport it's unique. Once you've seen a lacrosse game you're either a rabid fan or the game leaves you cold. Most spectators become fans; there's been a tremendous surge in game attendance within the past few years. Ten thousand "hunkers"-lacrosse fans-saw last year's open

Redmen played lacrosse long before Columbus set sail. Now sandlots and stadiums are resounding to the whack of netted sticks in a revival of

this riotous sport

Johns Hopkins photo Object: to place ball in net. Opposition: up to 10 armed huskies

title match, foghorning their enthusiasm across the Johns Hopkins stadium.

If you live west of the Alleghenies you'll likely have a chance to watch your first lacrosse game soon. Zealots flatly state that it will become a major college sport, and they see

the day when professional tilts may vie with baseball in popularity. The Canadian government passed a legislative act in 1867 naming lacrosse the national sport, and hunkers see no reason why the game can't be just as popular in this country.

Despite the rough-and-tumble nature of the game, girls' schools are taking part in the revival. The first U.S. Women's Lacrosse Association was formed in 1934 after a visiting English team created a flurry of interest. Now several skirted teams are

playing the unladylike sport.

Lacrosse is the original "old Indian game." It was played by the redskins long before white men discovered the continent. "Baggataway," forerunner of lacrosse, was a warlike game in which tribe was pitted against tribe, the tilt lasting several days. Sometimes 400 braves fought for the ball at a time. When a warrior picked up the ball, he popped it into his mouth and raced a half mile for the goal. Opposing braves beat him on the head with their sticks, and if he lagged along the way the squaws dashed onto the field to spur him with whips. The first objective of a player was to cripple his opponent, thereby cutting down the number of players on the opposing team. Occasionally a particularly rough game would explode into a full-scale tribal war.

Great feasts and powwows were held before the big match. Some tribes made a ceremony of the game itself. Attached to each player was the tail of an animal, and during the battle he was required to imitate the creature he represented.

Canadian pioneers soon picked up the game, changed the rules and adopted it as a rough frontier sport. Later it spread from Canada to Baltimore. Johns Hopkins University has played lacrosse since 1888, has won or shared 18 national intercollegiate titles and brought the international championship to the United States in 1928 and 1932, the two years the game was played at the Olympics. In 1947 Johns Hopkins' three teams played a total of 21 games, an indication of the university's enthusiasm for the sport.

Because Baltimore is the home of Johns Hopkins, it has become the unofficial national capital of the game, and back-lot teams of that city have deserted baseball for lacrosse. The sport gradually has spread along the East Coast and now is invading the West. Today about 50 colleges and 75 high schools have lacrosse teams.

But the game hasn't lost its Indian flavor. Even now, the only manufacturers of lacrosse sticks are the braves of a Canadian tribe.

Equipment worn by the players is designed to give maximum protection without hampering speed. As most of the blows



While an attack man leaps for a pass, two opponents check—and double check—him with a pair of jarring blocks. Lacrosse is a tough sport for tough players

Ball lies between players' sticks for a face-off, which occurs at start of each quarter, after a goal and whenever ball is deadlocked between players



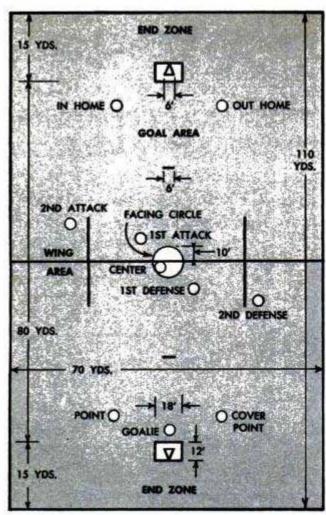


Diagram shows field with one team lined up for a face-off. Opposing players stand beside these men

Here only the goalie stands between the ball and a score. Attacker has completely eluded opponents

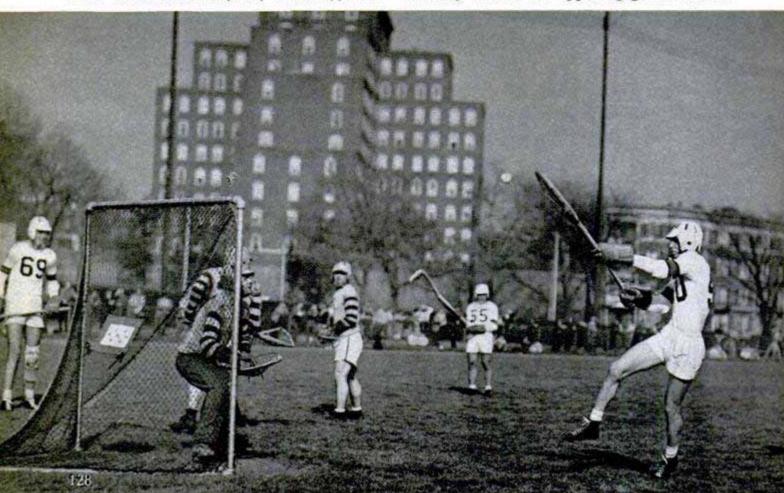
from opposing sticks beat a tattoo on hands, arms and shoulders, these areas are given special protection. Pads strapped to the shoulders extend down the forearm and heavy gloves protect the hands. In addition, each player wears a helmet with a wire face guard.

Lacrosse is played on a field 110 yards long and 70 yards wide, with the two goals, similar to hockey nets, 80 yards apart. Each team consists of 10 players—a goalkeeper, three defense men, three midfield men who play both defense and offense, and three attack men. Each player carries a "crosse," a stick three to five feet long terminating in a snowshoelike web in which the hardrubber ball is carried. Four 15-minute periods constitute a game.

To start play, the ball is placed between the sticks of the two centers crouched at midfield. Upon the referee's whistle they draw, trying to gain control. From that point the game moves as fast as the 20 fleetfooted athletes. The ball can be carried in the stick, kicked or passed.

The object of the game is to disorganize the opposing team's defense so that a man can be shaken free for a reasonably clear shot at the goal. At no time during the game can a team have less than four men on the defensive side of the center stripe or less than three men on the attacking side. The disposition of the remaining players is optional.

Rough stuff occurs when a player has the ball cradled in his stick and is threading his way toward the opposing goal. Defense



men can whack down on his stick or the hands that hold it, or they can stop a run-

ner with a jarring body block.

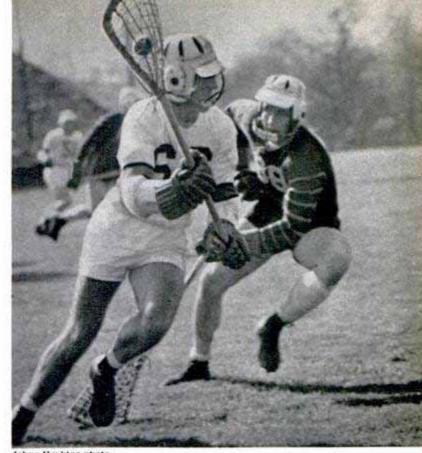
The runner can dodge opponents, zip the ball to a teammate or try a shot at the goal. The crosse acts as a sling when passing or shooting, giving the ball tremendous speed and impact, as many goalies, black and blue despite their heavy padding, will testify. Penalties are less frequent than in basketball or football because rules are simple and violations easily detected. Players know that a foul will leave their teammates shorthanded, as a player who has committed a foul goes to the penalty box for a specified time.

Some schools say "too rough" and turn their backs on lacrosse. Unofficially, the game has been tagged "organized mayhem," and anyone who has watched a runner caught in the "crosse fire" of two club-

bing defense men might agree.

Actually, the heavy padding, helmets and face guards prevent injuries—the fearful clatter during a game is the crash of stick on stick and not the sound of splitting skulls. Wesley Knight, Williams College trainer, cites figures to prove that injuries are less frequent and less severe than those of football, soccer or even basketball. "Howdy" Myers, coach at Johns Hopkins, can recall only one player who suffered a broken bone, and Myers has been fielding lacrosse teams for 16 years.

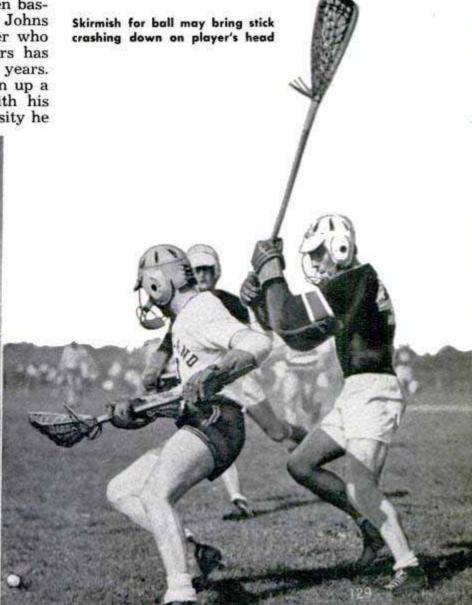
The Johns Hopkins coach has run up a phenomenal string of victories with his teams. Before coming to the university he



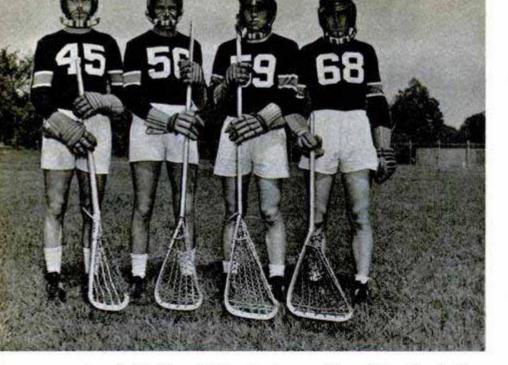
Johns Hopkins photo

Ball is "cradled" in the pocket

by twisting the stick on the run







Length of stick and size of net vary with position played. From left to right are the attack, midfield, defense and goalie sticks

coached a prep team, and his school and college squads won 71 straight games before the spell was broken in the Open Match play-off last year. Johns Hopkins lost to the Mt. Washington Club team, 6 to 5, in a seesaw battle.

Mt. Washington members are all rabid hunkers and will buttonhole anyone who shows the slightest interest in lacrosse. The club is composed of former lacrosse stars. Their team plays a schedule as stiff as any in the country, and no college team can claim the national Open Title without first whipping the Mt. Washington Club.

A good lacrosse player appears to combine the speed and power of an express engine with the precision of a ballet dancer. His passes must have bulletlike accuracy.

Once Coach Myers started a friendly argument with a base-ball coach who scoffed at the precision of lacrosse. Myers challenged him to a baseball game—lacrosse players to handle the ball only with their sticks. The befuddled baseball team was completely outclassed by the quick fielding and bullet throws.

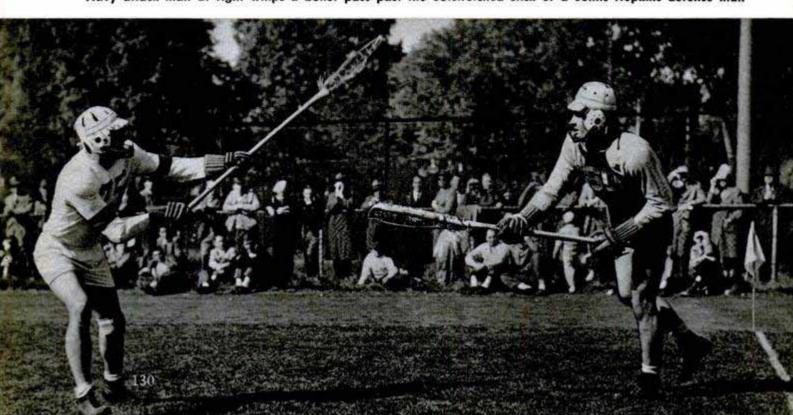
A typical tilt has all the excitement of a tight football or hockey game. Last year Johns Hopkins trailed Princeton by two goals with three minutes to play. The team managed to push through one goal, then with 30 seconds remaining, zipped the ball into the net to tie up the game. In the overtime period the Hopkins sharp-

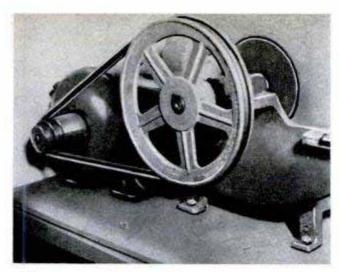
shooters whipped in two more goals to win.

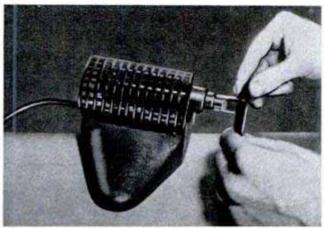
There are a lot of laughs in the game, too. Occasionally a player will race the length of the field, crash through the defense men, jockey the goalie out of position and make a spectacular shot—only to discover that the ball dropped out of his stick at the other end of the field.

The U. S. Intercollegiate Lacrosse Association draws up rules and schedules for college lacrosse. Seven new members have joined in the past three years—convincing evidence that the game is spreading. The superiority of the "Big Five" of lacrosse—Johns Hopkins, Army, Navy, Princeton and Maryland—may be challenged soon by teams from farther west.

Navy attack man at right whips a bullet pass past the outstretched stick of a Johns Hopkins defense man





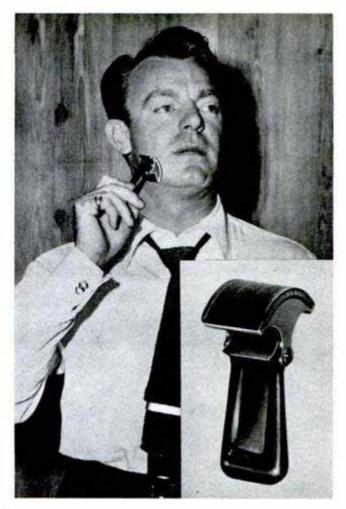




When heated to 300 degrees Fahrenheit, the ends of a plastic belting material can be fused to form an endless belt of any desired length without the use of hooks or other fasteners. The smooth joint is as strong as the belting material, which is available in a variety of sizes and shapes for small power tools. Although not essential, a special fusing tool speeds the joining operation by insuring exact heating of the material. When softened by the heat, the ends are held together for a few seconds and become permanently fused. Any rough spots are smoothed by sanding.

Cash Register Pays Jack Pot

Wired to the cash register, a jack-pot machine pays a cash bonus to the customer whose sale is the lucky one. The machine pays off irregularly and unpredictably, but the merchant can select the frequency by hundreds of sales. The machine can be set to pay the bonus in any group of hundred sales, but the exact sale cannot be predetermined as its selection is based on minor changes in room temperature. The merchant places whatever amount he chooses in the jack pot. Each person winning a bonus is required to answer a simple question before being given the money so as to avoid legal restrictions.

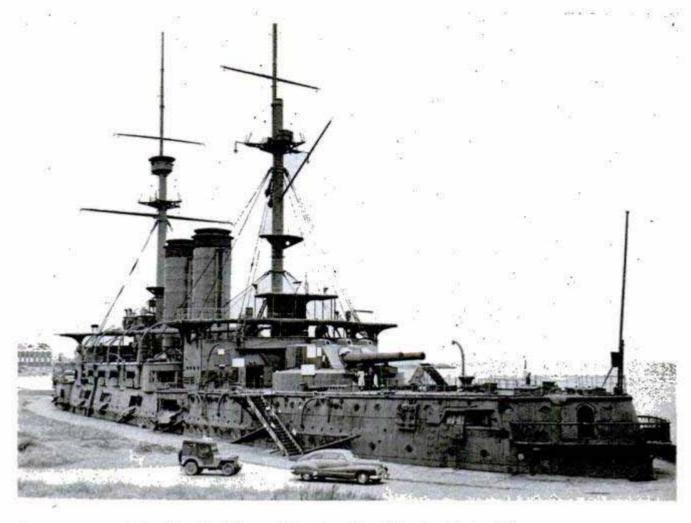


Shaver "Rocks" Away Whiskers

Whiskers are "rocked" away by a dry shaver that uses no electricity and requires no winding. Rocked back and forth against the skin, the razor whisks off the beard. Its many blades are fixed in such a position that they sharpen during use. According to the manufacturer, the razor is a full-fledged razor and is not designed solely for "in between" shaving, although it can be used for that purpose.



MARCH 1948 131



Japanese Admiral's Flagship to Be Made Into Museum

Embedded in concrete, a former Japanese admiral's flagship will be turned back to that country for conversion into an art museum and recreation center. As

the battleship Mikasa, it was the headquarters of ex-Admiral Heihachiro Togo. It is located inside what is now the Yokosuka Naval Base of the U. S. Navy.



High-Speed Camera Has No Shutter

Rifle bullets are slowed to one inch a minute with a high-speed movie camera which has no shutter. The camera takes as many as 11,000,000 separate pictures a second. Instead of the conventional shutter, which could not be opened and closed fast enough, a complicated system of lenses dissects the images cutting them into narrow strips of light that are recorded on the film. The images are reconstructed from these strips by projecting them through another camera onto a final film. The film in the high-speed camera speeds past the light opening at 400 feet per second. An electric motor powers the film drum. Suitable only for scientific use, the pictures appear blurred when projected.

Popular Mechanics is always ready to supply further information to readers about various products described in any issue. Just write to Bureau of Information, Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11

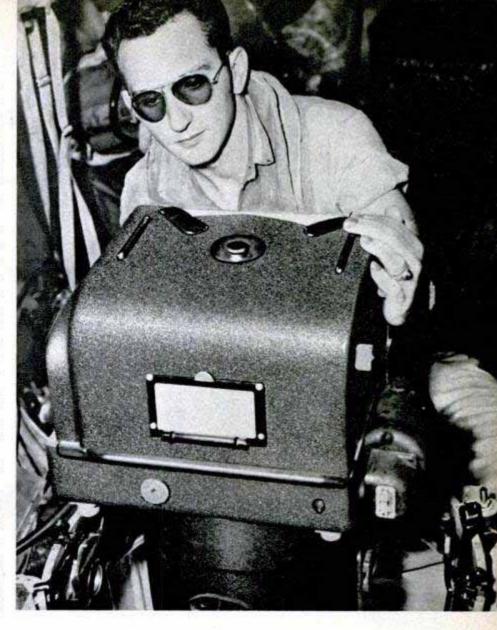
By Phillip S. Kistler

Many a Hoosier farmer, plowing alongside the highway, may have looked up in startled wonder at an airplane flashing over his fields, scarcely 200 feet above the earth, almost skimming the treetops. Some of these farmers probably turned back to their work muttering, "Dern fool."

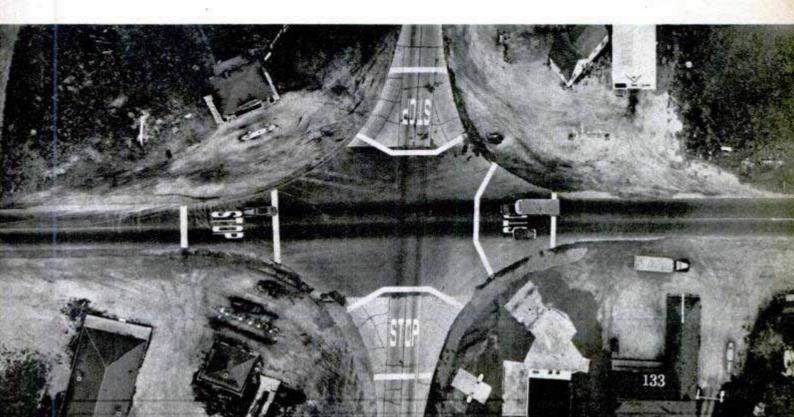
If so, they might well have saved their breath. For this was no thrill-packed joy ride they were witnessing, but a carefully planned and executed photographic expedition. Indiana's highways were getting their pictures taken, and the results were to be instrumental in revolutionizing highway maintenance, design and traffic control.

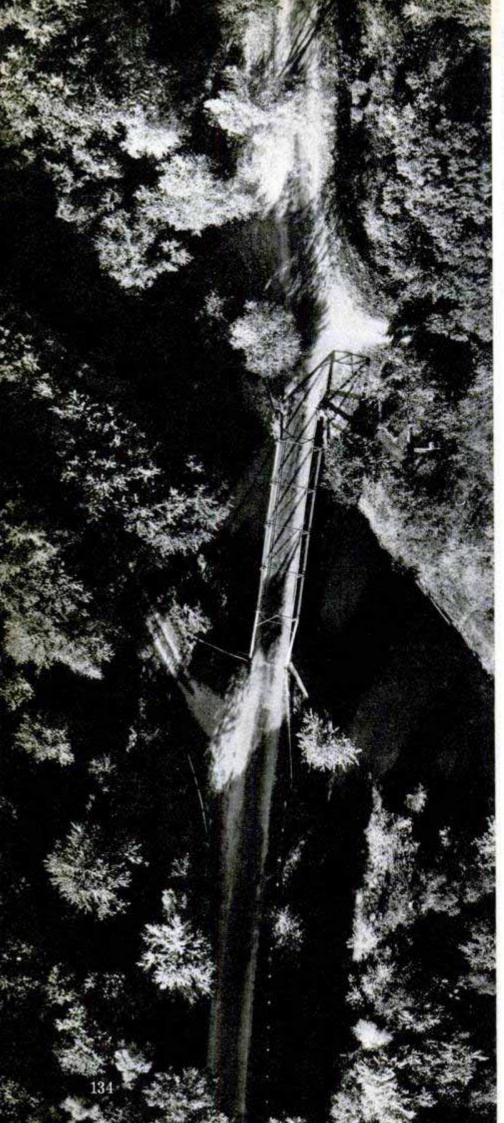
The man and the machine responsible for these remarkable innovations in highway performance studies are Prof. K. B. Woods of the Purdue University Highway Experimental Station, and the Sonne continuous strip camera. The aerial camera was invented and developed by F. T.

Through an aerial camera's "eyes" (right) faulty highway design and construction are easily detected. Below, camera makes traffic photos to help highway engineers



Hedge-Hopping Highway Engineer





Sonne of the Chicago Aerial Survey Company (see *Popular Mechanics*, May 1946, page 124). Shutterless, it utilizes a new photographic principle to take a single continuous exposure 200 feet long at unprecedentedly low altitudes.

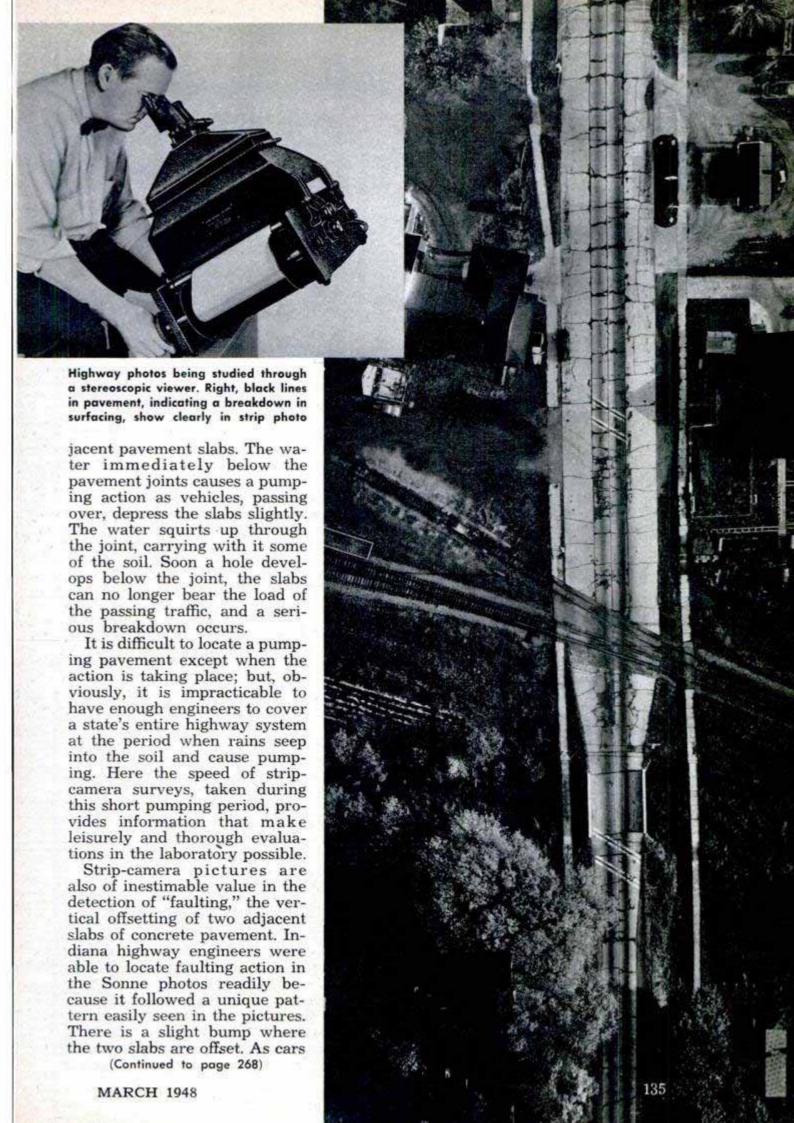
Conventional aerial photographs, used for some time in the solution of certain highway problems, have proved more or less inadequate because they lack detail. It remained for the Sonne continuous exposures to give a thorough and workable layout in low-level strip surveys for highway maintenance studies. Professor Woods saw possibilities of these exposures for highway use when witnessing an Army exhibition of strip camera photography in low-altitude reconnaissance flights.

To highway engineers, the evaluation of each pavement crack is of utmost importance, as it signifies pavement breakdown. Engineers were formerly required to walk the highways. locating and measuring even the smallest crack in the surfacing material. The time involved in this tedious undertaking was considerable. But now, through laboratory study of low-altitude strip photographs, each crack can be seen and estimated with amazing rapidity. Surveys that required months and even years to accomplish are now completed in a matter of hours.

The importance of speed in solving the highway maintenance problem can hardly be overemphasized. The Sonne surveys provide an almost simultaneous picture of the various parts of a highway system, and are especially valuable when taken at a chosen time of the year, such as the springthawing period when slow seepage of water undermines the roadbeds.

"Pumping," the maintenance engineer's biggest headache, can be detected in Sonne pictures by streaks of mud and water which have squirted up through the seams between ad-

Potential trouble points are ferreted out by the camera. Here is a dangerous bridge approach that was not marked









LIGHTS APLENTY—Above left, five individual flash units provide press cameraman Oscar Sweet of New York with plenty of light for outdoor action shots in color. The flash guns, mounted on a metal strap, go off simultaneously when the shutter is clicked

NO DIPPING, PLEASE—There's no need to dip this roller applicator (upper right) into the paint. It has a paint supply in the roller. You fill it through an opening in the side. Flow of paint is controlled by the amount of pressure applied against the wall

LOG THIS CALL—Left, logging camps in the woods of northern Ontario use portable 60-watt FM stations to keep in contact with headquarters. Radio orders for repair parts get fast action, boosting production by minimizing the time lost during breakdowns

AIRPORT FERRY—Below, plane passengers speed from downtown Boston to the airport across the harbor in seven minutes. The Diesel-powered ferries are 37½ feet long and the large windows give the 22 passengers an attractive view of the harbor and skyline







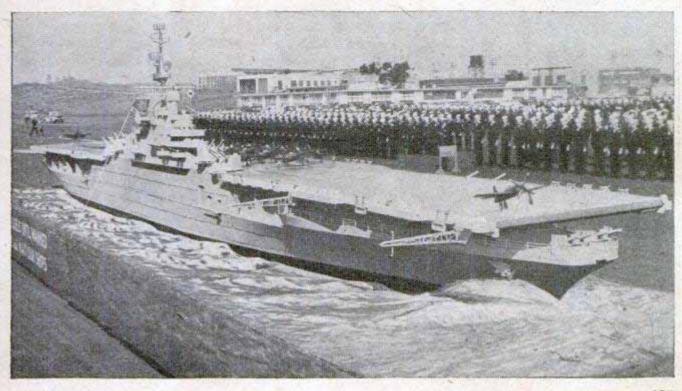
shown at a Paris fair, is amplified by any radio. The player imitates various instruments on the piano-type keyboard

LEVER-PEDAL BICYCLE (top right) invented in France is reminiscent of a model used years ago. However, combining the levers and sprocket makes pedaling easy

JAPANESE MOTOR CARS (right) get 30 to 40 miles on a gallon and can travel up to 54 m.p.h. The sedan and small truck are the first postwar models in production

NAVAL LANDLUBBER (below) will never go to sea. Built at the San Diego Training Center, the 44-foot aircraft carrier is complete even to guns that really fire. The planes on its deck have tiny motors



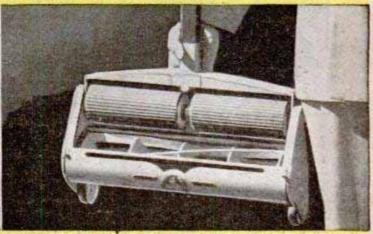


MARCH 1948 137



WHAT'S NEW For Your Home

A four-page "shopping section" dedicated to modern homemakers



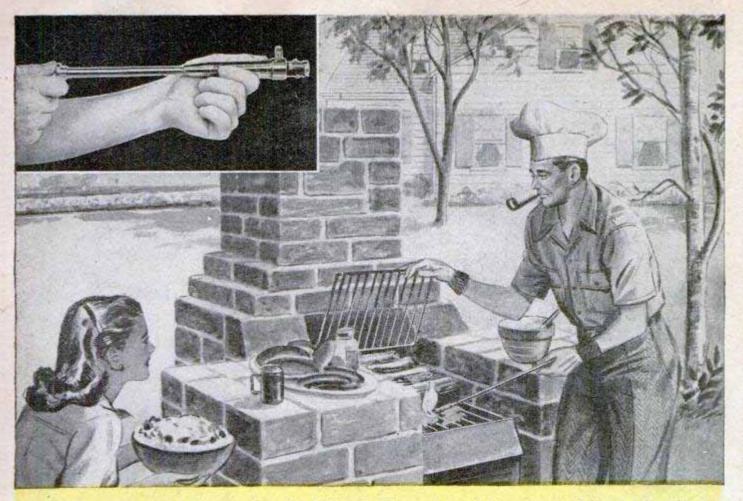
LIGHTWEIGHT LAWN MOWER weighs 19 pounds and cuts to within one inch of walls. Rear rollers spin blades

SELF-WRINGING MOP has a cellulose sponge that folds like a book when sleeve on the handle is pushed. It mops without splatter and wipes dry

OUTDOOR COASTERS keep drinks from spilling during lawn parties. Spike-tipped, the tulip-shaped holders raise glasses off the ground and away from the bugs







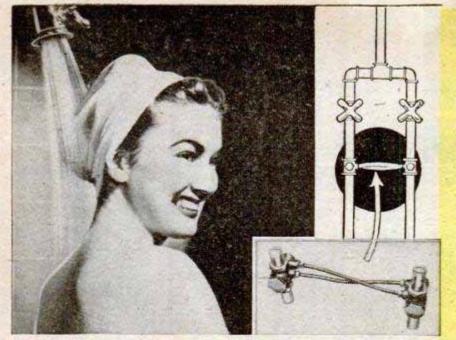
FIRE LIGHTER ignites when the barrel is slid back. It burns lighter fluid and works indoors and outdoors

MULTI-PURPOSE BRACKET, permanently mounted on edge of table, holds various kitchen utensils. Slipped into the bracket, tools are held firmly by a retaining ring HANGING STEP provides a safe platform when windows are washed or painted. Made of steel, it eliminates the danger of ladder-climbing





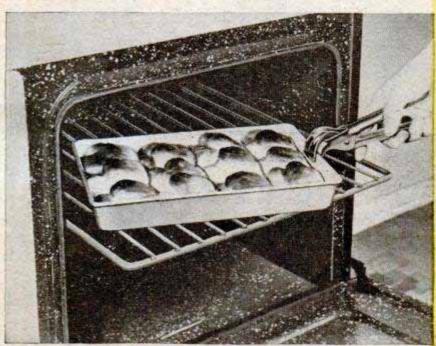
MARCH 1948

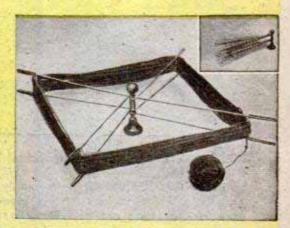


WHAT'S NEW For Your Home

Continued from preceding page

TEMPERATURE GUARD in showers ends unexpected changes in water temperature due to decreased pressure. Fully automatic in operation, it is easily installed on any shower



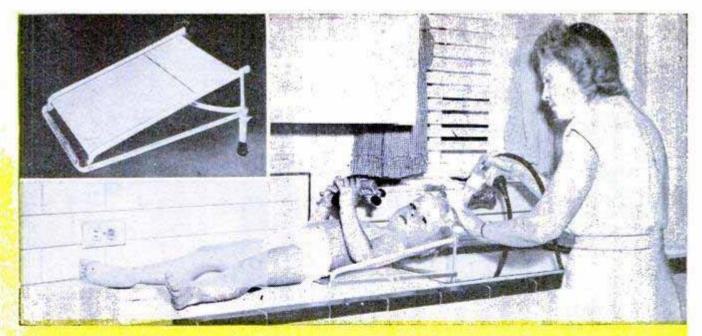


YARN HOLDER simplifies winding of skein yarn into balls. Adjustable, it folds into small space (see insert) and has a suction cup to hold it in place as the yarn is unwound

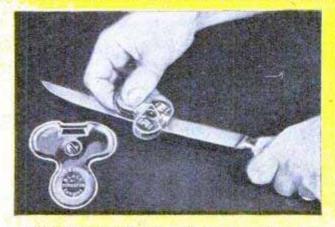


POT LIFTER, made of stainless steel, grips firmly hot pans of any shape, ending fear of burned fingers. It can also be used to crack ice and small nuts. Its toothed jaw serves to tenderize meat and to scale fish

SELF-FOLDING PLAY PEN folds easily when a foot lever is pressed. Compactly folded, it can be rolled on its casters. With baby inside, it is locked open by a safety catch

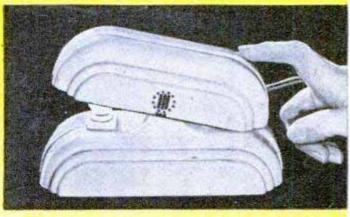


BATH RACK solves the shampoo problem for both mother and child by helping to keep soap out of his eyes



KNIFE SHARPENER gives blade a keen edge with a few strokes of its tungsten-carbide insert

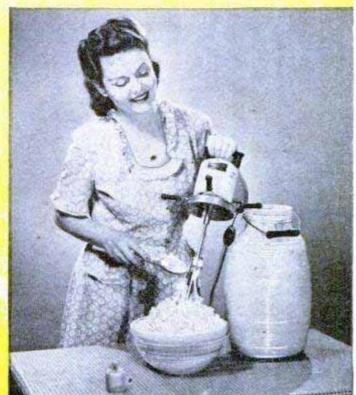
NONSKID MESH "locks" scatter rugs in place by the clinging action of its rubber coating



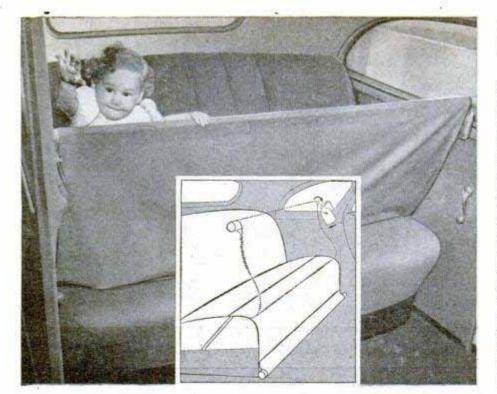
BEDSIDE LIGHT has no hard-to-find switch. To turn on the light you merely press down on the tilting shade

electric Churn can be adjusted to fit almost any jar or crock. Easy to use, it makes butter in 15 minutes





MARCH 1948 141

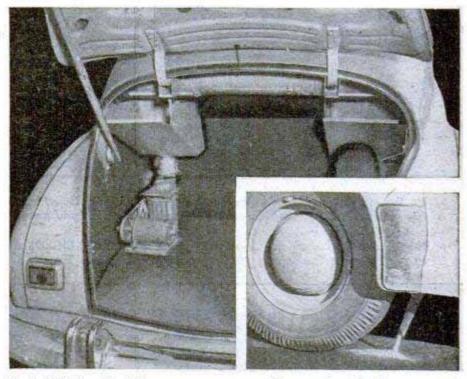


Baby Rides Safely In Car's Play Pen

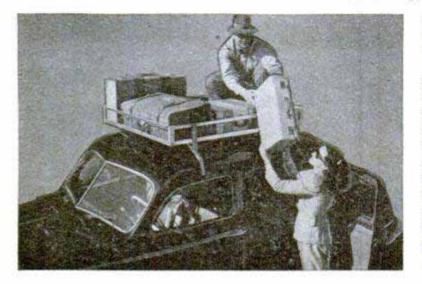
Children ride in comfort and safety when the rear seat of the car is converted into a play area by a removable fabric partition. A wooden pole, inserted through a hem in the fabric, clamps to the rear window ledge and supports the partition. The lower end of the fabric is tied to the seat springs. When not in use, the partition is lowered over the front edge of the seat in a few seconds. It can also be used to hold small packages and salesmen's samples on the back seat.

Car Sprinkles Sand On Icy Pavement

Icy pavements are no problem to motorist Robert Root of Vermilion, Ohio. When his car loses traction he presses a control button on the dashboard and a sand spreader in the car trunk sprinkles sand in front of the rear wheels. An automobile starter motor drives a small compressor that feeds compressed air directly into air-sand mixing chambers under two sandboxes. The air forces the sand through two hoses to the pavement. The mixing chambers are the same as are used on locomotives.



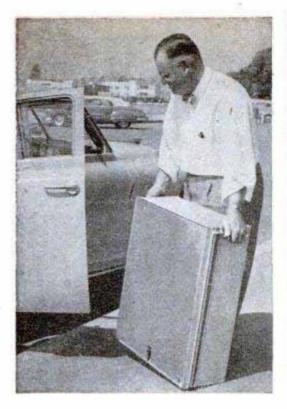
A dash button starts the compressor, spreading sand on the icy pavement

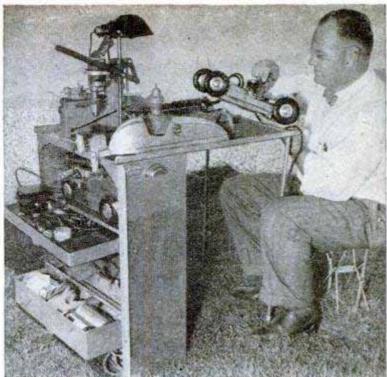


Aluminum Luggage Rack Holds 400 Pounds

Suitable for carrying up to 400 pounds of luggage or camping equipment on top of a car, an 18-pound aluminum carrier is held in place by four-inch suction cups and adjustable safety straps. The carrier, 3½ by 4 feet in size, remains securely in place while the car is in motion.

[America's automobile repair bill for 1947 totals about \$7,000,-000,000, according to the National Automobile Dealers Association.

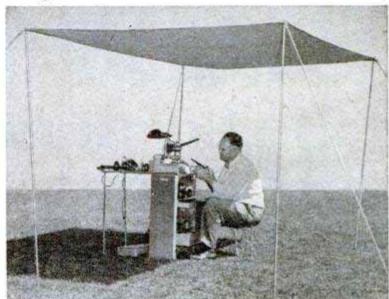




Hobbyists' Workbench Folds to Suitcase Size

Model hobbyists now can fold up their benches and equipment and take them out into the field during model tests and trials. Weighing only 11 pounds empty, a combination tool kit and workbench made of aluminum folds to the size of a large suitcase. Opened, it forms a bench for small power tools that are adapted for use on either 110-volt or 6-volt current. Among the power tools are a modelmaker's lathe, drill press and vise. Drill-press attachments include a buffing wheel and an air compressor for paint spraying. An adjustable lamp lights the bench for night work.

Five drawers provide enough room for all the power tools, additional equipment and a folding seat. Also included is an overhead awning with aluminum supports that telescope to fit on the side of



Combination tool kit and workbench for model hobbyists folds into a compact case for carrying. Weighing 90 pounds, it can be taken into the field during tests. The awning is included

the case. Loaded with tools and equipment, the unit weighs about 90 pounds and can be carried on the rear seat or in the trunk of an automobile.

Eyes That See "Invisible" Light Spoiled Wartime Plan

Because a few eyes can see "invisible" light, a wartime plan to use ultraviolet rays to land planes on carriers was never used. Navy aircraft were to use searchlights sending out only ultraviolet rays and carriers were to have special reflectors, each with a fluorescent button which the rays would cause to glow brilliantly. Diffused light from the buttons would be collected by the curves of a mirror and concentrated through a special lens that

would send a very narrow beam back to the pilot. The beam is so narrow, only a few feet wide after traveling a mile, that an enemy pilot flying wing to wing with the landing plane couldn't see the light outlining the carrier. University of Rochester scientists, who developed the reflectors, found, however, there was a chance that an enemy pilot might possess the unusual ability to see the ultraviolet rays which are invisible to most eyes.

MARCH 1948 143



They Blaze the Trail into Space

By Thomas E. Stimson, Jr.

PPROACHING the time when they will build inhabited space machines, aeronautical engineers are testing rocket-thrust aircraft that can ascend to 100,000 feet or more. Bell's XS-1 and the new Douglas Skyrocket have ceilings limited only by amounts of fuel they carry.

These experimental aircraft have one main job: to serve as pathfinders for new high-flying transsonic military aircraft. Much of their research will be at heights

not exceeding 60,000 feet, collecting information that can help raise the ceilings of turbojet and piston-engine planes.

At 60,000 feet an air crew must have extraordinary protection to remain alive. The temperature averages 99 degrees below freezing on the Fahrenheit scale and the air pressure is about one pound per square inch, compared with almost 15 pounds per square inch at sea level.



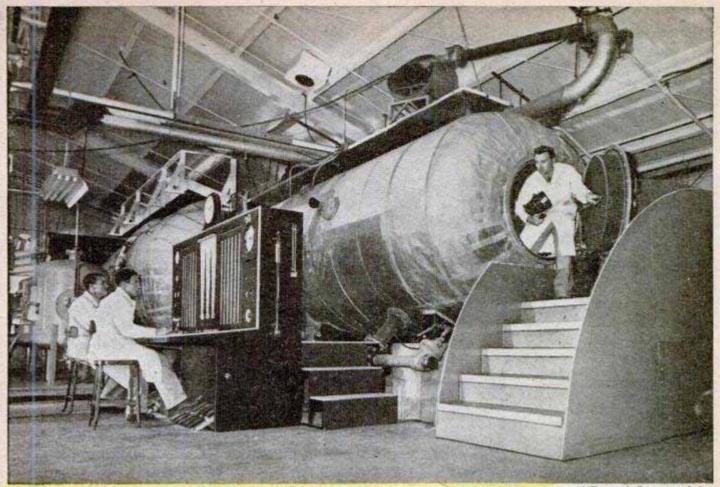
Crew in pressurized cabin flies at 43,000 feet without masks. For every mission topping 40,000, emblems like the one at left are put on the plane

The sky looks purple-black and there is virtually no twilight period between day and night. There isn't enough oxygen to support a candle flame. Gasoline boils and must be kept under pressure and the altitude is almost reached at which blood boils at body temperature.

Presumably high-flying pilots will wear pressure suits inside their pressurized cock-

pits. Aircraft are not yet built strongly enough to maintain high internal pressures at such altitudes.

The fight for altitude is a military necessity. Bombers try to get above the fighter planes and the fighters in turn strive for more altitude so they can swoop down on the bombers. With their heavy loads, few aircraft were able to climb above 35,000 feet in the last war, but most



AiResearch Company photos

Chamber in left background can be evacuated to pressure at 70,000 feet, while, separated by thin partition, cell at right simulates pressurized cabin. Below, controls for temperatures and pressures in and between cells

of the newest military aircraft have service ceilings announced as in excess of 40,000 feet. Boeing's XB-47 bomber and the North American XP-86 fighter, both swept-wing and powered by turbojets, have pressure cabins that eliminate the need for special clothing and oxygen equipment at extreme altitudes.

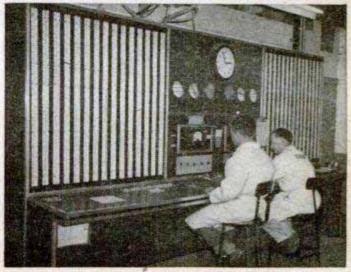
More power for the air-breathing turbojets and piston-engine aircraft is only one of the numerous high-altitude problems. Another concerns the shape of the plane itself.

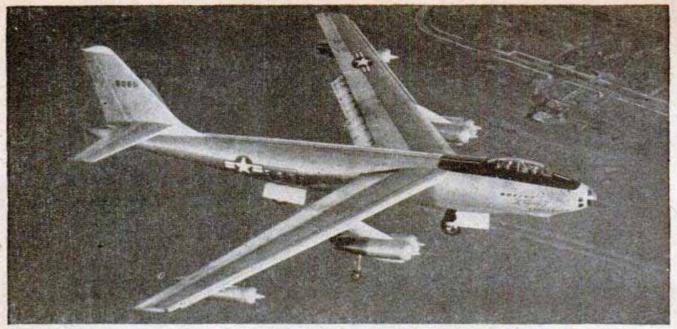
"It is conceivable that a heavily loaded bomber, flying high and fast, would have to continue to fly straight and level to avoid self-destruction," states

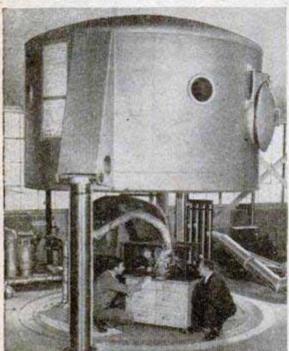
a Boeing engineer.

"This odd situation could happen to an aircraft of high wing loading that is flying, say, at 550 miles per hour at around 35,000 feet. If the airplane increases its speed it encounters compressibility effects that cause flutter and porpoising, quite possibly leading to structural failure. If the airplane slows down, it stalls and this could cause a heavily loaded craft to break









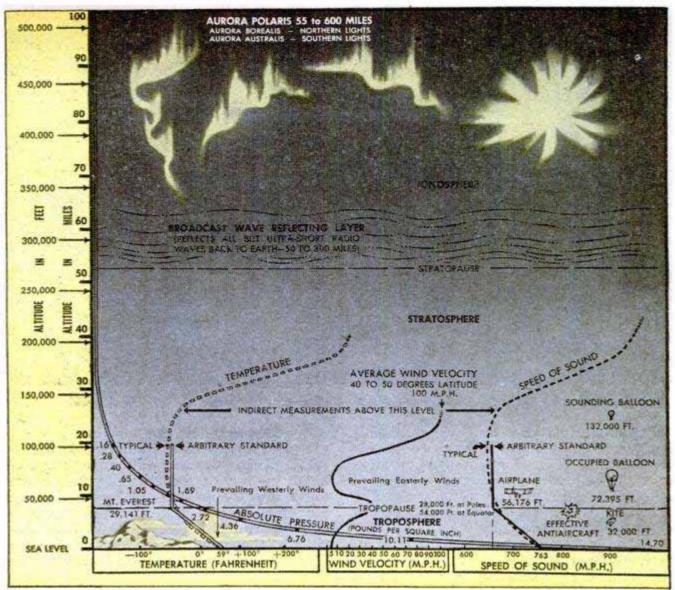
Swept-wing XB-47, a 600-mile-an-hour high-altitude bomber

apart. It dare not climb for fear of a stall, it dare not turn for fear of stalling, it dare not dive because of the flutter that the increased speed would bring. Not until its fuel load is materially reduced, in turn cutting down its wing loading, could the pilot maneuver in safety. The time is approaching when we must take this into consideration in designing aircraft."

Strangely enough, man's probing into the subzero stratosphere brings on new problems in cabin refrigeration. Instead of keeping the pilots and crew members warm, the question often enough is how to keep them from roasting. This is because air must be taken into the plane and compressed in order to maintain pressure in the cabin, and air's temperature

Temperatures and pressures above 60,000 feet can be simulated in bell at left when it is lowered to floor. Below, testing jet-assist take-off units at the rear of an XB-47





Adapted from Douglas Aircraft Company chart
Characteristics of the atmosphere, all pertinent to high-altitude research, are summarized above

automatically goes up when it is compressed. Even at 30,000 feet this heat rise can amount to several hundred degrees.

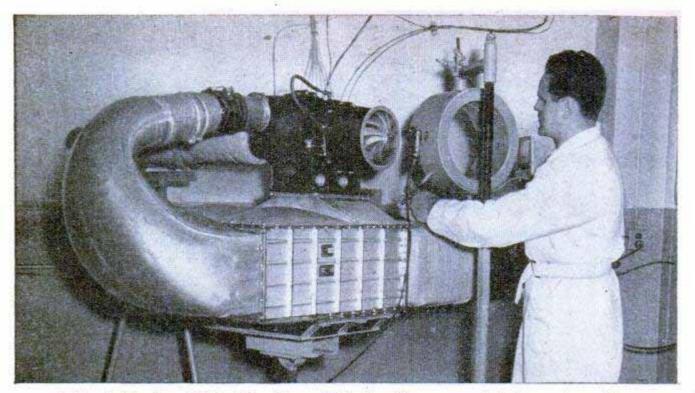
An ordinary refrigeration plant would be too heavy and too bulky for an airplane. Instead, a tiny high-speed turbine wheel is used to pull the temperature down. The superheated air coming from the compressor first passes through a heat exchanger, partially reducing its temperature, then it is delivered to the turbine. Expanding and slowing down as it spins the turbine wheel, the air is automatically cooled.

AiResearch Manufacturing Company, developers of the air expansion turbine, provided a 16½-pound refrigeration unit for the Skyrocket that does the same work as would be performed by 40 household refrigerators. The heart of the unit is an aluminum turbine rotor that spins at more than 100,000 r.p.m. and is about the size of a silver dollar. Pressurized air for the Skyrocket cockpit is taken from the compressor of its main turbojet engine at about 500 degrees Fahrenheit, and the little refrigeration plant pulls this temperature

down as low as 40 degrees. On a hot day near sea level the turbine sometimes spits snow and ice.

A modern cockpit or cabin pressurizing system consists of three units, an air compressor (unless compressed air is obtained from the compressor of a turbojet engine), the refrigeration unit, and the cabin-pressure regulator. Both the temperature and ventilation are likewise controlled automatically.

One of the hazards of high-altitude flight that has not yet been solved is that of explosive decompression, the sudden lowering of pressure that occurs if the cabin wall is ruptured. This can happen because of structural failure, such as the blowing out of a window, or by the piercing of the cabin wall by an enemy shell. A human can withstand the mechanical effects of rapid decompression at fairly high altitudes, but the body is then subjected to the subzero cold, lack of oxygen and low pressure of its surroundings. At extreme altitudes, explosive decompression alone appears to be lethal.



Testing turbine for a DC-6 refrigeration unit. Cooling the compressed air is a major problem

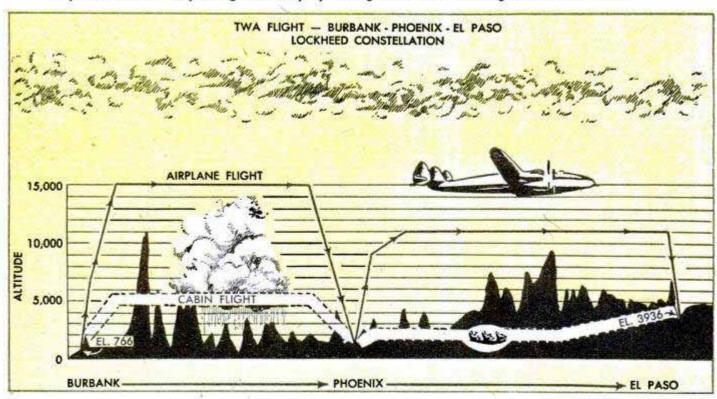
Pneumatic clothing that will automatically and immediately pressurize an air crew if the cabin loses its compression seems to be the best solution. Aeromedical authorities agree that eventually clothing will have to be developed that allows a flyer to survive in a vacuum.

Setting new altitude records is only an incidental part of upper air research. What the engineers are striving for is to develop equipment and materials so that all parts of a plane will always function perfectly at any altitude. Ordinary grease freezes

at low temperature, for instance, making the controls difficult or impossible to operate. During the war a number of bombing raids were complete failures because the bomb-bay doors were frozen shut by congealed grease. Since then new synthetic nonpetroleum greases have been developed that won't freeze, and studies are being made of silicone-type lubricants for the same purpose.

Electrical equipment located outside the pressure cabin is afflicted by many ills. The various rates of contraction of differ-

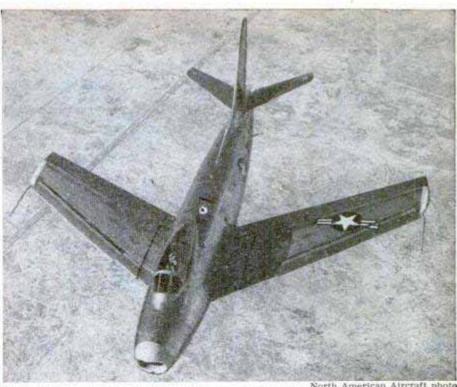
In pressurized cabins, passengers literally fly underground when traveling over the mountains



ent materials at low temperatures cause devices such as limit switches to operate erratically. The effect of low temperature on the resistance of conductors and resistors changes the potentials of circuits. Moisture freezes and sheathes contact points with ice. When moisture isn't present the thin air contributes to arcing and overheating of switch points. Generator cooling becomes a problem unless the cooling air is supercharged to an efficient density. Comparable troubles occur with radio and radar.

Many problems are solved on the ground by using altitude chambers

which simulate the pressures and temperatures of high altitudes. These are now standard tools that nearly all aircraft manufacturers use constantly. Augmenting the huge altitude chambers in which a large piece of aircraft structure may be tested are smaller one-man chambers in which engineers may "ride" to altitude while observing and adjusting some small device that is under test. Smallest of all chambers are the bell jars that are evacuated in the laboratory for testing electrical equipment. Using sealed-in switches, an engi-



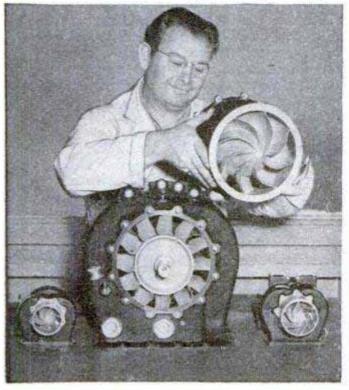
Ceilings for fighters, like the XP-86, have been pushed above 40,000 feet

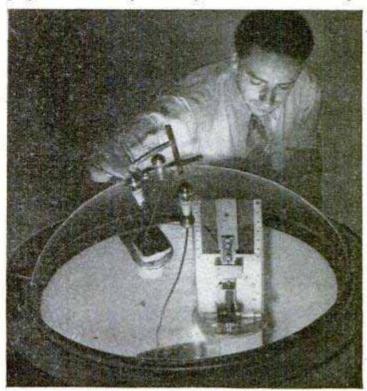
neer can turn on and off the current to an electric motor inside the bell jar, gauging performance at various altitudes.

A unique chamber that resembles a huge steel diving bell is used by the El Segundo division of Douglas Aircraft for conducting tests at up to 60,000 feet altitude and at temperatures as low as -65 degrees. Its virtue is that the entire bell, weighing many tons, may be raised from the floor by two hydraulic jacks, and heavy pieces of equipment that are to be

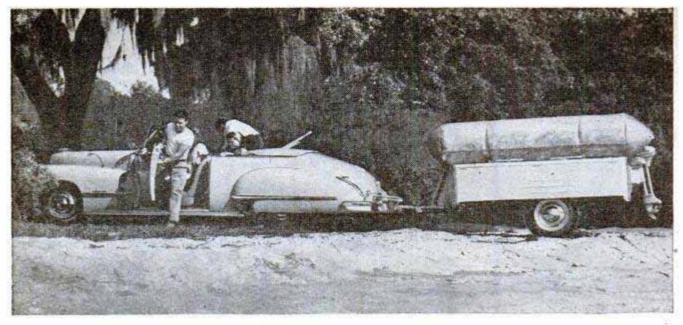
(Continued to page 246)

Left below, the three-pound turbine at left cools cockpit air in Skyrocket, Skystreak and P-80 aircraft. Large one is used in DC-6s. Right below, looking through plastic dome at parts being tested in vacuum bell jar





MARCH 1948



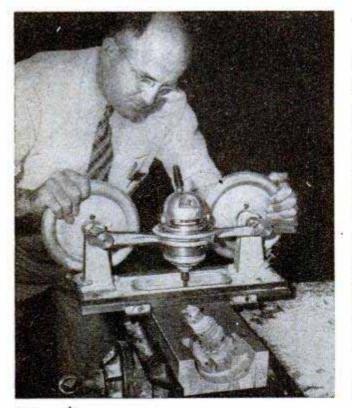
Trailer Provides Shelter Both on Land and on Sea

Changing from land to water operation takes only a few minutes with an all-aluminum trailer equipped with rubber-lined pontoons. The pontoons are inflated at any service station. When the two covers are folded back, the floats are in outrigger position to provide buoyancy and stability. Wheels are detached once the trailer is in the water. Fabric covering over a metal frame protects the occupants from the

weather. Sleeping accommodations for four are built into the trailer. A folding table, stove and cooking equipment enable



the fisherman to eat his catch without coming ashore. The camp also can be set up on land with pontoons still in position.

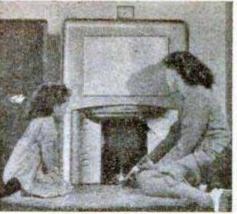


Core Cutter Routs Wood Patterns

Core boxes for molds are cut by an "internal lathe" that routs out patterns in wood. The machine has two handwheels locked together on a supporting guide frame. The motor and cutter are mounted in the center of the machine directly above the work. To operate the machine, the frame is placed over the block of wood and the router is set to cut a semicircle of the proper diameter. Turning the handwheels moves the motor and cutter to rout out the block to that diameter. The machine will work out a half circle or any portion of the arc, cut ribs, flutes and recesses and shape convex as well as concave surfaces. Diameters up to 71/2 inches can be cut in work of any length. With the addition of a circular base the machine has a universal motion for cuts in both a horizontal and vertical plane.

¶Argentina has established a radiophoto circuit to Switzerland and Portugal.







Two-in-One Fireplace

By moving the panels of a two-section fireplace, homeowners can produce an electric heater or a wood and coal firebox. The fireplace is manufactured in Britain and fits into the standard British chimney opening. When a decorative outside panel is raised, the electric heater can be lowered into place to warm the room. Later, with the room at the proper temperature, the electric panel is raised to reveal the open firebox for burning wood or coal to maintain the temperature and to keep a lowcombustion fire burning all night. The fireplace also heats the household water and has a built-in air-circulating system. The built-in fireguard can be lowered when the fireplace is in use to protect children from sparks.



Top left, mother takes chill from room with ejectric heater. Center, she lights wood fire and, above, pulls down guard. Top right, banked fire is covered for night





No Double Exposure With This Camera

Double exposures are impossible with a new, fixed-focus camera that automatically moves the film forward after each picture is taken. Using 35-mm. film, the camera has an attached outlet for a small flash gun. The bulb is ignited in synchronization with the 150-second shutter when the release is pressed.

Sterile Corn From Heated Seeds May Help Produce Hybrids

to produce fertile pollen, according to Dr. Donald F. Jones of the Connecticut Agricultural Experiment Station, who suggests that the discovery may be used in breeding hybrid plants where every precaution is taken against self-pollenization. In the experiments three lots of sprouted corn grains were exposed for one hour to temperatures of 104, 122 and 140 degrees respectively. When the seedlings were plant-

Heat-treated corn seedlings are unable - ed in fields beside regular plants from the same kind of seed, they grew into stalks averaging 90 inches in height that produced tassels but no fertile pollen. In producing hybrid corn, the tassels often are removed by hand to prevent self-pollenization. The heat-treated seedlings may mean that such methods are unnecessary.

> Norway now has a railroad that crosses the Arctic Circle.

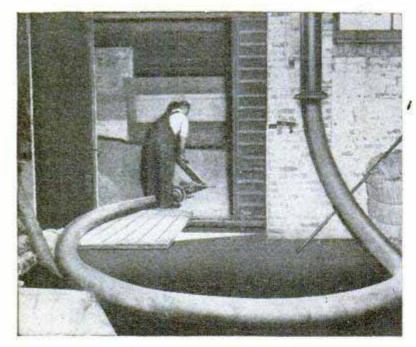


AUTOBORNE BOUDOIR

Two can sleep in a snug upper-deck "Carbana" attached to the top of a passenger car. The 4 by 6½-foot unit, weighing 150 pounds, rests on six suction standards on the car roof. Constructed for long-distance traveling, it has a canvas cover, with screened windows and flaps that can be battened down tightly against wind and rain. The two mattresses are air-inflated according to the sleeper's weight. When not in use, the aluminum ladder used for reaching the berths attaches to the side. The carborne boudoir's designer plans to build a model to fit atop truck cabs.

Above, upper-deck sleeping quarters safely battened down for travel. At right, the autoborne boudoir's designer climbs lightweight aluminum ladder to bed





Suction Hose Unloads Wheat

Rubber hose is used to unload wheat from freight cars by suction at an Arizona grain company. Previously, flexible metal tubing had been used, but extreme heat resulting from friction between the inner walls and the rapidly moving wheat made it difficult to handle and caused frequent breaks. The new six-inch rubber hose has a smooth lining to permit high-velocity unloading.

Information, including manufacturers' names, concerning products described in this issue may be obtained by writing Bureau of Information, Popular Mechanics, 200 E. Ontario St., Chicago 11

NE BLIZZARD-SWEPT winter night in Colorado, State Patrolman "Boots" Spaulding was driving toward Denver at 2 a.m., several hours after his normal quitting time. Suddenly through the swirling snow he spotted a car stalled beside the road.

Inside the car were a man, his wife and small child-almost frozen to death on a heavily traveled highway. The woman was unconscious and the man was crying. Not a single motorist had stopped in the blizzard to help them. Spaulding took the family to safety. If he had not stopped they might have died or been seriously crippled.

Highway patrolmen of the western states are far more than traffic cops interested only in catching speeders and drivers who are blind to stop signs. The control of traffic is an important part of their job, but a good patrolman in the sprawling West must be equal to any emergency.

His week's work may include such diverse jobs as tracking down cattle rustlers, giving first aid to the victim of a wreck, finding a plane that has crashed, dragging a river for a swimmer who has drowned and finding and arresting law violators from petty thieves to murderers.

Much of a patrolman's routine work, of course, is on the highways that thread his state, and through experience he has developed a knack of judging the flow of

traffic and is able to spot the points where trouble may occur. When a midnight driver went to sleep while negotiating a Wyoming curve at 90 miles an hour, his car crashed end over end into a dry river bed. It was a state cop whose sharpshooting eyes spotted the scarred earth beside the highway and whose prompt action saved the driver's life.

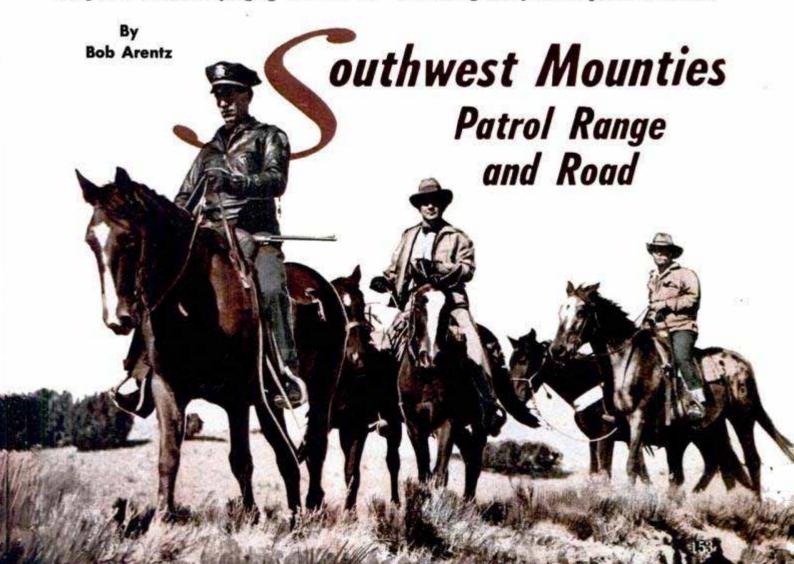
Often a patrolman eases into bed after a full day only to be called upon to drive 50 miles to the scene of an accident.

On hit-and-run cases along the highways beyond city limits the major hope for justice is the authority of the state police organization, which can move the length and breadth of the state without conflict over enforcement technicalities that occasionally tie the hands of the county sheriff's investigators. Because the state trooper is not subject to political whim, he has become a specialist in the profession of law enforcement.

Naturally, the police of various states differ in authority and prestige. Troopers in New Mexico parallel the efficient Texas Rangers in police power and jurisdictional rights. In fact, Colonel Homer Gar-rison, head of the Texas Rangers, was loaned to New Mexico in 1935 to organize

the state police.

In Wyoming, only seven troopers were left during war years to patrol the entire





Police are trained to breathe life into accident victims with resuscitator

state. New Mexico never dropped below 35 officers, but many of the men were about the only law in their territories, which in some cases equaled in size several of the New England states.

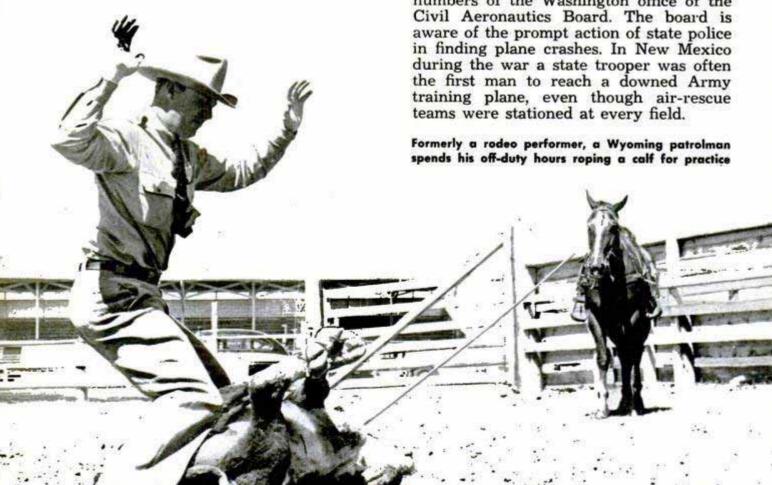
Principal duties vary between the different states. For example, Nevada state troopers team up with county sheriffs in all phases of police work, cracking robbery cases, murders, extortions and cattle thefts. Utah patrolmen, on the other

hand, work almost entirely in controlling traffic on the road, bringing to justice speeders, reckless drivers and hit-andrun motorists. Most of the larger Utah towns have fairly large and well-trained municipal police forces which take over the law-enforcement load.

Within New Mexico full credit generally is given to a lone state trooper for bringing down the Mora County homicide rate from a high of 52 in 1935 to a present rate of one or two per year - from among the highest rates to the lowest per capita.

There's been only one major case of extortion in Nevada's history, and the troopers were in on the break. Several months ago, Sergeant Shirley Robison worked with Sheriff Tom McLaughlin's men at Ely to bait the extortionists. And though the Nevada force was limited in manpower, the entire unit came as a group to Ely to help the sheriff spring the trap.

In the office of every state police bureau in the nation are listed the telephone numbers of the Washington office of the the first man to reach a downed Army training plane, even though air-rescue teams were stationed at every field.





Troopers unload a toboggan stretcher at ski resort. Toboggan is used to handle broken-leg cases on steep slopes

In one period of 30 days patrolman Bill Speight of New Mexico was called first on air crashes that involved the deaths of 150 airmen. By prempt action, driving narrow roads at high speeds throughout the night, he saved the lives of several others who would have died if they had not been found shortly after the crash.

One night Speight was racing against a 40-mile wind toward a flaming wreck when he sensed that there was something

wrong beside the road. He slammed to a stop and found a badly injured pilot, fouled in his parachute and being dragged to death across the rugged ground by the high wind. The man was several miles from the crash and would have been lost if Speight had failed to stop.

Budget limitations have

It was a grim task, but patrolman shown here dragged lake 48 hours in search of victims of drowning prevented any western state from organizing flying squadrons in an effective air war against fast-striking crime. But with young men on the force who were combat pilots during the war, every organization has a few officers who are ready to use their own planes for specialized work.

One "old timer" who has used a plane for years is Lieutenant Jess Miller of the Wyoming police.

Once Miller caught a motorist running





Trooper weighs cargo truck to check conformance with state law

through a stop sign—and made the "pinch" from the air. The trooper was up in his plane looking over a dangerous intersection with an eye to planning more effective controls. As he watched the intersection he saw a driver buzz through the stop sign. The country was flat and smooth so Miller

flew ahead of the car, landed beside the road, flagged down the driver, and handed him a ticket. It's probably the only time that justice struck from the air against a driver who ran a stop sign.

In one wartime winter in New Mexico some of the mountain villages became snowbound and supplies ran low. The state police flew to the rescue in chartered planes, dropping food and medical supplies for two weeks until snowplows could push through the packed drifts.

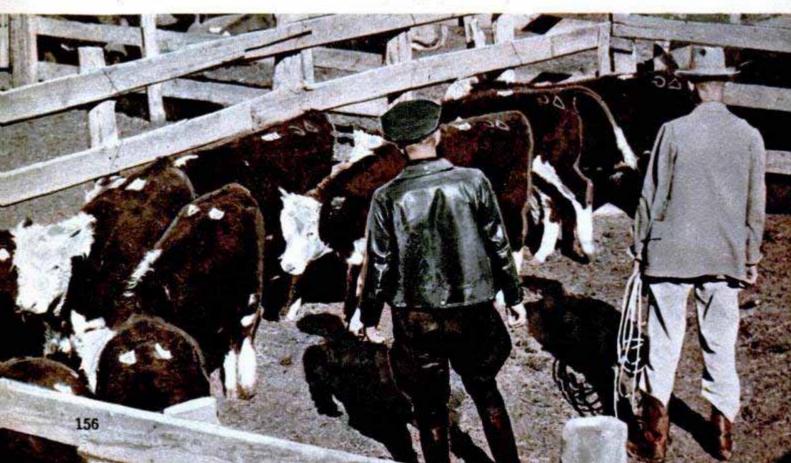
In some states a patrolman is given a territory and expected to police it 24 hours a day. In other states where the police job is mainly traffic control, the trooper may work an eight-hour shift.

Most states prefer young men for recruits but temperament is more important than brawn. A patrolman is a lone wolf in the broad territories of the West, where two officers are seldom seen in one car. He's a direct descendant of the legendary marshals who corralled the western bad men. Though most state po-

lice have radio-equipped cars, the trooper can't expect help quickly when the closest fellow officer may be 100 miles away.

Once Vernon Drain of the Colorado patrol almost became the victim of an angry mob merely because he was doing his duty. Drain was patrolling the highway

State police outwit rustlers and border runners by keeping a careful check on cattle brands in their area



when he found a car piled up beside the road. The injured driver showed all the symptoms of having internal injuries that occur with a broken pelvis. Drain followed his orders—he kept the victim flat and motionless, wrapped him in blankets and waited for a doctor to arrive in an ambulance. Meanwhile wellmeaning motorists who had little knowledge of first aid gathered at the scene. All of them wanted to "rush him to the hospital in my car" but Drain took the stand that the man should not be moved. Soon there was an angry undertone to the crowd's remarks, and Drain found himself facing a mob that insisted he move the man. In the showdown Drain held firm even though there was a threat of violence.

Among the odd jobs that may fall to the trooper are rescuing skiers, checking truck weights, photographing accidents and interviewing Pueblo Indian chiefs.

This last job requires specialized knowledge. Indians often have helped the troopers clear up rustling, murders and smuggling. But in order to get this information the trooper must be able to speak two languages —Spanish, which has become the Indian's native tongue, and the pure Indian which remains a living part of their language. An Indian may be able to speak excellent English, yet if the trooper comes to him on business he talks the Indian tongue or he doesn't get the information he seeks.

Vacationists in the West will find state troopers not only the guardians of law and order but trained officers ready to lend a hand at the first sign of trouble.

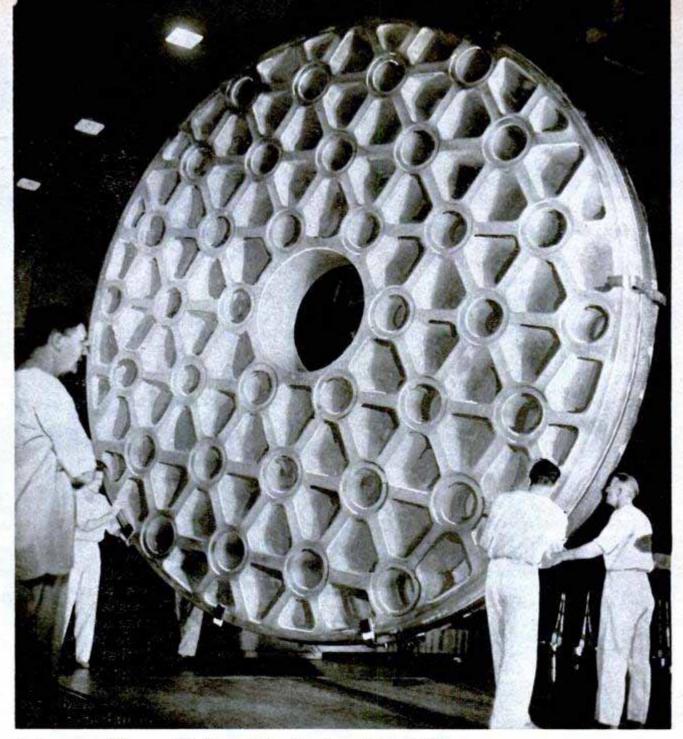


Trooper helps tourists change tire with jack that is kept in patrol car



† When accidents occur, this trooper is ready to take photos for evidence | Some officers learn tribal languages in order to deal with Indians





Palomar Mirror Makes Trip in Insulated Box

Ground and polished to within two-millionths of an inch, the 200-inch telescope mirror for the Palomar Mountain Observatory was carefully packed in an insulated wooden box for its trip up the mountain. Under preparation since 1936, the giant

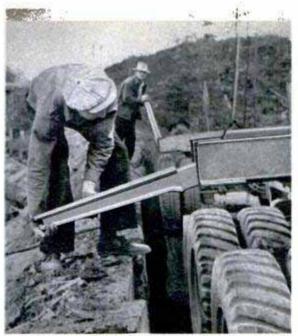
mirror and its supports weigh about 37 tons. Because of the extreme accuracy of the parabolic shape, any scratch would ruin the mirror, so workmen wore dust-proof tennis shoes and special clothing while handling the huge piece of glass.



Rear-Window Wiper Aids Driver

With a blade that flexes to conform to the curve of the glass, an electric rearwindow wiper provides the motorist with a clear view to the rear during rain and snow storms. Powered by an electric motor, the wiper is not affected by sudden acceleration of the engine. A single mounting hole and simple electrical connections are all that are required for installation.

POPULAR MECHANICS







Top, stakes lock in place automatically when they are lifted. Top right, tripping bar inserted in one side releases stake on opposite side. Above, trailer rides truck on return trip

Stakes for Logging Trucks Reduce Highway Menace

Logs can't slip off a truck to endanger highway traffic when new stake "bunks" have been installed on the truck. Each stake locks in an upright position when the logs . are loaded, cradling the load to prevent any of the logs from slipping. To unload into a river or millpond, the driver pries up a safety catch on each stake. This releases the lock fitted to the stake on the opposite side of the truck and the stake folds down to release the logs. In experiments, truckers found that the stake bunks saved 30 percent loading and unloading time because the logs fit easily into the cradle-type bunks and can be unloaded quickly by tripping the stakes.

Shear Notches Sheet-Metal Corners

Sheet metal is notched quickly by a shearing tool that handles up to 16-gauge steel plate. A 90-degree notch as large as six by six inches can be cut either at the corner or along the edge of the work. The notcher also can be adjusted to cut angles smaller or greater than 90 degrees and can be used for some straight-line shearing. The tool cuts plastics, leather, rubber, aluminum, cobalt steel, chrome molybdenum, leaded brass and stainless steel.

[Electrical impulses generated by radioactive materials can be counted at the rate of 10,000,000 per second by a General Electric electronic instrument called a decade scaling unit.



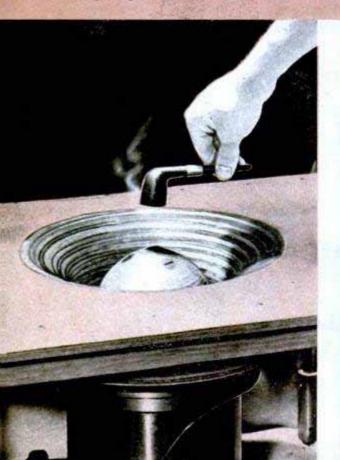


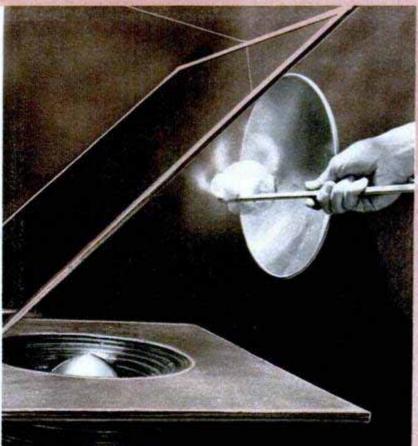
Heated by sound waves, coffee is made in seven seconds by supersonic siren

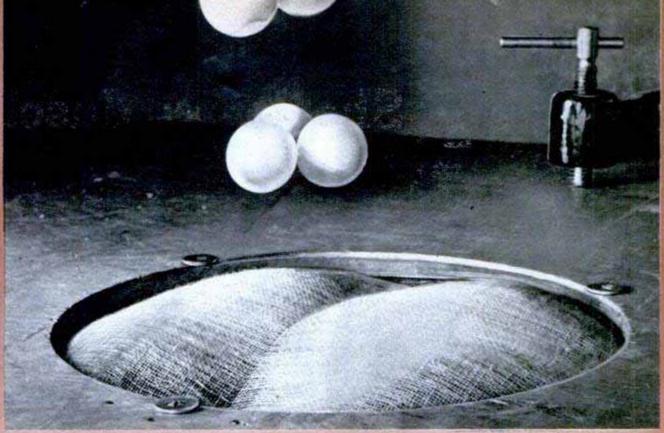
Not handy to carry in your pocket, the siren will light a pipe (below left). Bounced off a glass plate (right), sound waves are focused by a reflector igniting the cotton wad in six seconds. Steel wool will burn in one minute Sound too high pitched to be heard may become the washerwoman of the future. At least, experiments at Pennsylvania State College have proved that ultrasonic waves wash dirty clothes better than present laundry methods. But washing clothes is only one trick the ultrahigh-frequency waves can do.

They also make coffee, light pipes, ignite cotton, pop corn, hold marbles suspended in air as if by magic, and even kill mice and insects.

Producing the silent sound is a lantern-shaped siren that chops compressed air into pulses at a rate of 30,000 per second. As the air escapes through 100 small holes in the siren, a wheel, spinning at 18,000 r.p.m., slices it into individual sound waves.

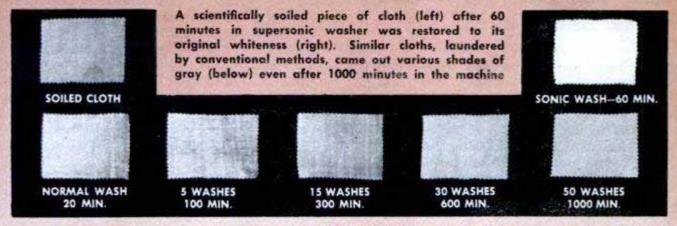






Pennsylvania State College photos

Only magic here is the magic of sound waves. Glass marbles, almost an inch in diameter, are suspended in air between siren and a reflecting board. For experiment, audible waves were used; workers wore ear plugs



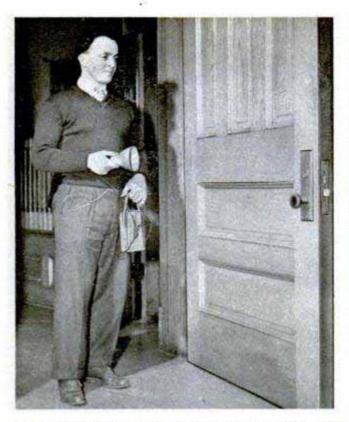
White mice placed in the sound field die after an exposure of one minute. One mouse that survived 30 seconds exposure died the next day because of deterioration of its outer ear.

Insects don't have a chance against the silent sound. Mosquitoes die in 10 seconds. Although the intense heat appeared to be the cause of death, the insects' wings were shattered.

Though effective, the siren is not practical for such tricks as lighting pipes and killing mice. Matches and mousetraps are more suitable. But scientists do see practical uses for it in sterilization of food, homogenization of milk, elimination of smoke in large cities and industrial areas, and treatment of seeds to increase crop yield.

Supersonic washer is merely a pan placed above the siren. Microphone above it measures sound







Left, a supersonic guidance device detects obstructions and warns the user by changes in earphone signals. Right, the electronic pencil "reads" printed letters and translates them into sound for the blind person

Sonic Aids for the Blind Permit "Seeing" by Ear

Electronic "sound-readers" for the blind may some day replace the Braille system. Under development at the University of Michigan, an electronic pencil converts the printed letters into sounds. These sounds vary for each letter and the blind person learns to identify them and thus to read. An improved model will actually read to the user, pronouncing the letters rather than making identifying sounds that must be memorized. The pencil,

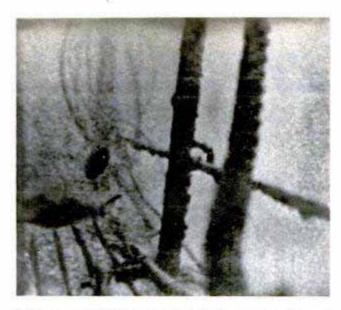
slightly larger than a fountain pen, contains a photoelectric cell that scans the printed lines. Sounds are amplified into a hearing-aid earphone. Another aid to the blind is a supersonic guidance device that sends out inaudible sound waves. These waves bounce back from obstructions in the path and the user detects these obstacles by sound changes in the earphone. Its major defect is that it does not warn the user of holes or depressions in the surface. Neither device will be available to the public until further development and production methods are completed.



Room Service by Tricycle

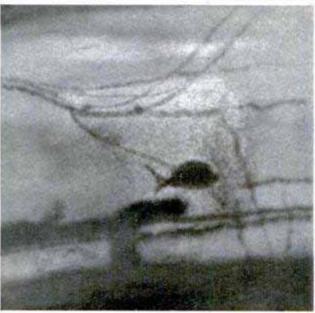
Hot food is pedaled to guests of the Williamsburg Inn at Williamsburg, Va., in a "foodmobile" made from a bicycle. The mobile serving unit carries food to guest houses some distance from the dining room. Designed by staff members, its three wheels support a large storage compartment. The top section holds trays, linen and dishes while the bottom section stores room-service containers which are kept warm with canned heat.

There are three pints of water, half a million bacteria and about 1200 billion dust particles in the air in your living room on a sultry summer day.





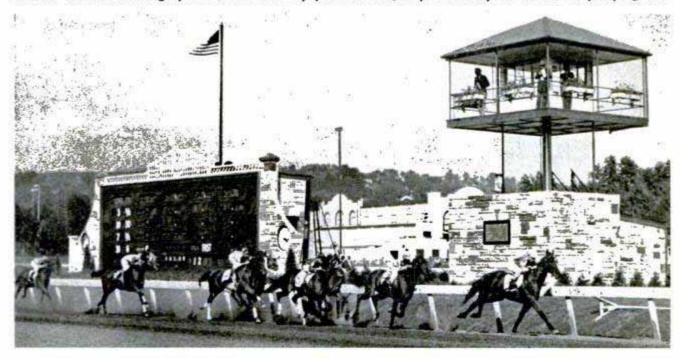
Official Navy photos



Televise Fish at Play 160 Feet Below Surface

Television that permitted scientists to watch fish 160 feet below the surface at Bikini has opened a new field in deep-water investigation. It may make possible exploration of vast craters and plains on the ocean floor, which divers are unable to reach because of water pressure. The television camera was in a steel housing, with a glass in its cover, and remotely controlled and focused from a surface vessel. The equipment, which can be used with regulation diving lights, is similar to that used for observing instruments in drone planes. It was adapted for the test by the Cornell University aeronautical laboratory.

JUDGES "RISE TO THE OCCASION" at a West Virginia race track when the steeds begin to run. For a better view, their stand is hoisted eight feet above its foundation by a foot-thick steel cylinder. The stand is actually a four-ton peaked roof "cottage," with a porch all around and flower boxes on the railings. Two guide rods telescoping into cylinders in the foundation prevent the stand from swinging around during ascent and descent. The main lifting cylinder, controlled by push buttons, is powered by an electric oil-pumping unit





Prospector crushes white quartz before testing for gold content by swirling it in water in frying pan

One prospector, a lithographer by trade, discovered an extensive deposit of lead on one of his trips and more recently has uncovered material that promises to yield tungsten in commercial quantities. Another, a 23-year-old mineralogy student, has staked his claim on deposits of gold, silver and zinc in the past year.

hills for new supplies.

looking for a lucky strike. But this time

it's a part-time project, more a hobby than a business, of weekend prospectors who

live in town, hold steady jobs during the

week, but on spare time head for the hills.

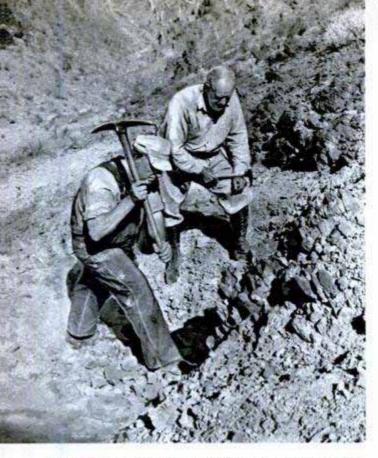
looking for. Industry needs more and more

fluor spar, manganese, antimony, barium

and cadmium, to mention only a few min-

erals, and weekend 49ers are combing the

Gold is only one of the minerals they're



Prospecting may be fun, but there's work involved. Ore is broken loose with a pick and lots of muscle

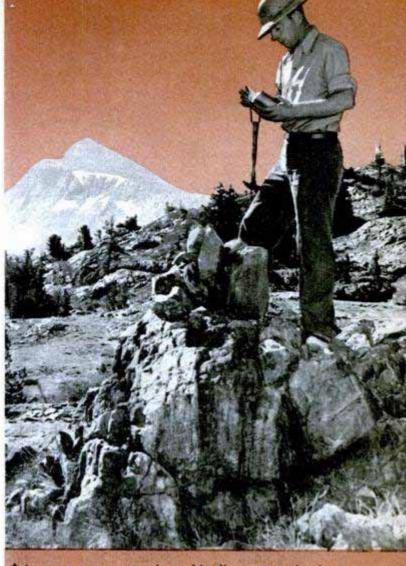
Just before the war, a resident of a small town on the Oregon-California border found a ledge of quartz that carried a trace of gold. After his discharge from the service, he went back and tunneled into the vein. It became richer and richer as he dug. Today he owns a valuable mine and digs out a hundred or a thousand dollars' worth of gold whenever he wants it.

This past year another prospector, working the Death Valley region, found a deposit of ore so rich in silver that a ton yields \$12,000. It was a lucky find, made when he investigated a ledge that previous prospectors had passed by without bothering to test completely.

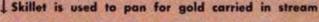
Prospectors combed the West thoroughly in the old days, but they missed many valuable deposits. Some ores were in forms they didn't recognize, some were too low grade for mining at that time, others were minerals that had no value then.

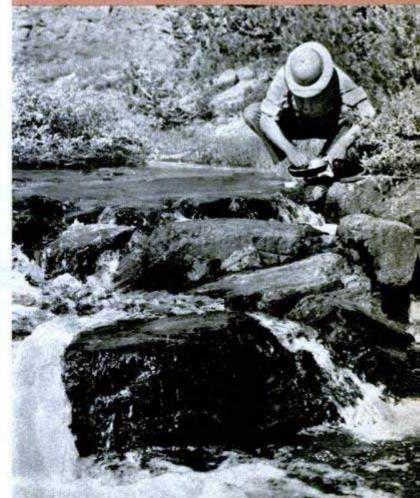
Rich strikes are infrequent among the weekend prospectors, but there's always a chance that one might come. During the week they study mineralogy so they won't miss the big one when it comes along. Night-school classes on the subject are held in several western cities. Last winter in Los Angeles the Mining Association of the Southwest held a public lecture series, during which assayers, mining engineers and veteran prospectors explained how to find and identify valuable minerals.

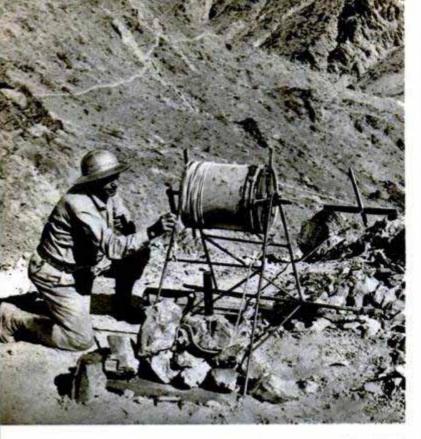
Students in prospecting schools are



Amateur prospector places his discovery notice in tin can he will leave on stone monument at ore voin







Carried up the trail in sections, a portable "high line" is used to haul mining tools up to the vein

taught basic geology and the rudiments of "skyline prospecting" by which the mineral possibilities of a region may be judged from the contours of its peaks and valleys, viewed from a distance. They learn to look for minerals in formations that are highly colored or that appear different from the surrounding rock and they learn that a change in vegetation or an abrupt absence of it may indicate a mineral deposit.

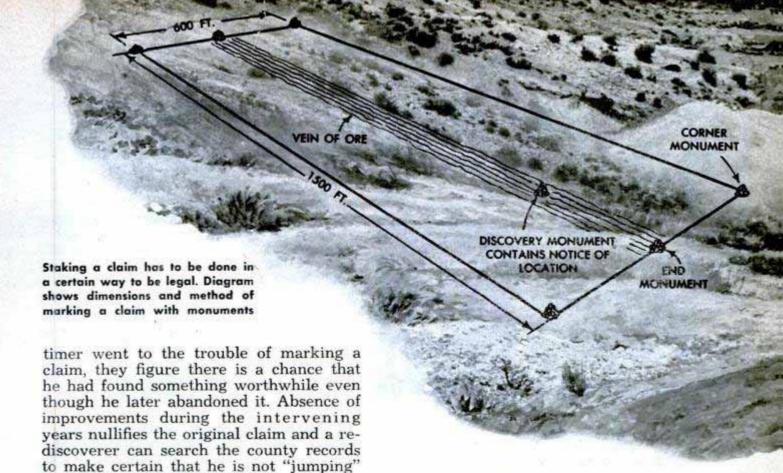
They learn that prospecting is not so easy as it sounds. Many common nonmetallics such as clay or pumice can be recognized almost at a glance, but many metals are found in ores that to a beginner appear to be worthless rock. Other rocks that look valuable prove worthless.

In most cases metallic ingredients can be concentrated by pulverizing the ore in a mortar or on a flat stone and then panning the material in a gold pan or gold horn or even a clean frying pan. Light materials are swirled and sluiced away. The heavy particles that remain are identified by various physical or chemical tests. To test for copper, for instance, nitric acid is poured on the sample, heated, cooled, diluted with water, and then ammonia is added. Copper is present if the solution turns blue. Gold usually can be recognized by its color, by the fact that it doesn't change color wet or dry or when moved around in the light, and by its softness. Gold doesn't shatter when struck by a hammer.

Student prospectors are warned that their own tests are apt to be unreliable and that they should submit their best samples to a reputable assayer. A trace of iron, for instance, can provide misleading results in a simple field test for a more valuable metal. Assay costs range from \$1.50 to \$4 per test. Spectrographic analysis at from \$7 to \$10 per sample shows all the metals that are present and gives some indication of the quantities.

Some part-time prospectors specialize in looking for rock monuments erected years ago by early prospectors. If an old-





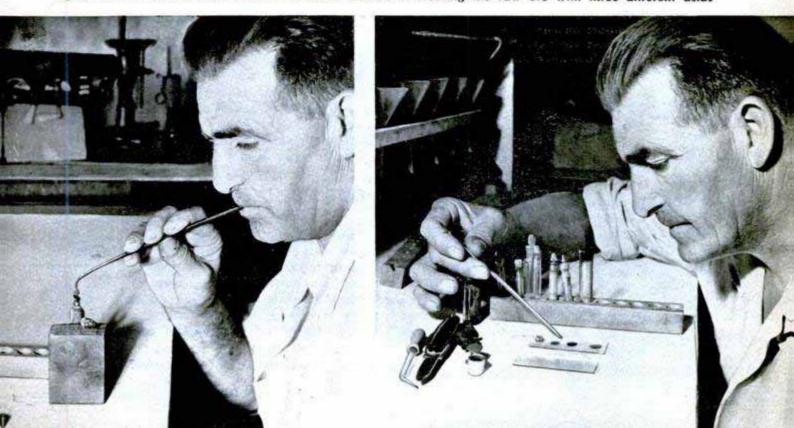
another's property.

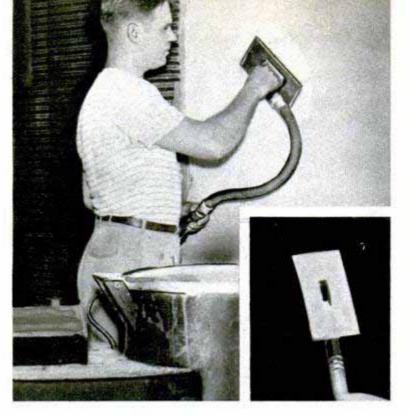
The laws that govern prospecting are complicated and sometimes confusing. If you plan to do serious prospecting in a certain area you should obtain from your state mining bureau a digest of the federal, state and local laws that apply to the

region.

Most public land in the United States, including most national forests, is open to exploration for minerals. Deposits of metals such as gold, molybdenum and tungsten, and nonmetallics such as gypsum, fluor spar or silica may be claimed outright. Ground containing coal, petroleum, oil shale, potash, phosphate or sodium salts may be worked only under federal lease. Private mining of public land containing radioactive minerals has been forbidden. In addition, prospecting is not permitted on Indian and military reservations, lake (Continued to page 256)

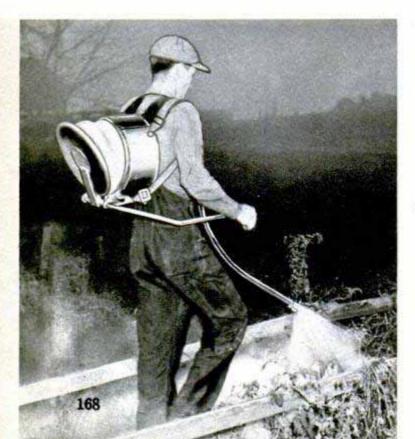
Left, ore sample is placed on a block of charcoal and metal is melted from it by intense flame of blowtorch. Right, another test for valuable metal content consists of treating the raw ore with three different acids





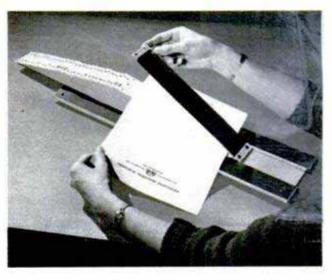
Indexing Device Speeds Filing

Office correspondence and forms are sorted rapidly by means of an indexing device that provides four convenient sorting classifications. The four classifications are an alphabetical index broken down into 31 divisions based on frequency of use, a numerical index from 1 to 31 for the days of the month, a monthly index and a second numerical index arranged by fives from 5 to 95. The 31 aluminum tabs are indexed on both sides. A rack is available for use with the sorter to attach it to the edge of a desk or table at any angle from 15 to 45 degrees.



Mixer Delivers Supply of Plaster To Trowel Continuously

Plasterers don't waste time waiting for material when they use a machine that delivers ready mixed plaster to the face of the trowel. The device, called a "fountain trowel," consists of two 38-gallon mixing tanks with revolving paddles that thoroughly mix a 100-pound bag of plaster in ten minutes. A 21/2-horsepower gasoline motor powers the machine and operates an air compressor. The compressed air forces the plaster through a 14-inch flexible tubing to the trowel. Rate of flow of the plaster is controlled by an adjustable valve in the tube held in the left hand. A narrow slot in the face of the trowel feeds the plaster against the lath. Because it eliminates time spent by the plasterer refilling his hawk, the machine makes plastering four times faster and can be used on any type of lath. It is, of course, suitable for stuccoing too.



Duster Worn Like Knapsack

Weighing less than eight pounds, a hand-operated duster uses a powerful bellows to spray powdered insecticide on plants and shrubbery. Operated by the right hand, a lever pumps the bellows to provide the air blast for spraying. The aluminum duster holds 20 pounds of powder and is worn like a knapsack.

DDT Kills Crop-Destroying "Fish"

Southern farmers are doing some dryland "fishing" in defense of young cotton, soybean and grain plants. They're using DDT-poisoned bait to kill crawfish that burrow in fields where the water table is close to the surface. As many as 50,-000 live in a single acre and they devour everything in sight. Cottonseed and ground-up corncobs soaked in DDT solution are proving the best bait.

POPULAR MECHANICS

Rail-Cycle in Mine Tunnel Cuts Transportation Time

Mine foremen and repairmen in western metal mines save both time and energy by pedaling along haulage tracks on a combination bicycle and handcar. Wire spokes in the flanged wheels make the mine cycle light enough so one man can lift it off the tracks when a train approaches. A wire basket between the front wheels is used for carrying small articles into the mine.

Exposure to Air at 75,000 Feet Fails to Kill Animals in Test

What will happen to airplane passengers flying at extreme altitudes if the pressure system suddenly fails? That question perplexes the designers of tomorrow's planes. In probing for the answer, Yale scientists have found that explosive decompression—sudden loss of air pressure—doesn't kill animals even at 75,000 feet. They learned that if a rat is promptly recompressed, its breathing recovers spontaneously after 18 seconds, and the

ously after 18 seconds, and the heart beat is resumed. If the rat is not brought down to sea level quickly, however, it dies. Breathing stops at all levels above 52,000 feet after 18 seconds, because at this height barometric pressure equals



the vapor and carbon dioxide pressure in the lungs of all mammals, and no oxygen is available to the lungs. Research is continuing with monkeys to get data more readily applicable to humans.



"Bomb" on Sailplane Shows Glide Angle

Odd-shaped scientific instruments are being used by Dr. Gus Raspet of Long Island, N. Y., a glider pilot, to check the performance characteristics of sailplanes. One instrument, shaped like a miniature bomb, is trailed from the glider to measure the gliding angle while the plane is in level flight. Another instrument measures instantaneous air temperature, which is virtually impossible to obtain with other devices. A long rocketlike instrument is trailed from the sailplane to measure air speed. Drag effect is checked by a wake-survey comb.



Hitchhiking Insects Forbidden



Armed with DDT, inspectors wage war on foreign insects arriving on incoming plane. Below, expert identifies a little-known species

By Andrew Hamilton

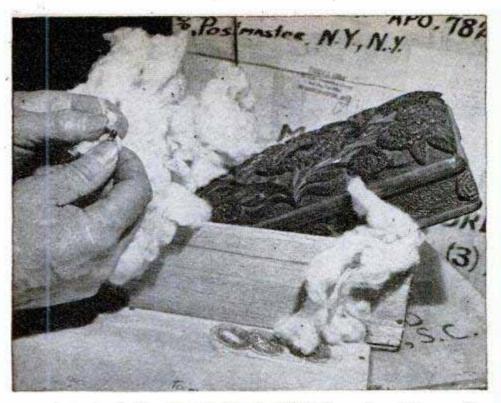
WEARING a beautiful corsage, a well-dressed matron stepped off the Havana plane at the Miami airport. She was stopped by an inspector from the U.S. Department of Agriculture.

"Sorry, madam, but we'll have to confiscate your corsage," he said politely and explained why.

The woman protested, but the inspector had orders to confiscate, examine and destroy all suspicious plant and animal life entering the United States from abroad.

As he took the corsage, the inspector heard the lady muttering to her husband that it was a pity the government spent so much time harassing honest citizens. Why wasn't it out catching crooks instead of worrying about a few bugs?

What she didn't know was that these little bugs —and there are 50,000 species in this country today — are dangerous



Inspector checks cotton packing in gift box from abroad for possible discovery of pink bollworm, a pest not yet found in our cotton fields

"crooks." They do 1½ billion dollars worth of damage every year. If it weren't for the vigilance of the Bureau of Entomology and Plant Quarantine inspectors, we'd have a lot more of the world's 700,000 species of insects and destruction figures would soar.

With four-motored planes winging passengers and cargo around the world these days, the problem of hitch-hiking insects has become serious. Pests that might not withstand a long sea voyage survive a short air hop, arriving ready to go to work—and their work is destruction.

The problem is becoming more serious every year. During 1941, for example, approximately 11,000 planes were inspected upon arrival from abroad. In 1946 the total jumped to nearly 59,000 planes. Look at it another way: 259,945 passengers, 452,589 pieces of luggage and 96,035 pieces of air cargo in 1946 produced 12,156 specimens of prohibited material and 3368 insects from diseased plants—a 66-percent increase over the previous year. Unintentionally, civilian aviation has produced a real threat to American agriculture.

To guard against this invasion, a staff of inspectors is maintained by the Department of Agriculture at principal ports, railway stations, highways, post offices and airports. To intercept airborne insects alone, 200 inspectors

are on duty at 45 major airports.

The plant quarantine law authorizes the Secretary of Agriculture to quarantine all plants and plant material that might carry disease or insects in any stage of their life cycle. Certain fresh fruits and vegetables such as oranges and avocados are prohibited outright; other plants such as cotton and broomcorn are permitted entry after fumigation; still others such as nursery stock, seeds and bulbs are passed under permits and after inspection.

Inspectors are chosen carefully. They are insect experts, university graduates with degrees in entomology and a knowledge of botany—especially plant pathology.

Working in pairs, one inspector carries a flashlight while the other uses a DDT-pyrethrum aerosol bomb.





Wilted orchid corsage found in plane arriving from Central America will be taken to an incinerator at once for burning



Above, incinerator at New Orleans airport is used to destroy prohibited materials. Below, oranges get careful inspection



Doors and cargo hatches are inspected and sprayed before being opened to prevent escape of any insects hiding in the cracks and to seal in what insects are inside.

As passengers alight and their baggage is opened, the inspectors search for corsages, bouquets, fruits, vegetables, nuts, seeds or any other plant and vegetable material. Servicemen and tourists returning from overseas are often dismayed to find that items they bought abroad are confiscated. Grass skirts from Hawaii, cotton stuffing in carved wooden boxes from Italy, Chinese dolls stuffed with rice straw and Mexican beads made from seeds are only a few items on the prohibited list.

Plane interiors are also carefully examined and sprayed. Insect pests have a way of hiding in cracks and dark corners and unless promptly killed they are like-

ly to escape.

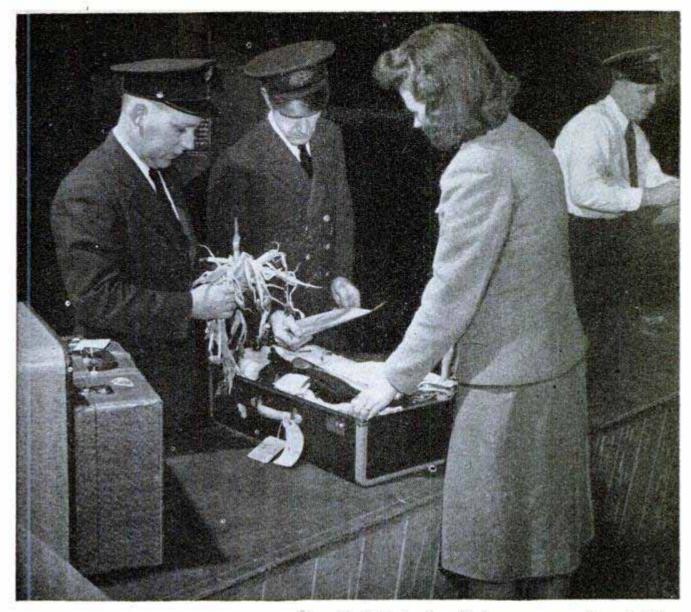
Suspicious material is examined under a microscope. Oranges and tulip bulbs are sliced open, beans shelled. Common insects are identified and the plant burned. Uncommon or unrecognized insects are dropped into a bottle of alcohol and shipped to the Division of Insect Identification at the Department of Agriculture's Research Center, Beltsville, Md.

In the fight against airborne insect pests, the most potent weapon is the DDT aerosol bomb. Seven strokes of the plunger atomizes seven drops of the liquid (DDT and pyrethrum in solution), enough to spray 1000 cubic feet.

Some foreign insects that have entered the United States, causing millions of dollars damage, include the Hessian fly, the Japanese beetle, the European corn borer, the gypsy moth, the Oriental fruit moth, the Mexican bean beetle

and the boll weevil.

In dollars and cents, the losses are enormous: in 1945 the damage to the cotton crop by boll weevils was 639,000,000 pounds worth approximately \$170,000,000; the European corn borer cost the American farmer \$22,700,000 in 1944, \$37,000,000 in 1945 and \$50,000,000 in 1946. Someone has stated that in a six-day week the farmer works four days to feed himself and his family and two days to feed the insects on his farm.

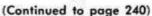


Above, English tulips found in baggage are confiscated. Below, inspector sprays baggage compartment door before he opens it

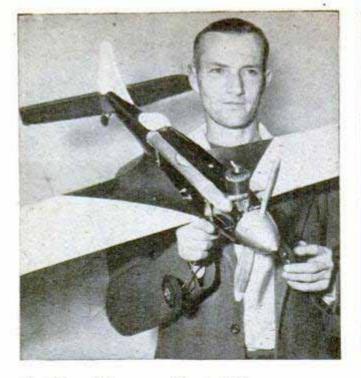
When foreign insects do get a foothold here, the bug experts of the department go to work on the problem of eliminating them.

The cottony cushion scale from Australia invaded California's citrus orchards. It spread rapidly and many orchards had to be destroyed. Sprays and oils were ineffective because the eggs are protected by a white, cottony layer. The government sent an expert to Australia to find a parasite that would battle the destructive pest. The Vedalia beetle, sometimes called the lady-bird beetle, was brought to this country and it has stripped its natural enemies from the citrus trees saving the growers many dollars.

Florida had an invasion by the Mediterranean fruit fly. A ban was clamped on all shipments until the vapor heat treatment for oranges was devised. The fruit is held at 110 degrees for eight

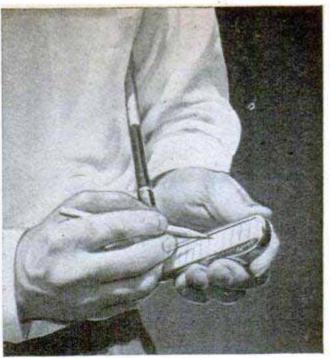






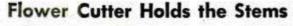
Muffler Silences Model Planes

Model-plane engines can't be heard 100 feet away when they're equipped with a muffler invented by Marty Johannes of Burbank, Calif. He made it for his son after police chased the boy and his friends from a public playground because their plane's engine noise was a nuisance. The aluminum muffler is 10 inches long and weighs 3½ ounces.

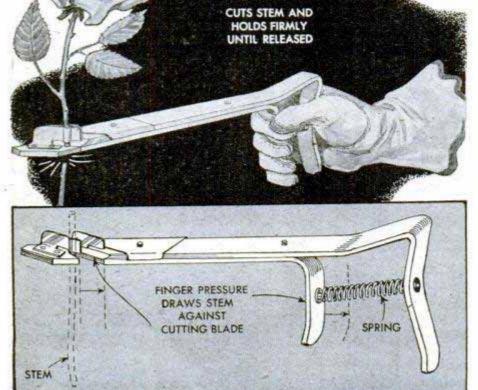


Score Card Fits in Putter Head

Golfers who habitually fumble for score card and pencil after each hole have an answer to their problem. A new putter has a head which contains the score card and a pencil or ballpoint pen. The 18-hole card slips into grooves in the back of the blade, which is curved to hold it in place during play. The pencil fits into a hole in the base of the club where it is held by a spring.



Flowers are cut and held by the stem with a new-type flower cutter that prevents scratches from thorns. The gardener holds the cutter so that the stem of a standing flower slips into a notch near the end of the tool. Then he compresses the handle to cut the flower and hold it until he releases the handle. Flower stalks are not damaged by the cutter.



You may wish to obtain additional information about new products described each month in Popular Mechanics. If you want to know the name and address of the manufacturer or distributor, just write Bureau of Information, Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Illinois

Electric Bed Sheet Can Be Laundered

Made of muslin, an electric bed sheet is used with conventional bed coverings to maintain an even temperature. The sheet, 84 inches long by 70 inches wide, is spread on top of the regular bed sheets and covered with a blanket or quilt. A thermostat maintains the heat at the desired temperature. The sheet can be laundered, as all electric elements are waterproof. Seventeen buttonholes around the edges permit the sheet to be buttoned to the blanket or quilt.

Colored Egg Whites

Chickens fed certain kinds of food lay eggs in which the whites are pink and the yolks are dark orange-yellow or olive

colored. Egg whites turn pink if hens eat hollyhocks or cheeseweed. Pink-tinged whites also result if hens feed on cottonseed meal and the eggs are kept in storage for a while, according to Clyde Driggers,



poultry expert at the Florida Experiment Station at Gainesville, Fla. Yolks become dark orange-yellow by feeding cornmeal or alfalfa-leaf meal. Too much cottonseed meal colors the yolks a dark olive.

Reel Assures Straight Garden Rows

Two stakes, an aluminum reel and 150 feet of cord assure gardeners of straight rows in planting their vegetables. The cord is wound on the reel which is attached to one of the stakes. On the same stake is a simple lock which holds the string taut at any desired length.



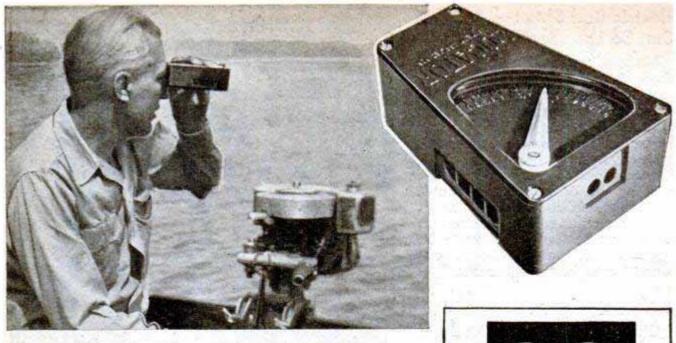




Press Seals Papers in Plastic→

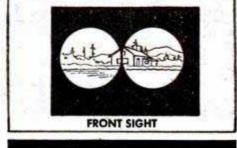
Photographs and valuable papers can be sealed in plastic with a laminating press that develops up to six tons of pressure. The paper or other flat object to be sealed is placed between two layers of plastic and the "sandwich" inserted in the press. The platens are tightened and the press is heated in a gas oven or over a burner. The plastic melts to seal the paper. The press handles objects up to four by five inches. It also can be used to make jewelry.

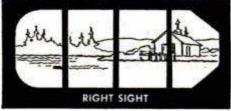
MARCH 1948



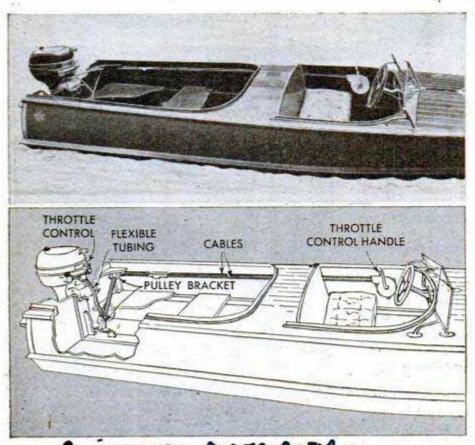
Spotter Marks Place Where Fish Bite

Returning to that spot on the lake where fish are plentiful is made easy by a fish-hole locator that operates by triangulation. The small, plastic locator provides a simple method of exactly relocating any spot. After aligning two objects on the shore through the front and right sights, the fisherman plots his location by reading the locator scale on top of the instrument. He can return to the exact spot by setting the pointer at the previous figure on the scale and resighting on the two objects. The pointer controls the position of a mirror inside the spotter making it possible to sight to the front and side through a single rear eyepiece.



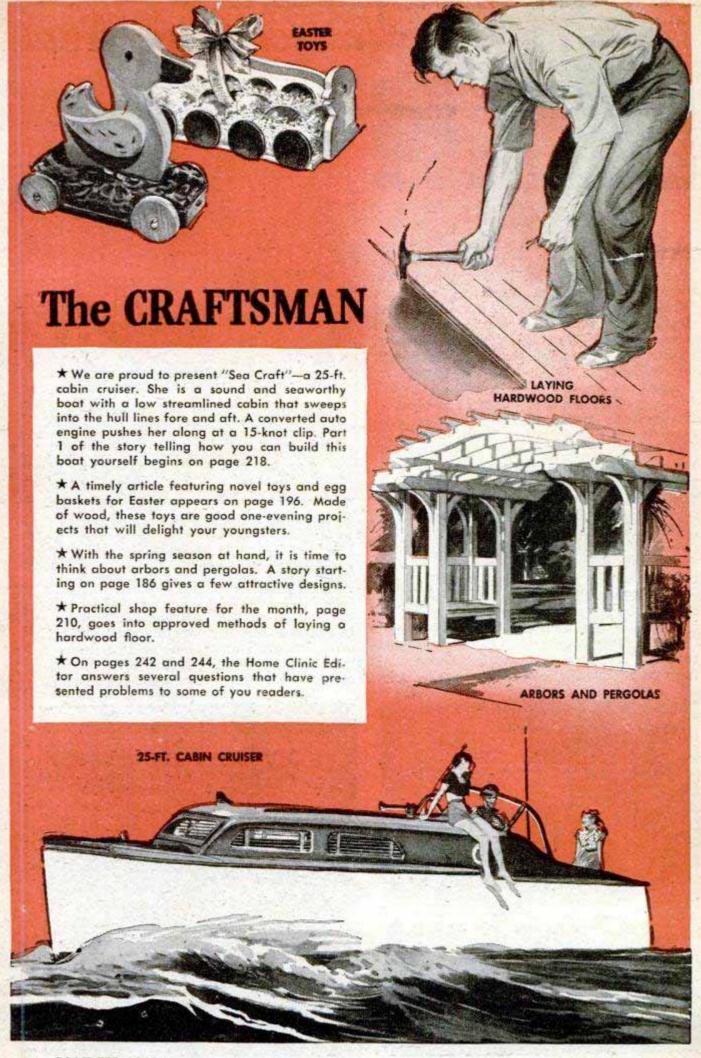


Remote Control Synchronizes Outboard Motor's Spark and Throttle



Operating the throttle of an outboard motor from the forward part of the boat is possible with a remote-control system that functions through cables and pulleys. The control automatically synchronizes the spark and throttle. A handle near the operator's seat is connected by cable and pulley to a bracket below the motor in the bottom of the boat. Flexible tubing carries the controls to the motor, where the spark and throttle are synchronized. Moving the handle transmits a change in throttle speed to the motor. The control system can be installed and attached to the motor without drilling.

MA. TODD, MERCURY DISTR, INC.



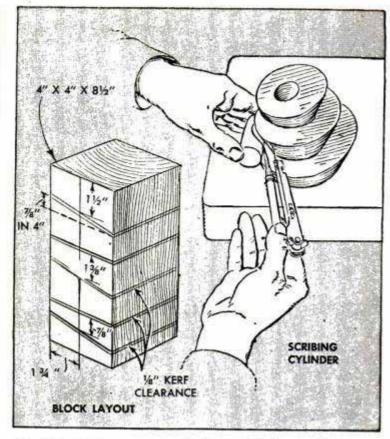
Turned Candlesticks in New

These modern candlesticks, in novel "climbing spiral" design, offer something new in one-evening projects for the wood-turning hobbyist

By E. M. Lous

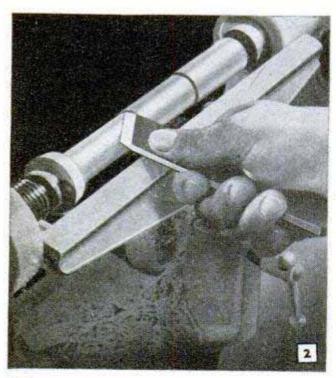
A FEW HOURS of fun with your wood-turning lathe can result in these attractive candlesticks, Fig. 1, that will please even the most discriminating person. While they are not a true climbing-spiral design, they do give that impression, and when made of contrasting woods, such as mahogany and maple or birch, they will add a decorative touch to any home.

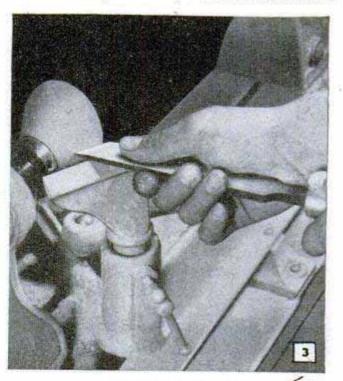
Mark and cut the cone sections for both candlesticks from a block of hardwood as shown in the detail, and sand the top face of each one. Locate the center on the bottom of each piece by drawing intersecting lines from the corners. Rough out the sections by removing waste from the corners with a chisel. Then mount one of the upper sections in the lathe on a screw center, Fig. 3. Set the tool rest at a 30-deg, angle and use it as a guide in turning the diameter. When this piece has been turned to size, bore the candle socket, Fig. 4, and sand the part to a smooth finish. Duplicate this procedure on the upper section of the other candlestick, and drill the tops of both sections to take 1/8-in. dowels which are used to attach a cylinder. Next, fashion each of the two middle sections of the candlesticks



in the same manner, but counterbore the top to fit the bottom of the upper cone. Follow with the lower sections, which also are counterbored. Then, screw the cone sections together and stain them.

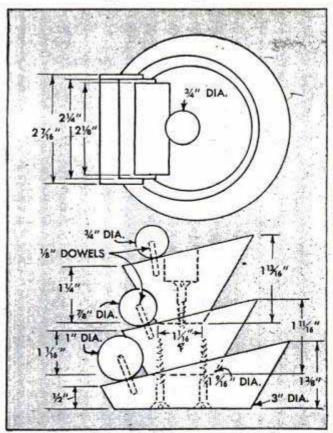
The dimensions of the decorative cylinders are given in the detail. Turn them as in Fig. 2, cut them apart and dress the ends on a sander. Then, scribe each cylinder as indicated to fit against the corresponding cone section, and shape with a half-round



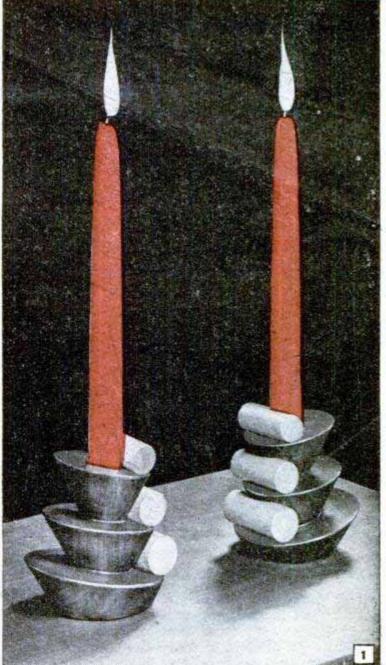


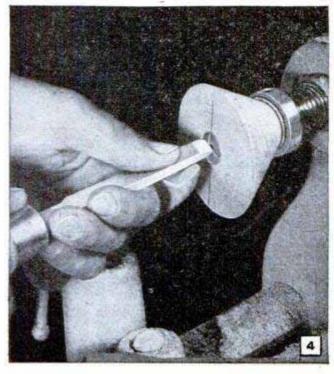
178

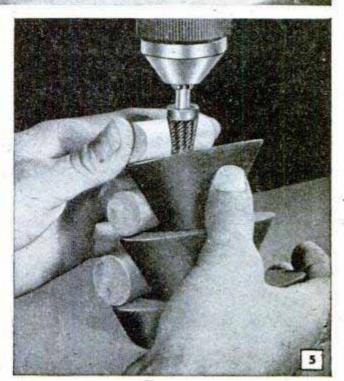
Styling *



file. Drill each one for attaching with dowels. Sand or scrape the cone sections at the points where the cylinders contact the sides of the cones in order to remove the stain and filler. Before gluing the cylinders in place, notch each top one at the point where it overhangs the candle socket, Fig. 5. When the glue sets, varnish or lacquer the candlesticks.

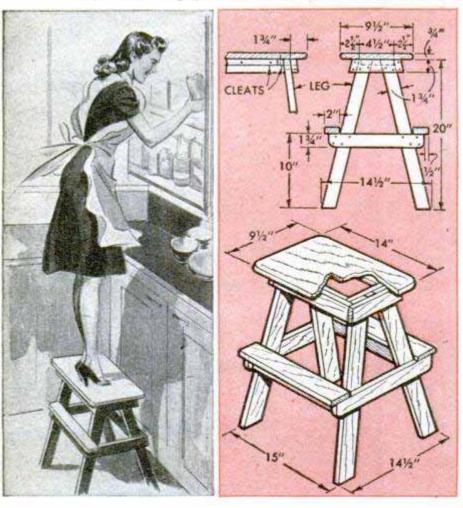






MARCH 1948

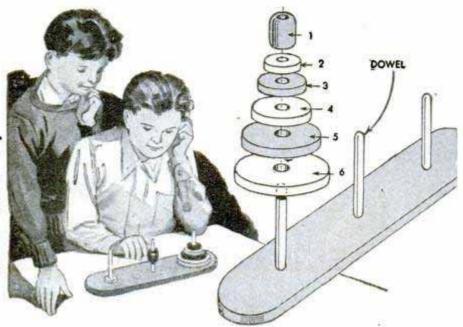
Has Variety of Uses Around the Home



tion of this handy kitchen stool will be ample reward for the few hours devoted to making it. The stool is only 20 in. high—a convenient height for many purposes. It can serve as a kitchen work stool, a small stepladder for reaching shelves or cabinets, and a child's chair at mealtime. Make it of 3/4-in. hardwood and assemble the parts as shown in the detail. Glue all the joints and fasten them with 11/2-in. wood screws. Note that cleats are attached to the inner faces of the apron pieces for screwing the top of the stool in place. Finish by sanding and apply an undercoater or sealer. When this dries, sand it lightly and follow with two coats of enamel that will harmonize with the color scheme of the kitchen.— Orville Wandersee, Springfield, Minn.

Tower-of-Benares Puzzle Fascinates Both Adults and Children

This puzzle has its origin in a strange East Indian legend, and will afford many hours of interesting and amusing competition. The problem is to move the stack of disks from the left-hand peg to the righthand peg, one at a time, without covering a smaller disk with a larger one during the process. The disks and base are cut from scraps of wood, and the pegs from lengths of dowel. The disks should be numbered consecutively from 1 to 6, beginning with the smallest disk. Paint the odd-numbered disks one color and the even-numbered disks a contrasting color. After this, paint



each of the pegs a different color, letter the lefthand peg A, the center peg B, and the right-hand peg C. The stack of disks can be transferred in 63 moves, and the solution to the puzzle is in the pattern of moves. The oddnumbered disks should be moved from left to right, and the even-numbered disks from right to left in rotation, except disk number 1 which is moved from left to right every other turn. The order of moves is: 1 to B, 2 to C, 1 to C, 3 to B, 1 to A, 2 to B, 1 to B, etc.

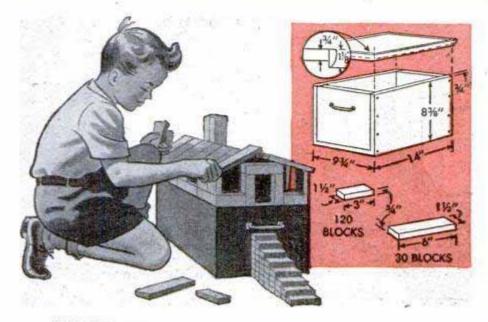
Twin-Duck Shoofly Gives Youngsters Merry Ride

Children will have a circus with this rollicking toy and it will appeal to the man whose tools are little more than a hammer and saw, for it's very easy to make. The toy differs from the usual shoofly in that it is ridden in a sitting or standing position. Box lumber or wood salvaged from an old piece of furniture will do for most of it, although plywood is best to use for the duck heads so that they will not split off. Sawing the duck heads will require the most work. Draw a full-size pattern for these by ruling 1-in. squares on paper and transferring the outline to corresponding squares. The heads can be sawed one at a time with a coping saw, or you can have these parts of the toy bandsawed at a local pattern shop. The sides of the shoofly are laid out on a ¾-in. board, 10 in. wide. The radius can be marked by holding a pencil at the end of a stick which has a nail point 26 in. from the end. The sidepieces

are joined with three braces placed flush at the top and then covered with ¼-in. plywood or solid stock. The duck heads are fastened to the inner face of the sides with

BROOMSTICK HANDLE -26" RADIUS 17" WIDE PLYWOOD BRACE BRACE 4" X 151/2" W" STOCK

> screws and a broomstick handle is added between the heads. Enamel the sides and duck heads white and the rest red or yellow.—D. Giaquinta, Canton, Ohio.



Block House Erected On Storage Box

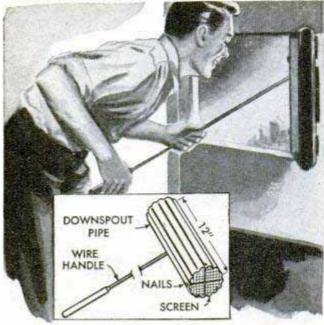
Besides furnishing a place to store the blocks, the box for this set of building blocks also serves as a part of the toy and is used as a base on which a house or other structure is erected. In addition to the box, the set consists of 150 blocks, 30 being larger than the others. The box is fitted with handles and a slipon lid.—E. S. Macgowan, Minneapolis, Minn.

MARCH 1948



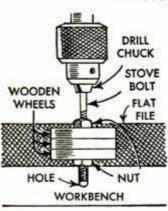


"Fire Tube" Aids Starting Fire In Stove or Furnace



If your stove or furnace smokes due to a cold, damp chimney when a fire is started, you can prevent it by preheating the chimney with this "fire tube." By doing so, a draft is created in a short time which draws the smoke up the chimney. The fire tube is made from a 12-in, length of downspout pipe, one end being fitted with a grate of screen wire held by two nails fitted crosswise as shown. A length of stiff wire is attached for a handle. To use the fire tube, place a handful of kindling in the tube and ignite it through the bottom, hold the fire tube inside the stove or furnace and near the smoke pipe. Then when the fire in the tube burns briskly, dump the contents onto a bed of wood and coal previously made and the fire will take hold quickly. It is best to form a small hole or pocket in the kindling bed to keep the fire concentrated.

Wooden Wheels for Pull Toys "Turned" With Hand Drill

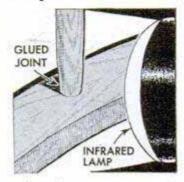


Not having a lathe to turn some wooden wheels for a pull toy, I used a hand drill to turn them. After sawing the disks as closely to line as I could, I drilled a hole through the center of each one and mounted the disks on a bolt,

tightening them together with a nut on each side. With the bolt clamped in the chuck of the drill, and a hole drilled in the workbench to serve as a bearing for the end of the bolt, I had another person hold a flat file against the edges of the disks while I rotated them with the drill. When the file was held on edge and pressed squarely, but lightly, against the work, it was possible to produce neat little wheels by hand.—Chester Wathey, Philipsburg, St. Martens, N. W. I.

Glued Furniture Joints Dry Quickly Under Infrared Lamp

When time is a factor, the heat from an infrared heat lamp will hasten the drying of small glued joints, such as chair rungs or legs. This works best when using a resin-type glue,



which sets quickly when heat is applied. Small furniture repair shops will find this hint helpful in doing "while-you-wait" and similar rush jobs.

Baffle Directs Flow of Water To Increase Heater Output

Troubled by poor water circulation through the hot-water heater of his car, which had no thermostat in the cooling system, one motorist found that a baffle installed in the heater-hose nipple at the point where it enters the radiator hose helped deflect the water into the heating system and increased heat output as much as 50 percent. The baffle is a short piece of copper tubing, cut to the shape shown, and forced tightly into the hose nipple. Let it extend 1 in. and solder it to the nipple.

William Williams, Wilkes-Barre, Pa.

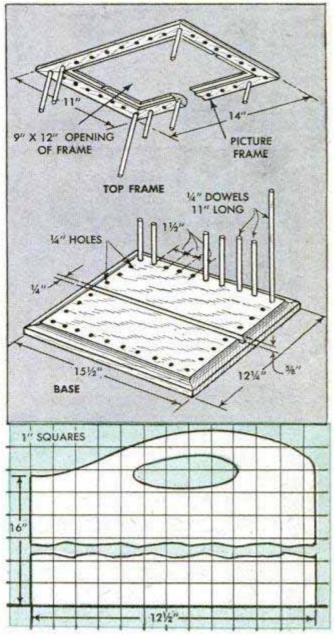
SOLDERED NIPPLE
RADIATOR HOSE

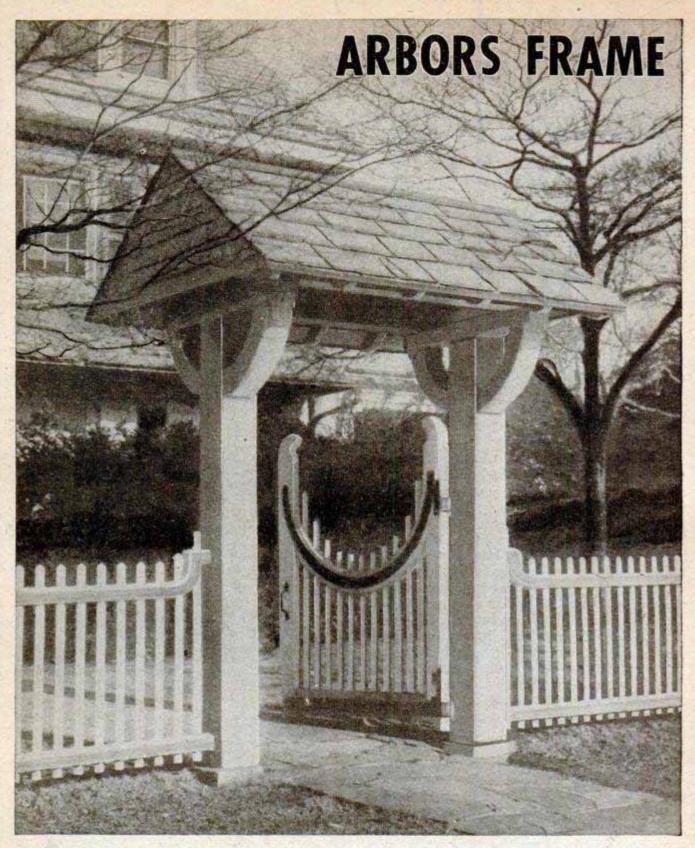
Novel Magazine Rack Is Made With Hand Tools



A BREADBOARD, a picture frame, a piece of ½-in. plywood, and a number of 1/4-in. dowels are the principal parts of this unusual magazine rack. The design fits in nicely with the furnishings of a den or basement recreation room. Although a breadboard or kneading board from an old kitchen cabinet makes a good base, you can build up a base by gluing together several wooden strips to make the required width. The base is detailed with molded edges but if no shaper is available it can be simplified by merely rounding the edges evenly. Holes for the ¼-in. dowels are spaced and drilled to a uniform depth in the base as indicated. Groove the base as shown. Top frame of the rack is a hardwood picture frame of the dimensions given. Holes are drilled in the back of this frame to register with those already drilled in the base. Cut all the dowels to an equal length and insert in the holes in the picture frame. A spot of glue on the end of each dowel will hold it in place. Next, place a drop of glue in each hole in the base. Then invert the picture frame over the base and insert the dowels one by one into the holes. Finally, tap the top of the frame lightly with a mallet to seat the dowels in the holes. Cut the center panel to the shape and dimensions given in the squared pattern, sand the top edge and the edges of the handhole smooth, notch the top frame as indicated and glue the part in place. Finish in the natural color with shellac and varnish or clear lacquer, or with colored enamels to match other furniture.

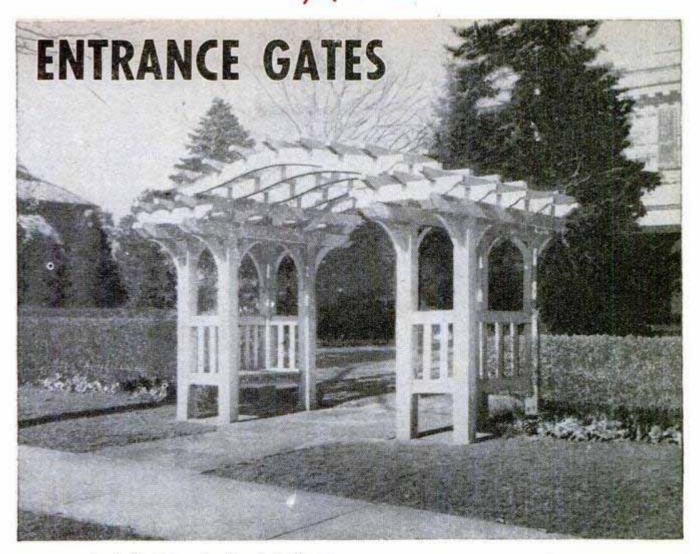
Simon S. Palestrant, Bronx, N. Y.





A RBOR-FRAMED GATES and pergolas such as these, will enhance the beauty of the grounds around your home. Regardless of the size of your property, they will add interest to an otherwise plain entrance and afford the opportunity to grow climbing vines and other plants that would be impossible to train without them. These photos show several of an unlimited number of designs that can be built by anyone with a few hand tools, and you can make them just as simple or as pretentious as you wish from standard stock.

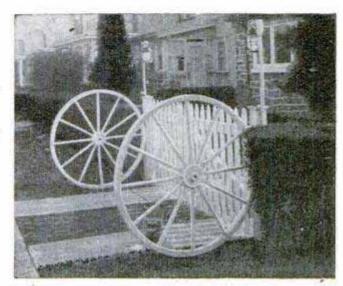
The unusual gable-roofed pergola shown above is covered with slate shingles to provide a shelter and has massive pillars that achieve an imposing appearance. The large arbor pictured on the opposite page has seats on either side and a heavy latticework roof which adds a note of dignity to more spacious grounds. Two buggy wheels painted white and securely mounted on each side of a driveway add a novel touch to a white picket gate between them. The carriage lamps hung from lengths of pipe are in keeping with the theme of the ar-



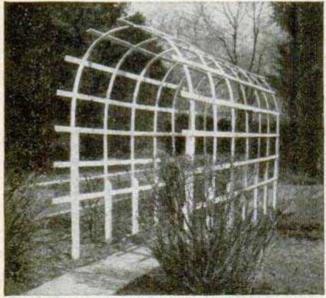
rangement. A buggy wheel set halfway into the ground, makes a clever trellis that also provides an attractive support for the numerals of the house number.

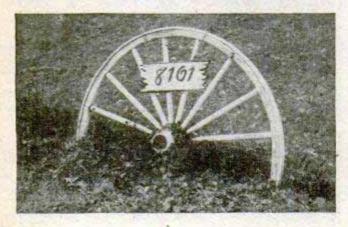
The conventional arched trellis, over which a privet hedge has been trained to grow, is a unique gateway. However, it will take several years for a hedge to attain the symmetry of the one in the photo. Another type of arbor shown is one made from strips of regular lattice stock, some of which have been bent U-shape and attached to short posts to form a framework for strips applied horizontally. When vines or climbing roses cover it, this ornamental arbor will shade the walk. In most cases, the strips can be bowed dry, but if the curve is of small radius, the strips can be made more pliable by soaking them in water for several hours and bending them while they are wet.

Since these arbors and pergolas are of a semipermanent nature, use the best weather-resistant wood available for their construction. Redwood, western red cedar and cypress are especially suited to this purpose. These woods are durable, take paint well and are easy to work. If they are not available, white pine or other regular lumberyard stock will do, provided it is kept well painted. Ample protection over a period of years can be had





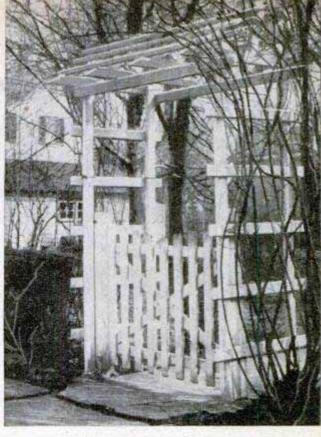




by applying three coats of any good outside paint or two coats of creosote stain. Paint all parts with a priming coat before they are assembled. Before nailing the pieces together, coat all of the adjoining surfaces with white-lead paste to prevent dry rot.

Set the supporting posts at least 24 in. into the ground. The portion of the post that will be below ground should be tarred or creosoted. To do this, soak the posts in creosote for several hours, and have the solution in a can deep enough so that the coated portion of the posts will reach 5 or 6 in. above the ground after they are in place. It is advisable to set all the posts, especially large ones, in concrete. Dig a hole several inches wider than the post and about 4 in. deeper than the distance the post is to be set below the ground. After the posts are set in the holes, plumb them and tamp the concrete well around them. When the concrete has cured, sometimes a small opening around the post will appear due to shrinkage. It is likely that water will seep into these openings, so seal them with oakum or roofing cement. One way to anchor a post securely in concrete is to drill a hole through it near the lower end, and insert a piece of broomstick or metal rod crosswise so that it projects 3 or 4 in. on each side. This will key the post securely.



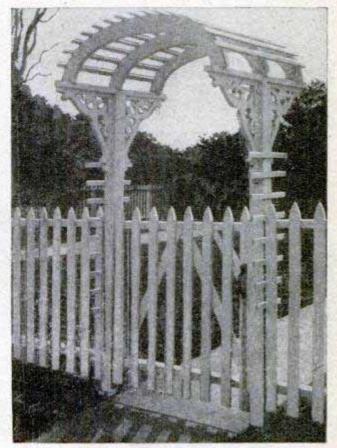


Trellis, with semicircular roof, and picket gate form interesting oval frame. Note how the tops of the supporting posts are pointed. Short strips of lattice stock are fastened horizontally to the posts and arch

Sturdily constructed pergola with gable-type lattice roof makes a gateway that blends well with the wooded surroundings. Set in concrete and kept properly painted, it will remain an attraction for years

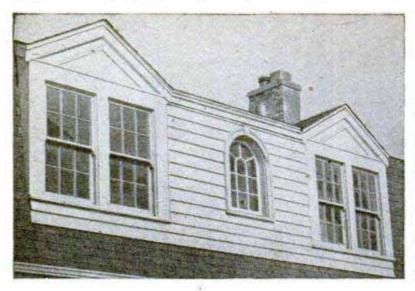
Pleasing arched entrance through the high, thick hedge is effected by this trellis along with a gate of unusual design. Use of vertical slats on arches and sides presents a distinctive, unique appearance Ornamental arbor sets off entrance way in neat picket fence. Scrollwork near top of supporting pillars lends delicate touch, and horizontal lattice on posts provides trellis for vines or climbing roses





MARCH 1948 189

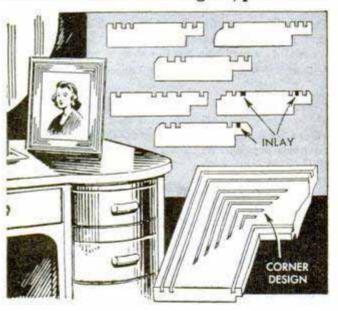
Twin Gables Give Lift to the Shed-Type Dormer



To improve the appearance of shed-type dormers on a Dutch Colonial home, one contractor added gable roofs over the windows at each end and obtained the pleasing modified Cape Cod appearance shown in the photo. The installation of a small arched window relieved the plainness of line and provided a finishing touch to the whole dormer. Flower boxes with scrollsawed fronts also will contribute a decorative touch. Adding such gables can be done to any existing shed dormer without the necessity of doing a major remodeling job.

Attractive Picture-Frame Molding Produced With a Circular Saw

Requiring only a circular saw, these varied designs for picture-frame molding show what can be done with this versatile workshop machine. After sawing the conventional rabbet for the glass, picture and

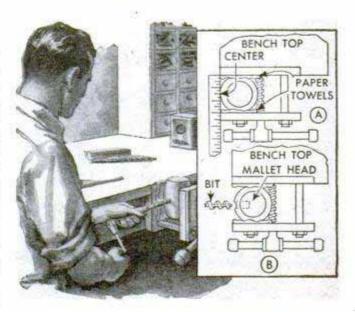


cardboard backing, the face of the stock is grooved lengthwise to form a border design around the edge of the frame when assembled. This is done with the saw blade projecting about 1/8 in. Some of the grooves can be inlaid with regular inlay banding, or with strips of contrasting wood. Decorative grooves also can be cut at the corners of the frame. To do this, first miter the four pieces of the frame. Then, clamp a stop block to the saw fence to equal the length of cut, set the fence and make the first groove. You'll be able to make this initial cut at one end of each piece with this one setup. Each subsequent cut is made by resetting the fence and the stop block. When the required number of cuts are made at one end of each piece, the pieces are turned end for end and similar cuts made so that they align with the others when the frame is assembled. A drill press with router attachment also can be used to cut the grooves.

Drilling Mallet Head Accurately

Drilling a hole squarely by hand in a gavel or mallet when fitting it with a handle is done with little trouble in the following way: Clamp the turning vertically in a bench vise so that one side is flush with the sides of the jaws. Then, holding a rule in contact with the turning and the jaws as in detail A, measure one half the distance between the jaws and make a mark on the turning. Without changing the position of the turning in the vise, mark the half-way point lengthwise. The point where the two marks intersect is the drilling point. Guide the bit at right angles to the axis of the turning by sighting along the vise jaws.

C. R. Schlegel, Jenkintown, Pa.





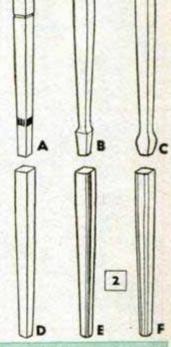
Includes straight and spade-foot types

By Sam Brown

CHARACTERISTIC of the Adam and Hepplewhite influence in period-furniture design, the square tapered leg in any of its variations lends itself to mass-production in the home shop by using a few simple jigs. Power tools are required, but the straight-taper leg can be cut completely on just a circular saw. A shaper or jointer is needed to produce the popular spade-foot leg.

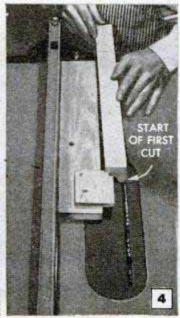
Design variations: Various leg styles are pictured in Fig. 2. Style A is a straight taper with a decorative groove at the top and an inlaid or painted band near the bottom. B shows the spade foot commonly used for period pieces, and C is somewhat similar but with the spade rolled into the taper without a break of line. Leg style D is a straight taper on two sides only, a style often used because it represents less work and the slight splayed effect is quite attractive. E is a straight taper with outside corner rounded, very popular for modern furniture, and F shows another edge treatment, with all edges beveled. In period pieces, the legs often are ornately carved, fluted or inlaid on the show faces, but for modern pieces the only decoration in popular use is the banded style pictured at A.

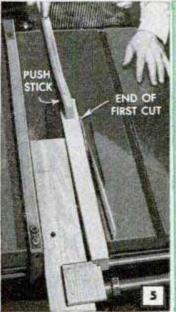
Cutting the straight taper: Whenever practical, the taper should be sawed in preference to jointer and shaper methods. The best

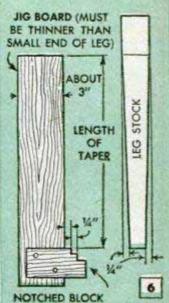


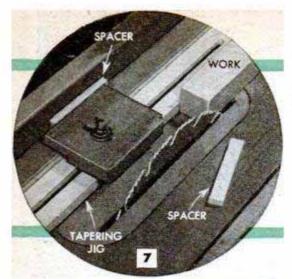
1

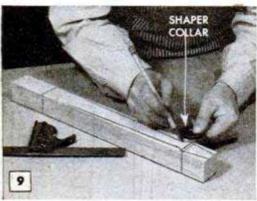




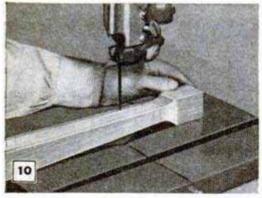




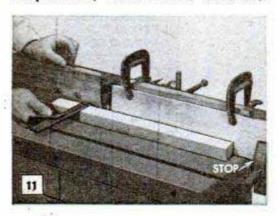




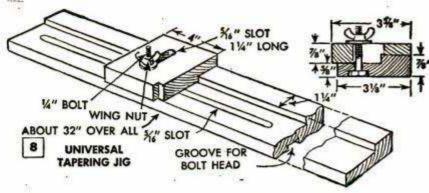
Draw outline of leg in pencil on adjacent faces and use shaper collar to mark curve



To save wear on the cutting edges of the shaper knife, remove waste wood first



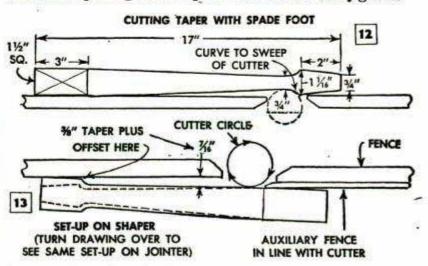
Either a jointer or shaper can be used to cut the taper. Infeed table or fence, as the case may be, is offset a distance equal to the amount of taper you desire

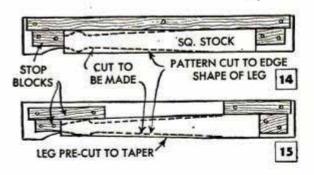


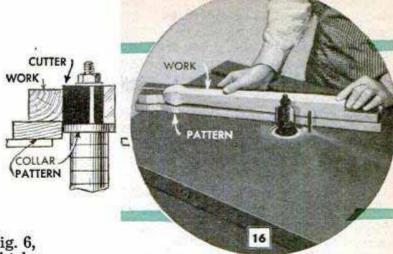
blade to use for this is a combination one, hollow ground, sometimes called a planer saw. Such a blade produces an exceptionally smooth cut, requiring only light sanding. Fig. 6 shows a typical straight-taper leg design, calling for a ¼-in. taper on each face on all four sides. Fig. 6 also shows a simple jig which is used in conjunction with a circular saw. The jig board should be as long as the tapered part of the leg, plus 3 or 4 in. to accommodate the notched block. Notice that the depth of the notches in the block must equal the taper, in this case, ¼ in.

How the jig is used: With work dressed to net size and perfectly square, the saw-fence setting is made to equal the combined width of jig board and work, as shown in Fig. 3. Then the work is placed in the first notch of the jig and pushed into the saw, Fig. 4. Note that feed pressure is on the work, not the jig. The end of the cut is shown in Fig. 5. Two adjacent sides are cut with the work in the first notch. Then, without disturbing the fence setting, the two remaining sides are cut with the work in the second notch. To compensate for the waste removed from two sides, retack a block equal to the thickness of the waste so that the work will ride horizontally in cutting each taper. A push stick must be used for feeding near the end of the cut, Fig. 5.

Universal jig: While the jig board is practical, some workers prefer a more permanent device, such as the one shown in Fig. 8. Here, only one notch is used, the sliding block being arranged so that it can be adjusted to any taper up to ½ in. (about 1½-in. taper if the cut is made on one side only). This jig is set with spacing blocks placed between the jig and



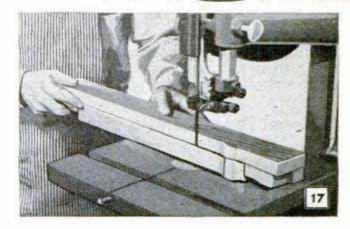




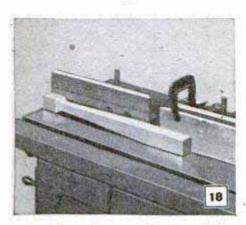
saw fence. In the example shown in Fig. 6, the spacer blocks would be ¼ in. thick. The saw-fence setting is made as before. Offsetting the block for the first cuts is made with one spacer block, as shown in Fig. 7. The final cuts are set with two

spacer blocks as in Fig. 1.

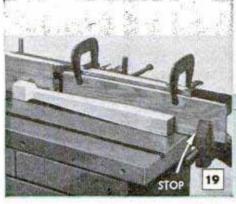
The spade foot: It is not possible to make the long taper of this style of leg on a circular saw, hence the cut must be made by a jointer or shaper. Start by laying out the shape of the leg for a master pattern, Fig. 12, and make the curve at the bottom equal the radius of the shaper collar or jointer cutterhead, Fig. 9. Rough-bandsaw some of the surplus wood on all four sides, but leave the spade portion at full thickness, Fig. 10. Next, set up the shaper or jointer for tapering. This setup requires that the infeed table or fence must be offset from the cutter a distance equal to the taper desired, in this case, % in., Fig. 11. Also, because the shape of the leg holds the work out from the fence, as shown in Fig. 13, this extra distance must be added to the offset. The out-feed end of the shaper fence is fitted with an auxiliary fence and this should be pushed up as close to the cutterhead as possible in order to minimize the slight bite at the beginning of the cut. The out-feed fence of the shaper or the jointer table must be exactly in line with the cutting circle of the knives. Fig. 18



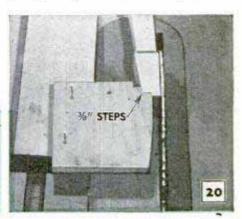
shows the start of the cut and Fig. 19 shows the cut near completion. All four sides are run with the same setup. The short taper comprising the foot is sawed with a modification of the step-block idea. The taper required is % in. on each side, hence the step-block has %-in. steps. The proper position of the work in relation to the saw for the first cut is obtained by using a straightedge across the saw blade, aligning the pencil mark on the leg with the straightedge. Then the step block is nailed to the jig board at this setting. The first pair of adjacent sides is cut as before with the work in the first notch; the remaining pair requires that the work nest in the second notch, Fig. 20, to cut the taper.



Auxiliary fence minimizes slight "bite" of cutter at start of cut



Here taper cut is nearing completion. Note use of handscrew as a stop block



Taper of foot is cut on saw, using a modification of stepped block

Tapering with pattern: The rolled spade foot requires the use of a pattern, which should be cut to the outline of the leg, Fig. 14. The machine setup for this is conventional outline planing, the pattern riding a collar of the same diameter as the cutter, as shown in the end view and Fig. 16. If the cut is heavy, waste wood should be bandsawed by turning the pattern over with the work in place, Fig. 17. In fitting the work to the pattern with stop blocks, it should be noted that the thick portion of the leg at the spade foot must be exactly in line with the pattern. In other words, no stock is removed at this point. It can be seen that this is the contact point for final cuts and if wood is removed at this point on the first cut, the work will set deeper in the jig when the opposite side is cut. Note in Fig. 15, that when the spade is narrower than maximum, precutting of the leg to a straight taper simplifies the setup.

Sectional Fence Can Be Dismantled To Facilitate Mowing

Here's a picket fence designed to overcome the tiresome job of trimming grass along the bottom of a fence. It's assembled in sections so that you can lift each one out and mow between the posts. While this still requires trimming around the posts by hand, it does save considerable time, and by being removable, the sections of the fence also are much easier to paint. The pickets in each section, which can be arranged in any pattern desired, are nailed to the face side of 2 by 4-in. rails, cut to fit between the posts. The ends of the rails rest in notched blocks which are screwed to opposite faces of each post. The notch should be made a little oversize to allow for possible swelling and ample clearance when the parts are heavily painted.

David B. Clapp, Livingston, N. J.



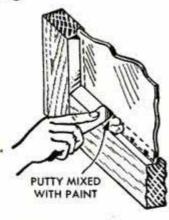
Motorcycle Wheel With Lugs Makes Simple Plant Spacer



Home and truck gardeners alike will find this simple plant spacer a real time-saver and convenience. It is used like a wheelbarrow and has wooden blocks attached to the rim of a wheel which forms a continuous row of depressions, equally spaced, as the spacer is pushed along. A discarded motorcycle wheel was used to build the original, but any wheel of sufficient weight will do. Bolt or wire the blocks to the wheel, spacing them to equal the distance desired between the transplants, and fit the wheel with two wooden handles as shown.

Putty Colored Before Applying Eliminates Painting

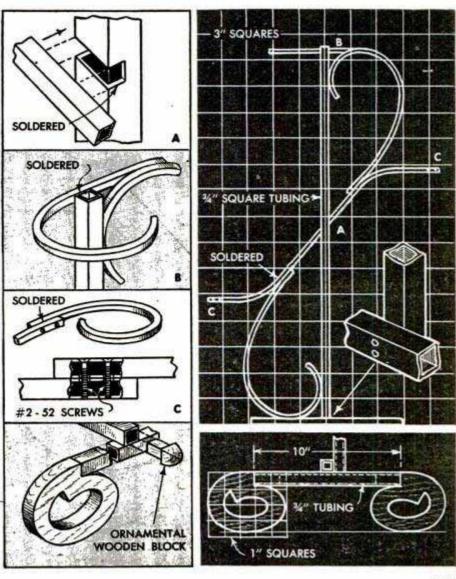
When reglazing a window sash and time is a factor, you can save yourself the job of painting the putty later by coloring it before applying. If the window trim is white, simply add a little white lead or paint and knead it into the putty

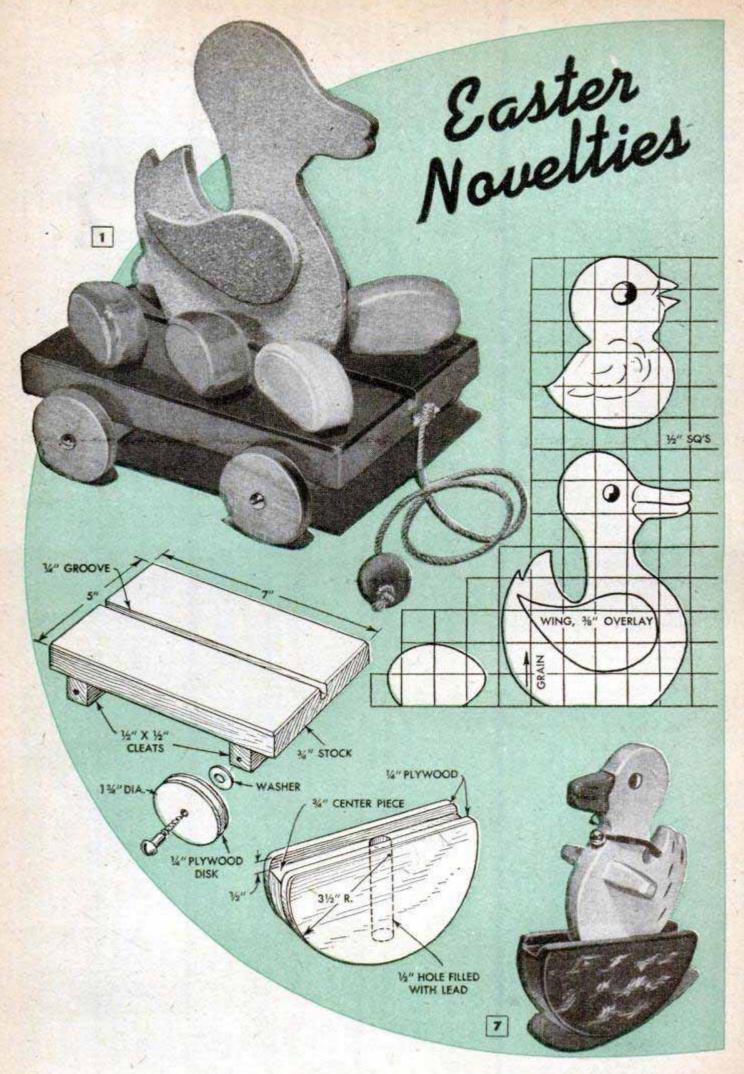


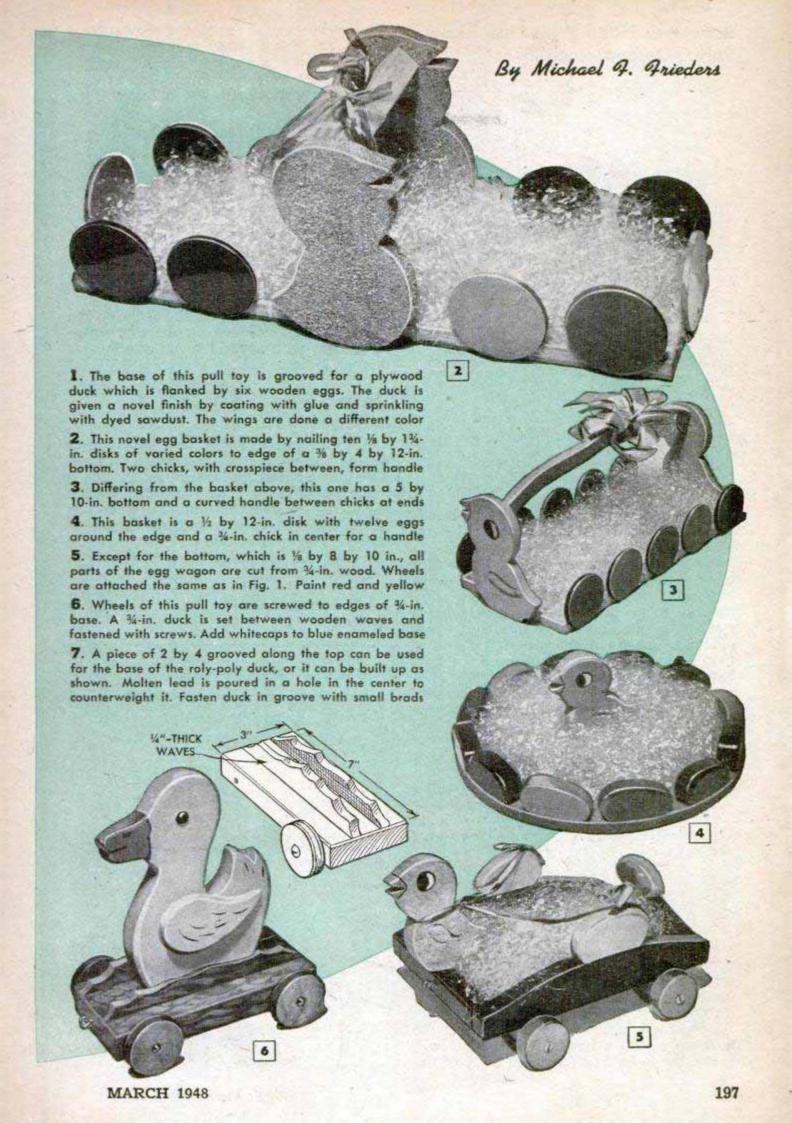
until the mixture is uniform in color and of a workable consistency. If too much paint is added and the putty becomes sticky, dust it with a little whiting and work into the putty with the hands. Colors in oil are good for matching purposes.

GRACEFUL plant stand that gives the effect of fine ornamental ironwork, can be made . from square brass tubing. Use 34-in. tubing for the base and standard, and ¼ or %-in. tubing for the remaining parts. One way to form the tubing is to bend it around a wooden disk fastened to a bench top. Another way to bend the curved parts is to clamp an adjustable end wrench in a vise so that the jaws open in a vertical position. Then slide the tubing through the jaws, making a gradual bend. Always use a gentle, steady pressure. First, draw a full-size pattern as given in the squared drawing, and place the work on it occasionally to check the bending as you go along. After the parts are bent, assemble the stand as shown. If you prefer, the pot holders, C, and their supporting member, A, could be bent from a single length of tubing. Fasten all joints with small machine screws and high-strength alloy solder, and then file them smooth. The feet are jigsawed from pieces of hardwood and the tenon on each is cut to fit tightly into the tubing. Make a decorative wooden plug to fill the opening in each end of the base cross member. After the stand is assembled. enamel it white, or polish the brass with steel wool, apply a coat of clear lacquer, and stain and finish the wooden parts.—Alexander Maxwell, Evanston, Ill.







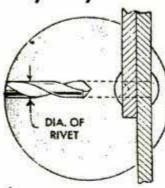


Blowtorch Fitted With Pipe Elbow Solves Outdoor-Cooking Problems



When on a hunting or fishing trip, building a camptire is often impractical or impossible. To save both time and trouble, a 90-deg. elbow attached to the nozzle of a blowtorch converts it to an effective cooking implement. This can be done either by threading the inside of the nozzle for a close nipple and attaching an elbow, or by placing a large elbow over the outside of the nozzle. With the elbow turned vertically to direct the flame upward, the blowtorch can be used by itself for heating coffee as shown, or placed below an improvised grate.

Easy Way to Remove Rivets

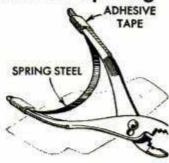


Instead of using a cold chisel or cutting torch to remove soft-iron rivets, try this stunt employed by a truck-body repair shop: First, center-punch the rivet head and drill a hole through the cen-

ter of the head, using a twist drill of the same size as the body of the rivet. Drill through just the thickness of the head. Then place a punch in the hole and strike it sharply with a hammer. The blow will break the head free from the body of the rivet and drive the remaining portion from the work. This method will not mar the surface of the work, and can be used to remove any iron rivet regardless of size. John Krill, North Lima, Ohio.

Spring Makes Pliers Self-Opening

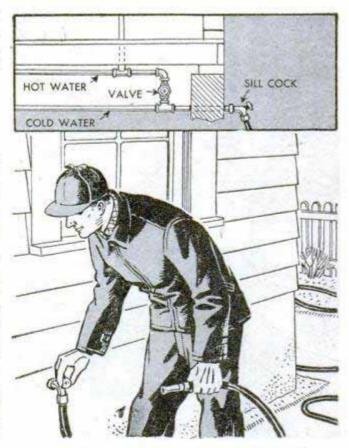
If a pair of pliers is used frequently in bench assembly work, they can be made self-opening for rapid use by fitting them with a piece of spring steel, such as a



clock spring. Just fasten the ends of the spring to the handles of the pliers by wrapping them with several turns of adhesive tape as indicated.

Valve Converts Sill Cock Into Mixing Faucet

Keeping porch floors and steps clear during winter is less work when you are able to use a hose and warm water. This is made possible by converting the outside sill cock into a mixing faucet so that you can temper the water to suit. All that is required is a shutoff valve installed between the cold and hot-water pipes as shown in the drawing. This does not affect the regular use of the sill cock during summer months as the valve makes it possible to shut off the hot water.



WATER SOFTENER

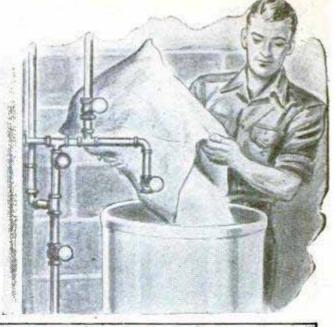
tank, 34-in. pipe and fittings, and a large-size earthenware container

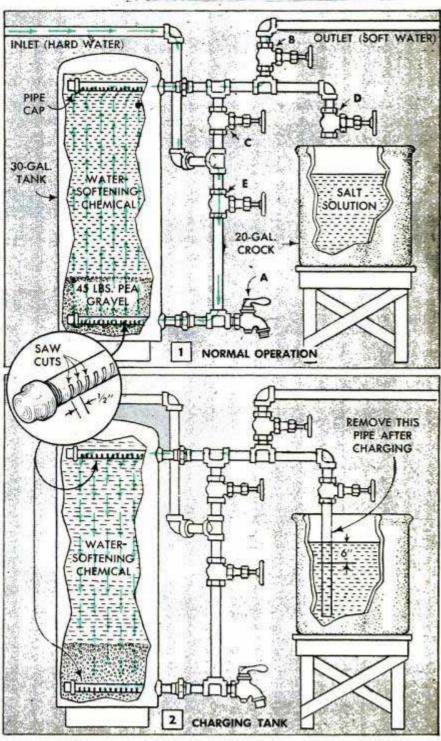
By A. E. Holden

HOME-DESIGNED and home-built by Maurice Arendt of Branch County, Mich., this water softener is of ample capacity to supply soft water for all purposes in the average home, with a minimum of servicing. It is periodically charged with a salt brine siphoned from a large earthenware container located near the softener. Fig. 1 shows the unit assembled with the

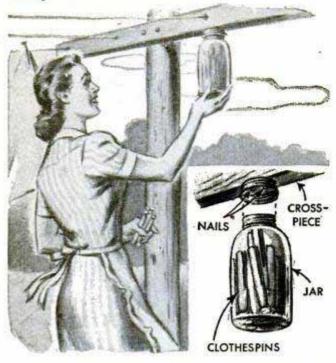
valves set for normal operation. The arrows indicate the flow of water from the hard-water inlet through the softener and into the soft-water outlet, which may be connected to a hotwater tank or water heater. Although ½-in. pipe will serve the purpose, ¾-in. pipe is recommended.

To recharge the softener, close valves B and E, Fig. 1. Then open valve A and when water starts to run from fitting A, open valve D. This starts a siphoning action, Fig. 2, drawing salt brine from the crock into the tank. Let the siphon operate until the level of the brine solution has dropped 6 in. or so. Then close valve D and open valve C. Water under full pressure then comes back into and through the tank, forcing the salt solution through and removing accumulated lime and other mineral substances. Let the water run with the valves in this position for 15 minutes or more. Then close valve A and open valve D to bring the salt solution back to the original level, forming brine for the next charge. Finally, close valves D and C and open valves B and E to put the unit back in operation. Salt must be added to the brine solution occasionally to keep it at full strength.





Glass Jar on Clothesline Post Keeps Pins at Hand

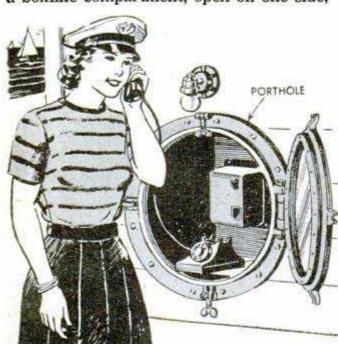


A few clothespins kept in a glass jar attached to a clothesline post is a real convenience when it comes to hanging a few items occasionally washed by hand. Attach the lid of a fruit jar to the crossrail and screw the jar into it.

Benj. Nielsen, Aurora, Nebr.

Ship's Porthole Serves As Door On Novel Phone "Booth"

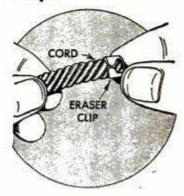
Desiring to have a telephone accessible from both inside and outside the boathouse, a member of one yacht club solved the problem of protecting the instrument against moisture and at the same time added a nautical touch to the building. First, a boxlike compartment, open on one side,



was framed in the Sile of the control of the and then a ship in the control of the opening to provide a door. A small ship's wheel lamp was fastened above the porthole to light the interior of the phone compartment. The brass parts were coated with clear lacquer after polishing.

Nonfray Tips for Rope

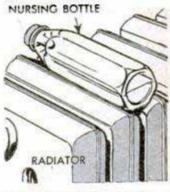
The little metal clip attached to the eraser of a mechanical-type pencil has a new use when the eraser is worn out. It forms an excellent metal tip for the end of a tent rope or other rope which is threaded



through grommets. Such clips are just the right size for sash cord or clothesline rope, and are attached by squeezing with pliers.

Radiator Warms Baby's Bottle

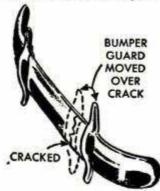
If your home is heated by hot water, the radiator in the baby's room can be put to good use as a nursing-bottle warmer. By placing the bottle on its side on top of the radiator as shown, it will take only a short time



to warm the contents to the right degree. This hint will be found especially handy when baby fusses at feeding time and you wish to keep the bottle warm during this period.—Jack Miller, Gooding, Idaho.

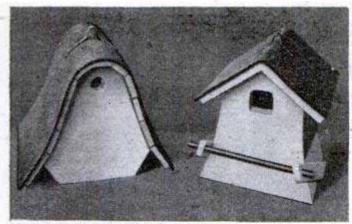
Guard Repairs Crack in Car Bumper

As a temporary repair for a cracked bumper, move the guard so that it will cover the crack and then clamp it tightly. This will hold the halves of the bumper in place until the crack can be welded or

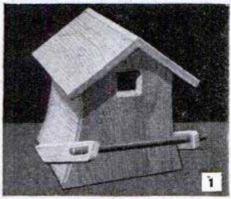


until the bumper is replaced. Use an extra guard if shifting one of those on the bumper would leave a fender end unprotected.

POPULAR MECHANICS



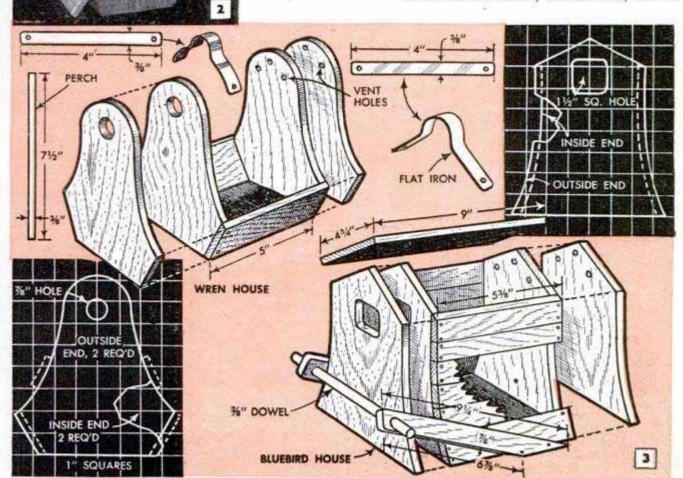


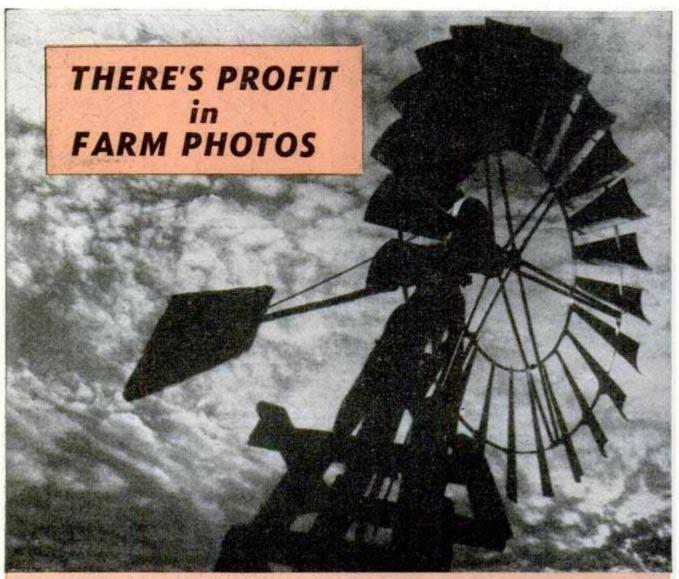


OUR FEATHERED FRIENDS NEED HOUSES TOO

BOTH the bluebird house, Fig. 1, and the wren house, Fig. 2, can be constructed easily from almost any 3/8-in. scrap lumber. Packing-box material is especially suitable for this purpose, but as it is surfaced only on one side, build the houses so that the smooth side is on the exterior. Assembly of both designs is indicated in Fig. 3. Double the front and back pieces, making the outer ones larger to cover the ends of the siding. Jigsaw duplicate parts to obtain identical shapes. The perch on the bluebird house is a dowel, mounted as shown. After setting the nails, fill the holes with putty, allow it to dry and then sand the surface. Apply two coats of outside paint, and cover the roof with pieces of asphalt shingle fastened with nails or roofing cement.

Dick Hutchinson, Alhambra, Calif.





Good photos of farm scenes will make money for the photographer who knows how to select interesting subjects with composition and pictorial values characteristic of the farm and its seasonal activities

EVERYDAY rural life can be a source of educational, pic-

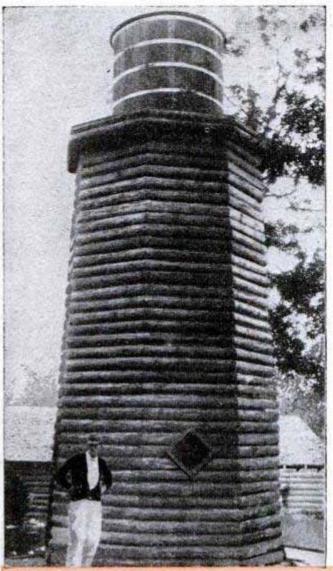
torial and human-interest pictures of infinite variety. Farm activities proceed on a twelve-month schedule, making outdoor action shots and pictorial photography possible on almost any day of the year that natural lighting conditions will permit. Simple record shots of unusual or especially attractive farm structures, such as the slab-sided water tower shown on the next page, the windmill, the rooster crowing defiance, cattle grazing, a farm gate in winter time, planting and harvesting scenes and photos of growing and harvested crops-all these commonplace farm scenes make interesting, salable pictures if taken with an eye to good composition. Essentials to correct composition are a natural pose of live subjects, a point of interest, plus a feeling on the part of the photographer for elements of atmosphere and character that make wellbalanced pictorial values in a farm photo.

By Paul Hadley

Most farm photos taken outdoors necessarily include portions of sky. Sometimes as much as half

of the film area will be brilliant blue sky, and this goes white on the prints, of course. That beautiful cloud formation you saw in the ground glass or in the view finder, disappears completely in the developing and printing. Even snow scenes, with no sky included, sometimes come out flat and patchy. This is due to the blue reflected from a clear or partly cloudy sky. To render true values in outdoor shots, you need a deep yellow filter to darken the open areas of the sky and bring out clouds in detail. Typical cloud formations in a farm pictorial photo give it depth and realism. As examples, see the photos of the windmill, shocked corn and heads of wheat.

Most experienced farm photographers use a camera fitted with a ground glass for critical focusing. However, some prefer the reflex camera in which the image can be viewed right side up until the instant of



Above, a rustic tower supports the water-supply tank for this farm. It's made from slabs trimmed to a uniform width. Below, you'll find few subjects more typical of farm life than these baby chicks



Above, it's only a picture, yet you can almost hear this rooster crowing, so real are the pose and action. Such a shot takes time and patience. Below, no wonder this pumpkin took the blue ribbon!





MARCH 1948 203



Country people know the time the mail carrier is due each day. This rustic mailbox is an example of photo possibilities you'll see along rural roads



It's harvest time—that's the simple story of this picture. Notice the clouds and bold shadows on the corn shock. A yellow filter gives this rendering



There's no figure in this winter shot of the pasture gate, but its pictorial quality calls for fine camera technique. Overcast sky gives promise of more snow



Friendly photographers get full cooperation from farm children. They like to pose for pictures. Pose them in familiar surroundings with something to do



This turkey gobbler, although not at all certain about the whole proceeding, quite obviously has decided to strike a pose just to see what happens



Here's one farm editors like to illustrate—a story about up-to-date methods of small-grain growing or similar subjects. Note low angle and cloudy sky

exposure. On pictorial shots, scenes where distant detail must be included, you would use slow shutter speeds and the smaller stop openings, in some cases as low as f:32. For this work a tripod is essential. Film size can be anything from 35 mm. up, but most farm photographers use the larger film sizes, 4 by 5 and 5 by 7 in., as these make acceptable contact prints. Probably the 4 by 5-in. film size is best for all-around work. Most cameras taking this film combine easy portability with ground-glass focusing and are provided with a removable lens board, making it possible to change lenses quickly for extremely fast action and wide-angle work.

Wherever possible, pose people doing something typical of every-day farm life. Work or play pictures are always interesting, both to farmers and others interested in farm activities. Even record shots and scenics will be made more interesting to editors and readers alike if a figure is unobtrusively included.

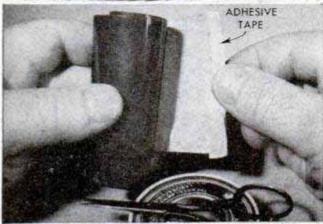


Above and below, work pictures shot without the subjects paying attention to the photographer or his camera. Such shots are nearly always good sales bets for farm publications



MARCH 1948 205





Adhesive Tape Over Ends of Film Protects Emulsion in Processing

If you process roll film without using a regular developing tank and fix or wash it by placing the roll loosely in a washbowl or other container, the sharp corners of the film are apt to scratch the emulsion side when the strip curls up. To prevent this, cover each end of the strip with adhesive tape as shown. This, of course, is done before the film is developed and the tape is attached under darkroom safelight or in total darkness, depending on the speed rating of the film. Usually there is sufficient leader on each end of the film to permit gripping it when attaching the tape so that any finger marks at this point on the emulsion will not matter.

Wall Easel for Enlargements

Here's a way of making a simple easel for holding enlarging paper flat when projecting enlargements onto a wall. Cut a piece of plywood or heavy cardboard the same

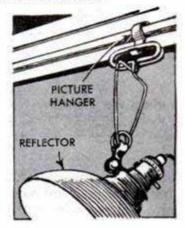


size as the enlarging paper and glue masking tape to it, gummed side up, around the edge as shown. In use, the enlarging paper is pressed against the tacky surface of the tape, using paper or cloth to avoid finger marks, and then the easel is hung like a picture. After the exposure is made, the paper is peeled off and developed.

Kenneth Murray, Colon, Mich.

Picture Molding Around Room Holds Photoflood Reflectors

When using a curtain-covered wall for a back-drop and there isn't room to backlight the subject with a reflector on a standard, the picture molding around the room, if it has one, can be used to support a photoflood reflector of



the clamp-on type. Hook a picture hanger over the molding and clamp the jaws of the reflector to it. Supported in this way, the light is out of camera range and can be moved and adjusted to highlight the subject as desired.

R. F. Donavan, Jersey City, N. J.

BUILD YOUR HOME YOURSELF

Springtime is building time when most of us begin to think of our dream house in specific terms and become impatient to see it become a reality. Of course, we are prejudiced, but we do not know of a better, more beautiful or practical design for the average home builder than our "Build-It-Yourself House." It can be built in any one of five styles-with or without a breezeway and attached garageand you can have four, five, six or seven rooms; or start with four rooms and add others later. Best of all, you can build it yourself and save at least 50 percent of the cost. To help do this, we have prepared a book, Your Home and How To Build It Yourself, and a set of ten workingsize blueprints.

The book contains 100 pages-three fifths of

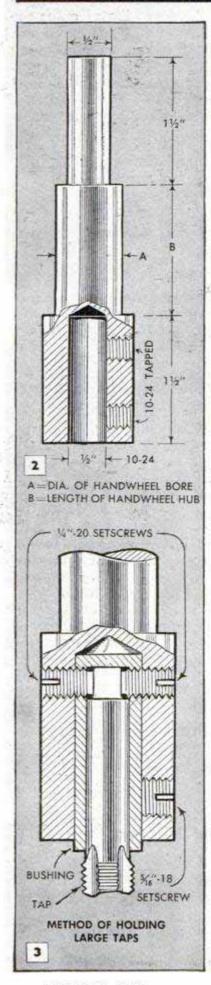
it consisting of photographs and working drawings. Several sections are printed in colors showing just how your own house will look. Every construction detail is given step by step and board by board, so that even the most inexperienced person can understand it. The blueprints give floor plans, elevations, etc.

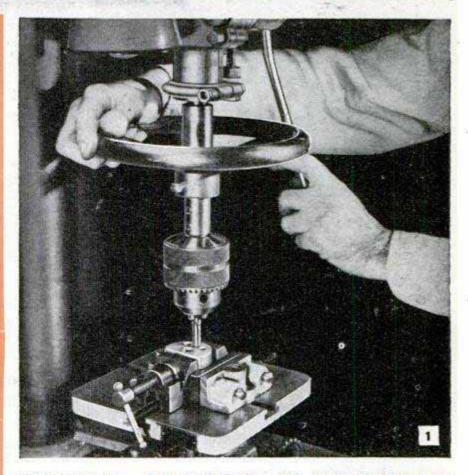
If you do not care for this type of architecture or any of its modifications, the book will enable you to be your own architect in designing a home, or in remodeling your present one. Both the book and plans are available from our Book Department. The book, Your Home and How To Build It Yourself, sells for \$3.00, and the set of blueprints for \$12.50. Both in combination for \$14.00. Duplicate sets of plans are priced at \$5.00 each.



SHOP NOTES







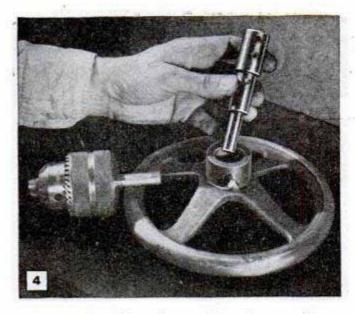
DRILL-PRESS TAPPING ATTACHMENT

By Walter E. Burton

THIS ATTACHMENT makes a hand tapping machine of any small drill press. The unit utilizes the accuracy of the machine to guide the tap squarely into the hole, a trick that is quite difficult to do by hand with an ordinary tap wrench. Fig. 1 shows the unit in operation. By using the hand feed of the drill press and turning the tap with the large handwheel, a delicate feed is obtained which avoids tap breakage. No power is used, the tapping being done by hand.

To make the attachment, you need a true-running handwheel 8 in. in diameter, a length of 1-in. cold-rolled-steel shafting for the adapter, a key-operated chuck of ½-in. capacity, and several socket-head setscrews. The exact method of machining the adapter will depend on the type of spindle on the drill press and the method of mounting the tapping chuck. The adapter shown in Figs. 1 and 2 is attached to a drill-press spindle having a collar with a ½-in. hole and two setscrews for holding router bits, etc. It takes a drill chuck fitted with a ½-in. straight shank. Fig. 2 details the adapter for a straight-shanked chuck. It is machined all over and shouldered to three diameters. The hole drilled in the large end is reamed to finish diameter. Transverse holes are drilled and tapped for 10-24 socket-head setscrews. Machine the

MARCH 1948 207



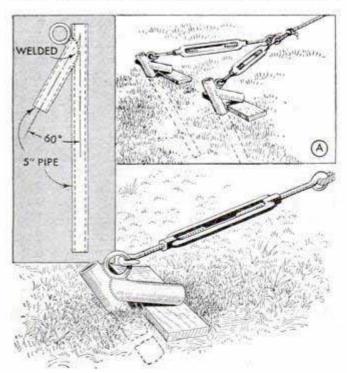
other end of the adapter, Fig. 2, to a diameter of ½ in. for a distance of about 1½ in. This diameter will fit most drill-press spindles of the type shown. Drill and tap the handwheel hub for a 5/16-in. No. 18 sockethead setscrew. File a flat on the middle section of the adapter to provide a seat for the handwheel setscrew, and then bore and

ream the handwheel hub to a tight slip fit.

A key-type chuck like that shown is satisfactory for taps up to % in., but for larger taps a special chuck, Fig. 3, is needed. In construction, this is similar to the adapter shown in Fig. 2, except that it holds the tap by means of setscrews and bushings, several of which are made to fit varying sizes of taps. Notice that 1/4-in. No. 20 setscrews turn into holes drilled and tapped through both the adapter sleeve and the bushing, Fig. 3. The setscrews seat on the squared end of the tap, making a positive nonslip drive. The detail shows a closedend bushing, the closed end acting as a stop when the tap is inserted. This provision is handy on short-run production, but openend bushings can be used, of course. Fig. 4 shows the three parts of the unit required for installation on the average drill press. Careful machine work is necessary as any misalignment will cause repeated tap breakage. Work must be mounted securely on the drill-press table and tap holes should be drilled with the drill press to assure accuracy.

Pipe-and-Spud Guy Hitch Holds Fast in Marshy or Sandy Ground

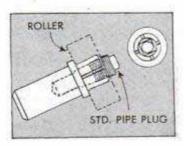
When it is necessary to guy derricks, cranes or other equipment in marshy or sandy soil where it is impractical to dig a pit for a deadman, the hitch shown will effectively anchor the guy. This hitch is made from a length of 5 or 6-in.-dia. pipe with the ends left open to enable it to be driven into the ground. A spud about 2 ft. long is welded at a 60-deg. angle near the upper end of the pipe, and an eye for a turnbuckle hook is welded just above the junction of the pipe and spud. To use this



hitch, drive the pipe into the ground so that the spud is almost flush with the surface and rest the end of the spud on a short plank placed at right angles to the direction of pull. The pressure of the spud against the plank and the resistance of the lower end of the pipe to being forced backward, hold the hitch securely. One of the main causes of a hitch gradually working loose is the transmission of vibration from the guy to the hitch. This often can be remedied by using two hitches, as shown in detail A, with the turnbuckles adjusted so that their lengths are unequal. This method also is efficient if two ordinary iron stakes are used for the hitches instead of the special pipe-and-spud assembly.—Elton Sterrett, Houston, Tex.

Mandrel Expands to Hold Work

If you have a number of rollers or similar items to face, this expanding mandrel will permit them to be mounted and removed from the lathe

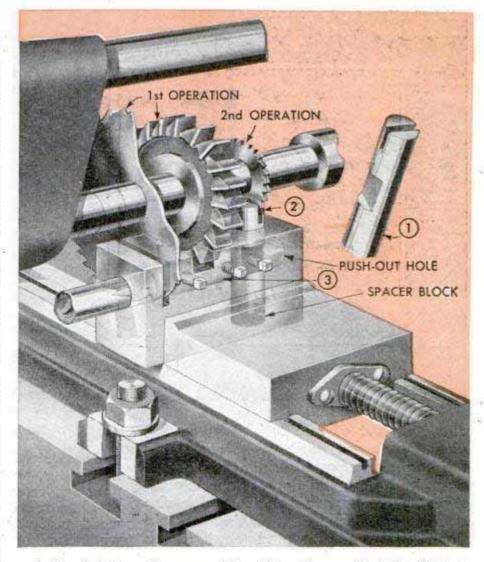


rapidly. Turn a shoulder on the mandrel to seat squarely in a 4-jaw chuck. Then drill, tap and slot end, as shown, to take a pipe plug. Tightening the plug after the work is mounted expands the end to hold the work.

Setup Finishes Work In a Single Cut

This setup can be adapted to a considerable range of work that is milled from round stock. After the initial pass, one cut produces a finished part from that point on. The detail makes clear how this is done. The fixture is a milled rectangular block of steel slotted for the parting cut, drilled lengthwise, and also at right angles and then fitted with three setscrews, two on the long hole and one on the short hole. The initial operation as shown mills a flat and cuts off to length. The semifinished part is then pushed out through the push-out hole, dropped into the vertical hole and the setscrew is tightened on the flat. In this position, the part acts as a stop for the succeeding piece, Fig. 3. At the next pass the first piece is slotted, Fig. 2, the piece

following is cut to length and the flat is milled. As the sequence is repeated each pass produces the finished part as in Fig. 1.



Care must be taken to see that the fixture is locked firmly in place.

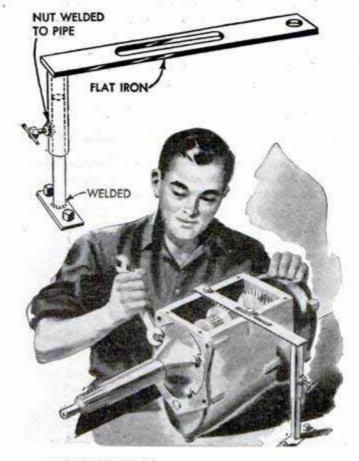
H. Moore, Kirkstall, Leeds, England.

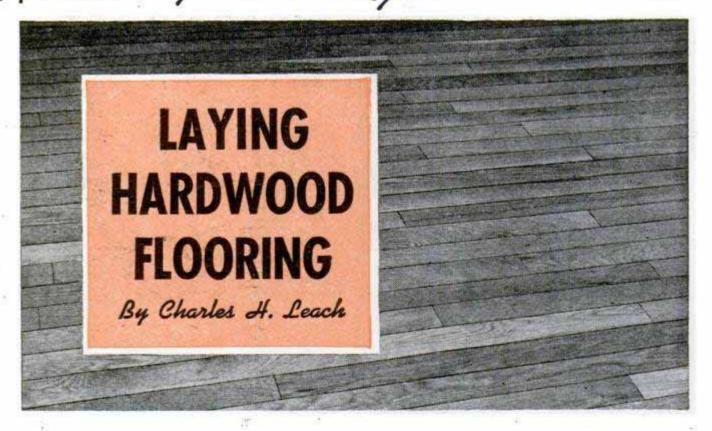
Adjustable Jig Holds Transmission Upright On Workbench

Dismantling an auto or truck transmission or a similar part on a mechanic's bench is a job that ordinarily requires the services of two men. But if this adjustable jig is used, one man can assemble or disassemble a unit and have both hands free for work. The jig consists of a rod with a mounting flange welded to one end and a slotted arm welded to a pipe sleeve, which telescopes over the rod. The sleeve is set at any desired height by means of an adjusting screw and nut, the latter being welded in place. Before welding, drill a larger hole in the pipe for the screw to pass through. The crosspiece has a bolt hole and a slot for fastening it to the top of the transmission. The slot accommodates transmission housings of different widths.

Clarence Purnell, Allentown, Pa.

¶Although it is recommended that cast iron be reamed dry, a little oil applied to the lands of the reamer will prevent the squealing noise made by a large reamer.

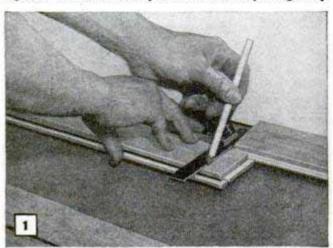




This, the first of two articles on laying and finishing a hardwood floor, takes the homeowner and builder through the steps of laying the floor. Complete instructions on how to finish it, which also can be applied to refinishing an old floor, will be presented next month

IF YOU are one of many homeowners who have purchased an old-type house and are remodeling it yourself, few improvements will increase its value and improve its interior appearance more than beautiful hardwood floors. Whether the condition of present floors is beyond refinishing and requires resurfacing with thin flooring, or whether an old softwood floor is to be covered, almost anyone who is handy with a hammer and saw can do the job with excellent results. Most of the

This is how the last strip of each row is marked for length with a try square by placing it end for end against the wall and parallel with adjoining strip

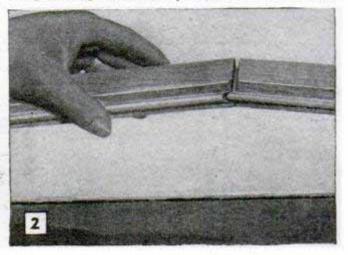


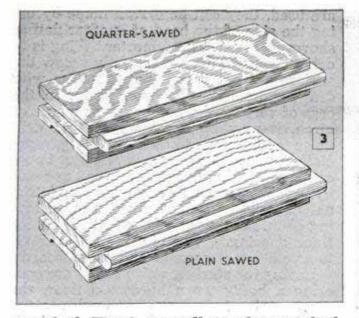
Photos by Roger Williams

tools required are common ones. Besides a hammer, you'll need handsaws for ripping and crosscutting, a nailset, a pair of dividers or a compass and a can of plastic wood putty to cover exposed nailheads where the flooring must be surface-nailed.

Types of flooring: The attractive grain of quarter-sawed flooring makes a beautiful job when waxed or varnished and, when available, is to be preferred to the plain or "flash sawed" type shown in Fig. 3. Quarter-sawed flooring is recognized by the wavy pattern of surface grain and by the slant of the growth rings in the end grain. It is somewhat more expensive than plain-sawed flooring, but has less tendency to curl and surface splinter. Flooring usually is sold in bundles of strips ranging in length from 2 to 12 ft. or more and end-

Flooring is sold in bundles of strips of random lengths up to 12 ft., which are end and edge-matched with a tongue and groove, and cup-molded on the underside





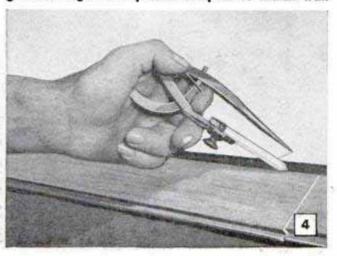


Finished with two coats of durable varnish, a hardwood floor will withstand rough usage by youngsters

matched, Fig. 2, as well as edge-matched by a tongue and groove in the edge. The underside face of the strips is hollowed or cupped so that any unevenness of the subfloor will not interfere with their laying flat. Flooring can be had in four hardwoods: oak (white and red), maple, beech and birch. Oak flooring is available in strips of two standard widths and thicknesses. One measures 3/8 by 11/2 in., the other 13/16 by 21/4 in. The condition of the subfloor or nailing base determines largely the size and type of flooring to use. Some homeowners prefer a floor laid of narrow strips which are used in resurfacing an old hardwood floor and when the nailing base is solid. The 13/16-in, flooring generally is used over a rough subfloor or one that is not thick enough or properly reinforced to give adequate support to thin-type flooring.

Ready-finished flooring recently has been introduced which saves the work of finishing and the inconvenience encountered in waiting for the floor to dry. This feature is especially desirable when laying a new floor in an occupied house. It differs from regular flooring in that it has

Starting strip should be laid at right angles to side walls. If corners of room are not square, mark grooved edge of strip with compass to match wall



a V-joint instead of a tongue and groove and, of course, it is stained, sealed or otherwise finished, ready for use as soon as it is laid. However, being prefinished, it requires great care in laying to avoid marring. To help reduce possible damage from hammer marks, the flooring is factory drilled for nails and is packaged for further protection. It naturally is considerably more expensive, as in addition to being finished, it is specially selected for straightness and uniform grain.

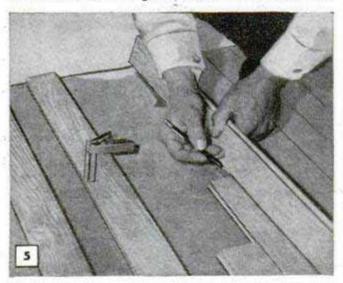
Keep flooring dry: Due to its low moisture content when kiln dried, flooring is highly subject to dampness and, until it is laid and completely finished, it is very important that it be kept dry at all times. This is especially so if the flooring is stored for any length of time prior to laying. It also is important that if laid during damp weather, the building be heated. If allowed to absorb moisture, a tightly laid floor will shrink when it dries out, leaving objectionable openings between the strips. In new construction, flooring should not be laid until the plaster has dried completely as it will absorb moisture from the walls.

Preliminary steps: The first step in laying a new floor is to inspect the old floor, or subfloor if it is new construction, for loose boards, ridges and any other high places that might prevent the new flooring from lying flat. Nail such places thoroughly to pull the boards down flush. This is important to assure a squeakless floor and prevent movement in the finished floor. In resurfacing a previously laid hard or softwood floor, it is advisable to remove the baseboard. This can be done without damaging the baseboard by locating the nails and driving them completely through and into the studs with a pin punch. Following this, the floor should be swept clean

and covered with a good grade of building paper, lapped at the sides and ends. Old softwood floors that are worn badly sometimes are covered first with plywood and special long nails used to apply the flooring. On new floors, the paper liner serves as a dust-and-draft barrier between the subfloor and finish floor, while on an old floor, which without doubt was originally laid over a paper covering, the new paper simply provides a smooth, clean, working surface.

How flooring is nailed: Flooring is nailed blind, in other words toenailed, so that the nailheads are hidden. This is done by driving the nails into the angle between the tongue and front edge of the strip as shown in Fig. 6. Use 8-penny wire flooring nails or special cut-steel flooring nails and drive them at an angle of 45 deg. Experience will enable you to drive the nails practically all the way with a hammer, as in Fig. 9. However, it is advisable at first to drive them part way and finish with a nailset to avoid the possibility of accidentally damaging the edge of the flooring. If cut nails

When waste portion of the last strip in each row is a foot or more in length it is used to start next row



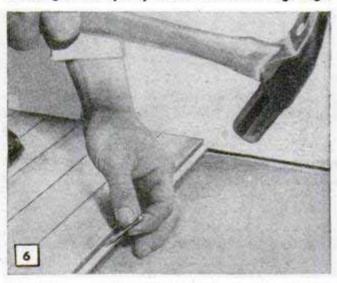
Each nailhead must be set flush or slightly below surface. Side of cut nail or regular nailset will do



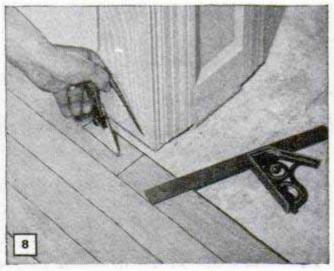
are used, they can be driven home by using the side of the head of another nail as shown in Fig. 7. The important thing is to drive the head flush or slightly below the surface so that it will not interfere with drawing up the subsequent strip. In the case of very hard woods, such as maple or birch, it may be necessary to first drill holes for the nails to avoid splitting, especially if wire nails are used. The blunt nose of cut nails will not split the wood as readily, as they punch through the wood. The nails should be spaced about 8 in. in laying %-in. flooring and from 10 to 16 in. for thick flooring. It pays to nail a floor well to avoid later squeaks and loose boards.

Laying the starting strip: If you are covering a badly worn hardwood floor, the new flooring is laid at right angles to the old. The first strip is selected for straightness and is laid with the grooved edge facing the wall and close enough so that the baseboard, if used, will cover any small opening. If the corners of the room are not square, the starting strip should be placed at a 90-deg. angle to the side wall, marked

Blind-nail each strip by nailing in angle of tongue and edge. Use 8-penny nails driven at 45-deg. angle

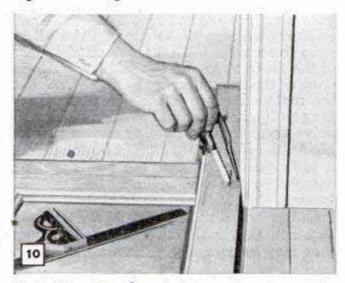


Pencil compass is handy for marking strips when fitting flooring neatly around or under a doorcasing

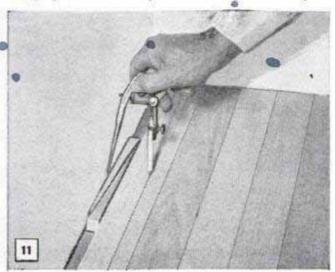


with a compass as in Fig. 4 and ripped to conform to the adjacent wall. This starting strip generally is face-nailed along the rear edge and sometimes it also is toenailed in the tongue. While it is best to have the starting strip in one piece, the size of the room may require several pieces laid end to end. In the latter case, if the piece cut off is greater than a foot in length, it usually is used to start the next row, Fig. 5. The last strip in each row is marked for length with a try square as in Fig. 1, after placing it end for end and against the wall. From here on it is a case of drawing the flooring strips of each row tightly against those of the preceding row to assure tightfitting joints. For this purpose cut a scrap of flooring and use it to drive against. This will prevent damaging the tongue and will be found helpful in drawing up stubborn joints. Strips of flooring that are slightly bowed can be forced tightly against the preceding row by prying with a wooden block placed against a 2 by 4-in. lever and block temporarily nailed to the floor. The joints in each subsequent row always

Abutting strips are placed crosswise to the door opening when ending the floor at bathroom or kitchen

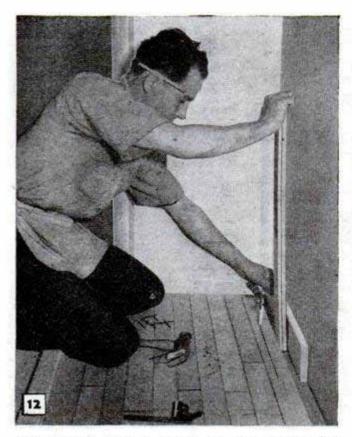


Final fill-in strip is marked to conform to wall by wedging full-width strip and marking with compass



Practice will enable you to drive nails rapidly from standing position. Heads are set later with nailset

should be staggered at least 6 in. or more. Notching around doorcasing: When you must fit the flooring around or under the casing of a doorway leading to an adjacent room or closet, a pair of dividers or a compass is used to mark the depth of the required notch. Fig. 8 illustrates how this is done, the flooring in this case being fitted to butt against the casing. If you are resurfacing an old floor and wish the flooring to run under the casing and jamb, it will be necessary to saw off these two pieces to allow for the extra thickness. As shown in Fig. 8, the strip to be marked is not nailed but is simply tapped temporarily in position and butted against the end of the adjoining strip in the same row. Note that the joint of the adjoining strip ends flush with the face of the jamb. Now, measure the space between the loose strip and the face of the casing and set the compass so that this distance is marked on the strip when one leg of the compass is held in contact with the casing. Any slight cant or irregularity of the casing will be transferred to the strip assuring a perfect-fitting butt joint. The loose strip is removed and replaced with a full-width strip, the two strips being laid at the same time to enable wedging snugly in place. When the direction of the flooring runs through a doorway and you wish the new floor to end in

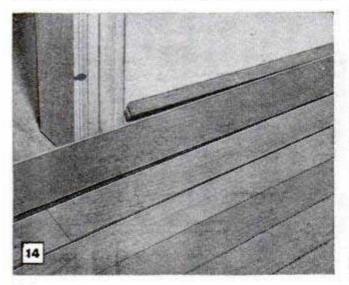


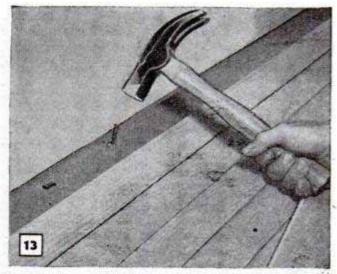
Bowed fill-in strip is forced in place tightly for marking by prying against wall with board and block

the center of the opening as in Fig. 10, the compass method is used as before to mark the strip to fit the jamb. Note here that one or two strips of flooring are first nailed down parallel with the opening and serve as header strips against which the flooring is butted. This generally applies when a hardwood floor is butted against a bathroom or kitchen floor which is to be built up flush and covered with linoleum.

Fitting final strips: If no baseboards are to be used and only a shoe mold, the steps in fitting the last remaining strips are shown in Figs. 11 to 15 inclusive. When the space remaining along the wall is less than a full width of flooring, the strip next to

To permit inserting the fill-in strip, last few strips are laid at same time to engage the matched edges





Drive nails part way and bend them over to support narrow fill-in strip flush with the rest of the flooring

the final one is set in place temporarily and wedged either with tapered blocks as shown in Fig. 11, or forced in place by prying as shown in Fig. 12. After this it is marked, as before, with a compass to transfer the contour of the wall, then ripped and used as a fill-in strip. Due to the fact that flooring is cupped or hollowed on the underside and ripping removes one supporting edge, a few nails should be driven part way into the subfloor and bent over, as shown in Fig. 13, to support the fill-in strip flush with the others. Actual laying of the fill-in strip and the last few strips is done at the same time, as in Fig. 14, so that the matched edges will go in place. Tapping with a hammer and wooden block will drive them into position as shown in Fig. As the fill-in strip cannot be toenailed, it is face-nailed so that the heads will be covered by the shoe mold. Fitting the fillin strip tightly is not so important when both baseboard and shoe mold are used, as together they will cover any slight gap that may remain along the wall.

Fill-in strips and others are gradually forced down with hammer and block. Then the strip is face-nailed



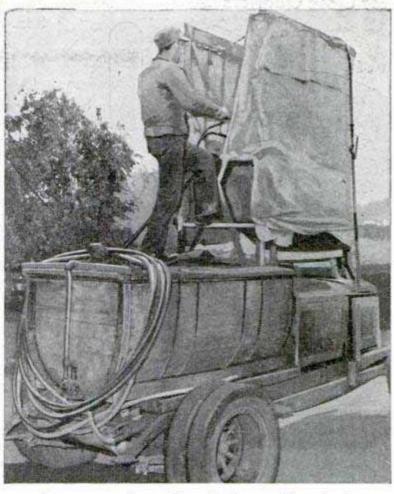
214

POPULAR MECHANICS

Homemade Orchard Sprayer Has Shielded Deck

By mounting a compressor and wooden sprayer tank on an old car chassis, one farmer built this orchard sprayer at a very reasonable cost. It will handle from two to four "broom" nozzles, depending on the size of the compressor used. The compressor is located between the motor of the car and the tank, and is operated by a dual V-belt drive. As the motor is used only to operate the compressor and tank agitator, the unit must be towed by a tractor or team. A canvas-shielded platform is erected over the compressor to enable the operators to reach the tops of tall trees. The canvas protects the men from wet branches when working in old orchards where the trees are close together. A cable-type control arranged on the platform will afford convenient operation of the motor from this position. The tank is filled through a trap door in the top, and an agitator inside keeps the spray mixture from precipitating. The agitator should be of the rotary type, driven from the motor by a V-belt

and jackshaft. Spray hoses are connected to the outlets from the compressor and they should be long enough to enable the men to move about the orchard on foot or

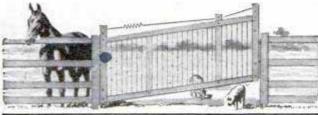


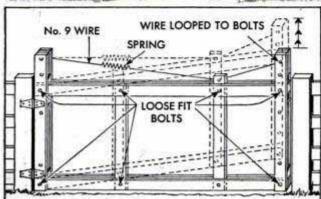
to stand on the platform. The dual rear wheels prevent the heavy unif from cutting in when used on soft ground.

A. M. Wettach, Mt. Heasant, Ia.

Self-Raising Gate Elevates to Permit Passage of Small Animals

When this unusual stock gate is unlatched, the end automatically will rise several inches off the ground enabling it to clear rocks, snow and other obstacles when swung open. If provided with two latches, one mounted a distance above the other, the gate may be left closed and in the raised position to provide a creep for smaller animals while still confining the larger ones. It is constructed and strung with barbed wire as shown.





Rubber-Sheathed Drench Bottle

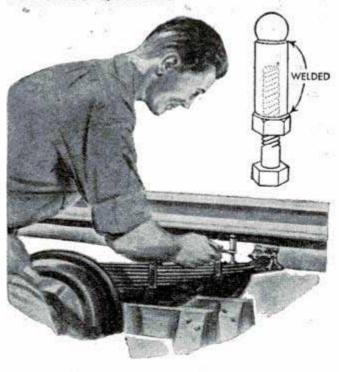
When drenching a sick cow or horse, the danger of the animal's breaking the neck of the bottle and swallowing a piece of glass is overcome by fitting the bottle with a rubberhose extension as shown. This meth-



od simplifies drenching, as the hose is inserted in any part of the animal's mouth.

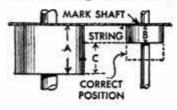
A. R. Stroda, Marion, Kans.

Handy Four-Piece Jackscrew For Close Quarters



Especially useful in making auto-spring repairs, this handy little jackscrew will have many other uses in both garage and machine shop. Just four parts are needed to make it, a steel ball, pipe nipple, and a cap screw and nut. The nut is welded to one end of the nipple and the steel ball to the other end, although the jack can be used with the ball simply resting in the end of the nipple. If the ball is welded in place, a stainless-steel welding rod must be used. The length of the nipple can be made to suit the job at hand. To use the jackscrew, the bolt is turned into the nut as far as necessary, and then an open end wrench is used to back the nut off the bolt, the latter remaining stationary as the upper part turns with the steel ball.

Centering Flat-Belt Pulleys



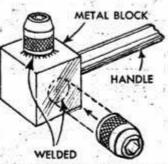
Lining up flatbelt pulleys of the same width is not difficult because it is merely a matter of aligning the rims, but where

the widths of the faces differ, alignment is more difficult. Here is one way to do it: Assuming that the shafts are in alignment, line up one side of the rims of the pulleys by using a length of string or a straightedge and mark the position on the relative shafts. Then measure distances A and B. Subtract B from A to obtain C and halve the result. The answer is the distance that the narrower pulley must be moved away from its mark on the shaft. To illustrate

this, if A is 9 in. and B is 3 in., the difference is 6 in. One-half of this is 3 in. Therefore, the narrower pulley must be moved 3 in.—W. F. Schaphorst, Newark, N. J.

Multiple Wrench Has "Turret Head"

Instead of having to carry four sockets and a wrench handle when working on a car, make a multiple tool which has all four sockets in one head. Use a solid metal



block for the head and weld the sockets to it, making a light weld to avoid heating them and withdrawing the temper. If the sockets are alloy steel, it will be necessary to use a special welding rod designed for that particular metal.

Doorknob "Eggs" in Hens' Nests Fatal to Egg-Stealing Snakes

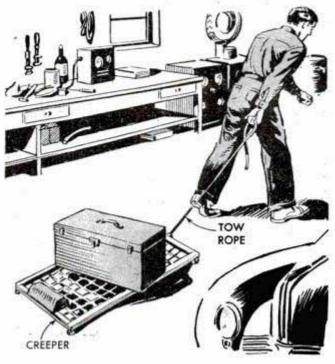
One farmer found that when he placed white doorknobs in hens' nests, egg-eating snakes, believing they were eggs, would swallow them and die. By doing this, he was able to rid his buildings of the pests.

William Allen Ward, Dallas, Tex.

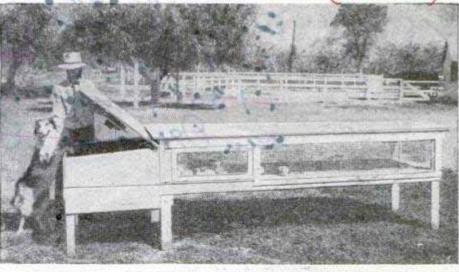
Creeper Used as Dolly

If a towrope is tied to a creeper, it will serve as a dolly to move large tool chests about the garage. This eliminates the necessity of having two men carry the box. A large number of repair parts can be moved in the same manner.

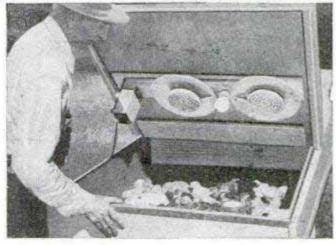
Marvin H. Doughlass, New Bern, N. C.



100-CHICK BROODER AND RUNWAY

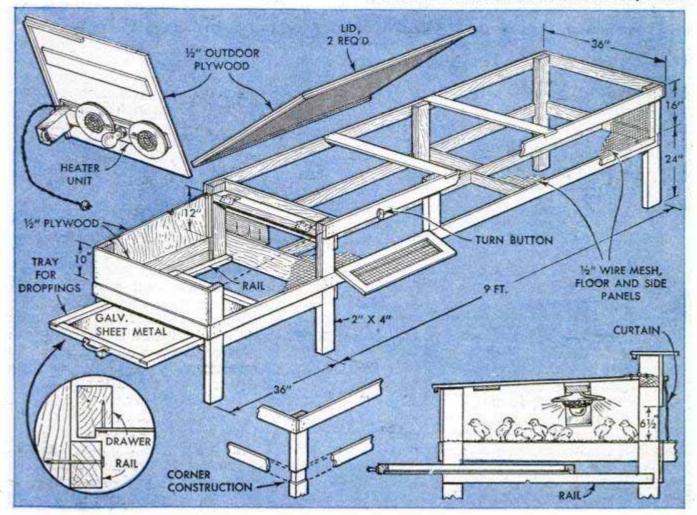


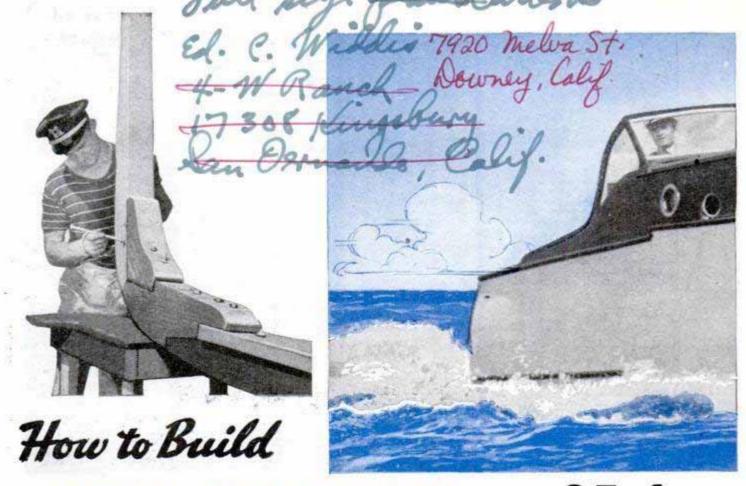
This wire-floored brooder is designed to accommodate 100 chicks from hatching time to the age where they can be released on open range. Wire floors of both the brooder and runway are 24 in. from the ground, a special feature of the design which makes it convenient to replenish the food and water supply and, at the same time, protects the chicks from rats and other vermin. A thermostatically controlled heating unit is installed in the hinged plywood cover, or roof, of the brooder. A hinged door shown on one side of the runway gives access to the interior, and a two-section plywood lid covers the runway to shield the chicks from the sun.



155 ed.

Wire floors in brooder protect chicks from vermin and disease. Heater maintains constant temperature





"SEA CRAFT"—a 25-ft.

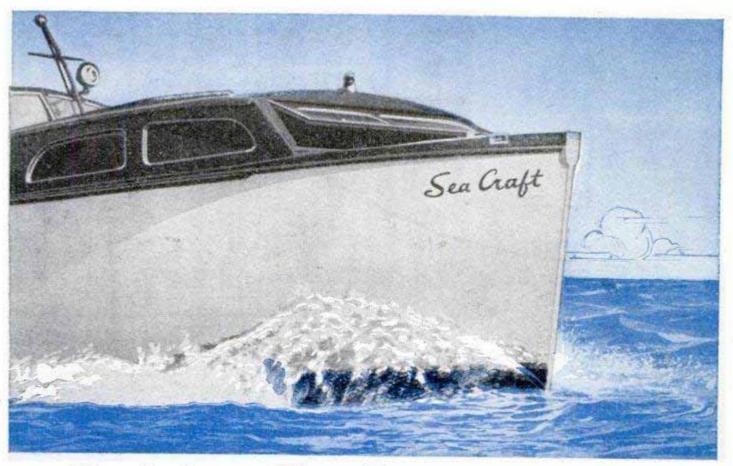
DEAL for use on large lakes or rivers, and fully seaworthy for offshore ocean cruising, "Sea Craft" was designed with an eye toward simple, lowcost construction for the inexperienced boatbuilder. During World War II, the original boat was given severe tests for seaworthiness when it was used by the United States Coast Guard to take highranking officers from ship to shore. The boat has an over-all length of 24 ft., 7% in., and a breadth at sheer of 7 ft., 834 in. A converted Chrysler "75" auto engine easily pushed it along at a cruising speed of 15 knots. However, any marine or converted auto engine of similar horsepower could be used.

Although this article describes the building of a sedan cruiser, this particular hull, with a few changes in the cabin construction, is readily adaptable to a sport fisher, express cruiser or utility boat. The cabin design of Sea Craft was selected because it offers one of the best all-around accommodations. Its open cockpit is large enough for fishing, lounging or sun bathing and the roomy cabin provides comfortable living quarters on a long cruise. It is equipped with a fresh-water tank, sink, cooking stove, toilet and two bunks. Two additional upper bunks can be fitted to sleep a total of four. In addition, there is

Part 1 plenty of cabinet and stowage space. The photo, Fig. 1, shows the cabin interior looking forward.

Laying out, cutting and assembling the keel and rib structure is by far the most important operation of building the boat. As this framework is the backbone of the entire boat, the performance and beauty of the craft will depend upon the accuracy and skill with which the framework is constructed. As previously mentioned, the type of cabin, engine and even decking can be changed to suit the individual builder's fancy, but no changes should be made in the hull if the proven performance of this cruiser is to be maintained.

The first step in building a boat of this size is lofting, that is, drawing the profile, the plan view and the body-plan views full size on paper, as shown in Fig. 4. These drawings are cut out to serve as patterns for marking and assembling the hull frame. Full-size, cutout patterns of the keel and ribs are available to those who care to purchase them. If you intend to make your own patterns, get a roll of heavy wrapping paper and edge-lap and glue enough strips together to make up the required width for the height from the base line to the top of the stem shown in the profile view, Fig. 4. The paper is tacked down on a wooden platform—a



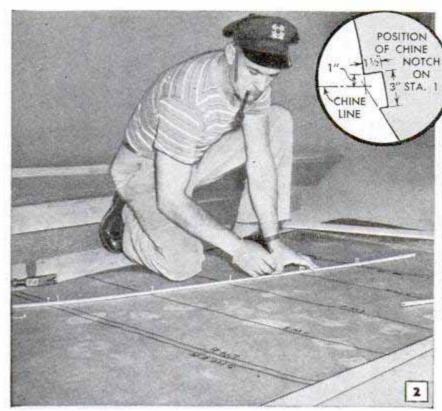
Cabin Cruiser

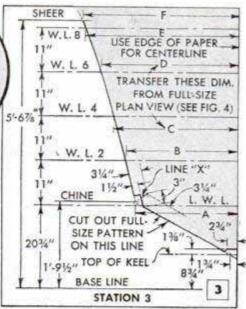
By EDWARD COLBY Designed by H. M. WILSON



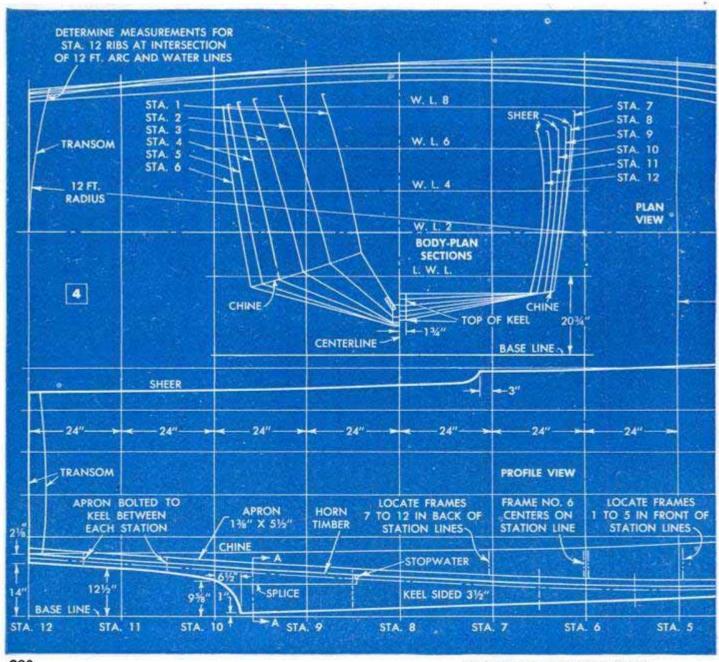
Large roomy cabin with sleeping accommodations and galley provides comfortable quarters on long cruises

MARCH 1948 219





Above, full-size half pattern of each station is drawn on heavy paper. Left, the natural curve of a wooden batten is used to mark curved line connecting half-breadth dimensions

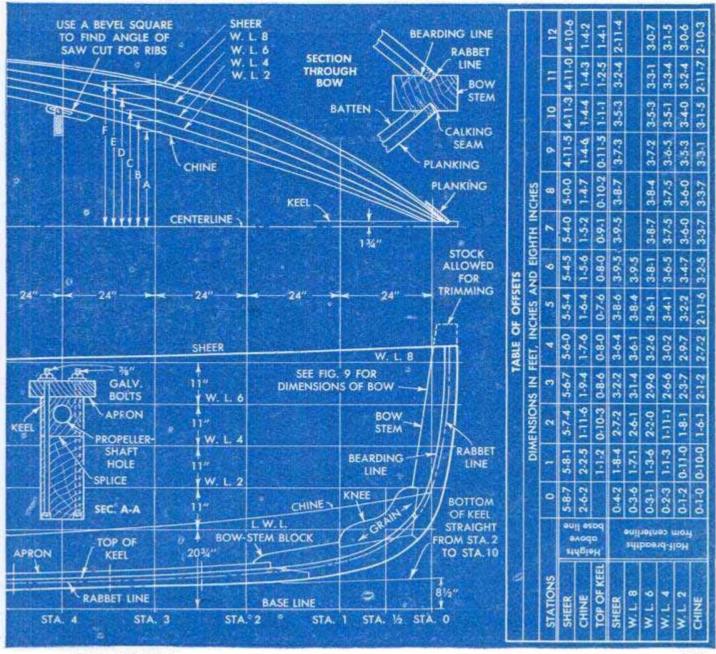


floored attic is an excellent place—and the profile view is drawn first. With a long straightedge or chalk line, lay down the base line, load water line (L.W.L.) and water lines (W.L.) from the dimensions given in Fig. 4. Then mark off the station points from 0 to 12, spacing them 24 in.

apart along the base line.

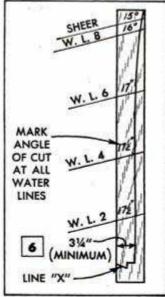
In the table of offsets at the right in Fig. 4, refer to the column which reads "top of 'keel." Note that station 0 is blank because at this point the top of keel runs into the bow stem. At station 2 the top of keel isthe bearding line. Station 3 reads 0-8-6 which means the top of the keel is 834 in. above the base line at this point. All figures in the table of offsets are in feet, inches and eighth inches. For example, the 6 for station 3 indicates % in., or ¾ in. Measure this distance from the base line along the No. 3 station line and mark it. Follow this procedure at all station lines, marking each top-of-keel point. Drive a small nail through the paper into the floor at each

mark and bend a ¾ by 1-in. batten against the nails. It will be necessary to place nails on both sides of the batten at some stations to hold it in place. The batten should be straight-grained wood that will bend easily without any irregularity in the curve it takes. It should be somewhat longer than the length of the boat as it will be used later to fair the sheer, chine and water lines in the plan view. When the batten is in position, transfer its curvature to the paper by drawing a line along it. This is the shape of the top of the keel. The bottom of the keel is straight. Measure $8\frac{1}{2}$ in. above the base line at station 0 and 1 in. above the base line 6½ in. forward of station 10. Then connect the two points with a line drawn along a straightedge or snap a chalk line. The sharp curve at the aft end of the keel can be drawn freehand, or with a French curve. The chine and sheer lines are drawn in by the same method used in plotting the top-of-keel line. To draw in the bow stem, knee and



MARCH 1948 221





Angles of saw cut marked on ribs, above, are called off by bandsawyer, left, as a helper tilts table

bow-stem block, follow the dimensions given in Fig. 9. Use a light, flexible batten to fair in the curves. Carefully mark the rabbet and bearding lines, as these must be transferred to the bow-stem pieces after they are assembled.

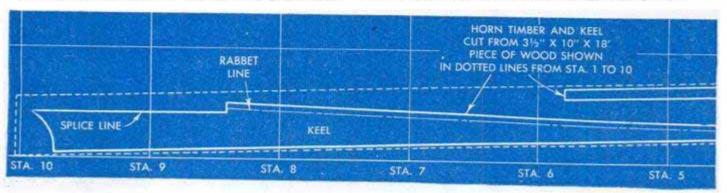
To transfer the lines to the wood, cut the paper along the bottom of the keel and forward edge of the bow stem. Do not cut the other lines as the pattern will be used later to lay in the propeller-shaft angle and motor mounts. The uncut lines can be transferred to the wood by rubbing the underside of the paper with a soft pencil and then tracing over the lines in a manner similar to that of using carbon paper. However, no cutting should be done until all other patterns have been made.

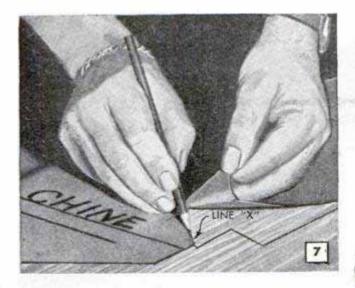
The keel is made of oak, apitong or straight-grained Douglas fir, and is assembled in two pieces cut from a single piece of timber as indicated by the dotted lines in Fig. 9. The aft section, known as the horn timber, is spliced to the keel proper as shown in the profile plan. Be sure to place the bolts off-center so they will not interfere when drilling the propeller-shaft hole through the keel, see section A-A, Fig. 4. The keel apron also

should be oak, apitong or Douglas fir, 1% in. by 5½ in., and extends from the bowstem block to the transom. Bolt the apron to the keel between the stations. The dotdash lines through the bow-stem parts in Fig. 9 indicate where to bolt them together.

A plan view, as shown in Fig. 4, must be drawn full-size in the same manner as the profile view. First, lay down the centerline and then draw perpendicular lines across the paper at each station point. These station lines should be labeled clearly. Refer to the table of offsets in the chine column of the "half-breadths from centerline," and measure off the distance given from the centerline.

For example, read across the chine column under station 3, measure off the distance 2-1-2, which is 2 ft., 1¼ in., and mark the spot. This is shown as dimension A in Fig. 4. Then drive a small nail at the mark. Follow this same procedure at each station for the chine, and bend the long batten against the nails. When fairing the line, it may be found that the batten will clear some of the nails by ¼6 or ⅓6 in. This is not serious. The important thing is to have the curve follow the natural bend of the batten. When the batten fairs up nicely and





has a smooth, flowing curve, which you can see by sighting with your eye, draw in the line. Use the same method for all the water

in the line. Use the same method for all the water lines and the sheer line until you have a full-size drawing of the plan view as in Fig. 4. To avoid confusion later, draw each line a different color.

Full-size drawings of the body-plan sections, Fig. 4, become patterns for marking the ribs and assembling the frames. Cut a piece of paper for each station. The paper must be perfectly straight along one of the long sides which is used as a centerline. Draw a base line at right angles to the centerline, 2 infrom the bottom edge. Taking station 3 as an example, draw in the load water line and water lines 2, 4, 6 and 8 parallel with the base line from the dimensions given in Fig. 3. These lines are spaced the same

for all stations. Identify each line.

HORN TIMBER

STAL 3

APRON

STA: 4

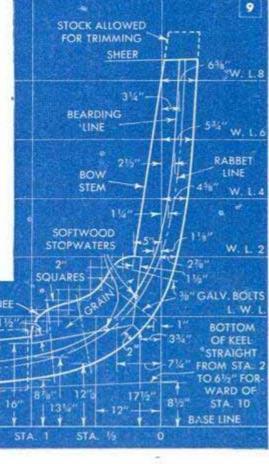
The table of offsets is not used to draw in the lines for the rib patterns. All dimensions are taken from the faired lines of the full-size plan and profile drawings. On the profile drawing, measure up from the base line for the top-of-keel, chine and sheer lines at station 3 and transfer them to the station-3 rib pattern. From these points, draw lines parallel with the base line and identify each. On the plan view, measure the distance from the centerline to the chine (see dimension A, Fig. 4) and mark this distance on the chine line of the pattern by measuring in from the edge of the paper used as a centerline. Follow the same procedure in transferring dimensions B, C, D, E and F, Fig. 4, to their corresponding lines on the rib pattern. Drive a nail at each point marked, fair a batten against the nails, and scribe the line as in Fig. 2. Using a straightedge, scribe a line from the point marked on the chine line to a point 134 in. from the edge of the paper on the

TOP OF KEEL

STOPWATER

eer ize mig.
mtaine
aw
in.
m4,
m
A compass or marking gauge set at 3¼ in.
is used to seribe a line conforming to

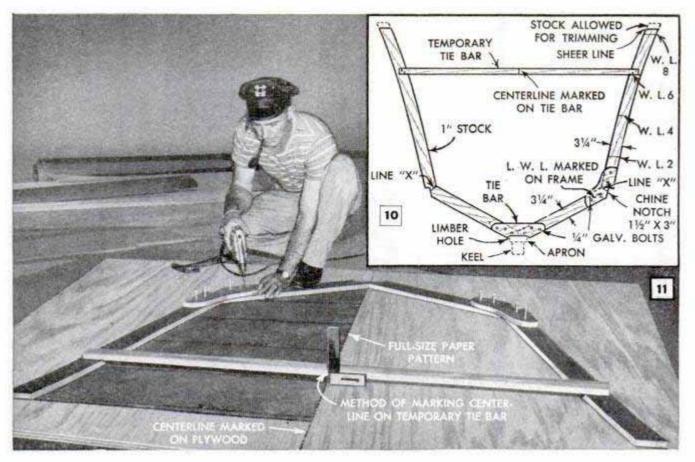
A compass or marking gauge set at 3¼ in. is used to scribe a line conforming to the contour of the outside edge of rib. This becomes the inside edge of the rib



MARCH 1948 223

BOW-STEM

BLOCK



Ribs, gussets and tie bars are assembled directly over full-size patterns to assure exact alignment. Builder is shown drilling bolt holes through gussets and ribs. Note how centerline is marked on temporary tie bar

top-of-keel line. Dimensions for the notch over the keel apron and limber holes, indicated in Fig. 10, are given in Fig. 3 above the top-of-keel line. These dimensions apply to all stations except stations 1 and 2, which are slightly narrower because the apron tapers to $3\frac{1}{2}$ in. where it joins the bow-stem block.

To draw in the notch for the chine batten, draw a line parallel with and 1½ in. from the faired line at the chine end. Measure 3 in. along this line from where it intersects the straight line from the chine to top-of-keel. All chine notches are made the same way with the exception of station 1, shown in the inset of Fig. 2. Line X, Fig. 3, indicates where the two ribs join and is located by scribing a line from the point of intersection of the straight and faired lines to the point of intersection of two lines drawn parallel with and 31/4 in. from the straight and faired lines. Cut out the pattern as indicated by the shaded area in Fig. 3, allowing it to extend about an inch beyond the sheer line for trim. Also make a cut on line X to mark the ends of the ribs as shown in Fig. 7. All rib patterns are drawn and cut out as previously described, except station 12 for which the following method is used: On the full-size plan view strike a 12-ft. arc extending across the chine, sheer and water lines with a string centered at station 6. To determine the half-breadth dimensions for

station 12, or the transom, measure the distance from the centerline to where the arc crosses the water lines.

Use oak, apitong or vertical-grained Douglas fir, 1-in. thick, for rib stock. Each frame, with the exception of station 1, has four ribs held together with gussets and tie bars as shown in Fig. 10. Station 1, being narrower, requires only one rib on each side. Mark the rib stock by laying the full-size pattern directly over the wood and scribing a pencil line along the edge of the pattern, Fig. 7. Allow at least 31/4 in. for the width of the rib. After marking the sheer, chine and all water lines on the rib stock, refer to the full-size plan view and measure the angles at the sheer and water lines with a bevel square as indicated at station 4, Fig. 4. Then, mark these angles at their respective water lines as shown in Fig. 6. When making the angle cut on a bandsaw, it is a good idea to have a helper, as in Fig. 5, because he can change the angle of the cut as marked at the various water lines while you guide the board.

Cut two sets of ribs for each frame, but be sure to reverse the angle cut so that the ribs can be assembled as pairs. If a tilting-table bandsaw is not available, you can cut the angle with a wood chisel or block plane after the rib is sawed. However, this method is much slower and not quite as accurate. Mark the line for the second cut of the rib with a compass or marking gauge set at 3½ in., as in Fig. 8. This cut need not be made at an angle. Leave the penciled water-line marks on the ribs as they are, but cut a small notch at the load water line so that it can be located after the frame has been painted.

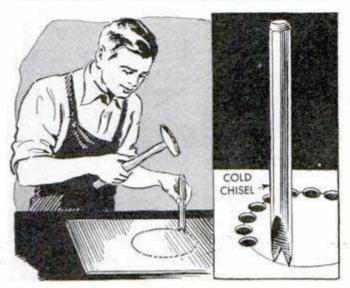
Assemble the frames either on a wooden floor or on two sheets of plywood fastened together. Draw a heavy line on the floor to serve as a centerline and line up the edge of the full-size pattern with it. Then place a bottom and side rib directly over the pattern to assure perfect alignment and temporarily nail a gusset to the ribs to hold them together. Pencil marks made on the floor along the outside edge of the ribs will help locate their position when the paper pattern is slid out and turned over to assemble the ribs for the other side of the frame. When both sides are assembled, carefully check the distances from centerline to sheer on each side and nail the temporary tie bar across at water line 6, as shown in Fig. 10. Then bolt the tie bar across the bottom with its lower edge flush with the notch for the keel apron. The tie bar is 4 in, wide and is made of the same material as the ribs. The gussets are also 1 in. thick and extend about 8 in. each way from the chine corner. The shape of their curve is not too important and may be drawn freehand.

The gussets are then bolted to the ribs. Before removing the frame from the floor, carefully mark the centerline on the temporary tie bar as indicated in Fig. 11.

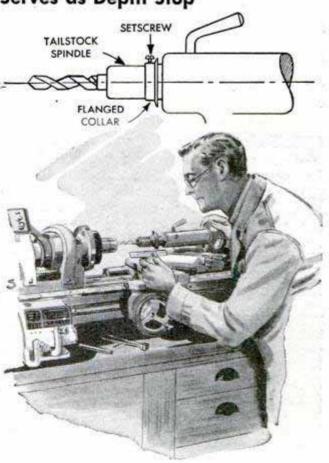
(To be continued)

Double-Point Center Punch

It's a simple job to accurately centerpunch a series of holes that are the same distance apart when you use this doublepoint punch. Make it from a cold chisel and grind a V-notch in the end to form points spaced to suit the distance you want holes apart.—C. Klumb, Rockfield, Wis.



Flanged Collar on Tailstock Spindle Serves as Depth Stop



If your lathe is not equipped with a graduated scale on the tailstock spindle you can make a depth stop for drilling operations by merely placing a flanged collar, fitted with a setscrew, over the spindle as shown. To set the collar, first drill the work until the bit makes a full cut and then lock the collar against the end of the tailstock. As the drilling progresses, measure the distance between the flange and tailstock with a scale. This distance indicates the depth of the drill in the work.

Groove Reclaims Small Taps

To prevent a small tap, especially a bottoming-type tap from breaking at the body and therefore having to be discarded, grind a groove in the shank as shown. If too much stress is put on the tap,



it will break, in most cases, at the groove rather than at the threaded part. When this happens, the tap can be reclaimed by grinding new wrench flats on the shank. If space permits, another groove may be ground and the tap reused a second time.

R. C. Roetger, New City, N. Y.

SICKLE-BAR LAWN MOWER

It operates like a farm mowing machine

—cuts tall weeds and tough grass where
a reel-type lawn mower won't work at all

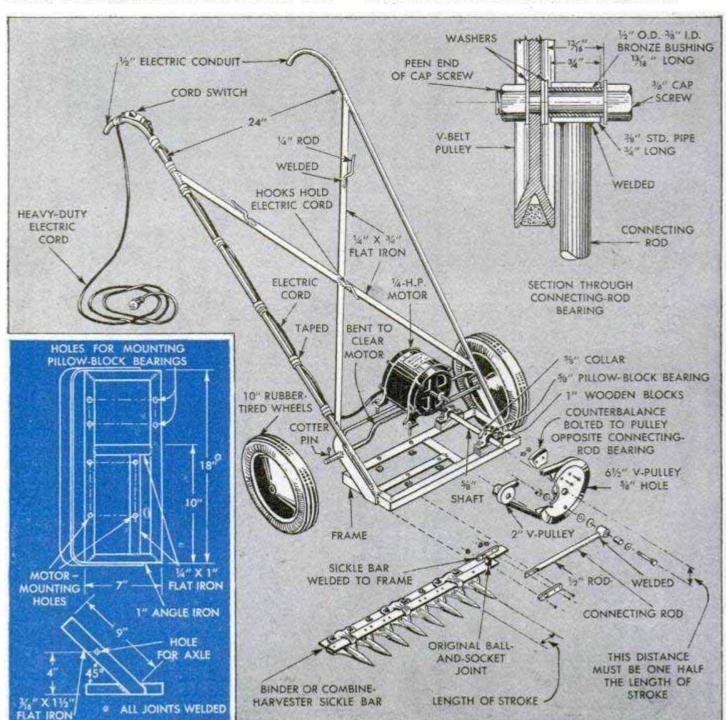
THIS electric "scythe" will save a lot of time and hard work for farmers and homeowners alike. You can get it into places where the conventional lawn mower will not operate—under picket fences, around trees and under low-growing shrubs, along flower beds and rock walls. On vacant lots and large lawns, it will cut the troublesome tall-growing weeds and heavy bunch grass. Besides, it mows well

on the smooth lawn, for the sickle cuts as low as a regular lawn mower.

2 2.1 M. Chicado VAS Chiccolo

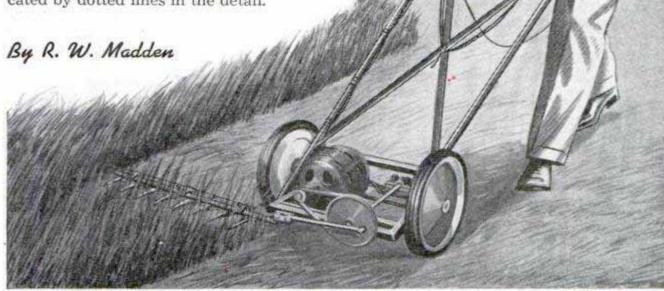
Only the sickle is power-driven. The parts of the mower are lightweight which makes it easy to push on reasonably level ground and easy to maneuver in close quarters. Construction is shown in the details below. Obtain 10-in. rubber-tired wheels of the semipneumatic type, a ¼-hp. motor and a 24-in. length of sickle bar from a grain binder or combine-harvester. This type of sickle bar is lighter and better suited to the purpose than the sickle from a conventional farm mower.

Notice in the detail that the angle-iron



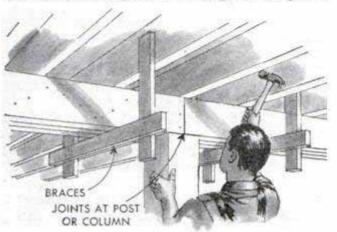
Has Electric Drive

frame is underslung and is carried well forward of the axle so that weight of the motor and sickle overbalances the handles. The frame, which supports the motor and pitman drive unit, is welded to give one-piece rigidity. Additional pieces of flat iron are welded into the frame to provide a suitable base for the motor. Handles, bent from rigid electrical conduit or pipe of equal size, are X-braced with flat iron and are welded at the lower end to a U-shaped member. The latter is welded to the main frame at a 45deg. angle as shown in the blueprint detail. The axle, welded in place last, is bent to clear the motor. Tape a heavy-duty electric cord to one handle and connect a feedthrough switch for control of the motor. The connecting-rod bearing and the pitman assembly are clearly shown. The sickle bar is welded to the frame in the position indicated by dotted lines in the detail.



U-Shaped Hangers Support Planks When Replacing Floor Beams

Much of the heavy work involved in replacing old floor beams can be eliminated if these simple wooden hangers are used to support the planks on edge as they are



installed. Spike the hangers to the joists to hold the top edge of the new beam slightly below the bottom edge of the joists to permit sliding the individual planks in place. Then apply floor jacks to the joists in the usual manner and raise the joists slightly to compensate for the amount the hangers are dropped. Erect two hangers for each post, placing one on each side. The planks are set in place, one by one, and then spiked together to form the beam. Lap them so that all joints of the entire beam are staggered. After setting the posts or columns in place, remove the jacks and temporary hangers. The same procedure may be used to install beams when putting a basement under a house. Michael Ligocki, Gary, Ind.

MARCH 1948 227

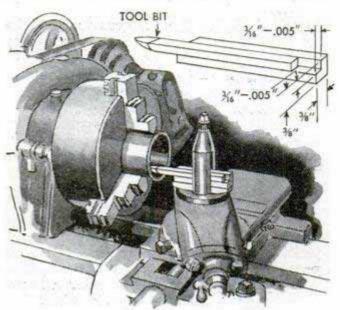
Fountain Brush to Clean Floors In Shops and Garages



You can save time and do a better job of cleaning concrete floors in shops, farms and garages by using a floor brush like this one. It is merely a regular floor-scrubbing brush which has a garden hose taped to the handle so that the nozzle directs water in front of the brush as it is pushed over the floor.

Rabbeted Clamping Block Supports Small Bits

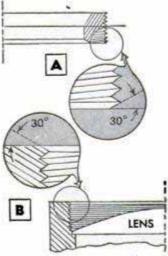
When a lathe job requires a tool bit of small cross section, this rabbeted clamping block will give rigid support to the bit when placed in the tool post. It is simply a piece of %-in. cold-rolled steel, rabbeted along one edge to take the size of bit being used. Note that the depth of the rabbet should be machined about .005 in. under



actual measurement to assure positive clamping of the bit. With the bit supported in this manner, chattering will be reduced.—Joseph F. Grece, New York City.

Chamfered Edges on Optical Parts Help Start Fine Threads

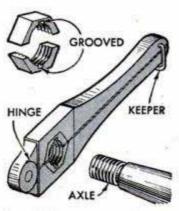
Threaded lens rings, screw-on metal lens shades on older-type cameras and similar optical and mechanical parts often become difficult to screw on due to a tendency to cross-thread. This becomes more and more troublesome as the thread wears at the starting



end. One remedy is to cut a 30-deg. chamfer on the leading edge of the male fitting, detail A, and also on the internally threaded part, B. The chamfer positions the parts so that the threads will engage properly.

Die Improvised From Nut

If the threads on a bolt or axle become damaged or stripped to such an extent that the nut cannot be replaced, and a die of the proper size is not at hand, you can true up the threads with a duplicate nut. First, two grooves



are filed on the inside of the nut as shown to form cutting lips, and then the nut is sawed in half at right angles to the grooves. The two parts of the nut are held in a special pliers-type holder, which is pivoted or hinged at one end to permit the nut to open and engage the end of the damaged threads, after which the handles of the holder are squeezed together and held with a keeper. While the original holder was machined from metal, a simplified one can be made of hardwood. Or, an adjustable end wrench may be used.

William P. Houser, Organ, N. Mex.

To store tubes of oil colors after use, spread a little petroleum jelly on the threads of the tubes before screwing on the caps. This will make the caps easy to remove when the colors are used again.

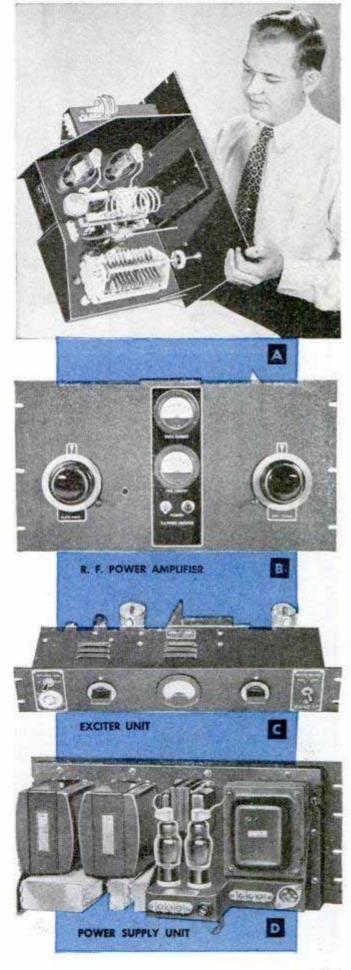
RADIO and ELECTRONICS &



Foundation Units for Amateur Transmitters

WITH all of the troublesome "bugs" eliminated, these flexible time-saving units enable the amateur to assemble an efficient rack and panel transmitter in a comparatively short time. The r.f. power amplifier shown in photos A and B is a compact universal type designed for use with a pair of such tubes as T40s, TZ40s, T55s or type 812s. Only a slight change is necessary for altering the circuit for these, or other tubes of the builder's choice. Although this Millen r.f. amplifier stage comes wired for the 6.3-volt 812 tubes, it is a simple matter to change the filament transformer specification to 7.5 volts for any of the other popular tubes listed above. Ample room is left in the chassis to provide for mounting the filament transformer. The plate-circuit input is on the order of 500 watts.

Individual plate and grid meters of 100 and 500-ma. range are mounted on the front panel as well as the grid and platecircuit tuning controls. The unit is equipped with center-linked coils in the grid circuit, and coils for use with swinging link in the plate-tank circuit. Either 10, 20, 40 or 80-meter Millen coils may be used. A suitable high-voltage power supply can be found in the A.R.R.L. radio amateur's handbook. This r.f. amplifier unit may be used to increase the power of any small transmitter. However, it was designed to be driven with the exciter unit shown in photo C. This is a 50-watt exciter which employs a type 6L6 tube as the oscillator and 807 tube is in the output stage which feeds directly into the r.f. power amplifier. A tri-tet circuit is used in this exciter unit to obtain harmonic output at the crystal fundamental by short-circuiting the cathode tank circuit. Sufficient oscillator output at the fourth harmonic of the crystal frequency is obtained to drive the 807 tube, which may be operated as either a straight amplifier or frequency doubler, making it possible to obtain an output of from 25 to 50 watts in four bands from a single crystal of properly chosen frequency. A companion power-supply unit for this exciter is shown in photo D. It is also mounted on a standard 19-in, racktype panel 10½ in. high. It uses two type 816 rectifier tubes and has a d.c. output of 700 volts at 250 ma., completely filtered. Final assembly is made in a relay rack.



1948 "LITTLE GIANT" TWO-BAND A.C.-D.C.

SPEAKER OUTPUT TRANS.

SOL6
GT

12SA7

To

12SK7

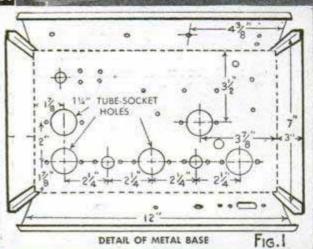
FILTER CHOKE

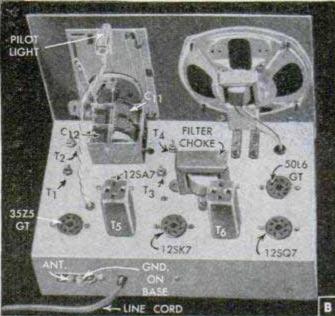
GND.
GND.
GND.
GND.
BASE

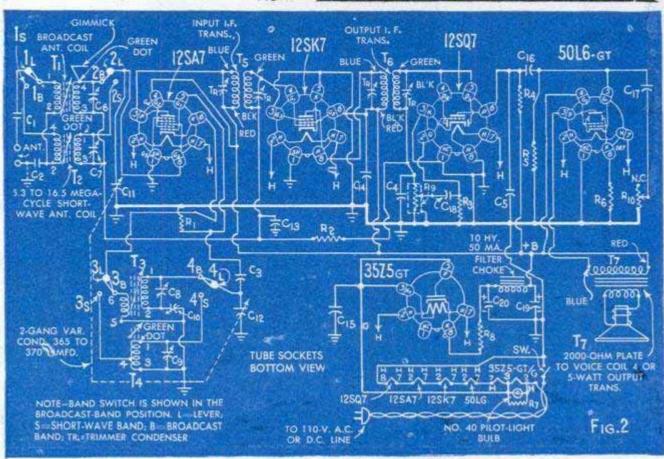
LIGG

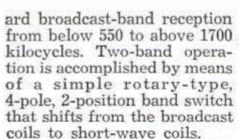
By L. M. Dezettel

Outstanding two-band performance is the main feature of this new model of the popular "Little Giant" special student set that many readers of Popular Mechanics always look for in the March issue. It will reach out and bring in overseas short-wave programs on the 6 to 18-megacycle band, which is the favorite DX band that gives the best results during the evening hours on the North and South American continents. It also provides excellent stand-





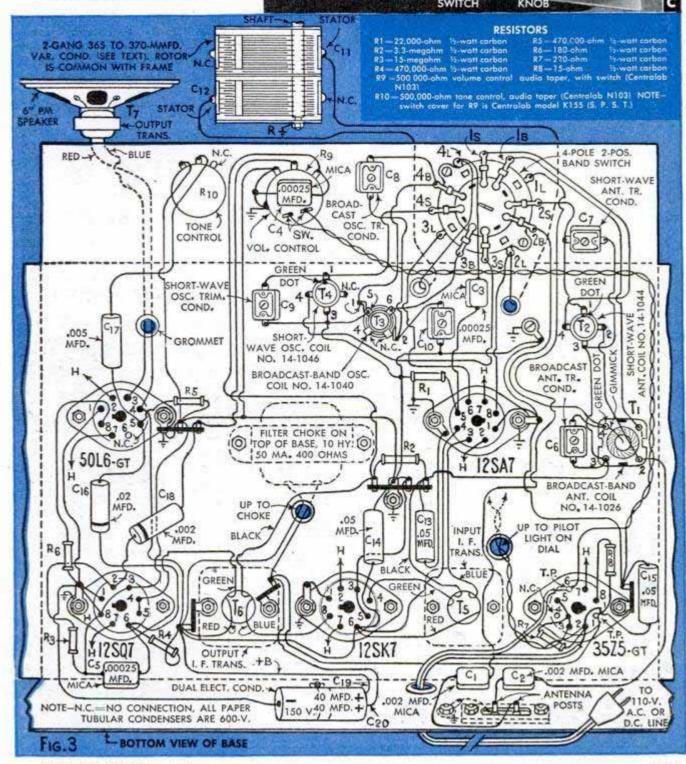


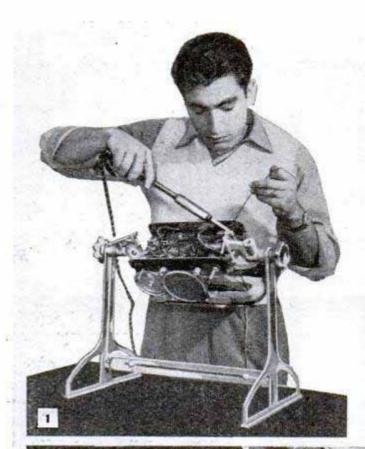


The circuit is of straightforward type, and the tube filament voltages are such that, when they are connected in series, they add up to about the line-voltage value.

(Continued to page 234)

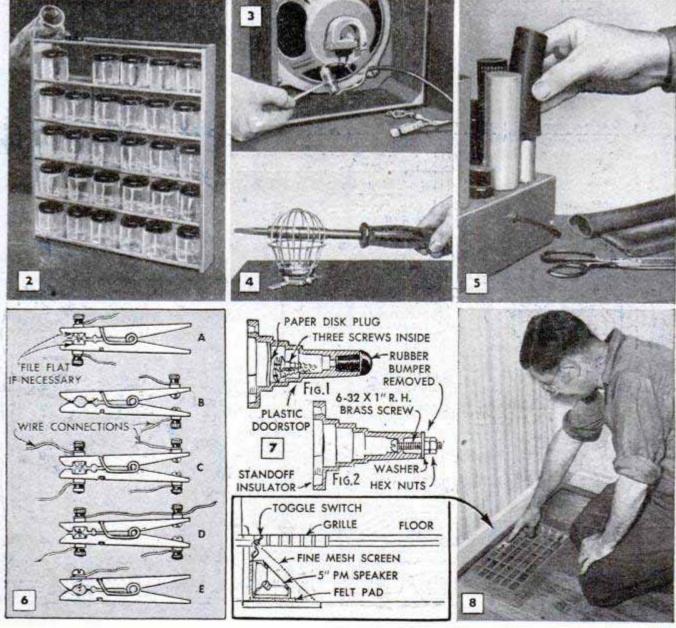






HELPFUL RADIO HINTS

1—All-purpose chassis holder for the workbench rotates any radio chassis or phonograph turntable through 360 degrees in a horizontal plane during the repair job. 2—This handy steel rack keeps small radio parts in an orderly and convenient manner; it consists of 5 shelves with 30 clear glass screw-cap containers. **3**—To arrange a test speaker of the PM type permanently for connecting to the plate terminal of an output tube to check speaker systems, connect a .01 paper-type fixed condenser in series with the test speaker leads. 4-Metal lamp guard fastened to the workbench with angle brackets provides a support for soldering iron. 5—Section of bicycle inner tube over tube shield eliminates vibration troubles. 6—Simple experimental switches and connecting clips made from snap clothespins. Fig. A shows closed-circuit type; B, open circuit, for temporary closing; C, open-close circuit; D, singlepole, double-throw switch; E, temporary connecting clip. Small insulated screw-cap binding posts and r. h. brass machine screws are used for contacts. **7**—Figs. 1 and 2 show a standoff insulator made from a dime-store plastic doorstop. 8—Non-directional remote speaker system for the home. Speakers are mounted under ornamental floor grilles; the box-type baffle is insulated from the structure



with these inexpensive

KODAK WASHING ASSEMBLY . . .

converts your home sink into a circulating washer . . . washes negatives and prints. Fresh water enters sink from faucet through a hose, which can be affixed to side of sink by means of a vacuum cup. This insures desired circulation and thorough washing. Water drains out through adjustable stopper over sink drain. Price, \$2.25.



KODAK COMBINATION FUNNEL...helps you pour solutions



without wasteful spilling. Easy to clean. Made in two sections which can be used singly or in combination, providing 3 sizes of funnels. Large section has maximum diameter of 5 inches, and 2-inch spout. Small section fits over spout of large section and terminates in 1/2-inch spout. Price, 85 cents.

KODAK DARKROOM THERMOMETER... provides accurate temperature readings from 0° to 120° Fahrenheit in 2° calibrations . . . is marked with a big star at 68°, the safe temperature for most of your darkroom solutions. Price, 45 cents.

...and to get beginners off to a flying start,



KODA. ABC PHOTO-LAB OUTFIT . . . contain. everything you need for easy developing and printing—metal printing box with 4 x 51/2-inch negative area, darkroom lamp, trays, chemicals, stirring rod, graduate, darkroom thermometer, printing paper, film clips, and an illustrated book of complete instructions. Price, \$6.50 plus tax. EASTMAN KODAK Co., ROCHESTER 4, N. Y.

"Kodak" is a trade mark

Kodak

MARCH 1948 233





PAINTS BEHIND RADIATORS!

Lowell Electric Painter actually atomizes paint. Covers area in a minute. Directional nozzle sprays paint straight ahead, up, down or sideways.

FURNITURE PAINTING EASY!

Use any kind of paint with the Lowell Electric Painter—enamel, flat paint, or varnish. Holds a quart. Easy to use. Small, efficient AC/DC motor. Weighs 8 lbs.





Write for fascinating, new booklet: "40 Ways to Beautify Your Home." Send 10c to Lowell, Dept. 72, 589 East Illinois Street, Chicago 11, Illinois.

!"Thoro-Spray"*
Electric Painter
COMPLETE
No Extras To Buy

Guaranteed

\$**34**95

Slightly higher in western territories. *T. M. REG. U. S. PAT. OFF.

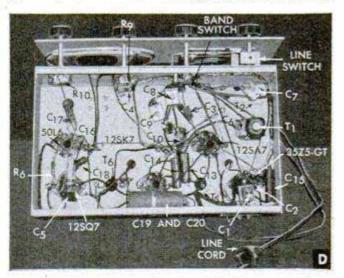
LOWELL Manufacturing Co.

World's Largest Manufacturer of Sprayers and Dusters Exclusively

"Little Giant" A.C.-D.C. Super

(Continued from page 231)

No ballast tubes or dropping resistors are required. Automatic volume control (AVC) is included. The parts used are all



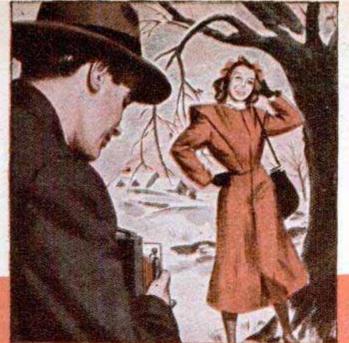
standard items made by reliable manufacturers and available from any of the larger parts houses; the chassis base, Fig. 1, is intentionally rather large to make wiring easy. A clear plastic panel was used in the model mainly for the purpose of showing how the parts are mounted on the top and front. Plywood or ½-in. hard-pressed wood may be substituted for the plastic; uncut ready-made cabinets are listed in

parts-house catalogues.

A complete schematic circuit diagram is shown in Fig. 2. Every wiring detail is clearly indicated in the pictorial wiring diagram, Fig. 3. Trimmer condensers C6, C7, C8 and C9 are all 2 to 30-mmfd. ceramic compression types; C10 is a 100 to 580mmfd. padder condenser of the same type. Coils T1, T2, T3 and T4, and the I. F. transformers are all Meissner types. The I. F. input transformer is a 456 kc. No. 16-6666; the I. F. output is a 456 kc. No. 16-6667. Coils T2 and T4 are both universal 5.3 to 16.5-megacycle variety. The 2-gang variable condenser (C11 and C12) may be any of the old type 365, or 370-mmfd. units. If the parts house supplies one of the new standard types which are 489.8 mmfd. per section, it is necessary to remove 3 plates from each rotor section. Instructions are furnished with the condenser for doing this. Follow the placement of parts as shown in photos A, B, C and D.

Underside photo E is a close-up view to show the coils clearly. These coils are of the adjustable iron-core type, and the adjusting screws are identified in the top view, photo B. The dial is a Crowe tuner, type 231, with a No. 36419 vertical 2-band

(Continued to page 236)



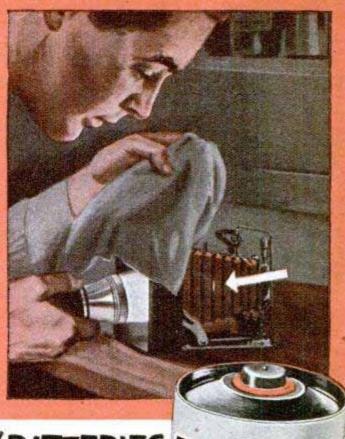
HOW TO KEEP

LIGHT STREAKS

OUT OF YOUR SNAPSHOTS

CO YOU did it again. You were so sure this was going to be the best "shot" yet! But, no ... it's just another snapshot full of light

GET OUT YOUR FLASHLIGHT. Take the back inside. The remaining exposed area of back



Proof: "EVEREADY" BATTERIES in the laboratory. "EVEREADY" BATTERIES in the laboratory own in your own in Your shlight.

Brighter light, longer life! That's what you want in a flashlight battery - and that's what you get with "Eveready" brand batteries. Laboratory tests prove it. And the best "laboratory" of all - your own flashlight - proves it! That's why "Eveready" batteries outsell all other brands - because they outlast all other brands!*

The registered trade-mark "Eveready" distinguishes products of

NATIONAL CARBON COMPANY, INC.

30 East 42nd Street, New York 17, N. Y. Unit of Union Carbide I and Carbon Corporation *According to the "General-Purpose 4-Ohm Intermittent Test" of the American Standards Association. which most closely approximates average use.

235 **MARCH 1948**



TELEVISION AND **NEW HOME RADIOS**



SERVICE SUPPLIES BUILDERS' SUPPLIES



AMATEUR GEAR



SOUND SYSTEMS

Radio's Great Buying Guide

Send today for your FREE copy of Radio's Leading Catalog! It's the preferred Buying Guide for Servicemen, Dealers, Engineers, Soundmen, Amateurs, Builders and Experimenters. Shows everything you want in Radio and Electronic equipment-all the newest releases -complete, highest quality stocks at low, low prices that save you money on every purchase!

World's Largest Stocks!

You'll find everything in the new 172-page ALLIED Catalog-television receivers, latest home radios and radio-phonos, Ham receivers and station equipment, test instru-ments, public address equipment, new builders' kits, thousands of parts, tubes, tools, radio books, diagrams. Get the speedy, reliable service and expert help you want from ALLIED-Radio's Largest Supply House! Be sure to send today for your FREE copy of AL-LIED'S new 1948 Buying Guide!

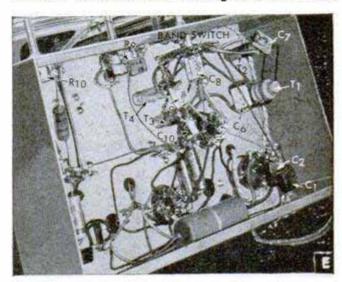
ALLIED RADIO CORP. 833 W. Jackson Blvd., Dept. 5-C-8 Chicago 7, Illinois

Rush FREE 1948 ALLIED Catalog

City......State.....

scale. Resistors and condensers should be connected with the shortest possible leads. A piece of heavy hookup wire is used as the "common negative bus" which is also grounded to the chassis, thus reducing the possibility of interstage oscillation on short waves. Note that this also makes the internal wiring a part of the chassis circuit. Therefore, when making adjustments on the chassis outside of the cabinet, place the set on a wooden table away from radiators or other grounded metal objects. When placed in a cabinet this precaution is no longer necessary.

Do not connect an external ground wire directly to the chassis of this set. With the band switch in broadcast position, tune in a station and adjust each of the I. F. transformer trimmers in the tops of the cans



for maximum volume. Now tune the set to a station near the low-frequency end of the band and note the dial reading. If the actual station frequency and the dial reading do not agree, turn the tuning control back and forth, at the same time adjusting the C10 padder condenser on the broadcast oscillator coil T3 until the station frequency and the dial setting agree. Now tune to a station near the high-frequency (Continued to page 240)

Dexter UNIVERSAL LATHE CHUCKS

IMMEDIATE DELIVERY. Shipped postpaid from stock same day order received. Precision accuracy and construction assure you complete satisfaction.



Size	Fits Spindle	Price (Postpaid)	Note: 5" chuck
2"	1/2"-20	\$16.00	also to fit following
3"	1/2"-20	17.00	spindles 3/4" x 16 1" x 10 1" x 12
4"	1″-8	21.00	
5"	11/2"-8	25.50	1" x 14
6"	11/2"-8	33.00	1" x 16 11/8" x 7

MACHINE COMPANY THELEAVITT ORANGE, MASSACHUSETTS



Swing into the saddle of a Harley-Davidson and set out for fun land! Pick up a pal along the way, or join a jolly caravan of riders happiness bound — to exciting race meets, hillclimbs, "gypsy tours", scenic wonderlands, faraway places. There's no sport like motorcycling — no fun like owning a Harley-Davidson. "Owning your own" is easier than you think. See your Harley-Davidson dealer to-day. Fill out and mail coupon now.

HARLEY-DAVIDSON Motorcycles

HARLEY-DAVIDSON MOTOR CO., DEPT. P, MILWAUKEE 1, WISCONSIN

Send FREE copy "ENTHUSIAST" Magazine filled with thrilling motorcycle action pictures and stories; also literature on your 1948 models.

Name				
Address	City	State		

MARCH 1948 237

"That brand name means plenty, Mister"



JONES: Sure it does—to you hardware dealers. Tools with advertised names get you higher prices. But how about me? I want the most I can get for my money.

DEALER: Well, sir, let me ask you this. Do you think you get more for your money when you buy unknown tools at bargain counter prices?

JONES: Not necessarily. But I know this much—you can't change a poor tool into a good one just by putting a well-known name on it.

DEALER: Of course not. But don't forget

any other piece of hardware—it's got to be good.

JONES: How do you figure that?

DEALER: The manufacturer has a reputation to protect. Thousands of men believe in that brand name ... depend on it ... and he can't afford to let them down. It's the same way with me and my hardware store. I've got to keep my reputation for quality merchandise or I couldn't even stay in business.

Your HARDWARE DEALER sells QUALITY tools and hardware...Buy from HIM



POPULAR MECHANICS





y and protection are sprayed on old and new buildings . . . exterior neterior surfaces . . . by COLORCRETE. It's a plastic, water-resistant ial, spread evenly over surfaces and forced into cracks by air pressure. i to masonry with enduring tenacity. Many textures. Range of 30 colors. Fully proven by 20 years of actual use under all conditions.

Dig Earnings for Colorcretors

Colorcrete ties in with today's huge building program. Renews old buildings. Makes new construction more attractive and enduring. Large waiting market, because building owners get long lasting beauty and protective values at low price. Yet your selling price can be several times your basic cost. Machine is easy to operate. Moderate investment. Write or wire for complete information. COLORCRETE INDUSTRIES, INC.
Ottawa Avenue Holland, Michigan





IF you stop, look and listen, we can show you how to build a business of your own NOW with Tradio, the radio functionally-designed for coin operation in designed for coin operation in hotels, tourist camps, restaurants, taverns, etc. in your community. Hundreds of men and women are entering this new depression-proof business daily. It's a natural for big earnings and a steady income. Tradio has pioneared in this flourishing parts. neered in this flourishing war industry. Only a small in-vestment is needed to get in on the ground floor.

WRITE Dept. N-3 for complete information and free Illustrated

ASBURY PARK NEW JERSEY

A. J. MARCOTTE CO. DEPT. PM, CHICAGO 51, ILL.



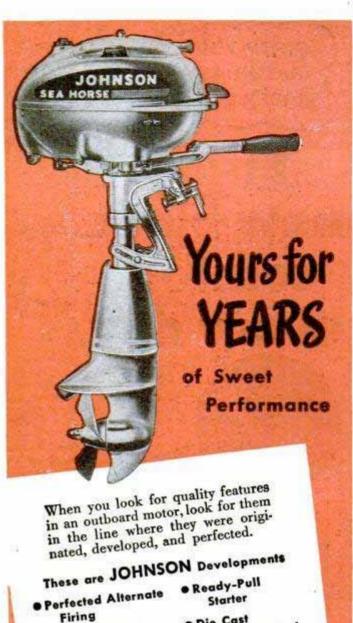


aluminum, steel, plastics, etc. It is as indispensable to your workshop as electric power. An ideal tool for electricians, welders, farmers, dentists, toy makers, hobbyists. Send check or money order to-day. Wheel will be sent by return mail.

-\$1.65 Eoch 7"-\$2.15 Eoch 8"-\$2.80 Eoch

All wheels 3/32" thick with 1" hole. State size of shaft if smaller than 1". Proper bushing will be sent free.

POSTAGE PREPAID Anywhere in U.S.A. by: Bay State Abrasive Products Co., Westboro, Mass.



- Dual Carburetion
- Die Cast Cylinder Block
- Reverse
- Anti-Cavitation Plate
- Shock Absorber Drive
- and many others
- Rotary Valve

Also yours, in a Johnson, are Nation-Wide Service, High Trade-in Value, Long Life.



FREE Handy Chart

Write for the new 1948 Sea-Horse Handy Chart. Illustrates, charts the

5 great Johnsons for '48. See your Johnson Dealer about delivery. Look for his name under "Outboard Motors" in your classified phone book. Johnson Motors, 400 Pershing Rd., Waukegan, Ill. Johnson Motors of Canada, Peterboro, Canada

for DEPENDability

end of the band and make the same adjustment using the C8 trimmer condenser. Again, tune to a station near the center of the band and repeat the operation, adjusting the oscillator-coil iron-core setting on T3 above the chassis. Each of the above operations will affect the setting of the others. Therefore, it may be necessary to go over each one again if precise tuning calibration is desired. The broadcast antenna coil T1 is peaked for loudest signal by tuning to a station at about 650 kc. and adjusting its core on top of the chassis. Then tune to a station at 1100 kc. and adjust trimmer C6. Aligning the short-wave band is done in exactly the same manner, except that coil T4 has no padder condenser. Adjustments are made at only two points on the dial, using the iron core and C9 trimmer condenser. It may take some time to identify stations and their frequencies on the short-wave band. A good starting point is to listen for WWV, the Bureau of Standards station at Washington, D. C. Their frequency is exactly 10 megacycles. Detailed student material list R-364 is available from Popular Mechanics Radio and Electronics department upon receipt of ordinary letter postage.

Hitchhiking Insects Forbidden

(Continued from page 173)

hours. Finally, the experts isolated this

pest and wiped it out.

At present, the Department of Agriculture is making steady progress in its battle of the bugs. But entomologists are keeping their fingers crossed. They remember that 20 species of insects, six unknown in the United States, were carried here by the Graf Zeppelin in 1929. That was only one flight! Today international airports are in use all over the United States and increased traffic means more chances for destructive pests to sneak in.

Just a few of the new insects that have been discovered in cargo are the Latin-American fruit fly, found in the cabin of a transport; the pink bollworm, one of the world's worst cotton pests, discovered in cotton bolls from Egypt; the European cherry fruit fly, spotted in a cherry shipment from Portugal; the olive fruit fly from Italy; the West Indian sweet potato weevil from Puerto Rico; thrips, a destructive pest of carnations, on cut flowers from Greece; and the European pea weevil on fig marigold plants brought from Bermuda for propagation here.

Because of the tremendous increase in . international air travel, the government

(Continued to page 246)

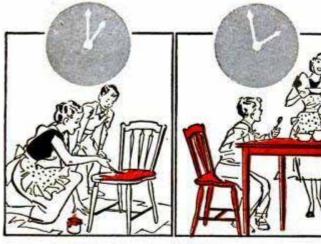


OIL IMPREGNATED BRONZE BEARINGS OR DOUBLE SHIELDED BALL BEARINGS, BOTH WITH THE PATENTED BALL BEARING TRANS-AXIAL MOTOR DRIVE



MARCH 1948

paint at \[\]... use by 2!



Easy to apply. Flows on. smoothly. Low cost!

Dries dust-free in 17 min. Little does a lot!

WONDERFUL NEW

Stop Watch Enamel

- . FOR FURNITURE IN CONSTANT USE!
- . FOR MODELS!
- . FOR TOYS!
- . FOR TOILET SEATS!
- . FOR HANDICRAFTS!



STOP WATCH ENAMEL is available at Hardware, Paint and Variety stores in 14 decorator colors: Robin Blue, Java Brown, Foam Green, Canary Yellow, Forest Green, Pilgrim Gray, Jade Green, Rich Cream, Imperial Red, Royal Blue, Orange, Ivory, White or Black.

If your dealer cannot supply you, send \$1.50, plus 25 to cover shipping, for I qt. of STOP WATCH ENAMEL. Indicate color wanted.

THOMAS C. DUNHAM, INC.

Long Island City, New York, Founded 1852
*Average drying time



As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—the editors of Popular Mechanics invite you to present your problems to The Clinic Editor for help and advice. Address your questions to The Clinic Editor, Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, III.

Installing Basement Drain

Q—My home is in a low area, but my basement is dry the year around. There is no basement drain. A septic tank has been installed and connected to a large disposal field. Do you think it advisable to install a basement drain and connect it to the disposal system?

A. B .- Sandwich, Ill.

A—Under the conditions you outline we would say offhand that it would not be advisable. Without being on the grounds it is difficult to state positive reasons, but in general, much depends on the kind and nature of the soil in the drainage area, the length of the branch-tile runs in the disposal system and the direction of natural drainage in your locality. One method that has been used successfully under similar conditions is the installation of a separate drainage field for the basement drain, with local conditions determining the length of the main-tile run, the diameter and fall of the main tile, and the length, number and fall of the branch runs. Of course, in a poorly drained area this would involve a lot of labor and expense and even this installation would not entirely eliminate the danger of water backing through the tile into your basement during an exceptionally wet season.

Matching Wood Filler With Walnut Stain

Q—My living and dining rooms are trimmed with birch, stained walnut color. I tried filling nail holes with a wood putty, but it will not take the stain. What should I use?

A. C .- Toronto, Ont., Can.

A—Most wood-putty products are obtainable in colors, such as walnut, mahogany, etc. We suggest that you obtain the walnut color and test it for matching with the stain on your trim. If it is too dark, try one of the lighter colors, such as brown maple—not red maple—or light oak.

Removing Rust Stains From Asbestos Siding

Q—How do I remove rust stains from asbestos siding? The stains are under the windows and come from the screens.

R. G.—Elkhart, Ind.

A—It is difficult to remove rust stains from asbestos siding by any ordinary means without spreading the stain and damaging the siding. Many homeowners with this trouble have successfully used a masonry paint. This is obtainable in an off-white color and if you do a careful job of spraying the material, the rust spots can be covered effectively without the necessity of going over the whole wall.

(Continued to page 244)





"QUAD-CITY SHARPENER"

for this

Get into profitable lawn mower sharpening at low cost with this highly successful machine. Order direct from QUAD-CITY PRODUCTS CO., Box 42, Rock Island, Ill.



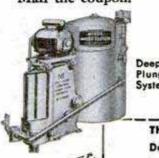
LOOK INSIDE THESE FAMOUS WATER SYSTEMS

Mechanically minded people like to see the inside construction of MYERS precision built Water Systems—see the working parts and how they operate. Cross-section views of *Ejecto* and Plunger Types in the complete Myers line are shown in free booklet. Includes charts, descriptions, much useful information. Mail the coupon.



Shallow Well Plunger Type System

243

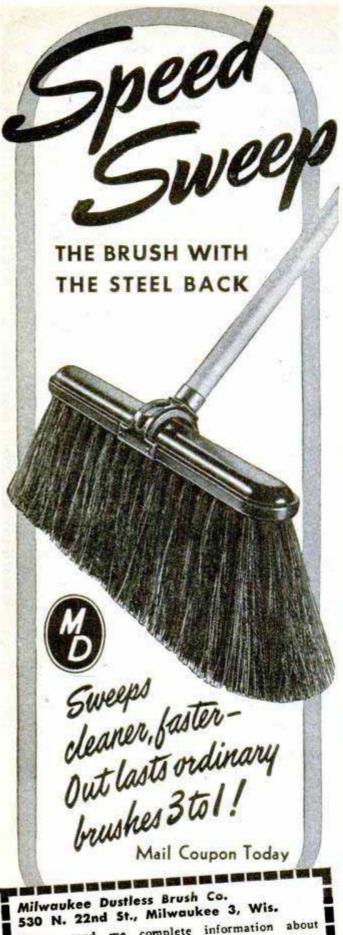


Deep Well Plunger Type System

"H" Series

THE F. E. MYERS & BRO. CO. Dept. K-165, Ashland, Ohio Send your water system booklet.

Name	
Town	
PARAMETER STATE	•



Milwaukee Dustless Brush 530 N. 22nd St., Milwaul Please send me complete Speed Sweep brushes.		about
Name		N.
Street Address	TED!	Lis
City, State		

Windows "Steam" and Drip Condensation

Q-What can I do to prevent windows steaming all over the house? The water runs down the inside of the glass and loosens the paint and enamel on both the sash frame and stool.

A. D .- Cincinnati, Ohio.

A—Probably the humidity in your home is too high. It would be well to check on this. But basically, the steaming is caused by moisture condensing on the glass because of the variation between inside and outside temperatures. At the present time, the cheapest and best remedy is installation of storm sash. The latter should be seared with felt strips tacked or glued to the inside face of the stlies and rails. Sash should be fastened in place with metal turn buttons rather than hangers. If the storm sash is properly sealed as described, captive air between the inner and outer sash will tend to equalize the temperatures, thereby preventing condensation.

Waterproofing Basement

Q—During heavy rains water seeps through my basement wall, which is of concrete-block construction. Most of the water comes through just above the floor, through the first and second courses of blocks. How can I stop this?

C. W.—Wheaton, Ill.

A—Several products are now available for effectively waterproofing basement wails from the inside. If the wall is unpainted and in good condition—no cracked blocks or open joints—the joints almost as simple as applying a masonry paint. Follow the manufacturers directions closely in preparing the material for application. In most cases, the waterproofer should be applied only when the wall is dry. If you work carefully you can do a good job with an ordinary whitewash brush. The important thing is to apply an even coat and to work the material well into the joints and the porous areas of the wall. If there are open joints, these should be cleaned out and repointed with regular mortar before applying the water-proofing solution.

Closing Open Joints in Linoleum Floor

Q—I recently laid linoleum squares over a softwood floor. The lengthwise joints have opened up. How can I repair the damage?

W. W.—Brownville Junction, Me.

A—Your description of the manner in which the joints of your linoleum floor have opened up suggests several possible causes. Moisture absorption by the floor boards, due to clothes drying in the basement, for example, could be the cause. Or, if in a new home, the boards under the opened joints might have had a higher moisture content when laid than those adjacent. This would cause slight warping in drying and might result in the opened joints in the linoleum floor. Another possibility is the presence of air pockets either under the felt base or between the linoleum and felt—one of the more common causes of trouble with floor squares. If any one of these possibilities is the cause of your trouble, then there is little you can do to remedy the fault except to re-lay the affected portion. However, rolling the floor with a heavy roller has, in some instances, helped to correct this trouble.

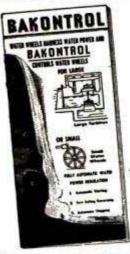
Water Seeps Into Brick Garage

Q-Water seeps through the brick wall of my garage at the back where earth is banked against it above the floor level. How can I prevent this seepage?

L. W.-Oklahoma City, Okla.

A—There will be considerable water pressure against the wall of the building. However, we believe it advisable to first try a masonry water-proofer, several of which are now supplied under various trade names, and commonly used in water-proofing basement walls. This can be applied to the wall inside the building when the wall is dry. This suggested remedy will not succeed, however, if the wall is cracked, or if the mortar has weakened and crumbled at any point. Only sound masonry walls will successfully take a waterproofer. Another method, involving more labor and expense, is the installation of a system of tile drainage, or the construction of a wall above the building at some point to divert the flow of surface water away from the garage.





LET BAKONTROL GIVE NEW, PROFITABLE USES TO YOUR



BAKONTROL gives automatic starting fast acting governing—automatic starting—fast acting governing—automatic stopping —of any hydro plant. Bakontrol hoards water, gives amazing convenience. Pays for itself. Lock up your power house and leave it for weeks, while it continues to deliver power automatically.

Tell your friend with water power of this ad Send now for free 12 page booklet B-1.

Bakontrol Mfg.Co. 4867-B HAMILTON



The great building industry is your profitable market for masonry products. Low investment . . . high returns . . . wide-open opportunity to establish a lifetime business.

The biggest building years in the nation's history are just beginning. New construction, involving billions of dollars, means huge demands for block, drain tile, and other masonry products which YOU can manufacture locally, from local materials, with local labor for local consumption. Remember, MASONRY products are in mesh with today's building preference! building preference!

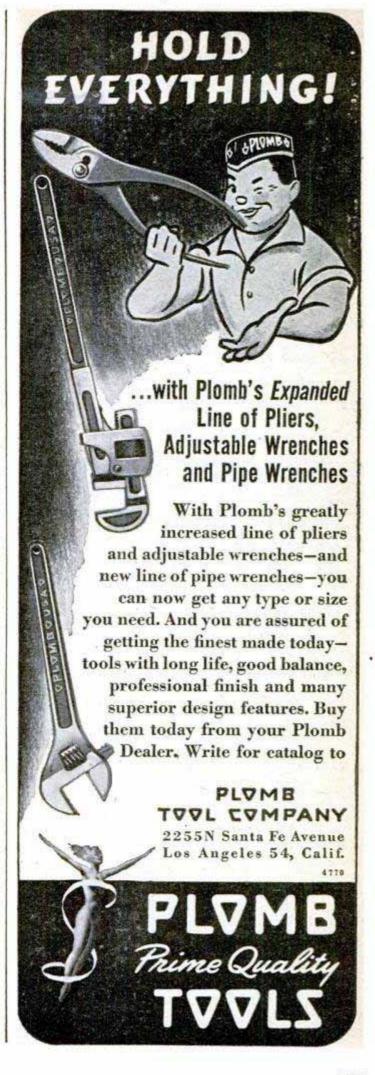
Use our modern machines and equipment to insure the finest quality products at pared-to-the-bone manufacturing costs. Sold direct from factory to you. Backed by 40 years of pioneering and manufacturing. Write for new catalog. Describes complete line of equipment with prices plainly marked. Tells how we help you in manufacturing and merchandising. Write TODAY.



CONCRETE EQUIPMENT COMPANY

512 Ottawa Avenue Holland, Mich.





BIG MACHINE FEATURES!

You get them in a SMITH-CORONA PORTABLE TYPEWRITER

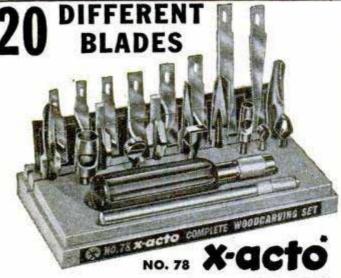


Regulation 84 character keyboard same as on big office machine

- 1. TOUCH SELECTOR
- 2. VARIABLE LINE SPACER
- 3. FLOATING SHIFT
- 4. ONE STROKE RIBBON REVERSE
- 5. TYPEBAR SPEED BOOSTER

ASK DEALER FOR DEMONSTRATION

Smith-Corona PORTABLE TYPEWRITER



COMPLETE CARVING SET

Here's everything you need for a super-slick job, from toothpicks to totem poles. Super-sharp blades, firm-grip handles for light and heavy work. Ideal for wood, linoleum, plastics, etc. Contains: 6 different gouges, 4 routers, 2 punches, 6 regular blades, 2 three-inch blades, one No. 1 knife, one No. 5 knife. On wooden block, complete......Only \$5.00

Other X-acto Knives, Blades, Tools and Sets, 50¢ to \$50 Prices slightly higher in Canada

At hobby, gift, hardware and department stores X-acto Crescent Prod. Co., Inc., 440-4th Ave., N. Y. 16 InCanada: Handicraft Tools, Ltd., Hermant Bldg., Toronto officials are planning three lines of defense against insects instead of the single line now used. These are: (1) inspection of planes and cargo at the foreign airport before departure for this country; (2) continued inspection of incoming planes where the preflight inspection was not performed; and (3) an intensive program against pests that get through the first two lines and become established here.

The airplane has opened a new era in transportation for man and for insects. It affords a bridge over the world's water barriers for pests of the insect world. The problem is a serious one-much more serious than the disgusted lady on the Ha-

vana plane realized.

They Blaze the Trail into Space

(Continued from page 149)

tested wheeled into place directly below it. Built for much less money than the usual installation, the bell speeds up the

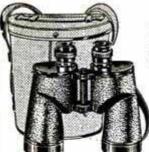
Douglas test program.

Another unique chamber is the twin stratochamber used by AiResearch in which the conditions inside and outside a pressurized plane at high altitude may be duplicated simultaneously. One end of the chamber can be pumped out to simulate the pressure of 70,000 feet altitude while in the other end, separated by a strong partition, a pressure representing that of sea level or any intermediate altitude may be maintained. By operating their valves and switches, AiResearch engineers can duplicate the climb and dive characteristics of the fastest jet fighters and meanwhile check the functioning of pressurizing equipment installed in the partition between the two portions of the chamber.

Altitude chambers play an important part in research, but they can't duplicate actual proof-testing of equipment at high altitude itself. The final examination is to install equipment and carry it aloft for tests under actual operating conditions.

Members of the Boeing flight-test group have spent more than 1300 hours at altitudes above 25,000 feet collecting data on the performance of equipment under test. One B-29, "Noah's Arc," is credited with over 52 hours above 40,000 feet during 32 flights, believed to be more than any other airplane in the world. For each hour in the air, 650 man-hours of research is performed in laboratories and altitude chambers. Each 1000-foot jump in altitude is based on research that is often tedious and uncomfortable, and occasionally dangerous. But, as a result, military aircraft will soon be making routine flights at altitudes never before attained.

U.S. NAVY 7X50



PRISM BINOCULARS WITH COATED OPTICS

Used but in Excellent Condition

\$95

Complete with leather carrying case and sling

Universal, 6x 30 Navy Prism Binoculars, used but in excellent condition, complete with leather \$42.50 with Coated Optics, \$10 Extra.

Engineers All Metal Army Type Hand-Sighting

LEVELS 2.00 PRECISION QUALITY



Send \$1.25 for 3rd Edition of Gun Digest with our complete catalog of new and used guns, etc. Our separate catalog 25c.

PUBLIC SPORT SHOPS

11 S. 16th St., Phila. 2, Pa.

No COD's

SOUTH BEND

NEW ADJUSTABLE COLLET BUSHING CHUCK -

provides an accurate method for mounting centerless armature shafts and similar parts in a lathe. Use in either head



or tail spindle. The brass collets are adjustable for running or driving fits. Chucks supplied with 3 collets; 9/16", 5/8", and .637" capacity. Extra round collets, 1/4" to 1" by 16ths, \$1.00 each. Chuck with No. 2 shank \$8.95 Chuck with No. 3 shank \$9.45

SOUTH BEND LATHE WORKS South Bend 22, Ind.



4 WHEELER (Illustrated)

\$175

2 WHEELER \$125

WATSON DOUBLE-ACTION HYDRAULIC TRAILER DOLLY

60 miles per hour SAFELY — all day

THE WATSON AUTOMATIC MACHINE CO.

Glendale, Calif.

Mansfield, Ohio



for AMAZING acceleration

DIXIE-WESTERN

DUAL INTAKE MANIFOLDS for

V-8 FORDS AND MERCURYS

\$1500 Gas Line and Throttle Kit \$2.50 extra

Chrome Plated Velocity Stocks — \$1.50 ea By Test: Increased Acceleration by 28% Increased Power and Speed by 11%

All DIXIE-WESTERN manifolds are brightly polished cast aluminum.

DIXIE-WESTERN MANIFOLD CO. Box 364 • Los Angeles 43, California MAKE UPTO \$ 1000.00

PER MONTH...OWN YOUR OWN BUSINESS...BE YOUR OWN BOSS



EASY MONEY!

EASY WORK!

UNLIMITED OPPORTUNITIES I

EVERY HOME OWNER A CUSTOMER!

Sign Long Term Profit Making Contracts With Schools, Parks, Playgrounds, Cemeteries, Golf Courses And All Types Of Institutions.

THE MODERN LAWN MOWER SHARPENER IS A PROFIT PRODUCER FOR YOU!

Make more money the Modern way! Everywhere grass grows and lawn mowers are used offers you unlimited opportunities to make up to \$1000.00 per month in a business of your own. For the first time in history, you can sharpen any reel type lawn mower from a five inch edger to a thirty-six inch power mower in from ten to twenty minutes. Dismantling is unnecessary. Handle, wheels, roller and motor remain in place when sharpening even the most complicated mower. The Modern Lawn Mower Sharpener eliminates all hand filing. It precision grinds to extreme ends of both left or right twist reel blades. Bottom knife is held in same brackets for sharpening. No extra attachments required for grinding. Hand, power, gang or fairway units sharpened equally fast . . . equally easy for greater profits. Anyone can operate the Modern Lawn Mower Sharpener. It is simple in design and simple to operate. Send for details today!

START YOUR OWN BUSINESS TODAY SMALL SPACE REQUIRED - SMALL INVESTMENT

Take steps today to start your own business. Send for FREE bulletin on Modern Lawn Mower Sharpener plus FREE booklet on how to organ-

ize your business plus ideas and plans for future expansion. Paste completed coupon to penny postcard and mail today!

MAIL

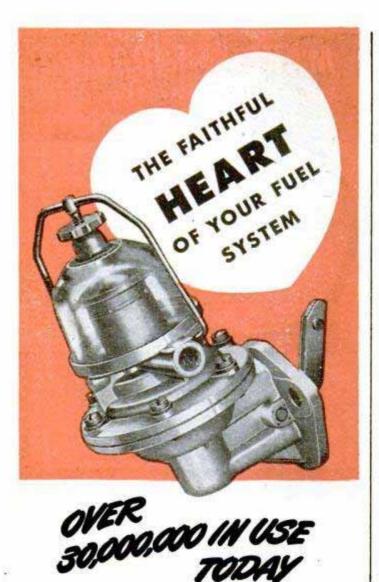
MODERN MANUFACTURING COMPANY 160 N. FAIR OAKS AYE., PASADENA 1, CALIF

Gentlemen: Please send me your FREE booklets No. 10 and 10A.

NAME.

ADDRESS_

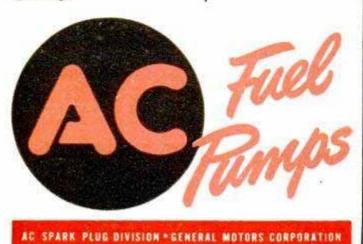
CITY____STATE



Pulsing steadily, nearly 100,000 times an hour, your AC Fuel Pump is the strong, reliable heart of your fuel system. It has given you long, faithful service because of its inbuilt quality and scientific design.

You can prolong that faithful service indefinitely, if you insist upon a new AC when you replace your present pump.

There is no satisfactory substitute for quality.



Tools That Fit in a Needle's Eye

(Continued from page 124)

glass slide and size them up under a microscope before putting them in an incubator.

At intervals of an hour or so while these cells are multiplying they are removed and slipped under the microscope again to see whether mutations are taking place in the newborn cells. When one is spotted that differs from its fellows, it is picked up with a minute pipette and put in a separate droplet where its descendants will be kept together.

If this isolated cell proves to be a sort of superman, it may be used to start a completely new culture which eventually can result in a loaf of bread of finer texture and higher nutritional value. If it's a weakling, it's doomed to an early death.

Micromanipulation in telephone laboratories helps make it certain that when you dial a phone you'll get the number you want. Few persons realize the complicated machinery they set in motion simply by taking down a receiver and turning a dial. To get the combination of numerals that represents the number you're calling, you may set to work as many as 5000 relay switches. Dr. Harold Wadlow, microchemist at Bell Telephone laboratories, points out that the deposit of foreign matter as small as a hundredth of a milligram one three-millionth of an ounce-on the contact points of just a few of these switches can foul up transmissions.

"Usually the damage is done by films of corrosion and tarnish or by chemical changes that take place with aging equipment or which come about as an inherent result of the particular combination of materials used," he says.

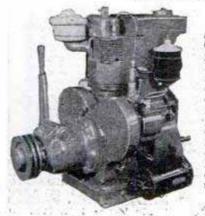
He tells of a group of relay switches that had been gumming up connections because corrosion formed on their fine connecting wires. He put one of these wires under a microscope, and by manipulating a diminutive scalpel and needle he scraped off the foreign material, which weighed only a fraction of a milligram. This infinitesimal substance then was processed in equally tiny amounts of liquids through various tests until the mischief maker was found. It was a chloride deposit which, by corroding the copper wire, had prevented the flow of electric current. The chlorine salts were tracked down to their source and the trouble was eliminated.

"Likewise, micromanipulation often is the first step in paving the way for new designs that make for better service," says Dr. Wadlow. "When microanalysis shows that the tiny specks of rust or corrosion,

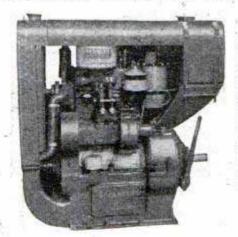
(Continued to page 252)

Sheppard DIESEL Engines

WILL SOLVE YOUR POWER PROBLEMS?



AMAZING SMALL AIRCOOLED DIESEL—Sheppard Model 14—(left),
At last—dependable
Diesel power for garden tractors, sprayers,
other moving equipment, home lighting
plants, machine shops,
compressors, pumps,
saw mills, other small
engine uses! 5.4 H.P.
Availableas power unit
or 2,000 watt generator.



SHEPPARD POWER UNITS (left), 5.4 to 100 H.P. Thrifty, dependable Diesel power to drive portable, stationary and self-propelled equipment . . . compressors, pumps, shovels, mills, conveyors, saws, etc. Proved in thousands of war and peacetime installations, ashore and afloat, during past ten years.

Check These Advantages Against Your Present Power

Fuel Economy: Sheppard Diesels cost only 1/4 as much to operate as equal H.P. gasoline engines.

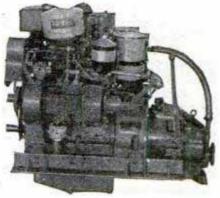
Diesel Dependability, Long Life: In tests have operated 3 to 5 times as long as equal H.P. gasoline engines without breakdowns or overhauls.

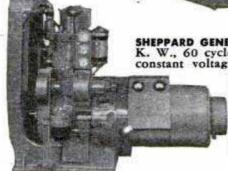
Easy Mointenance: All Sheppard Diesels have fuel injector with only one moving part for smokeless carbon-free combustion; no carburetor; no ignition system. Easily serviced by any average mechanic.

Simple Operation: Electrical pushbutton starter. No operating adjustments; to start in any weather—set throttle, press button; to stop—close throttle. Runs itself.

Delivered Complete: Ready to produce power. No extras to buy. All accessories standard: electric starting (motor, battery, battery charging generator); power take-off with clutch, instrument panel, filters, etc.

MARINE PROPULSION ENGINES AND AUXILIARIES, 8 to 100 H.P. Available with reverse gear, with or without 2:1, 3:1 or 4:1 reduction gears. Auxiliaries come complete with fire and bilge pump, compressor, generator. Ready to operate. No extras to buy. Mail coupon for further details.





SHEPPARD GENERATING SETS, 2 to 36 K. W., 60 cycle A.C. or D.C. Supply constant voltage. Exclusive Sheppard Load-Control . . automatic starting and stopping of generator by load demand on A.C. power circuit. Dependable power for farms, camps, service stations, hatcheries, boats!

Mail this FREE BOOKLET COUPON Today

DEALERS! Complete your line of engines and equipment with Sheppard. Send coupon for Sheppard Diesel franchise plan. No obligation.



GET FACTS on how Sheppard Diesels can do your small power jobs at amazing savings in fuel costs, upkeep, and do the jobs better due to long life, dependable operation! Mail coupon now for free illustrated data sheets, facts, specifications, figures. No obligation!

R. H. SHEPPARD Hanover, Pa.	CO., INC., Dept. P-3	3
Send me further interested in (che	information on Sher	opard Diesels. I am
☐ Dealer Franchise ☐ Power Units	☐ Original Equipment ☐ Generating Sets	☐ Air-cooled Engines ☐ Marine Engines
Name Address	·····	
City	Zone	State

DIESEL'S THE POWER Skeppards THE DIESEL

LOOK! PHOTO BU

A FEW OF THOUSANDS FROM OUR NEW 1948 SPRING-SUMMER CATALOG-WRITE!

MERA



The FALCON takes 16 clear pictures on 127 roll film . . . snapshot or time exposures . fixed-focus, easy to operate. Reg. price \$3.98. Special at

carrying

Q

OTHER

FOTO-VALUES

QUE

1948

SPRING-SUMMER

TALOG

1/1/11/4/

ROLL FILM

SENSATIONAL SPECIAL!

FRESH GAEVERT SUPERCHROME 127 size, Reg. 27c ONLY 18c

120, 620 size, Reg. 33c. ONLY 22c

116, 616 size, Reg. 42c.ONLY 28c

Minimum Order - 6 rolls



MOVIE CAMERA



Lektro Jr.

Electric-drive, magazine-load uses standard Kodak magazine film. F3.5 anastigmat lens . . . other fine features. Complete with battery.

Sole leather compartment carrying case - \$14.00

FILM MOVIE

KODAK SUPER-X

Spooled from Gov't. surplus. Tested — Guaranteed

8mm. 25 ft. \$165 Dbl. 8.

16mm. 50 ft. \$250 Magazine.

16mm. 100 ft. Roll



Prices include Automatic-Machine Processing.

SPECIAL OFFER





Winder and 100

100 ft. film only,149

SLIDE PROJECTOR

Famous MARTON SLIDE PROJECTOR



2 x 2 slides. Lightweight cast aluminum. 4" Dou-blet lens; ventcooled carrier; triple condensers: 100 watt lamp.

FILM PROCESSING LABORATORIES

Fotoshop's new Automatic Processing Machines assures finest 8 and 16mm, processing. Also duplicating, tilling, editing, Write for prices.

128 PAGE 1948 VALUE CATALOG

Brimming over with thousands of wonderful Photo Values—for the be-ginner — the advanced fan — the pro-fessional. Write for your FREE copy fessional, today,



WRITE 23D

18 East 42nd St.

136 West 32nd St., New York City

SURPLUS MONEY BARGA

A FRACTION OF ORIGINAL COS



HYDRAULIC PUMP

No. 1—New, gear type hydraulic pump: 1000 p.si., pulley drive. (Pulley not included). Ideal for hydraulic rams, struts, concrete machine (blocks) or any place power is needed. Built by Pesco. Readily converted for \$9.95 Shp. wt. 5 lbs. Each



AIRPLANE GENERATOR

No. 2-Ideal for use on boats, trucks, light and power plants, light welders, water wheels, etc. 24 volts, 25 amps, RPM 2500, ½ inch diam, shaft. Measures 10x5 in. diam, Actual weight 23½ lbs. Guaranteed brand new. Shp. wt. 28 lbs. Two for \$30.00. \$17.50

All F.O.B. Houston. Mail orders promptly filled. Send check or money order. Satisfaction guarantee

AERO INSTRUMENT COMPANY, Dept. PM 3 MUNICIPAL AIRPORT HOUSTON, TEXAS



SWEDISH SUPERDETAIL SHIP MODEL PLANS

Scale 1/s" = 1 ft. (1:100)
World's largest 5-masted fullrigged ship "PREUSSEN,"
complete plans consist. of: 2
sheets 40"x28" printed in black
line white paper, with English text \$3.00 p.p. Due to
lctions, please send cash with order. Please write your
reas in black letters.

exchange restrictions, please send

ESKADER-MODELS, Gumshornsgatan 8, STOCKHOLM, (Manufacturer of models for the Royal Swedish Navy) SWEDEN.

DRILL



Sharpens round shank drills from 3/32" to 1-1/16" in diameter, up to 11" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only \$2.95 At Dealers or Postpaid

CRANDALL MFG. CO. 1512 W. Slauson, Dept.



EARN MONEY WITH THE WONDER VISE

It's pleasant, profitable work. No experience or skill required. Easy to learn, Full line of guaranteed Stringing Tools, Frames, Gut and Silk Strings. Every item high quality,

W. A. BICKEL & CO. 803 South Boulevard, Dept. A-60, Oak Park, III.



Gerstner TOOL CHESTS

More years of satisfactory service built into Gerstner Chests for Machinists and Toolmakers.

GERSTNER TOOL CHESTS

ASSORTED SPRINGS

FOR REPAIRING

AND REPLACING

POSTPAID

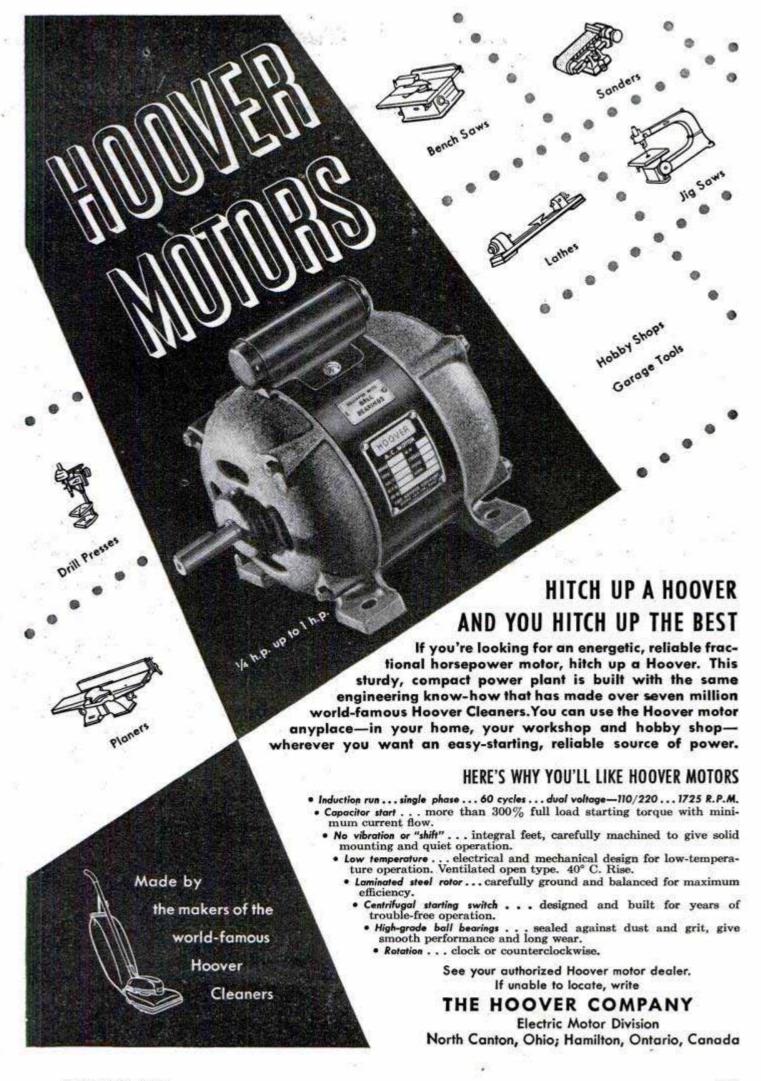
handy SPRING kit Wide assortment of compression, extension and torsion springs-just what you need for a multitude of

odd jobs requiring use or replacement of springs.

High quality—same springs that are made for topnotch manufacturers to their rigid specifications. Several dozen springs in kit.

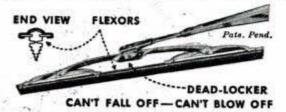
Have the Handy SPRING Kit handy. Send a check or money order right now to Department B

NEW ENGLAND SPRING MFG. CO. Unionville . Connecticut



ANCO CLEAR-FLEX

WINDSHIELD WIPER BLADE



FLEXES TO CLEAR THE LOW SPOTS

Know CLEAR-FLEX... the first Wiper Blade to conform fully to all windshield surface irregularities. Even wipes uniformly all types of curved windshields. Keeps clear those annoying hard-to-reach low spots common to all FLAT windshield glass. Clears quickly blinding road muck...slapped against your windshield from sloppy pavements... by passing cars. CLEAR-FLEX already has engineering approval for original equipment on coming models of high-grade cars.

THRILL WITH CLEAR-FLEX AS OUR "GUEST"

Deposit with your dealer only the regular retail price. Use CLEAR-FLEX through the next storm. Then IF you are willing, dealer is authorized to remove CLEAR-FLEX and refund all your money.

ANCO DEAD-LOCKER®



WIPER ARM

ANCO Arm fits quickly any wiper shaft. Suits any good wiper motor. Holds Blade true . . . at correct pressure. If not now on your car, ask serviceman to install a PAIR quickly for you. More than 250,000 good gas stations and service stores sell ANCO BETTER Blades and Arms.

Made by the makers of long-famous ANCO RAIN-MASTER® Blades and Arms... original equipment for years on DeLuxe models of high-grade cars. Your dealer knows ANCO.

Get yours next time you buy gas. May save you a costly smashup.

Quality Protected Under Fair Trade Laws ANCO Patented Products—Patents Make Jobs

THE ANDERSON COMPANY

Established 1918

GARY, INDIANA

which we manage to pry from faulty apparatus, are caused by exposure to the weather or to various operating conditions, our engineers devise new ways of protecting the parts from these ravages."

Pinning down the cause for failure of this intricate equipment, except through costly trial and error, would have been impossible only a few years ago because of the lack of tools small enough to obtain samples of the foreign particles doing the dirty work. Now micromanipulation is solving the riddles.

"Chessie" Has That New Look

(Continued from page 111)

There's no pounding on the rails in the 500. Instead of the heavy, counterbalanced drive wheels of the conventional steam engine, the 500 has 40-inch drivers that roll as smoothly as the wheels on your car. That means longer life for miles of expensive track.

By now the 500 is in open country and you look at the speedometer. The needle is hovering around 75 miles an hour. That's the speed limit here and the engineer takes his hand off the throttle. It's on the seventh notch. The engineer grins.

"Sure like to be able to pull it back to eleven!" he says.

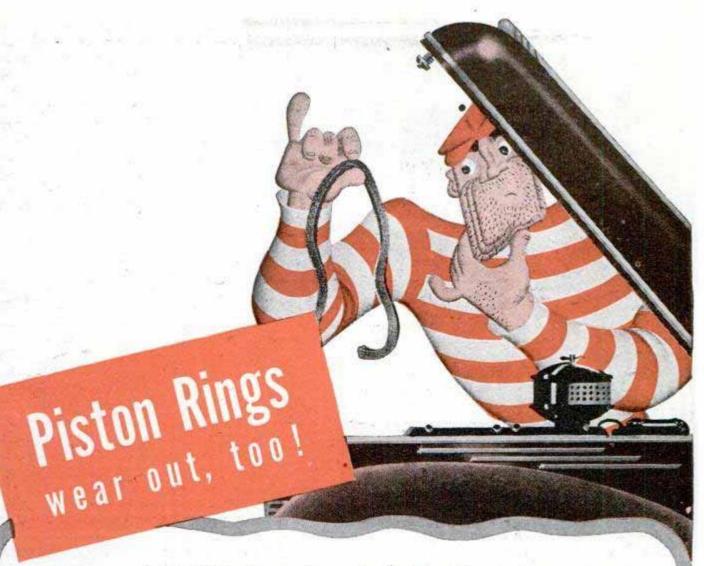
Far down the track you can see a grade crossing. The engineer squeezes the whistle control. Faintly you hear the deepthroated whistle of the 500. At this speed the whistle behind you can hardly be heard inside the cab.

Ahead the lights of a town appear. The engineer pushes back the throttle and as the huge engine rolls quietly toward the station he applies the train brake. Smoothly, the train pulls down to a stop. With the locomotive standing still you hear plainly the hiss of the stoker jets and the clangclang of the bell.

There's no puffing of smoke and no soot. The smoke problem has been solved by two turbine-driven fans that force air over the firebox when the locomotive is stopped or moving slowly. Air mixes with the coal gases causing almost complete combustion. The 500 is the first C & O main-line locomotive to use over-fire air.

Just now the 500 is breaking in at the unromantic task of hauling freight. But soon the 500 and two sister engines will pull the new luxury trains, the "Chessies." These ultramodern coach trains will make the Washington to Cincinnati daylight run in 11 hours and 45 minutes. Included in the "Chessie" will be a special

(Continued to page 256)



... and Oil Pumping is the First Symptom

It's possible to ignore oil pumping for a while, and to continue buying and wasting oil. But this kind of neglect is bound to cost real money later because oil pumping and engine wear go hand in hand.

Destructive engine wear is not far off when oil pumping starts.

By installing Hastings Steel-Vent Piston Rings promptly you can check this engine wear, stop oil pumping and restore performance. It's the best money you can spend on your car. Hastings Manufacturing Co., Hastings, Michigan. Hastings Ltd., Toronto.



HASTINGS

STEEL-VENT PISTON RINGS

TOUGH on Oil Pumping
GENTLE on Cylinder Walls

MARCH 1948 253





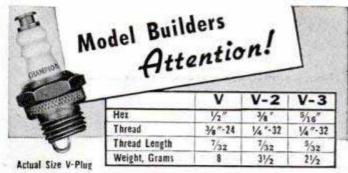
MOTO-SAV

THE AMAZING ELECTRIC SCROLL SAW

Boys from 8 to 80 (and girls, too) have fun with a Moto-Saw...it works more like masic than any tool you ever saw! It takes no effort to run, no perceptible pressure to feed. Runs 7.200 strokes a minute... easily cuts intricate scroll designs in medium hard wood up to 34" thick. Blade holder faces blade 4 ways . . . permits you to saw sideways as well as forward and backward. No limit to length of stock it will cut . . . saws to center of 19" widths. Moto-Saw is as safe as a hand saw . . . has only two moving parts . . . never needs oiling. Uses 110-120 V. 50 or 60 cycle A.C. (only). Thousands of satisfied users.

MONEY-BACK GUARANTEE: If your dealer does not yet have Moto-Saw, send only \$5.85 . . . we'll pay postage. Or send \$1, and pay postman balance plus postage. Money back if not delighted after 5 days' trial,

DREMEL MFG. CO., DEPT. S-118-C, RACINE, WIS.



Champion Spark Plugs for model gas engines give the same dependable performance as regular Champions. Champion Ceramic insulation - Sillment sealed. Alloy needlepoint electrodes for easy starting. One piece construction.

CHAMPION

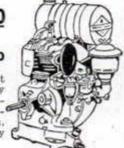
SPARK PLUG COMPANY . TOLEDO 1, OHIO

11/2 HP. MODEL N - GOVT. SURPLUS

Special Low "as is" price

In good operating condition with \$4450 30 day written guarantee

Engines will develop almost 2 Hp. at 3600 RPM. Hurry don't wait, buy now while limited supply lasts. Suitable for lawn mowers, garden trac-6 tors, motor bicycles and scooters. midget cars, etc. Will power many kinds of machinery.



Write for Descriptive Circular

MIDWEST SURPLUS SALES CO. 1520 LOCUST ST.

WOODWORKERS CONSTANTINE MASTER MANUAL

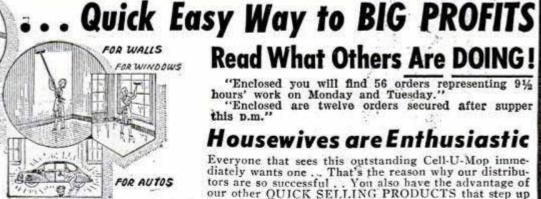
Get the Most Fun From Your Hobby Indispensable to woodworkers. Newest, bigge edition, more pages, more color, helpful how to-do-it articles, pre-war and new items, mor bargains. Send 25c today and we will include FREE!FULL YRS. SUBSCRIPTION to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON. Inc. 791-F: 135th Street, New York 54, N. Y.





Hands Never Touch the Water-Can be put in Boiling Water. Housewives Like It.



48" Long Handle

Read What Others Are DOING

"Enclosed you will find 56 orders representing 91/2

hours' work on Monday and Tuesday."
"Enclosed are twelve orders secured after supper this p.m."

Housewives are Enthusiastic

Everyone that sees this outstanding Cell-U-Mop immediately wants one ... That's the reason why our distribu-tors are so successful . You also have the advantage of our other QUICK SELLING PRODUCTS that step up your Volume Sales and Profits.

Sales QUICK, EASY Every Locality

SALES ARE EVERYWHERE . . Sells quick to Taverns, Clubs, Hotels, Hospitals, Stores, Restaurants, Large and Small Buildings and the Homes . . Scores can be sold on a single street out the Water so thoroughly that HANDS NEVER TOUCH THE WATER. Makes no difference what you ever sold, you will like this proposition. Your name on a Post Card will bring you FREE PARTICULARS.

CELL-U-MOP CO., Dept. P-3 FREEPORT, III.

We Teach You How

Gets down under and around for MOPPING, DUST-ING or WASHING

WORK OF TOOLS IN 1

DOES THE

Get Choice Territory NOW!

Holds 20 times its weight water.



Dependable

CHAMPION

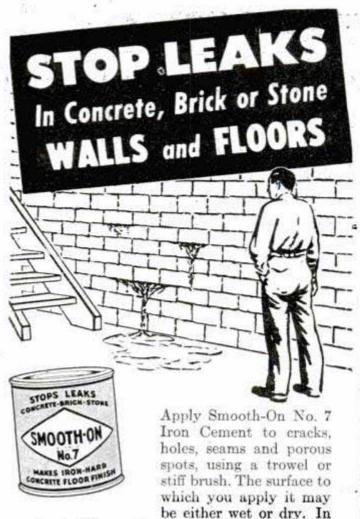
America's Favorite Spark Plug



Your choice of Champion Spark Plugs for your car is made easy and sure by the fact that Champion has consistently been America's favorite spark plug, and is backed by performance records unequalled by any other. Champion Spark Plug Company, Toledo 1, Ohio.

FOLLOW THE EXPERTS—DEMAND NEW DEPENDABLE CHAMPIONS FOR YOUR CAR
Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

MARCH 1948 255



about 24 hours the Smooth-On will have set hard, sealing the leaks. It will stay in place, because it expands slightly as it sets.

Use Smooth-On No. 7 also to line cisterns, swimming pools, troughs, fountains, septic tanks, etc. Use it to seal openings where piping passes through walls.

Buy Smooth-On No. 7 in 1-, 5-, 25-lb. or larger size at your hardware store; if they haven't it, write us.

FREE REPAIR HANDBOOK

40 pages. 170 illustrations. Clear, simple directions for stopping leaks, sealing cracks, tightening loose parts in household equipment and autos. Every home needs this useful repair guide. Just mail the coupon for YOUR free copy.



Sian		CJ	NIO	MA/_
	ana	sena	NU	VV-

SMOOTH-ON MFG. CO., Dept. 37C, 570 Communipaw Ave., Jersey City 4, N. J.

Please send me a Smooth-On Handbook.

Name		
Address		
Address		

3-48_

Do it with SMOOTH-ON NO. 7 IRON CEMENT

kindergarten coach under the direction of a nurse so that mothers can relax during the trip. There'll be movies on board, individual radios in every seat, news bulletins will be flashed on moving ribbons of lights at four places on the train. Telephone calls will be received en route. A lighted map will show the train's location at all times. A tavern car will provide snacks at all hours and a new dining system will eliminate waiting in line for meals. If your taste runs to reading, there will be books and magazines in a library.

The coal-burning, turbo-electric 500s have accepted the challenge of the oil-burning Diesels and no matter which wins, the result will be better railroads and increased service for their passengers.

Weekend 49ers

(Continued from page 167)

beds and the beds of navigable rivers, areas below high tide, and certain other lands including the sites of proposed reservoirs. This still leaves hundreds of thousands of square miles of territory, especially in the region from the Rockies to the Pacific, open for exploration.

There are two kinds of mining claims. A lode claim covers a vein of ore such as quartz and a placer claim covers all other types of mineral deposits including gold-

bearing earth or ceramic clay.

A lode claim may not exceed 1500 feet in length along the vein nor more than 300 feet on each side of the middle of the vein. Placer claims may be up to 160 acres in extent, with eight persons named as locators. Boundaries of a claim must be marked either by sturdy 4-foot posts or by stone monuments 3 feet high at each corner. For lode claims similar markers are erected at the middle of each end boundary in addition to the corner posts.

Likewise a discovery monument is placed at the point where the discovery was made. Attached to this monument is the notice of location consisting of a written statement that includes the date, name of the locator, name given to the claim, a description of the claim including the number of feet claimed each way from the point of discovery (placer claims may be designated by acreage), and the distance and direction from the point of discovery to permanent landmarks. The notice needs no witnesses. It is left at the point of discovery, protected in a bottle or can.

A copy of this location notice must be filed with the county recorder within a time period that varies with the different

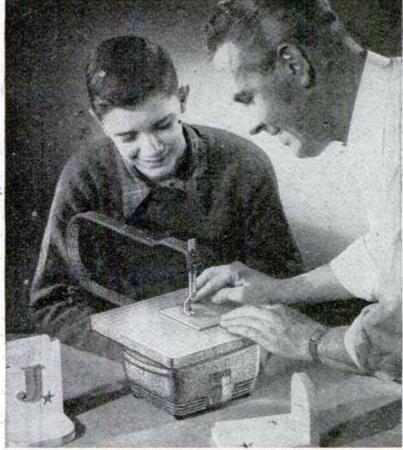
(Continued to page 260)



PORTABLE ... SAFE ... CUTS CLEAN, SMOOTH!

CRAFTSMEN! PARENTS! Get SYNCRO... the remarkable, safe, patented magnetic jig saw... ready for immediate shipment! Use for fun or money making! SYNCRO needs no belt, no gears, no oiling. No rotating motor to buy. Just plug in any 50 or 60 cycle (A.C. only) 110-120 volt wall outlet—in kitchen, attic, basement—set on kitchen table, floor, anywhere—and saw! The high-speed short Magnetic Safety Stroke Action, and freedom from belts makes SYNCRO so safe small boys and girls may use it. Cuts intricate designs on %" soft wood, ½" medium hard plywood and thinner hardwoods, plastics, thin metals. Leaves no ragged undersides on plywood, cardboard. Cuts to center of 27" circle! SYNCRO is the biggest, most powerful, safest—and has the greatest clearance (13½") and largest table top (10" x 10")—of any magnetic jig saw made! Base, 7½ x 634". Get, enjoy this safe, educational, practical quality tool for making models, displays, puzzles, inlays, silhouettes, toys, whatnots, etc. Limited supply—so

DELUXE JIG SAW



WHY SYNCRO SAWS ARE

SYNCRO has no continuous cutting blade nor Long Stroke blade to pull fingers into teeth — instead there are 14,400 strokes per minute — 7,200 short cutting strokes plus 7,200 upward NON-CUTTING, REPELLING strokes! (Fig. 1) SYNCRO will not even CUT wood unless piece is pushed FIRMLY DOWNWARD AGAINST blade and FIRMLY FORWARD — both actions at SAME time! SYNCRO blade teeth cut ONLY on DOWN stroke. (Fig. 2) Teeth raise, repel, push away any object on UP stroke. (Fig. 3) When blade moves UP it KICKS finger away free. On down stroke, blade does not move far enough to accidentally cut finger unless finger is intentionally, deliberately fed into blade like wood is fed in Figure 1. No wonder SYNCRO is the world's SAFEST saw

. . a feature old and young users acciaim!

users acclaim!



No. 2000

15 SYNCRO FEATURES

World's safest saw. Portable, No rotating motor needed as self-contained magnetic power unit transmits A.C. magnetic impulses to armature-diaphragm-power transferred to blade. No rotating parts to wear out, 14,400 magnetic strokes per minute. Never needs oiling. Large 10" x 10" table top, Cross section engraved lines on top. Big 13½" throat clearance. Finest steel blades. Rubber feet. 5' cable, plug. Varying voltage adjustment nut, Lifetime, durability. Quality materials, workmanship, performance.



Order with complete confidence on this liberal Trial Offer. When you get your SYNCRO, plug it in and saw, as per directions. Then, if it does not saw cleaner, better than any other jig saw you ever used, and with more safety...

if it does not satisfy YOU . . . return it undamaged, postpaid and post-marked within 10 days of its delivery date . . . and we will refund the saw price promptly without question!

SYNCRO SAW CORPORATION

DEPT. A-38

ROCHESTER, MICHIGAN

City.

Export Address: 120 Wall St., New York City WORLD'S LARGEST MAKERS OF ELECTRIC JIG SAWS

Complete With Cord. 3 Blades See Your Dealer First

SYNCRO SAW CORPORATION, Dept. A-38 ROCHESTER, MICHIGAN Export address: 120 Wall St., New York City
Gentlemen: Here's my order for one SYNCRO MAGNETIC JIG SAW, Model 2000, Shpg. wt. packed, 18 lbs. \$17.50 FOB Factory. Please send it complete with electric cable and plug, 3 blades, on your 10 Days Money Back Trial Offer.

1 enclose \$17.50 as payment. Please ship saw:

Express charges collect or Dercel Post charges collect.

Express, for which I enclose an extra 8. □ Parcel Post, for which I enclose an extra 8.

Name. St. and No.

☐ I enclose no money — send FREE SYNCRO Circular.



"Best Results with Jitterbug"

"Fred Arbogast Co.: Your Jitterbugs caught these bass at Indian Lake, New York. They weighed 63/4 lbs., 6, 51/4 and 4 lbs. each. We use many of your baits but have best results with the Jitterbug." Fred & Bill Tripton, Maybrook, New York.

Fascinating Action!

Jitterbug's exciting surface action fascinates fish and fishermen. Bass strike it furiously. And the action is right on the surface where you can see, hear and feel it. These noisy wobblers take bass day or night. Many northern pike and occasionally muskies are caught on Jitterbugs. Try them.



Send for Free Catalog
FRED ARBOGAST & CO., INC.
1623 North St., Akron, O.

NYDRAULIC

KRWISON- TO THE



McCambridge & McCambridge



KINKADE GARDEN TRACTOR

A Practical Power Plow and Cultivator for Gardeners, Suburbanites, Florists, Truckers, Nurserymen, Fruit Growers. Easy Terms - Write Today

American Farm Machine Co. 1058 33rd Ave. S. E. Minneapolis, Minn.





Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Arbor Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses. Write for your copy today.



K. R. WILSON, DEPT. 17, 215 MAIN ST., BUFFALO 3, N. Y.
Builders of Shop Equipment for Ford Dealers Since 1916

GENERAL ELECTRIC TRANSCEIVER

TWO-WAY COMMUNICATION

10 times as powerful as a

> walkie talkie

A brand new twoway communication
set which cost the
Army over \$400.00 and is ideal
for two way communication
between house and cars, office,
service trucks, ambulances,
boats, etc. Range up to 15
miles in the 450 to 500 Megacycle band. Operates in the
new citizens band. Supplied
complete with 15 tubes and
conversion instructions to operate from 110 V A.C, Add postage for 25 pounds. age for 25 pounds.

A brand new two-

ACCESSORIES NEEDED
PE101C Dynamotor for 12
or 24 Volt storage battery
\$3.95

operation\$3.95
110 V A.C. Power Supply
to operate BC 645 from
house current\$11.95

\$14.95 2 \$27. T-32 Table Microphone\$2.95 Microphone Transformer....\$1.00 5" PM Speaker for BC 645 \$2.80

GN58 GENERATOR

Makes excellent home lighting plant, makes excellent home lighting plant, operated by wind propeller, waterfall, gas engine, or hand crank. Reduction gear allows full output at slow speed; supplies 6 volts at 2.45 amp., 425 volts at .115 amp. New. Add postage \$7.95



DYNAMOTORS

\$1.95 An electric motor operating a generator on same shaft—hundreds of uses—gives high voltage from stor-

uses—gives high voitage from age battery.
Dynamotor C—Input 28 volts, output 220 volts at 60 MA. Add postage for 6 lbs.
Dynamotor A—Input 12 volts, output 1000 volts at 350 MA. Shipping weight, 72 lbs.
Dynamotor B—Input 6 or 12 volts, output 500 volts at 160 MA. Shipping weight, 30 lbs.

BRAND NEW ARMY AIR FORCE

ASTROGRAPHS With Case

New B29 navigation instrument which can easily be used to make a good contact printer, strip map holder, etc.
The plywood case 14½"x11"x10" high is perfect as a tool kit, camera, projector case or for building a portable phonograph, picnic kit, make up case, etc., has leather handle reinforced covers. 8 covered compartments covers, 8 covered compartments in bottom. Cost Gov't \$125.00. Add postage for 20 lbs.



ASTROGRAPH FILMS

7¼° S. to 37° S. 23½° N. to 8° S. Your Choice 68½° to 54¼° N. 28° S. to 45° S. \$2.50 Ea \$ 2.50 Ea.



\$14.95

HEATHKIT AMPLIFIER KIT

Complete kit INCLUDING TUBES and 110 V A.C. 60 CY TRANSFORMER to build a high fidelity amplifier for radio, phonograph and public address use. Has two preamplifier stages and push pull phase inverter output using 1619 (military type 6L6) tubes. 25 Watt output. With complete parts and instructions. Add postage for 25 pounds.



Complete kit to assemble a 1 Watt battery operated amateur 80 meter transmitter including tube and crystal. Range up to 500 miles. An ideal beginner's kit. Uses Army parts all brand new. Only accessories needed are sending key and batteries. A complete transmitting station for only a few dollars. Complete instructions supplied. Add postage for 2 pounds.

postage for 2 pounds. Key—add post, for 2 lbs.\$1.00 Batteries—add post, for 4 lbs. 3.25



\$3.95

MINIATURE HEADPHONES

S1.00

Hearing aid type, comfortable, keeps out outside noise, one of the army's best types. Add postage for 2 lbs.

T32 TABLE MICROPHONE



RADIO B-UILDERS' KITS

Power supply kit to convert to army radios 110 VAC 5" P.M. loudspeaker for army radios Experimenter's Kit, 5 lb. of radio parts for \$1.00 Kit of 20 radio tube sockets for Kit of 20 Bypass bathtub condensers Kit of 10 radio volume controls Kit of 10 Midget variable condensers .. Kit of 100 color coded insulated resistors \$1.95

RADIO SHOPS write for Free literature on Heathkit service instruments.

J.S.

G. E. CIRCUIT BREAKER

\$2.95 Protect your electrical equipment, eliminate fuses. 50 AMP 220 Volt rating. Add postage for 4 lbs.

THROAT MICROPHONE

anannan kanan kanan

Used by army in noisy applications in aircraft, tanks, etc. Many inter-



G.E. BC375

TUNING UNIT

A beautifully constructed tuner containing the best in variable condensers, coils, vennier dials, etc., at least \$30.00 worth of parts, complete with conversion instructions to transmitter and receiver. Add postage for 20 lbs. \$2.49

MINIATURE MOTOR

24 V. D.C. size 1 ¼ "x1"x2" Add postage for 1 lb..... POWER SUPPLY KIT to convert motor to 110 V. A. C. Add postage for 6 lbs.....\$2.49



No Orders Under \$2.00 Add postage for weight shown. Write for Flyers listing hundreds of other electronic bargains.



COMPAN BENTON HARBOR, MICH.



NORIZONTAL BORING ON THE LATHE . . . is easier and far more accurate than with brace and bit . . especially good when piece is too long for drill press. Extension bits and a JACOBS HEX-KEY CHUCK make deep holes easy to bore.

Your lathe can be taught new tricks to multiply its usefulness when you use tight-gripping JACOBS CHUCKS.

Here is just one of many unusual operations you can perform on your home workshop equipment with the aid of JACOBS CHUCKS.

GET GREATER GRIPPING POWER...BETTER ACCURACY...LONGER LIFE WITH JACOBS' NEW RUBBER-FLEX COLLET CHUCKS

Exclusive, bonded rubber-and-steel construction . . . no loose jaws . . . no springs . . . not harmed by oils or coolants. Real precision chucks at popular prices. See them at your local hardware dealer's.

IF IT'S A JACOBS ... IT HOLDS



HEX-KEY CHUCK . . . fits drill press spindles — motor shafts — jack shafts. With Morse taper arbor, fits lathe head-stock, tailstock. 4 models, capacities to 1/2", fits 1/2" or 1/2" shafts.



HAND-TITE CHUCK . . . fits all hand tools and power tools with threaded spindles . . . used on polishing heads, bench grinders, flexible shafts, etc. 3 sizes . . . capacities to ½". Models to fit ½-24, ½-20 and ½-24 threaded spindles.

Jacobs Chucks

Have The Rubber-Flex Collet Its Parallel Bite Holds True And Tight



The JACOBS MANUFACTURING COMPANY 150 Jacobs Road, Hartford 2, Conn.

Please send me your new illustrated folder on the Jacobs Rubber-Flex Hex-Key and Hand-Tite Chucks.

NAME	 	 	••••	•••	 ٠

STREET	•••••		••••
CITY	ZONE	.STATE	

states. Some states require that a certain amount of work such as sinking a 10-foot shaft be performed within 30 or 90 days and that a statement to the effect that the work has been done be filed with the county recorder.

From then on a minimum of \$100 worth of work per year toward developing the claim is required and a yearly affidavit attesting to the work must be filed. This legal provision was suspended during the

war but is now in force again.

There's more to prospecting than luck. Weekend 49ers are discovering that it means work and study. But sometimes they hit the jack pot! As one man said, "If we make a strike, that's good; if we don't, it's still fun."

Deep Sea Rodeo

(Continued from page 119)

weighing 151½ pounds, caught by Nick Kinzbach of Tampico.

(2) Acapulco—a 9-foot 10-inch sailfish weighing 114 pounds, caught by Sarah Bright of Greenville, Ohio.

(3) Veracruz—a 6-foot 2-inch tarpon weighing 132 pounds, caught by Jose Igle-

sias of Veracruz.

The attitude of the government toward the angler who comes to Mexico for sport fishing is extremely friendly. Fishing licenses are inexpensive. A citizen or foreign resident of Mexico pays 1 peso for one month, 3 pesos for three months, 10 pesos for a year; the foreign nonresident pays 4 pesos for one month, 10 pesos for three months and 20 pesos for a year. (A peso, remember, is worth about 20 cents in United States money.)

Foreign yachts fishing in Mexican waters are charged 25 pesos a month; small craft are charged 4 pesos a month. Many charter launches are available at Mexico's principal ports with experienced fishermen and tackle. The price depends somewhat on size and condition of the boat—ranging from a few pesos an hour up. There are no established prices and a little good-natured bargaining is usually in order.

Mexican customs regulations are extremely lenient about tackle and fishing equipment brought across the border. It is best to bring as much of it as possible, for the added thrill of using your own equipment.

In addition to deep-sea fishing, Mexico offers a limited amount of lake and stream fishing. The government has established hatcheries and is stocking streams and

(Continued to page 264)



HERE'S BIG VALUE! MODEL No. 1

MOTO-TOOL KIT Only \$17.50

his popular Kit contains he smaller, lighter Model 1) Moto-Tool and 44 accessories in attractive, lacquer-finish wood ox. It's the biggest argain in the field, MOTO-TOOL KIT No. 2

With 23 Accessories (HIGH SPEED STEEL Cutters, Grinding Wheels, Polishing Accessories)

MONEY-BACK GUARANTEE: Buy Dremel Moto-Tool from your dealer. If he cannot supply you, order direct on 10 day trial, money-back guarantee. Shipped post-paid for payment in full (send check or money order): or send only \$2, we will ship C.O.D. You pay postman balance plus postage.

DREMEL MANUFACTURING COMPANY . DEPT. 118 C . RACINE, WIS.

A SHOP-TESTED TOOL

Moto-Tool is backed by over 10 years of industrial use . . . packs extra years of pleasure . . . yet, due to increased production, prewar prices still prevail!

About 27,000 R.P.M. Cuts Cleaner . . Saves Cutters

LOOK FOR THESE MOTO-TOOL FEATURES

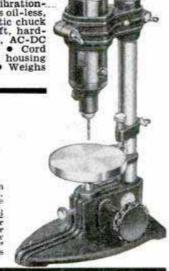
Approximately 27,000 R.B.M. plus: dynamically balanced armature provides vibration-less finger-tip control. Moto-Tool has oil-less, sealed bearings • Patented automatic chuck lock pin • Over-size armature shaft, hardened, ground, polished • 110 Volt, AC-DC motor • Sliding snap-type switch • Cord protector • Shock-proof bakelite housing • Dust-filtered air-cooling system • Weighs only 13 oz.

New DREMEL DRILL PRESS

Only \$9.95

(Less Moto-Tool)

Here's a light, portable precision drill press at an amazingly low price. Just the thing for creating costume-jewelry, model making, wood carving, routing, etc. Utilizes Model No. 2 Moto-Tool, which can be raised or lowered, swung in any direction or quickly removed in a few seconds for off-hand use. Drill Press stands 12" high. Base is 634" x 4". Weighs approximately 31/2 pounds.



Do You Ride a Bike? Here's the Real



for all Bicycles

- LEVELS ROUGH ROADS
- PREVENTS BROKEN SPOKES, WHEELS, FORKS
- MAKES RIDING SMOOTHER, SAFER
- . EASY TO INSTALL

A Shockmaster and front wheel shock absorber, Ruggedly constructed of nickel plated steel and engineered for years of real service. It'll pay for itself in added pleasure, saves tires and eliminates many costly repair bills. 20.000 satisfied users. Order yours today. Only \$3.69 postpaid. No C.O.D.'s. Complete satisfaction or money back. Dealers Wanted.

H. M. GIBB and COMPANY
1304 PENOBSCOT BLDG. DEPT. A DETROIT 26, MICH.



Timest) ORNADO GAS TORCH

The Modern Way of Soldering

Ideal for hard and soft soldering. Will heat quickly; solder will flow freely and smoothly. No compressed air required. Self-adjusting. Safe. Economical. Can be used for annealing Safe. Economical. Can be used for annealing small parts and bending metal parts. Generates a heat of 1700° F. Simply connect to any illuminating gas jet with a rubber hose and operate. Tornado Torch No. 119 comes with three tips. (1/8", 1/4", 3/8" blast).

Tornado Gas Torch No. 119 — Complete with 2 tips, for Natural Gas or Bottled Gas; with 3 tips for Manufactured Gas. \$2.95 per set. See your dealer or order direct. Send check or money order — post paid.

Robco Corporation, 202 E. 44th Street, New York 17, N. Y.



able resiliency and strength of resintance and strength of resintance at the person of the person of

fly casting models. Buy at your sports store.

FREE TACKLE BOOK and Pocket Fishing Calendar.

Reels, Rods, Lines, Accessories, Fishing tips. Send coupon.

Shakespeare Company Dept. 83, Kalamazoo 2, Michigan Send me your FREE TACKLE BOOK and Pocket Fishing Calendar.

Name.,... (Please write address and zone No. below)



5 DAYS TRIAL!

\$14<u>95</u>

FOB

NEW WONDER TOOL Ready!

The remarkable Bandsander Economy Homeshop Model is again available to hobbyists, craftsnen, model-makers, etc. for immediate shipment! Try it 5 days in your own workshop. See how it quickly shapes, sands, carves and polishes wood, metal, plastics—how it works equally well on inside cut-out openings or irregular outside edges, on intricate scrolls, curves! Gets at places no other can! Patented. Tilting table for bevelling, chamfering. Rust-and-sweat proof top. Seif-oiling sleeve bearings.

sleeve bearings.
Saves time, labor, money. Normal band speed 1600 feet per min. gives



ORDER NOW or Circular FREE!

Order-or write for details on "the machine that amazed the experts!" Send postal NOW.

MEAD SPECIALTIES CO. 4114 N. Knox Ave., Dept. 138, Chicago 41, 111.

"I THREW MY OLD TOOL BOX OUT



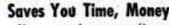


Treat yourself to the **newest** in tool box styling and arrangement! Two big lift-out trays, each $1\frac{3}{4}$ " deep, have removable partitions to make any conceivable arrangement. Newest rounded-corners; streamlined cover with easy-grip, steel core leather handle; continuous piano hinge; modern chromium plated hardware. Richly finished in latest gray wrinkle enamel, baked on. An outstanding ruggedly-made steel box, at only \$7.75, prepaid to your city (\$7.85 in south and west; \$7.95 Pacific Coast states). The finest tool box in our 20 years of box-making! At your dealer . . . or send check or money order. MASTER METAL PRODUCTS, Inc., 277 Chicago St., Buffalo 4, N. Y.



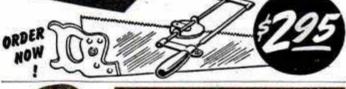
Practical, safe, low cost Highway Runabout with all the snap and looks of the finest midget track racers. Home assembly keeps cost low. Just bolt together from our factory built parts. Immediate delivery. See how easy it is: 24-page assembly book, drawings, photos, blueprints, Plus detailed illustrated circular \$1, (refunded first order). Circular only — 25c.

MIDGET MOTORS MFG. CO. Athens, Ohio The SPEED SAW FILER



Now you can do expert saw filing at home. Lifetime tool makes precision filing easy for even the most inexperi-enced. Two simple adjustments make in fit any type hand saw. Keep your saws extra sharp and true-cutting with a Speed Saw Filer Complete with file, ready to use. Money back guarantee. Cash with order, prepaid (C.O.D.

THE SPEED CO., Dept. PM 2025 N.E. Sandy, Portland 12, Ore.





Spotwelded Heavy gauge steel REDUCED PRICES!

est. 1.19
ADD 10c ea. to all 8" prices for hubcap.
10", bronze hub, \(\frac{1}{2}\)'' bearing, 1.75 semipneumatic tire, ea. 2.19
10", \(\frac{1}{2}\)'' KILIAN Ball Bearings, 1.75
semi-pneumatic tire, ea. 2.29
Add 10\(\frac{1}{2}\) to ALL prices for P.P., 15\(\frac{1}{2}\) west of
Miss. Check or moneyorder anty. We guarantee
satisfaction. Mail order NOW!

C. W. YOUNG MFG. CORP.
300 Burnet Ave. Syracuse, N. Y.

New MILLING ATTACHMENT



Sizes for 8" to 16" metal lathes

BUILD IT YOURSELF from our sets of semi-machined castings and save \$8. Can be finished on your lathe alone. Complete working drawings and step-by-step in-structions furnished with castings.

Mill keyways, slots, splines, dovetails, flutes in reamers, taps, hobs, and special cutters; produce spur, bevel, mitre and worm gears, ratchets and racks: mill flat surfaces, square shafts, mill hexes, spot face, drill spaced holes, bore, etc. on your lathe with this precision attachment. It has a T-slotted table, a vise which swivels for angular milling, a gear cutting fixture and dividing centers.

FREE! Illustrated folder and price list. Includes milling cutters, keyway cutters, drill rod, slitting saws and many hard to get shop items. Mention your lathe. Write today.

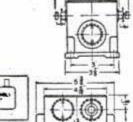
HURON MACHINE AND TOOL CO.

Just the thing for the Home Work Shop, Hobby Shop, Bench Work, Ani-mated Displays, Light Production work, Used daily in thousands of homes and shops. Sturdy, compact. (see dimensions), Case of aluminum. Gears, SAE 65 (British) Gear Bronze. Worm of case hardened steel. Timken Bearings throughout. Torque capacity 100 inch pounds. Available in 4 different assemblies (shown below) and in these standard ratios:

25-1 200-1 30-1 75-1 300-1 10-1 40-1 80-1 400-1 50-1 20-1 60-1 150-1 800-1

When ordering be sure to specify as-sembly and ratio required. Shipping weight in carton. 8 lbs. Full money back guarantee. Prompt deliveries.





Maytag Kit

Completely

Assembled

FOR HAND

SAWS

1403 EAST 179th ST. . CLEVELAND 10, OHIO

CONVERT HAND MOWERS TO POWER MOWERS Takes Less than 3 hours

The Handy-Dandy Lawn Mower Kit fits any hand mower from the 16 to the 20 inch size. Complete with all necessary parts. Kits can be purchased separately or complete with power units.

DEALERS WANTED

LE CLAIRE MFG. CO., Le Claire, Iowa

Mfgs. of the Handy-Dandy Aluminum Clothes Pole

AUTOMATIC RETOOTHER

Cuts new saw teeth in 50 seconds - any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job. Write today

for details on GREATER PROFITS FOR SAW SHOPS.

8933-P Venice Blvd. URR MFG. CO. Los Angeles 34, Calif.



Happy evenings for you . joyous days for your children . . . holiday gifts for all. Detailed plans for easy to make, hard to buy toys . . . wheelbarrow, rocking horse,

kiddie push car, scooter and toy wagon. Send just 10c and ask for free list of all the Stanley Plan Sets. STANLEY TOOLS, 138 Elm St., New Britain, Conn.

EMERSON 3 HP MOTOR:

AAF Type D50. This motor can also be used as generator when driven by another motor. Ideal for portable welder, etc. 28 Volts, D.C. Compound, 3800 RPM, 115 AMP, windings glass insulated, blower cooled,

shaft dimension 5/8". Weight 27 Lbs. new \$13.95 each

SEND CHECK, MONEY ORDER or SPOTLIGHT: Made for Air Corps, trigger switch for signalling, second switch for continuous light, 12 Volts, throws a powerful beam, seal beam reflector. For use on farms, around homes, trucks, autos, boats, police cars, fire trucks, etc., complete with 15 ft. rubber-cov-

ered 2-wire cable. Weight 6 Lbs. \$7.95 Each. Extra seal beam reflector, \$1. Each.



SCOOPI We have been awarded 100,000 genuine briar pipes by Quarter-

master Corps. Assorted shapes and sizes. All popular makes. Set of 6, \$3.50

MICROMETER:

Chrome plated, precision engineered and carefully tooled to give long life and highest degree of accuracy.

all new. 1" capacity, \$2.25 2" capacity, \$3.50 Each.

25% DEPOSIT REQUIRED ON C.O.D. ORDERS

TRANSFORMER: Jefferson Electric step up or step down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 Lbs. New. \$7.95 Each.



GOGGLES:

Designed for paratroopers. Unbreakable, laminated, cellulose acetate lenses. Adjustable elastic band Great for motorcycling, speed boating, skiing, hot-rod driving, etc. All new... 2 pair for \$1.00. (One



Type Z - 2" x 1" x %" Mfd. by Microswitch Corp. Can be used normally opened or

closed. For automatic contacting - light, sound, model train systems, chimes, etc. New, 3 for \$1. Aluminum Spring Actuator to fit above Microswitch. 3 for \$1.

ALL PRICES F.O.B. CULVER CITY, CALIF.

CLAMPS: Rubber lined, aluminum, hundreds of uses in any shop. Assorted sizes, all new. 5 Doz. \$1. - 500 \$5.00



polarized and one clear.)

BLOWER COOLER or HEATER: For trailers, autos, offices, darkrooms, homes. DUMORE Motor, 1/6 cont. HP, Amperage 7.5, RPM 6400, 24 Volts. May also be used as dryer. Simple installation,

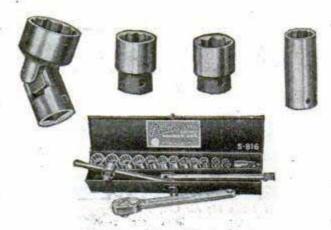
radiator type, copper coils. Transformer advertised in this ad will operate this unit from house current. Weight 13 Lbs. New, \$15.00



CONDUIT WRENCH: Mfd. by JOAR. Jaws pass over conduit, pipe or tubing, slips down to snugly encircle fittings. Slight pressure tightens or loosens fittings. Will not mar or kink material. Set of 8. All new wrenches, Nos. 4-6-7-8-10-14-22-28, (Reg. cost \$50.00), \$10.00 per set. Weight 4 Lbs.

CULVER CITY, CALIF.

SAY YOU SAW IT IN POPULAR MECHANICS



Socket Sets. Sockets . . Parts

Your wrenches are always handy when they're in sets. 38" - 1/2" - 3/4" Square Drive. Ratchets, extensions, speeders, flex and deep wall sockets in rugged steel boxes. Literature aladly sent.



THE BILLINGS & SPENCER CO. HARTFORD & CONNECTICUT, U.S.A.

IT STAYS STUCK!

MULTI-PURPOSE AMBROID

If you want permanent results from an adhesive, you can't equal multi - purpose 'Ambroid liquid cement - for home workshop, household or factory. A quality leader for 37 years, ready-to-use Ambroid is waterproof, transparent, quick-drying, extra strong. Flexible, heat-and corrosion-resistant. For assembling, repairing or mending jobs, keep Ambroid handy. At your dealer's, or send 25¢ for big 2-oz. tube post-paid. Money back guarantee.

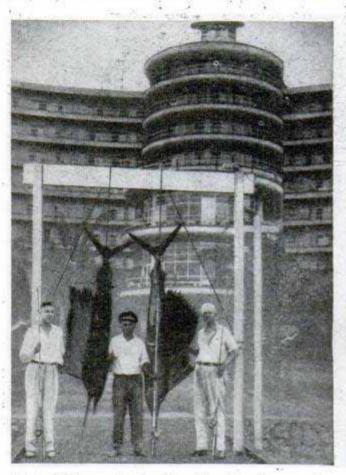
Also 50¢ 4-oz. tube. Pts., qts., gals., for industrial use.



303 Franklin St., Boston 10, Mass.

lakes with trout and black-bass fingerlings. Best lake fishing is to be found between Mexico City and Guadalajara-Patzcuaro, Chapala, Cuitzeo, Lerma and San Miguel Regla. Best stream fishing is to be had in the rivers that tumble out of the Sierra Madre into the Gulf of Mexico-in the eastern states of Tamaulipas, San Luis Potosi and Veracruz. Streams flowing into the Pacific are not satisfactory because they are dry most of the year and rage with muddy torrents when it rains.

In Mexico, a willingness to experiment is often the sign of a successful fisherman.



First sailfish caught at celebration attending opening of the modernistic Hotel Club de Pesca at Acapulco

Insect life in the tropics and subtropics is somewhat brighter-colored than that in the United States. Trout, for example, may take a royal coachman and not even sniff at a brown hackle.

So take a tip, bring along a well-stocked fly book and a wide variety of spinners. Whether you're happiest on the afterdeck of a cabin cruiser plowing through blue waters, or casting a spinner into a quiet lake, or working the riffle of a stream, consider Mexico for your next fishing trip.

Let one angler explain its lure:

"The sportsman will find greater numbers and kinds of game fish in the waters bordering Mexico than he ever dreamed of in any fishing grounds.

(Continued to page 268)

WATERPROOF

FLEXIBLE

READY TO USE

DRIES QUICKLY

TOUGE

INC.

0000000

TUBE

AMBROIL

BOSTON.M

Be "sittin' pretty"

For more fun fishing in 48!

See your Evinrude dealer now!

Here are the facts. Not for years before the war were there Evinrudes enough to satisfy top-of-the-season demand. Now, the number of sportsmen who want Evinrudes only has multiplied many fold. So, if you want fishing features and per-formance only Evinrude offers, it's wise to see your dealer now!

There's a "fishing" Evinrude just right for you. The handy Sportsman and sparkling new Sportwin give you the revolutionary Weedless Drive . . . power revolutionary Weedless Drive . . . power where you please . . . through thickest weeds and over rocks, snags and reefs. For famed four-cylinder performance on larger craft choose the Zephyr or the Lightfour. Look for your dealer's name in your classified phone directory under 'Outboard Motors,' Catalog Free—address EVINRUDB MOTORS, 5707 N. 27th

Motors, 5707 N. 27th St., Milwaukee 9, Wis.

In Canada: Evinrude Motors Peterboro, Ontario



26" BOAT MODELS



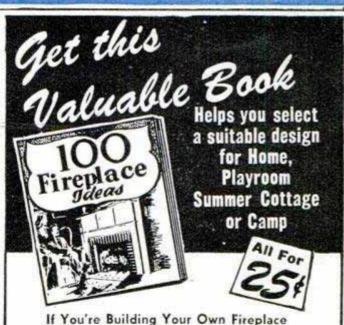
OWENS YACHT CO.'S "FLAGSHIP"-26" ROUND HULL

Full size factory copied plans

Chris-Craft Cruisers—Express Cruisers, Runabouts, Owens Yachts, Harbor's "Harco 40" for mantel, den or actual sail-ing. Fast, strong, waterproof. Built same as actual boat-frame construction. Speeds to 41 M.P.H. with engines. Send 10c for literature on all models, fittings, special motors and drive units. Models endorsed by Chris-Craft, Owens and Harbor Boat Co's. Write Today! No C.O.D.'s.

DUMAS PRODUCTS, 2222L North Farwell Avenue, Milwaukee 2, Wis.





If You're Building Your Own Fireplace here's an easier, fool-proof way to do it.

Choose a design that will look well with the materials you have available. Prepare a concrete or brick slab the size of your fireplace. Center your Fyro-Place, the warm air circulating form, on the base and build around it. You will have a well engineered, successful fireplace. You can't fail. Wrap a quarter and enclose it today for this valuable book.

TANK CORPORATION 8 7 Austin Street Buffalo 7, New York

ALL POPULAR STANDARD EQUIPMENT

START YOUR SHOP NOW! At Home, Garage, Basement, or Shop

OUTFIT INCLUDES:

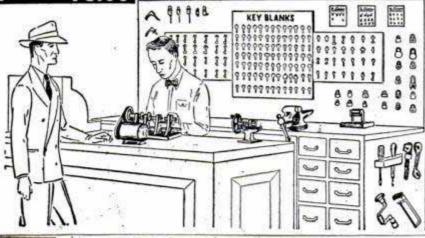
- ONE NUMBER 50 PRECISION KEY MACHINE
- ONE HUNDRED DOZEN POPULAR KEY BLANKS ONE KEY BOARD WITH 100 KEY HOOKS THREE POPULAR LOCKSMITH BOOKS
- ONE SET OF LOCK PICKS
- ONE AUTOMATIC PARTS SERVICE MANUAL TWO LOCKSMITHS' WARDING FILES
- BIG ASSORTMENT OF PARTS AND TOOLS
- ALL NEW MERCHANDISE

ALL FOR \$98.00 COMPLETE

Slightly Higher Out of U.S.A. Worth Over \$150.00, 25% Deposit on C.O.D. Orders.

Start Making Money At Once. Order Your Outfit Today. Satisfaction Guaranteed. Send For Catalog.

REPAIR SHOP SERVICE, Box 264-P, Skokie, Illinois



KEYS MADE WHILE UWAIT



of any kind—Completely Wireless BROADCAST IMMEDIATELY!



Broadcasts through any radio indoors—outdoors—anywhere. It's a completely self-contained wireless transmitter—a marvel of modern electronic engineering. Talk into it—sing into it—and without plugging in—without connecting wires your voice comes booming through any radio set within a 50-foot radius. Use it for fun at gatherings, parties, Mike is not a toy—it's a rugged, sci-

etc. Ultra-Mike is not a toy—it's a rugged, scientifically engineered transmitter in mike form that gives high fidelity — performance.

Loads of Fun — and Practical, Too

Ultra-Mike is highly efficient over a full 50-foot range. It is completely self-contained, with its own tube and long life (easily replaceable) battery. No hook-up or connections are needed. Carry it with you — talk as you walk — and you'll marvel at its fine modulation its full-bodied volume - the clearness with which your voice is reproduced.

ORDER TODAY. SEND NO MONEY.

Just send name and address and we'll send C.O.D. plus postage, or send \$10.00 and we ship postpaid. Don't delay.

MAIL MART INC.

Dept. EC-72

230 Grand Street, New York 13, N. Y.



For Fast, Snappy Drivers Makes your Stop Light Shout, Flashes 115 times a minute. Fully automatic when brake is applied. Approved by leading Safety Engineers. INSTANT ACTING. If your dealer can't supply you, send check or M.O. for \$3.00. We pay postage. Dealers and Agents desired.

MACCHI and COMPANY Patented. Simple to install. 927 Larkin Street . San Francisco 9, California

Ottawa Self-Propelled Buzz Master

CLEARS LAND FAST! Powerful 7-HP motor with friction clutch for safe operation. Cuts down timber, brush and hedge; turn blade vertically and saw logs to length. Also furnished with post hole diggers. Has clutch pulley for belt work. OTTAWA MFG. CO., 1-827 Brush Ave., Ottawa, Kansas

CANVAS COVERS Waterproof tarpaulins, war surplus (Used), perfect condition. Originally made for tents. Approx. 5'x8'. Two buttoned together make approx. 80 sq. ft. Complete with buttons attached. Suitable for use as canvas dams, hay covers, truck covers, machinery and equipment covers, etc. Packed in bales 40 each, priced 40 covers, \$1.00 ea.; 15 covers, \$1.50 ea. Less than 15, \$1.75 ea. All FOB, Kansas City.

AMERICAN SUPPLY CO.

Bept. P. M. Kansas City, Mo.

Other

Like Itt



make your own *Gems*

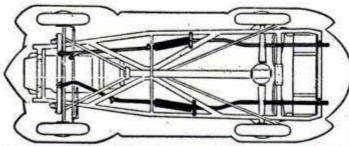
All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, an all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown less motor and belt, for only \$29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.

Dept. S

Burlington, Wis.





935 TO 1947-V-8 FORD AND MERCURY ONLY

Better Gas Mileage

Blow - Out Proof Straight Thru Mufflers

FORD & MERCURY DUAL SETS\$20.00 C.O.D. - F.O.B. Los Angeles Order by Year and Model

No Welding, Cutting, Drilling of Holes. Fixtures Furnished Rubber Insulated Clamps

DEEP TONED Ford, Chevrolet, Ply. \$4.86 SINGLE MUFFLER All others\$5.50 21/2" CHROME TAIL PIPE TIPS\$1.75

Advance Mufflers 6800 SO. VERMONT AVE.



WAR SURPLUS BARGAIN SPECIAL **CENTRIFUGAL PUM**

BRAND NEW!

Ready for Use On Any Liquid Pumping Need

Use It For DRAINING BASEMENTS

HOME WATER SYSTEMS

IRRIGATION

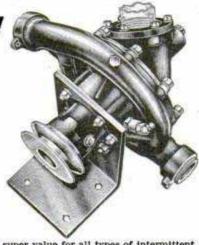
STOCK WATERING

. PROTECTION

PONDS, TANKS, etc.

INDUSTRIAL PUMPING

COMPLETE WITH PULLEY AND MOUNTING BRACKET — READY FOR USE



A super value for all types of intermittent service in pumping large volumes of liquid in home, farm and industrial service. Ideal for home water systems, draining basements, fire protection, etc. On the farm for watering stock, draining ponds, sprinking, etc. In shops and factories for all types of pumping service.

MOVE LARGE VOLUME QUICKLY
When operated at 1750 RPM, will pump
42 gallons per minute on a 23 foot head;
at 3600 RPM on 52 foot head will pump
88 gallons per minute. May be run with
electric motor, gas engine or power takeoff on tractor.

COMPLETE WITH PULLEY AND MOUNTING BRACKET . . . READY TO INSTALL

READY TO INSTALL

Pump has cast aluminum housing—accurately machined brohze impeller vanes. Complete with mounting bracket and 3½" V belt pulley. Shaft rotates on sealed ball bearings with grease gun fittings. Has 1½" threaded intake flange, two 1 inch outlets. Use one or both, as necessary. Made for Packard Motor Car Co, for use in Rolls-Royce Merlin Aircraft engines.

GREATEST PUMP VALUE IN YEARS Original cost approx. \$147.00. Sold F.O.B. Chicago. Shipping weight 23 lbs. Complete engineering reports and operating instructions free with pump. You can't beat this pump value at anywhere near this price. Satisfaction guaranteed. Original Cost Approx. \$147.00.

29.75 F.O.B.



CONTAINS 1 stencil brush; 1 can paint, stencil paste; 1 complete set of metal letters, figures, punctuation and spacers

Here is YOUR identification stencil set: Saves time, money and effort, easy to use, pays for itself. Metal letters, INTERLOCKING to make words. Comes in handy wooden box with sliding top. Ideal for all industries in marking boxes and packages, identifying inventory, numbering doors, etc. GUARANTEED.

with 1" letters . COMPLETE KIT with 2" letters . . \$2.50 Pre-\$3.95 Pre-paid

SUPPLY GROBAN DEPT. PM-3, 1507 S. MICHIGAN AVE., CHICAGO 5, LLINOIS

"Those who have participated in the International Fishing Rodeos held in previous years at Tampico, Acapulco and Veracruz caught game fish in abundance and enjoyed the thrill of holding 'a hot reel and a tight line' on many great fish.

"A new appreciation of fishing and of Mexico awaits those who visit this country of friendly greetings and carefree laughter. It will ever be enshrined in their hearts as it is in thousands of others and in

That was LeRoy H. Dorsey of Chicago speaking—and he should know what he's talking about.

Hedge-Hopping Highway Engineer

(Continued from page 135)

pass over the bump a little of the excess oil is jarred from the bottom of the car. This results in a widening of the natural road oil streak, just beyond the bump in the direction traffic moves, which is quickly discernible in a strip photograph.

The design of new highways will be as sharply affected by this method of studying pavements as surface maintenance problems have been. Pavement cracking may be due to the soil on which the surface is laid, or to the surfacing material itself.

By referring to soil maps, the Indiana engineers could study the Sonne pictures, which had been flown for stretches of pavement on the state's highway system at altitudes of 100 to 400 feet, and make accurate interpretations as to which of these causes of breakdown was responsible in a given area. Where poor aggregate in the surfacing material caused the breakdown, the highway experts could refer to the construction records and find that aggregates (usually those containing chert and other impurities) were always present where the breakdowns occurred. Needless to say, future highway surfaces will not be made of these aggregates.

An early result of this new method of studying highways through strip photography will be its effect upon traffic safety. Because the airplane moves so speedily compared to the vehicular traffic below, a very true picture of traffic distribution and density is provided. The causes of congestion and the resulting sources of accidents can be quickly discerned and appropriate corrective measures can be taken. Also, the location of bridges, sharp curves, railroad crossings and other danger points that need posting can be quickly located.

The discoveries of Professor Woods and his associates may have far-reaching results, not only for the state of Indiana, but for the entire nation.

Groban Really Offers Bargains — Available Now!

BARGAIN SPECIAL



AUTO COMPASS

Know where you're going at all times with this NEW North Star brand auto compass. Easily mounted on automobiles, aircraft, boats, etc. Comes complete with mounting bracket and instruction sheet. Can be manually adjusted. Easily compensated. Formerly \$7 \$4.95—NOW



GRINDING WHEELS

Actually Worth \$50.00!

A wonderful buy! 350 pieces incl. 35 ass't. Grinding and Cut-off wheels up to 10 inches diameter. 1/16 to 11/4" face, 1/5 to 3 in. holes. Ass't grits—all brand new—Made by Norton, Carborundum, Macklin, Bay State, etc. Also included are 100 slotted disc cloths; 100 paper discs: 10 pencil rolls; 20 abrasive strips; 2 felt bobs; 2 felt wheels; 1 4" rag buff; 3 honing stones; 10 abrasive sleeves; 10 mounted stones, 1/8 and 1/4 shank; 2 mandrels; 2 rotary files, 1/4 shank; 50 abrasive discs; 2 72" abrasive belts; 5 9x11 abrasive sheets.

SATISFACTION GUARANTEED. 350 PIECES - Ass't sizes FOB Chicago - ALL FOR ONLY.....

HAND GRINDER

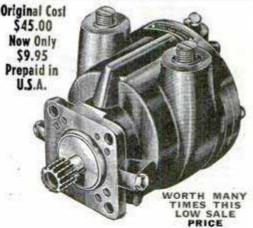
41 Piece Assortment

For home and Shop—Packed in attractive set-up box as illustrated. Would cost well over \$15.00 if bought separately! Consists of: 20 Mounted Stones. Assorted shapes and grits, all on ½" shanks. 10 Mounted Stones. Assorted shapes, all on 3/32 inch shanks. 10 lx½x½ inch grinding wheels. Top quality and all brand new. 1 ½x½s inch Mandret.

SATISFACTION GUARANTEED -POSTPAID IN U.S.A. COMPLETE 41 \$4.95

BRAND

WAR SURPLUS



BRAND NEW! VACUUM-AIR HYDRAULIC GENERAL PURPOSE PUMP

Use Them for OIL BURNERS

> SPRAYING MACHINES

MILKING MACHINES

COMPRESSORS

VACUUM PUMPS

HYDRAULIC SYSTEMS MANURE

LOADERS PRESSES, etc. • Originally cost \$45.00. May be used as air or fluid pumpfor pressure or vacuum. Standard 3½ inch pipe thread with interchangeable ports. Will pump 71/2 gal. SAE 30 oil per minute at 300 RPM. Builds air pressure of 30 lbs. per sq. in. at 1000 RPM. Vacuum will draw 26 inches of mercury at 1750 RPM. Develops up to 120 lbs. per sq. inch of hydraulic pressure, which in conjunction with a 3 inch hydraulic cylinder will lift 840 lbs. minimum. Runs forward or reverse. Self aligning shaft. Die cast aluminum housing 6x4x4 inches. Has stainless alloy steel vanes and impelier. Made by Bendix Avia. Corp. Spline terminal for direct drive-readily replaced with a pulley. Recommend a 1/4 H.P. or stronger electric motor. Rated capacity 1500 RPM with high overload factor. Special price for quantity users. Complete lilustrated engineering report and instruction booklet FREE with every pump. Send check or 50.95

HI-PRESSURE CYLINDER

NEW, 11½"x2". 1C63A
1800—P.S.I. Can be filled
with CO2 and used as tire
inflater or fire extinguisher. Also as pulsating tanks,
storage tanks, Wheel control
brass valve. COST THE
GOVERNMENT \$9.80. NOW ONLY.....
\$1.95



CLUTCH WITH UNIVERSAL JOINT

Brand new. merly used on amphibious Jeeps. Has shaft 3 ft. long and 5 inch pulley .

with ball bearings in pulley, can be used for power take-off with winch and hoist.

Only \$4.95

Worth a lot more!

AUTOMATIC PILOT SERVO UNIT



24V. electric motor with **U. S. Surplus Bargain**

POLAROID GOGGLE KIT



150 PIECE ASSORTMENT MOUNTED STONES, FILES, BURRS, BUFFERS

Amazing value for home and shop! There are hundreds of uses for this great array of wanted parts.



is great array of wanted parts.

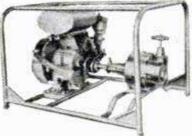
3 Fast cutting grinding wheels 3/4x1/g"
8 mtd. grinding stones on 1/g" shank
4 Cutters, ass't snapes 1/g" snank
4 Mtd. wheels on 3/32" shank
100 Emery discs, 7/g" med. grit
2 3/4x1/sx1 /16" rubber wheels
1 Circular saw 3/4x.023x1/g"
1 3/4x3/32 mtd. wire brush
3 Ass't bristle brushes, mtd.
3 1" sewed muslin buffs
3 Cutters 3/32" shank
5 1/gx1/16" mandrels
6 7/g" cut-off wheels
1 Roughing stone

REGULAR RETAIL VALUE over \$20.00. NOW—for years of \$7.95

GROBAN SUPPLY CO. DEPT. PM-3, 1507 S. MICHIGAN AVE., CHICAGO 5, ILL.

269 **MARCH 1948**

BRAND NEW GOVERNMENT SURPLUS EQUIPMENT



portable pumping units, gaso-line engine driven rotary pump, good lift and pressure, 1½ in. suction, 1¼ in. discharge, adjustable flow control. Direct connected to Johnson 4 cycle gasoline engine, foot starter, develops about 1¾ h.p. mounted in steel frame base, capacity to 3000 gals. per hr., can be used for pumping water, gaso-line, kerosene, distillate and most oils.

Price complete boxed F.O.B. . . \$96.00 As above, less engine F.O.B. . . \$35.00

As above, less engine F.O.B...\$35.00
Suction hose, wire wound 16 ft.
length with connection...\$ 6.50
Discharge hose, wire wound 20
ft. length with connection..\$ 6.50



ELECTRIC HEAVY DUTY PORTABLE DRILL

Electric 3/4 in. drill 110 volt A.C. - D.C. 3/4 in. Jacobs key chuck takes 3/16 in. to 3/4 in. (incl.) standard round shank drills. Easily handles 3/4 in. drill in metal, 13/4 in. in wood. 2 speed switch in handle 275-375 r.p.m. chuck speed. Heat treated machined steel gearing enclosed precision ball bearing equipped. Oilematic safety clutch. 50 ft. extra heavy oil and weather proof Electric cord with grounding wire. Electric motor, switch, gearing and housing made by nationally known precision manufacturer in U. S. Each drill carefully tested and packed in original individual shipping carton with cord, chuck wrench and instructions. with cord, chuck wrench and instructions.

with cord, chuck wrench and instructions.

PRICE COMPLETE F.O.B. \$56.50

A limited quantity of each item available. Send check or money order.

Money refunded if condition not as represented new and unused.

All prices quoted are only a fraction of the original purchase price.

PRONTO MOWERS, Oldsmar, Florida



SAY YOU SAW IT IN POPULAR MECHANICS



Price \$2.75 without Leads, \$1.50 additional for Leads. Order TODAY. STAR FUSE CO., 233 Canal St., New York 13, N. Y.

PRECISION JEWELERS SCREW DRIVERS Complete Set of 8 for Every "Hobbyist"



At last—a complete set of precision screw drivers to meet the needs of every model builder. Not a miniature but the same type sat used by U. S. Navy for precision instruments and watches during the war. Brass knurled handles, hexagon haads, finest tempered steel blades. Sizes 2-9. Never before a set of this quality and precision at such a low price. Your money back if not satisfied. C.O.D. \$2.00 plus postage or send \$2.00 and we pay postane. Eldridge St. New York 2. N. Y. &

PINE WATCH CO., Rm. 40A, 29 Eldridge St., New York 2, N. Y.

SINGLE PHASE COIL HEAD



ADDRESS.....

A fast and simple setup for winding single phase stator coils. Winds any length coils for motor slot length up to 6 inches, with 15 various widths. For motors up to 1 and 2 horse power.

The head is made of aluminum, weighing less than eight pounds. Has one inch hole and key-way for mounting on drive.

ETCHER ELECTRICAL SPECIALTY CO.

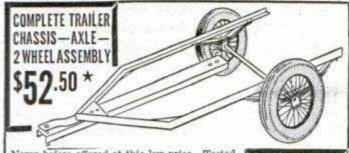
WITH CHUCK New 90° angle—5/32". With Jacobs chuck. \$28.00 value at this low price......

Mail orders Rushed, Send check or money order - No C.O.D.'s.

LEVINS SONS

	1322 CAL	LOWHILL	ST., PH	ILADELP	HIA 23, PA.
UT	ILITY	CAL	BINE	T	
36 4-7"	Roomy Cor Drawers wi Partiti	th Remov	ts vable	1	
A Thou	sand Uses For				
HOBBY	ISTS	-	THE 88	Same of the last	60.00
MECHA	NICS	(Upper land		The said	\$2.98
DRAFT!	MEN	100		1	plus
TECHN	ICIANS	100		2000000	postage
fishing Made of Strong	ne workshop, ry, garage, c and hunting, heavy gauge airplane co of—Rust proof	aluminum.			Shipping Weight 2 lbs., 8 ozs.
			and sen	d with mo	neu
NAM	E				

Enclosed find check or money order for \$2.98.



Never before offered at this low price, Tested to carry 1000 lbs. — built to take hardest usage . . . COMPARE! — in constructionutility-value! You'll agree there's nothing

YOU GET: Complete draw bar assembly, chassis of steel angle, 2 automobile type springs; 2 wheels with Timken roller bearings take standard 4.75 x 19 tires, 2 hub caps and grease rings . . . 91" Overall, 57" Tread. Less Tires, Tubes.

*Shipped KD., F.O.B. Yonkers or send \$10 and balance C.O.D.

UNIVERSAL YONKERS CORP., 137 Alexander St., Yonkers 2, N. Y.



PLYWOOD BOAT KITS



This READY-CUT 12 ft. fishing boat can be assembled in 8 hrs. without forms or special tools. Kits are complete including all hardware, paint, and etc. Send for free folder.

TAFT MARINE WOODCRAFT

Dept. E, 636 39th Ave. N.E.

Minneapolis 18, Minn.

Why Buy Expensive Equipment?

MAKE THESE CONCRETE BLOCKS AT LOW COST FOR YOUR OWN USE OR FOR SALE WITH EQUIPMENT YOU CAN MAKE FOR LESS THAN \$3.00 AND A FEW HOURS TIME.



THIS BOOKLET CONTAINS SIMPLIFIED BLUEPRINTS. INSTRUCTIONS AND PHOTO-ILLUSTRATIONS FOR THE "PLANS SYSTEM" OF MAKING CONCRETE BLOCKS WITH A MINIMUM OF EFFORT AND EQUIPMENT.

VIRGINIA, MINNESOTA

\$1.00

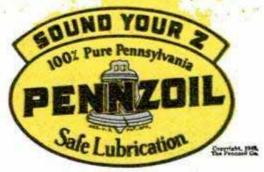




BE FAIR TO YOUR HAIR Want better looking hair? Embarrassed by falling dandruff, itching scalp? Then try VITABRUSH, new electric driven scalp brush that gives your scalp a vigorous and invigorating "workout" in just three minutes of fun. Cleans scalp. Stimulates blood supply. Restful. Pleasant. Write today for complete information and satisfaction-guaranteed offer. Hershey Mfg. Co., 3714 Field Bldg., Chicago 34



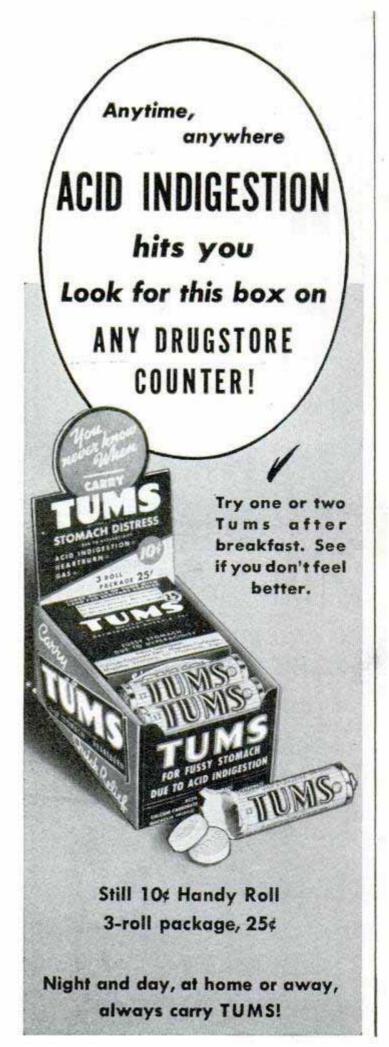
Protect your engine the instant it starts, and give it lasting safety for long, hard driving . . . Pennzoil's double action gives you both.



At this sign of better dealers, coast to coast

Tough-film PENNZOIL* gives all engines an extra margin of safety

MARCH 1948



Uncle Sam Weighs His Resources

(Continued from page 93)

to many important products. A quarter of it goes into electrical manufacturing, an eighth into wire and rod, a tenth each into building and automobiles and the remainder into light and power lines and miscellaneous products. With production in the next few years running an estimated 33 percent behind demand we shall have to import copper.

Stockpiling of critical materials from foreign sources as insurance in case of war is on a small scale and some skepticism concerning its long-range success has been expressed. Doubts are based on two factors: To be successful it will cost billions rather than millions of dollars, sums which are subject to the approval of a Congress which changes annually; and, such stockpiling is in reality part of an arms race, which means that exporting nations may feel it is against their interests.

Some of the materials to be piled and their uses are: antimony (compounds, lead alloy); asbestos; chromium (steel alloy, plate); copper; diamonds (cutting tools); lead; manganese (steel alloy); nickel (steel alloy); tantalum (electronic tubes, cutting tools); tin; tungsten (steel alloy, cutting tools, electronics); zinc; bauxite (aluminum); cobalt (cutting and die metals); graphite (lubricant, making of crucibles); and mica (electronic equipment).

The iron-ore outlook might be considered alarming in view of the federal estimate of only 73 years' reserves (the Twentieth Century Fund sees only enough highgrade ore for 11 years) but there are vast reserves of brown ores and magnetite which experts say we can learn to recover economically. Bauxite isn't very plentiful, but aluminum can be made from clays which we have in quantity.

Magnesium, baby of the mass-produced metals, mates nicely with aluminum, manganese and zinc and can be "mined" from sea water, although brine wells, magnesite and dolomite ores are richer sources. We have lots of nitrogen, potash and phosphate rock to fertilize the earth—if we don't let the earth get away from us.

We are said to be only six inches from starvation, the half foot of fertile topsoil that covers our productive land. The Department of Agriculture says that of our 460 million acres of high-class cropland, all but 70 million needs protection from erosion. The Federal Bureau of Reclamation and the Army Engineers are combining their efforts in the Missouri River

(Continued to page 276)



purses, wool-skin toys and mittens, many other useful items. Wide line to choose from. Moderate priced tooling leathers as well as top quality calfskins. All tools and accessories. No experience necessary; instructions come with materials. Send ten cents at once for catalog.

C. LARSON COMPANY 4232 ARTHINGTON ST., CHICAGO 24, ILLINOIS

\$20000 NAVIGATOR'S SEXTANT \$1750 GOV'T SURPLUS



A precision instrument of recognized quality. These Link Sextants are used for navigating by the stars or other celestial bodies, on large and small boats—for all types of aircraft—anywhere on the face of the earth, The Sextant is to the mariner what the transit is to the surveyor.

FINEST PRECISION CONSTRUCTION

These fine Link Sextants are the product of a famous name manufacturer. Original procurement cost was approximately \$200.00. Now, as war surplus, you can buy one at a fraction of original cost. Instrument is equipped with easy-reading vernier type scale. Bubbles are checked for accuracy. Although slightly used, they are in perfect operating rondition. Furnished complete with operating instructions and protective wood carrying case 8x12x4 inches. These are guaranteed to be the genuine Link A12 Sextants. Sold FOB Houston. Send check or money order. Rush your order.

AERO PARTS SUPPLY, Dept. PM3

MUNICIPAL AIRPORT

AVES MANY ELECTRIC APPLIANCES



NICHROCITE REPAIRS HEATING ELEMENTS Simply overlap ends, apply Nichrocite Paste and turn on current. Used by large utility companies. Trial order, \$1.00; 4 oz., \$2.50; 1 pound, \$8.00.

COSOM INDUSTRIES, Dept. A 4234 25th Ave. S., Minneapolis 6, Minn.







THE FIRST TOOL OF ITS KIND AND TODAY'S FINEST Smooth, steady power at your fingertips! Perform precision operations not possible with any other portable tool! With a Handee you can turn out professional looking projects for pleasure or profit-ship, plane and train models, delicate, internally carved costume jewelry, wood carvings, puppets, initialed tumblers, etc. AC or DC. 25,000 r.p.m. Wt. 12 oz.

> **GET A GOOD START** GET THE HANDEE KIT

HANDEE Tool and 40 most popular accessories packed in compact steel carrying case. You'll be amazed at what you can accomplish! Com-

plete, \$27.50. Handee only, with 7 accessories \$20.50. THE URSELF OR A FRIEND ...



NEW PLASTIC-CRAFT KIT

For internal carving. Contains special plastic cutters, buffers, sanding discs, buffing compounds, dyes, cement, a liberal supply of clear plastics, and instructions. At stores or postpaid\$6.95

*Reg. U. S. Pat. Off.

Get a Handee at stores everywhere. If they can't supply you we'll send it postpaid. Satisfac-tion guaranteed! Ask for free 52-page Manual

		*******	•		
CHICA	GO	WHEEL	ě.	MFG.	CO.

1101 W. Monroe St., Dept. PM, Chicago 7, III.

Send ☐ Handee Kit ☐ Handee Tool ☐ Plastic-Craft Kit ☐ C.O.D. ☐ Remittance enclosed ☐ Send Manual

Name	•••
Address	

MARCH 1948 273 **WE'LL TRADE AN** ACRE of plowed ground for 2 packs of cigarettes*!

The price of two packs of cigarettes is all it'll cost you to plow an acre with the powerful, easy-handling 11/2 H. P.

BREADY GARDEN TRACTOR! BREADY. with all-purpose, year 'round implements, does all the work on small acreage and is a profitable auxiliary on larger farms!



THE BREADY TRACTOR & IMPLEMENT CO.

SOLON, OHIO

Proved by Big Truck Fleets-Now Available to Motorists!

Scientific Discovery **Ends Auto Radiator** Rust-Ups!

Installed in radiator hose. Butler De-Scaler's galvanic cell action dissolves scale and rust throughout cooling system— keeps water crystal clear, mineral free,

274

BOX NO. 230

At last—modern science ends your auto cooling system troubles caused by rust and scale! The amazing Butler De-Scaler, used in industrial bollers for over ten years and successfully proved in thousands of trucks and buses from coast to coast, is now available to car owners. De-Scaler's silver-plated coil and Butler-metal core, installed in radiator hose, produce a galvanic cell action that dissolves existing scale, prevents further formation—thereby prevents rust-ups, boiling over, pump and thermostat troubles due to scale. Guaranteed for 1 year or 25,000 miles. Does not interfere with anti-freeze or stopleak. At service stations, garages and car dealers, \$4.95 Fair Trade List Price. Butler Engineering Co., 2622 Rousseau Street, New Orleans 11, La.

TLER De-Scaler

Butler De-Scalers are available for use in home hot water systems, boilers, Diesel engines, etc.



Works with your electric drill, flexible shaft or chuck equipped motor. Speeds up all grinding, sanding and polishing jobs—fits any 1/2 inch cluck. Rubber face plate flexes into curves for fast, smooth, clean work, Outst includes 61/2 inch rubber disc, with metal flange and shank, fibre backed sanding disc, and heavy sheen's wool polisher. Makes your drill the equal of any 875.00 grinding or polishing outst. Satisfaction guaranteed. \$4.95 Order today. Shipping wet. 2 bs. F.O.B. Chicago, Only DEALERS WRITE

PREHLER PROVED PRODUCTS

Division Norbert Prehler & Co. Dept. PM3, 1623-5 Milwaukee Ave. Chicago 47, III.

Easy way to remove paint

Write for WONDER-PASTE leaflet

In refinishing furniture, woodwork, etc. all cracked or peeling portions of the old finish should be removed. It's easy with WONDER-PASTE REMOVER. Applied with an ordinary paint brush, this remarkable paste quickly softens up the toughest finish, whether paint, varnish, enamel, lacquer or shellac. Will not run, even on an upright surface. Turns the finish into a soft sludge that comes off easily at every stroke of the scraper. A long-time favorite of painters. Get Wonder-Paste at your paint or hardware store. Write for Wonder-Paste leaflet, and for advice on your particular removing problem. advice on your particular removing problem.

Wilson-Imperial Co., 119 Chestnut Street, Newark 5, N. J.

8-inch STEERING W

For Soap Box Racers.. Toy Autos.. only Car Bikes .. and other vehicles \$ 125

B-inch compression molded plastic steering wheels, with heavy steel insert. Knurled on one end to keep wheel from working knurled on one end to keep wheel from working loose, and hole through other end for securing unit to he steering shaft. Black in color, \$1.25 postpand. Send check or money-order, Immediate delivery.

Junior-Pro Products Co. 300 Marganiard Rd.



COMPOSITION FLOORS

wei, Soray III Mold Novelties, Statuary, Art Goods in Flexible Plastic Molds, 5c material makes \$1 seller, Make MARBLE; ZED FLOORS, tile walls, Coloriul, glossy, amazing; Easily learned; start in garage or basement. Particulars free. MARBLEIZING SERVICE, Dept. 10-E, Edwardsville, III.



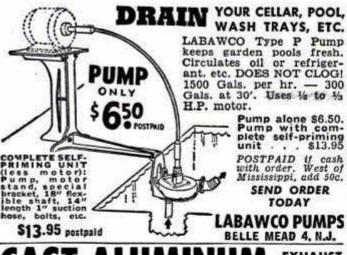
Be permanently tooled-up for every operation on **vour Metal Cutting Lathe** The ACE Set is complete-there's nothing

The ACE Set is complete—there's nothing to buy. Drop forged by the manufacters of cutting tools used by 96 per cent of the plants and shops in industry they are correctly designed, are of special steel, are finely finished, are steel, are finely finished, are steel, are finely finished, are steen, are finely finished, are time. You can cut easier, is after a not more accurately with ACE TOOLS.

Store— The Complete Steel Culture in Street Steel Culture in Str Tools, 2 Cuthing

Tool, Baring Tool Threading Tool, High Speed Steel Culters and

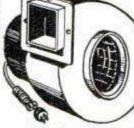
ARMSTRONG BROS. TOOL CO. IT FINES SHEET CES "The Tool Holder People" 5268 W. Armstrong Ave., Chicago 30, U.S.A.



EXHAUST BLOWERS

NOW! Only \$10.00

FOR WORK SHOPS, DARKROOMS, CELLARS, ATTICS, LAUNDRIES, ETC. 110V. A.C. 50-60 CYCLE. Cord attached ready to plug in. Delivers approximately 100 cubic feet per minute. Satisfaction guaranteed.



\$3.95

DOUBLE EXHAUST \$15.85

Send check, money order. West of Mississippi add \$1.00 for mailing, handling, IMMEDIATE DELIVERY. Service men and dealers: Inquire about quantity discounts.

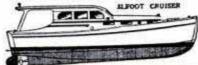
(Dept. M-3) 137 Alexander St. YONKERS 2, N. Y. UNIVERSAL YONKERS CORP.

NEW! ROTARY SANDER FOR DRILL PRESS OR ELECTRIC DRILL

No Gluing - No Special Discs Uses 3" square of any paper. Change in one minute without messy gluing. 3%" shank for drill press. 34" shank for electric drill, Specify size. Write for literature on other time-saving tools.



FULLSIZE, CUT-TO-SHAPE BOAT PATTERNS

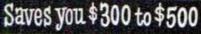


and specifications. Designed by Navai Architect. Cruisers, run-abouts, sloops, outboards, sali-ing cance, etc. Low prices, Send 10c (coin) for illustrated catalog. SPECIAL: Send \$1.00 for "HOW TO BUILD BOATS" book, postpaid.

Cleveland Boat Blueprint Co. Dept. 666, Cleveland 13, Ohio

All kinds. Highest prices paid for jewelry, rings, spectacles, gold teeth. diamonds, broken and usable watches, etc. Cash mailed diamonds, broken and usable watch Holland Bldg., St. Louis 1, Missouri

With this HOBART "Build your own" Combination A.C. Welder and Power Generator



over cost of factory built machine. This one, that you can build your-self, ARC WELDS and POWERS TOOLS and ELECTRIC LIGHTS ANY-PLACE. Valuable to garages, farmers, contractors and others who want to double their earnings by doing repair and construction work in places where electric power is not available.



Furnished with pulley or shaft for coupling to your own engine

Hobart Brothers Company Box M385. Troy, Ohio One of the World's Largest Builders of Arc Welders."





Tremendous power under control. Top speeds, or slowest trolling —your Mercury responds instantly to the throttle. Full-Jeweled Power* proved through thousands of hours of operating performance provides the "guts" for seasons of the toughest outboard operation . . . gives MERCURY parts an anti-friction ride on ball and roller bearings . . . See the full MERCURY line at your dealer. There's a model for every outboarding need.

	Write for FREE Illustrated Broch and name of you MERCURY dea	ure
	NAME	
	ADDRESS	
CLIP AND MAIL TODAY	CITY	STATE

basin to save soil, control floods, provide water for irrigation and industrial power.

The Twentieth Century Fund estimates that an annual depletion of about 16 billion board feet of lumber is whittling down our forests slightly, but feel that better fire control, and increasing use of substitutes leave us with the future secure. The Forest Service of the U. S. Department of Agriculture, however, gloomily reports that our present lumber shortage may grow worse rather than improve because we are not growing enough trees. It sees a need for about 42 billion board feet of lumber in the coming years and a maximum output of about 33 billion board feet.

Our water power is by no means fully developed and, if it were, it could produce about one fourth the energy produced by coal each year and 40 percent of that produced by petroleum and natural gas.

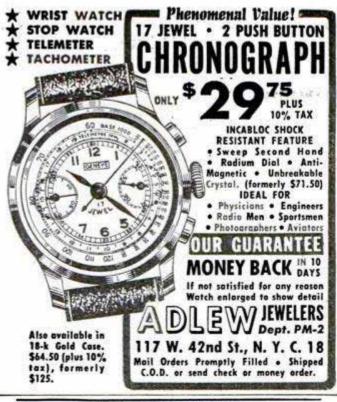
Standing out like a beacon among our resources is uranium, the mighty metal which provides the charge for the atom bomb and may, within comparatively few years, be an important source of industrial power. The most recent Bureau of Mines Mineral Yearbook reports that we had important reserves, possibly second only to those in Canada and the Belgian Congo, before World War II, but security restrictions blanket the results of what must have been incomparable prospecting since 1939. Qualified authorities estimate the advent of commercial electric power from this source anywhere from 1951 to 1960.

The estimates of our wealth contained in a recent report by the Bureau of Mines and the Geological Survey are in the table below. The reserves are expressed in years of consumption at the average annual rate of consumption from 1935 to 1944:

MagnesiumUnlimited	Fluor Spar33
Nitrates Unlimited	Bauxite23
SaltUnlimited	Zinc20
Bituminous Coal	Gold19
and Lignite4386	Copper19
Phosphate Rock 600	Petroleum15
Helium 235	Silver13
Anthracite Coal 187	Cadmium11
Molybdenum 157	Lead10
Rutile 124	Vanadium 8
Potash 99	Manganese 4
Iron Ore 76	Platinum Metals 3
Ilmenite 73	Antimony 3
Arsenic 55	Mercury 2
Natural Gas 55	Tungsten 2
Cobalt 53	Tantalum 1
Sulphur 39	ChromiteLess than 1
Bismuth 36	OM OME OF THE E
Dismum 30	

The same report states that we have negligible reserves of mica, flake graphite, tin, long-fiber asbestos, nickel, industrial diamonds and quartz crystal.

Even though we're well off as a nation, experts advise us to draw with care on our bank balance, cashing in our natural resources as slowly as possible.



WAR SURPLUS! HIGH SPEED DRILL B



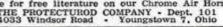
LIKE NEW! Original value over \$16.00. 25 assorted sizes and lengths. \$2.50

Send check, money order or cash. Shipped F.O.B. Culver City. Weight 1 Lb.

AIRBORNE SALES CO. INC. CULVER CITY, CALIF.

WOO-WEE

Reproduces "Wolf Whistle" better than any sailor. Screeches, barks, whistles, imitates siren, moves any "road hog" off the highway in "double quick plus." Attract more attention than by driving a yellow Cadillac. Operates from manifold, Installed on any car in 15 minutes. Sturdily constructed, Cloverest novelty since the use of the auto. Be the first user in your neighborhood, Absolute money back guarantee, 6 dollars each, Order today, Ohio orders add 3% tax. Write for free literature on our Chrome Air Horns, THE PROTECTUROD COMPANY - Dept. 101 4033 Windsor Road - Youngstown 7, Ohio





Cards, Tickets, Stationery, etc. Good profit in spare time, PRINT YOUR OWN greeting cards, movie titles, church work, etc. Save money. Easy rules supplied. Raised printing like engraving too. Have bome shop, Sold direct from factory only. Send dime for Save money. Easy rules supplied. Raised printing like engine too. Have home shop. Sold direct from factory only. Send dime for supply hook, suggested outlits, all details and advice on your needs. No obligation. KELSEY, INC. C-37, MERIDEN, CONN.

SAFE HANDS



WORK FASTER

with Steel-Grip Gloves

The best opportunity for lower costs lies in speeding production. Keep materials moving with Steel-Grip Reinforced Gloves. They handle rough, heavy, jagged ma-terials at breathless pace. Chrome terials at breathless pace. Chrome tanned cowhide. Steel ribbon reinforced palm and fingers. Steel thread sewed. Protect against cuts. bruises. Or what's your need? Over 4300 proud Steel-Grip Safeguards may give immediate answer. Used by big industrials since 1910. Write for catalog or state your need today.

INDUSTRIAL GLOVES CO. 647 Garfield Blvd., Danville, III. In Canada: Safety Supply Co., Toronta



Winter driving causes a great accumulation of harmful gum and carbon deposits. For more power, pep and pleasure NOW is the time for the spring tonic Clean-Out—a dollar KARBOUT Engine Clean-Out.

KARBOUT dissolves gums and sludge that form on valve stems, and in the guides and in piston ring grooves. Thus the carbon particles that adhere to the gum are released—passed off with the exhaust.

Restore Lost Compression and Engine Power

Sticky valves are freed, lost compression and power are restored, acceleration stepped up, full lubrication assured for longer engine life and quieter operation.

For immediate relief, give your Engine a KARBOUT Clean-Out. It's easy, just introduce the KARBOUT slowly through the intake manifold with engine idling. For evidence, watch your exhaust.

Introductory Offer Free 60-page Book on Lubrication



If your regular garage, dealer or gas station is out of KARB-OUT, send for an introductory 8-oz. can along with a free copy of our 60-page book on engine lubrication. Send '50 cents in coin (no stamps, please).

THE SHALER COMPANY Waupun, Wisconsin.

The Shaler Company, Waupun, Wis.

Gentlemen: Enclosed find 50 cents in coins for introductory 8-oz. can of KARBOUT, with Free copy of 60-page book on lubrication.

Name	
Street Address	
City or Town	State

MARCH 1948 277



3 USE IT LIKE A FILE Fix Damaged Threads on Bolts, Shafts or Studs with a Few Easy Strokes!

A NECESSITY

FOR EVERY

TOOL KIT

8 TOOLS NONE

No. | for 11, 12, 13, 14, 16, 18, 20 and 24 Threads per Inch.

No. 2 for 9, 10, 12, 16, 20. 27. 28, 32 Threads per inch.

...State.....

KROME COMPANY	READING, PA.
Enclosed Money Order, \$	or Check
Please sendNo. I	No. 2 Nu-Thred

Address.....

2.00 EACH, POSTAGE PAID DEALER INQUIRIES INVITED



No Streaks MIIIICE YOU

CAN DO A FACTORY

LIKE JOB

One Quart Covers Average Car With Two Gleaming Coats, A Glowing Profes-sional Finish!

Not a streaky wax or polish. KAR-WIPE is the new miracle high lustre auto enamel that is so easy to use. Anyone can do a professional looking job quickly.

get high-gloss job that looks like a Professional finish. KAR-WIPE does the trick! Easy to apply! No brush! No masking! Simply WIPE IT ON with the applicator that we give you FREE. Get a factory-like finish that's GUA-

RANTEED against chipping, cracking, peeling, fading when simple directions are followed. Dries dust free quickly. In newest colors, SEND NO MONEY! Order one or more quarts today. Just mail postcard Pay postman plus C.O.D. upon delivery. Send remittance, save postage.

SEND NO MONEY! ORDER Kar-Wipe TODAY! In Black, Grey, Firey Red, Brewster Green, Washington Blue, Maroon . . . \$1.95 per qt.

KAR-WIPE CO., Dept. P3, 828 S. 18th St., St. Louis, Mo.

FOR THE SHOP—HOME—FARM—INDUSTRY



Bench ROTABIN

15" High, 17" diameter with 3 steel trays, 4 compartments each circular shape. \$4" pipe extends through center of trays, making them revolving type, Hundreds of uses, Used—good condition. Priced at fraction of \$6.95 \$6.95



ALL STEEL WORK BENCHES

27" high, 20½" wide, 72" long. Exposed parts rounded, smooth finish. ½" steel top, Metal cross bars can be turned to make shelves. Stored outdoors, excosed to weather, slightly rusted. A great value \$19.95

B & G SUPPLY CO. 800 E. 18th St.

Converts Any Radio into an Automatic Radio Phonograph!

No Wires or Connections to Radio!

Amazing new WIRELESS AUTOMATIC RECORD PLAYER converts any standard radio, regardless of age, size or type into an automatic radio phonograph combination. No wires or connections to be made to radio. Plays over any number of radios at same time!

Detrola record changer plays 12 ten-inch records or 10 twelve-inch records automatically. All you have to do is plug in record player in any electric outlet—turn on radio—dial "90" and the records play right through the loud speaker of your radio or any radio within 200 feet. Adjustable to any spot on dial. Operates on 110 ONLY

Use at home, parties, indoors, or outdoors. Wonderful \$29.50 gift for entire family. Send your order today. Shipped \$29.50 express collect. (Approx. 10 lbs.)

Dealers: Write for Information - Immediate Delivery. ELECTRONICS LABS.; 1438 Laurel St., St. Louis 12, Mo.

SAVER Liquid BRUSH CLEANER mfd. by CELCO CORP. 110 E. 42nd ST.

NEW YORK 17, N. Y.

IN LESS THAN I HOUR! Cleans wet brush for change of color or lay-up almost instantly . . . Use over and over again.

> If not available at Paint or Hardware stores-send 60c for full pint postpaid, U.S.A. only.

Alse at 50c for a full pint TIME SAVER PAINT REMOVER "A Little Removes a Lot of Old Point"

SATISFACTION GUARANTEED . . . Dealers, ask your jobbers!

BEGINNER

Clay . . . will harden at 250° in Kitchen Stove. Attractive Gift Box contains clay, moids, colors and in-

structions.

3 Sets for \$2.50
Send Cash . . . Save Postage

G & M SERVICE

1503 MAPLE RD. (E)

CLEVELAND 21. OHIO

Write today for booklet on the new FLEX-O-SHAFT Tool Kit, illustrating this improved all-purpose power machine with the hand-piece that works as easily as a pencil. Motor with switch, foot-operated rheostat, and 66 accessories, all at a special low price. FLEX-O-SHAFT SALES CO., Dept. C. Prairieview. Illinois.

EXTRA MONEY SEND SPECIAL FOR SPECIA

SELL PERSONAL INITIALED BELTS

BUCKLES, CAP BADGES, TIE HOLDERS 2000 emblems to choose Fast profits repeats Write to-day. Special outfit offer.

HOOKFAST SPECIALTIES, Dept. 51 PROVIDENCE, R. I.

A NEW SPORT SHOOT SMALL GAME INDOOR TARGETS

Designed by JOHN MILLIGAN, World's Slingshot Champion,

who breaks bottles in mid-air, clips coins at 30 feet and outperforms pistol experts. Now making appear-ances at sportsmen's shows . . . The Milligan Slingshot kills small game at 300 feet. Sturdily made of hand-buffed aluminum alloy; natural gum rubber . . . You, too, can attain surprising accuracy with practice. Price includes dozen steel pellets. Money back if not satisfied . . . Men and Women, get in

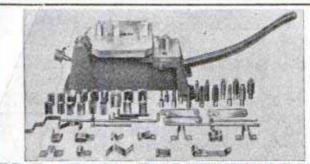
on this fascinating sport for recreation room or outdoors.

Only

ORDER TODAY.

If desired, we can supply steel or lead pellets in quantities. When shot against canvas backdrop ammunition lasts indefinitely.

MILSOR CO. • 7432 Churchill • Detroit 6, Mich.



Make It On A "MU BENDER-CUTTER

BENDS - CUTS - PUNCHES All Types Metal and Plastics

J. A. RICHARDS CO., Dept. 5M KALAMAZOO 13F. MICH.

BUSINESS TRAIL



Write for large illustrated catalog on trailers and money making equipment.

KING CO., 82 Orchard St., Mt. Clemens, Michigan

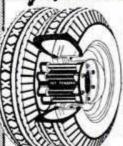


MUFFLERS STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels \$5.50, Aluminum \$7.00. Chry., Olds., Buicks, etc., Steels \$7.50, Aluminum \$9.00. V-8 and MERCURY DUALS, Steel \$17.50, Aluminum \$21.00. Split Manifold Sets, Steels \$35.00, Aluminum \$45.00. Aluminums are guaranteed for life of your car.

MUFFLER 296 LA TIJ., LOS ANGELES 43, CALIF W. SLAUSON AVE., LOS ANGELES, CALIF. Now! You can install & WHEELS! &

TEN MINUTES



Complete Set of Castings and Extension Bolts for 2 Wheels Install with a rim-wrencheasier than changing a tire. New patent Du-All Adapters eliminate entirely the expense of changing to truck-type wheels and hub; no need to change the entire rear axle. Do the job at a fraction of the old cost.

Du-All Adapters are scientifically designed so that load is transferred from outer wheel by the casting direct to the hub. Increase traction and increase tire life with Du-All Adapters. Trailers can carry up to 50% more with Du-All.

GUARANTEED SATISFACTION OR MONEY BACK.

WWW WWW ATTENTION: JEEP OWNERS

Now you can convert your wheel tread to standard 58" width. Avoid trouble with ruts on un-paved roads or driveways with these completely new Jeep wide tread adapters. Set of 4 castings and 20 extension bolts, for all 4 wheels, can be installed or removed in 15 minutes. Safe. Sturdy. Simple to install. Only \$36.00, complete set.

G. I. MILITARY TRUCK PARTS

1 ann

Every part for every G.I. type vehicle from jeep to 20-ton prime mover 6x6. 40% to 80% below list.

COMPLETE STOCK OF PARTS FOR STANDARD CONVENTIONAL CARS AND TRUCKS

New-used-re-built. Truck operators, dealers, garagemen, learn about amazing low prices.



834 North 7th Street, Minneapolis 11, Minnesota

	기가 주시 [다리 가장 전 기가 있다면 하고 있다면 가장 하고 있다면 하는 사람이 되었다면 하는 사람이다
	Picase send me
ŀ	Name
ł	Address
i	City State

DEALERS: Sell DUAL WHEELS. Many fine territories open.

GOVT.

TRUCK

PARTS AND

Military Type. We have for immediate delivery genuine parts for all makes and models. 4x2-4x4-6x4 and 6x6. All models from $\frac{1}{4}$ ton to 20 ton. All makes: Jeeps, Fords, Chevrolet, GMC, Studebaker, Reo, Auto Car, Federal, Diamond T, Brockway, Bierderman, Macks, Oshkosh, Dodge, White and Sterling.

Special Discounts to Fleet Owners On Above Parts.

NEW POWER WINCHES

Govt. Surplus. All are Brand New and Suitable for front or rear mounting.



WINCH, GARWOOD OR HEIL 15,000 lb. \$15000



GARWOOD WINCH—25,000 lb. \$20000

A 25,000 lb. Winch with 3 speed power take-off, shafts, joints and attaching parts for International TD-9 and TD-14. \$25000 For Front enly. Shipping weight 1700 lbs. Only... \$25000 Above Winch adaptable to front or rear of H. D. Trucks.

Above Winch adaptable to front or rear of H. D. Trucks. We can furnish cables, power-take-offs, shafts and joints at reasonable prices.

WINCH CABLE—With Chain and hook. 1/2" in diameter. 200 ft. length. New.........................\$2500

SNATCH BLOCK

All Steel 6" pulley, overall length 21" with grease fitting. New \$12.50. Lots of six, \$950 each.

Austin PINTLE HOOKS

For All Trucks and Trailers, 25,000 lbs. capacity, shipping wight. 30 lbs. List price \$47.50. Single ea. only \$8.95. \$750 Lots of 12, each only....

These were illustrated in previous issues. Prices FOB K. C. Firms not rated, 25% deposit required. Balance COD, Export Business invited.

AMERICAN AUTO PARTS CO., Inc.

1830 Locust

Kansas City, Mo.



ESPEY Television Kit

Designed around modern circuits, and manufactured of the finest materials, this ESPEY Television Kit offers you the opportunity of building your own personal television set at unbelievably low cost. Kit is supplied complete (less tubes and cabinet) with all parts, punched and welded chassis, instruction book, etc. \$69.50 for only.

For full details, write to Dept. D

ESPEY MANUFACTURING COMPANY INC



LATHE CENTERS and DRILL PADS

	Description	No. 2 Taper	No. 3 Taper
	L-SCREW CENTER	\$3.00	\$3.25
	G-DRILL PAD		2.75
7	H-CROTCH CENTER		3.25
	J-HOLLOW CENTER, 60°	2.00	2.75
e	1-60° CENTER	2.25	3.00
	P-CARBIDE TIPPED CENTER		8.00
	Q-HALF CENTER	2.25	3.00
	N-CUP CENTER	2.00	2.75
	M-SPUR CENTER	3.00	3.25

SOUTH BEND LATHE WORKS 455A E. Medison St.



OUR MONTHLY SPECIAL

5 Inch Cathode Ray, Type 5BP1 tubes. In their original cartons. Brand New. At this price every scope owner should buy a few and keep in reserve. How can you go wrong for only.

MICHAEL STAHL, Inc.
39 Vesey Street
New York 7, N. Y. Dept. P. M. 3

Replacement \$7.00
Handle Kit—postpaid

A big deller's weeth

A big dollar's worth

It's easy to replace broken
handles on those badly needed
tools with this convenient kit.
Handles fit screwdrivers, chisels,
files, soldering irons—nearly all
small tools. Bored and shaped to
facilitate fitting. Save time and
money by ordering several kits now.
PIQUA GENERAL SUPPLY COMPANY
Piqua, Ohio

Add years to tool life! These days you want to keep "hard to get" tools in service. Keep spare handles handy.

MINERALS and METALS with M-SCOPE

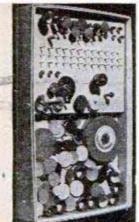
New sensational lightweight models, unsurpassed efficiency Low prices. Time-payment plan. Write for free 16 page booklet.



FISHER RESEARCH LABORATORY, INC.
PALO ALTO CALIFORNIA

TOOL BARGAIN

Electric Hand Grinder Assortment



Now Only \$9.75 A \$45 Value MASTER KIT POSTPAID IN U.S.A.

KIT

102 Grinding, Cutting and Polishing WHEELS PLUS 150 assorted items for Home or Shop.
2 Grinding Wheels 3" and 2" dia.
2 Rotary Files, High Speed Steel.
6 Hotary Cutters 1/8" Shank.
8 Rotary Cutters 3/32" Shank.
6 Mounted Grinding Wheels 3/8" Shank.
6 Mounted Grinding Wheels 3/32" and 1/4" Shank.
30 Rotary Cutting Burs 3/32" Shank.
2 Mandrels 3/32" Shank.
2 Mandrels 3/32" Shank.
3 Mandrels 3/32" Shank.
1 Mandrel 1/8" Shank.
3 Rotary Bristle Brushes 3/32" Shank.
1 Rotary Bristle Brushes 3/32" Shank.
1 Circular Saw High Shank.
1 Circular Saw 1/8" Shank.
2 Rubber Cylinders and Mandrel 3/32" Shank.
3 Rotary Bristle Brushes 3/32" Shank.
4 Rotary Wire Brush 3/32" Shank.
5 Rotary Wire Brush 3/32" Shank.
6 Circular Saw 1/8" Shank.
7 Rubber Cylinders and Mandrel 3/32" Shank.
8 Rotary Drum Sander 1/8" Shank.
1 Rotary Drum Sander 1/8" Shank.
1 Rotary Drum Sander 1/8" Shank.
15 Bands for Rotary Drum Sander.
15 Rotary Felt Wheels 1" dia.

The right attachment for every job.
 ORDER TODAY. Send check or send
 \$2.00 deposit with C.O.D. order.

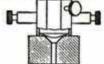
D. SCHUPACK, 7331 Cottage Grove Ave., Dept. PM-3, Chicago 19, III.

MACHINISTS GAUGE



Checks form and hole sizes in tool, die and machine work quickly and easily with compar-ator accuracy Measures openings of angles, radii, topers, slots, counterbared holes, Vis, dovetails, etc., in the machine or off. As simple as checking a hole with a telescope gage. Does hours of inspection work in minutes.

++++ \$12 50 000 000 Used with 2" to 3" Micrometer, direct reading. Range 160 to .760 Hardened, ground, and lapped, send check or money order. Free folder.



PENJASKA TOOL COMPANY P.O. BOX 210

OWOSSO, MICHIGAN

HIGH LUMINOUS PIGMENTS

For Dusting, Painting and Mixing to Suit Your Requirements

We can furnish you with unadulterated, non toxic chemicals that really glow in the dark. Be recognized for your craftsmanship and make unlimited profits by useful applications — safety aids, toys-games, novelties, displays, advertising, premiums, decoration, radio, automotive, aviation, etc. Listing of various pigments and wide range of colors free with your special trial order for only \$1.00 prepaid.

GLOWELL ENGINEERING CO.

475 FIFTH AVENUE

NEW YORK 17, N. Y.



Give your youngster the joy-ride of a lifetime! TRACTALL looks just like a man-size Tractor. It's the perfect gift for boys, girls, up to 12 years old. Pedal-driven, Sold direct from factors. Wells for direct from factory. Write for Literature and FREE trial offer.

INLAND MFG. CORP., Dept. PM • 164 Ellicott St., Buffalo 3, N. Y.



MINIATURE **ENGINES**

Gasoline—Steam Air-Locomotive



THE WORLD'S MOST FASCINATING HOBBY

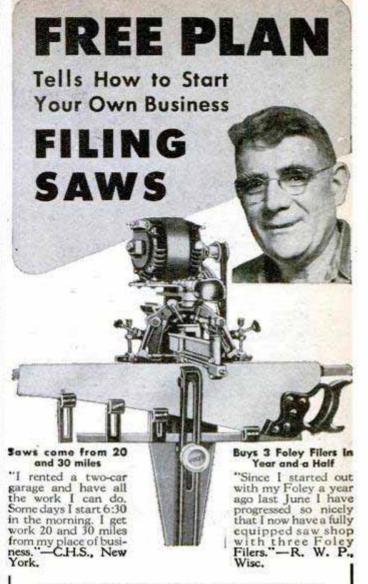
Build them yourself — In your own shop With your own tools



Send 10 cents for my illustrated catalogue listing the world's largest selection of miniature engine castings and drawings.

McADED MODELS

1313 S. TALMAN AVE. CHICAGO 8, ILLINOIS



FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings you more customers. S.M.H., Penn. wrote to us: "I am doing very well with my Foley Filer, and I am glad I invested in your machinery. It is very satisfactory and works very well in the small community in which I live."

You can file all hand saws, also band and cross-cut circular saws on the Foley Saw Filer. The adjustments are simple—there is no eyestrain— and you can start right away to turn out perfect cutting saws. "The first saw I sharpened with my Foley Filer came out 100%. I think it is a marvel of perfection."—writes C.E.P.

NO CANVASSING—Our Free Plan explains how you can get business from hardware stores, home owners, farmers, carpenters, schools, mills, factories, etc. Just think—with a modest investment, no overhead, no stock of goods to carry, you can start right in on a cash business that will help pay the rent, buy groceries, or a new car. Start now—you can get IMMEDIATE DE-LIVERY on a Foley Saw Filer.

Send for Free Plan on FOLEY SAW FILING BUSINESS

FOLEY MFG. CO., 316-8 Foley Bldg., Minneapolis 18, Minn.
Send Free Plan on Saw Filing business, no obligation.
Name

Address....

RIDE TO WORK

Tired of waiting for streetcars, buses? Be your own transportation boss with a WHIZZER Motor on your bike. You'll go 125 miles and more on a gallon of gas—that's six miles for just one cent! Speeds up to 35 miles per hour . . . 2½ sturdy horsepower. Backed by eight years of progressive engineering. Fits any man's balloon tire bike.

FOR JUST ONE CE



for HOMES • FARMS • SHOPS • BOATS

CLIMAX

Gasoline Generating Sets

6-12-32 VOLT DC

110 VOLT AC

efficient economical operation



Remote control models for operating from a distant location

300-600-1000-1500 WATTS

WRITE TODAY!

FACTORY & HOME SUPPLIES

241 CANAL STREET NEW YORK, N. Y.

HANG THAT DOOR THE PROFESSIONAL

USE THE TIME SAVING -LABOR SAVING .

E-Z Mark Butt Gauge You get a clean cut deeply etched profile. Remove chips.

Repeat this operation on the jamb and hang the door. THAT'S ALL—NO MORE!

OU DO THIS AND GET THIS

Hang more doors better.

- No adjustments . No errors.
- Used and approved by Master mechanics.
- Comes in 31/2" and 4" (standard) sizes.
- · Precision made.

Cost ONLY \$1.75 each or \$3.50
a set at your hardware store.
If your Dealer can't supply,
send only \$1.00 with order and
pay Postman balance, plus postage
C.O.D. \$3.75 in Canada (No C.O.D.)

E-Z MARK TOOLS . P. O. BOX 8377 . LOS ANGELES 16, CALIF.

CROSMAN Silent RIFLE Most Amazing Gun Ever Invented for Target and Small Game Shooting The ideal rifle for year 'round shooting indoors or out. Shoots low-cost SUPER PELLS without noise, odor or recoil. Requires no cleaning. At your dealer or write direct, Adjustable power—rifled

CROSMAN ARMS CO., INC. Write for information.
3 HENRIETTA ST., ROCHESTER 7, N. V.

barrel for accuracy. .177 and .22 caliber models.

FILLS HOLES, CRACKS, DENTS, GOUGES Master craftsmen use these finest fillers



WEBB PRODUCTS CO., 228 S. "G" Street, San Bernardine, Calif.

Air Corps Type SUN GLASSES



Brand New, Protect your eyes in style with this attractive sun glass. Ground and polished processed lenses, Approved by the Government Burcau of Standards, These glasses absorb over 96% of the ultra-violet and infra-red rays, 24 K gold plated frames with pearl Sweat Bar. Comes in individual case, \$3.45 Also available in ladies styles.

SEND CHECK OR MONEY ORDER. IMMEDIATE DELIVERY. 714 DELAWARE ST. KANSAS CITY, MO. B-G SALES CO.

STATION WAGON BODIES



CABS FOR ALL JEEPS SMART MAPLE - OAK WOODS

Year around comfort for Jeep owners. Kiln dried hardwoods, safely glass. Finest hardware, varnishes, top materials. Full opening rear door, locks. Sead 25% with order balance COD. \$165.

FOB Cleveland... \$165.

STATION WAGONS, INC. (PM) 6619 Euclid Avenue Cleveland, O.

Big Money for Workers In Home or Shop



Licensed Concrete Specialists wanted. No experience needed. Make Colorgiazed concrete pottery without molds. New, low cost, patented method. Cemetery products, novelties, tiles, etc. Basement leaksealing. Other big pay projects. Booklet, details free. Men only.

NATIONAL POTTERIES COMPANY
415 Third Avenue, W., Grand Rapids, Minnesota



vided with accurate scale that shows exact angle of tilt.



Knife guard completely covers knives, and slides back out of the way with the work. It is instantly removed for rabbeting and as quickly replaced.

Jointer, you can plane

any piece of wood up to 4" wide — smoother and faster than by hand. You can plane the edges of boards true, straight, and square, so that they can be joined together perfectly. And you can cut 1/4" rabbets. You eliminate all the drudgery of hand planing.

A Lot for the Money!

The Homecraft 4-inch Jointer has features that make it just as fine a hobby-shop joint-er as can be built for its moderate price:

- Solid-steel cutterhead runs in lubricated-for-life ball bearings.
- Fence is accurately-ground casting heavi-ly ribbed for rigidity.
- Fence securely locks in place anywhere across the table.

- good work.
- Both tables are adjustable.

See It At Your Dealer!

Ask your Homecraft dealer to show you the No. 37-110 jointer, and his complete display of Homecraft Power Tools that range in price from \$29.95 to \$41.95.

Visit your Homecraft dealer now!

General Sales Office - Chicago 2, III.

Descriptive Literature! Shows all Homecraft Power Tools and Use coupon, for your copy

accessories. Sent to you free. out coupon and mail today DELTA MANUFACTURING DIVISION Rockwell Manufacturing Company Rockwell Manufacturing Company 681C E. Vienna Ave., Milwaukee I, Wis, Please send descriptive literature on Homecraft Power Tools. Address. City

HOMECRAFT POWER TOOLS

are built by the makers of Delta-Milwaukee* Power and Machine Tools the tools with a widespread reputation for safety, accuracy, and dependability, in factories and schools, as well as home shops. Trade Mark Reg. U.S. Pat. Off.

If your goal is a shop equipped with power tools that embody the most advanced principles of engineering, design, and construction, then insist on Delta-Milwaukee Power Tools. See your dealer.

BIG ... POWERFUL ATTERY CHARGER

Keeps Auto, Truck, Tractor, Fence, and Radio A Batteries Up To Full Strength...

Now you can keep a battery up to full strength, for quick starting and top performance of all electric auto accessories, with the Acme Electric big, powerful, 10 ampere Battery Charger. No more run down batteries, no towing, no service expense. In a few hours, in your own garage you can recharge the battery to peak perfor-mance. Simply plug in to any AC 60 cycle lighting circuit and attach bat-tery clips to terminals, that's all there is to it. No liquids, no acids, no

A SPARE TIME MONEY MAKER-When you are not using the battery charger, rent it to your neighbors for 5c or 10c rent it to your neighbors for Sc or luc an hour; or you can build a battery recharging business that will earn ex-tra money for you. Order today. Now only \$17.95. Prepaid anywhere in tra money for you. Order today. Now only \$17.95. Prepaid anywhere in U.S.A. Send check, express or postal money order. No C.O.D.



ACME ELECTRIC CORPORATION 9 WATER ST. CUBA, N.Y.

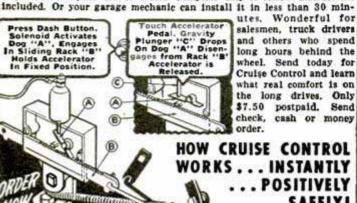
HOLDS ACCELERATOR IN ANY POSITION. ENDS DRIVING FATIGUE. IDEAL FOR THE MAN WHO DRIVES A LOT. QUICK, EASY TO INSTALL

When you hit the long stretches, and

NOW

PREPAID

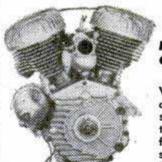
the road looks endless and dreary, relax with a Cruise Control. This amazing accessory on your car means no more foot fatigue, no more aching legs, Just press a button on the dash-take your foot off the accelerator and relax. The accelerator is held in place in any position. Your car goes cruising along while you relax., Touch the accelerator again and Cruise Control cuts out instantly and positively. If you drive long hours, if you take frequent long trips or are planning a motoring vacation, if you just want the utmost in modern accessories on your car, get a Cruise Control today. Install it yourself on your car or truck. Complete easy-to-follow instructions



WORKS...INSTANTLY ... POSITIVELY . . . SAFELY!

CALIFORNIA DESIGN MFG. CO. 228 N. FRONT ST., BURBANK, CALIFORNIA

Harley-Davidson Motors Brand NEW (not



used) 1/2 Price! For '37 to '48 Motorcycles. Or boats, power plants, saws, midget cars.

Worth \$265. Complete with new carburetor, new generator, new sprockets. Never uncrated. Positively guaranteed new in perfect condition. Government surplus. These are not rebuilt but BRAND NEW regular Harleys. Side valve. L head. 30

HP (N.A.C.C. 6.05). Worth more than our price for new parts! \$122.25 crated. FOB Okla. City. Weight packed 220 pounds. Remit \$25, bal. C.O.D. Shipped immediately. Few left. Guaranteed as advertised or money refunded. You have seen our ads for years.

FEDERAL IDENTIFICATION CO. 1910 Classen Blvd. Oklahoma City, Okla.

PRICES SLASHED! ALUMINUM PIPES

\$4.50 pipe for \$1.00.
Imported briar bowl, hard rubber stem, air cooled aluminum shank.
No filters required. Check or money order, we pay postage.
C. O. D. orders filled on request. Write for FREE catalog of pipes and cigars.

date THE CIGAR MAN

Dept. M-3, 1094 Bedford Ave., Brooklyn 5, N. Y.

AMAZING SUBICE RADIO



No Electricity • No Tubes
Cost Nothing to Operate and
Never Wears Out
Transparent plastic cabinet 7/8" square by 3/4"
deep, rests easily in bowl of ordinary teaspoon.
Picks up broadcast stations up to 75 miles. Contains Radar type 1N34 Germanium Fixed Diode
Detector. One of the smallest crystal sets made.
Ideal and Safe for children to operate. Order
yours NOW. \$2.39 postpaid, no ear phone;
\$3.19 postpaid with ear phone.

CARING PRODUCTS Dept. P, Box 1308
Chicago 90, III.

HAUCK FLAME KILL GUN



2000° F controlled heat quickly, easily destroys seeds, roots, brush, poison ivy, wild morning glory. Canada thistle, other unwanted growths. Many uses; splitting rocks, burning stumps, sterilizing poultry houses. Burns kerosene. Does the work of 4 men. Safe, easy to use. 10 day trial. Satisfaction guaranteed. Free catalog.

HAUCK MFG. CO. 74 Tenth St. Brooklyn 15, N. Y.

SAY YOU SAW IT IN POPULAR MECHANICS

OTTAWA

SELF-PROPELLED - MOVES ANYWHERE on OWN POWER

World's fastest Log Saw. Powerful 6 H-P air-cooled motor.

Attachments for sawing down trees, buzzing limbs, post hole digging and pulley for belt jobs. Big demand for wood, pulp, posts. Make big money sawing wood this easy way. Low factory-to-user prices. Nothing like it. FREE details.

OTTAWA MFG. CO., 7-827 Pine St., Ottawa, Kansas

BUILD YOUR OWN ZEOLITE WATER SOFTENER

You can do it inexpensively with only a wrench and a little spare time. Same Zeolite process as used by other leading water softeners. Send \$1 for easy-to-follow directions and list of materials. (Materials available locally or from us.) Your money back if not satisfied.

LAKE REGION MFG. CO.
Minneapolis 16, Minn.

4184-A Xenwood Ave.

BUILD SOUNDLY FOR THE FUTURE WITH Atlas. PRECISION TOOLS

AMERICA'S OUTSTANDING BENCH LATHE VALUE

- 10" Swing 24"—36" between centers.
- Quick-Change Model gives instant selection of 54 threads or feeds.
- Timken tapered roller bearings.
- Precision ground bed.
- 16 spindle speeds—V-belt drive.
- · Back gears for extra power.
- Instantly reversible power cross and longitudinal feeds.

Atlan DRILL PRESSES



1234" and 15" bench and floor models. Extra-heavy head, column, table, and base. Precision-ground table tilts. 90° right or left. Exclusive "floating-drive" spindle, with deep grooved ball bearings. Low-cost accessories for all drill press operations.

Atlah SHAPERS

Handle all shaping operations within a
7" stroke —
dovetailing,
keyseating,
vertical and

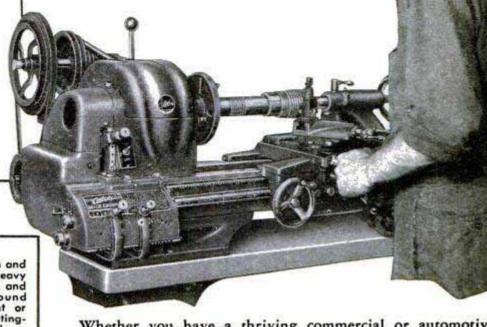
keyseating, vertical and angular cuts. Timken bearings. 4 speeds. Operates from ½ HP motor.

Atlas MILLERS



Gives you full range of milling operations—slabbing and facing cuts, end milling, keyways, boring, layout work. Timken bearings. 8 spindle speeds. Operates from 1/3 HP motor.

Send for FREE LITERATURE



Whether you have a thriving commercial or automotive shop — or are increasing the usefulness of your home shop — Atlas tools are a sound investment.

Industrial plants and commercial operators get all the speed, versatility, and precision of expensive machines in small space, at low cost. Auto repair men find 44 profitable jobs for an Atlas lathe. Home shop owners save many dollars a year on home equipment repairs and many types of home furnishings. And if your home shop interest is profit-wise — for developing your own business — Atlas tools are ideal research and production equipment.

Years of dependable service are engineered into every Atlas tool. They are heavily and ruggedly built — by the latest low-cost precision methods. Today's values are outstanding! See them at your Atlas distributor's. Send the coupon for complete details.

ATLAS PRESS COMPANY

343 N. PITCHER STREET . KALAMAZOO, MICHIGAN

Please ally inter	send latest information about Atlas tools. I am especi ested in:
□ 10" le	the 🗌 6" lathe 🔲 drill presses
☐ Miller	☐ Shaper ☐ Also woodworking tools.
Name	
Address	

MARCH .1948

3 Save 80% ALL PARTS READY-MADE - READY TO ASSEMBLE OWN A GENUINE INDUSTRIAL-TYPE HEAVY DUTY WELDER y pay expensive assembling and shipping costs? The LDER PARTS come packed in a compact box — YOU SA WELDER PARTS come packed in a compact loss.

DIFFERENCE!

EASY TO ASSEMBLE with simple, step-by-step instructions, in a few hours. Also included are 10 easy lessons in Arc Weiding. Safe, rugged, IDEAL HEAVY-DUTY WELDER for all-numpose are weiding. Safe, rugged, compact and EFFICIENT. WILL OPERATE FOR ONLY A FEW CENTS per DAY.

Pings into either 110 or 220 AC line, Can be used consistently on 30 amp. fuse. ALL PARTS DESIGNED TO GIVE LIFETIME SERVICE.

SATISFIED USERS FROM COAST TO COAST SAY: Including secondary and shunteells wound completely with double glass covered electrolitic copper.

ORDER WITH CONFIDENCE!

Try your ATOMIC WELDER for 30 days. If not satisfied, return as is. Your money will be refunded with no questions asked. What could be fairer than that?

ATOMIC WELDER COMPANY • 1038 So. 19th Street • Omaha, Nebr.

SURPLUS SPUR GEAR HAND

LIFTS, as a hoist . . . or pulls, as a winch. Hundreds of uses for this converted bomb hoist. Made by famous manufacturer for Uncle Sam . . . Brand new, unused.

Easily lifts or pulls up to 350 pounds. 20 ft, of multi-strand wire rope can be fed out of any one of three drum housing openings.

Rig it up yourself on wall, beam, tripod or trolley, wherever you want to lift or pull heavy or bulky loads, such as boats, outboards, stock . . . anything too heavy to handle. Free illustrated "How To Use It" suggestions.

LIMITED QUANTITY at never-again price of:

Postpaid in U.S.A.

IRELAND & VICE P. O. Box 146-A, Auburn, N. Y.

SAVE Surplus Bargains PERFECT ALL WOOL SLEEPING BAG OLIVE DRAB

Handy for fishing trips, hunting, camping, boating, just roughing it or use as auto robe and many other purposes. Warmth of 2 blankets: sipper slide fastener; tilestrap on bottom: approx. Gov'l cost \$12.90. Our Price each...Outside Cover for Sleeping Bag—Water repellent...Perfect—2 man size for scouting, Camping, etc. Without Pole 52.39

NEW GOGGLES Set comes complete. Kit with 1 extra cellulose acetate lens. Green and white colors. A rubber flexible goggle frame. Back adjustment head strap. Cost Gov.

cellulose acetate lens. Green and white colors. A rubber nextore goggle frame. Back adjustment head strap. Cost Gov't 98c approx. 84.50. Ea. SLANKET—Wool OD, perfect. Wonderful value 53.95. SLANKET—Wool OD, perfect. Wonderful value 51.75. PYRAMIDAL TENTS—16'x16', 8 man tent. Reconditioned of the complete with the ropes. Cost Govt. over \$100.00 \$2495. Our Sale Price 519.75. WALL TENT—9'x9', reconditioned, perfect. 519.75. WATER CONTAINERS—Perfect for Contractors, Truckers, etc. New Reserve Water Bottles. 5 gal. cap. Made of heavy durable plastic. clamp top. Used to drop water to land troops, Ea. only. 51.95. NEW PARACHUTES (Green Rayon) Approx. 36 sq. ft. Cloth good for making into ties, handkerchiefs, lining, etc. Complete with canister, with approx. 10 lbs.

Add 10% for Mailing — No COD — Send check or M.O.

AMERICAN SUPPLY CO., Dept. P. M., 329 W, 5th St. Kansas City, Mo.



The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put— Does not chip, shrink or fall out. Easy to use. Economical Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you postpaid (in U.S.) for only \$1. Full money-back guarantee, order now.

DONALD DURHAM CO. Box 804-O, Des Moines, Iowa

"I'LL TAKE THE WHITE ONE EVERY TIME!"

28 1 29 1 2 10 2 11 3 0 1 1 1 8 2 1 8 3 1 8 4 1 5 1 8 6

NYTEFACE

STEEL MEASURING TAPES



KEUFFEL & ESSER CO.



C.O.D.'S ACCEPTED

25 RODS

1001 Uses for Craftsmen, Hobbyists, Mechanics, etc.

For Making Punches
Chisels
Engraving
Tools
Shafts, Etc.
Free machining, easily worked, yet can be made file hard or hardened to graving shafts, Etc.

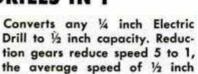
Free machining, easily worked, yet can be made file hard or hardened to der 6" Steel comb. rule and depth gage with pocket clip and latest price list.

The section of

The Precision ground flat tool steel with the satin-smooth finish.
Simple to work, easy to harden, ready to use.

BESSEMER STEEL COMPANY OF AMERICA, Dept. FC-15

GIVES YOU 2 DRILLS IN

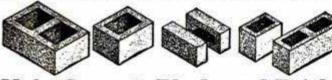


Drill thereby increasing power. Jobbers write Price \$1195 for proposition

M.O. or check with order

G. M. CO. MANUFACTURING, INC.

1308 43rd Avenue Long Island City 1, New York



Make Concrete Blocks and Bricks

New superior method makes square, true, easy-to-lay units which will pass any building code. Small investment, high production, big profits. One \$30.00 machine will make four 5"x8"x12" blocks per minute. Pays for itself in a few days. Sell blocks or save 24 building cost by making and laying your own.

POST CARD BRINGS FREE FOLDER

Economy Manufacturing Company Stone Mountain, Georgia

FASTEST PLANER in the WO at this Low Price ... \$4

Belsaw Multi-Duty Planer

Needed by every saw mill owner and woodworking shop to Speed Up Production — Increase Profits.

Belsaw high speed thickness planer provides for single surfacing stock up to 12" wide by 6" thick at the high speed rate of 24 lineal feet per minute for HIGH PRODUCTION. Planes GREEN or DRY sawed lumber into higher priced, valuable smooth and worked forms. Machine has welded all STEEL frame . . nothing to break. Safety-type all Steel cutterhead runs in heavy duty ball bearings. Three HIGH SPEED Steel knives make 42 cuts per inch for smooth finish.

Belsaw Multi-Duty Planer is REALLY ECO-NOMICAL any motor developing 2 horsepower — REALLY PROFITABLE . lowest estatechments for all costs, and takes inex-

horsepower — REALLY PROFITABLE . lowest pensive attachments for all common planing mill operations: Jointing, Rabbeting, Grooving, Matching, Produces S4S Finish (surfaced four sides without the great investment required for S4S Surfacers, Simple accessories provide for SHARPENING and JOINTING its own knives. You get BIG VALUE in Belsaw, and provide for your progressive growth.

progressive growth.

Write for FREE specifications, illustrations and low

BELSAW MACHINERY CO., 1015 Field Building 315 Westport Rd.
World's largest manufacturer of light sawmill and woodworking equip





ALL BEARING ST

Complete with GOODYEAR, GATES or OSBORN PUNCTUREPROOF Semi-Pneumatic Tires . . . Also Solid and Pneumatic Tires . . . FUN . . . SPEED GALORE . . . BUILD YOUR OWN RACER, ETC.

SIZE BEARINGS 12" x 2½" Semi-Pneumatic Ball ½" or %" 150 Lbs. \$ 5.50 \$10.00 \$18.00 10" x 1¾" Semi-Pneumatic Ball ½" or %" 125 Lbs. \$ 3.00 \$ 5.50 \$10.00 10" x 2½" Semi-Pneumatic Ball ½" or %" 125 Lbs. \$ 3.00 \$ 5.50 \$10.00 20" x 1¾" Semi-Pneumatic Ball 7/16" 60 Lbs. \$ 5.50 \$10.00 \$18.00 (the above 20" is Bike type 20 Spokes)

6" x 15%" Solid Ball 34" 480 Lus. \$10.35 6" x 17%" Solid Ball 34" 640 Lbs. \$10.35 4.00" x 8" Pneumatic T.R. 1" 700 Lbs. \$13.50 \$26.00 \$50.00 (the above 4.00 x 8 is 4 Ply Goodyear with Tube and Tayer Roller Bearings for 1 inch diameter straight axie.)

Add 10% For Prepaid Shipment in U.S.A.

Add 10% For Prepaid Shipment in U.S.A.

Also Steering Wheel Assemblies . Pulleys . Pulleys SEND 10c FOR CIRCULAR ON: Model "C" Racer with 2 H.P. Gasoline Engine: 86" ORDER Long x 40" Wide and 4.00" x 8" Tires. Also Steering Wheel Assemblies . . . Auto Type Axles . . . Carts . . . Gasoline Power . . Trucks . . Pulleys . . . Belts . . . and many other interesting items. (25% DEPOSIT ON C.O.D. ORDERS)

OSBORN WHEEL COMPANY, 115 So. Main St., Dept. P-3, Doylestown, Penn.

Made To Outwear Other Type Wheels

1948 MODEL "B" RACER

REAL THRILL FOR ANY BOY!
76" Long x 30" Wide, 12" Steering
Wheel; Left Side Steering, Two Passenger, 12" Wheels, Foot Pedals, Internal Brakes, 1-H.P. Gasoline Engine,
Transmission, Etc., as shown READYTO-RIDE... ONLY \$175.00.

Add 10% for Prepaid Shipment in U.S.A.

CHASSIS as shown CHASSIS as shown less power plant. ONLY..\$56.00 Add 15% For Prepaid Shipment in U.S.A.



A MUST FOR EVERY CAR OWNER



AUTOMATIC SIGNAL WARNS DRIVER TO RELEASE HAND BRAKE

Reduces wear on brake lining . . . Eliminates scored brake drums

Will serve as a handy light for night reading of notes and road maps by removing cap.
Cuts down on repair bills . . . makes driving safer

ONLY OΩ

The moment your ignition goes on, your EKLIND EMERGENCY BRAKE SIGNAL-LITE flashes a brilliant red light to warn you that your emergency brake is ON. Most drivers know the hot, amoky smell of dragging brakes—the "too-late" warning that the emergency brake is on—EASILY INSTALLED—complete instruction sheet with each lite. FITS ANY CAR OR TRUCK.
Order now from your dealer. If he cannot supply you, send us \$2.00 (M.O. pref.) and we will ship promptly postpaid.

EKLIND TOOL & MFG. CO.

Chicago 47, III.

NEW EASY WAY TO MAKE ONEY ax HOME

Your cost only 5c You get \$5.00. Full or spare time.

It's easy to Bronze Baby Shoes, Business still in infancy. Get in on ground floor and skim cream of profit from rich and

cream of profit from rich and never-ending market. No experience needed. Learn in one week. Income up to \$1,000 a month full time—\$50 to \$75 weekly in spare time. We furnish complete kit and full instructions. So easy to understand that a 12 year old can become expert.

FREE FACTS. Write today. Don't send a penny. Just name and territory to reap rewards waiting. Costs only 5c to bronze shoes. Sell for \$5.00! This is too good to miss. Get facts today. Write to KIKTAVI COMPANY

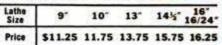
Dept. 18, 8620 So. Ruthelen

Los Angeles 44, California



Universal Tool Block

Replaces tool post and nine standard tool holders. Rigidly supports turning, boring, threading, and cut-off tool bits. Rotatable. Has self-aligning knurling head. Precision adjustment for tool height. No re-adjustment required when replacing tools. Adaptable to some other lathes. Write for dimension sheet.



SOUTH BEND LATHE WORKS South Bend 22, Ind.

TING - NOTCHING - INLAY - ANY

TWO MODELS IMMEDIATE DELIVERY DeLuxe Model includes bottom bearing that anchors tool

to bottom of press. Regular Model without bearing. Comes complete with adaptor and 6 blades making 12 standard cuts — balance blade — beautiful wood box. Over 100 different, practical cuts can be made with the 6 blades. See your dealer or send check or money order for delivery to your door. All other orders C.O.D. plus postage.

THE DESIGN COMPANY 2603 Warwick, Dept. M18, Kansas City 8, Mo.





DELUXE MODEL with bottom

bearing as illustrated REGULAR MODEL

without bottom bearing ...

Patent Pend-

Dealers

Write for

Information





NOW YOU CAN POLISH 'SIMONIZ" and WAXEASY

This exclusive patented way . . saves ½ the time. Does a better job. 25c can enough for 4 cars. At your dealer or send 25c for can postpaid. TIMEX PRODUCTS CO.



TERRITORIES STILL OPEN FOR

A BETTER JOB EVERY TIME

CLEANS AND WAX POLISHES IN ONE EASY OPERATION!

Just Rub On, Let Dry, Wipe Off

Quick and easy. Do your car in less than an hour. Contains expensive, pure Carnauba wax, hardest wax known, Lasts up to 6 months.

RAIN-PROOF, SUN-PROOF, MUD-PROOF

ready-to-use powder form. At your dealer or send ,50 for big 10-oz, can (enough for 4 cars) and get mex Wax Polisher FREE, Limited offer! C.O.D.

TIMEX PRODUCTS CO. 5506 Virginia Ave.



AT BARGAIN PRICES

BUILD YOUR OWN—Wagons — Scooters — Soap Box Racers—To order above wheels write number wheels wanted in space provided, tear out and mail this ad with check or money order and your name and address. If other sizes are wanted write for FREE LIST.

TRULSON MFG. CO., 811 E. 31 St., Dept. PM 13, Kansas City, Mo.



 Move into a 1948 Schult and you have an equipped home, ready for comfortable living or extended travel. Separate bedroom with luxurious bed . . . kitchen with built-in range, refrigerator and sink . . . generous wardrobe and storage space . . . all the most-wanted features, tastefully combined. No wonder that Schult, famous more than a decade for quality, is also today's outstanding VALUE. See the 1948 Schult models now . . . Write for name of nearest dealer. SCHULT CORPORATION. Department 3203, Elkhart, Indiana. In Canada: John Inglis Co., Ltd., Toronto.



1948 Schult models have beautiful interiors. Above: Decorated living room of the Luxury Liner.

Member: Trailer Coach Manufacturers Assn.



ree Write today for book on trailer coach

living and easy-trailing

new Schult 1948 models.



FIRST CHOICE BECAUSE IT'S GUARANTEED to Increase Crop Yield

- MATURE'S

22% to 51%

Milwaukee Equipment Mfg. Co., So. Milwaukee, Wis., U. S. A.

M-E Rotary Tiller Does All This with LESS Work!

Prepares perfect seed bed ... increases mineral and moisture content ... rebuilds soil Nature's way. M-E makes work easier ... does it better ... than any other equipment you can buy. Write today!

Milwaukee Equipment Mfg. Co. Dept. PM3, So. Milwaukee, Wis. Please send illustrated folder.

Name Address

y Garden Tillers d Tractor Power Take-Off Units



- Graduated base can be used ain or swivel
- Width of Jaws 3"
- Depth of Jows 1"
- Opens with steel jaws 2"(hardened)
- Weight complete with crank 16 lbs.

odern production facilities enab us to produce hi-quality machine to ment at the lowest prices.

- Large Acme steel screw sturdiness and durability
- Four bolt and key slots are vided to attach the vise rigidly to the machine table so that work holding surfaces are at true right



NEW ADDED FEATURE! Gas - Moisture Vapor Injector creases Mileag with Smoother Performance

ON FACTS

ORDER TODAY or write for complete catalog

MPGRS. UNIVERSAL AND INDEPENDENT LATHE CHUCKS . MILLING MACHINE VISES . POWER HACK SAWS . DIVIDING HEADS . MAGNETIC CHUCKS . RECTIFIERS . DEMAGNETIZERS

L.W. CHUCK CO., 31 So. St. Clair St., Toledo 4, Ohio

L. W. CHUCK CO. 31 SOUTH ST. CLAIR ST. TOLEDO 4, ONIO	FOR YOUR CONVENIENCE Please ship one 3" Vise. Check on money order enclosed. Please send complete L-W Cotalog.
STREET	STATE



Continuously cleans and RE-REFINES motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times—reduces motor wear to a minimum! Proves conclusively that "Oil Does Not Wear Out Mechanically" as stated by U. S. Bureau of Standards, (Bulletin 86).

"RECLAIMO"

REMOVES SOLIDS (by filtration)

REMOVES WATER (by distillation)

PREVENTS Excess Fuel Dilution

PREVENTS Acid and Sludge Formation

MAINTAINS Stable ELIMINATES Changes CAR • TRUCK • TRACTOR OWNERS!

You'll want to know more about Reclaimo's Oil, Motor and Money-Saving Features. FREE 40-PAGE BOOK "Oil FACTS" gives you the complete "Reclaimo" story "OIL FACTS" gives you toe complete Recisimo Book plus details about our New 90-Day No Risk-No Cost TRIAL OFFER I WRITE for YOUR COPY TODAY!

RECLAIMO MFG. CO.

5083 ELSTON AVE., Dept. 66, CHICAGO 30, ILL



21 x 27 in. hardwood table reinforced with aluminum channel, tilts full 45 degrees; 13 in. capacity in front of blade.
8 in. blade mounted to cut from 0 to full 2½ inches.
Self-aligning and calibrated rip fence and miter gauge.
No machining, no welding, no blueprint reading.
Sturdy wood, steel, and aluminum construction. Build easily with common hand tools.

common hand tools.

GIL-BILT Step-by-Step Plans — Simplified perspective drawings, full size patterns; illustrated with 15 actual photographs. Post-\$1.00 paid anywhere in the world.

GIL-BILT 5/2 in. Arbor—Machined spindle, two precision ground lubricated for life ball bearings, assembled ready to run in one \$6.95 gill-BILT Special Metal Parts Kit—Includes Step-by-Step Plans, 5/2 in. ball bearing arbor, aluminum channel and bar, cast aluminum handwheels, steel hinges, V-pulley and all other metal parts \$14.95 (less blade).

Same Kit with high quality 8 in. combination blade... \$18.95 ...\$18.95

(less blade). \$14.
Same Kit with high quality 8 in. combination blade. \$18
(Prices include postage up to 600 miles)
GILLIOM POWER TOOLS P. 0. BOX 1-B, LAMBERT FI
ST. LOUIS 21, MISSOURI



GATEWAY SPORTING GOODS CO.

1319 MAIN STREET

KANSAS CITY 6, MO. Start a NEW BUSINESS



Sharpen Dull Pipe Wrenches

Or Add to Your Present Repair Business

Write for Information.

J. C. MOORE INDUSTRIES P.O. Drawer 276

REAL GAS ENGINE \$6.95



The new THOR "B" — Sensational miniature gasoline engine that really works. Superpower performance. Smooth, velveted power that roars into action with a "twist of the wrist." Over 25,000 already sold. 1/6 H.P. Complete with coil and condenser. Ready to run, only \$9,95. In KIT form, fully machined, 5 minutes to assemble, \$6,95, without coil and condenser. Powers all models. Fully illustrated instructions. Send \$1,00—shipped collect same day C.O.D. FREE—Send for 24-page illustrated hobby catalog.

AMERICA'S HOBBY CENTER Dept. B-38, 156 West 22nd Street New York 11, New York

OF ALL TYPES—10c UP
AMAZINGLY POWERFUL!!
5 oz. Alnico Magnet, lifts 10 lbs.
\$1.00. Our Leader, 15 oz. Magnet,
weaken! Useful for lifting va.uables from tanks,
akes, or rivers easily! 7 small magnets \$1.00 with
many shop and home uses. Satisfaction guaranteed,
1CH, 2566 N. 49TH ST., MILWAUKEE 10, WIS.





WINDO-GLIDER CARRIES WINDOWS WITHOUT WEIGHTS, STOPS RATTLING

Take no chances with windows that must be propped to stay open. They may cause serious injury. Don't be deprived of uninterrupted sleep by rattling. Any defective window can NOW be put in good working order in just a few minutes at very small cost. (Described on page 162 of the January, 1948 issue.) See your HARDWARE or LUMBER DEALER about it. They either have Windo-Glider in stock or will get it for you. If not, send us \$1.00, Cash or M.O. for two sets postpaid. Add 50c for each additional window, Don't delay. Act now. It will bring you years of comfort and prevent accidents. Attention BUILDING CONTRACTORS! This device works in frames with or without boxes, cuts costs. Investigate.

LEON PRODUCTS. Deat. 8. 1028 N. Ashland Ave., Chicago 22. Ill. LEON PRODUCTS, Dept. 8, 1028 N. Ashland Ave., Chicago 22, III.



ARRIVE ON TIME. EVERY TIME with a HULL AUTOMOBILE COMPASS

Avoid confusion and delay of wrongway travel. Drive by Hull. Be sure everywhere, night or day. Beaconlite illuminated, \$5.95. Streamline stand-ard, \$3.95. At your dealer's. Write for circular.



HULL MFG. CO., P.O. Box 246-D3, Warren, Ohio

ASTIC Shows How To

Magically Changes Cloth To

Luggage — Leather Covered Furniture — Golf Bags — Auto Seat Covers—Restaurant Furniture, Booths or any Leather or Leatherette item with new plastic discovery called Leather-New. Coat cloth or cloth covered items such as Gider Cushions, Tarpaulins, Porch Furniture, Etc. and make them look and wear like they were leather. Spreads easily with brush or spray gun—leaves NO BRUSH MARKS. Simple Acids, Caustics and Alcohols do not stain this finish—It is sun and mildew proof. Stays Fresh and Clean as long as real leather. Comes in all standard colors. Just mail coupon for Free sample of Leather-New coated material which shows effects.

LEATHER-NEW, Leather-New Bldg., Dept. J33, 4723 Troost, Kansas City, Mo.

Imitation Leather

OWN A PROFITABLE LIFETIME BUSINESS

Cash in on big profits to be made in this new business—Profits up to \$700.00 months possible, renewing booths and furniture for bars, restaurants, grills, movie houses, etc. Mail name and address on le postcard—I'll show you how.

Jack Edwards, Sales Mgr.

JUST MAIL COUPON

No Obligation

Leather-New, Leather-New Bldg., Dept. J33 4723 Troost, Kansas City, Mo. Address.....

City.....State.....

Name....

Fill Out-Mail Today



Motor dynamically balanced to insure smooth operation at 20,000 R.P.M.

Attractive, Hard, baked enamel finish

Designed and Engineered for Ease in Handling

Comes Packed in Beautiful Natural Finish Wood Case as shown

Operates on 110-120 V AC-DC

Carries Reputable Fairchild Industries Factory 90 day Guarantee This Flexible Shaft tool Grinds-Polishes-Sands-Buffs-

10 Tools with Kit

The Best Tool of this type for anything near this price

We also have a 50 piece assortment of Hand Grinder Accessories in a nice box. We guarantee this to be over \$15.00 in value for only \$4.75 while quantities last.

U. S. GOVERNMENT SURPLUS

New Lighting P

A 350 W 110 V A.C. Light Plant Powered by a 1½ H.P. Briggs and Stratton Gasoline engine. Planned for use for advance army hospitals. ALL NEW. \$179.50. Can be used for up to 700 W in actual use. Some used units for \$99.99. Guaranteed good condition. We also have some NEW Surplus 250 W 110 D.C. Light Plants for \$129.50. 10% less in lots of 5 or more. We have a few NEW Surplus 550 W 32V D.C. Units \$169.50. Also some 1000 V Radio Transmitters for Ham Owners \$299.99.

Write for Complete Literature on Lighting Plants and Radio Transmitters

Lighting Plants Sold Shipment Collect Chicago, USA

1627 N. Damen Ave., Chic	cago 47, III. Grinder: Literature—Lighting Plant.
Enclosed M.O. for Grinder	☐ Grinder Accessories ☐ Lighting
Plant Size	Radio Transmitter
Name	
Address	





Only on the UNIVERSAL GRINDER can the inside face and edge of the stationary blade, as well as the reel blades, be ground to proper clearance

ALL IN ONE SET-UP

WITHOUT REMOVING ANY BLADE FROM THE MOWER Write for Free Folder TODAY!

Dept. M-38, Rogers Mfg. Co., Lindsey, Ohio



SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your KIT \$14.75

NOW! ONLY...

Postage prepaid with check or money order

Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. PM-8

22 Havemeyer Street

Brooklyn 11, N. Y.



NEW 30" SHEET METAL BRAKE

Forms angles, channels, vees, flanges, locks, zees boxes. Handles 26 gage sheet steel, heavier gage of aluminum, copper, plastic, etc. Portable. Can be held in a bench vise, or boited down. All steel construction. Wt. 40 lbs. \$2450 Shipped exp. collect. ONLY

12" BRAKE. Cast iron and steel construction. Price, \$14.50 PP. construction. Price, \$14.50 PP.

20 CURVE FORMER. Forms cylinders, round corners and cones in sheet metal and strap iron. Price, 10.00 PP.

VISE IRON BENDER. Forms rings, hooks, eyelets, etc. in 1/2" round or square: 1/4" up to 2" wide in bar iron. All steel construction. 8 parts. Price \$10.00 PP. Immediate delivery. Order direct, cash or C.O.D., or send for folder.

VISE BRAKE MFG. CO. 1318 So. 30th Ave. Dept. P3 Omaha 5, Nebr.

SAY YOU SAW IT IN POPULAR MECHANICS

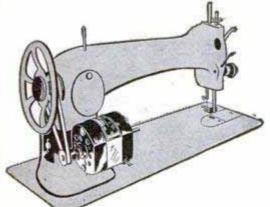


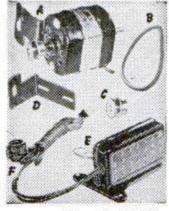
MIDWEST SURPLUS SALES 1520 LOCUST ST.

ELECTRIFY Your Sewing Machine With a

"SEWING MACHINE MOTOR KIT"

The IDEAL GIFT for Mother ... Wife ... Sister!







ADJUSTABLE FOR USE WITH ANY TYPE OF SEWING MACHINE

ANYBODY CAN INSTALL IT!

Takes but a few seconds

IGKES DUT a few seconds

COMPLETE SET CONSISTS OF:

(A) MOTOR & BRACKET—Universal AC or DC, 60
cycle. 115 Volts. (B) BELT—Long Wearing Rubber
Belt. (C) PULLEY—Single Grooved Steel Hubbed Pulley. (D) BRACKET—New and Improved. (E) FOOT
CONTROL—7 Step Rheostat. (F) CORD SET—Extension Cord fitted with plug and socket. (G) Installation Instruction Sheet.

SPECIAL NOTE: This 1/20 H.P, motor with double
end shaft and rheostat can be used in all hobby
workshops for flexible shaft attachments, grinding,
drilling etc.

Special Offering to DEALERS!

MAIL THIS COUPON

City

Dept. PM-4

BROWNELL DISTRIBUTORS, INC. 308 Canal St., New York 13, N. Y.

Please rush motor kits at \$17.75 each (postage pre-paid) in:

money order or check send C.O.D.—and I'll pay postman \$17.75 plus C.O.D. fees.

3-ROLL BARGAIN

- 100, 120, 150 Grit

3 - 50 YD. ROLLS ABRASIVE CLOTH \$5.95 Now Only

Tremendous bargain in abrasive cloth rolls. Three 50 yd. aluminum oxide rolls of finest abrasive cloth from mfgrs. like Minn. Mining, Carburundum, Sandpaper Inc. A \$27.60 list value for only \$5.95. Specify widths and grit sizes. Send check or M.O. Or send on \$2.00 deposit and let bal, come C.O.D.

D. SCHUPACK Dept. PM-3R Cottage Grove Ave. Chicago 19, Ill.



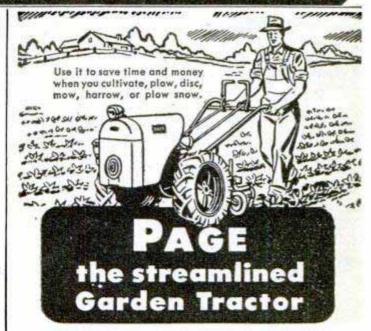
GUARANTEE: Our abrasives guaranteed to be top qual-ity. Return for money back IN FULL if not satisfied.



boat in which you are interested.

THOMPSON BROS. BOAT MFG. CO. (151)

213 Ann St. Write to 113 Elm St.
PESHTIGO, WIS. (sither place) CORTLAND, N.Y.



does your job quickly, easily, at low cost

This new Page, backed by 20 years' experience, gives you "big-tractor" features at low cost. Headlight and equipment light for night work. New quick-change hitch. Balanced for easy handling. Direct drive, worm-gear transmission, using cut gears and ball bearings. No cheap belts or chains. Gears and clutches in dust-free case. Adjustable wheels. Individual wheel clutches make turning easy. 11/2, 2, 3, and 4 H.P. Prices are surprisingly low. Write for dealer's name and free catalog.

Page Dairy and Farm Equipment 1904 S. 81st Street P-4 Milwaukee 14, Wisconsin

MANUFACTURERS Clearance

MAKING WAY FOR NEW LINE



Perfect for light-duty buffing, grinding, polishing. 5000 RPM motor; 60 cycle, 110 volts AC; All aluminum case-ripple finish; polished base; 4" grinding wheels. Reduced from \$14.95.

Send no money! Fill in and return—Send Parcel Post, C.O.D. one Bench Grinder at the new reduced price of \$6.95.

Name

Charges Paid if Money Accompanies Order

WOLFSON & FAIRCLOUGH MFG. CO. 45 NORTH DIVISION ST. BUFFALO, N. Y.

New CONCORD

The ONLY Complete Up-to-the-minute Catalog of RADIO PARTS • RADIO SETS KITS . HAM GEAR . TESTERS

The greatest, latest complete presentation of radio, electronic and television equipment and supplies in Concord history! Packed from cover to cover with thousands of items — 160 pages

of everything in Radio and Electronics. Special bargain section of hundreds of money-saving values. Scores of new items from famous makers. Parts, blueprints for famous Popular Mechanic and many other kits. Mail coupon below for your copy sent FRFF

CONCORD RADIO

Downtown Chicago Branch: 229 W. Madison LAFAYETTE RADIO CORPORATION

CONCORD RADIO CORPORATION, Dept. P-38
901 W. Jackson Blvd., Chicago 7, III.
Yes, rush FREE COPY of the comprehensive new Concord
Radio Catalog.

State.

Name

Address

City

DER *Mew fasy wa* ... Less than I per Job No Experience or Tools Necessary Nothing Else to Buy only

CONTAINS GENUINE TIN LEAD!

CONTAINS GENUINE TIN LEAD!

Now, practically anyone can do soldering easily and quickly with this amazing, newly-invented Self-Soldering Tape that requires No use of Soldering Iron or Blow Torch! Just wrap a small piece of Self-Soldering Tape around wire or other metal part to be soldered. Ignite the tape with a match, and as it burns, it solders! Self-Soldering Tape is used by both amateurs and skilled repairmen. Saves time and work—NO waiting for iron to heat, NO tinning the iron, NO need of an electric outlet or torch. Convenient to use in small places or when working on a ladder or pole. Both hands are free while soldering. You can solder two or three spots at the same time! Contains no magnesium, You get 8 feet of Self-Soldering Tape for only \$1.00. As you use only \$26" to 1" for each job, each job costs less than 1c! Complete ready to use with full instructions. Order NOW! Send \$1.00 or order C.O.D. If you send money we pay postage, otherwise you do. SEECO, \$10 St. Charles, Dept. 302-C, 5t. Louis, Mo.

Sand Casting — Forging — Heat Treating — Case Hardening



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum copper, brass, etc., \$22.50, \$29.50, \$42.00 f.o.b. Kansas City, Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. P2 Kansas City, Mo.

Insist on Safety-Engineered

- Bull Dog Hitches and Parking Jacks
- Torq-Less Axles

HAMMER BLOW TOOL COMPANY

Dept. 120 Wausau, Wisconsin Send for FREE Catalog

BUILD THIS CONCRETE BLOCK MACHINE

Sell blocks; or build your home, garage, barn at 1/5 cost by making and laying your own blocks.

This simple machine which you can build yourself at a cost of about \$15 (excluding motor) will make a block in 30 seconds using only one form. 2 to 4 forms can be used on each vibrator.

Power driven concrete mixer plans also. Send dime for details and 'How to Make and Lay Blocks.'

U-BUILD-IT SERVICE Dept. 3-A, 206 West Wilder Ave., Tampa 3, Fla.

BUILD YOUR OWN POWER LAWN MOWER

WHY BREAK YOUR BACK MOWING FIELD OR LAWN?

WRITE FOR

FREE LITERATURE

The Rite-Way Mower Attachment |



can save time

IT'S FUN TO BUILD and effort mowing field or lawn by building their own whirl type power mower. Build according to your own ideas and needs at small cost. Cut close to fences, walks, buildings, etc. Build in short time with parts and instructions we furnish. Save hours of time and back breaking labor. Write today for FREE information,

T&H MFG. CO., Dept. MP-13 811 E. 31, Kan. City 3, Me.

294



12 years experience enables us to offer you the newest model Speedex tractors at big savings. All enclosed gears running in a bath of oil, powered with Briggs and Stratton engine, easyto-handle controls, equipped with 500-12 pneumatic tires and has many other features. Model C cultivates up to 2 acres per day. Replaces up to 5 or 6 men with

SPEEDEX BIG BOY

Heavy-duty walking tractor powered with 6 horsepower Briggs and Stratton engine. Pulls 10" plow. Cultivates up to 5 acres. Replaces light team. Only \$265.00 F.O.B. Ravenna.

FULL LINE OF IMPLEMENTS DELIVERIES NOW BEING MADE

Ravenna, Ohio Box 216

The CLINTON Gas Engine

2 H.P.- \$5950 3 H.P. - \$7475

Complete, compact, dependable, 4 cycle, single cylinder, air cooled gasoline engines—by world's largest producer of 2 H.P. gas engines. Ideal for power tools, saws, farm machinery,

pumps, boats, bikes, etc. A penny postcard brings you full information. Immediate Delivery

FOUR MODELS: Kick starter . Thrust bearing type Gear reduction . Marine type

FREE: Literature describing all uses. Write today. CLINTON ENGINE CO. Detroit 30, Mich. 16351 E. Jefferson

SPECIAL

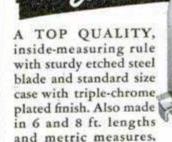
Personal Initials in Solid Bronze

Beautiful polished bronze initials person-alize home-craft items — fireplace sets, cigarette boxes, doors; many other uses. Easy to apply to metal, wood, leather or plastics. Order your initials today.

ets Polished Bronze Initials, total 6 letters, 3/4" high, (\$1.50 regular price): Special offer, 51 postpaid. Send \$1.00 for 2 sets - money back guarantee.

H. W. KNIGHT & SON, INC., 42 Lane St., Seneca Falls, N. Y.

ith Standard Size B



Carlson & Sullivan, Inc. MONROVIA, CALIF.

SOLD BY LEADING HARDWARE STORES

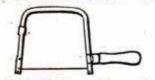
Without

CHANGE BLADE

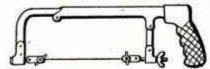
IN 10 SECONDS

WITHOUT TURNING WORK OR SAW ONLY SAW BLADE THAT CUTS IN ALL

「YLER *Spiral* SAW BLADES



COPING SAW... Entirely new, better way of saw-ing... Only coping saw blade that cuts plastics ... wood... metal... with absolutely clean, even edges. Won't tear. Now... anything you can draw ... you can saw. 360° cutting blade. 1 coping saw



REVOLUTIONARY SPIRAL HACKSAW BLADE ... Cuts iron, steel, bronze, beass, aluminum, plastics...any direction. Only blade that cuts tubing without tearing or grabbing. For intricate internal work..., before impossible. Fits any standard frame. Merely slip adapters over pins. Length 10°. ne. 5 spiral blades, complete only \$1.00 2 blades and pair of adapters . . . a real buy . . . only 394

MANUFACTURING CO. SANTA MONICA, CALIF



Saws in any Direction for Most Intricate, Difficult Patterns.... Oil-rempered spring steel wire blade...outlass other type blades



At Your NEAREST HARDWARE STORE Or order direct today . . . Prompt shipment Your money back if not delighted.

YOUR BLADES ARE THE ANSWER TO MY CUTTING PROBLEMS. SEND AT ONCE SAWING IS BELIEVING

TYLER MFG. CO. - 938 Pico Blvd., Santa Monica, California, Dept. M3

Please Rush Send 1 coping saw frame Send 2 hacksaw blades and 5 blades (enclosed \$1.00) Send BOTH — 1 coping saw frame 5 blades plus 2 hacksaw blades and pair adapters complete (enclosed \$1.39)

NAME		-
ADDRESS		
CITY	STATE	

If you make things or fix things, this unique tool will utterly astound you!

> It's a PLIER It's a WRENCH It's a CLAMP It's a VISE It's a . . .

> > WONDER!

 \mathcal{S} EYMOUR \mathcal{S} MITX PLIER-WRENCH

Serves as a plier — or the jaws can be locked, so hand pressure can be released and tool used as a vise. Swivel jaw holds objects of all shapes with terrific grip. Pressed steel body. Hardened (replaceable) jaws. Guaranteed. 10" size, \$2.25; 7", \$1.75. If not at your dealer's, order from us but give his name. Send for circular.

> SEYMOUR SMITH & SON, INC. 900M Main Street - Oakville, Conn.



AMERICAN



Here's the new American Portable Electric Saw-ideal to save time, labor and money in production work. Not a hobby tool. Speedy . . . powerful . . . easy for one hand operation. 8" blade. Adjustable. Precisionbuilt, dependable. Write for free details, giving your occupation. The American Floor Surfacing Machine Co., 535 So. St. Clair St., Toledo 3, Ohio.



REYNOLDS CIRCULAR SAW GRINDER

Increases Your Profits!



JOINTING GUMMING SHARPENING

SAWS 5"-30"

WRITE FOR CIRCULAR

REYNOLDS MACHINERY CO.

303 EDDY STREET, PROVIDENCE 3, R. I.



For Laughs DAFFY DILL For Fun The Wonder Drinking Clown

The Greatest Acrobat of All Time Complete with stand. No springs, no gadgets, no wires, not mechanical. Sensational "Daffy Dilly" somersaults through the air into a glass of water. It's "eye-stounding." Young and old go wild over him. A wonderful gift. Send no money. Start laughing at the anties of Daffy Dilly today. Pay postman \$1.95 plus postage and C.O.D. charges when delivered or send \$1.98 and we nay postage.

BERNARD FINE CO., INC.
501 6th Ave., Dept. PM10, New York 11, N. Y.



ELECTRIC WELDER

AC or DC 110 Volts

Pre-war type—All metal—No chemical—
5 year written guarantee. Welds ¼" thick metal or money back. Repairs tanks, of enders, machine parts, etc. Comes complete with rods, unit directions and eye shield. We also manufacture a set you can \$3.95 complete. On C.O.D.

5645

Complete

mailing charges extra. ESSAY MFG. CO., INC., Dept. P.M., Quincy 69, Mass.

TOW CHEAP OIL BURNER FOR HEATING AND COOKING STOVES-FURNACE WITH CHEAP FURNACE OIL

NO MORE SHOVELING COAL
OR ASHES. Sensational Fuelizer
Starter Vaporizing System turns Cheap
No. 1 Furnace Oil, also Range, Heater,
Tractor Distillate, Kerosene and like
oils into oil heat—one of the quickest,
hottest fires known. Lifetime Guar
ANTEE. \$1.00 Benus Offer for Testing.
We will let you try it in your own
stove or furnace for one month. Get yours for introducing. Big profits QUICK, Be first. Send in your
name today for details and cash in on the tremendous demand for this Amazing Invention.

NORTHWEST MFG. CO., 608-C, Mitchell, S. Dak.



Mows and Trims Lawns



In One Simple **Easy Operation** 81/4 Lbs.

> Save Time and Labor with a

MONTAMOWER

New model. New type metal handle has special device to adjust cutting height. Drive shaft now mounted on free rolling, factory lubricated, sealed ball bearings. No tired backs or aching arms. 8¼ lbs. live precision made mechanism that first gathers, then cuts smoothly a clean 16" swath through nrst gathers, then cuts smoothly a clean 16" swath through grass, dandelions, spike grass, lawn weeds. No noise or clatter. As modern and efficient as your electric razor. Cuts right up to walls, fences, trees or posts; leaves no fringes to be trimmed by hand. Cutters self-sharpening. Built to last many years. Many thousands in use. Sold direct from factory for 26 years. Costs little. Write at once for trial on your own lawn "approval offer," guarantee information and literature.

MONTAMOWER DISTRIBUTING CO.

GRAND RAPIDS 2, MICHIGAN

RUST! RUST!

WHAT a headache! Here's the answer! A new liquid RUST REMOVER-quickly dissolves rust on iron or steel, tools, hardware, machinery, etc. NO RUBBING or hard

work. Brush, swab, spray or dip. Put ON-let SET-wipe off-RUST GONE! On sale at all Sears Retail Stores in HARDWARE DEPTS. 50c and \$1.00 in Mid-West (slightly higher elsewhere.) Also available through our mail order catalog. Manual of rust control FREE.

SEARS, ROEBUCK and CO.

For further information, write ALLIED PRODUCTS COM-PANY. Dept. C-1, 1133 Newport Ave., Chicago 13, III. Manufacturers of CorOdex.

Liquid RUST REMOVER

VHEELS

FOR BUILDING YOUR OWN



Toys, Carts, Scooters, etc.

5" diameter-strong pressed steel. Molded rubber tires. Bright finish. 5/16" Axle.

Send cash or money order. Shipped immediately, postpaid.

CARL F. ULRICH

3530 West 119th St. Cleveland 11, Ohio

ONLY

COP DEX

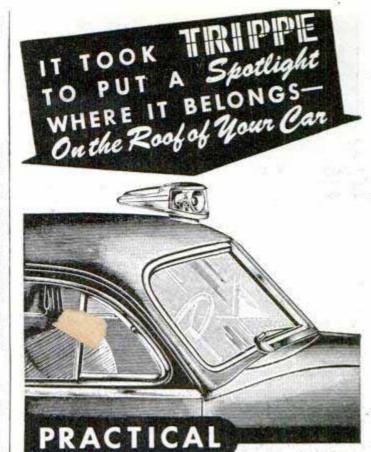
NO WOODWORKING SHOP COMPLETE Without the Electric WONDER PEN



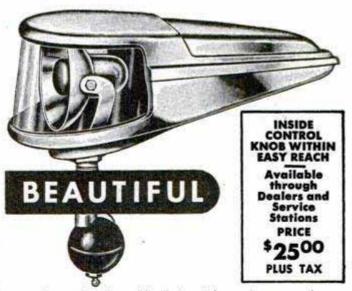
Costs so little, yet enables you to put magiclike professional finishing touches, borders, decorations, etc. on whatever you make. Six interchangeable points for etching (woodburning), embossing, cutting, shading, hole cutting. Simply plug in and use. Guaranteed, Pays for itself the first time used. Complete professional kit in wood chest. Only \$2.25, postpaid.

AMERICAN T. & F. CO., 6130 N. Clark St., Dept. 138, Chicago 26, III.





Mounted on the roof of your car in such a manner as to allow a sweep of 240° range of view (ahead, on both sides and to the rear) plus a 40° up and down movement. Inside control knob, directly connected with the lamp itself, is mounted close to the car roof within easy reach of the driver's right hand or the passenger's left hand.

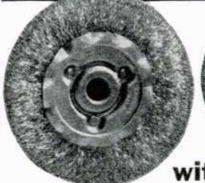


Streamlined to blend in with modern car design, this highly chromed attractive unit adds distinctiveness to any car on which it is mounted.

Write for descriptive literature. Also we would appreciate having the name of your dealer or service

TRIPPE Manufacturing Co. 2610 W. 16TH STREET, CHICAGO 8, ILLINOIS

CLEAN UP JOBS IN A JIFFY





with TOUGH

HOME-UTILITY Wire Wheel Brushes.

You'll handle dozens of cleaning and finishing jobs ... more quickly ... more efficiently . . . with tough, durable Home-Utility Wire Wheel Brushes! You can use these brushes for high-speed work with grinders, drills, flexible shafts, bench spindles or lathes. They're built of quality wire . . . with each tuft securely anchored . . . by BLACK & DECK-ER, famous maker of quality industrial tools for 37 years! They come in 6" and 4" diameters, in fine and coarse wire, used singly or in "gangs" for added thickness. Order them by name today . . . Home-Utility . . . from your hardware, electrical or

Quality-Built by BLACK & DECKER for Cleaning Buffing Burnishing Removing Rust, Dirt, Scale, Old Paint

implement dealer. And ask him about a speedy, well-built Home-Utility 1/4" Electric Drill (at only \$18.95) and the 1/2" model (at only \$35.95) for farms, homes, hobby shops,

Products of the BLACK & DECKER Mfg. Co. Dept. H-2, Towson 4, Maryland

3 Easy Ways to

KILL Rats

OR YOUR MONEY BACK!

K-R-O Powder and Bis-Kits

Kill rats more safely with these red-squill products. Mix K-R-O Powder (75c) with ground meat, fish, or cereal, or get baked K-R-O Bis-Kits (35c and \$1.00) that are ready to use.

RatStop Contains Du Pont ANTU

Buy RatStop for fast, easy rat-killing by the tracking method, or for mixing with baits. 75c can holds enough powder to kill more than 300 rats! Directions for safe use are on every can.

 If these products are not available at your nearest drug, feed, or seed store, order direct. Include 15c for postage and handling.

The K-R-O Company, Springfield, Ohio

DUAL TAIL PIPE EXTENSION

Fits all cars — chrome plated.

DEEP TONE

produced by 21/2 inch outlets Postage free on prepaid orders DEALER INQUIRIES INVITED

LYONS PRODUCTS COMPANY 2319 Ridgeley Drive, Dept. PM4, Los Angeles 16, Calif.

Convert full power of your headlights to fog lights. Each amber colored plastic lens has 3 rubber suction cups. Attach over headlight glass. Use both up and down beam. Approved! Guaranteed! Directions! Supply limited. COD. plus charges.

PER PAIR POSTPAID

\$4.95

HART SALES SERVICE, 105 LATROBE, GRAFTON, W. VA. (Dealers Write for Wholesale Prices)



INSTALL AND SERVICE OWN OIL BURNER!

SAVE UP TO \$150! Send for the famous DE NUAL. Simple, easy step-by-step photos of a oplete oil burner installation. Complete with necessary plans, drawings and easy-to-follow ections. Published under exclusive copyright

at \$5.00.

SPECIAL OFFER—CLIP SI to this ad and mail today.

"... am very much pleased with same ... I am sure it is the most complete manual ever put out by any company ..." B. R., Whitehall, N. Y.

DELTA HEATING CORPORATION, Dept. M.

85-05 Northern Blvd. Jackson Heights, New York City

\$2.95 HIGH-FLYING ARMY BOX-KITE ARMY BOX.112

1 feet high
17 inches square.
17 inches square anyHere's a kite anyone can fly just
toos it in the air and
toos it in the air The
watch it climb.
The watch it climb.

sky's the limit for
sky's the see sky's the limit for beight we've height we've height up to 2,500 flown it up to 2,500 flown i

1/30 H.P. 1725 RPM \$9.95 60 cycles, single phose

This sturdy, beautifully balanced motor was built for the Navy by the famous Ohio Electric Company, Pre-lubricated bearings permit either vertical or horizontal end-



either vertical or horizontal end-bell mounting. Size 63%" long, 57%" diam., 4 mtg. holes in 45" wide flange, 54" shaft, Every hobbyist and experimenter needs one of these motors! Include postage for 20 pounds.

HEAR THRILLING FM on your own radio!

Pilotuner does the

does the trick Now - for only \$29.95 - you can bring Frequency Modulation into your home — with your own radio. Just add the amazing new Pilotuner to your set and enjoy the fidelity and freedom from noise possible with FM. Pilotuner is complete with tubes, self-contained power unit, and built-in FM antenna . all in hand-some wood cabinet. DON'T WAIT . ORDER IT NOW! Include postage for 15 pounds.

GAY GOLDENROD PARACHUTES Just the thing for

making for making for TENTS SAILS SCARVES DRAPES AWNINGS DRESS GOODS DRESS GOODS CABANAS

CABANAS

. or just give
one to the children and they'll have a barrel
of fun with it. You'll find a
host of uses for the strong,
beautifully fine material in
these genuine U.S. Army delivery chutes. They're 36 feet
around the bottom, 5½ feet
around my to peak, have 16
strong woven tapes each 10½
feet long. Brand new—never
used. ORDER NOW!
Include postage for 5 pounds.

Orders filled within 24 hours. Send check or money order. Be sure to include postage for total shipping weight, Sorry - no C.O.D.'s.

The RADIO SHACK CORP.

167A WASHINGTON STREET

BOSTON, MASS., U. S. A.

SURPLUS SAL

Liko BINOCULA



COATED OPTICS

IMMEDIATE DELIVERY

First Time in America! Now you can get close-ups of all events with these all-purpose heavy duty binoculars. Coated precision lenses, interpupillary adjustment and other features found only in high price binoculars. Carrying case and shoulder straps included. 10 day no risk money back trial. Ideal gift. SEND NO MONEY! Pay postman on delivery plus charges. Send payment with order and we mail postpaid. Be sure to add 20% Fed. tax (\$1.40). Act now.

VETERAN'S EMPORIUM, Dept. B-30 CHICAGO 22, ILL.



SUCCESSORS TO PLASTIFORM MFG. CO. DEPT. PM-1, 306 BOYD STREET . LOS ANGELES 13, CALIFORNIA

Genuine

Available Only Through Snap - on's Direct - To - User Tool Service

WRITE FOR INFORMATION SNAP-ON TOOLS CORP. . Kenosha, Wisconsin

PLATE WITHOUT ELECTRICITY! . . . on any surface!

New discovery plates hard, non-corroding nickel alloy on any wood, leather, or metal surface (except chrome, zinc, or white metal). Wears like chrome. Thousands of home uses: door knobs, golf clubs, baby shoes, hobby parts, etc. No electricity, anodes, or fixtures—just add water. Kit contains everything needed for 5 full hours of plating. MONEY-BACK GUARANTEE: Use 10 days according to directions; if not completely satisfied, return for full refund.

MAI	L THIS HAND	Y ORDER	FORM
Metal Processing Ship one LUSTR enclosed.			erson, N. J. Check for 812.50

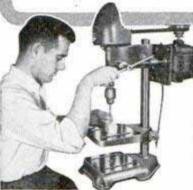
Name		

Address

(348)



get it in this new Power King 9" wood lathe! Handles all inboard and outboard wood-turning . . . table legs, chairs, circular tables, lamps, etc. . . . quickly, easily, accurately. With proper attachments, turns light metals and plastics as well. Oilite bronze bearings support spindle. Ball bearing absorbs end thrust. Built extra-heavy for smooth operation and lasting accuracy. Send for full details and name of nearest dealer today.



POWER KING 12" DRILL PRESS \$39.75

Another top tool value! Rugged, smooth, accurate. Drills wood, metals, and plastics. Has low-cost accessories that help you get real "professional"

results on such jobs as mortise and tenon joints, routing, shaping, sanding, carving, inlaying. Send coupon for complete information on this handy precision tool.

POWER KING

7"-8" TILT/ARBOR SAWS \$42.75 and \$58.75

All prices F.O.B. Warsaw, less motor. Subject to change without notice.





City, State_

POWER KING TOOL CORP. DIVISION OF ATLAS PRESS CO.

SEND FOR FREE LITERATURE TODAY

POWER KING TOOL C	ORP.,
320 Cleveland St., Wa	rsaw, Ind.
Please send new Powe	r King catalog sheets to:
Name	



Here is THE precision tool that every man who works with wood just can't afford to be without. The REDFORD is a shaper, planer, sander — all in one — at a price never before thought possible. It is portable (weighs only 12½ pounds) takes any standard cutter, planer or sander that fits a ½-inch spindle. Power-driven from a ½ H.P. electric motor (not furnished) or it may be bolted to a drill press table and driven direct from drill press chuck.

Illustrated folder explains in detail ALL of the many NEW FEATURES and advantages. Nothing else compares with its versatility—o-LOW COST

Send for FREE Illustrated FOLDER

DON'T WAIT - WRITE TODAY

REDFORD SPECIALTIES INC. 18437 Salem . Detroit 19, Mich.

SAVES TIME... SAVES WORK



Garden-All gives you everything you need for a complete job in efficient gardening. Attachments include Plow, Disc, Spike Tooth Harrow, Cultipacker, Seeder (for single or double row planting) and Cultivator. Also Sickle Bar, Lawn Mower, Utility Scraper and Dump Trailer. And you can attach or detach any one of them in less than a minute. No wonder so many owners say there's nothing at all like Garden-All !

GARDEN-ALL TRACTOR, INC. Dept. P, 100 W. UNION STREET, LIBERTY, INDIANA

HOIST & WINCH New



Eliminates Back Breaking Ordeals

Small But Mighty. Were made to be used on B-29s for lifting bombs. 2,000 lbs. capacity. Weight 16 lbs., perfect for lifting or moving loads in trailers or onto trucks, tractors, or any other movable machinery.

Fine for garages, implement stores, warehouses, assembly lines contractors and many other uses. Original cost, approx. \$100.00.

Sale Price complete with mounting brackets, \$26.30 Cable and hook and Hand Crank, only...

Send check or money order for immediate delivery

SESCO ENGINEERING & SUPPLY CORP.

15th Ave. and Clay St.

Dept. PM

No. Kansas City, Mo

BETTER PERFORMANCE OUTROARD MOTOR

Enjoy more speed, Enjoy more speed, smoother performance, greater carrying capacity by equipping your motor with the Michigan propeller recommended for your particular motor and type of boat used. Write for outboard catalog containing recommendation chart for all motors, old and dation

INBOARD: Our "AQUA-MASTER" is miles ster; smoother than conventional propellers.

MICHIGAN WHEEL COMPANY DEPT. P. GRAND RAPIDS 3, MICHIGAN

MOTOR BIKE AND SCOOTER OWNERS



At last a Motor Cycle type Gas control. Instantaneous gas control at the twist of the wrist. Rugged construction with chrome plate finish.

Fits all %" handle bars, a minute to install. dealer cannot supply, send \$2.50 M.O. Prepaid. No C.O.D.

TYCO ENGINEERING CO., 2225 HERVEY AVE., NORTH CHICAGO, ILL

A Super-value, fine poplin Army FIELD JACKET can be voors for only \$2.88, Quality features: full zioper-front, 100% blanket-lined, water repellent, adjustable hip straps. I'cal for Farmers, Lumbermen, Truck Drivers, Sportsmen, Although used, every jacket maranteed good condition. Sizes 34 to 40. State size and send check or M.O. Supply limited. Hurry.

MARKO SURPLUS CO., Dept. PM-3 2924 Logan Bivd., Chicago 47, III.



SPECIAL OFFER! Famous, patented, lock-stitch sewing awl complete with needles, waxed thread, direction folder, Hundred uses—sewing, repairing leather goods, canvas, belting, old or new harness, saddles, gun cases. Satisfaction guaranteed, or money back. Send currency, check or money order, no stamps please. rency, check, or money order, no stamps, please Yates Mfg. Co., 611-H Main St., Lake Geneva, Wis

100% PRIMARY AIR KELLER GAS TORCH Burns Regular House Gas (Natural Gas Only)—No Compressed Air, No Adjusting Needed—Develops 2100° F.

7100 F. Guaranteed to silver solder, light brazes, solders, removes paint rapidly. Precision-engineered. 1506 B.T.U. per hour. Order today C.O.D. from

KELLER GAS APPLIANCES

P. O. Box 261

Califor



Eliminates need for tricky, expensive rewiring of war surplus radios, motors



110 volt A.C. to \$15.95
er pack for only

Direct current to operate WAR SURPLUS radios, charge storage batteries, operate small electroplating units, now available to you direct from manufacturer at low prices you can afford to pay, Ideal for fractional horsepower motors, solepoids, relays . . . anything designed for direct current.

Each unit utilizes full-wave bridge

Each unit utilizes full-wave bridge type selenium rectifier, transformer, cir-cuit breaker, on-off switch. Ready to plug in and use.

SCINTILLA RAIL AND POWER WORKS, INC.





BATTERIES for HEAVY DUTY USE TRUCKS — TRACTORS — BUSES — DIESEL



EXIDE-12volt-150 amp. hr.

21 plates-150 lbs.

\$40 ea. f.o.b. Brooklyn

AUTOLITE-6 volt-15 & 17 plates WILLARD 175 amp. hr.

& OTHER 6 volt-25 & 27 plates-MAKES 175 amp. hr.

\$22.50 ea. f.o.b. Brooklyn

Each Battery In Perfect Condition No C. O. D. WRITE — BENJAMIN'S for MOTORS

2000 Mill Ave., Brooklyn, N. Y.

HERE'S YOUR ORDER BLANK **WAR SURPLUS DOLLAR SALE**



□ NAVY COMBAT KNIFE

BRAND NEW. Tempered steel
5% inch "Parkerized" blade.
Laminated leather grip handle, with sheath—as pictured.

☐ AIR CORP PROPELLER

BRAND NEW. Genuine airplane propeller mig. for radio controlled target plane. 30 inches from tip to tip. Highly polished beautifully grained hardwood. Many uses as decoration for den or boy's room. Clock can be easily mounted in center. Order several at this low price.





☐ ARMY GOGGLES

BRAND NEW Polaroid goggles in original packing. Each a complete set with three interchangeable shatterproof lenses. Heavy sponge rubber ventilated frame. Adjustable eliatic headband. A MUST for motorcyclists, skiers, and production against wind, sun, snow, and dust particles.

CLIP	ENTIRE	AD.	Check	items	desired.	Send	check.	money
order.	or cash.	All	items	shipped	postpan	d any	where	in U.S.

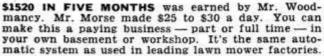
Name		
Address		
City	C+	nte

NATIONAL JOBBING COMPANY 1703 No. 24th St. Omaha, Nebr.

QUICK MONEY SPARE TIME

Sharpening Lawn Mowers

a cost of 2c per sharpening! That's what users of the Foley Electrakeen Lawn Mower Sharpener report,



REPEAT BUSINESS is assured because people like to have their mowers sharpened the Foley way. Lawn mowers cut better and stay sharp longer. Easy to operate—because you just slip the lawn mower in the machine with handle on and turn on the power. As simple as that! Spring will soon be here with its rush of business. IMMEDIATE DELIVERY! Investigate this opportunity now. Send coupon for FREE PLAN.

FOLEY LAWN MOWER SHARPENER

FOLEY MFG. Send FREE business, Name.	CO., 3	on the	Fuley	Lawn M	apolis lower	18, Minn. Sharpening
Name		3				

Does Your Chevy Shift-Lever Rattle or Slip Out?

You can easily and quickly have it corrected by your dealer or you can do it yourself Just get

HOVE Genuine SHIFT-TITE Self Adjusting SWIVELS

Anyone can install them. Does the job permanently Takes a load off your mind because the condition may be dangerous Insures positive stay in gear shifting. It's inexpensive.

ASK YOUR CAR DEALER OR GARAGE

If they don't carry them-send \$1.50 per pair and we will mail them to you with instructions, postpaid. Don't wait—Be safe—tomorrow may be too late All models from 1940.

HOVE ENGINEERING 1108 SO. 6TH ST. MINNEAPOLIS, MINN.

NO MORE BACK BREAKING MOWER PUSHING



PRECISION BUILT To Last A Lifetime

If you prefer:

Enclose \$10.00 deposit. I ship C.O.D. for balance.

Build a POWER LAWN MOWER yourself from your old HAND MOWER

We supply complete ATTACHMENT that needs no welding. Easy to in-stall in less than an hour, fits any make or size of mower for Electric Motor or Gasoline Engine. COM-PLETE ATTACHMENT ONLY \$27.80.

Both the ATTACHMENT and the EN-GINE are ABSOLUTEIN GUARAN-TEED, you are getting the very best that money can buy at a price you can afford,

ATTACHMENT AND GASOLINE ENGINE ONLY \$89.95

Orders filled in seven days. Send Stamp for FREE FOLDERS.

ROYAL-OAK LAWN MOWER SHOP

\$1350 Value for Only \$1.95

8000 ohm impedance Headphones, produced to Air and Signal Corps specs. Extremely sensitive, lightweight (only 9 oz.) With 51/2 ft. cord, plug, jack and ear cushions. BRAND NEW.

No. 17A37 Spec., Per Pair. \$1.95 Plus 25c each for Postage.

FREE Catalog on Everything in Radio and Electronics.

Burstein-Applebee Co. 1012 McGee, Kansas City 6, Mo.

SPARKRITE, The Amazing Electronic Coil gives your car 20% more miles per gallon and 25% more pep and power by actual scientific tests! Cures hard starting! One minute to install. Pifteen day money-back guarantee. ONLY \$5.00 postpaid. Send today! State make, year automobile. (No Fords) Free descriptive literature on request. PACIFIC ENGINEERING ENTERPRISES, Div. PM-38, Box 456, Station A, Richmond, California.

SAY YOU SAW IT IN POPULAR MECHANICS



28 Lawn Ornament Patterns, 25c. Other patterns; 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 16c each. 2. Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid. Strother Pattern Service, Dept. AG-8, Box 383, Belington, W. Va.

BUILD YOUR OWN MACHINE TOOLS! Blueprints \$1.00-Catalog FREE

Make your own Milling Machines, Shapers, Drill Presses, 8" Circular Saws, 6" Jointers and similar tools with Lewis ready-to-machine costings. Save up to 80% of finished machine cost. \$1.00 brings complete blueprint specifications for above 6 tools. Catalog describing Lewis line sent free with blueprint order.

WRITE TODAY!

LEWIS MACHINE TOOL CO. P. O. Box 7446, Sta. L, Dept. M, Los Angeles 23, Calif.





Race it With Class A or B Engine and MINI-MOUNT POWER



POWER RACING SENSATION THIMBLE DROME

Real scale model of the classiest midget racer you ever laid Die cast aluminum body, aluminum rubber-tired wheels. Chrome exhaust stacks. Wobble Pump. In-strument panel. Car is 93's" long, 4" high. Weighs 18 oz. \$4.25 postpaid. Mini-Mount transmission unit, die cast frame, ball bearing, for all class A, most class B engines, complete \$9.45. Less gears \$4.95. Unit with ring gear \$7.45. Pinion Gear \$2.00. Rush order for postpaid delivery. \$1.00 deposit for C.O.D.

HOME SHOP PRODUCTS CO., Dept. 13, 4821 Sheridan Road, Chicago

Alfax Electrosensitive Paper

Pioneer Ahead of the Crowd

Be the first to experiment with the new Alfax papers used in facsimile and impulse recording. Send One Dollar and get postpaid a roll of Alfax Paper with directions telling how to make recorders and experiments with Alfax paper, in which an electrically connected wire becomes an electric pen indelibly marking the paper.

ALFAX PAPER AND ENGINEERING CO.

.95

Complete

vith chain, hook and

handle.

40 Riverside Avenue, Brockton 27PM, Mass.

W CROSLEY



Smart! Practical! Costs \$600 to \$700 less than any other station wagon—operates for about $\frac{1}{2}$ as much. Seats 4 in comfort. With rear seat removed hauls 1/4 ton load.



Convertible: If you love sun and air.

Panel Delivery: Full 1/4 ton capacity.



Pickup: Cuts service and delivery costs.



Sports-Utility: work or play seat obtainable. Low priced even for CROSLEY-\$130 less than station wagon.

All models have new 4-cylinder engine



For beautiful, full-color catalog, write: Crosley Motors, Inc., 2532-HJ Spring Grove Ave., Cincinnati 14, Ohio.

Get that NEW-CAR FEEL again!

SEALED POWER PISTON RINGS

The only ring with the Full-Flow Spring! SEALED POWER CORP., DEPT. G-3, MUSKEGON, MICH.

AMERICA'S FINEST BUM

Here's an all-around hydraulic utility jack with hundreds of uses where. easy lifting or pulling is required. Safest, quickest, easiest to use on any car built. Result of 15 years of advanced precision engineering. Extra long, heavy duty steel chain with forged steel grab hook

picks up loads from 4" BELOW bottom of jack to 22" ABOVE. Base, handle socket, head and chain plate are all tough malleable iron castings. 17" hydraulic lift, 3000 lb. capacity. Order now at your dealer or send money order or check to

@ 1948 American Hydraulics, Inc.

merican SHEBOYGAN, WISCONSIN American Hydraulics, Inc.

Sheboygan, Wisconsin

Enclosed find check or money order.

Please send..........American Bumper Jacks.

Address.......

saved \$150.0

sir! I saved \$150.00 when I installed my Delta Automatic Oil Burner myself in a few hours. shopped around but couldn't get a burner installed for less than \$350.00. The work was easy because of the Delta Photo-Installation Manual . . .



MADE BY THE WORLD'S LARGEST MANU-**FACTURER OF OIL BURNERS**

Now you can enjoy fully automatic heat in your home by installing it yourself simply and quickly with a few tools. You can save at least \$150.00 in your spare time! The Delta Automatic Oil Burner comes completely assembled along with everything necessary for the complete installation by you for the low price of only \$195.00. Includes the famous copyrighted DELTA PHOTO-INSTALLATION MANUAL showing step-by-step photographs of an actual installation.

PAY AS LITTLE AS \$6.26 A MONTH! And—you need not pay a single penny to get the Delta Automatic Oil Burner because a simple deferred payment plan is available. Just send the coupon below for full information and free brochure in color describing how you can install and enjoy fully automatic heat in your home with the Delta Automatic Oil Burner, Delta Automatic Floor Furnace, and other Delta Heating products. Mail coupon today!

-- PASTE COUPON ON PENNY POSTCARD----

DELTA HEATING CORPORATION

85-07 Northern Blvd., Jackson Heights, New York City Please send FREE Color Brochure and full information about DELTA Automatic Heating Products.

NAME

(Please Print Clearly)

PM-M



Try this NEW Portable

ON 10-DAY MONEY-BACK GUARANTEE

This ADDOMETER does more work at lower cost than any other ADDING MA-CHINE! Adds, sub-tracts, multiplies quickly, accurately;

AMAZING

ONLY

8-col. capacity. Easy to use, easy to han-dle at desk, on the job or at home. Over 100,000 in use: praised every-where. Yours for only \$12.95 WITH 10-DAY MONEY-BACK GUARAN-TEE if not fully satisfied. Write for descriptive folder or send check or money order TODAY.

DEPT. E-3 RELIABLE TYPEWRITER & ADDING MACHINE CO. 303 W. Monroe St., Chicago 6, III.

HEAVY DUTY CUTTING UNIT with Timken Roller Bearings



Build your own rotary type lawn or weed cutter.

Take the hard work out of weed cutting. Build yourself an up-to-date weed and lawn mower with the Nu-Way heavy duty unit.

Write for Free Circular—We Supply Cutting Unit Complete TRACTOR-LITE MFG. CO., Spirit Lake, Iowa

INTERESTED IN RADIO?

Send for this today! Pocket size templet for quick, accurate symbol drawing. Produces almost every known symbol used in Radio, Electronics, Television. For Home and School.

\$1.00 EACH-at your Radio Parts Dealer OR send to COLETTE PRODUCTS COMPANY, Dept. R-4
Royal Oak, Michigan 25440 John R.



Aircraft surpuis, turbines, etc. be converted into blowers, turbines, etc. Cost to Gov't approximatety \$3,000. Sale price \$15.00 each while they last. FOB, Washington, D. C. No COD. Send check or money order to: MICHEHL INDUSTRIES, ATLANTIC BLDG., WASHINGTON, D. C.

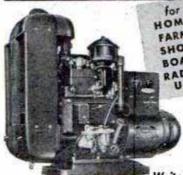
Trees Into Money

Beisaw Models in 16 to 24 foot sawing lengths.

MECMANICAL FEED, accura works and positive dogs. Use to or old auto engine for low cost property for itself quickly. Send post card of Woodworking Equipment.

ZONE HEAVY-DUTY ROOF COATING Sensational product cuts essential building repair cost up to 75%. Amazing demonstration gets orders in a hurry. Only six average orders a week can pay you well over \$190,001! Complete FREE selling outfit includes everything you need to make big money right from the start. If 30 or over, this may be the opportunity of your life. Tell about yourself. Write, Jack Canning, Vice Fres. ZONE Company P.O. BOX 789, DEPT. C-12, ZONE COMPANY FORT WORTH 1. TEXAS

CITY Amyunkene



HOMES FARMS SHOPS BOATS RADIO USE

Onan gasoline-engine-driven Elec-tric Plants supply reliable, economical electric service for any use Portable, stationary or stand-by models. Water or air-cooled, compact and rudded. and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 10,000 watts, 115 and 230 volts. BATTERY CHARG-ERS: 500 to 3,500 watts; 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.

2539 Royalston Ave., Minneapolis 5, Minn.



MAKES ELECTRIC DRILLS MORE USEFUL



A safe, precision-made attachment for any size Electric Drill, Air Drill, Flexible Shaft or Drill Press with speeds from 400 to 3000 RPM that will receive a 14-in, shank.

The Uni-Tool is an attachment for wead or metal Sawing, Filling, Chiseling, Screping, Buffing, and Polishing. Order from your dealer by mail or write for descriptive folder.

Uni-Sander and an assortment of \$8.15 accessories for Lako Power Tools \$8.15

WATCH FOR MORE REVOLUTIONARY, NEW LAKO TOOLS AND EQUIPMENT! *Patents Pending —Trade Marks Registered.



AT YOUR DEALERS OR BY MAIL POSTPAID

WANTED! Distributors, LAKEVIEW MANUFACTURING CO., Inc. bors. Write for catalogs

YOUR POWER TOOLS



POLY BALL BEARING ARBORS

10,000 R.P.M.

(No extra charge for left hand threads)

C4-1/2x121/2 spindle, housing 2x8 57.95 PP.
C5-5/2x121/2 spindle, housing 2x8, 58.25 PP.
C6-1/2x121/2 spindle, housing 21/2x8, 59.25 PP.
D8-1x171/2 spindle, housing 21/2x8, 59.25 PP.
D8-1x171/2 spindle, housing 21/2x8, 59.25 PP.
1 INCH BETWEEN WASHER AND COLLAR thehes between collars, C4-1/2 \$14.25, C5-5/2 inches between collars, C4-1/2 \$1.50.

2032-A E. Walnut, Pasadena 8, Calif.

Rotary, Indexing, Milling TABLE

DUAL CROSS FEED and ROTARY FEED

Bas 8" table, 360° movement and 4" cross-feed travel, Adjusting wheels and dials gradu-ated in degrees and thousands. Slotted for bolting to table. No. 83 Priced \$49.50. No. 82 without rotary feed \$39.75.

Write for Circular No. 10

CHICAGO TOOL and ENGINEERING CO. 8365 South Chicago Ave., Chicago 17, III.



MOTORIST

Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all ears, trucks and tractors. It is automatic and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits! Send name, address on penny postcard for free VACU-MATIC CO., 7617-1309 W. State St., WAUWATOSA, WIS.





HEAR BETT

Western Electric Hearing Aids

 Find out why thousands are enthusiastic about the finer hearing, new wearing comfort, provided by Western Electric's new all-in-one hearing aids. Send for free, illustrated booklets.

FREE! MAIL COUPON TODAY

WESTERN ELE 193 Broadw	CTRIC Dept. PM3 ay, New York 7, N	e. y.
in-one Wester free copy of "	n Electric Hearin	about two new all- g Aids. Include my nd Your Hearing."
Name		
Address		30
City	Zone	State
Distributed in Ca	nada through North	hern Electric Co., Ltd.



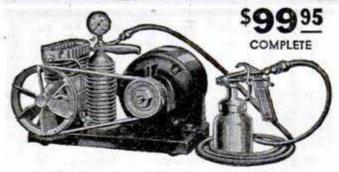
It is now possible for home craftsmen . . . and garage-men, gunsmiths, and repair-men . . . to turn and cutoff metal without buying an ex-pensive lathe. This new tool converts woodturning lathes, drill presses and grinder stands into precision metal lathes. TRU-TURN has a built-in micrometer . . . turns and cuts-off steel, brass, aluminum. TRU-TURN TOOL — Two guide bushings; and bits for steel, brass and aluminum.....only \$11.75

FACE-PLATE WORK-DRIV-ING CHUCK—For convert-ing woodworking lathe. Chuck plus three adapter bushings.....only \$4.50

Add 25c to each item for C.O.D. orders. Send money order or checks for prepaid shipment within U.S.A. Iliustrated fold-er free.

MILLHOLLAND SCREW PRODUCTS CORPORATION 134 West 13th Street, Indianapolis 2, Indiana

FOUR CYLINDER PORTABLE AIR COMPRESSOR PAINTING O



COMPACT

RUGGED

The ideal air supply for home and farm workshop, machine shop, garage, service station and contract-ing painter. Inflates tires; refinishes automobiles, trucks, implements and furniture. Paints buildings better, faster and at lower cost than brush work. Compressor has 4 cylinders, drop forged crankshaft, heat treated valves and pistons, bronze bearings, forced feed lubrication. 50-60 lbs. pressure without pulsation. Price includes compressor as shown, with air gauge, 15 ft. hose, spray gun and ½ h.p. motor; fully guaranteed. With ½ h.p. motor—\$109.95.

IF YOUR DEALER DOES NOT SELL PRESSURE QUEEN WRITE DIRECT.

THE CAMPBELL-HAUSFELD CO. 1046 RAILROAD AVE. HARRISON, OHIO

REALISTIC MODEL KITS



Famous Lockheed P-80 jet fighter. Try your hand at a model airplane and build one of the latest. This P-80 "solid" kit has baisa parts, shaped fuselage and canopy, landing wheels, template for curved parts, and decal. A beautiful show model for mantel or shelf.



Conestoga Covered Wagon. Live again the days of the Overland, Oregon, and Santa Fe Traits as you build this sturity little 'prairie schooner' in authentic 'b'' to ft. scale. Canvas, completely shaped ribs, die-cut plywood parts, free rolling wheels, etc. \$1.10 Covered Wagon..... Plus 15c postage.



Forget your cares on long winter evenings. Build these scale mementos of the old West and of World War II! Miniature Army Truck and lifelike Jeep in '4" scale: Western Ranch Buckboard Wagon and Wells Fargo Stage Coach in '4" scale. Precision parts die-cut from white pine and plywood for easy assembly. Free-rolling wheels, real metal parts. O. D. canvas, formed ribs, leather springs, etc., full size plans. Order now—save at "combination" prices. Add 15c per set for postage and wrapping costs.

Buckboard Kit .\$1.00 \$7.00

21/2 Ton Army Truck\$1.25 \$ 1.25 U. S. Army Jeep . 5.60 BOTH FOR

BOTH FOR.....

HOLLYWOOD MODELS POST OFFICE BOX 389

New Precision Built Commercial

Wood Shaper and Matcher

Now Within The Reach Of Every Home Workshop

Make corner matched joints, panelling, flut-ing, routing, notching, inlay, tongue and groove and joints. Designed for commercial use, now simplified design and mass production brings it within the reach of every one. Just attach in chuck of drill press and it's ready to use. Write for complete FREE information.

T&H Mfg. Co. Dept. SP-2, Kans. City, Mo. Write for FREE Information

PILOTS' JACKETS Left) NEW AIR-CORPS SURPLUS. B-15
Style. Green poptin. Warm alpaca wool
pile Ining. Genuine Mouton fur collar,
4 Pockets, 36-46. \$15-50
(Right) A-2 Style. Brown leather,
sturdy rayon lining. Zipper front.
Sizes 34-46. \$17.95
MAVY N-4 JACKET: Water repellent green poplin. All wool flannel
lining. Zipper front. Sizes 34-36
\$55.50

Write for FREE Illus, List Army Surplus, Orders sent postpaid except C.O.D.

Satisfaction or Money Back
CONSUMERS CLOTHING CO., Box P, 26 Greene St., New York 13, N. Y

Amazing! \$25 Is Yours!

For selling only 50 boxes greeting cards. Sells for \$1your profit to 50c. Also Easter and gift cards, stationery and wrappings. Costs nothing to try. Write for samples on approval. MERIT

70 William Street, Dept. Z

Newark 2, N. J.



AND NOVELTIES **JEWELRY** AT HOME!

Work right on your kitchen table! No tools or experience necessary. Learn—earn within a week. Complete home instruction course, beautifully photographed, shows how to make 115 different designs of earrings, pins, sprays, brooches, hair ornaments, braceles, candy dishes, ash trays, wall plaques, etc. Illustrates also 55 kinds of Sea Shells and Fish Scales often used. Explains fully home methods of dyeing, pearlizing, golding and glow-in-the-dark processes. Lists hundreds of raw materials with wholesale prices. Complete course only \$1. Beginner's Kit, \$3 (\$3.50 in Canada), postpaid.

HOUSE OF GIFTS, Box 4550-PM2, Coral Gables, Fla.



New BABY FLYROD, 1/4 oz., \$1.10. Ready APRIL 1.

HAVE YOU SENT IN A NAME? Send a catchy name in at once for the BABY FLYROD LURE—looks just like its DADDY—the Wonderlure above. Then write 25 words giving reasons for name. Send in as many names as you care to. Be sure to attach a Makinen care to. Be sure to a Box Top to each entry.

WIN CHEVROLET or \$500 CASH 2000 Other Valuable PRIZES

Get lucky — Why not try, Other prizes are Karriall Trailer — Television Set — Canoe — Johnson Sea Horse — Radios — Rods — Reels — Camp Stoves, Etc. Open to all, boys, girls, men and women. Contest closes Sept. 30, 1948.

GET FACTS TODAY! Don't Delay. Circular describes all prizes, rules, etc. Stop at your dealer or write us. Thousands of chances to WIN with names or photos.

IF DEALER CAN'T SUPPLY, send us his name check or money order and we'll ship lures postpaid. The more names you send in, the more chances you have to WIN. Give color of lures wanted: RED HEAD - FROG - PERCH - ORANGE - RED' SPOT - YELLOW RED SPOT - MOUSE - BLACKIE. Don't Delay! Enter Contest Today!

MAKINEN TACKLE CO.

Contest Editor, Dept. PM3, Kaleva, Mich.



FLUTED MAKIDEVL 8-Colors Weedless Spoon



Acme Bonderized-Galvanized Steel or Aluminum slats—Baked Enamel—Chip and Rust proof—Choice 14 tape—10 slat colors, 2 Wk, delivery, (Send 25c for sample Venetian Blind Kit—Credit on first order.)

POWERS, Dept. M3, 1153 E. 82nd St., Chicago 19, III.

HE ACCESSORIE



· New Time and Money Saving Items for ◆ New Time and Money Saving Items for your Metal Working Lathe—Lathe Mandrels in sets with a new and unusual feature—Center Drill Arbor sets—Stub Mandrels—Dual-Purpose Bail Bearing Cone and Pipe Centers for auto and electric motor Armature and Pipe and Tubing Work—Extra Long Hardened Centers—Extra Long Cut-Away Centers—Morse Taper Reamers—Drill Rod—Flat Gage Stock—Case Hardening Compound—Etc. pound — Etc. FREE! Illustrated folder and price list. Mention your lathe. Write today.

HURON MACHINE & TOOL CO. Yale 5, Michigan

FREE FOLDER

BLACK & DECKER ELECTRIC MOTOR . MATCHING WELDON PUMP



12,000 RPM 1/75 HP 27V AC/DC HAND SIZE FOR POLISHING— CUTTING



110 volt to 27 volt transformer for motor \$1.95

SATISFACTION GUARANTEED OR YOUR MONEY BACK DICK ROSE-ERECO, 2912 HEWITT AVE., EVERETT 21, WASH.

- For Lawnmowel Sharpening Profits PRECISION-BUILT GRINDS ALL MAKES OF LAWNMOWERS **AUTOMATIC OPERATION** NO EXPERIENCE REQUIRED MAKE UP TO \$200 PER WEEK OPERATE in YOUR OWN GARAGE OF BASEMENT

Ideal Lawnmower Sharpener sharpens blades easily, speedily, accurately. Grinds reel knives to fit the straight blade perfectly. Behind Ideal's strong, sturdy construction are nearly 50 years of engineering experience. Handles maximum width lawnmowers. Get ready for the lawnmower sharpening rush now.

Send for FREE Book

Dept. D-3, Plymouth, Ohio

BUILD YOUR OWN SPORTS TRAILER ACTUAL VIEW OF TRAILER ASSEMBLED

takes two days . . . saves you \$200

Now—this beautifully streamlined sports trailer—made and sold by Modernistic Trailer Manufacturing Co. for years at a price over \$500, is being shipped in a complete, prefabricated kit. Cames to you ready to assemble. It's easy—all you need is a screwdriver and wrench! Anyone can do it! Complete instructions furnished. Trailer has all-aluminum exterior. Accommodates 2 adults. Overall length, 12'7'; width 6', height, 5'. Has roomy galley, and plenty of stowage space. Total weight slightly over 400 lbs.—hardly noticeable behind your car. Kit comes complete with every part needed, less tires and tubes.

Build this deluxe sports trailer for your own use—or sell it and make money! Order your prefab kit today . . . fit and quality of every section unconditionally guaranteed. Price only \$279.50, plus tax, f.o.b. Los Angeles. Enclose full remittance, or, if you desire C.O.D. shipment, enclose \$50 deposit. If more convenient to you we will ship trailer in two kits—one kit now, the other later when you're ready for it. Price is slightly higher but you pay for each when you order. First kit, containing chassis and outer shell sections, only \$157.50. Second kit, containing balance of trailer, \$139.00. Order today specifying complete kit or first half of kit. Write for free tolder.

NATIONAL TRAILER STORES - Dept. 30 - Box 2353, Terminal Annex - Los Angeles 54, California

The Sensational NEW Combination ROLLER-ICE SKATES

• ICE SKATERS ROLLER SKATES

Streamlined

50% Lighter Than **Ordinary Skates**

FASTER-SMOOTHER-EASIER SKATING

OF SHOE.

Local Agents Wanted . . . RUSH ORDER

AFCO PRODUCTS, INC., 4547 No. Clark St., Dept. P-3, CHICAGO 40, ILL.

The Ideal Gift

Be First In Your Locality

Days . PAT. NO. 2113862 Only A PAIR

Postpaid in U.S.A. **IceSkateAttachment** \$2.25 Extra

3 Ball Bearing Wheels in line gives

MORE SPEED with LESS EFFORT . . .

Note the BRAKE! to STOP QUICK simply RAISE THE TOE

· We Ship C. O. D. Plus Postage

Mail Your Order Direct To Factory

Plastic Spray Gun, 71/2 ft. Air Hose 4 Color



WAR SURPLUS

ELD JAC

Ideal for Farmers . Lumbermen Truck Drivers . Laborers and for

Plain and Fancy Loafing

Nothing like it has ever been offered at this low price!

This full-zipper front, bi-swing back, fine poplin Army FIELD JACKET is the favorite of G.Ls all over the world. Although used EVERY jacket is guaranteed to be in perfect condition. Sizes 34 to 40. Send name, address and size and on delivery pay postman \$1.98 plus C.O.D. charges. Add 15c for postage. Or send \$1.98 plus 15c for postage with your order and save C.O.D. charges. Order yours today!

5 & B SURPLUS SALES CO., Dept. PM-26

3244 W. Roosevelt Rd.

Chicago 12, III.

SPRAY OUTFI Complete \$ 65 Handles all Ordinary Paint Spray Jobs Only / CHANGE COLOR IN 5 SECONDS

Spray painting is best for all kinds of finishing. Get this new low price complete spray outfit. Does a fine job. quick, easy, economically. Foot power compressor with expansion tank delivers ample steady air supply. Push button control on spray gun. Complete, as listed above, only \$9.65. Spray gun, air hose, 4 containers, only \$2.85. Order today with check or M. O. for prepaid delivery. If C. O. D. send \$1.00 deposit.

Home Shop Products Co., Dept. 513, 4821 Sheridan Road, Chicago

SURPLUS 25 lbs. RADIO PARTS

A gold mine of parts for repairmen, amateurs, and experimenters . . . sockets, condensers, resistors, transformers, coils, hardware, wire, etc. An outstanding bargain in usable parts! Send \$5.00 cash, check or M.O. today!

[Pay small express charges on receipt.]

ELECTRONIC DISTRIBUTORS, Inc. Dept. M3 620 W. Randolph St., Chicago 6, Ill.

FOR ONLY

.

COMPLETE DO YOUR OWN at a few repair jobs will by for this machine. A ractical and profitable actical and profitable achine tool for any workshop. Make money doing repair work for others.



WAYNE MEG. CO. WATRE PENNA. OW a DYNAMI Industrial Transformer Type



his portable, industrial transformer type Dynamic Welder easily carried right to the job can be operated from any convenient properly wired 110 Volt 10 day Trial Offer Metals. Has 8 metallic and carbon are heat stages. Does work you would think only possible with a larger more expensive machine . . . Can also be supplied for 220 VOLT 60 CYCLE operation and other voltages and cycles at slight additional cost. This portable, industrial transformer type Dynamic Welder easily carried right

DYNAMIC WELDER CO., 15 East 23rd Street, E, CHICAGO 16, ILL.

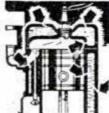
AUTOMOBILE REPAIRS



New ADVERTISING MACHINE Vill Increase Your Business

Learn how thousands of business men, in every line, are boosting sales in spite of conditions-with 14 messages-printed and illustrated in a few minutes on gov'nt post cards - with amazing new patented CARDMASTER. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine, built to last for years. Low price, sold direct. Guaranteed for five years. Send name today. SEND NAME We'll send FREE illustrated book of money-making IDEAS for your business and com-plete, unique advertising plans. RUSH YOUR NAME TODAY.

CARDMASTER COMPANY 46 RAVENSWOOD, Dept. 133, CHICAGO 40, ILL.



REPAIR CRACKED BLOCKS AND HEADS

External and internal leaks in blocks, cylinders and valve ports quickly and easily with LUSCO PLASTIC SEAL. 90 day Service Guaranteed or your money back. Send money order or check for full pint—more than sufficient for average repair

C. F. LUSK CO., 5924 BONNA AVE., CLEVELAND 3, OHIO



NEW B-M POWER MOWERS

For Modern Lawn Care odel self-drive, three-tary blade mower, with quick-starting, e, trouble-free 1 1/2dependable, trouble-free 11/2-2 h.p. Clinton engine.

LOW FACTORY

Light. Sturdy. Choose from three models of assembled mowers or Build-it-yourself kit of parts. Guaranteed. B-M MOWER COMPANY Box, 66-M Blue Mound, Kan

START YOUR OWN VENETIAN BLIND BUSINESS

We supply everything you need. No special skill or knowledge is needed. Send 25c in coin (credited on first order) for samples and more information.

METALIGHT VENETIANS

Stratford, N. J.



BUILD YOUR OWN CAR WITH A WAR SURPLUS HYDRAULIC TRANSMISSION



The plans for a really slick midget car, made with a Surplus Hydraulic Transmission used for controls on Bomber turrets, for control, can be found in the January issue of Popular Mechanics.

These transmissions will operate with a minimum loss of power on any motor up to 2 HP, and provide an excellent means of keeping your Midget cars speeds down for safe driving by youngsters. Each transmission is completely self contained and offers a variable speed in ... either direction from neutral.

This transmission also has an unlimited number of other uses on power tools, display tables, scooters, and any other job requiring controlled speed or instant re-

Single units shipped Express Collect, Larger quantities shipped per Instructions).



Seven Acres of Surplus

SAY YOU SAW IT IN POPULAR MECHANICS



LOOK

WEAR HITE-BUILDERS IN YOUR **OWN SHOES**

Want more respect?...more opportunities? Then increase your height INSTANTLY with Davis Hite-Builders. Slip them inside your own shoes. Invisible . . . comfortable . . . easy to wear. Made to last for years. Amazingly low-priced!

SEND NO MONEY

Rush name, address, and shoe size today. Pay postman only \$1.95 plus few cents postage for your pair of Hite-Builders, mailed in plain package. If not delighted with immediate result, just return them and we'll refund your morey at once, Or send \$1.95 now and save postage. Same guarantee... of course. Order today look TALLER next week! Same guarantee . . . of course. Or day, look TALLER next week!

DAVIS MFG. CO. DEPT. H-338, LOVELAND, OHIO



WALKIE-TALKIES!



Radio Telephone Sends And **Receives Several Miles**

This is the light weight batteryoperated radio that was used so
successfully by the Army. One
knob tunes both transmitter and
receiver. Sends and receives
merely by pushing a button.
Recommended for amateurs, explorers, police and Government
services, etc. Shipped ready to
operate, complete with tubes,
telephone handset, telescoping
antenna, and new batteries. Rebuilt by the Government and
guaranteed. Price only \$45.00
each or \$90.00 per pair F. O. B.
Chicago.

Extra Batteries (80 hours con-

Extra Batteries (80 hours continuous service) \$4.75 each.

Parts and Accessories for Walkie Talkies

We maintain complete stocks of replacement parts, batteries, antennas, chassis, etc., for Army Walkie Talkies and Handie Talkies. Write for Special Listing No. 20.



320 N. La Salle St., Dept. P-3 Chicago 10, Illinois



Up and go-with the rugged new Royal Enfield popular Model R.E. Style, safety, flexibility, 125 c.c. 2-stroke, single cylinder engine, 3-speed gears; 45 m.p.h. Write today for folder "P", for complete details. Also 350 c.c. and 500 c.c. models are immediately available.

Dealer inquiries given prompt attention.

WHITEHALL DISTRIBUTORS, Inc.

1385 Commerce Avenue, New York 61, N. Y.

NEW WRENCH FOR SOFT METAL

- Doesn't Crush
- Doesn't Mutilate · Self-Equalizing-

• Adjustable Jaws
• Capacity 38" to 16"

Tri-Grip ratchet-action jaws are self-equalizing, provide positive 3-way grip on carburetor, gas and oil line fittings, refrigerator lines, etc. Order yours today. \$1.50 Prepaid. If not completely satisfied return in 10 days and money refunded.

TRI-GRIP CO. AKRON 1, OHIO

Attractive Territories 1187 Bellows St. Open For Jobbers

TRI-GRIP



BUILD YOUR OWN ENLA

Enjoy Photography's most fascinating hobby at a fraction of usual cost, With simple step-by-step instructions and diagrams plus a screwdriver and pilers you assemble your own Enlarger and Savel Get ail features of more expensive Enlargers: precision machined aluminum alloy castings, 90° tilt for wall projection of prints, spherical aiuminum lamphouse, helical rack and pinion focusing with extra large knobs, unconditional guarantee.

Write Today for Free Illustrated Folder CALIFORNIA TECHNICAL PRODUCTS CO. 8510 Warner Drive, Dept. M-3 Culver City, Calif.

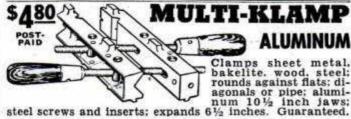


PAD IT WITH FOAM RUBBER

Will give a lifetime of comfort. Ideal for padding dining chairs, seats, benches, etc. Pattern with scissors. Comes in 16"x16" size—\$2.98 each. Send remittance (Postage prepaid). Leatherette covering also available—write for prices and sample.

2346 SO. DEARBORN ST.

ALLENDER & CO. CHICAGO 16, ILL.



MULTI-KLAMP

Clamps sheet metal. bakelite. wood, steel;

WINCHESTER COMPANY, Anderson, Indiana

LOW PRICED



STEAM CLEANER

Jenz Super Chief

Portable—No moving parts—Cleans anything — Motors — Chassis — Machinery — Floors — Buildings — Remove wallpaper — Dairy & Creamery—Oil Rigs etc. Oil fired — Economical—fully tested and warranted. 75 # Steam in less than 10 \$276.50 min. Complete as illustrated. F.O.B. factory.

HI-PURE LABORATORIES

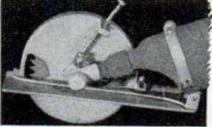
Say You Saw It in POPULAR MECHANICS



In Montreal, 7546 man; in Skaneateles, N. Y., Horle Welding Supply,

Agents Wanted

CANDEE-SMITH GOVERNORS 2841 S. Hill St., Los Angeles 7, Calif.



POWERDRILL CONVERSION

LITE-SAW converts most stand. 1/4" drillmotors to 6" circ. port. saw. Com-plete kit, ready to attach 819.50 postpaid. ORDER NOW. Write for litera-ture. DEALERS WANTED.

FUTURE PRODUCTS CO. 3625 N. Mississippi Ave. Portland 11, Ore.



Wm. Galloway Train

 Realistic StromBecKer model of first freight train in U. S. Length 14½", height 3½". Kit complete with ready-shaped parts for easy assembly, \$1.00...
 Other StromBecKer Kits: Piper Cub Supercruiser, 504; Submarine Nautilus, 354; Rock Island Rocket Streamliner, \$1.50; many more.

Ideal for display on mantle, desk, or in collector's group.
AT YOUR TOY OR HOBBY BEALER StromBecker

Send for free Catalog describing models.

STROMBECK-BECKER MFG. CO., Dept. PM-3, Moline, Ill.

SHOOTS BB SHOT DARTS . PELLETS . CORKS

Looks, Feels like a Luger Automatic

COMPLETE WITH 2 BARRELS & 127 PIECES AMMUNITION

Here's the high powered air pistol you've been looking for... the Sportsman, Jr. Swell for Indoor or Outdoor Target Practice.

Bighly accurate to 20 ft. All metal-Precision en-gineered. Packed in display box that opens into a target, SEND NO MONEY! Order today and pay postman \$4.95 plus small C. O. D. and postage charges. Or send \$4.95 now and we pay postage. Try Pistol for 5 days. If not completely satisfied, your money refunded. ORDER NOW!



lvs easy to build this household appliance with LeJay Plans. Made from new or used parts. Save up to 75%. No expert knowledge needed. Plans show 5 sizes and are easy to follow. All details clearly explained. Enjoy making one of these freezers. Mail \$1 for set of plans and catalog. LEJAY MFG. CO., 447 LeJay Bidg., Minneapolis 8. Minnesota



STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW Dept. 87-M, 646 N. Michigan Ave., Chicago 11, III.





\$5.00 Crating Charge

BUICK Outright Exch. 34-47 8 cyl. \$199.00 \$160.00

CHEVROLET

29-47 6 cyl. 117.50 87.50 CHRYSLER Outright Exch. 35-47 8 cyl. 199.00 160.00

DODGE-314" bore Outright 35-47 6 cyl. 144.00 109.00 Outright Exch. 87.00

28-31 4 cyl. 119.00 32-34 V8 . . 139.00 35-47 V8 . . 149.00 99.00 Rebuilt by skilled mechanics. Assembly has Rebored Block with New Pisions, Pins, Rings, Reground Cranksnaft, all New Bearings. Guaranteed 90 Days. Allowance on Old Motor

We ship at outright price. Send your motor prepaid, must be suitable for rebuilding. Send in notarized bill of sale showing title number if any. We refund difference when we receive your motor.

Hudson-Terra.

Outright Exch.

35-47 6 cyl. \$175.00 \$135.00 MERCURY Outright 39-47 V8 . 149.00 Oldsmobile Outright Exch. 37-47 6 cyl. 175.00 135.00 35-47 8 cyl. 199.00 160.00

35-47 6 cyl. 139.00 109.00 PONTIAC Outright Exch. 37-47 6 cyl. 175.00 135.00 35-47 8 cyl. 199.00 160.00 Studebaker Outright Exch. 35-47 6 cyl. 175.00 135.00 35-47 8 cyl. 199.00 160.00

NEW 5 Gal. CANS

We Can Supply REBUILT ENGINES, TRANSMISSIONS, REAR ENDS, etc., for Cars and Trucks, Also JEEP ENGINES. Wri e for Prices!

POWER TAKE-OFF for JEEP ENGINE



FOR GAS, OIL
OR WATER
Vented for
Safety,
Self-locking
Safety Cap
Extra Heavy
Construction
Will Float
When Full
Size of can,
18" high, 614"
thick, 13" wide.
PA35U-60Lots of 5, ca. Lots of 5, ea. 1.15 Lots of 50, ea. 1.05 Lots of 50, ea. 100, Each

SEND 25% CASH WITH ORDER, BALANCE C.O.D.



Car Owners! Meet Master Glaze-the sensationally different Lar Owners! Meet Master Glaze—the sensationally different luster for new and used cars! Not a wax—not an oil polish—not a paint!—nothing that "smears" over the surface.

MASTER GLAZE is a unique discovery—a creamy liquid—quick and easy to apply! Gives a hard, glass-like surface. Even gasoline cannot dull

An unusual opportunity! Quick, flashy demonstrator. Big profits. Goodterritory. Write today!

it! Lasts six months to a year! Amazing luster—beautiful, sparkling clean and bril-liant! Doesn't finger-mark—doesn't smear! A match box full glazes an entire car. Seals the pores—protects! NOTHING LIKE IT!

FREE SAMPLE Just send your name and address to

MASTER GLAZE CO., 7720-644 W. Harwood Ave., Milwaukee, Wis.

GIGANTIC SURPLUS SAVINGS

Only.

Transformer available for \$1495



WINDSHIELD WIPER KIT

Complete. Wiper, wiper bracket, switch and blade. 1/6 Hp. 24 voit DC motor, 5000 reverse or 10,000 forward RPM, with flexible shaft and switch circuit breaker. Only \$695

AMPLIDYNE Aircraft MOTOR GENERATOR -



New General Electric. Input 27 V. DC 6000 RPM, output 60 V-1300 Watts. Can be adapted for lighting power, welding. etc. Weighs 65 lbs. Only

A to Z Steel Letter PUNCH SETS



GASOLINE STOVE

Wickless Burner, 22" long, 19" wide, 9" high. The perfect out-door stove, for hunting, camping, Bar BQ Pits, house trailers, etc. Easily operated, instructions included. A real value \$095 \$995

All Prices FOB, K. C. Write for Our New Catalog.

ATLAS SALVAGE & EQUIPMENT CO.

229 Sw. Blvd.

Kansas City, Mo.



Send Send C.O.D. I won arrival. Send postpaid. I	am enclosi	ng \$3.00.			
ADDRESS	/ A-7	0.00	E 15	1913	- 89



NO SALES EXPERIENCE NEEDED

The biggest opportunity ever, to quickly establish a n The biggest opportunity ever, to quickly establish a moley-making, lifetime business, now awaits you as a McNess Dealer. Sell things farmers need and use up. Serve same families year after year. Pleasant work-no bosses--easy to do. We supply capital to work on. Also provide offers-advertising--premiums and trade secrets that bring sales.

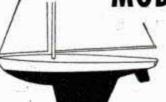
First to apply get best trading areas. Don't wait -- write us today for McNess proposition. Tell us county and state you want to serve. Ask for free McNess Book.

The McNESS CO.,

577 Adams St.,

Freeport, III.

ODEL BUILDERS



BUILD AND SAIL A 20 INCH SLOOP

Plans and Instructions 50 cents. Send coin or money order to:

S. POST 11 NORTH 15TH NILES, MICHIGAN

PROTEC



Covers for SOUTH BEND, ATLAS, LOGAN, CRAFTSMAN, etc. 9" and 10" lathes

Heavy Dust Tight Canvas Drill, Securely Stitched, Dark Blue, Tailored to Fit

Send \$7.69 and this ad, Cover will be sent Postpaid in U.S.A. Advise make of Lathe, Length Overall, Back or Underneath Motor. Covers for Anything — Prices on Request.

The CRAMSON Co., P. O. Box 184, Hales Corners, Wis.

ANDARD GARDEN AND TRA



Powerful Gas Tractors for Small Farms, Gardeners, Florists, Fruit Growers, Poultrymen, Nurseries, 1 & 2 Cylinders Rubber or Steel Tires.

Plow Cultivate Mow, Haul, **▶**Belt Work

High Wheels-Free Catalog

STANDARD ENGINE COMPANY
MINNEAPOLIS, MINN.
3221 Como Avenue

STANDARD ENGINE COMPANY
NEW YORK, N. Y.
617 West 26th Street



C.O.D. shipments—American and Lugrer and Mauser ammunition. Automatic and repeating rifles and and journals. For ammunition C.O.D. send \$1 carra. For gun C.O.D. send \$20. Most all kinds automatics and repeaters and ammunition C.O.D. send \$1 extra. For gun C.O.D. send \$20. Most all kinds automatics and repeaters and ammunition C.O.D. send \$20. Most all kinds automatics and repeaters and ammunition C.O.D.

BREAK or TRAIN

Keep your dog from running undesired wild game; train him to run any wild game wanted. Use Pete Rickard's Famous Dog Musks. Simple, Safe, Sure. STATE YOUR PROBLEM for FREE information or include 1.00 for bottle which usually is enough. Complete instructions.

Satisfaction Guaranteed.

PETE RICKARD, Dept. PM-3, Cobleskill, N. Y.

Ball-Bearing SPEED WHEELS Juvenile wheels, solid tire—No Bearings



		WI	teers				٠					٠	*		٠.		٠	۰	• •			. 97	300
	6"	wh	eels												٠.						*	. 51)C
1	4"	wh	ieels							٠.					٠.		٠	٠	٠,		٠	.31)C
	5	en	i-p	ne	e	,,	n	c	ıt	i	c	1	i	r	e	d		v	rl	h	e	els	
	12	x 1	.75"																		. \$	3.	25
	10	x 1	.75"	٠.		٠.															. \$	2.	15
	10	x 1	.25"			٠.							+	٠			ė	+	*		. 5	2.0	90

Industrial wheels for heavy loads

400 x 8, 2 ply tire and tube\$12.50
12 x 3.00", bolt hub, ea\$9.75
10 x 2.75" Hollow Core\$6.75
10 x 2.75" Single Tube\$7.25
8 x 2.50"\$4.90
6 x 2" lug base\$3.30
6 x 2"\$2.80

Free blueprints with all wheel orders. Send check with order. Shipments f.o.b. Akron.

JIM BROWN TOY COMPANY

1097 Home Ave.

Akron 10, Ohio

SILVER SOLDER KITS! For Silver Soldering ALL METALS

MAKES JOINTS STRONGER METAL ITSELF

FOR THE FIRST TIME there is available a complete Silver Braz-ing Outfit capable of Joining and repairing metal parts. Makes non-corrosive, leak-proof joints. Saves time, labor, cuts operating costs one half. No filing — highest tensile strength. Recommended for Refrigeration service, Small Repair Shops, Jewelers, Dentists, Home Shops, Hobbyists, etc.

Becommended for Refrigeration service, Small Repair Shops, developmentals, Home Shops, Robbyists, etc.

PRESTO ALCOHOL TORCH OUTFIT for silver brazing on all without acetylene torch of gas tanks. Anyone can operate. Complete outfit Includes: 1 Presto Alcohol Torch, 1 Pint High Plash Puel, 1 TUBE-O-FLUX Silver Brazing Kit, 1-Heat Chamber, and \$7.50 Accessories. Shipped Express Collect for only.

TUBE-O-FLUX SILVER BRAZING KIT Includes: 1.3 oz. tube TUBE-O-FLUX SILVER BRAZING KIT Includes: 1.9 oz. tube Paste, and 20.5 in. lengths assorted sizes "SS" Silver Alloy wires and 1 strip sheet. This kit also ideal for use with an acetylene torch. Sent C.O.D., plus postage, or if cash with order postpaid \$2.50 for.

AMERICAN PRODUCTS CORP., Desk A, 422 S. Dearborn, Chicago 5

Whether an invention is patentable can be substantially determined by a search of the U.S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH

Registered Patent Attorney

201 Columbian Building, Washington 1, D. C.

NE W

REVERSING SWITCH



Genuine Furnas 1 HP, switch for your workshop lathe or hobby equipment using reversible motors. Sturdy construction; plastic case, handle and rotor with built-in contacts. Case, 214 x 214 in. Easily wired; mounts on standard outlet box, Available also for OFF-ON duty. State which, Enclose \$3.75. We ship prepaid. RAY SALES COMPANY, 637 S. 16th Ave., Maywood, Illinois.

SAY YOU SAW IT IN POPULAR MECHANICS



Make this Battery-Driven, Rotary-Blade mower from an old auto generator and inexpensive parts. Cuts forward, backward, grass or weeds, any height. Plans complete, easily followed:

LEJAY MFG. CO., 847 LeJay Bldg., Minneapolis 8, Minn.

CONSTRUCTION BUILDING



with composition cement and cheap wood builds good 3-room house for \$250; barns low as \$50,00, 100 illustrations and 100 money and labor saving suggestions. Get this newly revised and enlarged, guaranteed book before you build. \$1.00, postpaid. SHEET METAL COTTAGES and other buildings. Several new methods. Illustrated instructions, 50c. FURNITURE OF COMPOSITION. Cement, sawdust, asbestos, scrapwood, metal, etc. Ills., 50c. HOME MFG. ENTERPRISE. 50 home shop projects. Ills., 50c. Special: All five booklets described above, \$2.00 postpaid.

HOME INDUSTRIES, 1318 So. 30th Ave., Dept. P3, Omaha 5, Nebr.



27 years of know-how is packed into every Blue Star tool. Convince yourself by trying any one of them in your own shop without sales pressure. If, after a 10-day trial you are not satisfied, the full purchase price will be refunded. All prices F.O.B. Fairfield.

*12-INCH TILTING TABLE BAND SAW

Outstanding tool that works wood, plastics or light metals. 11" x 13" table tilts full 45°...has 6" vertical, 11½" horizontal clearance. Balanced wheels run in Oilite bearings. Husky construction and heavy cast iron stand assure long life . . . vibrationless performance. 12-month guarantee.

*41/2-INCH

Best available. Its advanced design features a unique dial depth gauge . . . a cutter head mounted in life-sealed ball bearing . . . east iron table, fence and floor stand. Has 22" table — 4" x 22" fence — will rabbet 3/2" plus. Perfectly machined, aligned and balanced. 12-month guarantee.



★ WOOD TURNING LATHE—A superb tool—designed to accommodate accessories. Swings material 10" x 42"..., operates at 4 speeds (900 to 3500 r.p.m.). Has life-sealed ball bearings, balanced pulleys, No. 2 Morse taper quill and spur center. Vibrationless. PRICE: \$48.50 less motor.

*8" TILTING ARBOR SAW—Unsurpassed accuracy, ruggedness and longevity. Has 20" x 26" table—13" cross-cut capacity, blade edge to table edge, — 23" cast aluminum fence. Tilts full 45°. Has two 10" miter gauges. 12-month guarantee. PRICE: \$82.50 less motor.

Descriptive literature sent on request. Write today.

BLUE STAR PRODUCTS

617 W. KIRKWOOD ST., FAIRFIELD, IOWA





Cushman Engines

For 47 years Cushman has produced high qual-ity small air-cooled and water-cooled engines. These engines are available to original equip-ment manufacturers and other users. Write for businesses, factories, farms, dealers, service stations-here's the biggest little delivery truck you ever saw, the Cushman Package-Kar. Hauls 8 cu. ft. of packages. Costs less than 1c per mile to operate. Powered by famous Cushman "Husky" engine. Balloon tires, springs, lights the equal of any fine car. Thousands in use in all types of business.

illustrated folders and name of rearest Cushman dealer on re-quest. Ask about generous new TIME PAYMENT PLAN

CUSHMAN MOTOR WORKS, INC., Dept. M-300, Lincoln, Nebr.

D'S LOWEST

POCKET IDEAL FOR BUSINESS OR PERSONAL USE

ONLY

TOTAL SEND NO MONEY

FREE!!

Each Baby Cal-culator in Beau-tiful, rich-looking Leatherette case-at no extra cost.



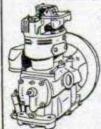
Pits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. Not a toy. Precision made, very durable—guaranteed for life against defects in construction. You positively can't buy a calculator of equal quality for as little money. ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS! Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion.

tiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided, and time saved. MAKES IDEAL GIFT.

Sold on a positive money back guarantee. Send only \$2 95, Calculator sent postpaid, or send name and address and pay postman \$2.95 plus postage. MONEY BACK IN 10 DAYS IF NOT DELIGHTED! (If outside U. S., send \$3.50.) AGENTS WANTED.

CALCULATOR MACHINE CO., (Mfrs.) Dept. 200, P. O. Box 248, Glenview, Illinois

Model 2-V-S-4-V-A Bendix-Westinghouse 4 cu. ft.



Govt. Surplus, 2 cylinder Bus and Truck Type. Ball bearing crank shaft. Pressure feed oil system. Positively one of the finest and most accurately built air compressors on the market.

Original Cost Over \$140.00

In good operating con-dition with 30 day writantee \$3450

Special Low "as is" \$2950 price....

ssories available for compressors, air regulators, safety valves, gauges, control governor, misc. fittings, hose, paint guns.
Write for Prices and Catalogue

MIDWEST SURPLUS SALES CO. 1520 LOCUST ST.







EMPIRE RADIO & TELEVISION CO. (Dept. R2) 1521 Bedford Ave. Brooklyn 16, N. Y.

For immediate delivery! Thousands of feet in sizes and grades to exactly meet your homecraft or woodshop needs. Bargains in Turning Blocks, Mouldings, Plywoods.

CATALOG OFFER: (U.S.A.)

Complete Hobbywoods catalog with periodic helpful

supplements sent along with a twentyfive cent can of Waterproof Veriply (urea resin) Glue—Both prepaid for 25c.

obbyw∞ds<u>æ</u>

Eastern Ave. and Cedar Baltimore 3, Md.





For Your Car Engine

3 WAY CHEMICAL TUNE UP

No mechanical knowledge necessary to give your car, truck or tractor this new amazing treatment. Follow simple directions fur-nished in each kit. Restores lost powereasier starting-increased mileage. Smooth-er performance-less battery wear. Money

back guarantee. \$1.65 postpaid anywhere in U.S.A. C.O.D. or money order

13245 SHERMAN WAY V-O MFG. CO. NORTH HOLLYWOOD, CALIF.

BURIED TREASURE, MINERALS AMAZING NEW GOLDAK LOCATORS

SENSATIONAL NEW MODEL! ONLY 11 pounds weight! One hand operation! Money-Back Guarantee of Write for full details. Superiority.

THE GOLDAK CO.

1542 WEST GLENOAKS BLVD. GLENDALE 1, CALIFORNIA





DIRECT TO YOU! SAVE UP TO 50%!

Full cut genuine diamonds, expertly reset in beautiful modern mountings of 14 kt. Yellow or White Gold, ladies' or men's, priced at a small fraction of retail value. Over 100,000 satisfied customers, Iron-clad guarantee. Wear your diamond 7 days. Your money refunded im-mediately if not delighted. Order from this ad.

Also write us for FREE illustrated catalog of other Unredeemed Diamond Pledges from \$5.00 to \$5000. Small deposit holds any diamond until wanted. Write us today. Bank Reference on request, or your own bank.

1 /5 Ct. (\$125 Value)

BERMAN'S COLLATERAL LOAN BANK Dept. P-7, 636-38 W. Balto. St. Baltim

Baltimore-1, Md.

MADE WITHOUT MOLDS! LORED POTTERY

fring or kiln required. New chemical coloring methods, Beautiful solid colors, mottled, veined, rainbow hues. Big money making Bird Baths, Wishing Wells, Benches, Garden Purniture, Cemetery Products, Stucco-rock, Particulars Free! w hues. Big iches, Garden Particulars

RAPID POTTERY SERVICE Box 170 Edwardsville, Illinois



YOUR CIRCLE SAW BLADE CAN CUT GROVES LIKE THIS Easily — Quickly — Accurately



YES—THIS NEW INVENTION WILL FIT THE ARBOR OF ANY WOOD POWER CIRCLE SAW—AND WILL SAW ANY DESIRED GROOVE CLEANER, EASIER AND FASTER THAN ANY DADO HEAD ON THE MARKET TODAY.
GRADUATED IN 32nds AND NUMBERED TO CUT ANY WIDTH GROOVE WITH YOUR SAW BLADE. MICRO-MATIC ADJUSTMENT MAKES POSSIBLE A CHANGE IN CUTTING ANGLE IN 15 SECONDS. WARREN DADO SAWING WASHERS CAN BE LEFT ON THE ARBOR OR QUICKLY REMOVED FOR CUT OFF SAWING.

ORDER YOUR SET OF FOUR WASHERS TODAY, TRY THEM FOR

☐ Money Order		
THE PARTY OF THE P	Address	
C 61 1	NameAddress	KIAII PAR

P. O. BOX 98 NORTH END STATION DETROIT, MICHIGAN



EXPERIMENTERS_ HAMS - ATTENTION!

This high-powered RF Source (with or without Modulation) can be used for thousands of experiments, laboratory demonstrations or as a ham station transmitter. Without a doubt the best bargain of the year. Range coverage: 200KC-500KC, and 1.5MC-18MC continuously variable. Originally cost the Government \$1800.00 and contains over \$1000-worth of fine radio and laboratory components, actually the most popular items ever offered at such a tremendous saving. Comes complete with 7 tuning units, antenna tuning unit, 2 instruction books and all tubes. Packed in original cases and manufactured by General Electric. BC-375E, Complete with 7 tuning units, 1 antenna tuning unit, all stubes, 2 instruction books, FOB Chicago, shipping \$

BUILD YOUR OWN ARC WELDER

Start with the generator and switches at low cost. Here is the chance you have been waiting for!

Brand new Delco Remy or Westinghouse Type P-1 \$25.00 Generator, 24V 200 Amp, FOB Chicago...... Fenwal Thermostat, Series 700 and 800.....ea. \$1.50

SURPLUS ASSETS CORP.

2315 W. OGDEN AVE. CHICAGO 8, ILL.

DRILL FOR RAWLPLUGS* or other Masonry Anchors



WITH YOUR 1/4 IN. ELECTRIC DRILL AND THE

Especially fitted to use RAWLDRILLS® Nos. 6 to 14, and 5/16 in. to 5/8 in. Easily adapted to operate any tool where hammering is required: Scaling, Riveting, Caulking, Gouging, Chiseling, etc. *Reg. U. S. Pat. Off

(Agents' inquiries invited. Attractive set-up.)

From your Dealer or send check or money order to

DRIL-HAMER Co. Box 158 Planetarium Sta. New York 24, N. Y.

SIZE 61/2"x11/8"

No C.O.D.

SAVE LABOR

DO A BETTER JOB WITH A DRIL-HAMER

SAVE TIME

ELECTRO TECH SET

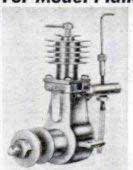


Entirely Safe! No 110 Volt AC Uses New Snap Leads! No Soldering

Sensational new practical Set for learning the fundamentals of electricity. Fifteen experiments—learn how to connect batteries—series-parallel circuits—how simple switches and three way switches ught bulbs wo.k—how a motor works (supplied in kit form—you build it too!—reversal and speed control of motors—how 3 heats are obtained with hotplate—9 with electric stove—short circuits, etc. This Set is designed so these same parts may be supplemented by our later Electro Tech Sets to build crystal receivers, code practice oscillators. 1. 2 and 3 tube radios and amplifiers. List price of Electro Tech Set #1 is \$12.30 less batteries (uses two inexpensive #6 dry cells), but a few are being o ered at special mail order introductory price of ONLY \$7.95. POSTPAID FOR CHECK OR MONEY ORDER. COD orders extra.

RAFFERTY LIMITED PRODUCTION CO. PETT. D-1. BOX 353

REAL DIESEL ENGINE For Model Planes, Boats and Race Cars



Now you can own and run a real minia-ture diesel engine that operates by the heat of compression. No coil, con-denser, wires, or annoying ignition failures. Simply flip the prop or fly-wheel to start. It's the new DEEZIL— a .125 cu. in. displacement, 5 oz. en-gine that runs at 8000 RPM. Order today; only \$12.95 p.p., less tank. Every engine fully tested and guaran-teed. DEEZILMIX FUEL \$1.00; PROP 50c.

- . U-Control Plane Kit for DEEZIL, \$2.95
- · Free-Flight Plane Kit for DEEZIL.
- Reuhl Race Car for DEEZIL, \$24.95
- . Marlin Boat Kit for DEEZIL, \$8.50

GOTHAM HOBBY Sth Street New York 35, N. Y.

How To Make

And BIG PROFITS In Your Own Business

Amazing Liquid Synthetic Marble can be made at home with-

Amazing Liquid Synthetic Marble can be made at home without machinery. Needs no heat or pressure. Can be poured into molds for casting expensive novelties, Liquid Synthetic Marble can be made in any color. It is even more beautiful than genuine marble because of its highly glazed finish. Costs far less. FLEXIBLE MOLDS: Make your own Flexible Molds. Cast novelties, statuary, desk sets, book-ends, etc. out of Liquid Marble, plaster and many other molding compositions. A large sized mold costs but a few cents. Hundreds of casts can be taken from a single mold. UNLIMITED MARKET: You will find steady year-round demand in your own community. No selling problem. We supply names of buyers for your finished products. Let BING PRODUCTS show you how to start with a small investment and build a permanent, independent, profitable business! Write now for FREE CATALOG!

BING PRODUCTS: Dept. A-28 BROAD STREET BOSTON 10, MASS.

Gasoline, burning 40,000 B.T.U., built by Stewart Warner for

USAAF as cabin and engine heaters. Brand new and in original cases. Ideal for installation in trucks, buses, trailers, small buildings, etc. No exposed flame. A bargain at \$28.50 each

MICHEHL INDUSTRIES

while they last. Send check or money order to:

107 East 126th Street

Den't P

BLE SHAFT MACHINE

37"

FLEXIBLE SHAFT

USES

HUNDREDS OF ACCESSORIES

PENCIL-SIZE

HANDPIECE

with PENCIL SIZE HANDPIECE for Finger-Tip Control

Works effertlessly and with marvelous ease. Tens of thousands of users attest to its infinite superiority over other small grinders. Affonds you vastly more satis-faction and fun.

5 REASONS WHY FOREDOMS ARE TOPS IN THE FIELD:

Extra power and longer motor life because motor not dwarfed to fit hand.
 Correct handpiece size for deft, sensitive, finger-tip control.
 No obstructed view of your work.
 Freedom from gyroscopic action—hence better work.
 Small handpiece size lets you get into hard-to-reach places.

Hundreds of Uses

Foredoms handle hundreds of tasks. Use them for pleasure or profit, for tinkering or expert craftsmaniship. Their versatility is unlimited. Use them to grind, polish, mill, engrave, sharpen, slot, rout, saw, carve, clean, sand, etch, cut, etc. Ideal for internal carving of plastics, the astounding new craft. You can work on wood, glass, plastics and all metals with a Foredom.

OVER 60,000 FOREDOMS NOW IN USE

The power grinder you'll eventually buy
if you want true operating ease and results which genuinely satisfy. Foredom's quarter century experience in
building fine tools for home and industry is your assurance of superior
performance.

Order your Foredom today, direct on 10-day trial. Send check or M.O. for \$19.95 (price not increased since OFA) and we send postpaid in U. S. or send \$2.00 and you pay postman balance plus postage. 50-piece accessory set \$1.50 extra. Catalog on

FOREDOM ELECTRIC COMPANY, Dept. F114 New York 7, N. Y.

27 Park Place

ATLANTIC BLDG

WASHINGTON, D. C.

) YOU WA GROCERIES TO EARN MONEY MEATS ON YOUR SPARE TIME MOTOR

ONE HOUR A DAY, CONTACTING BUSINESS CONCERNS ONLY, CAN BE TURNED INTO OF DOLLARS. SELLING OUR ILLUMINATED SIGNS TO - GROCERY -MEAT MARKETS - GAS STATIONS - GARAGES RESTAURANTS - FLORISTS - ETC. -

WE MAKE SIGNS FOR EVERY TYPE OF BUSINESS. FOR FULL DETAILS WRITE TO:-

PLEX-LITE CO.

3500 WEST ELEVEN MILE ROAD BERKLEY MICHIGAN

RUGGED? YOU BET! WATER-SHOCK RESISTANT

TUNE-UP

BEER

Handsomely styled, precision tested, built to take hard usage, ready to go places. No. TS220_ALL-STAINLESS STEEL CASE, 17 jewels, antimagnetic, radium dial and hands, unbreakable crystal, sweep second hand. (Price Includes Fed. Tax \$29.95 and Postage).....



NOW AT NEW LOW PRICES

Order Direct from BELL. Mail check, money order or pay C.O.D. Write for FREE Booklet "TS"

BELL WATCH COMPANY, INC. 9 Rockefeller Plaza, Suite 909, New York 20 N.Y.

60 POWER TELESCOPE \$2.95

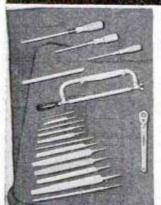
VARIABLE EYEPIECE 20X-40X-60X NEW! Three telescopes in one, 3 different magnifications. 20 extra long range, Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc., 60 times

Most powerful for anywhere near the money. 5 sections. Closes to 1 ft, Also used as a powerful compound microscope. Directions included. Mass production enables us to offer this high-powered instrument at the amazing price of only \$2.95. We pay the postage.

BROWNSCOPE CO.

Build Your Own.

lus Hardware BARGAI



3 PHILLIPS SCREWDRIVERS #2. 3. and 4.......\$1.10 set . 3. and

HIGH SPEED HACKSAW BLADES, Hand Type, Molyb-denum Steel, 10 in. 32 Teeth \$1.30 dz.

HACKSAW FRAMES, Adjustable, Mig. by Union Hardware

ROLL-UP TOOL KIT. duck, 26" x 52" — 49 WIT. Brown-49 Pockets \$1.50 ea.

12 ASSORTED AMERICAN STANDARD FILES, 4" to 12", Popular Brands \$2.35 set

NATIONAL PROPERTY.

REVERSIBLE RATCHET WRENCH. 1/2" Sq. Drive x 10" Long. Mig. by Duro-Chrome \$3.20 ea

Order Today --- We Pay the Postage!

SUPPLY COMPANY **NEW YORK 16, N.**





ADDRESS.....

COMPLETE HOME WORKSHOP

Here is power tool pleasure and profit in a ruggedly built, HEAVY steel unit—the Emrick Universal Woodworker. Handles big work. Drill press pulls ½" drill in steel. Saw takes 6" to 8" blade. Lathe 10" swing, 30" centers, spindle dia. ¾". Takes all standard accessories. Sander 8" dia. Emery wheel 5".

Bronze bearings, replaceable throughout.

10 Price does not include motor and saw blade. Order today.

EMRICK, Inc. KALAMAZOO 24, MICH. ☐ Ship on 10 Days Trial. I am enclosing \$17.50, balance C.O.D.
Send free literature. Name Address City_

AIR COMPRESSOR

Piston type, size 2x1%, head in valves, bronze bearings splash lubrication. Capacity 2.8 c.f.m. at 100 lbs. continuous pressure, or 150 lbs. Intermittent pressure with ½ HP motor, Can be used with ½ HP at lower speed. Weight 24 lbs.



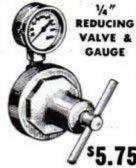
AUTOMATIC PRESSURE SWITCH WITH UNLOADER



125 to 150 lb. Pressure. Use with 1/4 to 5 HP Unit.

only \$7.95

air check valve....\$2.50 air check valve. " air gauge, 160 lb.. 1.75 safety valve, 125 lb. pressure.



Only 1650 FLEXIBLE SHAFT

Bft. Stow or Mail Flexible Shaft, Heavy Duty, 3½" Core. Best piano wire. Ball bearing handle and arbor, rubber covered housing: for ½" motor shaft; for ½" bore wheels. Operates on ½ H.P. Motor at 1725 or 3450 R.P.M. \$29.00 Value, only \$16.50. Wt. 8 lbs.

HEAVY DUTY MOTORS

Nationally known makes, Guaran-teed capacitor type, ball bearing heavy duty motors, 110/220 volts, 60 Cycle AC Single Phase, 1725 RPM.

1725 RPM.
½ HP Wt. 30 lbs. \$24.00
½ HP Wt. 36 lbs. \$34.50
¾ HP Wt. 50 lbs. \$44.00
1 HP Wt. 80 lbs. \$57.00
These motors also furnished in
3450 R.P.M. at same price.

Oil resistant, pressure 0-to-200 lb. Reduced pressure 0-to-75 lb.; 3 outlets 1/4". Wt. 2 lbs.



1/30 HP 24 volt DC motor 2450 R.P.M. .95 amps. 1/4" shaft size overall 3" x 4". Weight 3 lbs. Also operates on 32 volts.

32 volts.

USE AS 6 VOLT GENERATOR
Generate your own power. Can
be operated on your bicycle
wheel. Furnishes sufficient power for two 6 volt bulbs. Resistor furnished free with each
motor enables you to maintain
constant voltage. Special Price
\$2,45, or 4 for \$7,50. Write
for price in larger quantities.

C & M EQUIPMENT COMPANY 1831 S. State St., Dept. D-3



Assembly Jig and Full Scale Plans

assemble, everything else furnished. You save 75% cost of new boot. Earn money - make boats for others at a profit!

Send ORDER or WRITE FOR LITERATURE To:

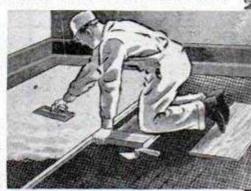
PRITCHARDSONS' Dept. PM-2744 W. 37th Place CHICAGO 32, ILL.

KE S MORE

Applying or Selling

THE MODERN PLASTIC FLOORING

EASY TO APPLY Here's your opportunity to get into business for yourself applying or selling Corkstone, the economical. top-grade plastic flooring, Plenty of profit Act without de lay!



& Agents Wanted Dealers WRITE FOR DETAILS

LASTING PRODUCTS COMPANY

Franklintown Road Plant,

Baltimore 23, Md.



BUSINESS OF YOUR OWN

Use simple home-made equipment, Make HOLLYWOOD STYLE cement pottery, benches, mantels, iature castles. Also birdbaths, tables, miniature garden walks, ste garden walks, steps, stucco-rock walls imitation marble. Chemical coloring, formulas & instructions, 10c brings picsample, details.

HOLLYWOOD CEMENTCRAFT

New 1948 SHOP NOTES Now Ready!

Bigger and better than ever-240 pages crammed full with the best articles that have appeared in Popular Mechanics during the past year. Invalu-able for the mechanic, painter, carpenter, autoworker, electrician, welder, farmer, plumber and home craftsman; in fact for every man who uses tools. Attractively bound in the new soil-proof Lamoste cover, it is on sale at your News Dealer for \$1.00 or obtainable from



POPULAR MECHANICS PRESS

200 E. Ontario Street

POPULAR

5113

Chicago 11, Illinois

THIS BOOK SHOWS HOW TO DO IT

STEEL SQUARE POCKET BOOK

Completely Revised

This concise and handy little book illustrates and describes the best methods of using the carpenter's steel square in laying out all kinds of carpentry work. It is easy to understand as a picture of the square laying directly on the work shows exactly how the various cuts are made. Its compact and handy size makes it convenient to carry in the pocket for quick reference.

Price \$1.25 Postpaid

MECHANICS PRESS 200 E. ONTARIO, CHICAGO 11, ILL.

POPULAR MECHANICS



With Each Order

EVERY TIRE GUARANTEED 98% NON SKID, ORIGINAL TREAD TRIPLE INSPECTED DEMONSTRATORS

Positively Not Re-caps!

	7
600-16 6.42	700-15 8.42
650-15 7.12	700-16 8.82
650-16 7.42	750-16 9.42
900-16 \$7.5	2 900-20 \$17.52
650-20 9.5	2 1000-20 17.52
700-20 12.5	2 1100-20 17.52
750-20(8) 12.5	2 32x6(8) 12.52
750-20(10) - 13.5	2 32x6(10) 13.52
825-20 16.5	2 34x7(10) 13.52
7.50-20 MILITA	RY 8 PLY \$17.52

1/2 million tires shipped to satisfied customers. Trial will convince you. Mail Orders Rushed on Receipt of Check or Money Order.

New...Self-Contained PRAY GUN

Hose! No Tanks! No Pumps! No Motor!

No Motor!

It's true! A high-pressure spray gun as self-contained, as compact and portable, as a flashlight! Uses no current. Pressure comes from inexpensive CO2 cariridge. A cartridge sprays 19 to 20 or. diquid (depending on viscosity). Use gun for paints, liquid insecticides, oils, etc. For home, farm, workshop, garden, garage, Comes with 3 cartridges. Fully guaranteed. The Becker Spray Gun is shipped postpaid for only \$18.50; or send only \$2 — we'll ship C.O.D., you pay postman bulance plus postage. Extra cartridges, 10 for \$1, postpaid.



(With 3 cartridges) POSTPAID

SULLIVAN-BECKER CO., Dept. 118-C, KENOSHA, WIS.



"CUSHIONAIRE"

air cushion made of FIRE-STONE VELON. Inflates by mouth.
Folds compact. THE PERFECT GIFT
FOR — MOTORISTS, MECHANICS,
HOME, SPORTSMEN, MACHINE
OPERATORS, TRUCK AND BUS Etc DRIVERS

Sent Postpaid for \$2.00 ea.

WESTLAKE PRODUCTS CO.

50 E. Cermak Rd. Chicago 16, III

EQUIPMENT

FOR ALL CARS

Engines, Racing Heads, Manifolds, Carburetors, Mufflers, etc. Speed Instructions and literature \$1.00-refunded first order.

LEE MOTORCRAFT CO.

Chicago, III.





SAY YOU SAW IT IN POPULAR MECHANICS



STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW Dept. 87-M, 646 N. Michigan Ave., Chicago 11, III.



13 WORKBENCH PLANS

new to-build benches . . . large cabinet bench with 29 drawers, streamlined cabinet bench, drop-down bench for narrow garage, portable apt. bench, carpenters' folding-leg bench, etc. Send dollar bill or check today. Money-back guarantee. PLANS, Dept. P-109, 7241 Madison, Kansas City 5, Mo.



Engrave your name . . . etch letters or designs . . . place permanent identification marks on anything with this unique hand tool. Carves wood and linoleum, cuts cardboard and balsa, tools leather. Just plug in on any 110 volt AC line.

No home shop is complete without a Burgess Vibro-Tool. See your dealer or write for information.

DELUXE KIT

Vibro-Tool complete with 22 attachments in handsome, polished wood chest.....\$16.50

BURGESS Vibro-Tool Division

LAKE ZURICH, ILLINOIS



Now you can Mill, Slot, Grind, Groove, Square Shafts, Saw at Angles, Recess and many other important jobs. SAVE TIME and MONEY! Why send work out or use costly methods when a PALMGREN MILLING ATTACHMENT will solve your problem. Precision built, it has accurate graduations for rotary angle adjustments, also graduated vertical feed screw. Fits South Bend, Atlas, Craftsman, Logan, Sheldon and all other lathes. Thousands now in use in small and large machine shops, repair shops, railroads, schools, home work shops, etc. ORDER SIZE NEEDED TODAY!—it will quickly pay for itself.

IMMEDIATE DELIVERY

Width Depth Weight | Fits Tool Pounds | Post Jaws Open Nos. 1" Dia. 11/4" Dia. 2" Dia. 61/2 11 25 15/8" 21/3" 4" Order From Your Dealer or Jobi

bber: Write for Circular No. 351.

Mfrs. of PALMGREN PRODUCTS
Since 1915

8365 South Chicago Ave.
Chicago 17, Ill.

CHICAGO TO ENGINEERING co. JUST A FEW OPERATIONS YOU CAN DO ON YOUR LATHE!













HANDY, FLEXIBLE SHAFT

Converts Any Motor, Drill Press, Electric Drill, Electric Fan Into A Handy Rotary

Attach ROTA-SHAFT in a Jiffy. Can Be Used for Grinding, Polishing, Sharpening, Cleaning, Engraving, Marking Tools, Carving, On Metal, Plastic, Wood, Glass.

Yes! Only \$2.95 and ROTA-SHAFT turns your old motor, drill press, electric drill or electric fan (10 inch or larger) with blades removed, into an efficient, versatile Flexible Shaft Tool for doing hundreds of grinding, polishing, sharpening jobs, especially in hard-to-get-at places. Attaches to motor shaft or in chuck. Convenient handlings for each of hardling. Generally 40. handpiece for ease of handling. Generous 40-inch overall length. Comes complete with buff and sanding disc ready to use in a drill press chuck. Order today,



MOTOR



VACUUM CLEANER MOTOR

SEND NO MONEY! Just mail order, only \$2.95 plus postage on delivery, or send \$2.95 and we pay postage. Try 10 Days — if not delighted return for money-back.

If you order Rota-Shaft for use on motor add 35e for Special Coupling and State Shaft Diameter. MAIL ORDER NOW!

STRADER PRODUCTS CO., Dept. A-101 259 Strader Ave. Cincinnati 26, Ohio





Incorporating the desirable feature of two movable jaws, the Royal Wade Machine Vise is made to fit any standard bench or floor type drill press. It serves as readily as a twojawed chuck for a machine lathe. Jaw faces measure 314" x 114" with 3" maximum opening-Weighs only 71/2 pounds.

Royal-Wade PRODUCTS COMPANY

DALLAS, TEXAS

DELCO MOTORS

1/75 H.P. Delco Motor—For cooling, ventilating and heating purposes. All are factory tested and guaranteed. Quiet operation. Triple rubber mountings. Horseshoe stand. 110 V. A.C., 60 Cy., 1000 C.F.M. 6 blade fan 7½"—stand 6¼", 4½" wide. Complete as shown. Shpg. Wt. 5 lbs.

Postpaid

No. 7014 Suction Type No. 9272 Blower Type—Each. Lots of 10—each..\$4.90 Lots of 50—Each..\$4.75

harger



Heavy duty super charger rotary pump designed to efficiently pump water, oil, gasoline, etc. Also used as a vacuum pump. Includes lovejoy coupling for \$\frac{5}{6}''\$ shaft. 1" outlet on top, 1" outlet on bottom. Size of pump 7\frac{7}{2}'' W. x 5'' D. x 7" H. Compact and sturdy. Will pump approx. 30 gals. per minute at high speed. Four mounting holes in base. Can be used with \$\frac{1}{4}\$, \$\frac{1}{5}\$, or \$\frac{1}{2}\$ H. P. motors. Shpg. Wt. 19 lbs. List \$48.00.

No. 8536-Each.

Send check or money order today plus postage.

FREE CATALOG—Send for new G. & E. APPLIANCE & PARTS CATALOG Dept. P. M. 3

G&E Equipment Supply Co. OGDEN AVE. AT FULTON CHICAGO 7, ILLINOIS



12 Foot

FOR PLEASURE OR PROFIT DESCRIBES 17 LOW COST BOATS Get this outstanding book and build a boat at home for your own use or to sell at a profit. You can do it. Just the boat you've always wanted—power, sait or row boat—17 different kinds and sizes.

Order BUILD A BOAT on postal card and pay only \$1.50 plus postage on delivery. Beturn in 5 days if not pleased and get money back. Or send \$1.50 with order and we'll pay postage. (Outside U. S. \$1.70 with order.) Order today.

POPULAR MECHANICS PRESS Dept. 598, 200 E. Ontario, Chicago 11





SANDING WOODWORK

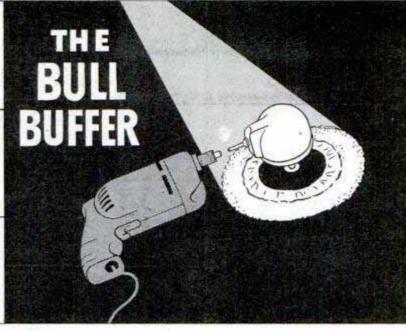


For the Home, Farm, Factory,

Garage, Office Building, Store, Shop, Service Station, Cabinet Shop.

RUGGED - POWERFUL - that's BULL BUFFER built for perform-You can do more in less ance. time with less effort. Fills real need. FITS ANY ELECTRIC DRILL. This buffer-sander gives you dollar savings in plant or home. It's fast. It's efficient. You can do proficient work with this

new type buffer because the swivel action with floating power makes it easy for even the most in-experienced to operate. Highly maneuverable. Holding drill stationary buffer may be turned in a complete circle while in use.







POLISHING FLOORS



POLISHING FURNITURE

For all shop applications in all conditions, BULL BUFFER gives top performance. Self lubricating bearings—steel gears operate in bath of oil. Sealed in a sturdy casting. Complete with 5" rubber disc, sheepskin bonnet and sanding disc, only \$9.95. If

BERTRAM ENGINEERING COMPANY 8300 WYOMING KANSAS CITY 10, MO. BOX 588

DEALERS WRITE FOR INFORMATION

DEMOUNTABLE BAR TYPE TRAILER HITCH

Custom built Utility Trailer Hitch for all new cars. Demountable bar type. Write for free particulars.

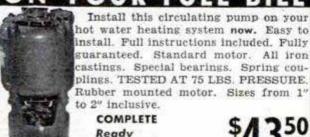


THE TRAIL-A-WAY CO., 25209 W. 8 Mile Rd., Detroit 19, Mich.

YOUR Raild own BOVI

Complete parts cut to exact size—ready to assemble. Marine water-proof plywood, hardwood frame; rustproof oarlocks. Ideal for car top carry. Also models with laminated airplane spruce frames; mahogany decked outboard motor, high speed runabouts. Build now for personal use or sale at attractive profit. Exclusive franchise to local builders. Send 10 cents (one dime) for illustrated literature today.

702 WASHINGTON AVE. WOODSTOCK, ILL.



Send check or money order to

CAMPET ENGINEERING ASSOCIATES

736 N. Western Ave.

Chicago 12, III

for the F

"CHICAGO" ROLLER SKATES

Forty years of leadership reflect the outstanding quality and performance of these beautiful "CHICAGO" Shoe Skates. Stars and Cham-pions are made on "CHI-CAGOS." Be popular—get on the road to Stardom. Own a pair of the World's Finest Skates.

Consult your Rink Manager before you buy. Get the best and a perfect fit.

Champions Choice of

Roller Skates Boys and Girls all want "CHICAGO" Sidewalk Skates. The World's Great-est Roller Skates for young

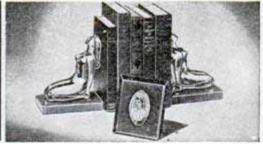
est Roller Skates for young-sters or grown-ups. The Triple Tread, Ball Bearing Steel Wheels give more ac-tion—Speed and Longer Life, Demand "CHICAGOS" from your Dealer.

Send for FREE Book let "How to Roller Skate." Enclose 10c for Skate Club pin. Value 25c.



CHICAGO ROLLER SKATE Leading Manufacturer of Rink Skates for Over 40 Years 4414 WEST LAKE STREET . CHICAGO 24, ILLINOIS





NEW LIQUID PLASTIC

MAKES SWELL GIFTS, **NOVELTIES, THINGS** TO SELL!

Thousands are having fun, making big extra money, using CASTOLITE, the wonder Liquid Plastic that pours without heat or pressure. Use crystal clear or with brilliant colors. Embed real flowers, butterflies, coins, medals, photos, for plaques, paper weights, novelties. Make useful objects like book ends, trays, pic-ture frames, coasters, jewelry, toys. Also make gears, parts, models. Can be sawed, carved, drilled, turned.

20-PROJECT KIT \$350

(West Coast, Canada, Mexico \$3.75)

Special Casto-Kit now ready. Contains materials and instructions to make useful objects at once. Get into this fascinating new field now, and have unusual distinctive gifts or make fine sales. Send \$3.50 (West Coast, Canada and Mexico, \$3.75) for your Casto-Kit, postpaid. Or order C.O.D. No overseas shipments. For instruction manual alone, send 25c. The Castolite Company, Dept. C-1, Box 211, Kenilworth, III.





The plastic with 1001 uses. DEALERS-Write for literature and prices.



THE JIFFY all CABINET

THE HANDY WAY TO KEEP SMALL PARTS, WASHERS, NAILS, SCREWS, NUTS, BOLTS AT HAND

DRAWER SIZE

1¼" DEEP 3" WIDE 6" LONG

CABINET SIZE

32 Drawer Unit 6" DEEP 12%" WIDE 15%" HIGH Shipping Weight approx. 9 lbs.

64 Drawer Unit 6" DEEP 251/2" WIDE 151/4" HIGH Shipping Weight approx. 18 lbs.

For small items, the low-cost Jiffy Cabinet, 32 or 64 drawer units that put office, shop, work bench, household and hobbyist needs at your fingertips. Metal flange drawer guides. Spot welded all metal cabinet with sturdy laminated drawers insures long timesaving service. Why fumble? With the Jiffy you know where it is. 32 drawer unit - \$4.95; 64 drawer unit - \$8.95. Send check or money order - No C.O.D.'s please. Ohio orders please add 3% Sales Tax.

KAYTEE PRODUCTS

Dept. M, Box 588

Canton, Ohio





Complete With 2-way Signals. Genuine Army Telephone-Not Unit supplied with 2 standard French type phones, signal buzzer for each phone, 50 ft, new Army field wire, flashlight batteries. Sturdily built and so easy to hook up. Use any 2 strand wire. Hook up several phones to one line if you wish.

House to Garage
Factory to Shop Farm House to Barns
Inter Office Communication
Stores
Etc.

ANUEL KLEIN 74 Cortlandt St. N. Y. 7, N. Y F.O.B. N.Y.C.

WAR SURPLUS BARGAIN KIT 4 LAMPS ELECTRONIC PHOTO FLASH

THIS POWERFUL HIGH QUALITY EQUIPMENT WAS made for the U.S. Aircorps and will be shipped in Brand New Original Boxes

THE POWER SUPPLY is built into a beautiful gray finished case, with all connectors, relay control, 2 condensers each 2000 Volts, 50 M. F. D. light output 110 watt seconds, can be used with any 12 wait battery as a professional studio flash equipment. (The power pack alone is worth more than the price we are asking for the complete unit.)

THE FOUR HIGH SPEED FLASH TUBES are plastic sealed, unbreakable, 12 million lumes light output for more than 15,000 flashes. IN ADDITION TO THIS we supply aluminum reflectors, transformer, connectors, connecting cords, space parts, diagram and instructions on how to use it for battery or on how to convert the unit for 110 Volt AC.

TIES THE BEST VALUE IN

IT IS THE BEST VALUE IN WAR SURPLUS MATERIAL

CINEX INC. 165 West 46th St., Dept. M.P. New York 19, N. Y.

USED BUT REBUILT IN CLEAN, GOOD CONDITION! ARMY SHOES \$2.49

Now you can wear these sturdy, all weather Army Shoes. Will last and stand up under the toughest wear. Fits comfortably, thick soled, strong leather. Russet tan color only. All sizes. Valued about \$5 a pair. Now only \$2.49 a pair. Send shoe size, name and address. SEND NO MONEY! Pay postman on delivery \$2.49 plus postage. Satisfaction Guaranteed. Order Now! Also send for our free catalog of shoes, hats, suits, army clothes, etc. Also send for the same clothes, etc.

EUNICE MAIL ORDER HOUSE
CTATION B. P.O. BOX 101,

DEPT. PM-C

N.Y.C.

SHOT SELLERS SURE

SPECTACULAR FIREWORKS-Beautiful Multi-Colored, Safe and Sane Selection — World's Best Made, Write For Price List.

MYSTERY CHINESE BOX TRICK - Everyone Will Want This Easy To Perform, Tantalizing Mystifying Trick \$7.20 Dz.

WORLD'S FUNNIEST TRICK—Multiplying Rabbits, Attractively Illustrated, 1 Dz. on Self Seiling Display Card — Sample Order Prepaid Anywhere\$2.00 Dz.

ERNIE'S ENTERPRISES, 725 Pine St., St. Louis 1, Mo.



SEWING MACHINES

BIG MONEY. Spare or full time. Open your own neighborhood shop. Thousands need repairs. Send for complete Repair Manual—only \$1.98 postpaid. Money back guarantee,

SEWING MACHINE SERVICE CO., Hamilton 25-L, Ohio

Take the Drudgery Out of Sanding! This Handy Sander is a SENSATIONAL Tool



Chuck to your electric drill or flexible shaft and you're ready to go. Top quality—cut steel gears scaled in grease—cast aluminum housing—phosphor bronze bushings. Guar-anteed! Complete with two belts—at deal-ers or direct—519.95. Folder, 10c, Cata-log 1046, listing tools, supplies, metals, plastics, etc. 20c.

METLPLAS SUPPLY CO. 1420 S. 16th Ave., Maywood, III.

Make Your Own Records SING! TALK! ACT! PLAY ANY MUSICAL INSTRUMENT THIS RECORD WITH THE LET ME MAKE A

GEE BOB, IT WORKS GREAT!

HOME RECORD MAKER!

ENJOY MAKING RECORDS IN THE PRIVACY OF YOUR OWN HOME

Now you can make records of your singing, talking, reciting, or instrument playing right in your own home! No longer need the high price of recording machines or studio facilities prevent you or your family from hearing their own voice or

playing. No Experience Necessary. Set up the NEW HOME RECORD Maker, play, talk, or sing, and immediately you have a record which you and your friends can enjoy.



LAYS BACK AT ONCE Record jokes, imitations, voices and instruments - and play for happy, happy

memories. You can play new record at once! Give yourself, your family and

friends a thrill! Records can be played back on ANY phonograph.

IT'S AMAZINGLY SIMPLE!

Make records right in your own home by just singing, talking, acting, or playing a musical instrument into your own record player using a NEW HOME RECORD MAKING UNIT. This wonderful little unit records on the blank records furnished with your recording kit. No processing of the record required . just make your recording and it is immediately ready for playback. USE THE NEW HOME RECORD MAKER with any type of standard record player - hand winding, portable, radio-phono combination or electrical phonographs operating on either AC or DC.

What is the Recordograph?

RECORD

The recordograph is an accoustical device for making home recordings to be used with a record player or turn-table.

You get the complete unit needed to make recordings at home. Accoustic re-





SING-PLAY-TALK

Have lots of fun! Record voices of seldom-seen but well-loved friends and dear ones. Make greeting records - Birthday, Anniversary Greetings for your loved ones.

EASY AS SPEAKING INTO A PHONE

Use your NEW HOME RECORD MAKER anytime and perform as comfortably as you'd talk on the telephone - needs no special "recording technique." No experience necessary.

MONEY! SEND NO

You don't have to send a cent. Just fill in coupon and mail today to get your complete NEW HOME RECORD MAKER, Sent C.O.D. for only \$8.49 plus postage and C.O.D. . . . or send check or money order for \$8.49 and we pay postage. dditional blank records \$2.00 per dozen (24 sides)

RECORDOGRAPH CORP. OF AMERICA, Dept. 17.72 230 GRAND STREET, NEW YORK, N. Y. Send entire RECORD MAKING OUTFIT, including 6 blank two-sided Send C.O.D. 1 will pay postman \$8.49 plus postage. ☐ Send additional blank records at \$2 per dozen. City, Zone, State ☐ I enclose \$8.49, send complete outfit postpaid.

MARCH 1948

Save On JEEP PARTS

with the "KING OF JEEPS"

CRANKSHAFT STD.: Willys A638121 - Ford \$3750 GPW 6303A - Civilian Jeep 2A. Our list - Each CAPSTAN WINCHES: Our List - Each \$3250 DUAL WINDSHIELD WIPER KIT: \$850 Our List - Each Our List - Each

COMPLETE DIFFERENTIAL: Willys A788 - Ford
GPW 4207 - Civilian Jeep 2A. 52495 \$2495 Our List - Each . PISTON RING SETS STD.: Willys 116110 - Ford GPW 6149 - Civilian Jeep 2A. Our List - Each ... USED TOPS IN EXCELLENT CONDITION. \$1250 Our List - Each 25% Deposit with order . . . Balance C.O.D. F.O.B. Chicago



^{for} Homecraft Use!



Use Kester Cored solders for hobby-craft work as well as home repairs and be sure of the finest solder bonds. Acid-Core solder for general work; rosin-core solder for all electrical work.

KESTER SOLDER COMPANY

4251 Wrightwood Ave., Chicago 39, Illinois

Eastern Plant: Newark, N. J. Canadian Plant: Brantford, Can.

ATTENTION FARMER

Now is the Time to Get a SEAMAN ROTARY TILLER

for Your Spring Work



Speeds up tillage; makes better seedbed; use for finishing seed-bed prepared with conventional equipment or for complete see bed preparation with this ONE machine. Provides ideal tillage control — fine pulverization, coarse, or medium to suit soil and crop conditions. Promotes s higher yields . . . holds more moisture, longer; mixes ferti-lizer and green manure into GROWING AREA of seedbed; hastens germination; aerates

seedbed; helps control weeds, grubs and many other crop pests; reduces wind and water erosion; makes plants more drought-resistant. Available in complete range of sizes from 3 ft. to 7 ft. tillage widths, power take-off and motorized (gas or diesel) models. See Your Seaman Tiller dealer and write for complete descriptive literature.

SEAMAN MOTORS, Inc. 364 N. 25th Street Milwaukee 3, Wis.

PATENTS

TRADEMARKS

Patrick D. Beavers

REGISTERED PATENT ATTORNEY 929 COLUMBIAN BUILDING

416 5TH ST. N.W.

WASHINGTON 1, D. C.



MECHANICS, MODEL MAKERS HOME CRAFTSMEN



If you have a workshop-at home or in business you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can relection plate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal...Gold, Silver, Nickel, Copper, Cadmium, and after a bit of practice, even Chromium! Everything furnished—equipment complete, ready for use. By nished—equipment complete, ready for use. By doing a bit of work for others, your machine can soon pay for itself. So make your shop complete by getting a Warner Electroplater right away. Send today for FREE PLATING SAMPLE and illustrated literature. ACT AT ONCE, WARNER ELECTRIC CO., Inc., Bept. R-28 1512 Jarvis Ave., Chicago 26, Illinois

1	R	E	E	D	et	ai	Is	દ	Sam	ple!
WAD	MED	Th.	COTRIC	00	1					0 0 00

Gentlemen: Sen	CO., Inc., 1512 Jarvis Ave., Chicago 25,111., Dept.R-28 d Free Sample and Details to:
NameAddress	
Cita	Class

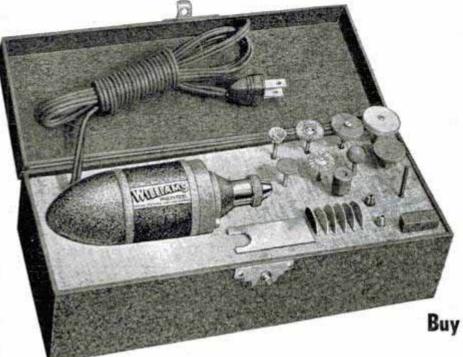
MODEL MAKERS MAINTENANCE

SALVARE PARTS

SENSATIONAL VALUE!

GET THIS AMAZINGLY VERSATILE ELECTRICALLY POWERED

PRECISION MULTI-TOOL



ONLY \$17<u>50</u>

FOR THE COMPLETE

36 PIECE OUTFIT

STURDY CHEST INCLUDED

Buy Direct - Save up to 40%

The Greatest Tool Value in Years!

The Williams Precision Multi-Tool is truly the greatest power tool buy in years! It offers more value, greater efficiency, better performance . . . AT AN AMAZINGLY LOW PRICE! Not a toy, but a real high quality, precision-made electric hand tool. Widely used in industry during the war years, now PROVED BETTER in hundreds of production line uses, Multi-Tool will simplify and speed up countless jobs in your shop.

Here's Why Multi-Tool is Your Best Buy...

It's PRECISION-BUILT throughout. Made of highest quality materials. The rugged, powerful motor is housed in a sturdy, non-breakable steel case. Has sealed-in, oil-less, trouble-proof bearings; balanced armature with hardened shaft; laminated field and armature cores. Motor is precision wound with high grade wire for maximum efficiency, longer life. Air-cooled by internal ventilating fan. Commutators are mica insulated. Instant action, sure-grip chuck with specially designed chuck lock. Finger-tip switch permits one-hand operation. Speed of 25,000 r.p.m. cuts cleaner, saves cutters. Vibration ess, quiet in operation. Weighs only 15 oz. Operates on 110 volt AC or DC.

Here's What You Can Do With It...

Multi-purpose in design, amazingly versatile, a whole shopful of tools in one. Important in the tool-room, a natural for the home workshop. Quickly interchangeable accessories provide facilities for grinding, finishing, burnishing, cleaning, rasping, drilling, buffing, cutting, sanding, scoring, etching, routing, burring and dozens of other valuable applications. Works expertly on wood, metal, glass, stone, bakelite, ivory, china, plastics, linoleum, leather, rubber, compositions and many other materials.

CHICAGO PRECISION MACHINE CO.

920 S. MICHIGAN AVENUE

CHICAGO 5, ILLINOIS

Member: Chicago Association of Commerce

Here's What You Get . . .

Complete 36-piece outfit includes: genuine Williams Precision Multi-Tool Power Unit with 8 ft. approved cord and plug. 3 mounted grinding stones, 3 bristle brushes, 6 cut-off wheels, 1 muslin buff. 1 felt wheel, 1 rubber wheel, 1 roughing stone, 10 abrasive discs, 4 mandrels, 2 collets (1/8" and 3/32"), 2 wrenches, all contained in a handsome, durable lifetime chest.

TRY IT, TEST IT, FOR 10 DAYS Send No Money — Just Mail Coupon

We believe this tool to be the most efficient, the finest value for the money, on the market today. We invite you to test it in your own shop and check its remarkable performance for yourself. Try it for ten days, then if you aren't completely satisfied, return it and your full purchase price will be immediately refunded, no questions asked, no obligation. That's fair enough isn't it? Take advantage of this 10-day trial offer, send for yours NOW! Sold under definite and positive guarantee.

SEND NO MONEY MAIL THIS COUPON NOW!

920 S. MIC	higan Av	e., Chica	go 5, Ittinois
postman \$1'	7.50 plus og that I	s postage	Multi-Tool outfit. I will pa and C.O.D. charges with th it within 10 days for refun
Name			
0.339			
Address			
City	$= \times$	8	

MARCH 1948 325

4 BIG SPECIAL BARGAINS at LOW PRICES

DEALERS:

Write For

Made For the Government: All NEW . . . Never Used

BRIGGS & STRATTON Portable Lighting Plant priced at a fraction of the original cost. Built to rigid Government requirements, Especially built for Field Use or for permanent installation in Cottage, Farm, Trailer, Boat, etc. Complete with 1 3/10 H.P. Gasoline Engine. Hand Starter, Rated 250 Watts will develop 500 Watts. With Spare Parts and Tools. Mounted on permanent base... Rubber cushloned... Ready for Immediate Use anywhere... At this LOW PRICE they won't last long... Better Hurry only \$129.50.

SPERRY S-1 BOMB SIGHT—Here is an unusual opportunity to get one of these MARVELOUS Precision Mechanical Instruments . . . Marvelous beyond description. Contains hundreds of parts usable in 1001 ways . . . Regular and Bevei Gears, Shafts, Approx. 100 Roller Bearings, Electrical Parts, Precision Lenses and Prisms, Countless Gears, Dials, Knobs, Switches, Polaroid Filter, Calibrated Dials for Air Speed, Drift Indicator and Illuminated Spirit Level, Gyroscope, etc. , . Excellent for Inventors, Experimenters, Hobbyists. Schools use for Study Demonstration. Only \$49.50.



POWER PLANT. ONLY \$129.50

A-8-B...OXYGEN MASKS:

Made of Genuine Rubber With Sponge Filters ONLY \$2.75 ea.

Cash with order or we will ship C.O.D. if 25% deposit accompanies the order. These prices F.O.B. Chicago.

. . . General Electric AIR COMPRESSORS

Most durable grips made. Positively un-breakable! For Colt, Smith & Wesson, Hi-Standard. Ortgies, Luger & Mausers in a wide choice of beautiful designs in ivory, pearl, walnut, onyx, etc. Low prices. FREE CATALOG. Dealers Wanted. SPORTS, INC. (Mfrs.) 5501 Broadway, Dept. P-3, Chicago 40, III.

AZING MYSTERY

Startles Everybody.
With this Electronic
Button you can make
your own Telephone—
Amplifier—Detectiphone. Attach this button to piece of
cardboard—transmit conversation to another room, Music also transmitted to distant places. Most interesting
electrical apparatus ever discovered. Enables you to
perform hundreds of experiments. So tiny it can be
concealed in dozens of places. A Pre-War
Product. Electronic Button including 5000
word instruction booklet with 50 illustrated
experiments. postpaid. only...
Electronic Products Company, Saint Charles 5, III.

EASY PROFIT IN PAINT SPRAYING

Paints walls, ceilings, screens, furniture and ma-chinery faster, better. All complete as shown less

motor. Carry anywhere. Fully guaranteed. Could be used with 1/4 H.P. motor or less. Price \$35.00 less motor F.O.B. Chicago. \$5.00 deposit balance C.O.D. or see your dealer. With motor \$55.00.

IDEAL AUTOMATIC PUMP CO., Dept.P.M.8

NEW ELECTRICIANS CABLE REPAIR KITS Steel construction, 151/2"x213/4"x13", has 2 trays divided into conpartments. Kit has a built-in 1500 watt 110 V. vulcanizer, also too of all kinds and materials. Cost Govt, over \$200.00. Our \$245. of all kinds and materials. Cost Govi, over substitution of all kinds and materials. Cost Govi, over substit

Catalog #T8252882 Gl . . . Rated Pressure 1000 pounds to square inch . . . Dual Cylinders . . . Shipping Weight 9½ lbs.

Modernize Your Gun! Improve Your Score!

New Designs in

RANZATIE

ONLY \$9.95 ea.



ACE SURPLUS SALES CO., INC., 1449 West 69th St., Dept. P-3, Chicago 36, III.



OTHER EXCLUSIVE FEATURES

Blades instantly replaceable—automatically drop into position-cannot loosen cally drop into position—cannot loosen or fly out . . . quickly rehoned or reground. Variety of blade shapes for varied contours. Balanced, concentric, built for lifetime use. One locking nut only. Fits tapered, threaded, or ½ I.D. spindles. Specify type and size spindle.



trated with 3 sets of blades. Full Money-Back Guarantee



WOOD PLANER

Most sensation

al, versatile drill

press tool ever built. Planes,

ALL-METAL SHAPER FENCE For use with shaper and molding cutters, planers and drum sanders. Fits all drill presses and shapers. Complete—with tempered hold down springs. Fully rust proofed. A real buy.

21/2" DRUM SANDER \$395

with 5 Sleeves



4" ROTARY SANDER

Sands wood and plastic surfaces to agate smoothness.
Available for hand drills, flexible shafts and drill presses. Two size arbors 1/2" or 1/2". Complete with 20 discs. \$595

FULL 10 DAY MONEY-BACK GUARANTEE

FREE Workshop Catalog BARRON TOOL COMPANY, INC. 269 Architects Bldg.: Detroit 1, Mich.

PRECISION WORK SHOP

trues-up, tenons, panels, rabbets, grooves, beads, bevels, etc. An all purpose lifetime tool. Complete \$7 50 THE EMBY COMPANY



801 W. Washington Blvd.

BUILD YOUR OWN!

Light or heavy. No rewinding. 16 Heats. Use old auto generator coils. Complete plans and catalog. 35c. LEJAY MFG. CO., 3347 LeJay Bldg., Minneapolis 8, Minn.

UILD YOUR OWN

Now! You can build your own enlarger. Takes negatives up to 4"x5". All necessary parts readily obtainable. Get com- \$100 plete plans, Only.
BIRMINGHAM 6, MICHIGAN



Ever have trouble getting the Trousers, Shirts, and Jackets you want for work, sports and knocking around, at the price you wish to pay? Write for our FREE CIRCULAR, No. 6.

ADDISON UNIFORM CO. . Dept. PM . CAMBRIDGE, OHIO





in WAR SURPLUS...SENSATIONAL VALUES THE WORLD'S LARGEST SUPPLY

MOVIE CAMERA

Standard Eastman

B-15 STYLE JACKET



Heavy Alpaca lined for Warmth. Sleeves with Heavy Rayon, bottom sizes 34 thru 46

He & bott AND LOOK AT \$12,95 THE PRICE

F-56 CAMERA

focal length, telephote with F-3.8 Bausch and Lomb lens. Complete with spare magazine, filler and

ilm roll in trunk. \$395.00

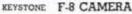
Handy, no winding, Has F-3-5 lens,
Cost Government \$235.00.
Used but perfect. Only \$24.95

BROWN LEATHER SHEEP LINED FLYERS PANTS

TREEP EM WARM
Front pockets, sippers at side and fly, suspenders.
Perfect garment for hunfers and authors man Sizes from and outdoor men. Sizes from 40 to 44. Original govern cost -\$22.50.

Used but perfect, \$5.95

photo lens. Hand operated complete with carrying



F-8. 15" focal length with F-5.8 tele-\$105.00

ARMY AIRFORCE TYPE A-2 OFFICER'S JACKET



THIS PRICE.

ed Cordovan Leather with concealed full sipper. Fly Front, Large patch pockets with snap fleps and stitched epoulets on shoulders.

NAVY MELTON

COSSACK STYLE

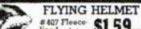
JACKET, New

All Wool, Sturdy. Warm, Zipper

front 2 slash pock-ets. taped collar.

A Wonderful Buy for utility & long

\$18.49



#407 Fleece \$1.59 and Ideal for cycle drivers, rocers, sportsmen. Used, but in excellent condition.



OMPLETE NAVIGATION SET. 14 clothbound, 230 page volt
A. B. C. D. E. F. G. H. I. I. K. L. M. N. P.
mbracing tobles 6 graphs from 0-4 degrees, thru 55-59 also Ac
can Air Almanac. 2 volumes Air
Navigation Line of position manuerla,
all issued by United States Navy.
1 Plastic Parallel Straight Edge.
1 Controllable Diamond Navigation
2 Controllable Diamond Navigation
3 Controllable Diamond Navigation
3 Controllable Diamond Navigation
4 Controllable Diamond Navigation
5 Controllable Diamond Navigation
5 Controllable Diamond Navigation
6 Controllable Diamond Navigation
7 Controllable Diamond Navigation
8 Controllable Diamond Navigation
8 Controllable Diamond Navigation
8 Controllable Diamond Navigation
9 Controllable

OXYGEN MASK



S.A.

A-14 Demand type. Slightly used. but \$1.95 A terrific deal with \$2.50

25 82 6

\$6.49 PLEXIGLASS DOMES

15"x19);"x6" deep. 1/4" thick Can be used for home hothouse, lish bowl, wash-bowl, ornamental light, Can be flattened in oven and will make flat sheets, 15" x 19" x 34". Weight 31/4 lbs. Also 200,000 lbs, of other

plexiglass sizes \$1.69

DOME

TEAR SHAPED PLEXI



\$1.39 ea.

TUNING UNIT CORPS In heavy alon, uses with black gracide ficial-15"x10"x8". Vel wat wernier died knob, calibon linn 0-100, with locking as seehly. Switch 1 position with knob. 810" diem. coil knob. 616" diam. col-three athers inside, and

#75-1-8

\$1.89 ea. RADIO HEAD SET

AN-BH-1 with Leather Spenge Rubber Pad Wonderful Buy \$1

MICARTA TUBE

Ideal for Insulation or Bushing Stock, 36" x 1/4" wall x 1" O. D. Original use was for trailing antenna - F 10. Use for towel rack, souvenir disple spacers, bearings, etc.

59¢ ea. In original car

PILLOWS CURLED CHICKEN FEATHERS

26" × 17 99cea Blue & white ticking. New, but still

and Sterilized in accor-Benovated dance with Lows of Califorina

New Skiing Goggles Poloraid
Colored lens, Your prolection against wind &
glare of dazzing snow.
A Terrific Value at

A Terrific Value at of dazziny ing, etc 33c ec.

NEW HUNTING KNIFE chrome vanadium blad-handle leather grip. Jeather In teather sheath.

\$5.98 Value For Only \$1.69 RUBBER GLOVES

1000 Uses. Home Farm. Factory 99

Divider Packed in Airplane Luggage
Type, comportmentalized with extra
roll insert celestal navigation suitcase
A-6 30-12-12, Dim. 10½, wide 8½ deep 23 outside compartment

\$31.25 or packed in briefcase 161/2"\$29.25 long, 6" deep, 11" wide

NAVY AIRFORCE TYPE A-2



TOO GOOD FOR THE U. S. NAVY" SAME AS ARMY TYPE A-2 BUT WITH GENUINE MOUTON COLLAR AND MADE

zes 34 thru 46 A TREE TREMENDOUS OF AERO TAN LEATHER \$19.95

AIRCRAFT ALUMINUM NEW BUCKET SEAT Use for boats, jeeps tractor seats, etc. 17 x 18" sect. 18" x 24" back. Rib enlorced. Adjustable height tube mounting. Wide, high-back gives back gives bacellent sup-port. Easily in-stalled. Shistalled. Shipped in origin

You'll oppreciate the buy at \$4.95 CUSHIONS

New leather cushions of linest pigskin, color, yellow. Filled with kapok. Will float. Size - 22½ "x17"x1½" thick.

At traction of Gov't. cost \$2.95

Navigators Mounetic type D-12 size T die e 41s deep Fabber Hoed - reinfing vange range ringe calibrated in 1 de gree boss D-360 with 2 parallel grid wires for alignment with And wive he allenn M.S. line. Boars. \$17.95 aioplones, atc.

NEW SHERRILLS VENICLE MAGNET COMPASS
our. with mounting backet, deviation bracket, instruction nel for Pla tire 3" "85"; Ideal for Place, B. Track, Auto, Mc..... \$5,95 ea.

Elgin 15 lewel STOP WATCH
Woltham Focket style, Shottespool crystal, am style. Shotterproof example (1/180a). We Case. NEW \$12.95 # 200

THE BARSES JUST A COUPLE HUNDRED



AIR CORPS FLEECE LINED JACKET

D-1 TYPE These bave been reconditioned. cleaned.

and brushed. but they are kinda rough. We do not recommend them for dress wear. However, if you want a warm, ruged, full sheepskin leit, fleece lined collar, rippered front, leather jacket that has lots of outdoor wear left in it that you can't beat for value at this \$7.95 ea.

You'd better write in fast, before they are all gone. Ideal for Hunters. Farmers. Garage Mechanics. etc.

Rubberized Nylon NEW Tarps, 7' x 11' \$6,95 Tarps, 7' x 11' Rubberized Linen 7' × 11'___



Only 3 lb. light weight yet waterproof. Ideal for outside car storage, etc.

SLEEPING BAG NEW! 100% wool. Mummy type. Heavy duty 30" zipper.

es extra Gov'l. cost 522.00 for used \$4.95 e 201 water re-pellant cover.

NEW TARPS - HEAVY CANVAS

Mildew & Flame Besistant, Cheap Outside Storage. Moving at These Prices. C2 OF

9"x16" \$11.95

NEW 100% ALL WOOL BLANKET

7 x 7 ft. Extra heavy.
Also
Double warmth. Fits
Wood's Bobe sleeping bag. \$4.65 SHE

> Twan Made for the Air Forces



THE BEST Loose Leaf BINDER

414

post. leavy ted h identification w price books, as photo alloans, surfact sketch 5 with bold 500 sheen, 81; A 55.03 Value for Colg. 59c 100 Page Binder Bond Fillers for 25c Estra. ec.

HORSEHIDE WORK GLOVES

ALL LEATHER GAUNTLET TYPE REINFORCED FALMS & FINCES STITCHING. LENGTH 11% 200 \$1.95 pt. LENGTH 11% 200 \$1.55 pt. Length 10% 200 \$1.55 pt. Ratted wire, welding, all purpose work gloves. A Stead . . Gov't, cost mony, mony times more.

COMPASSES

#151 Marching, Jen-±15) Marcine ite, with luminous \$1.69 dial #152 Matchb #152 Matchbox, both jewel & liqu floating dial 39c #154 Wrist stroro Compass 69c



ORDER DIRECT FROM THIS AD FREE - LARGE ILLUSTRATED CATALOGUE

All sales final. Make remittances by money-order, bank draft or personal check Purchase orders acceptable from D & B firms. All quotations F. O. B. Los Angeles. Send 1/2 deposit with C. O. D., orders, Also Complete Aircraft Supplies

PALLEY SUPPLY CO.

THE LARGEST FIRM OF ITS TYPE IN THE WORLD

DEPT. P. M. 38 - 6321 SAN FERNANDO RD. GLENDALE 1, CALIFORNIA

SOUTH BEND 10" Precision Lathes

The 10" Swing, 1" Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

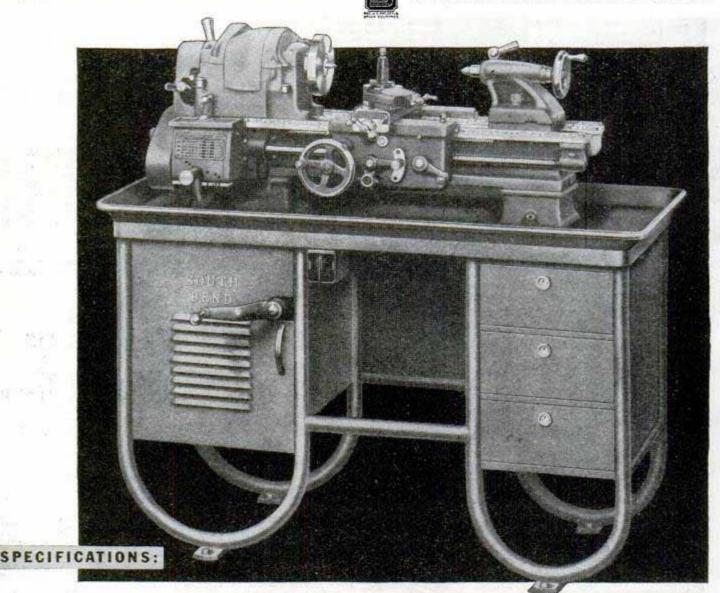
The precision, speed, and versatility of this lathe assures an efficient output on toolroom or manufacturing jobs. The 1%"bore through the head stock spindle makes it especially suited for machining parts from

bar or tube stock. A complete line of practical attachments greatly simplifies tooling the lathe for a wide variety of operations.

South Bend Precision Lathes are made with 9", 10", 13", 14½", 16", and 16/24" swings. We also manufacture Turret Lathes with ½" and 1" maximum collet capacity, and 14" Precision Drill Presses. Immediate deliveries can be made and a Time Payment Plan is available.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906 455 EAST MADISON ST., SOUTH BEND 22, INDIANA



Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe illustrated. \$93360.

Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum switch; and bench

swings: 10%" over bed and saddle wings, 5%" over saddle cross slide.

BED LENGTHS . . . 3, 3½, 4 and 4½ feet

CENTER DISTANCE . . 14% to 32% inches
COLLET CAPACITY 1 inch

SPINDLE BORE 1% inches

48 POWER CROSS FEEDS: .0006" to .0309"

THREAD CUTTING: 48 R.H. or L.H. pitches

PRICE RANGE OF
SOUTH BEND 10" PRECISION LATHES
Quick Change Gear Lathes . . \$718 to \$946
Toolroom Lathes \$994 to \$1186
These prices f.o.b. factory, less electrical equipment

Printed by Popular Mechanics Company, Chicago, Ill., U. S. A.





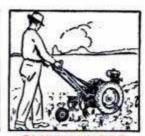
CUTTER BAR and HAY RAKE



PLOWS and CULTIVATES

Shaw tractors are the result of more than 45 years' experience in building tractors and other farm equipment. They're built by men who have the "know-how" of both farming and mechanics. That's why every Shaw tractor carries a full year's guarantee protecting you against any defect in workmanship or material.





PLOWS

TOP QUALITY MATERIALS

Built almost entirely of steel, arc-welded and consisting of thoroughly field-tested parts, Shaw tractors are famous for their dependability, utility and low upkeep. You can buy them with complete confidence. arc-welded and

LOW FACTORY PRICES

A modern factory and streamlined production methods assure you substantial savings. Shaw Du-All and Peppy-Pal tractors are available through dealers or direct from the factory. Mail the coupon for full information and special price list. · cial price list. Price List!

COUPON TODAY!

Dozens of Jobs Done Quickly and Easily

Do all kinds of hard jobs the easy way with Shaw Du-All or Peppy-Pal tractors . . . jobs that produce more food and feed, in less time with less work . . . at less cost. You can plow, cultivate, mow, harrow, disk, spray, grind, bulldoze, plow snow, saw wood and do many kinds of belt jobs, dig, haul, seed and scores of other jobs with these sturdy, powerful tractors.

extra-strength construction, precision engineering and efficient power utilization mean top performance on the most rugged job.

IDEAL FOR GARDENS, SMALL FARMS

Shaw walking and riding tractors are dependable, all-around economical workers . . . ideal for truck farms, gardens, orchards, nurseries, poultry farms, golf courses, estates, and cemeteries. They're always ready, always willing . . . a size to fit your needs — 1°_{2} to 9 H.P.

Many outstanding features make Shaw tractors easy to operate — women and children enjoy running them. Equipment is easily attached with the "Jiffy Hitch." handles are adjustable. Models with variable speeds — forward and

reverse. Also power turn.

SOON PAYS FOR ITSELF

Shaw tractors save so much time and labor and get so much work done, at such low cost, they pay for themselves quickly and many times over. Hundreds of operators use Shaw tractors to earn spare-time money.

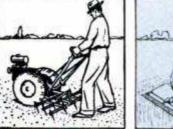
CHEAP TO OPERATE

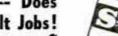
Just a few cents an hour will operate your Shaw tractor. They're strong, rugged, well-built . . . give you years of good service with very low maintenance expense. The initial cost is amazingly low . . write today for full information and price lists.





SAWS WOOD -- Does Many Kinds of Belt Jobs!





MOWS

and



S A	TRACTORS
COUPON FOR	

MAIL Send no money price list and free fold

SHAW MANUFACTURING CO.

4503 Front Street, Galesburg, Kansas or 668-G North 4th Street, Columbus, Ohio

Please send me Free Folder and price list.

Name

Address.

ALL OVER AMERICA... THE "CHOICE OF EXPERIENCE"!

More people are smoking CAMELS than ever before!



I SMOKED

MANY DIFFERENT
BRANDS AND
COMPARED_ITS
CAMELS WITH ME!

I'VE TRIED
OTHER BRANDS
NOTHING SUITS
MY'T-ZONE'
LIKE A CAMEL!



CAMELS ARE THE 'CHOICE OF EXPERIENCE' WITH ME!



CAMELS SUIT ME
BETTER ALL WAYS.
THEY TASTE SO GOOD
_THEY SMOKE SO
MILD AND COOL!

Jerry Ambler
RODEO
RODEO
RODEO

Mrs. Dorothy allan Newstead

HOLDER OF NATIONAL WOMEN'S FISHING RECORDS Cevil Smith

INTERNATIONAL

Mary Reilly TABLE-TENNIS

Let your T-Zone tell you why!



T for Taste...
T for Throat...

That's your
proving ground for
any cigarette.
See if Camels don't
suit your"T-Zone"
to a"T"

R. J. Reynolds Tob. Co., Winston-Salem, N. G.

• All over America, the story's the same! With smoker after smoker who has tried different brands of cigarettes, Camels are the "Choice of Experience"!

Zone" - that's T for Taste, and T for Throat and you'll see the reasons why! Com-

pare Camels for rich, full flavor; for mild, cool smoking — and you'll agree with the millions of smokers who say that Camels suit them to a "T"!

According to a Nationwide survey:

MORE DOCTORS SMOKE CAMELS THAN ANY OTHER CIGARETTE

When 113,597 doctors from coast to coast were asked by three independent research organizations to name the cigarette they smoked, more doctors named Camel than any other brand!