

# POPULAR MECHANICS

JULY 1967  
35 CENTS

What Sun Glare Can Do to Your Driving

Build PM's Exciting  
**UNDERWATER  
AQUAPLANE**

Page 142

In Color! **THE  
STUPENDOUS  
SATURN**

Inside the  
World's Hottest

and

Bright Ideas for a  
**HOBBY ROOM**

**Weekend Projects for Your Lawn  
and Patio—Also Roofing a Patio**

**How Good Is the Camaro?  
—What Owners Say**

**VIETNAM—'I Skipped a Swift': Action Report on Our 'Poor Man's PT'**  
**CARS—Saturday Mechanic: Hard-Starting • Auto Clinic • Dan Gurney's  
Driving Tips • How Owners Rate the Fury**

**BOATING EMERGENCIES—What to Do When You're in a Jam**

**New, Easy Way  
To Mount a Fish**

**New Tricks to Try  
On Your Bandsaw**

**How to Get Started  
With Model Rockets**



Take the action ride

on a **WARDS**  
**Riverside**

**BUILT BY BENELLI OF ITALY...BACKED BY WARDS,  
YOUR ASSURANCE OF QUALITY AND SERVICE**

Streak along at highway speeds . . . crack the throttle to pass . . . the road is yours on the Riverside® 250cc roadster! It's hemi-head OHV develops 20 horses of power

for you to tame. Price? Low, and nothing extra to buy. Terms to two years. Take a free trial ride at Wards...then decide if you want yours in black or candy apple blue!

**NO MONEY DOWN**

For more information write:  
Dept. 61, B-5; P.O. Box 8339;  
Chicago, Illinois 60680



Available nationwide at all  
Wards retail and catalog stores



Has earned its stripes on three continents. GT version

# Ford's Model C.



The Model C is Ford's new Cortina. The GT version shown here has a distinguished international racing and rally championship heritage built right in. (Specially prepared versions won the East African Safari, European Salon Championship, Canadian Shell 4000 and hundreds of other major events.)

And even if you don't rally, you'll like the Model C's other happy claim to fame—it's fun to drive. Razor-honed handling, sports-car performance, 5-passenger comfort—all at a sensible price.

#### All standard on GT

- Rally-proved 1500 cc ohv 4-cylinder engine.
- 83.5 bhp @5200 rpm, 97 lb/ft torque @3600 rpm.

- Weber carburetor and tuned exhaust headers.
- Full instrumentation including: tachometer, ammeter, oil-pressure and temperature gauges.
- Custom-contoured, individually adjustable bucket seats, and all-vinyl interior.
- Four-speed gearbox with short-throw gear change lever; fully synchronized.
- Individual front suspension.
- Front disc brakes: self-adjusting dual brake system.
- Self-adjusting diaphragm clutch.
- GT rally stripes and special insignia.

#### And a lot of other things going for you

- Aeroflow Ventilation—changes air every 34 seconds with the windows closed.
- Spacious room for five adults.
- A turning circle 6' less than VW's.

- A trunk that holds twice the luggage of a VW.
- Optional wide-based wheels with radial ply tires on GT's.
- Ford Motor Company Lifeguard Design Cortina Safety Features.
- The Model C is sold and serviced by Ford dealers—backed by Ford Motor Company.

Take a test drive and watch your sports-car senses come alive. GT shown, **\$2172\***.

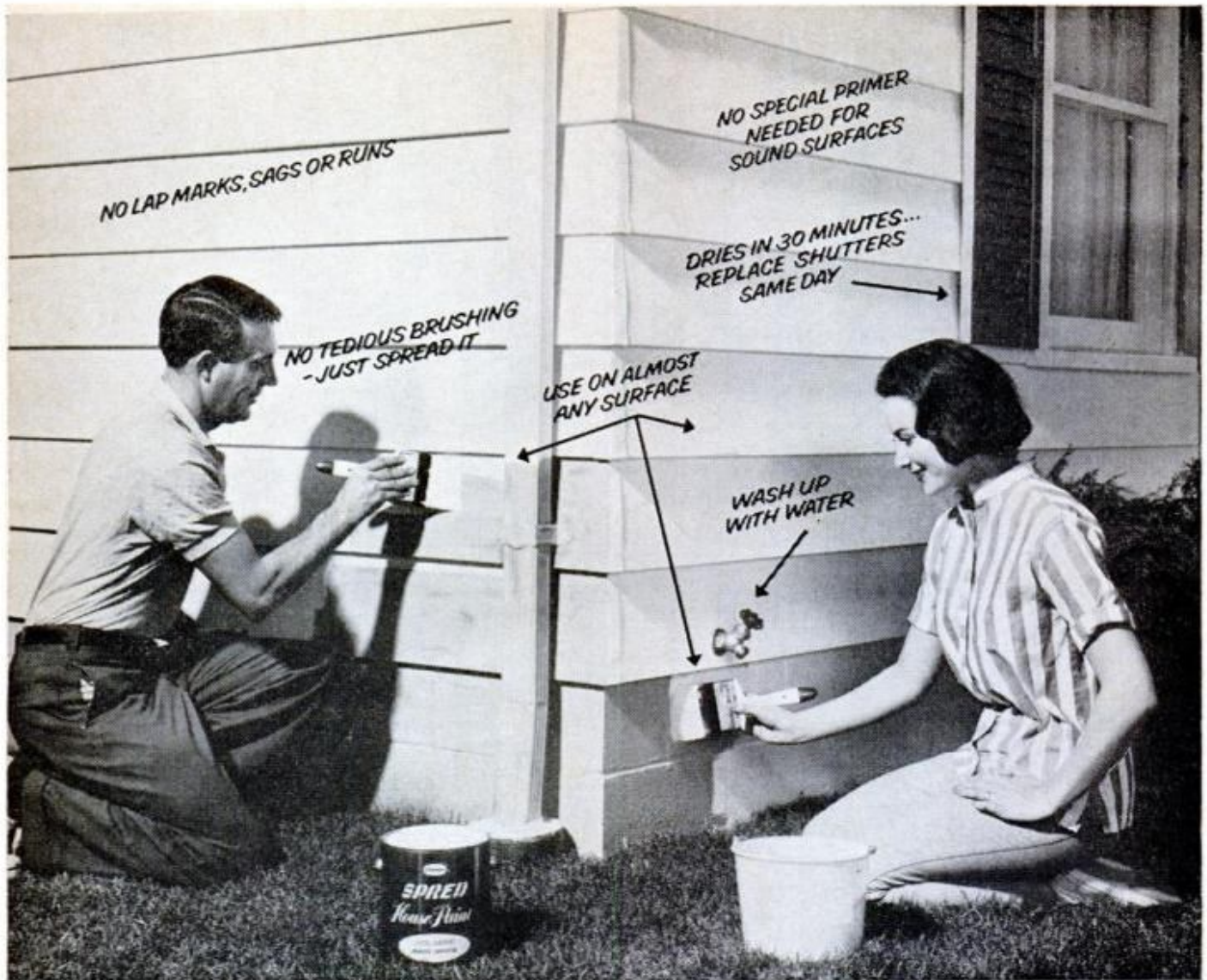
Other Model C's from **\$1815\***. Check the Yellow Pages for your nearest Ford Cortina dealer.

## Ford Cortina



\*Prices quoted are manufacturer's suggested retail base prices at East Coast P.O.E. The prices include Federal excise tax and suggested dealer delivery and handling charges. State and local taxes and transportation charges to your local dealer are additional.





## Homogenized Spred® House Paint is so easy... you can't call it "painting" anymore

"Spreading?" "Coating?" "Latexing?" There must be a better word for painting, now that there's a better paint:

**GLIDDEN SPRED HOUSE PAINT.**

Made with latex to take so much work, worry, time and mess out of painting.

And put in so much more long-lasting beauty.

So why go on using precious spare time for house painting? New Spred House Paint is made for starts and stops. It dries so fast you don't worry about rain, dust or bugs. You cover wood, masonry and previously primed metal without switching paint. Cleanup is quick and easy.

You've already used Spred House Paint? And you still call it "painting?"

O.K. But isn't it the easiest painting ever?



**COATINGS • DURKEE FOODS • CHEMICALS**

The Glidden Company • Cleveland, Ohio 44115

In Canada: The Glidden Company, Ltd.





# WE CAN'T SHORTEN THE ROUTE...

but Goodyear gives you The Workhorse—  
tough-job tire for pickup and delivery work.

The Workhorse tire is built for the stop-and-go grind of pickup and delivery.

The Workhorse has Tufsyn, toughest rubber Goodyear ever used in tires. And more of it—where it counts. The tread is 14% deeper. Under-tread is thicker, too. To give you up to 17% more rubber between the cord and the road. The Workhorse delivers as much as 25% more mileage than tires now used in most pickup and delivery work.

The Workhorse has stronger sidewalls for extra load-carrying

strength. Helps you haul more. In fewer trips.

The Workhorse is a natural on rough roads. Or no roads. Take off across a cornfield, or jump a curb. The strong triple-tempered nylon cord carcass shrugs off bruises, bumps and scrapes.

Next time you need tires for your pickup, panel, or light delivery truck, go to your Goodyear Dealer or Goodyear Service Store. Tell them to mount the Workhorse. Prices start at about \$15.00\*. Goodyear, Akron, Ohio 44316.



The Workhorse tire gives you a choice of two tread designs. Rib-type for over-the-road use. Extra-traction design for on and off-the-road work.

# GOOD YEAR

Tufsyn, Workhorse—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

\*[Size 6.00 X 16, 6PR. Rib-type, black sidewall. Plus \$2.38 federal excise tax and recappable tire. At all Goodyear Stores. See your local Goodyear Dealer for his competitive prices.]

JULY 1967

3

Материал, защищенный авторским правом



# POPULAR MECHANICS

INTERNATIONAL EDITIONS: AUSTRALIA, BRAZIL, CARIBBEAN, DENMARK, FRANCE, MEXICO, SOUTHERN HEMISPHERE, SWEDEN

## AUTOMOBILES AND DRIVING

- [14 Automobile Clinic](#)
- [38 Detroit Listening Post](#)
- [52H Drivin' with Dan](#)
- [70 PM Owners Report: Plymouth Fury](#)
- [78 What Sun Glare Can Do to Your Driving](#)
- [82 Gar Wood: An Old Sea Dog Is Up to New Tricks](#)
- [88 Hamming It Up at a "Stock" Car Race](#)
- [106 How to Keep 'em Rolling When the Going Gets Tough](#)
- [118 Saturday Mechanic: How to Solve Hard Starting](#)
- [122 PM Owners Report: Chevrolet Camaro](#)

## SHOP AND CRAFTS

- [148 Getting Started in Model Rocketry \(Flagged for Filing\)](#)
- [152 New Tools You Should Know About](#)
- [153 Hints from Readers](#)
- [159 Hints from Readers](#)
- [160 Don't Sell Your Bandsaw Short \(Flagged for Filing\)](#)
- [163 Tailgate Ramp for Pickups](#)
- [167 Hints from Readers](#)
- [168 Tools from Wire](#)

## SCIENCE AND INVENTIONS

- [11 Science Worldwide](#)
- [28 New Inventions](#)
- [66 Tuffy—The Navy's Deep Sea Lifeguard](#)
- [110 Slow Train to Great Slave](#)
- [114 Control Power with Fluid](#)

## REGULAR FEATURES

- [6 Letters](#)

## HOME AND YARD

- [26 Homeowners' Clinic](#)
- [126 Cool Off with a Covered Patio](#)
- [130 Solving Home Problems](#)
- [132 Weekend Projects for Your Patio and Lawn](#)
- [136 Three High Spots for a Hobby Room](#)
- [154 How to Reroof Your Home \(Part II\) \(Flagged for Filing\)](#)
- [164 Picking the Right Paint Remover](#)

## BOATING, OUTDOOR RECREATION

- [32 What's New Outdoors](#)
- [58 New for Your Boat](#)
- [61 How to Handle a Boating Emergency](#)
- [100 90 Minutes to Mount Your Prize](#)
- [125 Two-Ton Pier Is Solid as a Rock](#)
- [142 Build This Underwater Aquaplane](#)
- [144 How to Get More Out of Your Outboard](#)
- [146 Outboard Clinic](#)

## AEROSPACE, AVIATION, MILITARY

- [44 Aviation Jetstream](#)
- [92 I Skipped a Swift](#)
- [96 The Stupendous Saturn V](#)

## ELECTRONICS, RADIO AND TV

- [30 New in Electronics](#)
- [170 Installing CB Mini-Rigs: Two-Way Radios You Can Tuck Anywhere](#)

## PHOTOGRAPHY

- [74 Coming: Home Sound Movies for Everyone](#)
- [104 Shorty Tripod for Shooting Low](#)
- [105 Photo Hints](#)

Cover Photography by Bruce Mozert at Silver Springs, Ocala, Fla.

## NEXT MONTH IN POPULAR MECHANICS

**Watch It, Speeders. They've 'Gotcha' Coming or Going.** There's a new little black box that highway patrolmen use to compute your speed—whether you're in the same lane as the police car or in the other lane going the opposite direction.

**PM Owners Reports on the AMC Rogue and the Dodge Polara.** The owners tell you what's right and what's wrong with these cars.



Published by The Hearst Corporation  
**RICHARD E. BERLIN, PRESIDENT**

**RICHARD E. DEEMS**  
President, Magazines Division

**JOSEPH F. KERN**  
Publisher

**ROBERT P. CROSSLEY**  
Editor

**JAMES M. LISTON**  
Executive Editor

**JOHN A. LINKLETTER**  
Managing Editor

**WAYNE C. LECKEY**  
Home and Shop  
Editor

**SHELDON GALLAGER**  
Assistant Executive  
Editor

**THOMAS G. DAUER**  
Art Director

CLIFFORD B. HICKS \_\_\_\_\_ Midwest Editor  
THOMAS E. STIMSON \_\_\_\_\_ Western Editor  
WILLIAM KILPATRICK \_\_\_\_\_ Automotive  
KEVIN V. BROWN \_\_\_\_\_ Aviation  
ARTHUR MIKESSELL \_\_\_\_\_ Boating  
DANIEL C. FALES \_\_\_\_\_ Outdoors  
BILL HARTFORD \_\_\_\_\_ Electronics  
LEONARD E. SABAL \_\_\_\_\_ Home Workshop  
GARRY WINTER \_\_\_\_\_ Copy and Production  
RICHARD H. FUNK \_\_\_\_\_ Associate Copy and Production  
KATHY GARAVUSO \_\_\_\_\_ Assistant Copy and Production  
ALVIN KIETZ \_\_\_\_\_ Assistant Art Director  
LEO R. WEEKS \_\_\_\_\_ Assistant Art Director  
NILS NELSON \_\_\_\_\_ Assistant Art Director  
GEORGE W. BLOW \_\_\_\_\_ Technical Art Director  
FRANK P. FRITZ \_\_\_\_\_ Chief Photographer  
EVERETT JOHNSON \_\_\_\_\_ Cabinetmaker

ADDRESS ALL EDITORIAL COMMUNICATIONS TO: 575 Lexington Ave., New York, N.Y. 10022. For additional sources of information on the articles and products in this issue, write to Bureau of Information, Popular Mechanics, for free "Where-to-Find-It" list.

**L. PARK BENJAMIN, Advertising Director**

ADVERTISING OFFICES: New York: 575 Lexington Ave., Murray Hill 8-8500; Chicago: 520 N. Michigan Ave., 527-2400; Detroit: General Motors Bldg., TRINITY 5-8711; Cleveland: Hanna Bldg., 1422 Euclid Ave., PROSPECT 1-0456; Los Angeles: 801 North Vermont Ave., 666-6263; San Francisco: 1101 Hearst Bldg., YUKON 2-0823; Savannah, Ga.: 310 Drayton St., ADAMS 2-1106.

SUBSCRIPTION SERVICE: Mail all subscription orders, changes of address, correspondence concerning subscriptions, and Postmaster notices of undeliverable copies to Popular Mechanics, Box 646, New York, N.Y. 10019.

Popular Mechanics is published monthly by The Hearst Corporation, 57th St. at 8th Ave., New York, N.Y. 10019, U.S.A. Richard E. Berlin, President; George Hearst, V-Pres.; Richard E. Deems, President of Magazines; John R. Miller, V-Pres. and Gen. Mgr. of Magazines; William S. Campbell, V-Pres. and Director of Circulation; Joseph F. Kern, V-Pres. for Popular Mechanics; Frank Massi, Treasurer; Harvey L. Lipton, Secy. Single copy in the United States and Canada, 35 cents. Subscription prices: United States and Possessions, \$4.00 for one year; \$7.00 for two years; \$10.00 for three years. Canada, add \$0.50 for each year. Pan American Postal Union countries, add \$1.00 for each year. All other countries, add \$2.00 for each year. When changing address, give old address as well as the new, with postal-zone number, if any, and allow six weeks for change to become effective. Second-class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second-class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as second-class matter at the Post Office at Mexico, D.F., Mexico, June 20, 1950. © 1967 by The Hearst Corporation. All rights reserved. Printed in U.S.A.

JULY 1967

# Don't fiddle while you roam.

The KODAK INSTAMATIC 804 Camera lets you concentrate on what you're seeing. You simply drop in a film cartridge and wind the spring motor. Your 804 makes all the correct exposure settings, even for flash as you focus. It advances the film automatically, turns the flashcube, too. The lens is fast, the viewing bright, the range-finding accurate.

See how good the world looks when you have total automation and Kodak dependability going for you. Less than \$130 at your Kodak dealer's.

*Price subject to change without notice.*



**Kodak Instamatic®**  
804 Camera



ZRZ1-K45-NLGW



# WHY SETTLE FOR LESS? GET TOP PERFORMANCE

## WITH DELTA'S FABULOUS MARK<sup>®</sup> TEN



Only  
**\$44.95** CAPACITIVE  
ppd. DISCHARGE  
Deltakit — Only  
\$29.95 ppd. **IGNITION SYSTEM**

You read about the Mark Ten in the April issue of Popular Mechanics!

Now discover why even Detroit has finally come around. In 4 years of proven performance and reliability, the Mark Ten has set new records of ignition benefits. No wiring. And works on literally any type of gasoline engine. Buy the original, the genuine, the real McCoy — Mark Ten. From Delta. The true electronic solution to a major problem of engine operation.

### READY FOR THESE BENEFITS?

- ▲ Dramatic Increase in Performance and in Fast Acceleration
- ▲ Promotes more Complete Combustion
- ▲ Points and Plugs last 3 to 10 Times Longer
- ▲ Up to 20% Mileage Increase (saves gas)

LITERATURE SENT BY RETURN MAIL  
BETTER YET — ORDER TODAY!



**DELTA PRODUCTS, INC.**

P.O. Box 1147 PM - Grand Junction, Colo. 81501

Enclosed is \$\_\_\_\_\_ Ship prepaid.

Please send:  Ship C.O.D.

Mark Tens (Assembled) @ \$44.95

Mark Tens (Delta Kit) @ \$29.95

(12 VOLT POSITIVE OR NEGATIVE GROUND ONLY)

SPECIFY —  Positive Ground  Negative Ground  
 6 or  12 Volt

Car Year \_\_\_\_\_ Make \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ Zip \_\_\_\_\_

# LETTERS TO THE EDITOR

## Two more for safaris

Two new International Scout powerplants have been made available since Stuart James did the *Four-Wheel Safari Test* (page 119, May PM).

In October, International began production of a bigger four-cylinder engine rated at 111 hp, and this February, a 155-hp V8 for the Scout was announced. The PM test was accomplished with the smallest Scout engine now offered, a 93-hp four-cylinder unit. The new engines, naturally, outperform the 93-hp Four.

International Harvester Co.  
Chicago, Ill. **DAVID E. HARTMAN**

## Dorado or Bass?

I've been given new hope by your article *They Dive for Wrecks* (page 92, March PM) and a letter in your May issue suggesting that the lost submarine off Block Island is the *Dorado*.

My father, Fireman 2/C Joseph Vernarsky was aboard the *Dorado*. I was five, and my sisters, three and four, when my mother saw him off. I have waited 24 years to be able to sleep nights over that sub.

Could you please put me in contact with the men who dived on that wreck? And ask them not to blast it.

Weirton, W.Va. **JOSEPH A. VERNARSKY**

In 1944 I was on a ship standing by to sink a submarine if it didn't sink from the effects of an acoustic torpedo dropped from a TBM torpedo bomber. The submarine was the *Bass*, and the location was near Block Island. The submarine was on the surface, and a device was placed on it for the torpedo to home in on. As far as I know, all watertight doors were closed, and one torpedo sank the submarine.

If the torpedo damaged just one section and all watertight hatches were closed, there would still be air in the other sections—thus causing it to rest lightly in the water (as described).

Stockton, Calif. **M. E. BECKER**

## 'Sick to my stomach'

Can't you get rid of "Detroit boys" who seem to write all your automotive stuff? I get sick to my stomach month after month reading what wonderful things are coming out of Detroit. In May PM again

(Please turn to page 8)



# “Look who’s smiling now!”

“The department head’s job had just been left vacant. When the boys in the office learned I was gunning for it, they gave me their widest grins. One thing they didn’t know: I had made up my mind sometime back to take LaSalle training that would prepare me for a better job. My study paid off so fast it surprised even me—I was picked for that shiny promotion over everyone’s head. Who wouldn’t be smiling with a neat new \$1,500 increase!”

**L**A SALLE’S files are filled with letters from graduates who have rapidly climbed the ladder of success. You, too, can qualify for the job opportunity of your choice through LaSalle home study—without interfering with your present work—and by devoting only a little of your spare time.

LaSalle has been leader in home education for more than half a century and has enrolled more than 1,000,000 ambitious men and women. Its faculty includes some of the country’s foremost practicing specialists and instructors. Your training is in good, experienced hands.

Mailing the LaSalle coupon below may be the first step in getting a better job, higher pay, and all of the good things that go with success. Simply check the program in which you are most interested, and we will send you a valuable free booklet describing the opportunities in that field. Mail to LaSalle, 417 Dearborn, Chicago, Illinois 60605.



## LASALLE EXTENSION UNIVERSITY

A Correspondence Institution • 417 South Dearborn, Dept. 67-080, Chicago, Illinois 60605

Please send me, without cost or obligation, FREE booklet and full information on the field I have checked below:

### ACCOUNTING

- Complete Accounting with CPA Training
- General Accounting
- Income Tax
- Accounting Fundamentals
- Auditing
- Controllership
- CPA Training
- Modern Bookkeeping

### BUSINESS MANAGEMENT

- Complete Business Management
- Credit and Collections
- Office Management
- Personnel Management
- Business Correspondence

### LAW COURSES

- Bachelor of Laws Degree
- Business Law
- Insurance Law
- Claim Adjusting Law
- Law for Police Officers
- Law for Trust Officers

### SALESMANSHIP

- Sales Management
- Complete Sales Training

### DRAFTING

- Basic Drafting
- Aeronautical Drafting
- Architectural Drafting
- Electrical Drafting
- Mechanical Drafting
- Structural Drafting

### REAL ESTATE

- Complete Real Estate
- Real Estate Brokerage
- Real Estate Management
- Real Estate Sales

### TRAFFIC AND TRANSPORTATION

- Complete Traffic Mgt.
- Transportation Law
- Rates and Tariffs

- Agency and Services
- Motor Truck Traffic

### STENOTYPE

- Machine Shorthand

### TECHNICAL COURSES

- Mechanical Refrigeration
- Air Conditioning, Refrigeration and Heating
- Diesel

### HIGH SCHOOL

- High School Diploma

### CAREERS FOR WOMEN

- Interior Decorator
- Dental Assistant
- Secretarial
- Accounting
- Bookkeeping
- Real Estate

Name.....Age.....

Address.....County.....

City & State.....Zip No.....

Occupation.....Working Hours.....A.M.....P.M.





**CLEAN  
YOUR  
CARBURETOR  
QUICKLY  
AND  
COMPLETELY**



With GUMOUT and the easy-to-use Gumout Carburetor Clean-Out Kit, you can clean your carburetor right on the engine the fast, professional way. Or, simply add GUMOUT to your gas tank. It cleans as you drive. Get GUMOUT at your favorite service station or auto supply store.



**GUMOUT**

Cleveland, Ohio 44104

## LETTERS

*(Continued from page 6)*

we are told what to do to fix or live with what are just plain faults in design and engineering and poor quality by the manufacturer. Let's call on the manufacturers to make cars without these problems. We had them years ago, so I know they can do it, and at half the price, too.  
Seattle, Wash. H. SCHUBRING

*Some of our competitors have "Detroit boys," but we don't, so maybe it's something you're eating that's making you sick. We agree that manufacturers need criticism—and we criticize 'em (this issue for example). But, things being the way they are, we're really not as optimistic as you about getting cars at half the price.*

### Tension in the bathtub

In *Model Glue Propels This Bathtub Tugboat* (page 162, May PM), you describe a toy boat that goes by itself in a bathtub if a volatile substance is applied to its stern. The author seems uncertain of the reason for its forward movement.

Some of the volatile material flows over the surface of the water at the rear, drastically reducing surface tension there. Since the surface tension at the bow remains normal, the tension there pulls the boat forward.  
Paramus, N.J. AARON B. MILLER

*Just like a little nervous tension around the office keeps us moving?*

### After all, it's their word

In your article, *World's Wettest Drydock* (page 152, May PM), you state that the name of the ship being restored is *Wasa*. However, I've seen the name spelled *Vasa*. Could you straighten me out on this?  
San Diego, Calif. JOHN EATON

*You can take your choice; we went along with the Swedes. The Swedish name is *Wasa*, and it's pronounced like the anglicized version, *Vasa*.*

### More light on timing

I believe Mr. Schultz goofed in *Timing Techniques* (page 166, April PM). He has his test lamp hooked in parallel, and the lamp should burn when the contacts are open, not when closed (as would be the case in a series connection of the lamp).  
Palmdale, Calif. CHARLES A. MASON

*Mr. Schultz agrees.*



Medical news from America's leading society of foot doctors.

# Now! Clinically-proven relief of athlete's foot.



This official seal of the Council on Podiatric Therapeutics of the American Podiatry Association has been granted to Quinsana Foot Products with this statement: **“Quinsana Foot Powder, Penetrating Foam and Foot Deodorant are effective foot health aids and of significant value when used in a consistently applied program of daily foot care and regular professional treatment.”**

The Council on Podiatric Therapeutics of the American Podiatry Association.

Today, after hundreds of clinical tests supervised by some of America's foremost foot specialists, Quinsana's power to relieve athlete's foot was confirmed. Three out of every four patients tested showed *unmistakable* improvement.

Thus, Quinsana was granted this official seal—your assurance that Quinsana Foot

Products measure up to high professional standards of effectiveness.

**Quinsana Foot Powder**—for relief of athlete's foot and daily foot care.

**Quinsana Penetrating Foam**—for more stubborn cases of athlete's foot.

**Quinsana Foot Deodorant**—for long-lasting protection against foot odor.

## Quinsana

Products of Mennen Laboratories. The Mennen Company, Morristown, New Jersey.

JULY 1967





## POWERFUL WIRELESS TRANSMITTER

... the size of a  
package of  
cigarettes

AVAILABLE  
IN KIT FORM ...  
OR COMPLETELY  
ASSEMBLED.



ONLY  
**\$6.95**  
KIT

Here's a handful of transistorized electronics that does just about everything... yet is tiny enough to fit into a package of cigarettes. Called the WIRELESS BROADCASTER, this battery operated transmitter picks up sound through its sensitive microphone and transmits (without wires) thru any nearby AM radio. Useful for broadcasting, guitar & other musical instrument amplification, baby minding, remote recording, etc. Complete instructions furnished for quick assembly and use. Uses regular 9 volt battery. When ordering, either kit (\$6.95) or assembled unit (\$8.95)... If you desire, contact type for musical instruments enclose \$2 additional. Completely guaranteed or full refund made.

SEND CASH, CHECK OR MONEY ORDER TO:  
EMPIRE ELECTRONICS CO., Dept. PM  
241 LAFAYETTE STREET • NEW YORK, N. Y. 10012

\$8.95 ASSEMBLED  
CONTACT MICRO. \$2 EXTRA



## AMAZING HIDDEN AID MAKES NON-SWIMMERS SWIM

Now anyone can swim fast—new, easy way without fear! Start to swim INSTANTLY with fully guaranteed SWIM-MATE that hugs your waist, gives you sure confidence. Invisible out of water, worn under women's one or two piece suits, men's trunks. Now you too can join the water fun even if you can't swim a stroke. Non-swimmers swim easily. Average swimmers swim like champs. Made to last for years. Approved by America's champion swimmers. Satisfied users coast to coast. Compare our low price. State Waist Size. (Full 10 Day Money Back Guarantee) Send only 5.95 plus 25¢ pp. & hdg.

STANDARD AMERICAN **Our Low Price \$5.95**  
Dept. 7PM, 1 Park Ave., New York, N.Y. 10016

## SCOOT'R-BIKE BUILD FROM BICYCLE FRAME

BIGGER, BETTER THAN A MINI-BIKE  
Convert old bicycle frame for \$5.75, plus small weld job. Step-by-step Plans, photos show how. PLANS, \$2, refundable with order for wheels, engines, clutches, kits. Also Mini-Bike Plans, Kits. Discount Prices. GILLIOM MFG. CO., Dept. PM-7, St. Charles, Mo. 63301



**-Earn \$5 to \$8 An Hour, Full or Spare Time-**

# INVESTIGATE ACCIDENTS

**NO SELLING TOP SECURITY**

Universal has trained and placed hundreds of men in the booming Accident Investigation field. Most had no experience, no college. They ranged in age from 20 to 55, came from all job backgrounds. More men urgently needed now!

A boom business now and for years to come. That's Accident Investigation. Some 200 million accidents and losses must be investigated this year alone for insurance and other companies. Not enough trained men are available to handle this huge work load. And, the accident rate increases steadily as population increases. More men are needed.

### KEEP PRESENT JOB WHILE YOU TRAIN AT HOME

We train you quickly at home then give you free placement help. Hundreds of Universal graduates are making excellent money right now in Accident Investigation. Men working full or spare-time report earning from \$5 to \$8 an hour. Men working as staff investigators for companies report starting pay and benefits equal to \$8,000 a year. (This includes salary, company car, expense account and free insurance programs.)

### SEND NOW FOR FREE BOOK OF DETAILS

Without cost or obligation, Universal will send you a free book outlining opportunities in Accident Investigation. No salesman will call. You read. You consider. You decide in privacy. Don't miss this opportunity. Send coupon today!

STATE APPROVED FOR VETERANS' TRAINING



## Mail Now for FREE BOOK

M. O. Wilson, Dept. PM-7  
Universal Schools  
6801 Hillcrest, Dallas, Texas 75205

Please rush FREE BOOK on opportunities in Accident Investigation. I will have no obligation and no salesman will call on me.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_





BY JOHN F. PEARSON  
**SCIENCE**  
 WORLDWIDE

**TOOTH DECAY IS REDUCED** by as much as 30 percent through the use of a food additive discovered by Australian scientists. That's what a test involving 1300 Australian children indicates. The additive is composed of substances called calcium sucrose phosphates, which are found in sugar and other carbohydrate foods in the natural state. Trouble is, say the scientists, the phosphates are removed when the foods are processed.

**A FISHING REEF** made up of junked cars will be created off a Long Island (N.Y.) beach. Some 500 to 1000 old buggies will be sunk 60 feet below the surface of the Atlantic and lashed together to form the reef. Marine biologists believe that the structure will attract algae, bait fish and sport fish, thus building a cycle of marine life.

**NO FUEL IS NEEDED** for an experimental helicopter being built for the U.S. Air Force. Power for the nine-foot, pilotless chopper will be beamed from the ground in the form of microwave radiation, which will be converted in the aircraft to electric power to turn the rotors and operate the controls. Envisioned as a hovering antenna for military and civilian communications, the helicopter is undergoing test-stand flights.

**SPEED OF LIGHT** has been determined as 186,324.01 miles per second. But that figure, space scientists find, leads to errors of several miles in calculating distances to our neighboring planets. Now University of Colorado researchers are working with a 100-foot-long, laser-activated interferometer, a diagnostic tool for studying light waves, to get a more accurate figure. The interferometer is set up at the bottom of an abandoned gold mine, which has a constant year-round temperature of 50° F. and shields the apparatus from vibrations caused by cars and people walking.

**MONKEYS GO BALD** just like humans, according to researchers at the University of Oregon Medical School. "We have found the stump-tailed macaque to be a good experimental animal for this study," explains the chief scientist. "The young have a good covering of hair on the scalp, down

(Please turn to page 12)

# SHOPPING MART

Products available by mail. Money-back guarantee.  
 Order direct by Stock No. Send check or M.O.

## WAR SURPLUS ELECTRIC GENERATOR



Edmund Scientific Co.,

Brand new Signal Corps Electric Generator. Generates up to 90 volts by turning crank. Use in high impedance relays. Charge ground & bring up night crawlers for bait or study. 2 Alnico Magnets alone now worth more than original gov't. cost of \$15. Wt. 2 lbs. **\$6.95 Ppd.** Order Stock No. 50.225H. Mtd. with light, to demonstrate electricity. **\$11.95 Ppd.** Order Stock No. 50.365H. Barrington, New Jersey 08007.

## "FISH" WITH A MAGNET



Edmund Scientific Co.,

Go treasure hunting on the bottom! Fascinating fun & sometimes profitable! Tie a line to our 5-lb. Magnet—drop it overboard in bay, river, lake or ocean. Troll it along bottom—your "treasure" haul can be outboard motors, anchors, other metal valuables. 5-lb. Magnet is war surplus—Alnico V Type—Gov't. cost \$50. Lifts over 150 lbs., on land—much greater weights under water. **\$12.50 Ppd.** Order Stock No. 70.571H. Barrington, New Jersey 08007.

## AMERICAN MADE OPAQUE PROJECTOR



Edmund Scientific Co.,

Projects illustrations up to 3" x 3 1/2"—enlarges them to 35" x 30" if screen is 6 1/2 ft. from projector, larger pictures if screen is farther away. No film or negatives needed. Projects charts, diagrams, color or black-and-white. Operates on 115 volts A.C. current. . . . 3 ft. extension cord and plug included. Size 12" x 8" x 4 1/2" wide. Weight 1 lb. 2 ozs. Plastic case **\$7.95 Ppd.** Order No. 70.199H. Barrington, New Jersey 08007.

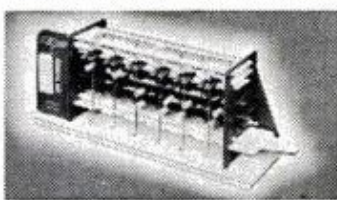
## WOODEN SOLID PUZZLES



Edmund Scientific Co.,

Here's a fascinating assortment of 12 different puzzles to provide hours of pleasure and stimulate ability to think and reason. Animals and geometric forms. Take them apart and reassemble them. Lots of fun for the whole family—young and old. Will test skill, patience and ability to solve problems. Order yours now. **\$3.50 Ppd.** Order Stock No. 70.205H. Barrington, New Jersey 08007.

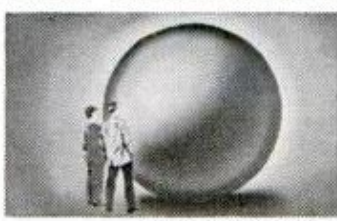
## NEW MODEL DIGITAL COMPUTER



Edmund Scientific Co.,

Solve problems, tell fortunes, play games with miniature version of giant electronic brains! Adds, subtracts, multiplies, shifts, complements, carries, memorizes. Colored plastic parts easily assembled. 12" x 3 1/2" x 4 1/2". Incl. step-by-step assembly diagram, 32-p. instruction book covering operation computer language (binary system), programming, problems & 15 experiments. **\$5.98 Ppd.** Order Stock No. 70.683H. Barrington, New Jersey 08007.

## GIANT WEATHER BALLOONS



Edmund Scientific Co.,

"Balls of fun" for kids, traffic stoppers for stores, terrific for amateur meteorologists. Create a neighborhood sensation. Great backyard fun. Exciting beach attraction. Amateur meteorologists use to measure cloud heights, wind speed and temp. Made of heavy duty neoprene. Inflate with vacuum cleaner or auto air hose; or locally available helium for high rise. 8' diam. **\$2.00 Ppd.** No. 60.568H. 16' diam. **\$7.00 Ppd.** No. 60.632H. Barrington, New Jersey 08007.

## GIANT FREE CATALOG



Edmund Scientific Co.,

Completely new 1967 Catalog. 148 pages packed with nearly 4,000 unusual bargains. Exciting new categories. Many new items. 100's of charts, illustrations. Many hard-to-get war surplus bargains. Enormous selection of telescopes, microscopes, binoculars, magnets, magnifiers, prisms, photo components, etc. For hobbyists, experimenters, workshops. Shop by mail. No salesman will call. Write for Free Catalog "H" to





For Sparetime or  
Full-Time Income  
There's Good

## MONEY IN SHARPENING

Here's a proven, practical way to earn sparetime cash while you develop a money-making business of your own. Investment is small. There's no overhead, no stock to carry, no selling involved.

**FOLEY SAW FILER**—Do a perfect job every time automatically with the Foley Saw Filer—and use the Modern Lawn Mower Sharpener to earn extra cash precision-grinding all mower blades. There's no experience needed—you can begin to make money right away in your basement or garage.

### \$3 to \$6 An Hour Sparetime

Get started now and watch your business grow! Thousands are earning cash this easy way—many build a complete sharpening service with year around profits. You can, too, with the easy-to-follow Foley Plan—write us today!

**Foley Manufacturing Co.**  
Minneapolis, Minnesota



**FREE BOOK**  
Shows you how!  
Valuable book  
shows how to start  
and make profits  
fast. Mail coupon  
today. No obligation,  
no salesman  
will call.

**FOLEY MFG. CO.**  
716-7 Foley Bldg., Mpls. 18, Minn.

- Saw Filer Information  
 Mower Sharpener Information  
 Money-Making Booklet

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_



## AUDEL SKILL-BUILDING GUIDES

### NEW AUTO GUIDE!

**FIX ANY CAR FAST!** Step-by-step 1966 Repair Guide shows you how to troubleshoot and repair every part and system in any make or model car. Features

unique symptoms-and-causes charts. Covers absolutely everything from axles to valves, including engine tune-up. Hundreds of illustrations. 736 pages. To order, check No. 1 below. **Only.....\$6.95**

#### USE THIS HANDY ORDER FORM

- No. 1 **AUTO GUIDE**. 736 pages..... \$ 6.95  
 No. 8 **Carpenters & Builders Guide**. 4 Vols. 1616 pgs.. 16.95  
 No. 15A **New Electric Library**. 10 Vols. 6016 pages..... 25.00  
 No. 2 **Home Appliance Service Guide**. 608 pages..... 6.95  
 No. 14A **Home Refrigeration & Air Conditioning**. 576 pgs. 6.95  
 No. 26 **Masons & Builders Guide**. 4 Vols. 1478 pages... 10.50  
 No. 6 **Plumbers & Steamfitters Guide**. 4 Vols. 2272 pgs. 10.50  
 No. 12N **Machinists & Toolmakers Guide**. 3 Vols. 1312 p. 13.50  
 No. 10 **Welders Guide**. 624 pages..... 4.95  
 No. 4 **Handy Book of Practical Electricity**. 1088 pgs. 5.95

#### FREE 10-DAY TRIAL • SEND NO MONEY

**THEODORE AUDEL & CO.** Since 1879  
4300 W. 62nd St., Indianapolis, Ind. 46206

P-77

Please mail me for 10 days **FREE EXAMINATION** the books checked above. I agree to mail \$3 in 10 days for each book or set ordered, and to mail \$3 a month for each book or set until I've paid the purchase price, plus shipping costs. If I'm not completely satisfied with my Audel Guides I may return them.

**ORDER  
TODAY!**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**SAVE SHIPPING COSTS.** Check here if you enclose complete payment (plus sales tax, if any) with order. We pay postage. Same return privilege.

## SCIENCE WORLDWIDE

(Continued from page 11)

to the eyebrows. At adolescence, however, the forehead becomes gradually 'naked.' As in humans, adult male macaques have the shiniest skulls.

**BUILDING BLOCKS OF LIFE**, possibly life itself, may exist on the planet Jupiter. That's the thinking of NASA scientists who have simulated Jupiter's atmosphere, which is believed to contain ammonia and methane, and passed electrical charges through it. The result: organic molecules that need only water to turn them into the more complex building blocks from which life can develop.

The temperature range of Jupiter's lower atmosphere (0° to 212° F.) would allow for the existence of liquid water. Much evidence suggests that the earth also had an atmosphere of ammonia, methane and water some 4.5 billion years ago and that lightning set off chemical reactions.

**GLASSY FRAGMENTS** having common properties have been found on the ocean floor in areas as far apart as the waters off Australia, Japan and Africa. Some of the fragments, called tektites, were found by Columbia University scientists who say they probably came from a huge object from space that exploded over the earth some 700,000 years ago.

**FIBERGLASS BOATS** keep growing. Though technicians at one time considered fiberglass suitable only for small-craft construction, you can now order a 1000-ton, 200-foot ship from a British firm. Key to the big size, say the Britons, was the development of a hollow plastic brick. The six-inch square bricks are used to build the core of the hull. Then they are covered with sheets of fiberglass.

**DISEASE-SPREADING MOSQUITOES** will be gone from the United States by 1973, reports the Public Health Service. The *Aedes aegypti*, carrier of yellow fever, dengue and hemorrhagic fever, has been the target of a \$23 million attack since 1964.

**ARTIFICIAL HAND** that's battery powered has been developed by the Army Bio-medical Research Laboratory, Washington, D.C. Not only does the hand look real, but it has a built-in piezoelectric sensing device in the thumb that controls grasping pressure. This makes it possible for the wearer to grip delicate objects such as ice-cream cones and paper cups without crushing them. ★ ★ ★



# POPULAR MECHANICS Readers: Take this Big \$2.98 Picture-Filled Volume.. **FREE!**

(with no obligation to buy even one book in this program)

It's Crammed with Hundreds of Exciting Fun-Filled Ideas, Plans, Projects for Home, Hobby, Yard, Car, Boat, Camp, Garden, etc.! 196 giant money-saving pages! 400 how-to pictures!

Why do we give you this exciting do-it-yourself Volume absolutely FREE? Because we want you to live like a millionaire! Thrill to the good things of life! Enjoy Vacation Cabins—Barbecues—Sailboats—Cabin Cruisers—smart Furniture for every room—luxurious Patio—Finished Basement—Extra Attic Apartment—super Work-Shop—Playroom—Added Bedroom—House-Trailer—Fishing Pram—Landscape Gardens—every type of improvement for HOME and OUTDOORS!

We give you this first Volume FREE—with no obligation—to prove to you how the famous PRACTICAL HANDYMAN'S ENCYCLOPEDIA will bring more fun into your life—bring you literally thousands of projects to save you money—keep entire family happy—keep yourself joyfully busy for pleasure and profit.

Here are clear, picturized instructions and plans for making all manner of wonderful things—from an acoustically damped microphone for \$2.00 to winterizing a vacation cottage for year-round living! And the cash savings you make by doing things yourself range from \$20.00 on a simple one-room paint job

up to \$2,200.00 on a cabin cruiser—or over \$2,000.00 on a summer cabin.

Mail coupon for FREE Volume—  
Nothing to Buy Ever!

Giant FREE VOLUME is a Preview of help you'll get from the complete PRACTICAL HANDYMAN'S ENCYCLOPEDIA! 18 superb volumes, 3,456 fact-filled pages, over 7,000 show-how illustrations, thousands of ideas and do-it-yourself projects.

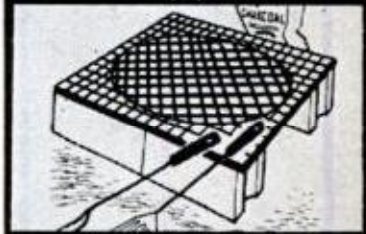
After you see your FREE volume you may, if you wish, collect other volumes in the Encyclopedia. Each volume comes ENTIRELY ON APPROVAL for 7 days FREE EXAMINATION—no obligation to keep or buy. Volumes 2, 3 and 4 come to you about one a month; remaining volumes come in two shipments... all ON APPROVAL. You may return any shipment within 7 days and owe nothing, or you may remit subscriber's low price of only \$2.98 per volume plus a few cents shipping—for only one book each month.

Even if you decide not to buy any books—giant first volume is still yours FREE. Mail coupon to: PRACTICAL HANDYMAN, Dept. PM-7, 100 Sixth Ave., New York, N.Y. 10013

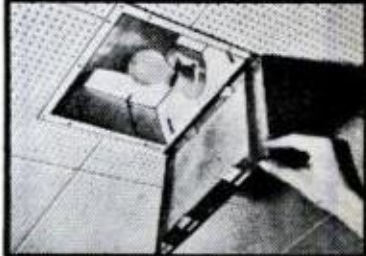
**IDEA!** add an extra bedroom virtually for cost of materials alone. Save up to \$1,000!



**IDEA!** Build this outdoor grill. Enjoy 1,001 other money-saving projects!



**IDEA!** Install a new, modern ceiling—complete with recessed lighting! Save \$50 to \$100!



## Get all this and more in your FREE BOOK:

Additional Bedroom • Built-in Closets • Furniture • TV Repairs • Antenna Problems • Burglar Alarms • Aluminum Projects • Attic Expansion • House Framing • Garden Accessories • Boosting Gas Mileage • Window Framing • Plywood Projects • Power Tools • Air Conditioning • Car Transmissions • Spray Painting • Outdoor Furniture • Dormers • Weatherproofing • Attic Fans • Patios • Barbecues • Emergency Car Repairs • Roofing • Appliance Repairs • Much MORE!

## Mail Coupon for FREE Book NOW!

PRACTICAL HANDYMAN DEPT. PM-7  
100 Sixth Avenue, New York, N.Y. 10013

Please ship me ENTIRELY FREE the big 7 $\frac{3}{4}$ " x 11 $\frac{1}{4}$ " colorful Volume I of the PRACTICAL HANDYMAN'S ENCYCLOPEDIA. I will be entitled to receive additional volumes of this great new Encyclopedia in 18 volumes as outlined above. After examining each book, I may purchase it at the low price of only \$2.98 plus shipping if I am more than pleased... or I may return the book in 7 days and owe nothing. I may cancel any time after buying as many volumes as I wish, or none at all if I choose. And you will send no further volumes after you receive my cancellation.

Big First Volume is mine to keep FREE in any case.

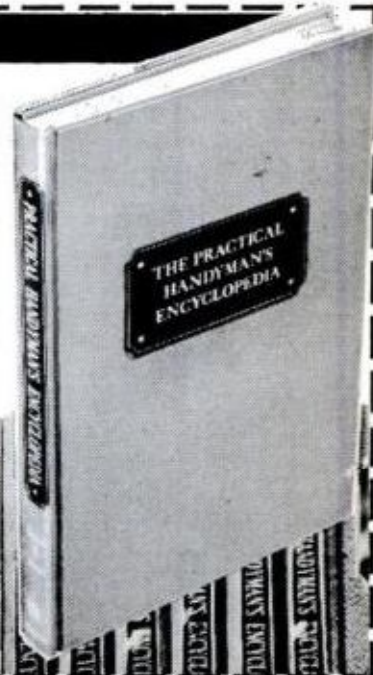
Print Name \_\_\_\_\_

Address \_\_\_\_\_

City & State \_\_\_\_\_ Zip Code \_\_\_\_\_

Canadian orders will be shipped and billed from Canada, duty free.

PH-3R





# SOLUTIONS FOR MECHANICAL HEADACHES

# AUTOMOBILE CLINIC

BY MORT SCHULTZ

## Phew!

*Whenever I use the heater in my 1965 Corvair, I get an odor similar to that of burning gas or oil. I find no leaks in the motor compartment. Any suggestions?—Rick Greenstein, Chicago.*

You're not the only one, Rick. This is a common problem, and I've heard of two reasons for it. First, any oil that gets on that engine and begins to smolder will transfer fumes to the passenger compartment. The only safeguards against this are a clean engine and sealing all holes between engine and passenger compartment. The trouble also occurs when there's a blown cylinder-head gasket.

## Dashing a stall

*Have you ever run across a 1966 Ford Fairlane that keeps stalling although apparently tuned to perfection? The carburetor has also been ripped apart, but nothing has been found. I know a problem like this is tough to diagnose, but your opinion would be appreciated.—Bernard Christy, Drums, Pa.*

The reasons for stalls, of course, are many. However, here's one that many people overlook. You don't say whether your car is equipped with an automatic transmission. If it is, stalling problems have been solved by installing an external dashpot on the carburetor. The purpose of a dashpot is to close the throttle slowly to idle position regardless of how quickly you cut your foot off the accelerator pedal, thus preventing a stall possibility.

## Rumbling rear

*I have a 1963 Chrysler New Yorker equipped with a sure-grip differential. There's a continuous loud rumbling noise coming from the rear axle. Four new shocks and rear wheel bearings have been installed. The differential has been opened and inspected. Nothing has helped. Do you have any ideas?—Dr. H. E. R., Paterson, N. J.*

Assuming everything's mechanically okay and the rumble is in fact coming from the rear, is it possible that you're not using the special additive grease made for

a nonslip differential? I think your first consideration is to make sure the rear axle is filled with this special sure-grip lubricant—part No. 2585318.

## Giving it a boost

*I have a 1960 Falcon that has a single-action fuel pump. I want to install a fuel pump with a vacuum booster (double-action) to improve windshield-wiper action. Is it possible?—Alvin Anderson, Mendham, N. J.*

Easy. Buy the part from a Ford dealer so you get the right one. Then, hook one line from the intake manifold to the booster part of the pump, and the other line from the booster to the wipers.

## Getting to the core

*I recently bought a 1964 Olds F85. It has a leak in the heater that the garage has failed to cure. Is this an inherent failure or what?—G. R. Rohmberg, Fitchburg, Mass.*

The first thing to check is the cylinder-head water outlet thermostat. Make sure it's not stuck in the closed position. If it's okay, check the nipple at the rear of the intake manifold. If it's colored black (yours probably is not), it means you have the new improved engine cowlings that was issued to stop this problem. The new cowlings result in higher water pressure. A restrictor was also incorporated in the heater water line as a correction to the heater core leaking problem.

## Dear Reader:

As you know, *Automobile Clinic* tries to help you solve your car problems. It doesn't matter who comes up with the answers. So when readers tell us how to do it, and the information checks out, we like to tell you about it.

For example, Harry E. Voelker of Two Rivers, Wis., says he may have the answer to why some Volkswagens stall in rainy weather (*Auto Clinic* page 24, Jan. PM). He had the same problem, but, as he tells us: "I replaced the original carbon train ignition wiring with good old copper wire. I haven't had a bit of trouble since. In fact,

*(Please turn to page 20)*





Discover America on

# The Round Tire



Because  
it rolls  
3,000  
more  
scenic  
miles!

You can discover the many wonders of America best and with complete confidence on the dependable Atlas PLYCRON\*—The Round Tire.

You see, The Round Tire is made in a mold that's precision engraved to within 3/1000 of an inch of perfect round. Other molds can be out of round as much as 30/1000 of an inch.

This near-perfect roundness is just *one* of the many reasons why an Atlas PLYCRON Tire rolls more smoothly, wears more evenly.

**FOUR ACTUAL PLYS.** The Round Tire has 4-ply construction for greater strength plus many other marks of quality—a unique tread design which puts more rubber on the road—longer-

wearing tough rubber compounds. These are just a few of the many examples of the *care* that goes into building The Round Tire.

**SAFETY TESTED.** You'll be glad to know The Round Tire is also safety tested in 54 different ways.

In addition, complete sets of tires from various manufacturers' production for '67 cars were promptly road tested under identical conditions by an independent test fleet.

These tests showed you can expect 3,000 more miles from The Round Tire than from tires that come on most new cars.

Get *your* extra miles with The Round Tire!

## ATLAS PLYCRON

\*TRADE-MARKS "ATLAS" "PLYCRON" REG. U.S. PAT. OFF. © 1967 ATLAS SUPPLY CO.

Sold at over 50,000 leading service stations  
Atlas Tires • Batteries • Accessories



# 253 ways to win yourself a RAISE IN PAY

Dozens of new careers are open to you with I.C.S. training. More than 250 job-related courses. Oldest, largest correspondence institution. 7,500,000 students since 1890. Learn facts, theories, practical applications. Instructors guide you,

answer your questions. Easy-to-read, illustrated texts, written by authorities, are yours to keep. Famed I.C.S. diploma to graduates. Convenient payment plan. Take charge of your future now. Send our coupon for three FREE booklets.

## ACCOUNTING

Accounting for Business  
Accounting (Canadian)  
Programmers  
Auditing Business Law  
Cost Accounting  
C.P.A. Review  
Estate & Trust Accounting  
Executive Accounting  
Federal Tax  
General Accounting  
Industrial Accounting  
Junior Accounting  
Legal Accounting  
Office Accounting  
Personal Income Tax Procedure  
Practical Accounting  
Public Accounting  
Small Business Accounting  
Starting & Managing a Small Bookkeeping Ser.

## ARCHITECTURE AND BUILDING

Arch. Drawing & Designing  
Architecture  
Building Contractor  
Building Estimator  
Building Inspector  
Building Maintenance  
Carpenter-Builders  
Carpentry & Millwork  
House Planning & Interior Design  
Mason Painting Contr.  
Reading Arch. Blueprints  
Review in Arch. Design & Practice  
Review of Mech. Systems in Buildings

## ART

Amateur Artist  
Commercial Art  
Commercial Cartooning  
Illustrating with Options:  
—Magazine  
—Advertising Layout  
—Illustration  
Interior Decorating  
Oil Painting for Pleasure  
Show Card & Sign Prod.  
Show Card Writing  
Sign Painting & Designing  
Sketching & Painting

## AUTOMOTIVE

Automatic Transmission Specialist  
Automobile Body  
Rebuilding & Refinishing  
Automobile Electrical Tech.  
Automobile Engine Tune-Up

Automobile Technician  
Automotive Mechanic  
Diesel-Gas Motor Vehicle Engines

## BUSINESS

Advertising  
Basic Inventory Control  
Business Administration  
Canadian Business Courses  
Condensed Bus. Practice  
Direct Mail & Mail Order Advertising  
Industrial Psychology  
Magazine & Newspaper Advertising  
Managing a Small Store  
Marketing  
Marketing Management  
Marketing Research  
Modern Exec. Management  
Office Automation  
Office Management  
Production Management  
Purchasing Agent  
Retail & Local Advertising  
Retail Bus. Management  
Retail Merchandising  
Retail Selling  
Systems and Procedures Analysis

## CHEMICAL

Analytical Chemistry  
Chemical Engineering  
Chemical Engineering Unit Operations  
Chemical Laboratory Tech.  
Chemical Process Operator  
Elements of Nuclear Energy  
General Chemistry  
Instrumental Laboratory Analysis

## CIVIL ENGINEERING

Civil Engineering  
Construction Eng'g Tech  
Highway Engineering Tech.  
Principles of Surveying  
Reading Highway B'pts  
Reading Structural Blueprints  
Sanitary Engineering Tech.  
Sewage Plant Operator  
Structural Eng'g Tech.  
Surveying and Mapping  
Water Works Operator

## COMPUTERS

COBOL Programming  
Fortran Programming for Engineers

Programming for Digital Computers  
Programming the IBM 1401 Computer  
Programming the IBM SYSTEM/360 Computer

## DRAFTING

Aircraft Drafting  
Architectural Drafting  
Design Drafting  
Drafting Technology  
Electrical Drafting  
Electrical Eng'g Drafting  
Electronic Drafting  
Introductory Mech. Draft.  
Mechanical Drafting  
Pressure-Vessel and Tank Print Reading  
Sheet Metal Layout for Air Conditioning  
Structural Drafting

## ELECTRICAL

Electric Motor Repairman  
Electrical Appliance Ser.  
Electrical Contractor  
Electrical Engineering (Power option or Electronic option)  
Electrical Engineering Tech.  
Electrical Instrument Tech.  
Industrial Electrical Tech.  
Power Line Design and Construction  
Power Plant Operator (Hydro or Steam option)  
Practical Electrician  
Practical Lineman  
Reading Elec. Blueprints

## ENGINEERING (Professional)

Chemical Civil Electrical  
Engineer-in-Training  
Industrial Mechanical  
ENGLISH AND WRITING

Better Business Writing  
Free Lance Writing for Fun & Profit  
Introductory Technical Writing  
Modern Letter Writing  
Practical English  
Short Story Writing

## HIGH SCHOOL

High School Business  
High School (Canadian)  
High School College Prep. (Arts)  
High School College Prep. (Engineering & Science)

High School General  
High School Mathematics  
High School Secretarial  
High School Vocational

## LANGUAGES

(Edited by Berlitz)  
French German  
Italian Spanish

## LEADERSHIP

Basic Supervision  
Industrial Foremanship  
Industrial Supervision  
Modern Woman as a Supervisor  
Personality Development  
Personnel-Labor Relations Supervision

## MATHEMATICS

Advanced Mathematics  
Mathematics and Mechanics for Engineering  
Mathematics and Physics for Technicians  
Mathematics and Physics for Engineering  
Modern Elementary Stat.

## MECHANICAL

Aircraft & Power Plant Mechanics  
Hydraulic & Pneu. Power  
Industrial Engineering  
Industrial Management for Engineers  
Industrial Eng'g Tech.  
Industrial Instrumentation  
Machine Design  
Mechanical Engineering Quality Control  
Safety Eng'g Tech'g  
Tool Design Value Analysis  
Vibration Analysis and Control

## PETROLEUM

Natural Gas Production & Transmission  
Oil Field Technology  
Petroleum Production  
Petroleum Prod. Eng'g  
Petroleum Refinery Oper.  
Pipeline Engineering Tech.

## PLASTICS

Design of Plastic Products  
Plastics Technician

## PLUMBING, HEATING, AIR CONDITIONING

Air Conditioning  
Air Conditioning Maint.  
Domestic Heating with Oil & Gas  
Domestic Refrig. Heat'g

Heating & Air Conditioning with Drawing  
Industrial Air Conditioning  
Industrial Heating  
Pipe Fitting Plumbing  
Plumbing & Heating  
Plumbing & Heating Est.  
Practical Plumbing  
Refrigeration  
Refrigeration & Air Cond.

## PULP AND PAPER

Paper Machine Operator  
Paper Making, Pulp Making  
Pulp & Paper Engineering  
Pulp & Paper Making

## SALESMANSHIP

Creative Salesmanship  
Real Estate Salesmanship  
Sales Management  
Salesmanship

## SECRETARIAL

Clerk-Typist Commercial  
Engineering Secretary  
Legal Secretary  
Medical Secretary  
Professional Secretary  
Shorthand Stenographic  
Typewriting

## SHOP PRACTICE

Drill Operator  
Foundry Practice  
Industrial Metallurgy  
Lathe Operator  
Machine Shop Inspection  
Machine Shop Practice  
Machine Shop Practice & Toolmaking  
Metallurgical Eng'g Technology  
Milling Machine Operator  
Multicraft Maintenance Mechanic  
Practical Millwrighting  
Reading Shop Prints  
Rigging  
Tool Eng'g Tech'g  
Tool Grinder Toolmaking  
Turret Lathe Operator  
Welding Engineering Tech.  
Welding Processes

## STEAM AND DIESEL POWER

Boiler Inspector  
Industrial Building Eng'r  
Power Plant Engineering  
Stationary Diesel Engines  
Stationary Fireman  
Stationary Steam Eng'g

## TEXTILES

Carding  
Carding and Spinning  
Dyeing & Finishing  
Loom Fixing Spinning  
Textile Designing  
Textile Mill Supervisor  
Textile Technology  
Warping and Weaving

TRAFFIC  
Motor Traffic Management  
Railway Rate Clerk  
Traffic Management

## TV-RADIO-ELECTRONICS

Color Television Principles & Servicing  
Communications Techn'g  
Electronic Fundamentals  
Electronic Fundamentals (Programmed)  
Electronic Fundamentals with Electronic Equipment Training  
Electronic Instrumentation & Servo Fundamentals  
Electronic Principles for Automation  
Electronics and Applied Calculus  
Electronics Technician  
First Class Radiotelephone License  
Fundamentals of Electronic Computers  
General Electronics  
General Electronics with Electronic Equip. Trng.  
Hi-Fi Stereo and Sound Systems Servicing  
Industrial Electronics  
Industrial Electronics Eng.  
Industrial Electronics Engineering Technician  
Numerical Control Electronics & Maint.  
Practical Radio-TV Eng'g  
Practical Telephony  
Principles of Radio-Electronic Telemetry  
Principles of Semiconductor-Transistor Circuits  
Radio Servicing with Equipment Training  
Radio & TV Servicing  
Radio & TV Servicing with Equipment Training  
Second Class Radiotelephone License  
Sound Systems Specialist  
Telephony Electronics and Radio Communications  
TV Receiver Servicing  
TV Technician

Clip coupon here... take your first step to real success!

I.C.S., Scranton, Penna. 18515



Accredited member,  
National Home Study Council.

Convenient payment plan.

Special Canadian courses  
in French and English.

Approved for veterans  
under the new G. I. Bill.

Special rates to members  
of the U. S. Armed Forces.

INTERNATIONAL CORRESPONDENCE SCHOOLS Dept. R0031F, Scranton, Pa. 18515

(In Hawaii: P.O. Box 418, Honolulu. Canadian residents mail to Scranton, Penna. Further service handled through I.C.S. Canadian Ltd.)

Without cost or obligation, rush me your famous "Success Package"—(1) "How to Succeed" booklet,  
(2) sample lesson demonstrating I. C. S. method,  
(3) catalog for program of study I'm interested in: \_\_\_\_\_

(Print name of course. See list.)

Mr. \_\_\_\_\_ Age \_\_\_\_\_

Miss \_\_\_\_\_

Mrs. \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Occupation \_\_\_\_\_ Employed by \_\_\_\_\_ Working Hours \_\_\_\_\_ A.M. to \_\_\_\_\_ P.M.





# Bob Jones boosted his salary 300%\*. Could you do the same?

A few years ago, he was just another guy. Putting in long hours in a monotonous job. Barely able to make ends meet. No prestige. And no opportunity to get ahead.

But Bob Jones had determination. He looked around and saw other men being promoted. Men with no more on the ball than he had. Except for one thing. Specialized training that made them worth more to their employers.

So then and there Bob made up his mind to get out of the rut he was in. He read an ad for International Correspondence

Schools, and mailed the coupon. (The same coupon you see at the bottom of this page.) And though he didn't know it, he'd already taken his first step up.

Soon, Bob was busy studying in his spare time. Learning new skills, and applying them in his work. It wasn't long before he was offered a better job, with a fat increase in pay. Then came other promotions—and each time, more money. Bob Jones was starting to go places. The future was bright. Today, his salary has skyrocketed 300%!

Bob Jones' success story isn't unique. It simply proves what determination can do. You can do it, too, if you're even half as interested in making good. Pick the position you want, and I.C.S. will help you prepare for it. Just as it helped Bob Jones, and hundreds of thousands of others.

Clip this coupon now. Mail it at once. You'll receive 3 valuable booklets—free. They'll prove to you that Bob Jones' success story can be yours!

\*The true story of Robert E. Jones, Houston, Texas. From the success files of I.C.S.

**More than 7,000,000 men and women have already enrolled with I.C.S.**

Clip coupon here—and take your first big step to real success! I.C.S., Scranton, Penna. 18515

Accredited Member  
National Home Study Council

## INTERNATIONAL CORRESPONDENCE SCHOOLS I C S®

Dept. L1031F, Scranton, Pa. 18515

(In Hawaii: P.O. Box 418, Honolulu.) Special Canadian courses available in French and English. Canadian residents mail to Scranton, Penna. Further service handled through I. C. S. Canadian Ltd.

Yes, I want to know about how I can get ahead through I. C. S. Rush me FREE Success Kit with 3 valuable booklets: "How to Succeed," opportunity booklet on the field I've checked below, actual sample I. C. S. lesson. (Special I. C. S. booklets for women.)

### ARCHITECTURE and BUILDING TRADES

- Air Conditioning Maint.
- Architecture
- Arch. Drawing & Design
- Building Contractor
- Carpenter-Builder
- Carpentry & Millwork
- Heating & Air Conditioning with Drawing
- House Planning, Interior Design
- Reading Arch. Blueprints
- Refrigeration, Air Conditioning
- ART and DESIGN
- Commercial Art
- Interior Decorating
- Sign Painting & Design
- Sketching & Painting

### AUTOMOTIVE

- Auto Mechanic-Technician
- Body Rebdg. & Refinishing
- Electrical Technician
- Engine Tune-Up
- Transmission Specialist
- BUSINESS
- Accounting (Canadian)
- Advertising
- Business Administration
- Canadian Business Courses
- Cost Accounting
- Gen'l Accounting
- Industrial Psychology
- Managing a Small Store
- Practical Accounting
- Public Accounting
- Purchasing Agent
- Real Estate Sales
- Retail Business Mgmt.
- Salesmanship
- Sales Management

### TRAFFIC Management

- Analytical Chemistry
- Chem. Engineering
- Chem. Lab. Technician
- Gen'l Chemistry
- Plastics Technician
- CIVIL ENGINEERING
- Civil Engineering
- Construction Eng. Tech.
- Highway Eng. Tech.
- Structural Eng. Tech.
- Surveying & Mapping
- COMPUTERS
- COBOL Programming
- Fortran Programming for Engineers
- Programming for Digital Computers
- Programming the 1401
- Programming the IBM SYSTEM/360 Computer

### DRAFTING

- Architectural
- Drafting Technology
- Electrical and Electronic
- Mechanical
- Structural
- ELECTRICAL
- Appliance Servicing
- Elec. Eng. Technician
- Ind. Elect. Technician
- Motor Repairman
- Practical Electrician
- Practical Lineman
- Reading Electrical Blueprints
- ELECTRONICS
- Electronic Computers
- Electronics Fundamentals
- Electronics Technician
- General Electronics
- Industrial Electronics
- Practical Telephony

### ENGINEERING (Professional Review)

- Chemical
- Civil
- Electrical
- Mechanical
- Industrial
- HIGH SCHOOL
- High School Business
- High School (Canadian)
- High School General
- High School Secretarial
- College Preparatory
- LANGUAGES (By Berlitz)
- French
- German
- Italian
- Spanish
- MECHANICAL and SHOP
- Gas and Electric Welding
- Industrial Engineering
- Machine Design
- Machine Shop Practice
- Mechanical Engineering
- Quality Control
- Reading Shop Prints

### TOOL Design

- Tool Maker
- POWER ENGINEERING
- Power Plant Eng'n'ng
- Steam Engineering
- SECRETARIAL
- Engineering Secretary
- Legal Secretary
- Medical Secretary
- Professional Secretary
- Stenographic
- Typist
- SUPERVISION
- Foremanship-Sup'rv'n
- Personnel-Lab. Ref'n's
- TV-RADIO
- Radio & TV Servicing
- Radiotelephone License
- MISCELLANEOUS
- Textile
- Other (Please specify)

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Occupation \_\_\_\_\_ Employed by \_\_\_\_\_ Working Hours \_\_\_\_\_ A.M. to \_\_\_\_\_ P.M.

Approved for veterans under new G.I. Bill. Convenient Payment Plan. Special rates to members of U.S. Armed Forces.



If there are 10 businesses  
in your town, you can

**MAKE UP TO \$50  
EXTRA A WEEK!**



Line includes hundreds of items businesses need & use!

By supplying just 10 businessmen in your town with the office supplies, business forms and printed material they need—and use up—every day, you can make extra money every week in just a few hours of your spare time! National's great line of business necessities and advertising specialties make it easy for you to earn \$50, \$100 a week—and more!

**NO EXPERIENCE NEEDED  
YOU DON'T SPEND 1¢**

We send you FREE everything you need to start making TOP COMMISSIONS right away. Send coupon below for FREE Kit that tells you how to start making extra money in spare hours you'll never miss. MAIL COUPON FOR FREE DETAILS. No obligation.

National Press, Inc., North Chicago, Ill. 60064 Dept. 747

Home Office, National Press, Inc.,  
Dept. 747, North Chicago, Ill. 60064

Yes, I want your big line of BUSINESS PRINTING, BUSINESS NECESSITIES, and ADVERTISING SPECIALTIES FREE AND POSTPAID so I can earn extra money week after week

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



WE'LL SEND YOU  
A MONEY-MAKING  
"SHOE STORE BUSINESS"  
**FREE**

Rush postcard today for  
free soles outfit

Run your own profitable shoe store at home. Sell to friends, neighbors, folks where you work. Earn \$217.00 EXTRA monthly on just 2 easy orders a day. You feature 230 styles of quality shoes for men and women. Famous Air Cushion Mason Shoes that sell themselves. Sizes 4-15. Widths AAAA to EEEE. Many comfort features—stock of over 250,000 pair to draw from. Also horsehide jackets. Represent fast-growing million dollar shoe firm in spare or full time and big profits are yours. Everybody is a customer. You don't need to invest a cent in this wonderful sales opportunity. We'll rush you FREE a complete starting outfit that contains everything you need to begin making money. Just send us a postcard today!



MASON SHOE, Dept. G-779, Chippewa Falls, Wisc.

## AUTOMOBILE CLINIC

(Continued from page 14)

during our last snowstorm (I have no garage), the engine compartment was completely filled with snow. Yet, at only five above zero, after standing all night, the engine kicked off the first time and ran smoothly... honest." (With too many cars like that around, *Auto Clinic* will be out of business.)

Several readers, like Mike Andler of Cle Elum, Wash., have heard loud whistling sounds from beneath the hood. It's a toughie to diagnose by mail, but we tried and advised Mike of the usual causes—belts, cooling system, etc. Mike found the source of the whistle in his 1963 Chevy himself, and his experience is a good one to stick in your bonnet.

"Tell the people who have trouble," he writes, "to check the bolts on the intake manifold. One of mine was loose. A little tightening was all I needed to get rid of the teakettle."

Don Whitten of El Centro, Calif., thought our answer to the Winter-Wearied VW problem (page 36, Sept. '66 PM) was "outstanding"... but. "Having been in Alaska for three years as a mechanic," Don writes, "I know of one item you didn't mention. Between the fuel pump and block there's a plastic thing I call the fuel pump push rod guide.

"After a period of heating and cooling, the block develops cracks. Moisture gets in and freezes. The push rod will then travel up, but the spring in the fuel pump will not return. The result is no start."

### Heat prostration

*I can't keep the front-pipe muffler tightened to the manifold of my '62 Rambler Classic wagon. Lock washers don't hold it. My teeth are rattling, so help, please.*  
—Rolland Witzberger, Barberton, Ohio.

It's a common problem with this car, but it's not being caused by loosening of the nut. The trouble is that the pipe ball end can't take high manifold temperatures and is collapsing. Rambler's issued an exhaust-pipe insert (part No. 3205629) that acts as a heat shield to stop the trouble. Service letter 64-9 (April 10, 1964) has the details, so refer your Rambler mechanic to it.

### Playing footsie

*You put both feet in your mouth when you told us to drain the fluid from a Chevrolet's Powerglide transmission every 12,000 miles (page 26, Jan. PM). It's not possible. Even the manual says the fluid lasts*

(Please turn to page 22)



## New Table Top Invention Puts You In... **PROFITABLE RUBBER STAMP BUSINESS**

Home Operators now make  
**\$16.50 AN HOUR** in Business  
once monopolized by  
a few big companies

Special rubber stamps bring high prices—cost only pennies to make on new, low-cost table top machine. Take 27 cents worth of material, make perfect stamps, the kind businesses and offices now buy by the dozen at \$2.75 each. Make up to \$16.50 an hour. Start in spare time in your own home. Run machine on kitchen table using ordinary electrical outlet. Make any kind of stamp. We'll send you free information without obligation about this established, highly profitable business. **We'll even help finance your start.** For free information send name and address today on a postcard to:  
Rubber Stamp Div., 1512 Jarvis, Dept. R-2-HT, Chicago, Ill. 60626



## LIVE CATCH ANIMAL TRAP



Trap without injuring squirrels, rabbits, skunks, minks, opossum, fox, pests, strays, pigeons, sparrows, rats. Easy to bait, set. Escape-proof. Bargains galore. Complete line. Write for free information and trapping tips.

FREE  
CATALOG

SENSITRONIX, DEPT. M-14, 2225 LOU ELLEN, HOUSTON, TEXAS 77018

## MAKE UP TO \$12 AN HOUR AT HOME

Let Me Prove It To You FREE!

I'll show you how Plastic Sealing and Laminating at home, spare time, can give you as much as \$12 each hour you operate. Table-top machine sets up anywhere. Easy. Fun. No experience needed. We furnish everything. **We'll even help finance you.** No house-to-house selling. Orders come by mail. Write for facts FREE. No salesman will call.



WARNER ELECTRIC, 1512 Jarvis, Dept. L-2-HT, Chgo, Ill. 60626



Transistor  
Radio with  
Battery  
\$1.70

Calendar  
Watch \$2.44

Derringer  
Pistol \$5.99

## HOME-IMPORT BUSINESS—Make Big Profits

New Drop Ship Plan offers you first day profits! Deal direct with overseas sources at prices shown. Dazzling bargains with no investment. Full or spare time. Write for FREE BOOK today to...

MELLINGER, 1554 S. Sepulveda, Dept. A257, Los Angeles 25

EARN UP TO \$50 A WEEK IN  
YOUR SPARE TIME AS A

## TYPEWRITER REPAIRMAN



Great demand for trained men. Over 25 million typewriters need service and repairs! Cash in on this 300 million dollar market. Now you can get industry-approved training at home. Easy to learn. Low Cost. Qualify in your spare time for a high paying job or a business of your own. Earn while you learn. Typewriters, sub-assemblies, visual aids, and professional tools at no extra cost. Simple, clear illustrated lessons. Expert teachers personally guide you all the way. Fully licensed, accredited, and approved school. State authorized diploma. Veteran Approved. **Mail coupon Today.** Typewriter Repair School, Little Falls, N.J. 07424

TYPEWRITER REPAIR SCHOOL  
DEPT. 3110-077  
Little Falls, New Jersey 07424

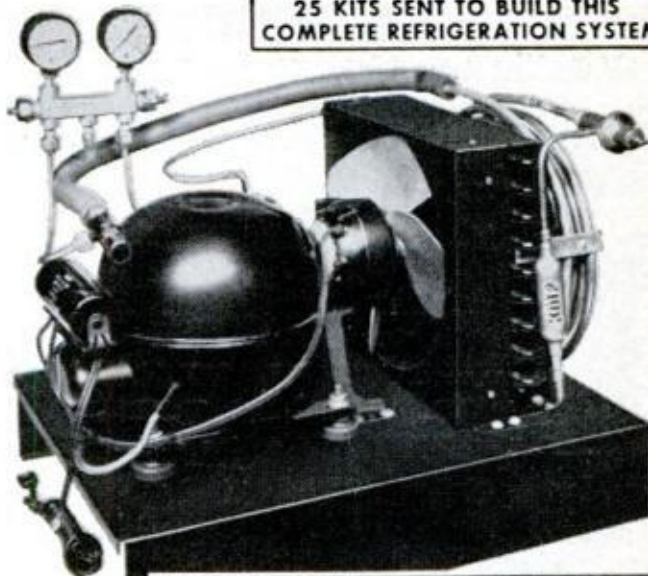
Send FREE BOOKLET describing unlimited opportunities for Typewriter Repairmen. No obligation. No salesman will call.  Check for Vet. Information

Name.....  
Address.....  
City..... State..... Zip.....

FREE  
BOOK

# EARN BIG MONEY IN AIR CONDITIONING, REFRIGERATION AND HEATING

25 KITS SENT TO BUILD THIS  
COMPLETE REFRIGERATION SYSTEM



APPROVED FOR GI TRAINING If you served since January 31, 1955 or are in service, check GI line in coupon

A better job, top pay and steady work are easily within your reach. Learn to repair and install air conditioning systems, refrigerators and freezers. Air conditioning is one of America's fastest-growing industries. Millions of autos and homes are being air-conditioned. The need for trained men is immediate and great.

**Make Home Your Training Center** — Learn by practicing. CTI sends 25 kits of tools and parts to build a complete refrigeration system — which you later convert into a refrigerator or freezer. The course is easy!

**Earn Money As You Train** — Since the CTI course includes training with real equipment, many students earn money repairing units soon after enrolling. On completing training they go into top pay jobs. Many get started in their own business.

**Mail Coupon Today** for free book. No obligation. Prove to yourself that the air conditioning, refrigeration and heating field is best for you — the easiest training to master and loaded with top pay opportunities.

Commercial Trades Institute, Chicago, Ill. 60626

COMMERCIAL TRADES INSTITUTE

1400 Greenleaf Avenue  
Chicago, Illinois 60626 Dept. PM-767

Send book, *Be a Success in Air Conditioning, Refrigeration & Heating*. No obligation.



Name..... Age.....

Address..... Zip.....

City..... County..... State.....

Check for facts on GI Bill

Accredited Member National Home Study Council





# FREE!

## Trial lesson in DRAFTING & DESIGN

Prepare at Home In Spare Time  
For a Job with a Real Future!



Check the want ads in any city newspaper—SEE the big-pay opportunities open to you as a Draftsman. Thousands of men like yourself have prepared at home, in their spare time, for this well-paid, prestige profession. Easily learned in a few spare hours each week. Start now, and you'll soon be ready to take your pick of many good jobs! Approved for Veterans.

### FREE INFORMATION— MAIL COUPON TODAY

Can YOU learn Drafting at home? You'll never know until you send for our FREE TRIAL LESSON and find out! No charge, no obligation . . . send for it today. C.T.C. resident and home study courses in Engineering and other subjects have trained thousands since 1904. Accredited Member, National Home Study Council.

WE  
FURNISH  
EVERYTHING  
you'll  
need!

## CHICAGO TECHNICAL COLLEGE

H-205 Tech Bldg., 2000 So. Michigan Ave.  
Chicago, Illinois 60616

Rush FREE Trial Lesson in DRAFTING.

Name..... Age.....

Address.....

City..... State..... Zip.....

New G.I. Bill! Veterans check here:



### DRAINS cellars, cisterns, wash tubs; \$8.95 IRRIGATES - CIRCULATES - SPRAYS

1,001 uses. Stainless shaft. Won't rust or clog! Use 1/8 HP motor or larger . . . 3/4 HP for up to 2,400 GPH; 450 GPH 80' high; or 1,800 GPH from 25' well, 1" inlet; 3/4" outlet. Coupling included free. \$8.95. HEAVY DUTY BALL-BEARING PUMP. Up to 5,200 GPH; or 3,000 GPH from 25' well. 1 1/4" inlet; 1" outlet. \$12.95. Postpaid if cash with order. MONEY BACK GUARANTEE

Centrifugal and Gear Pumps in All Sizes  
LABAWCO, Box 7, Belle Mead, N. J. 08502

## Aerospace Action and Performance REAL FLYING MODELS

# ROCKETS!

Flights up to 2500 ft.

### ORDER A KIT TODAY

- ASTRON ALPHA - 12" long, easy to assemble. Complete kit - all parts, 2 engines, design booklet, FREE catalog plus electric launcher kit with batteries. ORDER # BS-60 . . . \$6.00
- ALPHA KIT - without launcher. All other items included. ORDER # BS-20 . . . \$2.00

ESTES INDUSTRIES  
Dept. 15 PENROSE, COLORADO 81240



Giant illustrated catalog . . . 25¢

## AUTOMOBILE CLINIC

(Continued from page 20)

the life of the car and need not be drained.  
—John Ussery, Lincoln, Neb.

No matter what the manual states, that fluid must be drained every 12,000 miles. Chevy is so firm about this point that it issued a service bulletin (TSB 66-5).

Models built after midyear '64 have drain plugs in the sump. On models built prior to this—like yours, with no drain plugs—you drop the oil pan to drain the fluid. It must be done to prevent failure of transmission clutches.

## Service Tips

• According to Oldsmobile, certain types of repairs can be made to fabric roof coverings without removing the cover. If, for example, a small cut is present, you can try to cement the loose ends together. If this is not possible, the company suggests the following procedure:

1. Obtain a scrap piece of fabric roof cover of the same color as that needing repair. If scrap material isn't available, cut off a piece from a hidden area, such as from beneath a reveal molding.

2. Scrape off an appropriate amount of vinyl from the scrap piece and immediately apply it to the scuffed or cut area. Carefully blend the applied vinyl to the roof cover, using an electric wood-burning needle or low-heat soldering gun. Low heat has to be maintained to prevent discoloration.

• '65, '66 or '67 Chrysler or Fury owners should check carefully after a front-end adjustment or wheel alignment. There is a front-fender wheelhouse to the upper control arm seal that protects the engine compartment from road splash. If the seal is not clipped to the frame side rail in the correct manner, it can contact the front brake hose and rip it apart.

So, if the seal has to be disturbed, make sure it is tightly clipped to the frame side rail, and the forward flap is tucked under the upper control arm. Replace any missing or damaged clips (part No. 2405049). ★★★

Each month Auto Clinic answers questions on car repair. For a personal reply, send 50 cents in coin to cover mailing and handling. Write Auto Clinic, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022. One question per letter, please.



# RADIAL ARM SAW KIT... for under \$100



Buy direct from factory, assemble yourself. You get everything including 1/2 hp G.E. motor, all nuts & bolts, easy to follow assembly instructions. Guaranteed for life pat. pend. radial arm track, twice the usual bearings for extra rigidity, greater precision. Rips 24", crosscuts 12"; belt brake. \$99 freight col. Money back guarantee by one of the world's largest mfrs. bench type power tools. Write for brochure. Terms if desired or check or M. O. to American Machine & Tool Co., Dept. PM-77 Royersford, Pa. 19468.

## INVENTORS

### WHAM-O NEEDS NEW PRODUCT IDEAS

We gave the world Hula Hoop, Frisbee, Super Ball, Super Stuff, and many more. Hundreds of thousands of dollars paid in royalties. YOU may be able to help us find another fad. Wham-O's doors are always open to you for toys, sporting goods, or household items. Send for inventor booklet. For personal attention, contact: THE MAN FROM WHAM-O, George Strader, Wham-O Mfg. Co., 835 East El Monte Street, San Gabriel, California 91778

**FREE!**

Learn how you can buy used engines \$15 up, new engines \$30 with FREE confidential list and coupons when you order your plans

#### BUILD THIS MINI-BIKE!

Plans reveal step by step details!

#### BUILD A RACING KART!

Complete frame for less than \$10!



RUSH \$2 for plans (indicate type) or send 25¢ for circular describing plans. PLANS, Box 517, Omaha, Nebr. 68101

## START YOUR OWN MONEY MAKING BUSINESS

Clean rugs on customers' floors — upholstery in their homes — even painted walls — with highly efficient electric machines which are making big money for others and giving them independence. Write today for complete information. It's FREE!

VON SCHRADER MFG CO., Dept. 710 "R" Pl., Racine, Wis. 53403

## 75 POWER TELESCOPE \$498

**NEW** 3 in one telescopes, 3 variable 25X 45X-75X magnification. Brass bound, 25 power for ultra bright images 45 & 75 power for long range. Guaranteed to bring distant stars, moons, objects, sports 75 times closer. Most powerful scope anywhere at this amazing-low price. 5 sections. Opens 36" closes 1 ft.: Contains 4 ground & polished lenses. Can also be used as powerful microscope. American made. Mass production enables us to offer telescope complete including case \$4.98 post paid. Money back guarantee. CRITERION CO., Dept. PMB-39, 331 Church St., Hartford, Conn. 06101

# Be a LOCKSMITH



JOEL DAIGLE says, "Earned \$1136.75 while training. Now have excellent locksmith job—and enjoy every minute of the work." Fort Kent, Me.



ROBERT N. MILLER says, "I earned \$2,000 while training. I now own a mobile shop and enjoy a successful full-time business." Oakland, N.J.



JOE E. WARREN says, "Paid entire tuition and made \$800 besides in spare-time, even before completing training." Overland Park, Kan.

# 306

Pieces of Professional Equipment. LOCKS, PICKS & TOOLS supplied for use with course.



## TRAIN AT HOME—EARN WHILE YOU LEARN

Add to YOUR INCOME FAST—even double it with easy sparetime earnings. Cash in on the nation-wide shortage of trained locksmiths. Quickly step into a big pay job, or start a high-profit shop of your own!

### EARN EXTRA MONEY RIGHT AWAY!

You can quickly qualify as a skilled locksmith. Age, education, minor physical handicaps don't matter in this ever-growing trade. So easy to learn it's like a fascinating new hobby!

Study at home as little as one hour a week. All special professional tools, supplies, including files, calipers, tweezers, cylinders, door handles, assemblies, gages, pins, springs, extractors, picks, locks and keys—supplied FREE. Gain practical experience by doing real jobs on car locks, house locks, padlocks, safe locks, etc.

Send for FREE BOOK, "Your Opportunities in Locksmithing" and FREE SAMPLE LESSON PAGES. No cost, no obligation, no salesman will call.

Only school of its kind: Licensed by State of New Jersey, Accredited Member National Home Study Council, State Approved Diploma.

### APPROVED FOR VETERANS

## LOCKSMITHING INSTITUTE, Dept. 1110-077,

(A Division of Technical Home Study Schools)—Little Falls, New Jersey 07424

Est. 1948

### MAIL THE COUPON AT ONCE

LOCKSMITHING INSTITUTE, Dept. 1110-077, Little Falls, New Jersey, 07424

Please send without obligation the FREE illustrated book, "Your Opportunities in Locksmithing" and Sample Lesson pages. I understand no salesman will call.

Check here if eligible for veteran benefits.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_





# CHARLES ATLAS Says: MY FREE BODY-BUILDING BOOK

Shows How YOU Can Become A REAL HE-MAN



Ashamed of your body? Then tell me, in the coupon below, the kind of body you *do* want. I'll give it to you FAST—with my easy, 15-minutes-a-day method of "Dynamic-Tension." I'll make your chest and shoulders bulge, your arms and legs surge with power. I'll give you the kind of body women admire and men envy. *Your friends* will be amazed. *You* will feel like a tiger!

FREE BOOK. Learn how "Dynamic-Tension" made me "World's Most Perfectly Developed Man"—and how I can change YOU. Mail coupon to me: CHARLES ATLAS, Dept. 87, 115 E. 23rd St., N. Y. 10010.

CHARLES ATLAS, Dept. 87  
115 East 23rd St., New York, N. Y. 10010

Dear Charles Atlas, Here's the Kind of Body I Want:  
(Check as many as you like)

- |   |  |
|---|--|
| <input type="checkbox"/> Broader Chest, Shoulders | <input type="checkbox"/> Powerful Arms, Legs |
| <input type="checkbox"/> Iron-Hard Biceps, Grip   | <input type="checkbox"/> More Solid Weight   |
- Show me how "Dynamic-Tension" can make me a new man. Send your famous 32-page FREE book, full of pictures, valuable advice. No obligation.

PRINT NAME.....AGE.....

ADDRESS.....  
CITY & STATE..... ZIP CODE.....

In England: Atlas, Chitty St., London, W.1

## TELEVISION RADIO COLOR TV

### MAIL COUPON FOR FREE BOOK

Coyne Electronics Institute Dept. B7-C3  
1501 W. Congress Pkwy., Chicago, Ill. 60607

Send information as checked below

- |   |
|---|
| <input type="checkbox"/> HOME TRAINING in TV • Radio • Color TV • Electronics   |
| <input type="checkbox"/> RESIDENT SCHOOL COURSES in Electronics, Electricity, Engineering, Radio-TV, Color TV, Refrigeration, and FCC |

Name.....

Address.....

City.....State.....Zip.....

Phone.....Age.....

VA Approved—GI Bill

## TO YOUR OWN DOCTOR'S PRESCRIPTION



EYEGASSES BY MAIL AT GREAT SAVINGS!

Mail orders filled by \$9.95 licensed optician from

(Including single vision lenses, frame and case).

Doctor's prescription will be filled by a skilled, approved and licensed optician or your own prescription duplicated. Lenses are ground and manufactured to U.S. optical standards. Choose from complete catalog of men's, women's and children's glasses. Bifocals, trifocals, sunglasses or SAFETY HARDENED LENSES at low additional cost. We guarantee accuracy, perfect fit.

SEND FOR YOUR FREE CATALOG TODAY  
**PRISM OPTICAL INC.**

Dept. PM-11 136 Liberty St., New York 6, N. Y.

# REAL ESTATE BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, Women, all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, & related subjects. **STUDY AT HOME** or in classrooms in leading cities. **DIPLOMA AWARDED. Write TODAY for FREE Booklet!** Accredited Member National Home Study Council. (Established 1936)

FREE BOOK TELLS HOW

**WEAVER SCHOOL OF REAL ESTATE**  
3521-P Broadway Kansas City, Mo. 64111

## BILL PROBLEMS?

WE CAN HELP YOU

NOBODY REFUSED UP TO \$18,000  
Bad Credit No Problem • Not a Loan Co  
Send your name and address for FREE application

**NATIONAL ACCEPTANCE, dept. M-8**

5133 N. Central Ave., Phoenix, Ariz. 85012  
or 119 Ann St., Hartford, Conn. 06103

At Last a New Amazingly Simple

## GAS TURBINE JET ENGINE



Build from easy to follow plans. Length 15", Dia. 8 1/2", Wt. 15 lbs. Fuel: Gasoline or Kero.

"Screamin Demon" develops 20 H.P. Ideal project for serious-minded hobbyists, students; scientific and industrial arts classes. Make on 9" metal cutting lathe with milling attachment. For use on small racing boats, midget cars, etc. Full size assembly drawings with critical dimensions, bill of materials and photos. Price \$5.00. No C.O.D.  
SAVOY SCIENTIFIC, BOX 1398, SANTA MONICA, CALIF. 90406

give...  
so more will live  
HEART FUND



## EARN \$200 A WEEK

### LEARN A TRADE YOU LIKE

After graduation you start as a mechanic in a good paying job; then advance to head mechanic or service manager. Many earn \$200 a week and up. You learn fast in our shops because you learn with tools on real equipment. Some students earn the greater part of their expenses while going to school.

Check the course in which you are interested.

- |   |   |
|---|---|
| <input type="checkbox"/> DIESEL MECHANICS | <input type="checkbox"/> AUTO MECHANICS     |
| <input type="checkbox"/> WELDING          | <input type="checkbox"/> BODY FENDER REPAIR |

Mail to: **AUTO-DIESEL COLLEGE**

226 7th Avenue, North, Department 86, Nashville, Tennessee  
Send me FREE catalog about course I have checked, also information about your FREE Placement Service.

Name.....

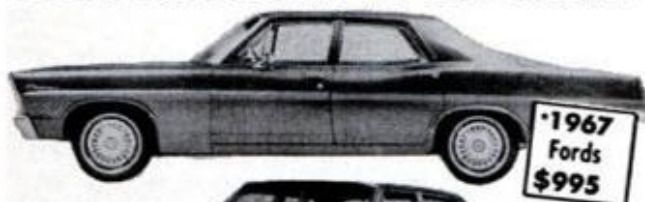
Address.....

City.....State.....



# NOW YOU CAN BUY FORDS, CHEVROLETS, DODGES BELOW WHOLESALE!!

**NO GIMMICKS, NO HIDDEN CHARGES . . . THIS IS A STRAIGHT, HONEST OFFER! PROMPT DELIVERY GUARANTEED. RIGHT TO YOUR FRONT DOOR ANYWHERE IN THE UNITED STATES!!**



**ONLY \$50 DOWN AND THE BALANCE ON LONG EASY MONTHLY PAYMENTS!!! ANOTHER BIG SPECIAL FOR CLUB MEMBERS ONLY. JOIN TODAY. ONLY \$50 DOWN**

## HOW DO YOU GET IN ON THIS FABULOUS DEAL?

All you have to do is join the **WHOLESALE-DISCOUNT BUYERS CLUB**. As a member we'll show you how you can get the car of your choice\* promptly at the lowest price ever as shown above.

## WHAT ELSE DOES THE CLUB DO?

As a club member, you receive regular mailings with pictures and descriptions of dozens and dozens of name brand items that you can buy direct by mail at fantastic low, low wholesale-discount prices. Name brands such as **DUNCAN-HINES, DORMEYER, COLEMAN, GRUEN, PRESTO, INTERNATIONAL SILVER, NUTONE, POLAROID, REMINGTON RAND, SCHICK, SMITH CORONA, SUNBEAM, WATERMAN, WEBCOR, WEAREVER, WESTINGHOUSE AND MANY, MANY MORE...APPLIANCES, TV SETS, TYPEWRITERS, WATCHES, JEWELRY, RADIOS, STEREO SETS, COOKWARE, FISHING SETS, SILVERWARE, HUNTING EQUIPMENT, BOOKS, GLASSWARE, LINENS, DRAPERY, FABRICS, FURNITURE,**

## MONEY BACK GUARANTEE

We're so certain that you'll be absolutely thrilled as a member of the club, that we'll refund your \$3.00 membership fee anytime during the year you belong if you are dissatisfied for any reason whatsoever, with no questions asked. You have nothing to lose and everything to gain!

**TOYS, FUR STOLES, HOSIERY, CLOTHING, SHOES, AND MUCH, MUCH MORE . . . Why pay regular retail prices? Join the **WHOLESALE-DISCOUNT BUYERS CLUB** today and start saving big money.**

\*Delivery of 1967 cars made on a first come first served basis, during last quarter of model year.

### WHOLESALE-DISCOUNT BUYERS CLUB

**DEPT. 196-7  
333 OLD TARRYTOWN ROAD  
WHITE PLAINS, NEW YORK 10603**

I enclose three dollars as payment in full for a year's membership in the **WHOLESALE-DISCOUNT BUYERS CLUB**. Please send complete information on the automobiles as described above, immediately by return mail. Also put me on the list to receive the descriptions and photos of name brand merchandise that I can purchase at wholesale and discount prices by mail. I understand that I am not obligated to buy anything and that I will receive a full refund of my \$3.00 membership fee at anytime, with no questions asked.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

ZIP CODE \_\_\_\_\_



# HOMEOWNERS' CLINIC

BY W. CLYDE LAMMEY

## Those sweating sashes again!

*Our home has steel casement sashes that sweat. Last winter, the water wet the frames, sills and the wall underneath, staining the plaster and loosening the wallpaper. The house is only one year old and we must find some way of preventing this damage. Can you tell us the cause and remedy?—C.E., Ala.*

Ever notice the beads of moisture that quickly collect on a glass tumbler filled with cold water or a beverage on a warm summer day? Water collects (condenses) on the frames and panes of the sashes for precisely the same reason that it collects on the tumbler. The surface of the latter, cooled by its contents, is colder than the air with which it is in contact. Moisture in the air surrounding the glass is cooled to the dew point and condenses on the surface. The air in your rooms is warm and moisture-laden; the sash is relatively cold. Thus condensate forms on the frames and panes.

Most steel sashes can be provided with tight-fitting storm sashes and this usually solves the problem. The storms must fit tightly so there is no leakage of warm air into the space between the sashes. If your heating equipment is gas-fired, be sure it is properly vented to the outside.

## No flowers

*Two years ago we planted a wisteria vine which has grown quite well but never flowered. It's in a well protected location and has been cared for as recommended at the time of planting. Can you tell us why it doesn't flower?—F.M., Ohio*

Perhaps you are in too great a hurry. It's just possible your plant hasn't reached the flowering stage yet, especially if it originally was a seedling and not a grafted plant. Although it hardly seems likely in your locality, it is possible that the buds have been "winter-killed." At any rate I would suggest you give it another season's growth before deciding on a replacement.

## Tile over wide flooring

*I've purchased an old home. The rooms upstairs are floored with wide boards that are rather rough. Some are cupped, with*

*cracks and openings between boards. I'm thinking of laying tile in all the upstairs rooms and the hallway. My problem is to prepare these old floors. Can you help with suggestions?—E.L., Md.*

First of all, it will be necessary to level the old flooring. Usually this can be done by nailing along the edges of the boards, but if not, the flooring will have to be sanded in order to provide a flat surface for overlayment. Any depressions at wear points should be over filled with wood putty and sanded. Also any chance knot-holes, splits or other defects should be filled in with a wood putty or otherwise repaired. In any event the old floor should be strengthened by new nailing. (Baseboards should be removed, of course.)

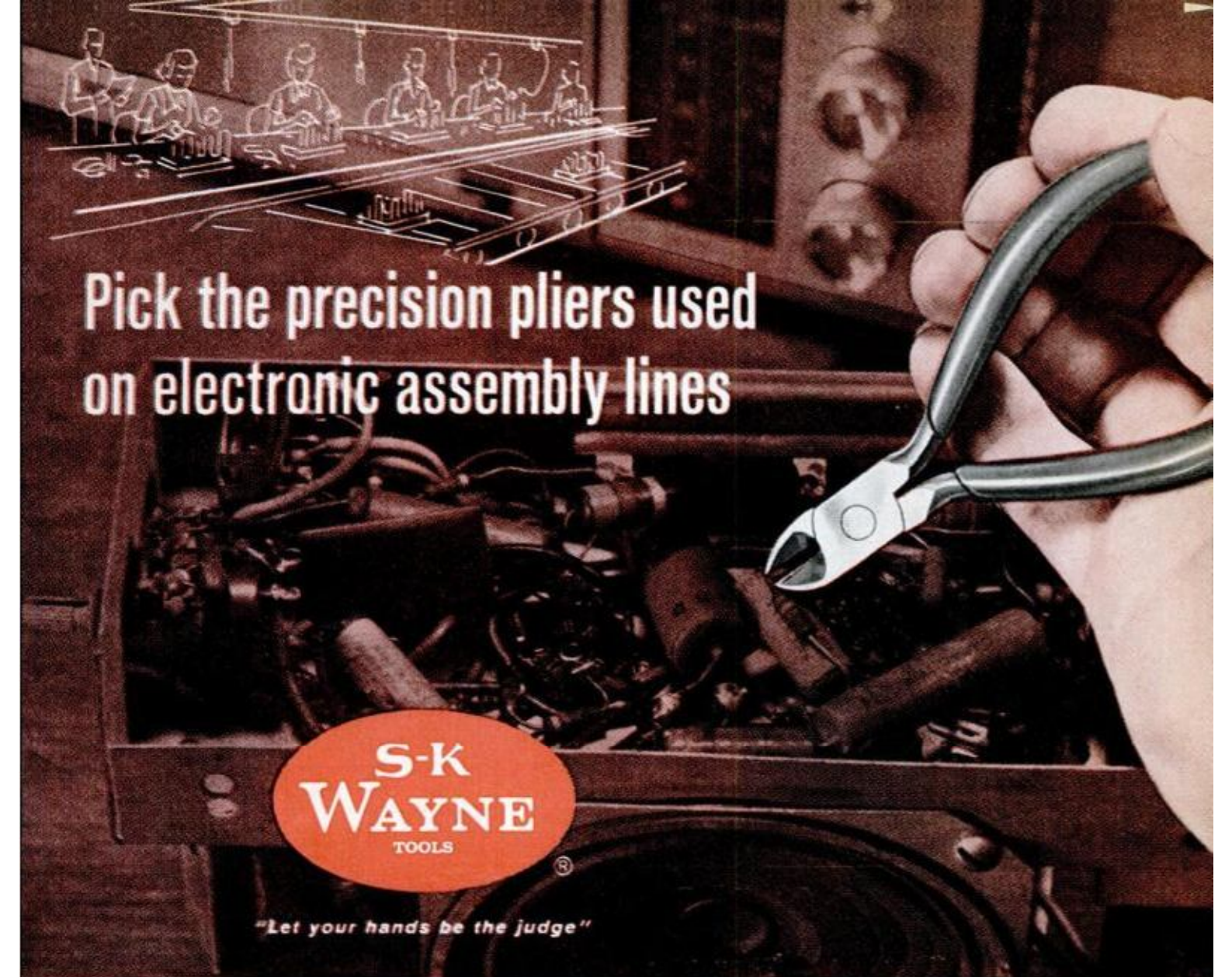
You have a choice of 1/4-in. plywood or hardboard of the same thickness for underlayment. In most cases, tempered hardboard is the better choice for laying over an old floor, although plywood is acceptable. In any case, the underlayment must be nailed solidly; otherwise, squeaks may develop in time. Try to plan and cut the pieces of the underlayment so that you do not end up with a narrow strip at the walls or in a doorway. Also be sure the underlayment is nailed down uniformly with no offsets at the joints.

## Dingy floor

*My oak floors are beginning to show signs of wear. The finish is still there but they look a bit dingy, especially in the more heavily traveled areas. I don't want to refinish them entirely if I can avoid it. How can I brighten them up a bit?—P.R., Colo.*

Offhand, it's difficult to say what is the one best procedure, except that I would not use a mop or scrub brush. It might be permissible to wipe the floors with a damp cloth well wrung out in water to which a pinch of detergent has been added, but it won't do to wet the floors as you would in mopping or scrubbing. Wiping in this fashion will remove most of the accumulated dirt which probably accounts for most of the discoloration. After wiping in this manner go over the floors with a cloth wrung out in clean water to remove any detergent residues. There also are floor cleaners with a wax base that are quite effective at cleaning and brightening up worn and dingy hardwood floors, if the instructions on the container are followed in detail. Other than sanding and refinishing these are about the only steps to be taken and, of course, can be considered only temporary. ★★★





Pick the precision pliers used  
on electronic assembly lines

S-K  
WAYNE  
TOOLS

"Let your hands be the judge"

... right for you because they look better, feel better, work better

Why are S-K Wayne small precision pliers preferred for the most accurate and exacting work in such fields as hobbycrafts, watchmaking, and all phases of electronics? For the same reasons *you* would have for owning them:

An S-K Wayne precision plier is made to *look* better. Each tool is drop forged from fine grain tool steel. Each is individually machined. Tempered. Carefully fitted and adjusted by expert American tool craftsmen. Fully tested. And finally, the head is polished like a fine surgical instrument to a smooth, gleaming finish—the famous S-K Wayne finish recognized as the finest in professional tools.

It's made to *feel* better. Expertly balanced and

shaped to fit the hand, with cross coil springs and Cushion Grip handles to fight fatigue and provide maximum comfort.

It's made to *work* better. Small, slim, polished head design permits easy access to tight work areas—spots other pliers can't reach. With carefully filed cutting edges to assure a perfect cut every time.

Professionals and serious hobbyists like S-K Wayne's broad selection of pliers of every type and size. *You'll* like it, too.

Visit your S-K Wayne dealer and ask to make your own comparison. Then, like the professionals say: "Let your hands be the judge."

**S-K WAYNE TOOL COMPANY**  
332 South Michigan Ave. • Chicago, Ill. 60604



Subsidiary of Symington Wayne Corporation



NO. 90

◀ 5-pc. matched set of precision pliers. Includes diagonal cutting plier, end cutting nipper, chain nose plier, flat nose plier and round nose/round jaw plier—in zippered case.

S-K Wayne makes a complete line of professional quality tools for home, farm and industry, including: sockets, ratchets and handles • alloy wrenches • combination and utility pliers • screwdrivers • adjustable wrenches • solid joint pliers • snips • punches and chisels • pipe tools • automotive tools • tool boxes





## Apply INSULATION

faster,  
easier and,  
better ...



with



## T-50 ARROW'S HEAVY DUTY STAPLE GUN

### THE GUN FOR 1001 FASTENING JOBS

- Install ceiling tile
- Install insulation
- Weatherstrip doors and windows
- Reupholster furniture
- Staple wire fencing to posts
- Repair window and door screens
- Fix loose wiring to floors, walls
- Replace worn window shades
- Tack down carpets
- Lay new linoleum
- Attach vines to trellis
- Affix plywood panels to walls
- Wrap and staple young tree trunks
- Line kitchen and closet shelves
- Hang drapes and curtains
- Make decorative cornices
- Cover valences with material
- Put up Christmas decorations
- Staple down building felt
- Quickly repair odd wood-working jobs

USE THIS AS A HANDY CHECK LIST

**ARROW FASTENER COMPANY, INC.**

Saddle Brook, New Jersey 07663

# INVENTORS

## INVENTIONS—NEW PRODUCTS—IDEAS DEVELOPED & PREPARED

*For Commercial Appeal & Sales*

## DESIGN—MARKETING—PATENT SEARCHES—DRAWINGS

*United States Patent Office former Patent Examiner  
United States Government former Patent Adviser  
Member: United States Chamber of Commerce*

*Second Decade of Reliable Service to*

## INVENTORS—MANUFACTURERS—ATTORNEYS

## THE RAYMOND LEE ORGANIZATION

130-Z West 42 Street—New York, New York 10036

**SEND FREE** "INVENTION RECORD" Form & "IMPORTANT PATENT INFORMATION"

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## BUILD YOUR OWN CAMPER AND SAVE!



Complete, easy to follow Camper Plans, Instructions and Materials List ... \$3.95

Satisfaction Guaranteed!  
PICKUP COVER PLANS \$2.00

EQUIPMENT CATALOG \$1.00

refundable on first order.

Also Factory Built Units.

**VIKING  
CAMPER SUPPLY, INC.**  
94-SP Glenwood Ave.  
Minneapolis, Minn. 55403

Save 50% With This  
Viking Package Deal

All items from our catalog to build a  
10' or 10'6" Camper. Average retail  
\$1,795. Total Pkge. \$847.10.

SEND CHECK OR M.O.  
FOR DETAILS SEND DIME

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

FROM THE PATENT OFFICE

# NEW INVENTIONS

BY M. J. PEDERSEN

**NECK INJURIES** from rear-end automobile collisions may be prevented by a roof-mounted head support that has earned patent 3,310,342 for Kazimierz Drelichowski of Union City, Conn. According to the inventor, the conventional fixed headrest is unsatisfactory because the head slams back against it and then is bounced forward again. Drelichowski's head support is fastened to a bar that slides backward against a spring to cushion the shock. Ratchets on the bar then prevent it from moving forward again.

**ACCIDENTAL POLLUTION** of lakes and coastal waters by escaping oil is a serious problem, as was demonstrated last March when the tanker *Torrey Canyon* dumped 118,000 tons of oil on European beaches. To remove oil slick from water, Edward J. Lane has designed an open-bottomed barge, which received patent 3,314,540. The barge scoops in oily water on a huge rotating belt. The water, being heavier than the oil, sinks to the bottom, forcing its way out the openings in the hull. When the barge is filled with nothing but oil, the bottom openings are closed, and the barge returns to port.

**A NONSKID BRAKE DEVICE** has earned patent 3,311,324 for Robert A. Horvath. It senses the point at which a car's wheels are about to skid and then cuts off the brake pressure. Unlike most antiskid devices, the new system adjusts for different road conditions. It senses both vehicle deceleration rate—useful on dry surfaces—and deceleration of the wheels themselves—necessary on slippery surfaces.

**LOOKING FOR NEW INVENTIONS?** You'll have a chance to see the world's biggest collection at this year's Third Annual Inventors and New Products Exposition to be held at the New York Coliseum Sept. 9 through 17. Inventors interested in displaying new devices can rent booth space at the show for \$180 from Patent Exhibits, 554 Fifth Ave., New York, N.Y. 10036. A handy guide to the inventions and new products to be exhibited will be available July 25th for \$2. Whether or not you make it to the show in person, be sure to read about its exciting highlights in *PM's* September issue. ★★★





## The MYSTERY of SELF

Unlock the secrets of self! Explore your mental world. Receive the keys to the hidden laws of life. Become the master of your affairs... the creator of your own happiness. FREE book explains. Write: Scribe: O.C.K.

The ROSICRUCIANS (AMORC)

San Jose, California 95114

PLEASE INCLUDE YOUR ZIP CODE

## FREE MUSCLE COURSE!

Trade in that skinny scrawny, milk toast or overweight body of yours for a new Weider Jet-Charged body, rippling with mountains of muscles loaded with energy, drive and virility, the envy of every man and admiration of every woman, now! In 15 minutes I'll prove you can slap on 4 inches of muscles to your chest,—3 inches to each arm—give you life-guard shoulders, trim your waist to athletic size—give you speedy athletic legs. I don't care if you're short or tall, (skinny or fat) young or not so young, expect a muscle building miracle when you send for my FREE course. Send only 25 cents to cover postage and handling and write to the Trainer of "Mr. Universe", "Mr. America", "Mr. Europe".

JOE WEIDER, Dept. 38-77  
531 32nd St., Union City, N. J. 07087



## FREE Key Machine

Kind master locksmiths use. Sells for \$125, but yours FREE with Locksmithing Course.



## You Can Learn To Be A LOCKSMITH in your spare time

There's a big demand for skilled locksmiths. You can earn big money either full or part-time in your own home. Be your own boss; earn steady, year 'round income with no layoffs. The BELSAW INSTITUTE training, recommended by professional locksmiths, teaches you to make keys, open and repair locks on homes, cars and buildings. Easy, step-by-step illustrated lessons complete with all tools and supplies. We tell you how to get servicing jobs, how much to charge, how to earn while you learn and how to build a secure cash profit business. "Approved for Veterans"

Mail Coupon for FREE Book Today!

BELSAW INSTITUTE, 1081 Field Bldg., Kansas City, Mo. 64111

Send FREE book, "Keys To Your Future!"  
No obligation. No salesman.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

JULY 1967

# MAKE IT BIG WITH NTS

PROJECT METHOD

HOME TRAINING

IN INDUSTRY...  
IN YOUR OWN BUSINESS...  
IN MILITARY OR GOVERNMENT

### ELECTRONICS DIVISION

Master Course in Color Television • Color TV Servicing • Electronics-TV-Radio Servicing and Communications • Master Course in Electronics-TV-Radio and Industrial Electronics • FCC License Course • Radio Servicing (AM-FM Transistors) • Television Servicing (including color lessons) • Stereo, Hi-Fi and Sound Systems • Basic Electronics • Electronics Math



### AIR CONDITIONING, REFRIGERATION DIV.

• Air Conditioning, Refrigeration & Electrical Appliances Master Course  
• Air Conditioning-Refrigeration Servicing Course



### AUTO-MECHANICS DIVISION

• Automotive-Diesel Master Course  
• Automotive Mechanics  
• Diesel Mechanics  
• Engine Tune-up and Electricity



### HOME APPLIANCES DIVISION

• Home Appliance Master Technician's Course  
• Home Appliances Servicing  
• Handyman Appliance Repair



## NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

4000 South Figueroa Street Los Angeles, Calif. 90037

### HIGH SCHOOL AT HOME

National offers accredited high school programs. Take only subjects you need. Study at your own pace. Everything included at one low tuition.



APPROVED FOR VETERANS

### CLASSROOM TRAINING AT LOS ANGELES

NTS occupies a city block with over a million dollars in training facilities. Check special box for details.

FREE BOOK & SAMPLE LESSON

## NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

4000 So. Figueroa St., Los Angeles, Calif. 90037

Please rush FREE OPPORTUNITY BOOK & SAMPLE LESSON for division checked below. Check one only.

- ELECTRONICS DIVISION
- AIR CONDITIONING, REFRIGERATION DIV.
- AUTO-MECHANICS DIVISION
- HOME APPLIANCES DIVISION
- High School at Home (Dept. 201-77)

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

- Check for veteran training under new G. I. Bill.
- Check if interested ONLY in classroom training at Los Angeles







**HEARING AID** small enough to fit in your ear is something new from Zenith Hearing Aid Sales Corp. Running on tiny battery  $\frac{1}{4}$  inch in diameter and  $\frac{1}{8}$  in. thick, it's designed for persons with mild hearing loss. Frequency response and amplification of integrated circuit are varied by user. It's \$295

# NEW in ELECTRONICS



**TV ANTENNA FOR BOATS** has omnidirectional reception characteristic to pull in good UHF or VHF picture as your boat changes its direction. "Ant-Dyna" is \$49.50 from Aquadynamics



**D.C. POWER-SUPPLY KIT** is among Allied Radio's new solid-state, Knight-Kit lab instruments. This KG-663, 0-40 volts, 0-1.5 amperes kit is \$99.95. Other solid-state kits include rf, sine/square wave and sweep/marker generators



**WIRELESS REMOTE-CONTROL SWITCH** is called "Teleswitch" by Euphonics Corp. Just aim the "Telewand" at the switch and anything that's plugged into it will be turned on or off. System, which works up to 40 feet, is \$22.95



**COMBINATION AM RADIO-VHF** monitor from Sonar Radio comes in three models, each with two crystal-controlled channels in one of three bands: 25-50, 108-136 or 150-175MHz. It's \$39.95



**DESOLDERING AT PRESS OF BUTTON** is feature of Uniline Mark VII pencil soldering iron from Vanguard Electronic Tools. Handle assembly, 40-w. cartridge and ten tips are \$39.50



**INVEST NOW!  
PROSPERITY AWAITS YOU!**

**1 1/4 ACRES**



**MEADOW VALLEY  
RANCHOS  
in NEVADA**

**\$1.00 DOWN \$10.00 MONTHLY FULL PRICE \$595.00**



THE BOOM THAT HAD TO COME IS NOW ON IN NEVADA. Ground floor buyers have reaped fortunes from small initial investments. A factual example of skyrocketing values is Las Vegas, Nevada. Land that originally sold for \$200.00 an acre, now sells for \$20,000.00 an acre, a profit of 1000%! The first offering of LAS VEGAS land was open to everyone. Buyers who took advantage of low opening prices have become wealthy. The ground floor opportunity of Las Vegas is gone, BUT ANOTHER AREA OF PROSPEROUS NEVADA IS BEING RELEASED FOR PUBLIC SALE!

This area has such a tremendous growth potential, such a fantastic, unlimited future, that wise investors have purchased large acreage. Bing Crosby's ranch was one of the largest cattle ranches in the county. James Stewart is honorary sheriff. Yes, the smart, experienced investors have sensed the future and are buying MEADOW VALLEY RANCHOS in Elko County, Nevada.

MEADOW VALLEY RANCHOS has all the factors needed to boom... to prosper... to skyrocket its land values. Ideally located in the prospering Elko Valley, The Ranchos have the backdrop of the statuesque Ruby Mountains. The sparkling Humboldt River actually flows through the property and is a valuable asset of the Ranchos. Every Rancho fronts on a graded road. The City of Elko, with its long established schools, churches, and medical facilities is MEADOW VALLEY RANCHOS friendly neighbor.



**FAMILY RECREATION**

**FISHING:** A fisherman's paradise. Huge Rainbow, Brook Trout and German Browns abound in Alpine-like lakes and mountain-fed bottom streams.

**GOLF:** Enjoy leisurely golfing, with never a rush for starting times, at the city owned Ruby View Golf Course. This beautiful golf course is only minutes from the property.

**LAKE OSINO:** No charge to Rancho owners for full privileges at nearby Lake Osino. Fish, Picnic and Relax with your fellow Ranch owners at this private lake and recreation area.

**HUNTING:** You will find the hunting of your life. Big game species such as Mule Deer are abundant. Duck, Quail and Chukar are plentiful.

**YOUR PROFITABLE TOMORROW**

YES, wise investors are buying in MEADOW VALLEY RANCHOS, but America's largest corporations, whose research closely follows the trend of increasing land values and population growth, are also busy investing throughout Nevada. U.S. COMMERCE BUREAU FACT: Per capita income in Nevada is highest of all 50 states.

**TAX RELIEF** — No State Income, Gift or Inheritance Tax. The low Real Estate Property Tax is actually limited by the State Constitution.

**WHAT ARE THE TOTAL COSTS?**

The full price of the title to your 1 1/4 acre Rancho is only \$595. Total payment schedule is \$1 down, and \$10 per month. No interest, no carrying charges. John D. Rockefeller said, "The big fortunes of the future will be made in Real Estate." You are not required to do anything to your land. You can live or vacation on it, or simply watch its value grow, then sell all or part of it for a profit. Your profitable tomorrow is here today in MEADOW VALLEY RANCHOS.



**NOW! DON'T MISS THIS OUTSTANDING OPPORTUNITY!**



**MEADOW VALLEY RANCHOS**

4714 STOCKMEN BLDG., ELKO, NEVADA 89801

**MAIL COUPON TODAY**

Yes!—Reserve acreage at MEADOW VALLEY RANCHOS for me—\$595 for each 1 1/4 acre parcel—payable \$1 down and \$10 a month. No other charges. Send purchase contract and map showing exact location of my holding. You will return my \$1 deposit if I request same within 30 days. I enclose \$1 deposit for each 1 1/4 acre Rancho desired.

SIZE ACRES	DOWN	PER MO.
1 1/4	\$1	\$10
2 1/2	2	15
3 3/4	3	20
5	4	25

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ Zone: \_\_\_\_\_ State: \_\_\_\_\_

Indicate No. of Ranchos \_\_\_\_\_ Total enclosed \$ \_\_\_\_\_

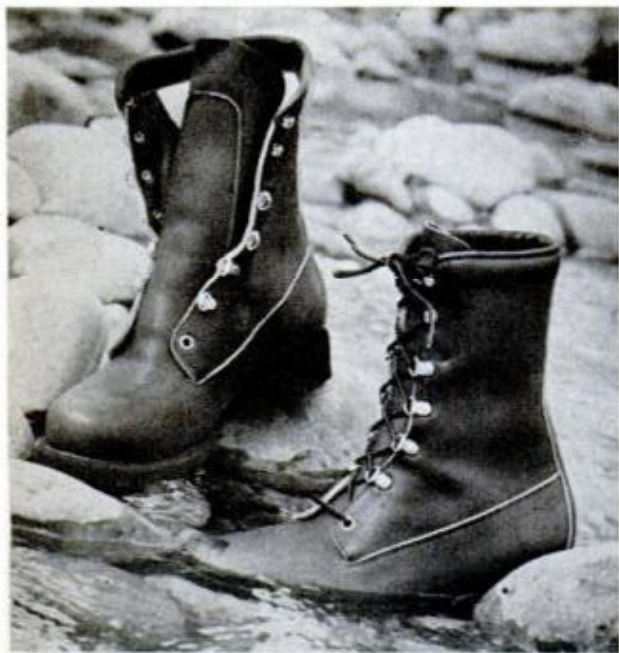


# WHAT'S NEW OUTDOORS

BY DAN FALES

**ALMOST EVERY SPORTSMAN** I know has been looking for waterproof leather boots. Starting this month, their search is over. Browning Sporting Arms Co. is marketing such a boot. Browning thinks its new leather treatment process and new design is good—so good, in fact, the company is *guaranteeing* the boot against leaks.

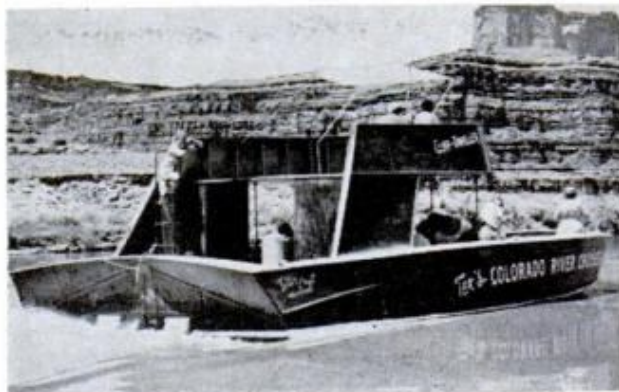
I've seen the boot. It's sure to live up to expectations. Fully insulated, the boot is good for every season. Browning says that



with a normal wool sock, you can wear the boot comfortably on zero-degree days, as well as during the summer months.

A new process of *cementing* the sole to the boot eliminates a trouble spot found in some other boots with either stitched or vulcanized soles. The neoprene crepe sole with a heavy cleat design provides good traction in mud or snow. The plain toe doesn't have the usual stitching around the top. The tongue is part of the boot body and conforms to the upper foot like a banana skin. The inside is cushioned on the bottom, while the sides are lined with glove leather. German speed lacings close the forest green boot. The leather is treated with silicon. Browning's suggested retail price is \$33.95 a pair.

**ADVENTURE PLUS** is now available in some of the most beautiful country in the United States. Tex McClatchy and Joe Lemon are offering a combined boat and Jeep trip from Moab, Utah, through Canyonlands. For \$25, you can spend half a



day on the Colorado River cruising through some of the roughest country in America. After lunch, provided by the boys, you transfer to a four-wheel drive vehicle for another thrilling trip on top of the canyons. It takes a full day, and is worth every second and penny. Tex operates water-jet boats on the Colorado, while Joe, the canyonlad, runs vehicles for Canyonland Tours.

**EAGLE CLAW** is marketing a convenience item for fishermen and other sportsmen who need some sort of magnifying glass for close work. The "tie-focal" is a two-power magnifier that either clips to a fishing jacket or rests on its own stand. The extra feature of this \$1.95 item is a small light that lets you see what you're doing at dusk or at night. The light, powered by an AA penlight battery (not included in the price) is bright enough to light the trail at night. ★★★





# If we hadn't made it with fiber glass, we could never call it the cool tire.

Heat is the enemy of tires. The hotter they get, the less safe they become. And the faster they wear out.

With this in mind, we set out to build a tire that would stand up to heat, especially on long trips and at high turnpike speeds.

Four years of research, and over 5,000,000 miles of road testing have gone into the development of this product.

Now we've got it. We call it the cool tire.

The cool tire is made with fiber glass; belts of fiber glass which are found between the rubber and the nylon cords. These belts keep the tread firm and tough.

(A firm, tough tread means less abrasion, less scuffing of rubber against the road. In short, a cooler tire.)

The cool tire virtually eliminates blowouts.

And it can give you at least 10,000 more miles of wear (don't be surprised if you get 20,000) than you can get with an ordinary tire.

The cool tire is here.

The Armstrong Rubber Company, West Haven, Connecticut; Des Moines, Iowa; Natchez, Miss.; Hanford, Calif.

## ARMSTRONG

Cool tires made with fiber glass





\$1269



**PLANS**  
**\$3**

\$1388



\$1355

**NO  
MONEY  
DOWN**



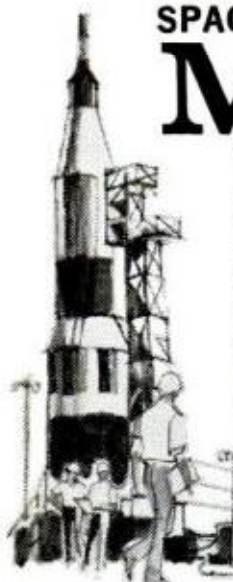
**DIRECT  
WHOLESALE  
PRICES**

*ENJOY RUSTIC LEISURE LIVING*

AT LAST . . . Finest leisure homes in America! . . . Why wait until "some day"? Make plans now to own your leisure home—today . . . Send \$3 for each set of Building Plans, complete with detailed illustrations, floor plans, material specifications, etc. . . .

Leisure Homes, Plan Dept. PM, 3450 Wilshire Blvd., L. A. Calif. 90005

## PREPARE FOR YOUR SPACE AGE CAREER AT **M S O E**



The Milwaukee School of Engineering offers residence study leading to Associate in Applied Science degrees in a wide range of Engineering Technologies and Bachelor of Science degrees in Electrical and Mechanical Engineering.

Programs approved for Veteran Training. Send for Your Career Booklet today.

### **MILWAUKEE SCHOOL OF ENGINEERING**

Dept. PM-767

1025 N. Milwaukee Street, Milwaukee, Wisconsin 53201

Please mention  
Popular Mechanics  
when writing to advertisers

## **NOW — FLY A BENSEN OF YOUR OWN!**



**THE GYROCOPTER  
EASY TO BUILD  
SIMPLE, SAFE TO FLY**  
Acclaimed by novices and pros around the world. Lowest cost flying. Kits available, also building plans and flying instructions. Get 3-View Drawings, photo, specs, Rotocraft Dictionary for \$3, or of Gyro-glider \$2. Send today!

BENSEN AIRCRAFT CORP., Dept. PM-77  
Raleigh-Durham Airport, Raleigh, N. C. 27602

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

Two or  
four-wheel drive  
**JEEP OR  
SCOUT**  
owners

**REPOWER** with a 6 or V-8  
H.D. ADAPTORS for using Car,  
Compact and some Truck engines.  
Conversion Kits \$45.35 to \$56.90.  
Want fast action? Give us **FULL  
INFORMATION**. Send \$15.00 Dep.  
and we will ship correct kit, bal.  
COD. Send full amount for prepaid  
shipment. Wire, phone or write  
today. Details **FREE**

**HOOSIER MACHINE PRODUCTS CO.**

312 S. E. 6th St., Phone 276-3442, Pendleton, Oregon 97801

Your **FUTURE**  
in **DRAFTING**  
APTITUDE  
TEST  
SAMPLE  
LESSON  
**ALL 4  
FREE**

## Be an Architectural **DRAFTSMAN**



1000s big pay jobs open to trained Draftsmen (see "help wanted" ads in city papers). U. S. Labor Dept. says "42% more Draftsmen needed in next 10 years." Easy step-by-step spare time home-study plan has helped 100s beginners toward \$\$\$\$\$, security, prestige! Why not you? Send for "**DRAFTING CAREER KIT**" & new **5-Way Drafting Instrument**—**ALL FREE!** No salesman will call. G. I. approved. Write & state age.

**NORTH AMERICAN SCHOOL OF DRAFTING**

4500 Campus Dr., Dept. 4177, Newport, California 92660

## **MAIL TODAY FOR FREE BOOKLET...**

Showing the most beautiful school in the country... elaborately equipped with the most modern, scientific testing equipment known.

Day and evening classes. Good, full & part time jobs and housing provided.



1645 S. Grand, Dept. P.M., St. Louis, Mo. 63104

Name \_\_\_\_\_ Age \_\_\_\_\_

Street \_\_\_\_\_

Town \_\_\_\_\_ Zip \_\_\_\_\_ State \_\_\_\_\_

Telephone \_\_\_\_\_

**WORLD FAMOUS**

**BAILEY TECH SCHOOL**

POPULAR MECHANICS



# What every creative person should know about writing for money

Here are interesting facts about full-time and part-time careers in writing — and how 12 famous writers are ready to help you get started

By Gordon Carroll

**W**riting today offers a life of financial reward, personal recognition and the freedom to live as you please. But...not everyone can or should become a writer. Before you decide, here are some facts you should know.

## How much can you earn?

Jobs for writers range from \$6,000 to \$35,000 a year, depending on ability and experience. Staff writers on magazines earn \$7,000 to start. Editors with experience earn \$15,000 or more. If you freelance, you can sell your work to newspapers and magazines for fees up to \$3,500. For those who reach the top, the rewards are truly substantial. Max Shulman received \$250,000 for the movie rights to one of his novels. Rod Serling has a contract with a television network that runs into six figures.

## Can you live an independent life?

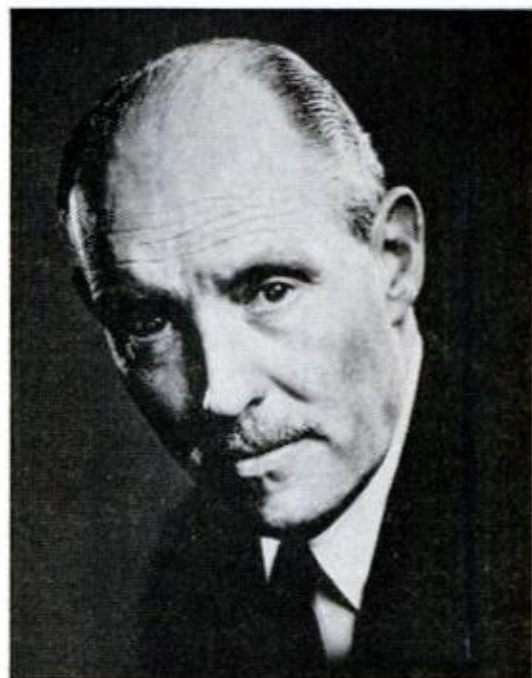
Certainly. As a free-lance author, you can live where you want and work on any schedule that suits you. J. D. Ratcliff, a leading article writer, works in the mornings and has his afternoons to relax. You don't have to travel to work, and you can submit your stories and articles by mail.

## What are your major markets?

There are 1,100 book publishers — 700 magazines — 11,000 newspapers — 12,000 trade publications — 500 radio and TV stations — 2,800 advertising agencies. All are looking for writers.

## Is writing for you?

Writing is *not* for everyone. You must have a basic aptitude to start and be willing to develop it. But if you possess this aptitude, you can learn the techniques of writing and seek a rewarding career.



Gordon Carroll is a former editor of the *Reader's Digest*, *Time*, *Inc.* and *Coronet* — and Director of the Famous Writers School.

## A new kind of writing school

Several years ago, twelve famous authors including Faith Baldwin, Bruce Catton, Bennett Cerf and Rod Serling founded the Famous Writers School to help qualified people acquire the skills it takes to break into print. They poured everything they knew about writing into a new kind of professional training course, which you take at home in your spare time.

## Your instruction is personal

You write at home and send your lesson assignments to the School by mail. Here, your assignments receive the personal attention of instructors who are themselves professional writers or editors. Your instructor goes over your work line by line, word by word, blue-penciling corrections right on it — much as editors do with established authors. Then he returns the corrected assignment to you with a long letter of advice on how to improve your writing.

This training works well. Our students have sold their writing to hundreds of publications.

## Writing Aptitude Test offered

To find out if you have a talent for writing, mail the card for our Aptitude Test. Your test will be graded free and returned to you. If you test well, you will be eligible to enroll. But there is no obligation. (If card is missing, write to Famous Writers School, Dept. 6416, Westport, Conn. 06880. Give name, address, age and ask for writing Aptitude Test.)



DETROIT

# LISTENING POST

BY BOB IRVIN

**SAFETY-CAR PROJECT** of Republic Aviation is nearing the construction stage. The division of Fairchild-Hiller is working on final plans for a prototype car supposed to protect driver and passengers in a 50-mph frontal crash. The car isn't any more attractive than were those originally proposed by Republic last year as part of its safety-car study for New York State. Head-on, the car—like its predecessors—resembles the top half of an airplane fuselage. Project manager George Hildebrand seems more interested in the car's safety features than in what it will look like.

Unique feature of the car is the steering column, located in the center rather than the left side. Driver, however, sits in his customary spot with the wheel in front of him. This is accomplished by a cross member connecting the column and the wheel.

First two-and-a-half feet of the four-wheel drive car are taken up with what Hildebrand calls an "impact absorbing structure." He says car has a "relatively small" engine, but that it will accelerate normally and hit 100 mph top speed. Present plans call for construction of a prototype fleet of 15 units, probably starting next year.

**SIDE COLLISIONS** should now be the main target of safety researchers, according to a traffic accident research team at UCLA. Team member Arnold Siegel says the problem is to make the sides of a car rigid enough to prevent collapse of the driver/passenger compartment. "The auto industry is well aware of the problem," says Siegel, "but is still two or three years away from a solution." Behind increasing attention to side collisions are what Siegel calls "giant improvements" in windshields, steering columns and instrument panels, all of which have combined to markedly reduce injuries in the event of frontal impact.

**FUEL CELLS** as automotive power will make their appearance within the next five to ten years, according to Russian scientist V. S. Bagotzky, of Moscow's Academy of Science. Not everyone agrees. General Motors has developed an experimental truck using a hydrogen-oxygen fuel-cell power system, but doesn't see a feasible application of the system in the foreseeable future. GM's idea truck has enough range and performance, but the system is too bulky and sharply reduces payload. Also, it's a bit dangerous. Fuel cells produce electric power through continuous chemical reaction.

**MECHANICAL DEFECTS** may be the cause of more auto accidents than has been supposed. A Southern California study disclosed that of 140 cars tested, 18 percent had serious defects. Most often found? Bad brakes. A Swedish study indicates similar results. In the first 16 months of motor vehicle inspection in Sweden, 1.6 million cars were checked. Less than one percent flunked the test outright, but of those that did, 90 percent failed because of brake troubles.

**A LARGER VOLKSWAGEN**—bigger than any present VW models—is a distinct possibility. A VW market researcher says that "as soon as the volume in the higher priced area increases to the point where we can use our production facilities to their fullest extent, we'll bring out a model to fit that market." When? "In five years—the early '70s, or by 1975," he said.

**A WANKEL ENGINE** may yet show up in a production Mercedes. "We have overcome many of the initial disadvantages of the rotary engine," says one Mercedes official, but he admits the firm hasn't "completely solved the emission problem." The prestigious German automaker is testing a Wankel-powered sedan, but won't forecast when—or even if—it will reach the production stage. But, don't be surprised. The Wankel engine

*(Please turn to page 40)*



# The taste that's country mellow

You find it only in  
**Half and Half  
Filter Cigarettes**  
made from America's  
mellowest tasting  
pipe tobacco.

Get yourself a new kind of  
flavor and aroma in a  
filter cigarette: full, rich, and  
country mellow. Light up  
a Half and Half.



© The American Tobacco Company



## START A MONEY-MAKING BUSINESS FOR LESS THAN \$50!



You can have your own lifetime business right at home . . . work in spare time . . . and make up to \$200 a month CASH! My FREE PLAN gives you all the facts: How to start, how to grow. You don't need previous experience. You don't have to sell. I'll even finance you. People bring you the work and pay cash. Over 90¢ of every dollar you collect is clear cash profit. And you work when you want to. Let me prove you can't find a more certain, lower cost, higher paying business of your own.

Just Mail Coupon—No Salesman Will Call

BELSAW SHARP-ALL CO., Stan Field, Pres.  
7173 Field Bldg., Kansas City, Mo. 64111

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

FREE  
BOOK



EARN  
**HIGH  
WAGES**  
as a HEAVY  
EQUIPMENT  
OPERATOR

Train your way to high pay in the booming construction industry! Learn the skills you need to qualify . . . NOT by correspondence, but by actual field training on machines like the ones used by the industry. Huge training grounds in North Carolina, a million dollars worth of school-owned diesel-engined machines, experienced instructors, full 220-hour and 440-hour courses. National, the original school of heavy equipment operation, is a recognized leader. Member American Road Builders Assn., Services and Supply Division. Associate Member A.G.C. Full-time Job Advisory and Counseling Director on staff. VA approved. For men ages 17 to 56. Train Now—Pay Later plan . . . other payment plans also available. Write TODAY for FREE catalog and FREE copy of school newspaper reporting news of National School graduates.

NATIONAL SCHOOL  
OF HEAVY EQUIPMENT OPERATION, Dept. D-5

P.O. Box 1686, Moores Chapel Road, Charlotte, N. C. 28201

Please send me FREE illustrated school catalog and complete information. I understand there's no obligation.

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_ Phone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

## DETROIT LISTENING POST

(Continued from page 38)

is already being used in the NSU-Prinz, but it's not regarded as clean burning, and—in view of stiffening U.S. air pollution standards—may run into official trouble here.

**YACHT DEALERS** are slated to sell Avanti automobiles. The South Bend, Ind., firm that has been producing the Studebaker-designed Avanti says yacht dealers "are selling a product that—pricewise—complements ours." The Avanti sells for \$7000. How are yacht dealers going to handle service? Firm says service can be handled by other Avanti dealers who specialize in selling and servicing.

**16,000 CARS** have been replaced by Volvo in the past 12 years, not because of defects, but because of the company's unusual "guarantee" on cars it sells in Sweden. The replacement plan amounts to a free five-year, \$80-deductible accident insurance policy. Since it went into effect in 1954, the plan has cost Volvo over \$60 million. This apparently has been money well spent, Volvo feels, because sales have climbed up and up. As with other cars sold in Europe, Volvos carry a six-month guarantee against defects. But to this the company adds a five-year "guarantee" against damage from accidents or vandalism. Should such occur, the owner pays the first \$80, the company all the rest.

About 450,000 cars have been covered by the insurance, and of these about 250,000 have been damaged. In 16,000 instances, owners received new cars. Volvo has been thwarted by local rules in efforts to apply the plan to other countries in which it sells cars. SAAB, to remain competitive in Sweden, now also offers the same sort of protection.

**ALUMINUM ENGINE** development, sidelined by concentration on the emission control problem, won't get going again 'til next year. Look for results about 1970.

**EVER HEAR OF** Argentina's Dinarg, Red China's Hongki, Turkey's Otosan, Japan's Mazda, Italy's Autobianchi, Britain's TVR, Russia's Zaporozhet? They're all cars, and—along with every other make of car in the world—are described in both text and illustrations in *World Car Catalogue 1967*, compiled by the Auto Club of Italy and available at bookstores for about \$16. Great for buffs, the book can also be ordered postpaid for \$16.35 from World Car Catalogue, P.O. Box 63, Bronxville, N.Y. 10708. ★★★



# IMPORTANT NOTICE

After exhaustive testing by ourselves—and others—we recommend booster-gap extended tip spark plugs be used in Chevrolet automobiles which are to be driven on the Bonneville Salt Flats at precisely 35 mph.

The AC type number of this spark plug is B44S.

We continue to recommend for Chevrolets which will be driven under normal conditions the AC original equipment spark plug, type 44.\*

\*Original equipment on Chevrolet 327-cu.-in. V-8 engines. For other engine applications and special driving conditions, ask your dealer for the recommended AC type number.



AC SPARK PLUG DIVISION

MARK OF EXCELLENCE

Full Time Firepower

FOR SAFETY'S SAKE, CHECK YOUR HEADLAMPS —  
REPLACE WITH AC GUIDE LAMPS



# PUBLICATIONS **WORTH WRITING FOR**

BY CATHY CLARKE

**SWIMMING-POOL OWNERS** should protect their investment with prescribed step-by-step maintenance. *Secrets of Successful Pool Painting* is a booklet which outlines seven steps to paint a pool in order to enhance its beauty and make it easier to keep clean. The booklet explains how to schedule the job, prepare the surface and select the paint and equipment. This free booklet can be obtained by writing to the Goodyear Chemical Div., Dept. 798, Akron, Ohio 44316.

**PAINTING YOUR BOAT** is the subject of a 48-page booklet that discusses latest paint development and preparation techniques to make your boat look its best the whole season long. *How to Paint Your Boat* covers such topics as proper use of color, care and use of brushes and anti-fouling. Send 25 cents to Woolsey Marine Paints, 201 East 42nd St., New York, 10017.

**TO CATCH A FISH IS ONE THING**, but properly preparing it for frying can make your catch a lot tastier. *How to Fillet Fish*, published by the Normark Corp., gives complete instructions on cleaning and filleting along with photos. Send 25 cents to cover postage and handling to Normark Corp., 1710 East 78th St., Minneapolis, Minn. 55423.

**BOAT SHOPPING?** Proceed with caution is the warning issued by the Aluma Craft Boat Co. A recently published booklet entitled *How to Buy a Quality Boat* enables the prospective boat owner to quickly judge the construction and performance differences between boats. The booklet contains a complete checklist of important structural features to look for when purchasing your boat. Write Aluma Craft Boat Co., 1515 Central Ave., N.E., Minneapolis, Minn. 55431, for the free booklet.



### USE THOSE BABY FOOD JARS TO STORE THINGS

Sturdy, plastic caps snap into 1/8" pegboard and hold quarter twist food glass jars. Perfect for storing all kinds of small parts and things. Keep your workshop neat. 10 for \$1; 36 for \$3; 72 for \$5; 500 for \$32.50. Handy Dandys only. No jars. Shipping paid anywhere USA. Send payment with order—no C.O.D. **WICKLIFFE INDUSTRIES, INC., P.O. Box 244, Dept. PM-7, Wickliffe, Ohio 44092.**



**WHAT A MONEY MAKER!** We boosted our family income permanently... started our own anti-poverty program with a beat-up chair we picked up for \$3... sold for \$150. Now that MUI taught us the secrets of upholstering our days of meager paychecks and dull-dead-end jobs are over. Send for FREE ILLUSTRATED BOOK on home study course for upholstering sofas, chairs, footstools, built-ins. New methods, all modern styles. Learn in spare time. Write for free book, free sample lesson. **APPROVED FOR VETERANS.**

**Modern Upholstery Institute**  
Box 899-ZK, Orange, Calif. 92669

## Secrets of Teaching Yourself MUSIC

Revealed in Your Home  
This Money-Saving Way

**YES!** Now you can teach yourself to play Piano, Guitar, ANY instrument in your spare time—even if you've never played a note in your life! Famous proven Course makes it simple as A-B-C. Pictured lessons show you how. No teacher. It's amazingly easy! Surprise your friends by playing favorite music. Write today for FREE 36-page illustrated book **U.S. SCHOOL OF MUSIC, Studio A307, Port Washington, New York 11050.** (Est. 1898. Approved, N.Y. State Educa. Dept.) Tear out as a reminder.



**FREE!!! POWERFUL MUSCLES FAST!**  
Fantastic New Discoveries in the science of bodybuilding. Now, in the privacy of your bedroom, our method will add inches of powerful muscles to arms, chest, shoulders & legs. Learn secrets on trimming the waist with ultra-modern methods—fast! Results Guaranteed! Send for free brochure, **Universal Bodybuilding, Box 4327-M-5, Northeastern, Dearborn, Mich. 48126.**

**READY? ALWAYS!**  Only \$3.95 P.P.

Metal kitchen or shop tools held magnetically by **MAGNAGRIP MARK X**. Always handy, orderly, safe. **MARK X** mounts on any surface easily. Smartly styled in white. Gift boxed.

Complete line folder on request. Money back guarantee. Send check or M.O. to Dept. E.

**PHELON MAGNAGRIP COMPANY, INC.**  
East Longmeadow, Mass. 01028

Only \$1.98 P.P.  Any soap cake hangs magnetically, air dries, always handy. **MAGNAGRIP SOAP HOLDER** mounts anywhere.

### HARD-TO-FIND TOOLS

**NEW CATALOG** of exceptional useful tools rarely found in stores or other catalogs. Industrial—professional quality only. Used by wood & metal workers, repairmen, welders, machinists, clock, watch and instrument makers, jewelers and model makers. Brookstone tools solve problems—make work easier, more fun. Send 20c.

**BROOKSTONE CO.**  
7724 River Road, Worthington, Mass. 01098



# POPULAR MECHANICS SHOPPING GUIDE



## MUSCULAR PHYSIQUE

GUARANTEED BY NEW METHOD  
IN LESS THAN 3 MINUTES A DAY!

An entirely new, tested method of muscle-building that combines isotonic and isometric contraction has been developed by physiologists at the famed Max Planck Institute in West Germany. The unique Tensolator® method was successfully used to train the German Olympic team and other champion athletes all over the world. A quick series of 7-second exercises positively strengthens each set of muscles without tedious, strenuous workouts. 3 to 5 minutes a day is all it takes for maximum results (guaranteed or money back). The Tensolator method builds powerful muscles, broadens shoulders, trims waist, increases lung capacity. FREE lavishly illustrated, step-by-step brochure shows you how Tensolator works for men 20, 40, 50 years old or more. Send 25¢ for postage and handling to Dept. PM-6, Thoylo Corp., 509 Fifth Ave., New York, N.Y. 10017.

## CONTRACTORS WANTED MAKE BIG MONEY



WATERPROOFING—NEW OR OLD—BASEMENTS—POOLS—WALLS WITH EVERHARD IRONIZED WATERPROOFING.

Applied on Inside While Leaking. No Digging Necessary. We Have Used It for Over 36 Years and on Thousands of Basements. Order a 10 lb. Package Now (Enough to Do a \$100.00 Job). Shipped C.O.D. \$10.00 or Save \$1.00 and Send \$9.00 with Order.

F.O.B. ALTADENA  
QUANTITY DISCOUNTS

**PULLEN WATERPROOFING CO.**  
2030 Pinecrest Drive, Altadena, Calif. 91001

STANDING DESK shop, warehouse, gas stations. Sloping top provides roomy area for writing. 34 1/2" w., 30 1/2" d., 32 1/2" h. to top of shelf. Center drawer 23" w., 28" d., 3 1/2" h. Grey color. Heavy steel. Wt. 95 lbs.

FALLS CHURCH OFF. FURN. CO., Box 219, 588 S. Washington St., Falls Church, Va. 22046 \$47.00 F.O.B. Falls Church. Send check or M.O. Va. residents add 3% sales tax.



Today let these  
AMAZING  
SHOES  
ADD INCHES TO  
YOUR HEIGHT!

Nothing like a pair of "ELEVATORS" to help you get up in the world! In seconds, these miraculous height-increasing shoes

make you almost 2 inches taller! And no one will suspect that you're wearing them because "ELEVATORS" look just as smart and feel just as comfortable as any other fine shoes.

Write for FREE CATALOG today.



## ELEVATORS® HEIGHT-INCREASING SHOES

Breckton Footwear, Inc.  
Dept. 1107-H, Breckton 68, Mass.  
Please send free catalog

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

CLIP AND MAIL COUPON NOW

## UNIQUE MILLING ATTACHMENT

Fits All Small  
Metal Lathes!

Ideal for home milling! Handles dove-tailing, T-slotting and most other milling operations easily. Vise and angle plate machined from iron casting. Industrial quality. First time offered to home workshops!

Money Back Guarantee: You get 15 day trial. If not completely satisfied, return it and we'll refund your money immediately!

You cannot buy a better milling attachment at this low price! **ONLY \$41.95** POSTPAID. Send check or money order. We pay postage.



**J & R TOOL AND MFG. CO.**  
Box 3204 E. 14th St. Station  
Des Moines, Iowa 50316



## SHOCK-PROOF MILLERS FALLS

Lifetime Guaranteed Tools  
THOUSANDS OF EXCITING  
TOOL VALUES

Send 25¢ today for our Big 148-Page Tool Catalog which features Millers Falls Hand and Electric tools and Hundreds of other Nationally Advertised Brands of Tools too numerous to mention.

We ship coast to coast at prices hard to beat

**SILVO HARDWARE CO.**  
Dept. PM-7, 107 Walnut St.  
Phila., Pa. 19106



## New Catalog Shows You How 6 Machines-in-1 for Low Price of 1

Be independent, enjoy having your own money making business. Make as much as \$6.00 an hour sharpening circular and hand saws, knives, scissors, pinking shears, tools, planer blades, clippers, etc.



### MAKE MONEY SHARPENING

Housewives, hobbyists, barber and beauty shops—supermarkets, farmers—everybody needs sharpening service. Start Now for Less than \$50. Thousands of successful Treycos users. Guaranteed quality. Factory-to-you savings. Write me for complete new catalog right now.

BURTON W. MANTH, President

**TREYCO PRODUCTS, INC.**  
381 Niagara St.  
N. Tonawanda, N.Y.  
Established 1946



SEND ONLY \$2.00

Money Back  
Guarantee

## HEAVY DUTY-ARC WELDER

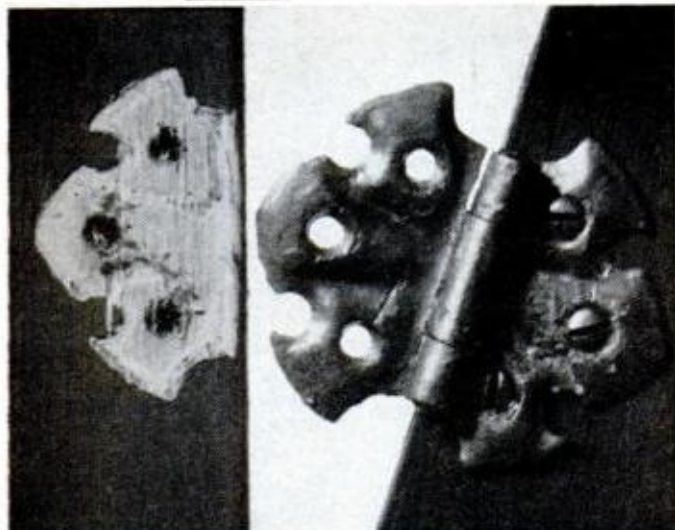
Life Time  
Guarantee

New Advanced Model 110 Volt Arc Welder. You cannot buy a better welder anywhere at this low price. **NO EXPERIENCE NEEDED.** With our easy-to-understand welding book, anyone can braze, solder, and weld any metal, even aluminum. **NOTHING ELSE TO BUY.** Comes complete, with rod-holder, helmet, ground clamp, generous supply of 1/16" and 1/8" welding rods, 1/2" carbon, flux and a special twin carbon torch which generates over 11,000 degrees heat for cutting or bending steel. **FREE.** If you order now we will send you free an extra \$2.00 supply of rods, flux, solder, and a pair of gloves. **LIFE TIME GUARANTEE.** Never a repair charge for parts or labor. **MONEY BACK GUARANTEE.** Try it for 10 days. If not completely satisfied, we will immediately refund your money without question. **SEND ONLY \$2.00** and when delivered pay postman \$16.95 plus postage, or send full price \$18.95 and we pay postage. (Remember: Order immediately for your bonus gift of rods, solder, flux, and gloves.)

Order Direct from factory: NATIONAL ELECTRIC, Dept. PM-7, DELRAY, FLORIDA



## FIX IT WITH PLASTIC WOOD... IT WILL STAY FIXED!



That loose hinge will stay put, when you use the great little fixer-upper: PLASTIC WOOD. It's the way to fix anything made of wood... because when it hardens, it's just like wood. Handles easy as putty. Does a "pro" job on busted furniture, loose screws, filling nicks, gouges—you name it! Great outdoors... resists weather. 5 colors, so you can match the job you're working on. Don't be without PLASTIC WOOD!



## Rust is expensive...



## 3-IN-ONE isn't.

Spray on a little 3-IN-ONE OIL regularly, and you can keep rust from getting started. Helps clean it off, too. Cuts down wear on moving parts... things last longer. When you spend good money on a power drill, garden tools, bike, etc... shouldn't you spend a few cents to protect them? Regular. Electric motor oil. Or this handy new spray can. 3-IN-ONE... it's wise insurance.



## BY KEVIN V. BROWN AVIATION JETSTREAM

**OUR CROWDED SKIES**, to no one's surprise, are getting more crowded all the time. But do you realize how much more?

Chicago-O'Hare International Airport, already the world's busiest, recently recorded more than 2000 landings and takeoffs in one day, an all-time record. In that 24-hour period it handled more than 78,000 passengers, or more than the entire population of nearby Cicero, Ill., transmitting more than 20,000 radio messages to pilots. The rush hour, from 5:00 to 6:00 p.m., recorded 172 landings and takeoffs, almost three per minute.

And it's going to get worse before it gets better.

### Traffic will triple

The Federal Aviation Agency predicts that air travel in the United States will triple within the next 10 years. There are slightly more than 41 million landings and takeoffs nationwide annually now. This figure is expected to go to nearly 140 million by 1977, chiefly from increased commercial and private flying, but also from new and improved facilities.

The airline fleet will increase by 1400 planes, mostly jets, from 2100 to 3500, including nearly 100 supersonic transports. General aviation's growth will be even more spectacular, nearly doubling from 95,000 aircraft to 180,000.

Concurrent with the increased activity will be attempts at increasing the safety of air travel.

### Gelled fuel

The FAA has been experimenting with a gelled fuel, the purpose of which is to reduce fire hazard in aircraft accidents. A jet engine has been successfully operated, on the ground, using the solidified fuel.

Automatic landing systems, "hands-off" landings, have been under investigation for years, and recently one was used in an actual commercial flight. A Pan American jet landed, hands off, at Kennedy International Airport with 98 passengers aboard, the first such landing on a regularly scheduled flight.

And the so-called 3-D radar has made its appearance at control centers. It automatically reports a plane's altitude, simultaneously with its visual display on the radar screen, showing its relative speed and direction of travel. It may help prevent mid-air collisions. ★★★



**What a time for Falstaff.**  
**Crisp. Clean. Robust.**  
**For four generations, good taste has made Falstaff**  
**the choicest product of the brewers' art.® Everywhere.**

Falstaff Brewing Corp., St. Louis, Mo.





# RARE FIRST EDITION FREE

- Want to know how to build a PM 38 — or Hydroplane?
- Planning your dream castle? \$35.00 gets you the plans for building POPULAR MECHANICS' own "House of Imagination" — a scientifically designed house of the future with kitchen, three bedrooms, 2½ baths, living room, family room, laundry and workshop area.
- Interested in bicycle boats? Children's furniture? Chairs? Booklets and plans are available from POPULAR MECHANICS.
- These and hundreds upon hundreds of interesting, educational projects are available through POPULAR MECHANICS CATALOG OF PUBLICATIONS AND PROJECTS. This illustrated catalog will be a rare addition and a rare edition.

**SEND FOR YOUR FREE CATALOG TODAY. FILL OUT THE COUPON BELOW:**

**POPULAR MECHANICS, PUBLICATION AND PROJECTS CATALOG  
575 LEXINGTON AVE., NEW YORK, N.Y. 10022  
PLEASE SEND ME YOUR FREE CATALOG**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_

State \_\_\_\_\_





INTRODUCING THE NEW  
*Schober*  
*Theatre Organ*

**The only  
Theatre Organ  
available in kit form  
—for only \$1350.**

**Build it yourself and  
save over 50%**

**Combination Action** Ten buttons select preset combinations of stops — actually move the stop tablets as in pipe organs.

**Percussion** Eight percussion stops provide exciting realism. Celesta, harpsichord, piano, mandolin, xylophone, chrysoglott, orchestral bells, single or reiterating, are played just like the real thing — and sound that way — alone or along with regular organ stops.

**Free Information.** Send today for your copy of Schober's 16-page full-color booklet — plus free 7" recording.

**You've asked for it and here it is — the NEW Schober THEATRE ORGAN that you assemble yourself. For the first time in kit form, a real Theatre Organ with that rich, full, old time theatre pipe organ sound. You create the organ, then you create the music!**

The Theatre Organ features special voicing, curved console design, two 61-note keyboards, 2-octave radiating pedal clavier, 8 octaves of tone distributed over 5 pitch registers (including a 1-foot register), 35 speaking organ stops, 8 realistic percussion stops, 4 couplers, and vibrato tablet—48 tablets in all. And all at a truly remarkable low price...you save over \$1,500 (well over 50%) from comparable theatre organs.

Just follow easy step-by-step instructions written in everyday language which anyone can understand. You'll have an unequaled pride when you're finished that only can come from assembling it yourself.

The Theatre Organ starts at \$1,350. This price includes a beautiful walnut console or you can save further by building your own from plans. Options available include combination action, genuine reverberation, percussion, and amplifiers and speakers.

THE *Schober Organ* CORPORATION  
43 West 61st Street, New York, N.Y. 10023

The Schober Organ Corp., Dept. PM-21  
43 West 61st St., New York, N. Y. 10023

- Please send me Schober Organ Catalog and FREE 7-inch "sample" record.
- Enclosed please find \$2.00 for 12-inch quality LP record of Schober Organ music. (\$2.00 refunded with purchase of first kit.)

Name.....

Address.....

City.....State.....Zip No.....



## CHARTER-SPHERES For More Living Enjoyment!

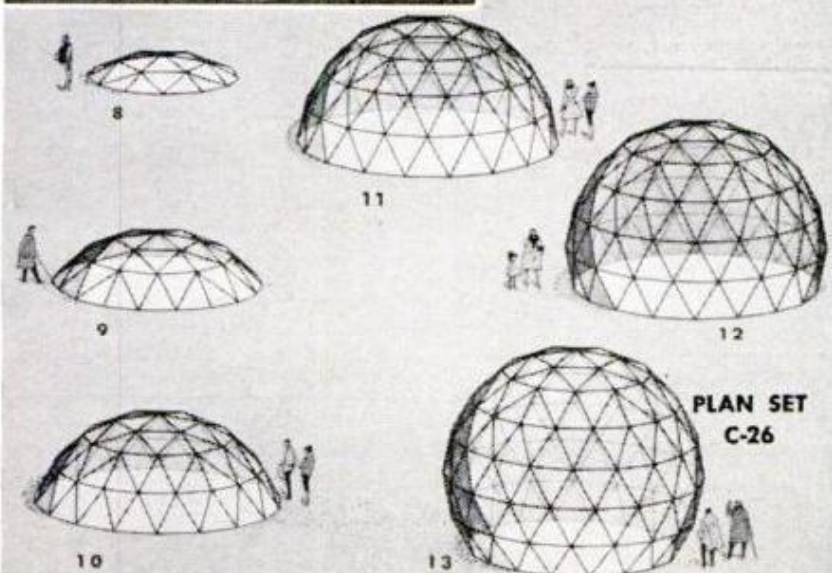
LOW-COST DOME STRUCTURES  
YOU CAN BUILD YOURSELF

Ideal for many kinds of outdoor shelter — an airy den or dining room . . . enclosed cook-out quarters . . . yard tool storage . . . small pool cover . . . children's playhouse . . . an aviary . . . greenhouse. Thirteen designs by Synergetics, Inc., with a range

of sizes and varying heights. Pre-cut, ready-to-assemble Frame Kits available with assembly instructions. Also Covering Kits with 3 different materials. Or, if you are a real do-it-yourselfer, SEND \$5 FOR PLAN AND SPECIFICATION SET C-26 which equips you with a Plan from which to make Charter-Spheres as depicted at left. Or write for free literature on combinations of plans.

CHARTER INDUSTRIES, INC., Dept. PM-67  
P. O. Box 9531, Raleigh, N. C. 27603  
Enclosed is \$5 for Plan and Specification Set C-26.

NAME \_\_\_\_\_  
STREET \_\_\_\_\_  
City, ZIP \_\_\_\_\_





# CLASSIFIED ADVERTISEMENTS

Rate: \$1.50 per word payable in advance each insertion. Capitalized words—75¢ per word additional. Minimum insertion ten words. To be inserted under the proper classification, copy must be in our office by the 15th of the second month preceding date of issue. The next available issue to place an advertisement in America's No. 1 Classified Section is September. The closing date is July 15th. Send remittance and order to C. A. Martin, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

## POPULAR MECHANICS

## AUTOMOBILES, MIDGET CARS

**ISSETTA** With tow bar \$29. Minibike \$20. Whizzer Motorbike \$30. Cushman \$15. Kart frame less engine \$7. Gasoline engines \$3 up. (Mailorder only.) Send 25¢ (35¢ for first class mailing) for Directory-Catalogue Number 133, listing these and hundreds of similar bargains, home-builders parts, plans, etc. Midget Motors Directory, Athens, Ohio.

**AUTOMOBILE** Literature, antique, classic. First Ford V-8 catalog. Hobby Club, free information. Enthusiast, Box 451B, Mt. Clemens, Mich. 48043.

## AUTO SUPPLIES AND EQUIPMENT

**ANTIQUE** Car pistons, gaskets, gears, valves, etc. Catalogue \$1.10. Antiques Auto, Milwaukee, Wisconsin 53204.

**REMARKABLE** New gauge continuously glows ignition condition. Free details. Q-Arc, Box 47876, Los Angeles, Calif. 90047.

**JEEP Owners—V8 conversions.** Read Jeep Owners ad, page 34.

**CROSLEY** New, used parts. Service Motors, 616 Burnside, Inwood, L.I., N.Y. 11696.

**FOREIGN** Car parts. Discounts. Service Motors, 616 Burnside, Inwood, L.I., N.Y. 11696.

**ANTIQUE** Ford parts, auto books, restoration supplies. New 124 page illustrated catalogue. \$1.00. Mark, Layton, New Jersey 07851.

**STOP** Theft and burglary of your car. Complete easy plans \$1.00. Rofick Ideas Company, Box 8325, Detroit, Michigan 48213.

**FREE** Information on building or buying Capacitor Discharge Ignition Systems under \$25.00. SYDMUR, Dept. 25 Midwood, Brooklyn, N.Y. 11230.

**MOST** Rear engine collisions caused by tail, stoplight failures. **SAFETY-LIGHT** shows yours are working! \$8.95. Corporation 87, Box 473M, West Hartford, Connecticut 06107.

**REVITALIZE** And save your Transmission with a Tonic. Guaranteed. \$2.50 postpaid. Weldite Conditioner, 120-C North Fourth Street, North Wales, Pennsylvania 19454.

**STOP-THIEF!** \$9.95 anti-theft system prevents starting, sounds alarm after attempt to start engine or open doors! Corporation 87, Box 473M, West Hartford, Connecticut 06107.

**COMPLETE** Guaranteed stock, used, new, rebuilt. All model cars and trucks, and front axle drives, Jeep and GI. Pioneer, 734 W. 13th Ave., Denver, 80217.

**SPEED-Cruise Control.** Excellent, ingenious. Send \$10.00 or write for brochure. Cruise, 3807 44th, San Diego, Calif. 92105.

**PILOT** Lights monitor everything. Cool! Write: Mathco, Cincinnati, Ohio 45217.

(SAVE \$150) Ring-Valve Job while driving, \$6.00 postpaid. Works where others fail! Money-back guarantee. Motaloy, Grantham, Penna. 17027.

**REMARKABLE—Wax** car once a year, simple formula 50¢. Artiron Inc., 4120 Sepulveda Blvd., Culver City, California 90230.

**JEEP** Parts catalog: Military and Civilian. For owners, dealers, garages, service stations. Save \$\$\$ Surplus and replacements. American Auto Parts Co., 1830 Locust, Kansas City, Missouri 64108.

## AUTO TRAILERS

**BUILD** Your Pickup Camper. Pre-cut kits. Blueprints, Supplies. Literature 10¢. Comstock Trailers, Dept. 664, Parsons, Kansas 67357.

**PICKUP** Camper, Trailer or Pickup-Cover... Build yourself. Save! Complete plans \$3.95 each. Cover plans \$2.00. Econoline Bus or Van, Foldout Trailer, Bus conversion drawings, \$2.95 each. Satisfaction guaranteed. Equipment catalog \$1.00 (refundable). Details 10¢. Viking Camper Supply, 94-F Glenwood, Minneapolis, Minn. 55403.

**WILD** Life decals, full color, large. Free folder. Dealer inquiries invited. Washington Poster Co., 16824-PMC Pacific Highway So., Seattle, Wash. 98188.

**CAMPER** Plans. Compact buses, Vans—Volkswagens, Econoliner, Dodges. Build yourself—Save! Details—Dot Campers, Box 2115M, Culver City, California 90230.

**BUILD** Camping travel trailer pickup coaches. Six different plans manual, 1.00. Guaranteed. Kamcraft, Box 1153, Milwaukee, Wis. 53201.

**TRAILERS:** All kinds—boat, box or camping. Also: All parts to build your own. Send 25¢ for catalog. Norjack, 670 S. 108th St., Milwaukee, Wisconsin 53214.

**BUILD** Aluminum pickup camper over-cab, hi-boy, lo-boy, blueprints, material, list, 3 models included. \$3.50. Blance Custom Campers, Wolflake, Indiana 46796.

## MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

**SNOW VEHICLE & GO KART CATALOG.** Hop up accessories—speed and performance equipment—manifolds, engine mounts, exhaust systems. Send 25¢ G.E.M. PRODUCTS, 436 Roosevelt Rd., Glen Ellyn, Illinois.

**HONDA** 50 to 90-S big bore & stroker kits. Columbia Engineering, 2105 E. 37th, Los Angeles, Calif. 90058.

**BUILD** Your own minibike! No welding required. Plans \$1.00. Westate, Box 537-PM 7, Campbell, California 95008.

**BUILD** Motorbike from bicycle! Plans—\$1.00; Go-Byk Industries, Rothsay, Minnesota 56579.

**BUILD** Go-cart; Motorscooter; Plans. \$2.00 each; Go-Byk Industries, Rothsay, Minn. 56579.

**MINI-Bike** plans! Complete instructions. \$2.00. 129 Oxford, Moraga, California 94556.

**HONDA.** \$25. Other bargains. Send 50¢ to Motorscooter, B443/1837 Harriman, Bend, Oregon 97701.

**HARLEY - Davidsons** — Used bargains. New, used parts, accessories, all models. Bulletin 35¢. Knuth's (Factory Dealer), 1753 Muskego, Milwaukee, Wis. 53204.



## AVIATION

**BARTLETT FLYING SAUCER.** Amazing machine hovers 200 lb. man over land/water, powered by ordinary lawn mower engine. Easy to build. Fun to fly. Complete Plans, Kit Brochure and Photo Review \$3.00. Write: Herb Bartlett, Box 3234-C, Scottsdale, Arizona 85257.

**HELICOPTER.** Portable, One-man. Information 25¢. 3-view drawings and photos, \$1. Compcop, Box 1267 Redwood City, Calif. 94064.

**AIRBOAT** — Snowsled — Hovercraft — Autogyro Propellers, Plans, Supplies, Hoovercraft, drawings, engines, 6-blade fans. Catalog drawings, photographs. \$1.00. Escoc-M, Box 1520, Bradenton Beach, Fla. 33595.

**PROPELLERS.** Plans, kits, supplies for airboats, snowplanes. Gauges, spark plugs, gas-oil hose, oil coolers, primers, wrenches, switches, propeller hubs, engine mounts. Corvair-Volkswagen conversion parts. 125-190 Lycoming engines, manuals, gaskets, parts, Catalog, \$1.00. Banks-Maxwell, Box 3301E, Ft. Worth, Texas 76105.

**HOMEBUILT.** Real enclosed helicopter, 24 pages ideas, information. \$2.00. Build "executive" helicopter, drawings, specifications, \$1.50. Helicopter Development, Box PM147, Washington, New Jersey 07882.

**BE A** Government licensed aviation mechanic. Practical training. Free information. Aero Mechanics School, Municipal Airport, Kansas City, Missouri 64116.



## BOATS

**BOAT PLANS, PATTERNS, FRAME KITS, BOAT KITS.** World's largest catalog—over 200 proven designs including 40 new complete boat kits, fishing boats, cruisers, sailing, ski boats, house boats, in-board and outboard hydroplanes. Send \$1.00 for large plan catalog or \$2.00 for catalog plus boat building handbook. Kit catalogue—Send \$1.00 or \$2.00 for catalogue plus boat building handbook to: Clark Craft, 1709-P Niagara Street, Buffalo, New York 14207.



**BUILD** Your own boat from our large-scale blueprints. Books of plans give how-to-build help. Hundreds of professional designs—motor, sail or auxiliary—for amateur builders. Free catalog. MoToR Boat- ing, 959 Eighth Ave., Dept. RS, New York N.Y. 10019.

**KAYAKS**—One-man \$19.50; two-man \$24.50; Sailboat \$44.00. Exciting Sitka Kayak Kits known world wide for speed and safety. Assemble in one afternoon. Free pictorial literature. Box 78-P, Brecksville, Ohio 44141.

**PLANS, Kits, hulls, 24-page 20th Anniversary catalog.** All class racing boats. Flatbottom to Drag Hydros. Midget to 7 Litre. 25¢. Champion Boats, Box 9215A, Long Beach, Calif. 90813.

**BOAT Plans—Full-Size Patterns—Frame Kits** specially prepared for amateurs. New 88 page catalog of over 72 designs including Sail, Jets, Inboards & Outboards. Cruisers, houseboats, "hotboats," catamarans. . . . all types from 8' to 36' "plus" boat trailers. New 1967 catalog only 50¢. Glen Designs, 9152 Rosecrans, Bellflower, Calif. 90707.

**FIBERGLASS Cloth and resin.** World's finest cloth and non-run resin, at direct mill prices. Flotation foam. Complete line of plastics, silicon bronze and brass screws save 60%. No sales tax. Boat Plans. Catalog 25¢. Freight prepaid. Stiles Boat Supply, Box 11P, Linden Ave., Mantua Hts., N.J. 08051.

**FIBERGLASS Canoes.** Three exciting models. Easily assembled kits, \$39.95 up (factory direct). Free literature. Riverside Canoes, P.O. Box 5995BP, Riverside, California 92507.

**BOAT KITS.** Save money—assemble yourself. Factory molded fiberglass or pre-assembled plywood. 12' to 32' Cruisers, Runabouts, Houseboats, Sail Boats. Big line accessories, motors, trailers. Easy terms. Free catalog. Luger, Dept. BC-67, 9200 Bloomington Freeway, Bloomington, Minnesota 55435.

**SEA Boats For The World; Low Cost Texas Dorics; Free Boat Plans To Builders; Portfolio 40 Plans 15' to 45' Power & Sail; Action Photos & Dory Lore \$2.00. "Gloucester Gull" 15' Rowing Dory \$3.00 with Portfolio 40 Plans, Texas Dory, Box 720, Galveston Texas 77550.**

**FREE Plan catalogue—canoes, kayaks, accessories.** Bruce Clark, 115 McGavock Pike, Nashville, Tenn. 37214.

**MOTOR SURF** With the "Sea Sled" on lakes, rivers or surf. More exciting than surfing, more fun than boating. Send \$2.00 for complete plans to: Novco, Box 632, Florissant, Missouri 63033.

**SPORTSCRAFT Canoes, factory direct.** Four canvas hulled models, from \$18.95. Streamlined appearance, unsurpassed performance. Also, canvas, paddle supplies. Free literature! Sportscraft, Box 8393-P, Columbus, Ohio 43201.

**BUILD** It yourself plans, prams, skiffs, runabouts, cruisers, 8' to 32'. Prices, \$2.50 to \$25.00. Send 10¢ for folder. Claude Horst, 6515 Earl Avenue, N.W. Seattle, 98107.

**FULL Size, cut-to-shape boat patterns, blueprints.** Send 60¢ for big new illustrated "Build a Boat" catalog includes fishing boats, garvies, cruisers, catamarans, houseboats—outboards, inboards, sailboats—7½ to 38'. "How to Build a Boat" booklet, \$2.50. Cleveland Boat Blueprint Co., Box 18250, Cleveland, Ohio.

## MARINE EQUIPMENT AND SERVICES

**CONVERT** Auto engines to marine. 68 Page Catalog, 50¢. Lehman Manufacturing Company, 800 Elizabeth Avenue, Linden 4, New Jersey 07036.

**FIBERGLASS Cloth, matt, polyester and epoxy resins.** Lowest prices. Seifert's, Box 1206-X, Green Bay, Wisconsin.

**"FLEET" Liquid Plastic Boat Finish** seals water out! Unsurpassed for rich, gloss finish. Wears longer! 28 colors. Use on wood, metal, fiberglass, canvas. Send for "Free" color card and introductory offer. Stay-Tite Products, Box 20130, Cleveland, Ohio 44120.

**MARINE Kits—Instructions for converting automotive engines to inboards—inboard/outdrives—jet. Save! Free catalog.** STAR MARINE ENGINE WORKS, Berkeley, California 94710.

**FIBERGLASS Cloth, matt, polyester and epoxy resins.** Lowest prices. Seifert's, Box 1206-M, Green Bay, Wisconsin 54305.

**WEATHERCASTER®—Portable radio receiver for U.S. Weather Bureau's new instant weather channel (162.55 MHz).** New York, Chicago, Honolulu, Kansas City and Miami now broadcasting. Inquire at other local Weather Bureaus before ordering. \$39.95. Shaw Electronics, Roper Building, Miami, Florida 33131.

**NEW, Used, rebuilt marine motors, Marine conversions, fittings.** Free catalog. Stokes Marine Supply, Dept. 24, Coldwater, Michigan 49036.

## ATHLETIC AND BODY BUILDING COURSES

**POWERFUL Muscles fast! Free brochure! Universal Bodybuilding, Box 4327-C, Northeastern, Dearborn, Michigan 48126.**

**KARATE—Complete instructions, illustrated, only \$1.25.** Bales Co., Box 5050, Rt. 2-PM, Escondido, Calif. 92025.

**TENSOLATOR REVOLUTIONIZES Muscle Building! Free Book! Dynamic Living, 1024-P7, Bendermere, Asbury Park, N.J. 07712.**

**"GIANT Arms." Dr. Young's, D.C. revolutionary discovery.** \$2. Satisfaction or refund. Gaucho, Box 9309 - S7, Chicago 60690.

**"COMPLETE Body-Building Course." "Gain Weight Easy". "Barbell 3-week Speed Course", "Super Karate". Complete combination offer—\$5.00, to; Duro-Stress, Dept P.M.-7, 1226 Michigan Blvd., Michigan City, Indiana 46360.**

**"GIANT Arms." Dr. Young's, D.C. revolutionary discovery.** \$2. Satisfaction or refund. Gaucho, Box 9309 - S7, Chicago 60690.

## SPORTING GOODS AND EQUIPMENT

**SILENCERS: Pistol, rifle details, diagrams.** Includes new design for .22s. Simple, clear! \$1.00 Crossbow plans, \$1.00 both, \$1.75. Twin, Box 192-A, Dunellen, New Jersey 08812.

**NEW—Binoculars, boats, cameras, guns, scopes, mounts, reloading tools and supplies—at best prices.** Hoagland Hardware, Hoagland, Indiana 46745.

**FREE . . . Wholesale catalog.** Arrow shafts, broadheads, fletchings, fisharrow parts, tools, bows, Finnyports (22G), Toledo, Ohio 43614.

**HUNDREDS Of Army - Navy surplus items, camping, hunting, fishing equipment, gun accessories, etc.** Write for free catalog. P&S Sales, Box 155, Tulsa, Oklahoma.

**BIG Money raising crickets and 12 inch African fishworms.** Free literature. Carter Ranch, Plains, Georgia 31780.



## FISHING, TACKLE, LURES

**MOLDS—For casting your own fishing sinkers.** Free illustrated booklet. Reading Instrument Co., Box P78, Reading, Pa. 19603.

**FREE . . . Wholesale catalog.** Beads, Spinners, Lure parts, Sinkers, Jigs, Reels, Finnyports (ME), Toledo, Ohio 43614.

**FREE! Newest edition famous Corcoran catalog.** Largest selection hunting, camping, fishing equipment. All items field tested. Boots, clothing, fishing tackle, tents, gun cases, sleeping bags. Dozens of specialties. Zip code, please. Corcoran, Dept. PM-77-B, Stoughton, Massachusetts 02072.

**AMAZING Canadian Walleye lure.** Satisfaction guaranteed \$2.00. Canadian Lure Sales, 149-A Berkshire, Winnipeg 6, Canada.

**OVER 5,000 HARD-TO-FIND FISHING SPECIALTIES and kits galore.** Send for free 170 page catalog. Netcraft Co., Dept. PM, Toledo, Ohio 43613.

**TRAP Turtles easy way.** Goodwin's new collapsible wire trap. Literature. Traps, R4, Owensboro, Ky. 42301.

**MOLDS For fisherman's sinkers, jigs, squids, casting and spinning lures.** Free catalog. Sweets Molds, Tonawanda 1, New York 14150.

## EARTHWORMS, LIVE BAIT

**MEN!—Women! Make money raising bait for us at home.** Wigglers, Warsaw 45, Indiana 46580.

**BIG Money growing fishworms, giant African Crawlers, crickets.** Free Literature. Fain's Hatchery-31, Edison, Georgia 31846.

**SUCCESS FOR YOU! Raise Carter's Pure-bred hybrid red wiggler fishworms, crickets, and 12 inch African worms.** "Known All Over the World." Write for Free Literature and our Success Story in Life Magazine. Carter Redworms, Plains, Georgia 31780.

**TOUGHNER Conditioner enlarges worms overnight.** Generous sample, \$2.00. Soilless formula literature. Three Oaks Ranch, Dresden, Tenn. 38225.

**HYBRID Redworms—1000-\$3.00, 3,000-\$5.75, 5,000-\$8.00, 10,000-\$14.00.** Bedruns, 20,000-\$18.00, postpaid with raising instructions. Brazos Bait Farms, R-9, Waco, Tex. 76705.

**EARN Money raising fishworms for us!** Exciting details free! Oakhaven—56, Cedar Hill, Texas.

## FROGS, FISH, REPTILES

**FROG Raising.** Young frogs and giant breeders. Stock your lakes, pond. Nu-Tex Frog Farm, Box 4029, Corpus Christi, Texas 78408.



## HUNTING, GUNS, DECOYS

**FREE! Newest edition famous Corcoran catalog.** Largest selection hunting, camping, fishing equipment. All items field tested. Boots, clothing, fishing tackle, tents, gun cases, sleeping bags. Dozens of specialties. Zip code, please. Corcoran, Dept. PM-77-C, Stoughton, Massachusetts 02072.



## DOGS AND KENNELS

**BRITTANY SPANIELS: Started dogs and puppies from choice hunting stock.** Reverend Busby, Lamont, Kansas 66855.



## GAME BIRDS

**PHEASANT Breeding Book \$2.95.** Bulletin: Hunting Club and Game Farm Opportunities, \$1.00. Stromberg's, Fort Dodge 25, Iowa 50501.

## RABBITS—FUR BEARING ANIMALS

**MINK Raising information free.** Lake Superior Mink Farm, Inc., Superior EE1, Wisconsin 54880.

**EARN \$10,000 Yearly raising Angora rabbit wool for us.** Particulars 25¢ coin. Angora, Malta 12, Montana 59538.

**MAKE Money raising chinchillas, mink, rabbits, cavies for us.** Free catalog. Keeney Brothers, New Freedom 2, Penna. 17349.

**RAISE Rabbits successfully by knowing facts.** 48 page illustrated book describing 25 breeds. Housing, breeding, feeding, markets, marketing etc. 25 cents. American Rabbit Association, 36 Arba Building, Pittsburgh, Penn. 15217.



RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio 43050.

### PETS—BIRDS, CATS, HAMSTERS, ETC.

PET IDENTIFICATION metal tags. Send pet's name, address and phone number. Only \$1.00. Lifetime Products, 3645 Congress Court, Fremont, California 94538.

HAWKS, Reptiles, raccoons, skunks, squirrels. Catalogue 25¢. Trails End Zoo, St. Stephens, S.C. 29479.

285 PICTURE Brochure—35¢—Everything, you name it. Books 50¢ each: Monkeys, Parrots, Pigeons, Skunks, Chipmunks, Chinchillas. Stromberg's Pets Unlimited, Fort Dodge 25, Iowa 50501.

PETS: 285 Picture brochure 35¢. "Everything—you name it". Stromberg's Pets Unlimited, Fort Dodge 25, Iowa 50501.

### CAMPING EQUIPMENT AND TENTS

FREE! Newest edition famous Corcoran catalog. Largest selection hunting camping, fishing equipment. All items field tested. Boots, clothing, fishing tackle, tents, gun cases, sleeping bags. Dozens of specialties. Zip code, please. Corcoran, Dept. PM-77-A, Stoughton, Massachusetts 02072.

SAVINGS Plus dividends! Campers-fishermen-outdoorsmen cooperative. Free 56-page catalog. Recreational Equipment, Inc., 1525-P 11th, Seattle, Washington 98122.

CAMPING, Tents, Giant catalogue. Send 25¢. Morsan, 810R, Route 17, Paramus, New Jersey 07652.

Camping Trailers, plans & kits. Sleeps 6 or more. Basic kit \$145., tent \$146. Complete plans \$3.00, circulars 10¢. Stratford Trailer, New Field Station, Bridgeport, Conn. 06603.

CAMP Cupboard organizes mealtime. Stores utensils, pans and food. Complete ready to assemble. \$18.00 postpaid. Circular, 10¢. Stratford Trailers, New Field Station, Bridgeport, Conn. 06603.

JUMBO CATALOG—Tents, sleeping bags, camping supplies. G.I. Surplus, outdoor clothing. Free 140 page newest edition now ready. Write I. Goldberg, Dept. P.M., 429 Market Street, Philadelphia, Pa. 19106

### EMBLEMS, BRASSARDS, PATCHES

NAZI Flags! Large 2X3 Souvenir \$3.00. Postpaid. W.W.=2 Products, Box 2063, St. Louis, Missouri 63158.

### TRAVEL AND RESORTS

BROCHURE Service \$2.00 per mailing. P.O. Box 66259, Chicago, Illinois 60666.

### ELECTRICAL SUPPLIES

LAMP Parts, Catalog, prices, wiring instructions. 50¢. Refunded first order. Gvro, 5218P N.W. 35 Ave., Miami 42, Fla. 33133.

METERS—Surplus, new, used, panel and portable. Send for list. Hanchett, Box 5577, Riverside, Calif. 92509.

### BATTERIES, GENERATORS

BATTERY Recondition Kit, includes Molds, Material, Instructions. Battery Shop, Box 878, Palm Desert, Calif. 92260.

CHARGE 6-12 bolt batteries with easily built 35 amp rectifier type fast charger. Simplified construction and operation manual, \$2.00. Lectrix, Box 106, Guilford, Conn. 06437.

### ENGINES, MOTORS, DYNAMOS

DIESEL Injector parts and fuel pumps wanted. GM51-53-71-110. Bares, 2093 East 19 Street, Cleveland, Ohio 44115.

FREE Catalog, Motor rewinders supplies. Modern, Box 10025, Kansas City, Mo. 64111.

DYNALITE, Flashlight 92000 C.P., 6-D cells, 10" long, spots 1 mile. \$8.95 Guaranteed. Box-2284, Dept. 7-B, Huntington, W.Va. 25724.

LIVE Steam powered backyard railroads! All sizes. Complete "bolt-together-kits" and rough castings. Excellent drawings. 100 page catalog \$1.00. Little Engines, Lomita, Calif. 90717.

WINDING Data, 275 motors, single and three phase \$1.10. Data Company, 512 Kensington, Kansas City, Mo. 64124.

### MACHINERY, TOOLS AND SUPPLIES

MAGNETIC Chuck V blocks & parallels, edge finders, center finders, thread measuring wires, sine bars. Hi-precision—first quality—low prices. Factory distributors wanted. Liberal discount, products guaranteed. Brochures, Fisher Machine, 11704-M, Inglewood, Hawthorne, California 90250.

FREE! Starrett Tool Catalog. Sheffield Supply Company, 3450 N. Clark Street, Chicago, Illinois 60657.

WRENCH-FANTASTIC! Think of it! One husky, new wrench that adjusts AUTOMATICALLY to fit 12 nut sizes, hex or square, 7/16" to 1 1/4". Grips, ratchets them instantly! Terrific time-saver! FREE DETAILS! TANGUY-TOOL, Dept. PM-77, Glen Mills, Pa. 19342.

INSTANT MAGNETIZER AND DEMAGNETIZER. Needs no charging, battery or wiring. Magnetizes and De-magnetizes a must tool for mechanics, Machinists, Hobbyists. \$5.95. Ammon, 90-42 185 Street, Jamaica 11423, Dp. 677.

SURPLUS BARGAIN New 1/4" ratchet drive torque wrench. "T" handle. Government Cost \$15.00, \$2.95 plus 25¢ Postage—Weatherly Machinery, P.O. Box 1419, Melbourne, Florida 32901.

MICROMETERS — Indicators — chucks — rods. Small Shop Supplies, 1424 Barclay, Springfield, Ohio 45505.

### WELDING, SOLDERING, PLATING

A.C. WELDERS, 150 Amperes, \$49.50. Morris, 1070 Inner, Schenectady, N.Y. 12303.

WELD With car batteries. Fast and easy to build. More amp's than you need or money refunded. Instructions \$2.00. Bob Hutson, 4807 Hillcrest Drive, Waco, Texas 76710.

CHROME Plating equipment, supplies. All other finishes. Home workshop and production sizes. Send \$1.00 (refundable) for formulas, operating data, equipment guide and catalog. HBS Equipment Division L50, 3543 East 16th, Los Angeles, Calif. 90023.

### GOVERNMENT SURPLUS

JEEPS Typically from \$53.90 . . . trucks from \$78.40 . . . boats, typewriters, airplanes, sporting equipment, used, 100,000 bargains direct from Government nationwide. Complete sales directory and surplus catalog, \$1.00. Deductible first \$10.00 order. Surplus Service, Box 820-A, Holland, Michigan 49423.

JEEPS From—\$52.50; Typewriters from —\$4.15; Cars from—\$31.50. Walkie-talkies, motorcycles, airplanes, boats. Typical "As Is" bid bargains from Uncle Sam. Tremendous variety. Exciting free list. Write: Enterprises, Box 402-X24, Jamaica, New York 11430.

GOV'T. Surplus. How and where to buy in your area. Send \$1.00. Surplus information. Headquarters Building, P.M., Washington, D.C. 20036

SURPLUS Army, Navy store illustrated catalog. Ruvel & Company's Mail Order Division. Send 25¢ stamp or coin (refundable with first \$5.00 order). Ruvel, 707 Junior Terrace, Dept. 9-J, Chicago, Ill. 60613.

### HOBBIES AND COLLECTIONS

U.S. ARMY SHOULDER PATCHES. Fascinating hobby for collectors. Decorations for dens, bars, game rooms. Official patches from every major Army and Air Corps unit. Ten assorted patches, price list and catalog, \$2.00. Catalog and price list only, 25¢. SPRINGER'S-PM, P.O. Box 577, El Paso, Texas 79944.

FREE—German Regulation Medal: Send 50¢ for postage, handling. Illustrated military catalog. International, Box 303-M, Jamaica, New York 11432.

TESTED Witch Hazel divining rod for locating water \$3.00 plus instructions. Clyde Blakley, Greenfield, N.H. 03047.

LINCOLN ENCYCLOPEDIA THESAURUS Classified answers to troublesome crossword puzzles. Four dollars postpaid. LINCOLN ACADEMY, Box 5362, Long Beach, California 90805.

25 "JUNGLE BUTTERFLIES" 99¢ Postpaid! (Different) The Discount Center, Dept. PM-7H, 9425 Merton Way, Seattle, Washington 98118.

50 JUNGLE Butterflies \$2.00. Giant nature hobbies catalog 25¢. Collectors Wonderland, Box 1170, New York 10008.



### STAMP COLLECTING

FREE Mint Africa set. Approvals. Litho. Box 51, Canoga Park, Calif. 91305.

U.S. Overrun countries complete mint, \$1.00, approvals. Stamper, 2013 San Salvador, Fairfield, California 94533.

FREE 1966 U.S. list, mint #704-15 \$4, #740-9 \$2.10, #859-99 \$6, #909-21 \$1, Simmy & Co., 40 Court St., Boston, Mass. 02108.

TEN Different nudes: 20¢. Approvals. Stamp Farm, 4M7, Oxford, Wis. 53952.

FREE! Triangle set, Scout Beauty 25 others. Approvals, Cambridge, Box 411, Cambridge, Ohio 43725.

PENNY! Approvals! Regardless catalogue! Kloster, 4164 52nd St., San Diego 5, Calif. 92105.

500 DIFFERENT Stamps, \$1.00. Smith, 508-A Brooks, College Station, Texas 77840.

FREE 100 World wide stamps with request for mint pictorial approvals. Dept. PM, K & B Stamp Co., Box 70, Brooklyn, N.Y. 11223.

NEW African Stamp Collection—including Burundi, Guinea, Mali, Rwanda, Togo and others. A colorful addition to your collection. 10¢ with approvals. Capital Stamps, Dept. #57B, Ferrysburg, Michigan 49409.

UNITED States commemorative collection containing 33 different—10¢. Approvals. White, 516-A Avenue L, Brooklyn 30, New York.

PIPEX—TipeX-CipeX-Ashville. Four miniature sheets used for \$1.00 if you ask for our bargain priced U.S. approvals. Triboro, 38 Park Row, New York, New York 10038.

BEAUTIFUL Topical collection — includes Olympic sports stamps, wild animals, bicolor triangles, colorful birds, outer space stamps, Poland kitten stamp, and others. 10¢ with approvals. Sunny Stamps, Dept. #57-A, Fruitport, Michigan 49415.

AMERICANS On foreign stamps—Presidents Kennedy, Roosevelt, Lincoln, U.S. spaceman, Princess Grace & others. 10¢ with approvals Roseland Stamps, Dept. #57, Spring Lake, Michigan 49456.

INTRODUCING Our better United States approvals we offer 15 United States stamps including Columbian, Bi-Centennials, famous American, airs, others; only 10¢. Ocean Stamps, Box 64-PM, Brooklyn, New York 11229.

50 YEARS Old, fifteen different United States, over fifty years old—10¢ with approvals. Jaxon, Box 145-P, Brooklyn, New York 11230.

50 DIFFERENT Old U.S. Revenue stamps 50¢. Winchester stamps, Box 1592, Mansfield, Ohio 44907.



225 STAMPS For only 10¢! This mammoth value includes airmails, pictorials, stamps from strange countries cataloging up to 25¢ each! Also approvals. Mystic Stamp Company Camden 80, New York 13316.

PENNY Stamps! 1000 Mounted in book at 1¢ each. Trust Stamp Company, P.O.B. 132-P, Jamaica, N.Y. 11435.

40,000 DIFFERENT. Amazing new plan builds your collection systematically, country by country. As low as 50¢ weekly. Ware, Monroe, Conn. 06468.

FREE Sample. Interesting, illustrated, informative National Stamp News, Anderson, South Carolina 29621.

AMAZING OFFER! 200 United States stamps—including commemoratives, airmails, high denominations to \$1.00. Only 10¢ to approval applicants! Illustrated bargain lists free. Mystic Stamp Co., Dept. 80, Camden, New York 13316.

"INVERTED Error." Dag Hammerskjold 5¢ with Approvals. Belmont Stamps, Washington, D. C. 20015.

FREE Surprise collection sent with approvals. Gould, 1784 Union, San Francisco 94123.

U.S. Bargain. 50 different 10¢, with beautiful worldwide approvals, Stamps, Kennebunk, Maine 04043.

GERMAN Commemoratives, 10¢ with approvals. Schaefer, Box 1704, Washington, D.C. 20013.

MILLION Foreign stamps! 2¢ each! Send for thrilling, giant approvals! ABC Stamps, Box 6000-MB, San Francisco, Calif. 94101.

FREE 50 Worldwide. Request approvals. University Stamps, P.O. Box 326, Pompano Beach, Florida 33061.

U.S. Approvals Low prices. Eagle, 2221 Romine Ave., Pittsburgh, Pa. 15226.

RUSSIAN Space set 10¢. Russian approvals. Snedco, Box 68-P, Waldwick, N.J.

NEW Issues — Free weekly illustrated list. Brooks, 2601N Avenue "U," Brooklyn, N.Y. 11229.

65 DIFFERENT United States stamps only 10¢. Approvals included. Shelton, Box 187, Hempstead, New York 11551.

64 PAGE U.S. and U.N. catalog 10¢. Stone, 260 Washington, Boston 8, Mass.

ONE Pound value Geo. VI Bermuda, plus 100 worldwide 10¢ approvals. Stevens, Box 105A, Homecrest Sta., Brooklyn, N.Y. 11229.

100 OLD United States between 1861 and 1935. \$1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio 44903.

U.S. Mint specials! Flag set, complete \$1.00. 1¢, 2¢, 3¢ famous Americans (21 different) \$1.00. Free list. Brooks, 2601 Avenue "U," Brooklyn, N.Y. 11229.

FREE Wonderful new United States catalog! Postage and airmails complete. 786 illustrations. Special offers, bargains galore—everything! Send today. H. E. Harris, Dept. FC-1, Boston, Mass. 02117.

ONE-Penny Approvals. All Singles priced at 1¢ each. Absolutely nothing higher. Bargain sets also included. SFC, 868 West Street, Mansfield, Massachusetts 02048.

1000 \$1.00. United States or foreign. large variety. Missions Distributors, Box 386, St. Petersburg, Florida 33731.

WORLD'S Largest stamp 25¢. Gift Set included. Daufeldt, Atalissa, Iowa 52720.

WOW! 110 All Different Germany 10¢ Commemoratives, Airmails, High Values. Big catalog, bargain lists also, fine stamps from our approval service, which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. A77PM, Jamestown, N.Y. 14701.

100 DIFFERENT! Free! 1/4¢ upward British Commonwealth or world approvals. Bush, 1677 Wimborne Road, Bournemouth, England.

121 DIFFERENT Flag stamps free. Approvals. W-B Stamps, Wilkes-Barre, Pa. 18703.

GIGANTIC Triple offer! \$10.00 Stamp Packet! Exact replica world's rarest stamp! Full years membership International Society! All for \$1.00. Cochran, 558PM Oakley Boulevard, Las Vegas, Nevada 89105.

ABSOLUTELY Free 25 different United States Commemoratives when requesting United States Approvals. K & B, Box 70, Brooklyn, N.Y. 11223.

BREATHTAKING, 50 Mint Monaco pictorials, \$1.00. Approvals accompany. Stamp Exchange, Box 103, Fairfield, California 94533.

215 STAMPS—10¢ Approvals. Stampmaster, Box 284D, Foresthill, California. 95631.

500 DIFFERENT Stamps \$1.00. Fain's Stamp Agency, Box 56C, Edison, Georgia 31746.

DEFECTIVE Old U.S. at bargain prices. Karl Swartz, Malden Bridge, New York 12115.

GIANT Stamp Collection including: Astronauts, Satellites, Moonrocks, Boy Scout issue, complete U.N. set, recent Olympic and Sport issues from many countries, etc., Plus Big Stamp Dictionary and Approvals. Everything, 10¢! Stampex, Box 47-RM, White Plains, N. Y.

NUDES! 25 Different, \$1. Approvals. Servo, Box 355, Topeka, Kansas.

33 DIFFERENT Colorful Triangles, only 10¢ with approvals. Valley's, Box 414PM, Spring Valley, California 92077.

FREE—Mint British Colonials from Antarctic Territory, Borneo, Brunel, St. Christopher, Nevis, Caymans, Trengganu, Pitcairns. Free with approvals. VIKING, Great Neck 8, N.Y.

SEND 10¢ For Stamp Grab Bag. Over 100 unsorted old and new Asia, Africa, Europe, South Seas, etc. Approvals, illustrated catalog included. Littleton Stamp Co., Littleton GB1, N.H. 03561.

RARE Stamp free. Also new packet Aden to Urundi with Kennedy, triangles, space, sports, ships, dogs, cats, reptiles plus others. All free. Send 10¢ for mailing. Empire Stamp Co., Toronto, Canada.

STAMP Grabbags 25¢, 5-\$1.00. Boyar, Box 508M, Bound Brook, N.Y. 08805.

100 DIFFERENT Large United States Commemoratives Before 1957 \$.65. Vaccari, 508-40th, Union City, New Jersey 07087.

101 DIFFERENT Including complete mint set, hi-values, 25¢ with approvals. Roderick, Hampden, Massachusetts 01036.

REWARD! Free stamps and literature for your address. Generous bargain lot \$1. High value packet \$3. Persile, 436 N.Y. Ave., Brooklyn, N.Y. 11225.

1500 Foreign \$1.00; 5000 \$3.00. 9000 \$5.00. 200 giant size only commemoratives and pictorials—foreign or USA—\$1.00; 700 \$3.00; 1250 \$5.00. 5000 USA—commemoratives, airmails, revenues, 19th Century, high values, presidentials \$3.00. 300 USA commemoratives, dating from 1893 to 1939 only \$2.00. 50 USA revenues \$1.00. No approvals. Meyers, 5321 Fleming, Richmond, California.

UNITED STATES stamps! Enjoy this challenging hobby more by using our approval service. Just starting, or advanced, you will find our material of great interest. 10¢ buys 65 different, when applying. Engle, Box 8, Lowell, Michigan 49331.

1¢, 2¢ APPROVALS. Other bargains. Pam, Box 22092, Memphis, Tenn. 38122.

VATICAN Xmas Set 60¢. Approvals. Barricks, Box 7154, Detroit, Mich. 48202.

GIFT Tokelau set to approval applicants. Deane, Box 14, Miami, Florida 33145.

FREE 400 Genuine postage stamps! Worth \$10.00 at catalogue prices. Africa, Europe, Asia, British Emp.—a fascinating valuable mixture from foreign convents, banks, etc. Who knows what you will find. Also free valuable booklet. Adults only. Approvals enclosed. Frasek Co., PM-7, White Plains, N.Y.

COLORFUL Set free! Request approvals. Gorliz, Drawer 388PM, Park Ridge, Illinois 60068.

SACRIFICE! \$12.00 worth stamp closeouts \$1.00. Scarce \$6.00 U.S. Collection. \$1.00. Ronnie's, 6117 South Kingston, Tulsa, Oklahoma 74135.

SEND \$1.00 For colorful mint Afghanistan pictorials. Approvals accompany. Shamrock, Box 453M, Kenmore, Wash. 98028.

FREE First Day Cover, approvals; Gall, Box 96PM, Coopersburg, Pa. 18036.

SAVE Dollars. New buy, sell, trade plan. Details 10¢. Stamp Club Unlimited, Box 5332-S1, Inglewood, Calif. 90310.

TRIANGLE and Diamond Collection!! Includes exotic birds, insects, flowers and animals. Plus 20 large US commemoratives. 5¢. Approvals accompany. Hamilton, 7150 Cyril, Chicago OE7, Illinois, 60649.

600 STAMPS 25¢ Approvals. Eric's Stamps, 287 Bedford, Kitchener, Ont., Canada.

MYSTERY Set, 10¢ handling. Approvals. Davco Stamp Company, Bakersfield, California 93308.

255 DIFFERENT Worldwide 15¢. Approvals. Tibbets, 8675 Meadow, Downey, California 90242.

CANADA. Paper mixture, top grade with comms. 6 ounces \$1.00. PAC, 1408 Fleury St. East, Montreal 12, Quebec, Canada.

200 MIXED U.S.—Various issues, 10¢ Monjar, Westknolls, Cincinnati, Ohio 45211.

FINLAND 25 Different 5¢. approvals. Hijop, Box 505, Norristown, Pa. 19404.

FREE! Big Bargain Catalog—New Edition listing thousands of bargains including U.S. & B.N.A. stamps, packets, albums, accessories and supplies. Also, fine stamps from our approval service which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. E77PM, Jamestown, N.Y. 14701.

## COINS, TOKENS, CURRENCY

SILVER Dollars uncirculated, 1878-79-80-81-82 S mint \$3.00 ea. Illustrated Catalogue 50¢. Shultz, Salt Lake City, Utah 84110.

SIXTY-EIGHT Page current listings COIN BARGAINS only 25¢. RARCOA, 31-A Clark, Chicago 60602.

U.S. List plus 54S cent 10¢. Schultheis, (Devonshire) New Hyde Park, New York 11040.

40 PAGE Illustrated United States and Canadian coin list 25¢. Stoney, 260 Washington, Boston 8, Mass.

EAGLE Cent \$3.90; Ten Indianheads \$2.90; (all four \$9.90) Nelson Exchange, 346-R, Rye, New York 10580.

SPECIAL Scarce Date Jefferson Nickels. All V.G. or better. Satisfaction guaranteed. 1944S—1946S—1948S—1958 30¢ each. 1942D—1949S—1950 50¢ each. 1943D—1951S—1955 75¢ each. 1938D—1939S—\$1.40 each. 1938S—\$3.00. 1939D—\$5.00 1950D—\$14.50. Dates not listed 20¢ each. Bryson Inc., 612A White, Toledo, Ohio 43605.

TRUNKFUL 25,000 Indian-Lincoln cents from the 1920's and older, mixed "grab-bag" style. 150-\$10. Sample bag of 20-\$2. Mrs. Fischer, Box 5490-X, Sherman Oaks, Calif. 91413.

TEN WARTIME SILVER nickels, \$1.65. 28 Lincolns 1909-1939, \$1.65. 22 "S" Lincolns, including 1955S, \$1.65. 10 "S" Jeffersons, \$1.65. 10 "S" Roosevelts (1946S-1949S complete), \$2.95. All Different. GUARANTEED. Buy four units, 1943PDS steel cents given Free. HARRIS, 4535-P, Stevenscreek, Santa Clara, California 95050.

LINCOLN Cent 1943-S, 10¢ with free list. Stevens, Box 212 F, Plainview, New York 11803.

LINCOLN Sale: 1909VDB-1939DS Mints, Thirty Different \$2.00. Fifty Different \$4.95. 22 Different "S" \$1.30. 1955S, 1939D, 1938DS, 1927S, 1916S, 1915D, 45¢ each. Gemcoin's, Box 4533M, Minneapolis, Minnesota 55426.

BARGAINS—Indian Head Cents, 15 different \$4.95. 50 mixed dates \$12.95. 1961-1962-1963 Proof Sets, each \$6.65. 1968 Redbook \$1.95. Bebee's, Incorp., 4514 North 30th, Omaha, Nebraska 68111.



TEN Different Indianheads \$2.75. Five V-Nickels \$1.25; 100 Different Lincolns \$4.85; 20 Different Buffalos \$3.95; Downeycoin, 7848-M Florence, Downey, California 90240.

100 DIFFERENT Lincoln cents, at least 21 S-Mints, 1909, 1910, 1912, 1913, 1916D, 1917D, 1933, 1943P&D, 1954, 1955S and other valued dates; an excellent buy at \$7.95; Madison International Coin Exchange, Inc., N27, Madison, Conn. 06443.

LINCOLNS Good and better: Pick ten different \$2.00—1921S, 1955S, 1916D, 1954, 1909, 1911, 1917D, 1918D, 1919D, 1920D, 1920S, 1921, 1925S, 1926D, 1927D, 1928D, 1929D, 1929S, 1930D, 1930S, 1931, 1934D, 1935S, 1936D, 1943D, 1943S. Or take all 26 coins for \$4.50! Martin's, 36M East Broadway, Tucson, Arizona 85701.

BUFFALO Nickel assortments with at least 20 to 30 different dates in teens, 20's, 30's, including mint-marked. Bag of 50 mixed \$8.85; 100 mixed \$16.65; 200 mixed \$29.75; Madison International Coin Exchange, Inc., N27, Madison, Conn. 06443.

SILVER Dollar \$1.90; 2c Copper \$2.10; 3c Nickel \$2.25. Terrific List! Fairway, 121-M Rye, New York 10580.

27 Different Jefferson nickels with dozen S-Mints, 39S, 55, 51S, complete wartime silver nickel set, average circulated to uncirculated; compare anywhere at \$5.95; Madison International Coin Exchange, Inc., N27, Madison, Conn. 06443.

SILVER Dollars, uncirculated rolls of twenty, \$41.50 each. Circulated rolls \$33.50 each. Bill's Coins, 3166 16th St., San Francisco, Calif. 94103.

COINS. Coin gifts, coin jewelry. Free brochure. U.S. Silver Dollars mint condition from old Carson City mint, coins dated 1878 CC \$15.00 ea. Danny Crabb, 13782 Victory, Van Nuys, Calif. 91401.

LARGEST Coin magazine, 200 pages 50¢. Scrapbook, 7320-J Milwaukee, Chicago 60648.

### ANTIQUES, RELICS, INDIAN GOODS AND CURIOS

ARROWHEADS, 10 for \$3.00. List free. Hyde's, Box 1788, Santa Fe, New Mexico 87501.

ANTIQUES! Monthly magazine. Sample 25¢ or free circular. Antiques Journal, Uniontown, Penna. 15401.

SELLING 20,000 Ancient arrowheads, spearheads, etc. List free. Lear's Glenwood, Arkansas 71943.

ARROWHEADS 10 For \$3.00. Free list. Nowotny's, 8823 Kenney, San Antonio, Texas 78230.

FROM APACHELAND—Polished Apache Tear stones—3 for \$1.00. Apache Gem, Box 2485, Tucson, Arizona 85702.

TONS Of antique gun parts and supplies. All reproduction muzzle loading guns. Send \$1.00 for enlarged illustrated catalog No. 116-A. Dixie Gun works, Union City 12, Tennessee.

MEN, EARN \$12,000 to \$16,000 a year. Big profit antique business at home spare time. Write free booklet American Institute of Antiques, 550-5th Avenue, New York, Dept. PM-77.

10 PERFECT Arrowheads \$3.00. George Smith, 9825 Conway Drive, Indianapolis, Indiana 46236.

### MODELS—SHIPS, TRAINS, PLANES, ETC.

SHIP and yacht model fittings: Pine construction hull kits: blueprints. Send 50¢ for illustrated catalog. A. J. Fisher, Inc., 1002 Etowah Avenue, Royal Oak, Michigan 48067.

SHIP Models. Kits, fittings, plans, books, tools, engines, motors. Big illustrated catalog. 50¢. James Bliss & Co., Dept. SM, Route 128, Dedham, Mass. 02026.

RIFLE: WINCHESTER, GARAND M-1, SPRINGFIELD, or M-14. Genuine Black Walnut Stock, calf leather sling, precision-fit metal parts. Exact scale models can be completely field stripped. Made in U.S.A. \$3.98 each Postpaid. MAJIX KITS, P.O. Box 594, Dept. PM, Cardiff, Calif. 92007.

SHIP Model kits and fittings: clippers, frigates, etc. Catalog paint-tool list, book list, 40¢. Model Shipways, Box 65, Bogota, N.J. 07603.

SHIP Models catalog 15¢. Scientific, Inc., 100 Monroe, Newark, N.J. 07105.

ROCKETS: Real flying models—flights up to 2500 ft. New illustrated catalog 25¢. Single and multistage kits, cones, engines launchers, trackers, rocket aerial cameras. technical information. Fast service. Estes Industries, Penrose 2, Colorado 81240.

BUILD Rocket engines! Send for illustrated book "How to Design, Build and Test Small Liquid-Fuel Rocket Engines." \$3.50. No COD. Rocketlab, Dept. PM-7, P. O. Box 5636, China Lake, California 93555.

HO Flying Brakeman (TM) jumps on and off running train! Station, caboose, switches and brakeman, \$7.50 Prepaid. Herman Enterprises, 6604 N. Whipple, Chicago 60645.

BUILDING Materials, 1/4" & 1/8" scale, windows, doors, siding, roofing, lumber and structural shapes. Send 35¢ for catalog with samples. Small Sales Co., 6025 Martway, Mission, Kansas 66202.

### GAMES, TOYS, NOVELTIES

FASCINATING Word game for one to one million players. Postpaid one dollar. Palabra, Squaw Valley, Calif. 93646.

### MAGIC TRICK, PUZZLES, JOKER NOVELTIES

LATEST World famous giant surprise catalog!! 1000 Professional tricks, magic jokers!! 164 pages!! 25¢. House of 1000 Mysteries, Dept. PM7C, Ft. Lauderdale Florida 33308.

NEW EDITION, 1967 Catalog of 500 Tricks, only 10¢. Fastest same-day service to magicians for 40 years. Send 10¢ today. DOUGLAS MAGICLAND, Dept. 21, Dallas, Texas 75221.

COMPLETELY Illustrated catalog, 84 pages, 25¢. Manhattan Magic, Box 334-M, N.Y.C. 10011.

FUN 'n Magic Catalog, 10¢. (1,500,399 tricks, jokes, novelties). Elbee, 7408-P, San Antonio, Texas 78207.

BE A Magician! Two booklets explaining sixty-eight tricks plus large professional catalog, \$1.00. Magic, Inc., 5082 Lincoln, Chicago, Illinois 60625.

MAGIC Catalog. World's finest. 3000 tricks. (340) pages \$2.50. Beginners, amateurs, professionals. Kanter's, A-200 South 13th St., Philadelphia, Pa. 19107.

FASCINATING Chinese puzzle real party teaser—3 for \$1.00. Box 345, Pen-ticton, B.C. Canada.

WORLD'S Finest professional magic tricks. Joker's Novelties. Giant illustrated catalog 10¢. Top Hat, Evanston, Illinois.

TEACH Yourself the Art of Magic. Magicians secrets revealed. Send 10¢ for our catalog of tricks and gags. "Fabulous Tricks and Magic," 3319 E. Charleston, Las Vegas, Nevada 89104.

GENII, THE CONJUROR'S MAGAZINE. Since 1936. 44 magic packed pages. By subscription only 3 month trial for \$1.00. P.O. Box 36068, Los Angeles, Calif. 90036.

VENTRILOQUISM! Information free! Dummy catalog. 25¢. State age, Maher, Studio G, Box 8536 Kensington Station, Detroit, Michigan 48224.

### BOOKS, PERIODICALS, NEWSPAPERS

BOOKS. Free general catalog. 60 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought, Est. 1902. Long's College Book Co., Dept. P.M., Columbus, Ohio 43201.

"UNUSUAL" Books! Catalogue Free! International. (PM), Box 7798, Atlanta, Georgia—30309.

FREE "The Laws of Prosperity," Prosperity, Box 542, Oakland, California 94604.

FREE Catalog. Self-help books. Write Wilshire, 8721 Sunset, Los Angeles 90069.

STOCKMARKET. List of paperbacks. One Dollar. Walter Kurz, Box 286, Kearny, N.J.

PROPHET Elijah coming before Christ. Wonderful book free. E. Megiddo Mission, Rochester, New York 14619.

HOW To setup a mailorder business \$1.00. Kel Enterprises, P236, Rockaway, N.J. 07866.

FREE List. Low cost books. Sex hypnosis, luck, golf, diet, thinking big, confidence and power. Lombardo Sales Co., Dept. PMJ, 411 So. 6th St., Steubenville, Ohio 43952.

FREE List self help books. Spears, Box 7336-M, Jacksonville, Florida 32210.

FREE List. Books on all subjects. Mason's, Box 7524-PM7, Detroit, Mich. 48209.

OUT-Of-print books at lowest prices! You name it, we find it! Fast service. No obligation. International Bookfinders, Box 3003-PM, Beverly Hills, Calif. 90212.

PERPETUAL MOTION JOURNAL Sample copy 35¢, information free. Room 110, 1616 South Compton, St. Louis, Missouri 63104.

INSTRUCTIVE And Informative Books: Success, Business, Health, Happiness, Money-making Opportunities, Traveling, Retirement. Free details. Sullivan's, Dept. 72, 103 Abbott, Lawrence, Mass. 01843.

FREE Catalog. Self-help books. Write International Enterprises, 440 S. Oxford, Los Angeles 18C.

FREE CATALOG HOW - TO - DO - IT BOOKS—Extensive lists all publishers, home improvements, furniture repair, gardening, boating, ceramics. Technical books may also be ordered. Handyman Books, Box 52A, Westbury, N.Y. 11590.

MAIL Sale Advertiser—Three months' subscription: 10¢! Robert Gross, 137-75 Geranium, Flushing, N.Y. 11355.

CHALLENGING! Different! Unusual books! Free catalog. Ruby's, D-26, Paradise, Pennsylvania 17562.

### PLAYS, STORIES, MANUSCRIPTS

WANT Your book published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PM, Vantage, 120 West 31, New York City.

BOOKLETS AND PAPERBACKS published. Send for free appraisal. Cisco's, Atlanta, Illinois 61723.

### BUSINESS OPPORTUNITIES

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMB Ensor Street, Baltimore, Maryland 21202.

ADDRESSERS And mailers needed. Send stamp for information. Lindbloom, 1508 West Erie, Chicago 60622.

SECRETS! Secrets! Mail order success revealed by internationally famous expert who discovered how to make home business fortunes. Beginners: Get free copy "How to Make Money in Mail Order." Discloses free advertising, profitable products, everything! No obligation. Write Mallico, 1554 Sepulveda, Dept. A707, Los Angeles 90025.

OPERATE Restaurant or diner. Free booklet reveals profitable plan. Write Restaurant Business School, Dept. EC-77, 1920 Sunnyside, Chicago, Illinois 60640.

IMPORT Export opportunity, profitable world-wide, mail-order business from home, without capital, or travel abroad. We ship proven plan, for no risk examination. Experience unnecessary. Free details, Mellinger, Dept. A707, Los Angeles 90025.

CLIP Newspaper items. \$1.60-\$5.00 each. Details free. Walter, Box 1360-PA, Erie, Pa. 16512.

FREE "Franchise Profit Letter" tells how unique NFR service is helping thousands seeking profitable businesses. Write today. National Franchise Reports, W-428, 333 North Michigan, Chicago 60601.



**OPERATE Home mailorder business.** Vozsack Printing, 4444A Ute, San Diego, Calif. 92117.

**PIANO Tuning** learned quickly at home. Tremendous field! Musical knowledge unnecessary. GI Approved. Information free. Empire School of Piano Tuning, Miami, Florida 33145.

**BOOKKEEPERS** Earn \$1000.00 month. Operate simplified Bookkeeping tax service. Universal, Box 664-M, Springfield, Missouri.

**\$200.00 DAILY** In your mailbox! Your opportunity to do what mailorder experts do. Free details. Associates, Box 136-A, Holland, Michigan 49423.

**BUILD** Custom cases at home for profit. Get orders by mail. We supply materials, instructions, everything. Free home business details. Customcase, 805CPM Sunset, Los Angeles 90012.

**400,000 BARGAINS** Below wholesale! Many free. Liquidations . . . closeouts . . . job lots . . . single samples. Free details. Bargainhunters Opportunities, Box 730A, Holland, Michigan 49423.

**START** Your own business on credit. Your own boss. Hundreds of dealers making \$100 to \$300 and more weekly. We supply stocks, equipment on credit. 300 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh, Dept. G-U-PPM, Freeport, Ill.

**VENDING** Machine big catalog. Rake, 523 A Spring Garden, Philadelphia, Pa. 19123.

**SELL** Advertising book matches. Write us today; we put you in business by return mail, handling complete line ad book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily! Superior Match, Dept. MX-767, 7530 S. Greenwood, Chicago, Ill. 60619.

**COPUBLISH** "Mail Sale Advertiser," leading mailorder paper. Copy and details 25¢. Vanroy Shirk, Lebanon, Pa. 17042.

**RAISE** Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio 43050.

**READ** Progressive Mailtrade, the magazine that tells how to make money by mail. Quarter brings sample and special offer. Mailtrade, P.O. Box 357, Sheboygan, Wis. 53082.

**\$400.00 MONTHLY** Raising giant fishworms. Soilless method. Charlie Morgan, Bushnell, Florida 33513.

**EARN** Money raising fishworms for us! Write: Oakhaven-38, Cedar Hill, Texas.

**LEARN** Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. A-114, 2251 Barry Avenue, Los Angeles, California 90064.

**DIFFERENT!** Outstanding Profits, high quality mailorder businesses. Complete setup service; not just instructions. Hermes Co., 152 West 42, New York City 10036.

**FREE** Catalogs. Repair air conditioning refrigeration. Tools, supplies, full instructions. Doolin, 2016 Canton, Dallas, Texas 75201.

**PROFITABLE** Catalog mailorder business! Vikari's, 835-PM, First Avenue, Salt Lake City, Utah 84103.

**BIG** Money raising fishworms and crickets. Free literature. Carter Farms, Plains Georgia 31780.

**SAWDUST.** Tin - cans, newspapers, 200 uses. Instructions \$1.00. Charles Company 42-GPW, Norwood, Ohio 45212.

**FREE BOOK** "990 Successful, little-known businesses." Work home! Plymouth-172G, Brooklyn, New York 11218.

**I MADE \$40,000.00** Year by Mailorder! Helped others make money! Start with \$10.00—Free proof! Torrey, Box 318-Y, Ypsilanti, Michigan 48197.

**\$60.00 DAY.** Manufacturing concrete posts. Carlayne, 1803 Fremont, Rapid City, South Dakota 57701.

**WORLD'S** Largest wholesale supply. Buy from 8753 American, European, Japanese wholesalers. Hongkong clothes, 123 dropship catalogues. Rockbottom prices. Automobiles. Free details. International Buyers, 216-MM West Jackson, Chicago, Illinois 60606.

**MAKE \$32.00** From 49¢ piece vinyl. PM-1834 Edgeland, Louisville, Ky. 40204

**PLASTERCRAFT** Molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Blue Rapids Supply, Blue Rapids, Kansas.

**SELL** Books by mail. 400% profit. Royal, Box 450-X, Cleveland, Ohio 44127.

**\$70.00 WEEKLY**—home, spare time. Simplified mail bookkeeping. Immediate income easy. Auditax, 34741A, Los Angeles 90034.

**"MAIL-Order** plan of the month." New service for those wanting their own Mail-Order Business. Free details. Volz-UN, Ypsilanti, Michigan 48197.

**MAKE \$46** from square foot plywood; jigsaw or bandsaw necessary. Free details. Woodar, Bridgewater, Mass. 02324.

**GIANT** Mail, Folio, magazines, opportunities. Merchandise 35¢. Daufeldt, Atalissa, Iowa 52720.

**\$15.00 HOURLY PROFIT-OWN** Business with one serviceman. Quickly learned. Easy to do. Operate from home. Few hundred dollars builds your own nationally advertised business while continuing present job. Investigate immediately. . . before your territory is taken. Free booklet explains everything. Send Today. Then decide. Duraclean, C7-164A, Duraclean building, Deerfield, Illinois.

**MODERN METHODS** Win 50% commission with personalized jewelry. \$2.00 for instructions and samples. Instant Sales Division, (NSC-G209) Charlotte Merchandise Mart, Charlotte, N. C. 28205.

**BIG profits**—Operating your own plastic laminating business with low cost equipment and supplies. Money making methods included. Money back guarantee. Jiffy—Box 23485P, Los Angeles, Calif. 90023.

**CONCRETE FACTS:** Highly profitable home business. Experience unnecessary. Unlimited unique pottery designs easily made without moulds. Birdbaths, fountains, wishing-wells, benches, etc. Chemical coloring formulas, marbling, FREE illustrated brochure. Hollywood Cementcraft, 602 Athens Street, Altadena, California 91001.

**BECOME** Tax consultant. Our students earn \$1,000—\$3,000 every tax season preparing returns evenings. Accredited, State approved, National Tax, Monsey 2DA, New York 10952.

**AMAZING** New way to own your own business. Send for Free copy. Modern Franchising Magazine, 1085-PM Walnut St., Des Plaines, Ill.

**MAKE** Money from old tires. Operators clearing \$600 weekly. Equipment costs \$1000. Get facts. S&S Patents, Inc., 3911 N. Damon, Chicago 60618.

**TRAIN** For solid high paying career in electrical repair. Practical equipment included. Free fact pack. I.T.I., Dept 65091, 815 E. Rosecrans, Los Angeles 90059.

**IMPORT-Export** business made easy. Complete setup. Not just instructions. Hermes, 152 West 42, New York City 10036.

**MAKE** Extra Money—show friends, neighbors—Gifts, Stationery, Christmas. All Occasion Cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas Card Album. Hedenkamp, 361 Broadway, Dept. PM-94, New York 10013.

**MAILORDER**—Business fundamentals. Hard-bound, permanent reference guide. For free brochure, write: Hetero-Books, Box 5187, Seattle, Washington 98107.

**\$1000.00 MONTHLY** Collecting delinquent accounts by mail. Continental Associates, 1004 Grand, Des Moines, Iowa 50309.

**\$3000 PER** Month and up in this fascinating business. Send for free details to Hillsdale House, Hillsdale, Michigan 49424.

**BUILT - IN** Vacuum cleaning offers ground floor opportunity in expanding, profitable new market. Sell and install VACUFLO . . . the industry pioneer. System easily installed in new or existing homes. Choice distributor and dealer territories still available. Build your own profitable business. Get the facts. Write: H-P Products, Inc., Louisville, Ohio. 44641.

**WANT** To make big money at home? \$10.00 profit in an hour possible with invisible mending. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1585 Howard, Chicago, Ill. 60626.

**MAILORDER**—Start with Gifttime's fabulous dropship color catalogs imprinted with name, address. Amazing bonus plan stimulates orders. Lists available. Free catalog, details. Gifttime, Dept. PM, 919 Walnut, Philadelphia, Pennsylvania.

**MEDICARE**—Social Security. Earn top fees assisting clients obtain maximum benefits. Accredited. National Tax, Monsey, 302DA, New York 10952.

**DRAFTSMEN**—Operate own drafting service! Free details: Roberts Drafting, 1741 Circle Road, Baltimore, Maryland 21204.

**HUGE** Profits! Mail order importing. Free information. ITIS-PM-5, Box 454, Hollywood, Calif. 90028.

**DOLLS** MAKE BIG MONEY! Start your own hobby-business dressing, making, repairing and selling dolls. Send for FREE booklet describing the excellent opportunities open to you. Doll Hospital School, Dept. D-321, 2251 Barry Avenue, Los Angeles, California 90064.

**MAILORDER** Book publisher wants dealers. Wonderful "drop-ship" proposition. Sample imprint circulars free. Neil H. Tasker, Shamokin, Pennsylvania 17872.

**SELL** Books by mail. 400% Profit. Emerson, 113-PM7, Middle, Santa Barbara, California 93103.

**MAILORDER IMPORTS.** Report reveals foreign drop-ship sources. World Trader's Digest. Ideal mailorder items. Send \$1.00. John W. Bennett, Dept. P-1, 10437 Lanark Street, Sun Valley, California 91352.

**MAILORDER**—Cash business. No merchandise investment. 65 products, drop-shipped. National Mdsers., 3408½ Motor, Los Angeles 90034.

**PROFITABLE.** Guaranteed mailorder business! Investigate! Long, 2501 Lippincott, Flint, Mich. 48507.

**MAKE** Money, copublish "Profitable Selling". Copy and details 10¢. Liberty Publishing, Desk 2, Box 576, Woodside, N.Y. 11377.

**\$200.00 WEEKLY** Spare time with home manufacturing. Start with \$10.00! Free Details! Wallin, Box 189-AG, Edmonds, Washington 98020.

**BOB FELLER** Has unusual distributorships. \$700.00 investment. Write: 32 Guilford Road, Aurora, Illinois 60538.

**HIGH** Profits, operating home mail project. Details free. Michael Boros, 311 Madison Avenue, Plainfield, New Jersey 07060.

**IMPORT OPPORTUNITIES!** Over 200 foreign suppliers advertise in each issue of Trade Magazine. Sample copy 25¢. Trade, POB 23, Winnipeg 8, Canada.

**START** Own profitable home import business. Lowest price sources, free details. Aubrey, Box 84-PM, Middletown, New Jersey 07748.

**WE** Need Ginseng growers! \$3000—\$25,000 annually. We buy your crop. \$2.00 brings seed sample and information. Glass' Ginseng Exchange, Dept. 13, Box 1969, Springfield, Mass. 01101.

**MOLD** Statuettes, novelties, artificial marble. Profitable business—start at home. Free details. Marbleizing, Dept. PM, 132 W. Lincoln, Collinsville, Illinois 62234.

**FRANCHISE**—Naugahyde and Vinyl Repairs. small investment. Write AMH Ind., Box 5386A, Santa Ana, Calif., 92704.

**SILK SCREEN** for Profit at Home, color pictures, signs, textiles. Detailed instructions \$2.00. Screenco, Box 862, Waukesha, Wisconsin 53186.

**INVEST** Only \$30. Earn good money with amazing new product mending naugahyde, vinyl, plastic. Free information. 13737 Somerset Road, Poway, California 92064.



**"MAILORDER WORLD OF OPPORTUNITIES"** Prints all kinds of bargains, new products sources. Send \$1 for your copy. Hall's Mailorder Supplies, Box 72146, Los Angeles, California 90002.

**HOW AND WHERE TO GET CAPITAL** Start or expand any business. Free details. Counselor-17, Harlingen, Texas.

**RETIRED MEN.** Make extra income selling printed forms (invoices, purchase orders, restaurant checks) to businesses. No experience necessary. Work when you please, full time or part time. Generous commissions. Catalog free. No investment. Write for details. KC Business Forms Co., 1016 Baltimore, Dept. PM, Kansas City, Mo. 64105.

**RADIO** Mail order. \$50,000 in one month possible. No cost percentage plan. Walthay Box 53M-7 Los Angeles 90032.

**PAINT** Signs, showcards. Easy instructions. \$2.00. Nuart, Box 86A, Oscoda, Mich. 48750.

**\$80.00 A Day!** Selling books by mail. Donkar, 1914A, La Cana, Hacienda Heights, Cal. 91745.

**BUSINESSES FOR SALE.** Nationwide listings. Write: Box 2091, Prescott, Arizona 86301.

**LIQUID** Molding rubber also liquid elastic. Free information. Chaney's, 5415-A San Jose Blvd., Jacksonville, Fla. 32207.

## MONEYMAKING OPPORTUNITIES

**AMAZING** Successes through franchises! Become exclusive franchise holder in your territory. Information rushed. National Franchise Reports, WP-528, 333 North Michigan, Chicago 60601.

**EARN \$500.00** Monthly clipping ads at home. No investment—experience. Free information, send stamp. American, Box 56, Muncie, Kansas 66057.

**RAISE** Rabbits and fishworms on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio 43050.

**MAKE \$100.00** Fast, assembling belts for profit. Redikut's, Loganville 40, Wisconsin.

**\$200.00 FROM** Sheet 1/4" plywood (scrap). Details 25¢. Novelties, 610 So. 24th, Elwood, Indiana 46036.

**BIG** Money raising fishworms and crickets. Free literature. Carter Hatchery, Plains, Georgia 31780.

**WHOLESALE** Magazine subscriptions. Highest commissions. Bonus! Box 151 TA, Woodmere, N.Y. 11598.

**CIGARETTES** — Make 20 filtertip or plain, king or regular, for 10¢. Facts free. Moberly, Box 953, Owensboro, Kentucky 42301.

**BIG** Money from paper scraps. Jackson, Box 7149, Oakland, California 94601.

**EARN \$240.00** a month at home, spare time, doing only two \$5.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1532 Howard, Chicago, Ill. 60626.

**VENDING** Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMM Ensor Street, Baltimore, Maryland 21202.

**HOUSEHOLD** And food products route. \$25.00 or more daily profit. Larger repeat orders. Man, woman. Full, part time. McNess, Freeport 26, Illinois 61032.

**LEARN** Junk Battery repairing secrets. "Fabulous Profits" at home. Details. Batteryman, Box 878, Palm Desert, California 92260.

**WATCH REPAIRING.** Swiss and American watches. Develop skill step by step in spare time at home. Diploma awarded. Free sample lesson. Chicago School, Dept. YTA, Fox River Grove, Ill. 60021.

**CLIP** Newspaper articles. \$2.00 each. Profitable circumstances. Instructions, send \$1.00 (Refundable). Lily, 42 Davidsons, Hinesville, Georgia 31313.

**MAKE** Extra Money—show friends, neighbors—Gifts, Stationery, Christmas, All Occasion Cards, Experience unnecessary. Salable samples on approval, free catalog, free name imprinted on Christmas Card Album. Hedenkamp, 361 Broadway, Dept. PM-96, New York, 10013.

**SPARE** Time money plan \$2.00. Dime brings details. PasAlex, P.O. Box 3, Summit Hill, Pa. 18250.

**EARN** Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle (1), Wisconsin.

**BECOME** Notary Public! Free particulars. Stationers Exchange, Box 4120-PM, Evansville, Indiana 47711.

**MONEY** Paid for homework. Free particulars. Lucky, Box 145 Inglewood, California 90306.

**CLIP** Newspaper items. \$1.00-\$5.00 each. Details free. Walter, Box 1360-P, Erie, Pa. 16512.

**SHARP** \$\$\$ Opportunity! One low-cost machine sharpens—serrates knives, scissors, pinking shears. Earn \$6-\$9 hourly in spare time. Professional results without experience. Free details. Beaver Grinder, 357 C Nielsen Bldg., Eugene, Oregon.

**INSTANT** Money! Plastics are the wave of the future. Big profits now! At home! Spare time! Materials costing 11¢ bring \$2.58 profits immediately! Free information! Rush name on postcard to: Warner, 1512 Jarvis, Dept. CL-2-HT, Chicago 60626.

**START** BIG-PAY Business at home in spare time. No experience needed to operate little table-top machine for bronzing baby shoes. Make \$7.32 profit on every pair. Full particulars free. Send postcard to: Mason, 1512 Jarvis, Room CM-2-HT, Chicago, 60626.

**OVER \$16.50** an hour. Spare Time at home! Rubber Stamp industry needs small manufacturers. We furnish all equipment and know-how! Particulars Free! Write: Roberts, 1512 Jarvis, Room CR-2-HT, Chicago, 60626.

**MANUFACTURER** Offers quality line of automotive chemicals. High profits, repeat sales, choice territories open. Write for catalogue and details. CLEANBRIGHT, Dept. 207, 2202 Folin St., Bronx, New York 10457.

**SELL** Your photos. Report tells how, where. Only \$1.00. Jacquelin's of Alvin, 406 East Foley, Alvin, Texas 77511.

**DIRTY** Business can make you filthy rich! For information send \$1.00 to: Hamlin, 316 Leonard St., Matty Dale, N.Y. 13211.

**NEED** Money? Our unique catalog (the only one like it anywhere) shows 92 ways to get it. Rush 25¢ for your copy and receive something different. Banner Sales, Box 67, North Manchester, Indiana 46962.

**"HOW** To make money in mail order!" Priceless rules for beginners—\$1.00. Literature free. Frantil Publications, 512-PM O'Kelly Drive, Ingleside, Ill. 60041.

**JANITOR SERVICE**—How you can make \$500 per week. Complete book on sales, service, contracts and pricing. Never before published. \$5.00. C & B Research, Box 1664, Ft. Worth, Texas.

**MAKE** MONEY MY WAY—send 25¢ and a stamped addressed envelope to: Hall's Mailorder Supplies, Box 72146, 9518 Croesus Avenue, Los Angeles, California 90002.

**WIN** Contests, cash, merchandise. Free details. Michael Boros, 311 Madison Avenue, Plainfield, New Jersey 07060.

**HOMEWORKERS** Wanted! New directory of information on 200 companies seeking parttime workers. Save time and money finding right opportunity. \$2.00. Quest Enterprises, Box 6029, Dept. 17, San Jose, California 95150. SATISFACTION GUARANTEED.

**SPARE** Time money plan. Free details. Don't delay—write us today. Walker Co., Box 8316, San Marino, California 91108.

**NOW!** 92 MONEYMAKING OPPORTUNITIES! Unique catalog (the only one of its kind) just published!! Rush 25¢ today! Gemini House, PM77, 62 Kail Street, Buffalo, New York 14207.

**QUICK** Money! Are your throwaways valuable? Booklet of 501 valuable collector's items. \$1.00. Collectors, Box 43, San Marcos, California 92069.

**MAKE** MONEY! booklet "YOU CAN EARN HOME PROFITS" tells how, money-making ideas, 35¢. Buck, Rio Dell Tr. Ct., Sp. 29, Rio Dell, California 95562.

**Make** Big money fast! \$1,000.00 in 60 days possible. It's easy taking orders for Dwarf, Standard fruit trees, roses, ornamentals, etc. Price earned \$7,118.90 first year! Color Outfit Free! Stark, Desk 30178, Louisiana, Missouri 63353.

**I** WORK HOME—MADE \$10,000 LAST YEAR! Free details. Ventures - 4, Harlingen, Texas.

**\$250.00** AVERAGE Commission clipping items for us. Unlimited earnings possible. Only investment \$1.00 for complete information. Financial, Box 1451-PM, Natchez, Miss. 39120.

## PROFITABLE OCCUPATIONS

**SHARPEN** Scissors, Pinkers. Inexpensive equipment, tools, supplies. Blackhawk's, Sheldahl, Iowa 50243.

**BECOME** A mortgage broker, earn \$10,000 to \$50,000 a year. Details free. United, Box 6284-C, Marietta, Georgia 30060.

**YOUR** Own sign shop—Signs, 1017 W. Mulberry, Springfield, Ohio.

**RAISE** Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio 43050.

**AUCTIONEERING** — Resident & home study courses. Veteran approved. Auction School, Ft. Smith, Arkansas.

**CHROME** Plating. Instructions, equipment and supplies. Platers' Supply, P.O. Box 565, Lugo Station, Los Angeles, Calif. 90023.

**FREE** Book "990 Successful, Little Known Businesses," Work Home! Plymouth-17G, Brooklyn, New York 11218.

**BIG** Money raising fishworms and crickets. Free literature. Carter Wormery, Plains, Georgia 31780.

**FREE** Facts and descriptive bulletin. Be an air conditioning, refrigeration, and heating serviceman. High pay, jobs open everywhere, operate your own service business, no school or correspondence necessary. Write Doolin, Trouble Shooter, 2016 Canton, Dallas, Texas 75201.

**INVESTIGATE** Accidents: Average earnings of \$5 to \$8 an hour—full or spare-time. No selling. No previous experience necessary. Learn to earn in your spare time. Write for Free book. No obligation. No salesman will call. Universal Schools, CPM-7, 6801 Hillcrest, Dallas, Texas 75205.

**BUILT - IN** Vacuum cleaning offers ground floor opportunity in expanding, profitable new market. Sell and install VACUFLO . . . the industry pioneer. System easily installed in new or existing homes. Choice distributor and dealer territories still available. Build your own profitable business. Get the facts Write: H-P Products, Inc., Louisville, Ohio 44641.

**MAKE** \$1,000.00 CASH for yourself at home! Dynamic proven plan with used clothing. Be first, operate anywhere. Rush \$5.00 for complete program. Jeanne V. Trest, 4303 Chalfonte Drive, Columbus, Georgia 31904.

**EARN** \$240.00 A month at home, spare time, doing only two \$5.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1586 Howard, Chicago, Ill. 60626.

## SALESMEN—DISTRIBUTORS

**\$200.00** WEEKLY. Every business and professional man has No-pay accounts. Send them to us for collection. We pay you for each name listed. No collecting. Dept. PM-12 General Finance Company, Pickwick Bldg., Kansas City, Mo. 64106.



**EARN Big Commission full or part time.** Show America's largest line low priced Business Printing and Advertising Specialties. Plus calendars in season. No experience. No investment. No collections or deliveries. On-the-spot commissions. Big Free Sales Kit samples hundreds items used daily by businessmen. Merchandise bonuses for you. Free gifts for customers. Build profitable repeat business. Start now. National Press, Dept. 70C, North Chicago, Ill. 60064.

**SELL Advertising book matches.** Write us today we put you in business by return mail; handling complete line ad book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily. Superior Match, Dept. M-767, 7530 S. Greenwood, Chicago, Illinois 60619.

**\$1,000.00 A MONTH For making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher.** Chemical used by Airforce snuffs out fires instantly. Only \$4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 East 32nd, Dept. P-67-N, New York 10016.

**NEW Plan! Pays up to \$25.00 an hour!** Little as 4 hours weekly. Place Thriftie self-service displays in stores. No cost to merchant. No experience needed. Free details. Lux Company Incorporated, Dept. 340, Elkhart, Indiana 46514.

**SELL Hertel Bibles—Part Time.** Finest reference Bible available. Demonstrator and supplies furnished. Excellent commissions. Write International Book, Box 118 PM, Wichita, Kansas—67201.

**NEGRO People buy on sight. 100% profit.** Nationally advertised cosmetics. Free sample offer. Valmor, Dept. GD, 2411 Prairie, Chicago 60616.

**GET New shirt outfit free! \$90 weekly on 5 average orders a day.** Famous quality made-to-measure dress and sport shirts at \$4.95 up, sell to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 719, Terre Haute, Indiana 47808.

**3 WONDER Money-Makers.** Auto Transmission Tonic, Softweld Solder, Self-Fluxing Aluminum Solder. Tremendous sellers, steady repeats. Free selling facts. Guaranteed. Weldtite, 120-B North Fourth St., North Wales, Pennsylvania 19454.

**MAKE Extra Money! Introduce New MIRACLE CANTRECE Nylons** at 69¢ a pair. Guaranteed Never To Run. We show you how. Supply big outfit and sample stocking free. Spare-time cash year-round. It's easy. Write American Mills, Dept. 145, Memphis, Tenn. 38101.

**NEW Car thief signal.** Lightning seller. Samples for trial. NORTHWEST ELECTRIC, Ave. 274, Mitchell, S. Dak. 57301.

**JOIN An established firm.** Over 30 years with Calendars and advertising specialties. Bonuses—prizes—free pens. Fleming, 6535-A Cottage Grove, Chicago 60637.

### AGENTS WANTED

**ESTABLISH Your own business.** Low prices on used clothing, shoes, household goods. Unlimited profits. Free catalog. Northwestern Distributors, 2129 No. Western Avenue, Chicago, Illinois 60647.

**PRINTING.** Advertising Salesmen—Excellent moneymaking sideline selling Decalcomania Name Plates, small quantities. Advertising Specialties, sign letters. Free Samples. Raico XL, Boston, Mass. 02119.

**MAKE Extra Money—show friends, neighbors—Gifts.** Stationery, Christmas, All Occasion Cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas Card Album. Hedenkamp, 361 Broadway, Dept. PM-94, New York, 10013

**CHRISTMAS CARDS — Business and Personal.** Customer's name imprinted. Earn unusually high commissions from this medium- and high-priced line. No investment. No inventory. Free sample album. Process Corp. (our 46th year), 3454 S. 54th Ave., Chicago, Ill. 60650.

**MAKE \$50.00 Daily** selling air-operated vacuum cleaners to service stations. Free details. Inka Industries, 2401 Crocker, Houston, Texas 77006.

**YOUR Own business—Used suits \$1.50; overcoats 65¢; mackinaws 35¢; shoes 12½¢; ladies coats 30¢; dresses 15¢. Enormous profits.** Catalog free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago Ill. 60608.

### EMPLOYMENT INFORMATION

**AUSTRALIA Wants You!** Good pay. Adventure, government paid transportation allowance! Send \$1.00 for Australian opportunities Handbook. International Services, Box 12-A7, Greenfield, Indiana 46140.

**AUSTRALIA Wants You!** Government assisted passage. Unlimited Opportunities. Latest Government Information \$1.00. Austco, Box 3623-E, Long Beach, California 90803.

**BOOMING Australia** needs your skills! Government assisted passage. Details, \$1.00. Irv Heyer, 1117A S.W. Columbia, Portland, Ore. 97201.

**FOREIGN And USA job opportunities** available now. Construction, all trades. Earnings to \$2,000.00 Monthly. Paid overtime, travel bonuses. Write: Universal Employment, Dept. C-1, Woodbridge, Connecticut 06525.

**FOREIGN Employment.** Construction, other work projects. Good paying overseas jobs with extras, travel expenses. Write only: Foreign Service Bureau, Dept. PM, Bradenton Beach, Florida 33510.

### HELP WANTED

**GAS APPLIANCE SERVICEMEN:** No experience necessary, will train. 52 weeks work guaranteed annually including paid vacations and holidays; insurance; opportunities for promotion; most manager started as servicemen. Apply manager, Baltimore, Boston, Chicago, Cincinnati, Cleveland, Columbus, Detroit, Los Angeles, Philadelphia, Pittsburgh, St. Louis, San Francisco, Washington, D.C. offices (we're in phone book). GAS CONSUMERS SERVICE.

**OVERSEAS Jobs—Europe, South America, Far East, etc.** 2,000 openings in all trades. Construction, Office Work, Sales, Engineers, etc. \$400 to \$2,500 month. Expenses paid. Free information, write Overseas Jobs, International Airport, Box 536-M, Miami, Florida 33148.

**FOREIGN EMPLOYMENT—Australia, Europe, South America, Far East, Etc.** Openings in all trades and professions—\$400.00 to \$2,500. Monthly. Free information—Write Foreign Employment Mart, P.O. Box 2235, Airport Mail Facility, Miami, Florida 33159.

### FARMS—REAL ESTATE

**U.S. And Brazilian Land . . . low as 40¢ acre!** Free details! Land Digest, Box 11071-GP, Indianapolis, Indiana 46201.

**\$1 ACRE—Canadian Border—hundreds campsites, islands, farmlands,** directly from tax authorities. (Non-profit). Lists, photographs mailed. Register, Room 303, 110 Church Street, Toronto 1, Canada.

**CANADA'S Finest lands.** \$4.00 an acre and up. Acquired through estate liquidations. Suitable for hunting, fishing, camps, cottages, farming, timber, minerals, investment. Small monthly payments. Free descriptive booklet. Canadian Estate Land, 194 Wilson Ave., Suite 101, Toronto, 12, Canada.

**CENTRAL Ontario—Choice 640 acre Sportsmen's paradises** still available—\$2.00 plus \$6.50 taxes yearly. Maps, pictures, \$2.00 (Refundable). Information Bureau, Norval 4, Ontario, Canada.

**FREE! Big 180 page Summer CATALOG!** Thousands of properties described, pictured—Land, Farms, Homes, Businesses—Waterfront, Recreation, Retirement. Selected Best thruout the U.S. 67 Years' service, over 500 Offices, 37 states Coast to Coast. Mailed FREE from the World's Largest! STROUT REALTY, 60-RX E. 42nd St., NY, NY 10017; 7-RX S Dearborn St., Chicago, Ill. 60603; 521-RX E. Green St., Pasadena, Calif. 91101.

**CANADIAN Vacation lands:** Full price \$385.00, 40 acres, \$10 month. Suitable cottage sites, hunting, fishing, investment. Free information. Land Corporation, 3768-C Bathurst, Downsview, Ontario, Canada.

**BUY Without risk for Retirement, Vacation, or Investment—under America's only "No-Risk Purchase Plan"—in Carolina Coast multi-million dollar, 14,000-acre development.** 10 year moneyback guarantee. Payments less than \$5.00 monthly. Shopping Center, Motel, hunting, fishing, golf, country club, right on property. Private ocean beach. Write for free literature. (Not offered to residents of California, Florida, New York.) Boiling Spring Lakes, Southport 1-J, North Carolina 28461.

**FREE!!!! Illustrated 168-page CATALOG!** Describes hundreds of farms, ranches, homes, businesses, vacation, retirement and waterfront properties coast to coast! Specify type property and location preferred. Zip code, please. UNITED FARM AGENCY, 712-PM West 47th St., Kansas City, Mo. 64112 Plaza 3-4212.

**CENTRAL Ontario—Choice 640 acre Sportsmen's paradises** still available—\$20.00 plus \$6.50 taxes yearly. Maps, pictures, \$2.00 (Refundable). Information Bureau, Norval 4, Ontario, Canada.

**FREE For the asking—Special summer bargain list of farms, ranches, recreational, retirement and investment properties.** Safe-Buy Real Estate Agency, 712-PM West Third, Little Rock, Ark. 72203.

**FREE! Real Estate catalog!** First edition! Farms, ranches, business, recreational and investment property. BANNER Adv., P.O. Box 3333 GS, 19A, Springfield, Mo. 65804. "Real Estate Our Specialty".

**CANADIAN Lands, seized and sold for taxes.** Our 50th annual series of lists, describe many choice properties, situated from coast to coast, acquired by us through Tax Sale. Priced as low as five dollars per acre, guaranteed perfect title, small monthly payments, no mortgage. Beautifully situated hunting and fishing camps, where there is real sport; summer cottage sites, heavily wooded acreages. Now is the time to invest in Canada's minerals, forests and farms. Write today for free twenty page booklet with full explanation. Tax Sale Service, Room 301D, 85 Bloor St., East, Toronto 5, Canada.

### FARM AND GARDEN EQUIPMENT

**NEW REVOLUTIONARY GARDEN HOSE NOZZLE.** At last—a guaranteed leakproof nozzle. Brass, powerful adjustable spray-mist to jet stream. \$2.29 PP. T-BAR, 5259 Cherry Ave., Long Beach, California 90805. DISTRIBUTORS WANTED.

### FLOWERS, PLANTS and NURSERY SUPPLIES

**WANT Greatest cash crop** working for you? Write Ginseng, Asheville 53, N.C.

### HOME CRAFTSMEN

**FREE!!! Copyrighted, illustrated, document** reveals 4 ways mitering picture frame moulding. Distinctive, original designs, moulding available. Inexpensive. Write. Expect the unexpected. Japs, 126-P, Seventh North, Hopkins, Minnesota 55343.

**WALNUT And Cherry tapered legs, lumber, gunstock blanks, picture frame moulding.** Midland Lumber Company, Box 262, Savannah, Missouri 64485.

**FREE! Big 80 page Leathercraft catalog.** 100's of new items! MacPherson Bros., Dept. K, 730 Mission St. San Francisco, Calif. 94103. Please include your Zip Code.

**FOUNDRYETTE 2400" F., 1½ to 48 lb. capacity.** Descriptive circular, send 10¢ for postage. Kansas City Specialties Co., Dept. P-7, 2805 Middleton Beach Road, Middleton, Wisconsin 53562.

**SKIL-CRAFTS New 200-page '67-'68 Catalog.** Largest selection of Leathercraft, Artist, Hobby and Craft Supplies from one source. Send 50¢ (refunded with first \$5 minimum catalog order). Skil-Crafts, Box 105-P, Joplin, Missouri 64801.



**WOODWORKING** Catalog and Manual 25¢. Plus free "101 Project Ideas." World's most beautiful veneers, lumber, plywood! Wood finishing, upholstery supplies. Cane. Lamp parts. Furniture hardware. Animal whittling blocks, 2,000 workshop products. Constantine, 2051-K Eastchester Road, Bronx 10461.

**CABINETMAKING MADE EASY** and "How to Make Formica Counter Tops," two excellent guides let you build kitchen cabinets and counter tops like professionals. Extraordinary guides bring master craftsmen's shortcut methods. Satisfaction guaranteed. Write: Japs, 126-P Seventh North, Hopkins, Minn. 55343.

**AMAZING** Carved flexible moulding. Brochure, 10¢. Free sample. Artiron Inc., 4120 Sepulveda Blvd., Culver City, California 90230.

**FREE** Popular Mechanics 16 page illustrated catalog of publications, plans and projects. Booklet covers an extremely wide variety of do-it-yourself data on home remodeling, shop tools and machines, car repair, hobbies, crafts, boating, games, lawn and garden and hundreds of others. For your free copy write to Service Bureau, Dept. PE, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022.

## UPHOLSTERY

**LEARN** And earn. New upholsterer's handbook in hard cover takes you step by step with easy to follow instructions and illustrations. Teaches you a profession in your spare time. Send check or money order for \$3.50 to Aanstac, Inc., Dept. 27, 111 Harrison Ave., Harrison, N.J. 07029. Free supply catalog with order.

## DO-IT-YOURSELF

**WATER!!** Amazing new \$175, machine drills wells to 200' deep. Information \$1.00. Refundable. Deeprock Drilling Company, 111 Trafco, Opelika, Ala. 36801.

**LAMP MAKING**—Parts list; basic instructions for lamp making, repair. Also wiring Kerosene lamps, \$1.00, no stamps. Craftsmen's, Box 2276-P, Loves Park, Ill. 61111.

**HOME** Refrigeration and Air-Conditioning. First lesson free. Little Giant Study Course, 5885 Cates, St. Louis, Mo. 63112

**NEW**—Miracle Mix Instant auto polish. Cleans, waxes, polishes in one quick operation. Cleans glass, stainless steel, aluminum. Gives brilliant lasting lustre; coin collectors try it on old coins. A good all purpose metal polish. 2½ quart size \$2.80 prepaid. National Products Co., 33 Hillside Ave., Hillside, Ill. 60162.

**BUILD** Your Own Home, addition, vacation house and save. Fascinating, rewarding hobby. Free how-to information, booklet. Do-it-yourself Homebuilders, 22 Timberlane Monee, Illinois 60449.

**FIRE** And burglar alarms, easy and inexpensive. Copyrighted instructions \$1.00. Fred Ondo, 2453 Ridgewood, Highland, Indiana 46322.

**FAMILY** Hair trimmer—1.00 refundable. National Laboratories, Box 1531, St. Petersburg, Florida 33731.

**REFRIGERATOR** Door gaskets. Send make and model for cost, Box 5145, Hamden, Conn. 06518.

**SAVE** Money on NAUGAHYDE and Vinyl repairs Amazing New Liquid VINYL REPAIR is the answer.—Cuts, Holes and Burns can be repaired by you. Send \$1.00 AMH Industries, Box 5386A, Santa Ana, Calif., 92704.

**POUR YOUR OWN SEAMLESS FLOOR, WALLS, COUNTERS,** etc. Write for details or send \$10.00 for trial kit. Everything furnished. Guaranteed. Dur-A-Flex, Inc., Dept. PM2, 269 Franklin Avenue, Hartford, Conn. 06114.

**WATER**—Drill your own well. Easy illustrated instructions, \$2.00. Guaranteed. Butler, Box 67H, East Longmeadow, Mass. 01028.

**BUILD** Your own swimming pool. Easy instructions, illustrated. \$2.00. Guaranteed. Garden House, Box 67M, East Longmeadow, Mass. 01028.

**AUTOMATIC** Washer repair manuals any make, model. 13 Different manuals, \$2.75 each postpaid. Dryer repair manuals for G.E. Kenmore, RCA Whirlpool, \$2.75 each postpaid. Major Appliance, 13108 Caine Ave., Cleveland, Ohio 44105.

## ARTS AND CRAFTS

**2500 DIFFERENT** Plastic molds, figurines, crafts. Catalog 25¢. Steece Bros., Box 177-PM, Sioux Falls, So. Dak. 57101.

**FREE** Book—How to make gold charms and rings, 25¢ Handling. Sedco, Box 291-A, King of Prussia, Pa. 19406.

**MAKE** Figurines, plaques, lawn ornaments. Molds, plastercraft kits, liquid rubber. Sample and catalogue 10¢. Wooley Company, Box 29-B, Peoria, Illinois 61601.

## BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

**BINOCULARS** Direct from manufacturer. Finest quality, tremendous savings! Request catalog. Koyu, 3860 Crenshaw Blvd., Los Angeles, Calif. 90008.

**REFLECTOR** And refractor telescopes, kits, tripods, etc. Free catalog. Suffolk Science, Mattituck, New York.

**SCIENCE** Bargains! Lenses, telescopes, binoculars, microscopes, kits, parts, war surplus. Send \$1.50 for beginner's 10-lens kit with instruction booklet. Order Stock 2-CH. Request free 148 page Catalog CH. Edmund Scientific Co., Barrington, New Jersey. 68007.

**BINOCULAR** Sale! Free color catalog 100 models \$9.95-\$250.00. Write, United, 9043 So. Western BCAT-7008, Chicago 60620.

**ILLUMINATED** Stand magnifier \$9.95 postpaid. Columbus, 717 East Pike, Seattle, 98122.

**WORLD** Famous "Dynascope" Telescope. Build your own reflector telescope; mirrors, eyepieces, tripods, accessories. Request free brochures. Criterion Manufacturing Dept. PP 8, Hartford, Connecticut 06101.



## CAMERAS AND EQUIPMENT

**CATALOG** Of Photography Books, 25¢. Search Service, A. Wilson Embrey, III, Photo Books, Fredericksburg, Va. 22401.

## PHOTO SUPPLIES

**SURE-FLASH** everytime, camera contact coating, \$1.00. Some associate manufacturers needed. Details, Box 9403, Fort Lauderdale, Florida 33310.

## PHOTO FINISHING

**A FREE** Kodak roll returned with each black and white or Kodacolor developed and printed, fast service, lowest prices, guaranteed quality send for free mailers. Economy Photo Service, Dept. P.M., Box 1111, Albany, N.Y. 12201.

**FREE** Film! Quality service, custom finishing, rapid! Send for bags. Quality Photo, Box 212, Downingtown, Penna. 19335.

**CAMERA** Fans! Expert photofinishing and free film returned: 8MM Kodachrome \$3.10; 8 Exp Kodacolor \$3.10; 8 exp black & white 90¢. We give you free photo stamps to redeem for gifts. Satisfaction guaranteed. Send exposed film or request mailers and complete price list. Direct Mail Photo, Box 8352-PM, Pittsburgh, Pa. 15218.

**SPECIAL WITH THIS AD**—Kodacolor developed 8 prints \$1.75; 12 prints \$2.25. Black & white developed 2 prints each Jumbo size 8 exposures 50¢—12 exposures 70¢. "For the month of June only". LENS PHOTOS, Dept. J-4, Janesville, Wis. 53545.

**FAST, Hi-quality** finishing. Kodacolor rolls: eight jumbo prints \$1.98. Twelve \$2.49. Twenty \$3.49. Reprints 15¢. Also low B&W prices. Custom Quality Studio, Box 4838-PM, Chicago 60680.

**PHOTOGRAPHY FOR PLEASURE** or profit. Learn at home. Practical basic training. Long established school. Free book. American School of Photography 835 Diversey Parkway, Dept. 674-017, Chicago, Illinois 60614.

## COLOR SLIDES

**FREE** 35MM Color Slide Catalog. Newest worldwide coverage in depth. Thousands exclusive. Wolfe, Dept. 1477, Los Angeles, California 90025.

## MOTION PICTURES AND SOUND EQUIPMENT

**8MM. MOVIES**—2"x2" Color Slides—biggest selection anywhere! Hollywood classics, great comedians, railroads, automobiles, trolleys, wars, travel, wild life, circuses, many others! 16mm. films also. Big catalog free! Blackhawk Films, 86 Eastin-Phelan Bldg., Davenport, Iowa 52808.

**16MM** Sound films features and shorts. Bedner, 5300 So. Talman, Chicago.

**FREE** Catalog! Save on 8/mm.-16mm. film and supplies. Superior, 448 N. Wells, Chicago 60610.

**16MM** sound-projectors, films, new, used for sale. Free catalog. National Cinema, 333 W. 57 Street, New York City, N.Y. 10019.

**5,000** 8-16 MM. Movie films. Free catalogues. International. Greenvale, N.Y.

## RADIO, TELEVISION AND HAM EQUIPMENT

**FREE** Electronics catalog. Tremendous bargains. Send postcard. Electrolabs, Department, C-665B, Hewlett, New York 11557.

**GOVERNMENT** Surplus receivers, transmitters, sniperscopes, parts. Catalog, 25¢. Meshna, Nahant, Mass. 01908.

**EXCEPTIONAL VALUE** in Portable Monitor Receivers. Details: Griffin's, 322 West State, Ithaca, N.Y. 14850.

**POLICE RADIO.** Hear all police calls, fire departments, Sheriffs, taxis, ambulances, Highway Patrol. New 5 band portable radio and direction finder. Free Booklet. Nova Tech, Dept. 222, Redondo Beach, Calif. 90278.

**BRAND** New tubes. World's lowest prices on radio, TV-industrial, special purpose tubes. Write for free parts catalog. United Radio, Newark, N.J.

**TV**—Radio tubes wholesale. Free price lists. Electronics Dist., 918-E. Valle, Kokomo, Ind. 46901.

**CAPACITORS**—G.E. Pyranol. 10 MFD 1000 volt, \$3.75 each. 15 MFD 1000 volt, \$5.00 each. Postpaid. The Nordon Co., 114 Puyallup Ave., Tacoma, Washington 98421.

**TV "Blab-Off"** Remote Control: Don't Get Up! Turn Sound Only. (Off or On) during commercials. Attaches to any TV. \$3.98. Gerstner, Box 6515, Minneapolis, Minn. 55420.

**33¢** RADIO & TV tubes. Free list. Cornell, 4213-17 University, San Diego, California 92105.

## HIFI, RECORDS AND ELECTRONICS

**RECORDS!** Discounts on all LP's. Free details. Citadel Record Club, 545 Fifth Ave., Dept. 2, New York 17, N.Y.

**TAPE** Recorders, hi-fi components. Sleep learning equipment, tapes. Unusual values. Free catalog. Dressner, 1523C Jericho Tpke., New Hyde Park, N.Y. 11040.

**AUTOMATIC** Telephone dialer. Send \$1.00 for diagrams and instructions. B.H. Industries, Box 5174, Pasadena, Calif. 91107.

**EXCLUSIVE** Free catalogue; extraordinary hard to find hobby party records. Record Suppliers, 300 Chelsea, Louisville, Kentucky 40207.





## MUSIC AND MUSICAL INSTRUMENTS

**PIANO** Self-Teaching Book. Includes popular, classical, harmony, theory, chords, scales. Price \$5.00. LaPont Publishing Company, Box 606-P, Franklin, Michigan 48025.

**GUITAR, Banjo Making** books Plans, woods, necks, tools. List 20¢. Satinwood, 510 East 11th Street, New York, N.Y. 10009.

**ACCORDIONS, GUITARS, BAND INSTRUMENTS!** Save to 50%. Famous makes. Easiest terms. Trades accepted. Free home trial. Free discount catalog. Mention instrument. **INTERNATIONAL MUSIC MART**, 5535-R Belmont, Chicago 60641.

**VIOLIN** And guitar makers, send for latest Free catalogue of woods & accessories. **International Violin**, PM-7, 414 East Baltimore St., Baltimore 2, Md.

**POEMS** Wanted for new songs and records. Send poems. Five Star Music, 6M Beacon, Boston, Mass. 02108.

**ELECTRIC** Guitars, amplifiers, wholesale. Free catalog. Carvin, P.M.M. Covina, Calif. 91722.

**CONCERTINAS**. New and used. Tuning, repairing and remodeling of all makes. Write for brochure. **Star Concertina Mfg. Co.**, 2351 Milwaukee, Chicago 60647.

**SONGPOEMS**. Songs for recording wanted. Royalties, copyright, publishing secured. **SONG ARCADE, INC.** 1472 Broadway, New York, N.Y. 10036.

**USED** Fender, Gretsch, Ricken Backe Guitars, Amplifiers, Many others. Bulletin, 25¢. Hills, 3526 California, Peoria, Ill. 61603.

**ACCORDION** Top brands. Buy direct. Tremendous discounts. Trade accepted. Free brochure **PM. Accordion-O-Rama**, 874 Broadway, N.Y.C. 10003.

**DRUMS**. Electric guitars, amps, organs. Free catalog **M: A.L.A.S. Import Company**, 31 East 18th Street, NYC. 10003

**ACCORDIONS**. Tuning and repairing, remodeling of all makes. **Star Accordion Mfg. Co.**, 2351 Milwaukee, Chicago 60647.

**SONG** Ideas wanted. Write with active professional songwriters with publisher contacts. Records made. Share royalties. Send ideas—free examination. **Songwriters' Associates**, 236 W. 55th, N.Y. 10019-P.

"**SWISS** Musical Movements. Mechanical-Electrical. Spielman, 131 West 42nd, New York 10036."

**INCOME** Guaranteed two years for songpoems. Free releases! **Castle's**, 203-P West 46th, New York City 10036.

**GUITARS**, \$11.95. Electric double pickups with tremolo bar, \$49.95. Accordions, \$125.00. Concertinas, \$350.00. Drums pearl set, \$99.00. Wind instruments \$39.95. Free catalogs. **EZ. Terms. Melody Music**, 4951 W. 95th St., Oaklawn, Ill. 60453.

**SONGS**. Poems wanted! Accepted songs published, recorded at our expense! Talent, 17-PM, Longwood Road, Quincy, Mass. 02169.

**GUITAR-AIDE**—168 enlarged, numbered finger position chord diagrams. All chords. \$3.00. **McDowell's**, 904 N. Minnesota, Sioux Falls, So. Dakota 57104.

**KITS!** Build a guitar, dulcimer, or balalaika. Prices from \$7.95. 8665 West 13th Ave., Denver, Colorado 80215.

**SONGWRITERS!** Can you write a hit song? Send poems to London Company now in USA. Details, free samples. **Musical Services**, 1881-P, Laurel Canyon, Hollywood, California 90046.

**POEMS WANTED** For new songs. All poems reviewed. Send poems to **Northeastern Music Co.**, 190 Massachusetts Ave., Boston 02115.

**POEMS** Wanted For new song hits and recordings by America's most popular studio. **Tin Pan Alley**, 1650-PM Broadway, New York 10019.

**ACCORDION** Manufacturing. 6343-P South Ashland, Chicago, Illinois 60636. Concertinas, Hohners, Chromatics, Guitars, Drums, New, Used, Tuning, Repairing. Wholesale Catalogues Free.

**PLAYER** Piano books. Free catalog. **Vestal Press**, Vestal 11, N.Y. 13850.

## EDUCATION AND INSTRUCTION

**PROFESSIONAL** Engineering, electronics. Free prospectus. **CIST**, Suite 805, 263-A Adelaide Street West, Toronto, Canada.

**OWN** Collection agency. "Little Gold Mine!" **Franklin Credit**, Roanoke, Virginia 24004.

**PASS** Civil service examinations. Alena, 1513 64th Street, Brooklyn, New York 11219.

**PIANO** Tuning pays. Big money in spare time. Learn at home. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. **Electronic Tuning** also taught. Free catalog. **Capital Tuning School**, 3160 S.W. 16th Court, Ft. Lauderdale, Fla.

**DETECTIVE** Training—for free information write to: 1917M, North Kenneth Ave., Chicago, Illinois 60639.

**COMPLETE YOUR HIGH SCHOOL** at home in spare time with 70-year-old school. Texts furnished. No classes. Diploma. Information booklet free. **American School**, Dept. XB45, Drexel at 58th, Chicago, Illinois 60637.

**BOOKKEEPERS**. Operate your own "Dollar-A-Week" system. **Ellis**, Box 200, Cedar Grove, North Carolina.

**MEN** Wanted. Earn \$125 a week and up. Master a trade with a future. Learn auto diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn \$125 a week and up. Write for free bulletin: Dept. 256, **Auto Diesel College**, Nashville 3, Tenn.

**PIANO** Tuning quickly learned with home study course. Diploma granted. **American Tuning School**, Gilroy, Calif. 95020.

**DETECTIVE** Course. Free information. **Universal Detectives**, Box 8180-F, Universal City, California 91608.

**MISSOURI** Auction School. Free catalog! 1330-03 Linwood, Kansas City, Mo. 64109.

**HIGH** School diploma at home. Licensed teachers. Send age, highest grade completed for free detail. No salesman will call. **Southern States Academy**, Professional Bldg., Dept. 16, Decatur, Ga.

**BE A** Real Estate Broker. Big earnings. Free catalog. **Weaver School of Real Estate**, 3519-P Broadway, Kansas City, Missouri 64111.

**SWEDISH** Massage and physical culture pays big profits. Learn at home. Diploma. Free catalog. **National Institute**, Dept. E77, 307 North Michigan, Chicago 1.

**USED** CORRESPONDENCE courses and books sold and rented. Money back guarantee. Catalog free. (Courses bought.) **Lee Mountain**, Pisgah, Alabama.

**PRE-PATENT IDEA WRITING:** Editing service. Details \$1.00, self-addressed-stamped envelope. **Clifford Johnson** 1345 4th Avenue, PM, Rockford, Illinois 61108.

**GET A** British degree. Divinity, Philosophy, Radionics. 35 courses. Prospectus free. **Brantridge Forest School**, "Lodge" Brantridge Forest, Balcombe, Sussex, England.

**USED** Courses! Books! List 10¢. **Smith's**, 124 Marlborough, Salem, Mass. 01970.

**AUTOSUGGESTION**. Sleep-learning headquarters! Tapes, records, books. Gigantic catalog free. **Research Association**, Box 24-PM, Olympia, Washington.

**FREE** Bible course. Degree. **PM**, 143 South Gregg, Charlotte, N.C. 28208.

**PENMANSHIP** Corrector. Improve poor penmanship quickly. Details free. **Ozment**, Box 665-34, St. Louis, Mo. 63188.

**PIANO** Technology—Electronic organ servicing, learned easily at home. G.I. Approved. Free booklet. **Niles Bryant School**, Dept. P, 3631 Stockton, Sacramento, California 95820.

**LEARN** Asleep or awake! Records, tapes, equipment! Free catalog! **Drawer**, PM-400, Ruidoso, New Mexico 88345.

**MINISTERIAL** Extension courses. Send for entrance examination. **Soms**, 887 West Spruce, Ravenna, Ohio 44266.

**BECOME A** Detective. Modern home training methods. Diplomas awarded. Men and women urgently needed in industry and government positions. Write: **Alabama School**, Box 185-P, Fairfield, Alabama 35064.

**LEARN** Auctioneering. Term soon. Free catalog. **Reisch Auction College**, Box 850, Mason City, Iowa 50401.

**WATCH** REPAIRING. Learn to repair American and Swiss watches in spare time at home. Tuition \$5 monthly. Diploma awarded. Free sample lesson. No obligation. **Chicago School**, Dept. Y.T, Fox River Grove, Illinois 60021.

**SWEDISH** Massage. Foot technique. Post graduate. Home study. Residential. Diploma. Dr. **Swanson's** Illinois Licensed School, 3809-PL Alta Vista, Chicago 60613.

**FREE!** "Learn fast as geniuses!" **Castle's**, 203-Q West 46th, New York City 10036.

**EARN** College degree at home. All subjects. **Ohio Christian College**, 1156 Striebel Road, Columbus, Ohio 43227.

**PENMANSHIP** Improver: Ornamental writing. Improve poor writing quickly. **Tevis**, Chillicothe, Mo. 64601.

**FCC** First Class License in six weeks—nation's highest success rate—approved for Veterans Training. Write **Elkins Institute**, 2603D Inwood Road, Dallas, Texas 75235.

**INSTANT** Success. Business, social, romance. Conversation secrets. Write **Strebtor**, Box 962, Flint, Michigan 48501.

**MUSIC TIME COURSE**—Twelve lessons—learn to count difficult measures in privacy of your own home—free brochure on request. **Montie & Dorothy**, 18053 Valley Boulevard, Bloomington, California, 92376.

**MOTOR** Tune-up taught by amazing new plan. Manual, six months instruction, valuable instruments. \$25.00. Satisfaction guaranteed or money refunded. **Particulars** free. **G.S. Sales Co.**, 1425 Park Blvd., Plano, Texas 75074.

**ANNOUNCING** Home study course in commercial baking. Practical basic training. Good field for those with aptitude. Free book, "Opportunities in the Baking Industry." **National Baking School**, 835 Diversey Pkwy., Dept. 674-017, Chicago 60614.

**GUARD** AGAINST ELECTRONIC BUGS. Detect "bugs" with AM&FM and all-band radios. Exciting, interesting information. \$2.00 postpaid. Satisfaction guaranteed. **M.G.N.**, 1128 13th Avenue, Sacramento, California 95822.

**LEARN** Civil and criminal investigation at home. Earn steady, good pay. State age. **Institute Applied Science**, 1920 Sunnyside, Department 167, Chicago, Illinois 60640.

## FOR INVENTORS

**PATENT** Application Financing. Free patent search plan. **Global Patent Division**, 2420 77th, Oakland, Calif. 94605.

**PATENT** Searches including Maximum speed, full airmail report and closest patent copies, \$6.00. Quality searches expertly administered. Complete secrecy guaranteed. Free Invention Protection forms and "Patent Information." Write Dept. 15, **Washington Patent Office Search Bureau**, 711-14th, N.W., Washington 5, D.C.

**IMMEDIATE** Cash, for patent applications. Free patent searches. Write for details. **Universal Patents**, 184-D, Marion, Ohio.

**PATENT** Searches, including copies of related U.S. patents, \$6.00. Inventors, attorneys, manufacturers use my "worldwide" airmail service! "Invention Record" form and "Information Every Inventor Needs," sent free! **Miss Hayward**, 1029P Vermont, Washington 5, D.C.



**INVENTORS:** Your ideas and inventions (patented; unpatented) expertly searched, developed for commercial appeal and cash/royalty sales to manufacturers by professional Invention Developer with excellent record of experience. B.S., Industrial Engineering; United States Patent Office former Patent Examiner, United States Government former Patent Advisor. Second decade reliable service! Member: United States Chamber Commerce, Free "Invention Record" and "Recommended Protection Procedure." Airmailed! Write: Raymond Lee, Invention Developer, 130-N West 42nd, New York City 10036.

**PROFESSIONAL** Patent searches, \$6.00 including official U.S. Patent Office copies of related U.S. patents! Prompt, dependable service. Certified, airmailed! For free "Invention Record Folio" and important patent information every inventor should have, write: United States Inventors Service Company, 501-P Thirteenth Street NW, Washington, D.C. 20004.

**INVENTORS:** Assistance with any problem. Searches. Applications prepared. All types. Design, chemical, mechanical. Time payment plan. Free information. Write: International Invention Service, Dept. 25; 160 Broadway, New York, N.Y. 10038.

**INVENTORS!** Get your "Little Piggy" to market via tested, most direct route. Highest cash or royalties. Financial assistance available. New York Invention Service, Dept. 1, 160 Broadway, New York, N.Y. 10038.

**PATENT EXCHANGE NEWS & REPORTER.** Professional publication for inventors, \$5 yearly, 12 issues, 26 Broadway, New York 10004.

**PATENT** Drawing: by qualified patent draftsman, 2542 N. 73, Milwaukee, Wis. 53213.

**PATENT** Searches complete and thorough. Related copies Air Mailed with maximum speed \$6.00. Free "Protection Forms" and "Patent Information." Write American Patent Search Company, Dept. 27, 711 14th St., N.W. Washington, D.C. 20005.

**"INVENTING For Pleasure and Profit"**—how to develop and market inventions. By renowned professional inventor and creative engineer. Single copy \$2.25 postpaid, money order only. WALDROP ENTERPRISES, 805 West Bowie, Arlington, Texas 76010.

**U.S. Patent Office** Searches, 234 Broadway, Room 3615, New York. Free invention certificates.

**INVENTORS**—If you have an invention for sale, patented or unpatented, wire for free brochure outlining manufacturer's requirements, Royalty rates, Kessler Corporation, C-57-IW, Fremont, Ohio.

**ELECTRONIC** Circuits designed to your specifications. \$5 analysis fee. Atomic Electronics, Box 4, 1323 N. Sunshine Way, Anaheim, California 92806.

**"INVENTOR'S Manual"** sent postpaid. Written for inventors by a professional with 30 years successful experience. Packed with tips, methods, information and ideas, any one of which you may find worth many times the price. How to protect ideas without a patent; cut costs on model development; get publicity for inventions; how to interest manufacturers; choose the right attorney; licensing; royalties; etc. Practical, down-to-earth explanations and examples. Soft bound. Satisfaction guaranteed. No C.O.D. Send \$4.95 to N. H. Stark Corporation, 10077 S. Washington, Cedarburg, Wisconsin 53012.

**PATENT** And invention development, by licensed professional patent engineer and U.S. Patent Office former examiner and engineering specialists. Your inventions and ideas engineered for patent protection and commercial value. Inventions developed by us negotiated for cash or royalties with our nationwide contacts. Send for free protection "Invention Certificates" and further interesting, valuable patent information. George Spector, Licensed Professional Patent Engineer Woolworth Building, New York

## INVENTIONS WANTED

**INVENTORS!** Sell your invention for cash or royalties! Our client manufacturers eagerly seek new items. Patented. Unpatented. Financial assistance if needed. 25 Years proven performance. For free information, write Dept. 15, Gilbert Adams, Invention Broker, 80 Wall St., New York, N.Y. 10005.

**INVENTORS!** Don't sell your invention, patented or unpatented, until you receive our offer. Eagle Development Company, Dept. H, 79 Wall Street, New York 5 N.Y.

**WE** Either sell your invention or pay cash bonus. Write for details. Universal Inventions, 298-E, Marion, Ohio.

**INVENTORS** Wanted: Manufacturers need new items! Your inventions, ideas developed for cash royalty sales. Free "Invention Record": Information. Raymond Lee, 130-P West 42nd, New York City 10036.

**INVENTORS: PROTECT YOUR IDEAS!** FREE "RECOMMENDED PROCEDURE." Washington Inventors Service, 422F, Washington Building, District of Columbia 5.

**INVENTORS!** Thousands have gone from "Rags to Riches" this safe, sure way. Custom-tailored, personalized program. Contact the organization with "Know-How." Pioneer Invention Service, Dept. 83, 150 Broadway, N.Y. 10038.

**INVENTIONS** Wanted immediately by blue-chip companies. Top cash or royalties. Do nothing 'til you hear from us. Write, wire, phone: Wall Street Promotions, Inc., Dept. 42, 99 Wall Street, New York, N.Y. 10005. (212-425-2280)

**INVENTORS!** We will develop, sell your idea or invention patented or unpatented. Our national manufacturer-clients are urgently seeking new items for highest outright cash sale or royalties. Financial assistance available. 10 years proven performance. For free information write Dept. 47, Wall Street Invention Brokerage, 79 Wall Street, New York 5, N.Y.

**INVENTORS!** Outright cash sale or royalties for your inventions. Patented. Unpatented. Active demand from our client manufacturers. Financial assistance available. Write Dept. 36, United States Invention Brokerage, 78 Wall Street, New York, N.Y. 10005.

**INVENTIONS** Needed immediately for manufacturers. For additional information write Kessler Corporation, C-57-FI, Fremont, Ohio.

**PERPETUAL MOTION HANDBOOK** \$1.25. Satisfaction guaranteed, 1616E South Compton, St. Louis, Mo. 63104.

**INVENTIONS** Wanted. Patented: unpatented. Tremendous manufacturers lists. Global Marketing Service, 2420G 77th, Oakland, California 94605.

## MANUFACTURING

**MACHINERY.** Tools—design, drafting. Zero Engineering, 2437 West 69, Chicago 60629.

**MODELS** — Small lot manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky 41005.

## BUY IT WHOLESALE

**HEARING** Aid batteries wholesale. National Wholesale Battery Company, P.O. Box 625, Wichita, Kansas 67201.

**NEW 6-Color** Deluxe below wholesale catalog. Automobile catalog and others. Housewares, clothing, suits, furs, shoes, furniture, rugs, appliances, refrigerators, washers, dryers, polishers, dinnerware, teflon, cookware, radios, televisions, stereos, phonographs, records, cameras, projectors, recorders, musical instruments, organs, typewriters, books, vitamins, shavers, wigs, binoculars, luggage, sporting goods, golf, bowling, game tables, guns, power tools, rider mowers, tractors, boats, motors, scooters, bicycles, watches, diamonds, jewelry. Huge discounts on thousands of name-brand products. For free list (factory prices) postcard: Selbyco-5, Decatur, Illinois 62522.

**BARGAINS!** Buy wholesale and below. Name brands. Appliances, furniture, sports equipment, televisions, cameras, watches, jewelry, thousands more. Huge discounts to \$1,000.00 on new automobiles. All makes. Free details. Write today: Worldwide Bargainhunters, Box 730-A, Holland, Michigan 49423.

**100,000 BARGAINS!** Wholesale! Closeouts! Imports! Free Details! Wholesalers, 1265-M Broadway, New York, N.Y. 10001.

**ELECTRIC** Guitars, amplifiers, wholesale. Free catalog. Carvin PMW, Covina, Calif. 91722.

**HEARING** Aid Batteries, AAA, 605-A North Stanton, El Paso, Texas 79901.

**ROSARIES** Direct from manufacturer—lowest prices. Free illustrated pricelist. Wynn, Box 56, Richmond Hill, N.Y. 11418.

**NEW "INFORMATION UNLIMITED"** Buy hundreds of items below wholesale. Money making tips. Details, stamp. Smyre's, Box 953-M, Newark, N.J. 07101.

**THE** Greatest car values anywhere are on page 25 of this issue.

**TREMENDOUS** Wholesale bargains. Half-million nationally known products. Rockbottom prices. Closeouts, bankrupts. Dropship merchandise. Automobiles. Worldwide imports. Hongkong clothes. Free details. International Buyers, 216-M, West Jackson, Chicago, Illinois 60606.

## EXPORT-IMPORT

**JAPAN:** 1200 Products Directory. Illustrated. Manufacturers' names, addresses: \$1.00. Send Cash. Yamagata Office, 814 Togin Bldg., Marunouchi, Tokyo.

## OF INTEREST TO WOMEN

**RAISE** Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio 43050.

**\$100 WEEKLY** Possible assembling our products! United, Box 55392-D, Indianapolis, Indiana.

**\$45.00 THOUSAND.** Home addressing! Longhand, typewriter. Information, send stamped, self-addressed envelope. Brewster, Box 1626-J, Clearwater, Florida 33515.

**FREE** Make 'Em and Save Leathercraft Idea Manual. Tandy Leather Co., 1001 Foch, F61, Fort Worth, Texas.

**MAKE** Extra Money—show friends, neighbors—Gifts, Stationery, Christmas, All Occasion Cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas Card Album. Hedenkamp, 361 Broadway, Dept. PM-95, New York 10013

**\$150.00 WEEKLY** Typing, possible! Plans \$1.00. (Guaranteed) Camille, 202-PM, Brownell Street, New Bedford, Massachusetts 02740.

**HOME** Typing—\$95. weekly possible. Instructions with employers list, \$1.30. Eaton Company, 543-A, Hopland, California.

**MAKE** Extra money! Show new seamless, runless Cantrecc nylons, 69¢ pair. Perfect fit. Guaranteed wear twice as long or replaced free. Extra profits with slips, bras, girdles, etc. Big outfit, sample stocking free. Write American Mills, Dept. 144, Memphis, Tenn. 38101.

**\$100.00 WEEKLY** Possible. Lacing and Assembling our products! Cuties, Warsaw 9, Indiana 46580.

**HUMMINGBIRD** Feeder \$1.39 postpaid. Fascinating gift catalog. D. G. Sewall, Dept. 277, Box 3024, Glendale, California 91201.



**DELIGHTFUL** Portable cabana. Patio, poolside, beach. Details, Sewall, Dept. 277, Box 3024, Glendale, California 91201.

**MAKE Extra Money!** Introduce New **MIRACLE CANTRECE** Nylons at 69¢ a pair. Guaranteed Never to Run. We show you how. Supply big outfit and sample stocking Free. Spare-time cash year-round. It's easy. Write American Mills, Dept. 144, Memphis, Tenn. 38101.

**WOMEN!** Make big money at home. \$10.00 profit in an hour possible with invisible mending. Make holes, tears disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1533 Howard, Chicago, Illinois 60626.

## WATCHES, OLD GOLD, JEWELRY

**HIGHEST CASH** for Gold, Jewelry, Gold Teeth, Rings, Diamonds, Watches, Silver, Platinum. Mail Articles Today. Free gift with information. Chicago Gold & Precious Metals, 6 E. Monroe, Dept. 1158, Chicago 60603.

**WATCH** And clock repairing books. Free catalog. North American, Box 77-AG, Fox River Grove, Illinois 60021.

**CASH** Immediately for old gold, jewelry, gold teeth, watches, diamonds, silverware, spectacles, platinum, mercury. Free information. Rose Industries, 29-A East Madison, Chicago 2.

**WATCHMAKERS** — Jewelers' supplies. Catalog 50¢. Bengal's, 10717 Venice, Los Angeles, California 90034.

**WANTED**, Gold, silver, platinum, scrap (any form), coins. Information free. Wilmot's, 1067-D Bridge St., Grand Rapids, Michigan 49504.

**WATCHMAKERS** Tools, materials, supplies, watches. Catalog. Gales, Box 1000, Chicago 90, Ill.

**USE** Wrist, Pocket Watches 5—\$25.00. Free list. Southern Watches, 5-PM South Wabash, Chicago 60603.

**USED** Pocket watches — as is — 5 for \$25.00. Joseph Bros., 5 South Wabash, Chicago 60603.



## SCIENCE AND CHEMISTRY

**FIREWORKS!** Rocket fuels! Explosives! Easily prepared formulas \$1.00. U.S. Pyrotechnics, Box 0234, Cedarhurst, N.Y. 11516.

**FREE** Periodic classification of elements and conversion tables with catalog 25¢. Chemicals, apparatus, biology. Mid-States Scientific, 7053 N. Clark, Chicago, Ill. 60626.

**CHEMICALS** And apparatus for industrial, analytical, and private laboratories. Catalog 35¢. Dept. M-50. Biological Supply Co., 1176 Mt. Hope Ave., Rochester, N.Y. 14620.

**ILLUSTRATED** Catalog: Chemistry, mineralogy, biology 25¢. Tracey Laboratories, Evanston, Illinois 60204.

**SKYROCKETS**, Firecrackers, fireworks — Make your own! 60 simple formulas \$1.00; 30 smoke formulas, 15 colors \$1.00; 10 fuse formulas 50¢. Paloma Pyrotechnics, Box 247, Auburn 5, California 95603.

**PERCUSSION** Bombs — Explode when thrown down. Complete, non-commercial manufacturing procedure, formula, only \$1. Chemicals available. Technitome, Box 22, Berlin, New Jersey 08009.

**ROCKETS:** Real flying models—flights up to 2500 ft. New illustrated catalog 25¢. Single and multistage kit, cones, engines, launchers, trackers, rocket aerial cameras, technical information. Fast service. Estes Industries, Penrose 7, Colorado 81240.

**FIREWORKS** — Explosives — detonators. New manual reveals formulas, preparations, only \$2. Free with order. \$2 certificate for fuse. Pyrochem, Box 169, Berlin, New Jersey 08009.

**PROFESSIONAL** Fireworks fuse, burns underwater, 75 feet, \$1.00. Edcolabs, Box 99, Berlin, New Jersey 08009.

**ROCKET** Fuel for sale, engine making kits, free information. Rocfuel, 56 Cortland Ave., Dumont, N.J. 07628.

**FIREWORKS** Supplies, casings, end caps, plugs, chemicals, fuse, do-it-yourself kits, send 35¢ for samples and catalogue—Ecco, Box 189, Northvale, New Jersey 07647.

**ROCKETS**, Single, multi-stage kits, parts amazing Accelerometer. Illustrated catalogue 25¢. Rocket Supply, Box 51B, Tappan, New York 10983.

**UNDERWATER** Fuse 54 feet plus fireworks catalogue \$1.—Christy, Box 85, Bergenfield, New Jersey 07621.

**SEARCHING** For economically priced chemicals and apparatus? Gifts with catalogue. 25¢. Starr Scientific, Manitowoc, Wisconsin 54220.

**AMAZING** New book of science experiments, formulas, and catalogue of laboratory supplies. Only 35¢. National Scientific Co., 18 S. Park Avenue, Dept. PM-7, Lombard, Illinois.

**FREE!** \$6.00 Worth of pyrotechnic and fireworks formulas with purchase of 55 cent catalog. To get hundreds of additional free formulas, see details in our catalog! Franks Scientific Co., P.O. Box 156, Martelle, Iowa 52305.

**CONTACT** Explosive—Explodes with touch of feather. Handled safely wet. Powerful. Ideal for jokes. Applies like paint. Made from household chemicals. Results guaranteed. Complete instructions for making both kinds only \$1.25. Free! \$8.00 worth of explosives formulas and fireworks formulas with every order. Franks Scientific Co., P.O. Box 156, Martelle, Iowa 52305.

**FIREWORKS**—All types. Detailed procedure, formulas, illustrations, etc., \$1.00. Pyros Limited, Box 656, Salem, New Hampshire 03079.

**BUILD** a laser—\$2.00 complete information. J. Canavan, 166 Embarcadero Street, San Francisco, California 94105

**LAUGHING** Gas, Nauseating, Mustard Gases, Formulas, \$1.00. Free with order: "Secrets" How, where to purchase fireworks: Skyrockets, 55¢ gross, Smoke Bombs, 28¢ gross, etc. Bylina, 5115 S. Campbell, Chicago, Illinois 60632.

**HAND** Grenades, Booby traps, contact explosives. Formulas \$1.00. Hilco, P.O. Box 71, Pottsville, Pennsylvania 17901.

**M-80's**, **SKYROCKETS**, Firecrackers, torpedoes, fireworks supplies, commercial and display fireworks. Huge illustrated catalog \$1.00. Carton of 25 assorted samples, \$2.00. American Fireworks, Box 10868, Fairfield, Connecticut 06430.

**FIREWORKS** Chemicals and laboratory apparatus catalog, 35¢. Sheard Science Supplies, Columbus, Wisconsin 53925.

**ROCKETS!** Flight kits, testing equipment. Catalog 25¢. Rocket Development Corporation, Route 3, Seymour, Indiana 47274.

**FREE** Periodic classification of elements and conversion tables with catalog 25¢. Chemicals, apparatus, biology. Mid-States Scientific, 7053 N. Clark, Chicago, Ill. 60626.

**FREE** Pyrotechnic formulas with science catalog 35¢. All home laboratory supplies. Dissect-A-Kit, Inc., Box A55, Wantagh, N.Y. 11793.

**FIRECRACKERS**—Complete plans, formulas, instructions for all sizes, types. All for \$1.00. ZEBRA, Box 865, Bellevue, Washington 98004.

181 **FIREWORKS** Formulas for \$1.50. Franks Scientific Co., P.O. Box 156, Martelle Iowa 52305.

**SKYROCKETS!** **SUPER FIREWORKS!** 28 Different types!!!—Complete, detailed instructions, diagrams, 75 formulas—rocket construction, aerial displays, streamers, stars, fountains, roman candles, mortars, fireballs, smokes, colored flares, fuses, propellants, contact explosives \$1.00. Sentec-RD, 1265 Athens, San Francisco 94112.

**CONTACT** Explosive. Simple formula 50¢. Glenn Lamb, Box 8, Northville, Michigan 48167.

**MAKE** Phosphorescent smoke, Skyrockets, match bombs, trick matches, Mini-pistol, from ordinary matches. Complete plans \$1.00. Free! 75 explosive and fireworks formulas, including the famous putty explosive formula, with order. Franks Scientific Co., P.O. Box 156, Martelle, Iowa 52305.

**FREE** Chemicals, **MONORAILS**, Rockets, **FIREWORKS**, Explosives, **COMPLETELY HOMEMADE**, Pamphlet 92-A, \$1.00. **PYROTECHNICS**, 679 Forest, Glen Ellyn, Illinois 60137.

**STRANGE** Metal rod produces showers of brilliant sparks when scraped with a knife. One for \$1.00, Three for \$2.00. Satisfaction guaranteed. Free fireworks formulas with every \$2.00 order. Franks Scientific Co., P.O. Box 156, Martelle, Iowa 52305.

**LASER PISTOL**—\$1.00. How to build Laser Rifle, Electronic Laser, Helium-Neon Laser—\$4.95 each. New project on **FLYING SAUCERS**—\$4.95. Complete Project Catalogue—25¢. Roy Davis Lab., Dept. PM, Drawer 17067, Jacksonville, Florida 32216.

**MEASUREMENT AND CONTROL**, New Calculator Guide to Linear Variable Differential Transformers plus 20 page instruction manual on the operation principles of LVDT's and their use in displacement, pressure, velocity and acceleration measuring devices. Send \$1 to SCHAEVITZ ENGINEERING, P.O. Box 505, Camden, New Jersey 08101.

**CHERRY** Bomb fuse, water proof 25 feet with formulas, instructions \$1.00; 125 feet \$4.00 Postpaid. Free catalog. Zeller, Box 638, Hudson, Michigan 49247.

## FORMULAS, PLANS, ETC.

**PRODUCT** Formulations, Catalog \$1.00. Refundable. Milici Chemist, 5540 Hollywood Blvd., Hollywood, California 90028.

**FOR** Proof of what you can do in specialty manufacturing get our literature. It's free! Miller, Chemist, 1517-P, Tampa, Florida 33601.

**LATE**, Modern manufacturing formulas. List free. Moon Chemical, Martville, New York 13111.

## PLASTICS

**PLASTIC** Embedders, jewelry workers. We have everything. Findings, moulds. New catalog 25¢. David Co., 861 Broad St., Dept. M, Providence, R.I. 02907.

**PLASTICS** For arts & crafts, fun & profit. See how easy it is to work with liquid plastics. Turn your plastics hobby into \$ for you. Send 50¢ for catalog to PMI, 1644 20th, Santa Monica, California.

## TREASURE FINDERS

**NEW** Revolutionary analytical transistorized metal detector. Push button tuning, automatic tuning, etc. Many models. Free catalog. Gardiner Electronics Co., Dept. 9, 4729 N. 7th Avenue, Phoenix, Arizona 85013.

**PROVEN SENSITIVE** M-SCOPES locate coins, relics, gold, silver, etc., Guaranteed. Terms. Free fascinating booklet. FISHER RESEARCH, Dept. PM-7, Palo Alto, California 94302.

**TREASURE**. Find gold, silver, relics with super, powerful Detectron locators. Free information. Detectron, Dept. PM-7, P.O. Box 243, San Gabriel, California 91778.

**TREASURE**. Gold, silver, relics. New 1967 detectors now available. Free information. Rayscope, Box 715, North Hollywood, California 91603.

**FIND** Buried coins, treasures, relics. New supersensitive, low priced detectors for land or underwater use. Free information. Sensitronix, 2225-C Lou Ellen, Houston, Texas 77018.

**LOCATE** Anything! Any depth! Anywhere! Electronically! Information \$1.00. Refundable. MicroBionics, 2A, Heritage Hill, Tuscaloosa, Alabama 35401.

**FREE** \$4 page detector catalog. General Electronic Detection Co., Box 67, Bellflower, Calif. 90706.

**SAVE!** Build transistorized treasure finder. Details free. Del Research, Dept. B, West Barnstable, Mass. 02668.



URECON Metal finder, 8" head, transistorized, \$37.50 delivered. Urpa, 6304 Beechwood, Sarasota, Fla. 33581.

TREASURE Hunters! Prospectors! Relco's new instruments detect buried gold, silver, coins, minerals, historical relics. Transistorized. Weighs 3 pounds. \$19.95 up. Free catalog. Relco-A40, Box 10839, Houston, Texas 77018.

TREASUREPROBE \$18.88 ppd. Absolutely complete, includes earphone and battery. Transistorized detector finds gold or silver coins and other metal objects by signal tone. 10 day money back guarantee. Treasureprobe, Dept. PAA, Box 3446, Granada Hills, Calif. 91344.

NEW For '67! Goldak Treasure Locators. Find coins, gold, silver. A profitable yet fun hobby. Goldak, Dept. PMC, 1544 W. Glenoaks, Glendale, California 91201.

POWERFUL Metrotech locators detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California 94205.

### PRECIOUS STONES AND MINERALS

400 POLISHED GEMSTONES \$2.75. Beautiful crystals, 6 different \$2.00. Lists with order. Sering, 1705 E. Michigan, Indianapolis, Indiana 46201.

GET Free catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free new catalog just off the press, yours for the asking. Write Grieger's, Dept. C-12, 1633 E. Walnut, Pasadena, California 91106.

EARTH Science Rockhound Magazine. Subscription \$2.50. Sample 35¢. Box-550-PM, Downers Grove, Ill. 60515.

SEMI-Precious uncut gems. Ten different for \$1.00. Request list 30. Prospectors Shop, 201 San Francisco, Santa Fe, New Mexico 87501.

100 COLORFUL, Polished gemstones, \$1.00. Tumblecraft, 5401 James North, Minneapolis, Minnesota 55431.

### CARTOONING, COMMERCIAL ART, SHOWCARD & SIGN PAINTING, TATTOOING

COMPACT 23 Lesson Cartoon Course and Cartoonist's Magazine, \$1.00. Hartman, Box 30367, Lincoln, Nebraska 68510.

YOU Can entertain with chalk talks. Catalog 10¢. Balda the Cartoonist, Oshkosh, Wis. 54901.

LEARN Profitable fascinating tattooing. Illustrated information \$1.00—Zeis, 2220 P Deley Drive, Rockford, Illinois 61107.

ART Lessons \$6.00 a month. Includes drawing, painting, advertising art, cartooning. Art kits (worth \$30.) and materials. Assignments corrected with overlays by mail and returned to you. Write for free book. No obligation. Washington School of Art, Studio 147, Port Washington, S. N. Y. 11050.

LEARN Sign painting at home. Free talent test. Ben Kerns, Box 812-PM, Greenville, S.C. 29601.

HOW TO MAKE MONEY WITH SIMPLE CARTOONS—Everyone who likes to draw should have this book; FREE. Send name, zip code. Cartoonists' Exchange, 97 Pleasant Hill, Ohio, 45359.

SIGN Painting, Fascinating system. Straley, 410 South Western, Springfield, Ohio.

### ADVERTISING AGENCIES, ADV. SERVICE, MAILING LISTS

MAILING Lists most all kinds 1000 \$5.00. Free folder. Your circulars mailed \$4.00 1000. Dixie Mailers, King, N.C. 27021.

ADVERTISING Ratebook leading newspapers, magazines, free. Chicago Advertising Agency, 28-E Jackson, Chicago 60604.

### TYPEWRITERS, DUPLICATORS, OFFICE EQUIPMENT

TELETYPE Machines, new condition, 5 years old. GRC 30 & 36. L. Surath & Sons, P.O. Box 56, Bay City, Michigan 48706.

XEROX Copies 25¢ each. No limit. confidential. L. C. Holmes, 13603 Hanwell Bellflower, Calif. 90706.

FREE Plan. Start printing, lettershop. Offset Presses, Mimeograph copy machines, DixieGraph, King, N. Car. 27021.

### RUBBER STAMPS AND OFFICE SUPPLIES

ADDRESS Stamp, \$1.50. Signature \$2.88. Free catalog. Jackson's, 1433 Winnetka, Chicago, Illinois 60640.

FREE Catalog—Rubber stamps, labels. Bilmar, 11117-Ewing, Minneapolis, Minnesota 55431.

FREE Rubber Stamp—printing catalog, with samples Rosie's Stamp Studio, Box 901, Waycross, Georgia 31501.

FINEST Quality Stamps, three lines, \$1.00. Dee's, Box 14004, Phoenix, Arizona 85031.

MAIL MOVES OUR COUNTRY, ZIP CODE MOVES OUR MAIL. Directory with over 35000 listing, 50 states U.S. possessions. \$1.00 prepaid. National Products Co., 33 Hillside Ave., Hillside, Ill. 60162.

DESK Name Plates. Door Signs. Free Catalog. Engraving, 34 Cora Avenue, Williamstown, New Jersey 08094.

FREE 32 Page rubber stamp catalog. Signature stamps \$3.50. Youngers Stamp Shop, Princeton, Iowa 52768.

### PRINTING, MULTIGRAPHING, MIMEOGRAPHING, GUMMED LABELS

FREE Literature: 1000 address labels \$1.00, 1000 business cards \$4.95. Printing, rubber stamps, Jordan's, 552 West O'Connor, Lima, Ohio 45801.

OFFSET Printing 25 to 5,000 lettersizes 8 hour shipment. Printing While-U-Wait, 305 S. 4th, Springfield, Illinois 62701.

FREE Booklet "Secrets of cutting printing cost" Printing, 305 S. 4th, Springfield, Illinois 62701.

EMBOSSER Business cards, \$2.99—1000, free samples. Gables, 405A Clifton, Glenshaw, Pa. 15116.

1,000 RAISED Printed business cards \$3.75. Samples, Marchione, Box 189 Smithtown, New York 11787.

1000 GUMMED Address labels, \$1.00. Wait's, Box 966-A, South Bend, Indiana 46624.

1000 RAISED Print business cards \$4.95 Ppd. Color samples free. Galensky, Box 367, N.Y.C. 10011.

OFFSET Printing 100 copies \$3.49. Parks, 1879 Dover, Wantagh, New York 11793.

ALL-Purpose certificate of award. Parchment, \$1.00. Additional certificates, 50¢. Awards, 4500 Denison, Snyder, Texas.

THERMOGRAPHED Letterheads, envelopes, business cards. Samples Cooper's, Box 178, Brighton, Michigan 48116.

FREE Pocket mirror of our late and beloved President John F. Kennedy with order for 1000 gummed name and address labels for \$1.00. A. B. Jones, 556 W. McMurray, Canonsburg, Pa. 15317.

DUAL-COLOR Thermographed business cards, commercial printing. OVERNIGHT service. Samples, Lee, M-3, 29 Redwood Road, Springfield, N.J. 07081.

1000 ZIP Code, gummed address labels \$1.00. Coy's, 2005 North Ninth, Springfield, Ill. 62702.

1000 HOLLYWOOD Style photo address labels, \$1.50. Send photo to Hall's Mail-order Supplies, Box 72146, Los Angeles, California 90002.

1000 REPLY Address labels \$2.50. Columbus, 717 East Pike, Seattle, 98122.

AMAZING Business printing values. Samples, Print Shop, Box 578, Greenville R.I. 02828.

### PRINTING & RUBBER STAMP OUTFITS—SUPPLIES

TYPE Catalog No. 11, 96 Pages. Send One Dollar. Deductible First Order. Acme Type, 732 Federal, Chicago, Illinois 60605.

MAKE Your own self-molding rubber stamps and printing cuts, Plexirubber, Argyle (1), Wisconsin.

RUBBER Stamp manufacturers supplies. Starting outfits, presses, low prices, fast service. Catalog. Jackson Supply, 1433 Winnemac, Chicago, Illinois 60640.

WHOLESALE Rebuilt offset presses, Maurice Bower, Route 3, Floyd, Virginia 24091.

DO Your own printing. Save money. Simple rules. We supply everything. Print for others: good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-11, Meriden, Connecticut 06450.

TYPE Cases, cabinets. Manufacturer. Catalog. King McKay Company, 23179 Telegraph, Southfield, Michigan 48075.

MAKE Rubber Stamps. Complete outfit, 119.95. Duckman, Avoca, Arkansas 72711.

PRINTING Presses, type, supplies. Lists, 5¢. Turnbaugh Service, Mechanicsburg, Pennsylvania 17055.

PRINTING Presses, type, supplies. List, 5¢. Turnbaugh Service, Mechanicsburg, Pennsylvania 17055.

RUBBER Stamp presses, mounts, supplies. Martin, 1425S Major, Jefferson City, Mo. 65101.

RUBBER Stamp outfits, supplies. Kiewiet, 2025 Barney Road, Kalamazoo, Mich. 49007.

TYPE And supplies for rubber stamp makers. New wholesale price list No. 4 free. Star Stamp Supply, 732 Federal, Chicago, Ill. 60605.

### REMAILING SERVICE

SECRET Receiving and remailing. Discreet and confidential. Remail 25¢ single. 8050 S. Main, Houston, Texas 77025.

MIAMI Remails 25¢. Monthly rates. P. Marie, Box 1266, Coral Gables, Florida 33134.

FROM Fabulous Las Vegas, Unexcelled, fast, dependable, confidential service. Remails 25¢. Monthly rates. Colorful cards. Ruthie, 558 Oakey Boulevard, Las Vegas, Nevada 89105.

SECRET Mail receiving system. Hedgpeth, 406-M South Second, Alhambra, California 91802.

SO. AMERICA Registered re-airmails, \$1.00. Confidential. Genaro, Box 360, Guayaquil, Ecuador.

NEW YORK CITY—REMAILINGS 25¢—Confidential mailing address—monthly \$3.00—Worldwide Remailings \$1.00. Established 1946. R. J. VALLES, 3450 Broadway, New York 10031.

SECRET Remailing, receiving system, packages, letters, \$3 monthly. Continental, Box 3781 A, Phoenix, Arizona 85030.

TAHITI, Fiji, Australia, New Zealand letters, 1.00 cards 50¢ Jeanne, Box 201, Pioneer, Calif. 95666.

LOS ANGELES, Hollywood, San Fernando Valley—25¢ single; \$3.00 monthly. Confidential, 10437 Lanark Street P. Sun Valley, California 91352.

CONFIDENTIAL Mail receiving system, 25 single, Westmail, 463-A7, S. Crescent Heights, Los Angeles, California 90048.

OFFICIAL Zip Code Directory, \$13.00 each. Fast Service, Post Office Box 66259, Chicago, Illinois 60666.

REMAILING—Send to BARR-W, 1431 S.W. Park Avenue, Portland, Ore. 97201.

STAMPEDE City remails, 25¢; monthly \$3.00. Halford Enterprises, Box 28, Calgary, Alta., Can.

PROMPT Confidential Dependable Remailing 25¢ each. 320 Rockland Road, Wayne, Pennsylvania 19087.

RELIABLE Remails, 25 each, 3.00 monthly. Jean, 2809 Onrado, Torrance, Calif. 90503.



MAILING Lists-Names classified, zip coded on gummed labels \$6.00 per 1000. Fidelity Mail Order, Box 172, St. Joseph, Mo. 64502.

UNIVERSITY City—25¢ single, \$2.50 monthly, Luma, Box 1465, Gainesville, Florida 32601.

TIMELY Remailing 25¢. Unlimited Monthly \$3.00. Confidential Postcards. Schoen, Box 1963-P, Chicago, Illinois 60690.

## SPECIAL SERVICES

RESEARCH—Your name product—subject. Send \$2.00. Horton, Randlewood, Greenville, South Carolina 29706.

INFORMATION On anything. Ferguson Research Specialists, 83-45 Vietor Ave., Elmhurst, N.Y. 11373.

LOCATING Service — manufacturers, products, etc. Barsketis, 2437 West 69, Chicago 60629.

CONFIDENTIAL Reports, any subject-product, mail \$3.00. Garrison, 620 Anson, J-29, Winston-Salem, North Carolina 27103.

## TOBACCO

TOBACCO Samples and pipe catalog. Home, Box 367, Short Hills, N.J. 07078.

MEN WANTED to try Scott's 5 different pipe tobacco blends, \$3. value. Send \$1. H. R. Scott, 64 Exchange Pl. N.Y.C. 10004.

## RAZORS

SAVE! Electric shaver year guarantee \$7.49 post paid. Satisfaction guaranteed. Economy World Traders, P.O. Box 16297, Portland, Oregon 97216.

## WANTED—MISCELLANEOUS

STAMP Collections, accumulations. Eagle Stamp Co., 2221 Romine, Pittsburgh, Penna. 15226.

CASH For box tops, labels, etc. List, 25¢. Williams, Box 832, Phoenix, Oregon.

MERCURY. Gold, Silver, Platinum; Ores assayed. Wholesale Terminal, Norwood, Mass. 02062.

## PERSONAL

SURVEILLANCE Equipment. New high performance models. Free details: Security Electronics-PM, 11 East 43 Street, N.Y.C. 10017.

SUBCONSCIOUS Conditioning remakes personality while you sleep. Free details. Sleep-Learning, Box 24N, Olympia, Washington 9851.

INVESTIGATORS. Free brochure, latest subminiature electronic surveillance equipment. Ace Electronics, 11500-P NW 7th Ave., Miami, Florida 33168.

BLITZ Reducing! 5 pounds overnight! Guaranteed! Bijou, Box 1727-BM, Hollywood, California 90028.

MUSIC Lovers, continuous, uninterrupted background music from your FM radio, using new inexpensive adaptor. Free literature. Electronics, 11500-T NW 7th Ave., Miami, Florida 33168.

MEN—Bring out your best personality, gain new confidence, style your hair like movie stars do. Kit with complete instructions \$5.00. diRoss, Box 1087A Hollywood, California. 90028.

BILL Problems? Poor credit no trouble. Not a loan company. Send for free application. Nationwide Acceptance, Dept. PM 930 F St. N. W., Washington, D. C. 20017 or 1326 Plainfield St., Cranston, R. I. 02919.

BIBLE Questions answered. Stamped envelope. Byron, 17167 Bentler, Detroit, Michigan 48219.

BORROW \$100 to \$1000 by Mail. Quick, Easy, Private, No Co-Signers. Repay in 36 small monthly payments. For the amount you want write today to Dial Finance Co., 410 Kilpatrick Bldg., Dept. G-214, Omaha, Nebraska, 68102.

NEED Money? Borrow \$100-\$1000 by mail. Confidential. Repay in 36 months. Free loan application. American Loan Plan, Dept. KA-010A, City National Bldg., Omaha, Nebraska 68102.

BORROW With Confidence! Over 50 years of experience. Loans by mail from \$100 to \$1000. World Finance Co., Dept. KW-010C, 620 Symes Bldg., Denver, Colorado 80202.

PAY Bills! Have cash left over. \$39.65 repays \$1000 in 36 months. Write for details. Budget Finance Co., Dept. KB-010B, 317 South 20th, Omaha, Nebraska 68102.

NEED Money? Your debts too big? Solutions to all financial problems. Amazing results. Consolidate debts. Non-Lending Service. Free details. Write Financial Consultants, 28 E. Jackson, Suite 1204-PM, Chicago 60604.

FEDERAL LAW WIPES OUT ALL DEBTS. Details free. Counselor-7, Harlingen, Texas.

WILL You be saved by Christ? Learn truth of true christianity—Sent free to any part of the world. Chester Kelley, 948-18th St., Des Moines, Iowa 50314.

BORROW \$1,205 AIRMAIL! Repay \$47 for 36 months. State licensed. Postal Finance, Dept. 17-N, 200 Keeline Building, Omaha, Nebraska 68102.

## MISCELLANEOUS

LOG Cabins; Ship anywhere 35 plans, specifications and prices. Send \$1.00. Write Bloch Brothers, Waterford 4, Michigan.

WINEMAKING . . . Grape, Elderberry, Dandelion, Frozen Juices, etc. Brewmasters' secrets revealed! Powerful methods! Instructions, recipes, and supplies catalog, \$1.00. Continental, Box 26034-PG, Indianapolis, Indiana 46226.

WINEMAKERS. Free illustrated catalog of yeasts, equipment. Semplex, Box 7208, Minneapolis, Minn. 55412.

HEARING Aids, batteries, discount. Free list. Fiston, Box 1444, New Preston, Conn. 06777.

BIRTH Certificates, Marriage Certificates, Diplomas! 2 blank forms \$1.00. Sample 10¢. Standard Forms, Box 482-M Washington, D.C. 20044.

HOW TO BUILD A STILL. Humorous, factual, illustrated, 50 pages. Includes distillation, fermentation, wine, homebrew, taxes, etc. Over 25 recipes, \$2.00. Buze, Box 490A, Norman, Oklahoma 73069.

HEARING Aid batteries wholesale. Free list. Habs, Box 51, York, Penna. 17405.

KILL Mosquitoes, crop destroyers! Electronically. Free information. Box P, 204, Metamora, Michigan 48455.

CIGARETTES — Make 20 filtertip or plain, king or regular, for 10¢. Facts free. Moberly, Box 954, Owensboro, Kentucky 42301.

WINEMAKERS Catalogue — Samples — Recipes—25¢. Kraus, Box 451-L, Nevada, Missouri 64772.

ZIP Code directory. Sell—huge profits! Sample \$1.00. BEAN, 377, Port Orford, Ore. 97465.

BOOKS On antiques and their prices. Free circular! P. Warman Publishers, Uniontown, Penna. 15401.

KNOW Mexico—free specimens Guanaquato town sketches Victor H. Gil, 25 Oriente 216, Puebla, Pue. Mexico.

FREE For life! Write: Hall's Mailorder Supplies, Box 72146, Los Angeles, California 90002.

SIMPLIFIED HANDICAPPING. Raising profits possible in 9 of 10 plays. Details. Howard, Box 507, PM-7, Carroll, Iowa 51401.

GAMING System books on keno, bingo, craps, black jack and slot machines, \$2.00 each or all five \$8.00 Cash or Money Order to: Fabulous Trick and Magic Co., 3319 E. Charleston Blvd., Las Vegas, Nevada 89104.

MAKE FIVE GALLONS OF REAL BEER Send \$1.00 to—EASY, Box 1181, Vernon, B.C. Canada.

PROFESSIONAL Comedy catalog plus jokebook, \$1.00. Orben Books, Box 241A, Atlantic Beach, New York 11509.

EVEREADY Hearing aid batteries at discount prices. List sent free. Thomas, Box 822, Omaha, Nebraska 68101.

HOW To be funny whenever you choose. Humor market insatiable. Just one gag worth \$1,000! Free Booklet, TeeVee Publications, Box 56-A, Kimberly, Wisconsin 54136.

ORNAMENTAL Iron designs. Book of 1600 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 3881 South 3200 West Salt Lake City, Utah 84119.

SILENCERS—For pistols and rifles. Complete details for construction and operation, \$1.00. Gunsmith, Box 185-C, Fairfield, Alabama. 35064.

WINEMAKING. Beer, Ale, Brandies. Strongest methods. Illustrated, \$2.20. (Supplies, Hydrometer Headquarters.) Eaton Company, 543-A, Hopland, California.

STOP Costly crop damage by sparrows! Catch hundreds in a single day with the most remarkable traps ever invented. Inexpensive. Free literature. Sensitronix, 2225-ST33 Lou Ellen, Houston, Texas 77018.

SO YOU WANT TO COME TO CALIFORNIA? Complete manual on cost of living, employment, housing, schools, growth, taxes, problems, etc. \$2.00. Premium Product Research, 15063 Brewster, San Jose, California 95124.

FOOD VALUES—The nutritional values of over 500 foods charted for easy planning of nutritionally adequate diets. Send \$1.00 to Nutrition, 5364 Venice Blvd., Los Angeles, California 90019.

TRAFFIC SAFETY With Japanese shrine amulet embedded in plastics. Send cash \$1.00. Miyasaki, Box 134, Kobe Port, Japan.

LOOK! Be famous for your country style home cooked meals. 20 easy menus with recipes any man or woman can cook, \$1.00. R. Mervin, Dept. 7P, 3074 Davison, Lapeer, Mich. 48446.

"STONED"! Pop slogans on finished wood. Free list. Ramon, Box 2512, Grand Central Station, New York 10017.

RECEIVE Mails—Magazines—Samples—Catalogues. Get Listed-25¢. Norman Rorick, Pleasant Plain, Ohio 45162.

HOMEBREW Formulas! Brewmasters secrets explained! \$2.25. (complete brew supplies hydrometers catalog with order)—Research Enterprises, 29-SN35 Samoset, Woburn, Mass.

WINEMAKERS! New illustrated supplies catalog . . . Free! Write today! Winemakers, Box 11211-PG, Indianapolis, Indiana 46201.

WINEMAKERS Recipe. Fine grape wine from grocery products. Perfect for beginners. Complete instructions \$1.00. Wine, 11 Woodruff, Dayton, Ohio 45405.

BREWMAKING — Brewmaster secrets! Powerful! Strong home-style formulas! Illustrated booklet, \$2.25. (supplies catalog included). Interstate Products, Box 1-7G40, Pelham, New Hampshire.

FINANCIAL WORRIES? Free 12-page pamphlet. Law Publishers, Dept. 806J National, National City, California 92050.

LIQUOR, Wine Formulas . . . Special brew secrets of the 1920's! Strongest available! \$2.20. (supplies catalog included). Brugenheimer, Box 158-E47, Lexington, Mass.

PIPE SMOKERS. Try this revolutionary, new way to smoke, at our risk. Send for free trial offer. The Philip's Co., Dept. PM-1, 99 University Place, N.Y.C. 10003.

ZIP Directory: 75¢! (Send Dollar—Change Returned!) Same Directory Sold for \$2.00! Robert Gross, D-AAA, 137-75 Geranium, Flushing, N.Y. 11355.

YOUR Name sent to 1000 importers, publishers, mailers, wholesalers, etc. on our mailing list. Year \$1.00. Dixie Mailers, King, N. Car. 27021.



# Drivin' with Dan

Should a high-school student own a car? Do those gas-mileage 'extenders' really work? Are racing-car drivers in the business just for kicks? Dan Gurney answers these and other provocative questions



**THE ALL-IMPORTANT TACHOMETER** gets the patented Gurney scrutiny before Dan pulls away from the pits to have a go at some pre-Indianapolis 500 practice

**Q.** Do you think that kart racing is a good way to learn how to drive race cars?—Steve Woodland, Downey, Idaho.

**A.** Karts can teach you a lot about racing-car driving. They touch on many of the phases of full-size car racing. However, after a certain point, they teach you more about kart racing than about other forms. I've always maintained that, in the beginning, virtually any kind of experience is valuable.

**Q.** I'm 17 and in high school. Do you think a guy in high school should be able to purchase a car, especially when he likes them a lot and knows how to handle them?—Dave Kast, Fort Wayne, Ind.

**A.** Yes, I do think a guy in high school should be able to purchase a car. However, it's a qualified "yes," because it really boils down to the question of whether or not a 17-year-old can assume the real responsibility of owning and driving a car. He or she must maintain serious and mature judgment at all times and control over distractions of all

kinds. Concentration on safety comes first. Some 17-year-olds can do it; some can't.

**Q.** Was the Parnelli Jones' Ford that won at Riverside this year an overhead-cam engine? Why does NASCAR let the Fords run dual quads and the Chrysler hemis only a single four-barrel? Would it be a fairer race if both ran dual quads?—Mel Nicolai, Sacramento, Calif.

**A.** Parnelli's Fairlane was not an overhead cammer, just an improved version of the old faithful 427 wedge pushrod Ford. Only NASCAR could give you an official interpretation of the current rules, but originally I believe it was done in an effort to keep all the cars on an even, competitive basis. That is, the Chrysler products used to put out more power on one carburetor than the Fords did on one carburetor. But recently, it seems to be more of a tossup.

**Q.** Does a man need perfect eyesight to become a driver in SCCA and Grand Prix racing?—J. R. Crane, Philadelphia.

**A.** There are many examples of great drivers who don't have perfect eyesight, or wear glasses—just as is the case in many sports. I would recommend that you have no worse than 20/20 vision, whether or not you need glasses to achieve it. Excellent vision, depth perception and peripheral vision are important to any driver, and many racing organizations or organizers require that participants pass stiff examinations before competing.

**Q.** Just what is the new Ford 351-inch engine? Is it a reworked 390 or 352? Is it intended for competition, and can it be swapped easily for the 289?—Ellis Couch, Lawrence, Kans.

**A.** It's an enlarged 289 and should be an excellent competition engine, both from the  
*(Please turn to page 56)*



**Even though 345 horses make you feel like flying,  
you don't need to feed them the most expensive motor oil.**



**Just the best.**

Your T-bird Landau can almost give you wings. The kind of car you care for as carefully as you do your chute. Especially the engine. But here again, the best care doesn't always cost the most. Using tests established by auto makers, we constantly check Gulfpride® Single-G oil for its ability to protect against wear, scuffing, rusting, deposit formation and clogging. Gulfpride far surpasses the requirements of car makers in these tests. Recent tests show Gulfpride Single-G performance equals or exceeds that of four leading competitive premium motor oils. (And one of them costs 25¢ a quart more than Gulfpride.) Get the best protection for your engine. Get Gulfpride wherever you see the Sign of the Gulf Orange Disc.

Gulf Oil Corporation

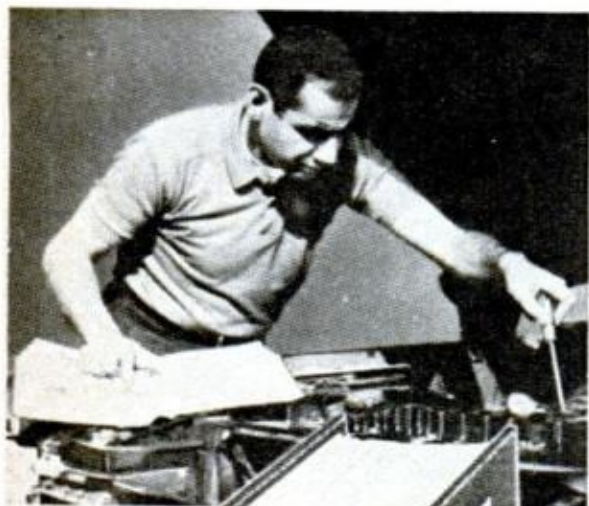




# Let MOTOR'S Big New **1967** AUTO REPAIR MANUAL

## Show You How to

# **FIX ANY PART OF ANY CAR**



**Quickly... Easily... Right!**

**Shows You Where to START...  
Which TOOLS to Use...  
Exactly What to DO!**

**1,256 pages, 3,800 pictures and diagrams  
cover 2,300 models (1959-1967) . . . 225,000 facts  
that make those "tough" repairs come easy**

**M**otor's great new illustrated 1967 AUTO REPAIR MANUAL! Here is the "meat" of over 300 factory manuals, brought together for you in the most complete, up-to-date auto repair guide ever prepared! Here are the easy directions and "see-how" pictures that help you sail through virtually every auto repair... from a simple carburetor adjustment to a complete transmission overhaul! Here are 1,256 almost-foot-high pages that can lick your toughest problems—quickly, easily, right the first time!

Yes—fix practically any part of any car! This revised, enlarged 1967 edition immediately identifies 2,300 models (1959-1967) for you. Just look up make, model, and repair in the huge Instant-Reference Index—and go to it! Motor's Auto Repair Manual takes you all the way—shows *where* the trouble is, *which* tools to use, *what* to do to fix it *fast*. 3,800 pictures and diagrams detail the parts... clear, simple language

puts over 225,000 service and repair facts at your fingertips! And a special Trouble-Shooter section pinpoints in a flash over 2,300 causes of car trouble: transmissions, brakes, engines, electrical systems.

### **Saves You Time, Money, Work**

You get hundreds of compact tables... over 50,000 essential specifications and dimensions... tune-up and adjustment charts... tables of measurements and clearances... overhauling and replacement facts... adjusting and servicing guidance, and *much, much more!*

Here is the step-by-step help every beginner needs. And here are the labor-saving methods and shortcuts that get old pros over the "tight spots" and save time and money. No wonder more than 5,000,000 copies of this great book have been sold all over the world — to garages, schools, Armed Forces!

**New Illustrated 1967 Edition**

### **SEND NO MONEY**

**Use Manual FREE for 10 Days**

Put Motor's big, new AUTO REPAIR MANUAL to work for you. See for yourself how quickly and easily it gets the work done! We'll send you this 1967 edition to use FREE for 10 days. If it doesn't start paying for itself in even this short time, return the Manual and owe nothing. Just mail the coupon below TODAY to MOTOR Book Dept., 250 West 55th Street, New York, N. Y. 10019. (Schools, Bookstores: Write for discounts).

### **Same FREE 10-Day Trial on Motor's TRUCK REPAIR MANUAL**



Covers 98% of all trucks, 1955-1967, including all new economy models. Over 2,000 illustrations; 300,000 facts. Covers all gasoline engines, plus Ford, GM, Cummins, Mack, Perkins, Caterpillar, International diesels. Over 1,000 big pages. For FREE Trial, check box in coupon.

### **FIX ALL THESE CARS**

Volkswagen	Chrysler
Mustang	Plymouth
Rarracuda	Fury
Jeep	Rambler
Chevy II	Dodge
Pontiac	Oldsmobile
Thunderbird	Ford Bronco
Buick	Buick Special
Imperial	Comet
Cadillac	Corvair
Lincoln	American
Dart	Oldsmobile F85
Continental	Falcon
Mercury	Ford Fairlane
Ford	Lancer
Chevelle	Tempest
Chevrolet	Corvette
Camaro	Valiant
Scout	Merc. Cougar
	Toronado

**FREE 10-DAY TRIAL**  
Return and Pay Nothing  
If Not Delighted



**COMPLETE AND SIMPLE.** "I always rely on my Motor Books. They're well illustrated — and complete and simple."  
—Mr. Ervs Jones, Minnesota (Garage Owner)



**DEPENDS ON IT.** "Motor's Auto Repair Manual is invaluable to me. I depend on it for all makes and models."  
—Mr. W. W. Fortines, Virginia (Mechanic)

### **MAIL COUPON NOW FOR 10-DAY FREE TRIAL** (Attach to Postcard if More Convenient)

**MOTOR BOOK DEPT., Desk 717  
250 West 55th Street  
New York, N. Y. 10019**

Rush to me at once (check box opposite books you want):

**MOTOR'S New AUTO REPAIR MANUAL.** If O.K., I will remit \$2 in 10 days, \$3 monthly for 2 months and a final payment of \$1.95 (plus delivery charge and sales tax, if any) one month after that. Otherwise I will return the book post-paid in 10 days.

Also send me for 10-day Free Trial **MOTOR'S New TRUCK REPAIR MANUAL.** If O.K., I will remit \$12, plus delivery charge and sales tax, if any, in 10 days. Otherwise I will return book postpaid in 10 days.

Print Name..... Age.....

Address.....

City.....

State.....

ZIP CODE ZONE NO

Check box and save shipping charge by enclosing WITH coupon payment of \$9.95 for Auto Manual (or \$12 for Truck Manual) plus sales tax, if any. Same 10-day return-refund privilege.



Okay, so we failed to invent  
a house paint that would last  
forever.

But wait 'til you see how  
close we came.



If you paint your house with new-formula LUCITE® you'll wait to repaint like you've never waited before.

We made it to last even longer than the original LUCITE House Paint. And the original LUCITE has held up on test houses for as long as eight years.

Another nice thing about new-formula LUCITE: the primer's already in the paint. No need to prime, even over most bare woods.

An easier job when you *do* paint.

A longer wait *between* paintings.

Longer, we think, than you dared hope for.



Better Things for Better Living . . . through Chemistry



## DRIVIN' WITH DAN

(Continued from page 52H)

standpoint of weight and power output. It could find its way into any car now powered by the 289 and will easily fit in the space required for a 390.

**Q.** I like cars and racing more than anything, but my parents don't want me to become a race driver. My mother says racing is just for kicks, but I don't think so. I know your column in Popular Mechanics isn't a personal advice column, but what do you think?—Ron Smith, Fairborn, Ohio.

**A.** Racing is a very serious business. People are fortunate if they enjoy what they do for a living. A racing-car driver who devotes himself to the business is a professional, much the same as a lawyer, ballplayer, teacher or businessman. Getting to the top of the field requires a lot of study, work and desire. All the best drivers get a kick out of racing, but they don't race just for kicks.

**Q.** Why didn't Jerry Grant drive for Ford and for All-American Racers? Also, can we expect enlarged versions of three-liter Honda, BRM,

Gurney-Weslake or Ferrari engines at Indy?—Nick Blake, San Jose, Calif.

**A.** Jerry left AAR to accept a position as number one driver for Friedkin Racing Enterprises of Escondido, Calif. His sponsor runs Chrysler products in stock-car racing, Chevrolet power in his sports car and Ford power in his Indy Eagles. I expect to see either enlarged versions or slightly smaller, supercharged versions of the Formula 1 engines you mention make their appearance at next year's Indianapolis 500.

**Q.** I recently ran across an advertisement (enclosed) for a device that supposedly would allow you to drive for an incredible number of days on a single tank of gas. I just can't understand how such a claim can be made, and if it is true, why isn't every motor vehicle in the country equipped with it?—Elwood Barker, Presque Isle, Me.

**A.** I don't see that it says how far you go each day on that tank of gas. It also avoids making definite statements and leads you to believe you get something for nothing—which I've never found to be the case. ★ ★ ★

## RACE FANS! Get This Handsome, Full-Color Wall Chart—Your New PM Guide to Competition Cars

32 types of racing cars in 8 major classes—Championship, Stock, Formula, Sports, GT, etc. Beautifully painted. Printed on heavy paper, 35 x 23 inches, suitable for framing. \$1.50 each postpaid.



Racing, Popular Mechanics, 575 Lexington Ave., New York, N. Y. 10022

Please send \_\_\_\_\_ copies of Popular Mechanics Racewatchers Guide to Competition Cars. Enclosed find \$1.50 for each

Name \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_



# WIN THE GOLDEN GATE BRIDGE FOR A DAY!



## ENTER KELLY-SPRINGFIELD ACTIONLAND SWEEPSTAKES AND WIN!

### 1ST PRIZE-CASH

Cash equal to tolls for all traffic in one direction (whichever is higher) over the Golden Gate Bridge on August 1, 1967.

**\$10,000 GUARANTEED**

\$1,000 BONUS if your entry is validated. (See rule 2)

### 250 2ND PRIZES

Sets of four Kelly-Springfield Citation Polyester Cord Tires.\*

\*When entry is validated. (See rule 2)

### 250 3RD PRIZES

Pairs of Kelly-Springfield Citation Polyester Cord Tires.\*

\*When entry is validated. (See rule 2)

## RIDE KELLY-SPRINGFIELD CITATION POLYESTER CORD TIRES AND WIN AGAIN!

Actionland is where you drive...and four full ply Citation with gold stripe sidewall is a winner for Actionland Driving. It's Kelly-Springfield's top-of-the-line tire with

Polyester Cord—the modern man-made fiber that gives you no bump, no thump, no flatspotting. The Kelly-Springfield Tire Company, Cumberland, Maryland, U.S.A.

## FOR ACTIONLAND DRIVING...KELLY-SPRINGFIELD TIRES



### OFFICIAL RULES

- 1 Print your name and address on official entry blank (additional entry blanks at your Kelly-Springfield Dealer) or plain piece of paper. NO PURCHASE REQUIRED.
- 2 Win \$1,000 First Prize cash bonus by having your Kelly-Springfield Dealer validate (sign) your entry. (Winning second prize entries not validated will receive TWO Citation tires, winning third prize entries not validated will receive ONE Citation tire. Validation not required in Wisconsin.)
- 3 Enter as often as you wish, but mail each entry separately to:  
"Kelly-Springfield Actionland Sweepstakes"  
P.O. Box 407, New York, N. Y. 10046  
Entries must be postmarked by July 31, 1967, and received by August 15, 1967.
- 4 Winners will be selected from all completed entries in random drawings conducted by the D. L. Blair Corporation, an independent judging organization whose decisions are final. Only one prize to a family. Winners will be notified by mail.
- 5 Sweepstakes open to residents of the United States, except employees (and their families) of The Kelly-Springfield Tire Company and affiliates, its advertising agency and the D. L. Blair Corporation. Void where prohibited by law. All Federal, state and local regulations apply.

### OFFICIAL ENTRY BLANK

KELLY-SPRINGFIELD ACTIONLAND SWEEPSTAKES

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Dealer's Name & Address \_\_\_\_\_

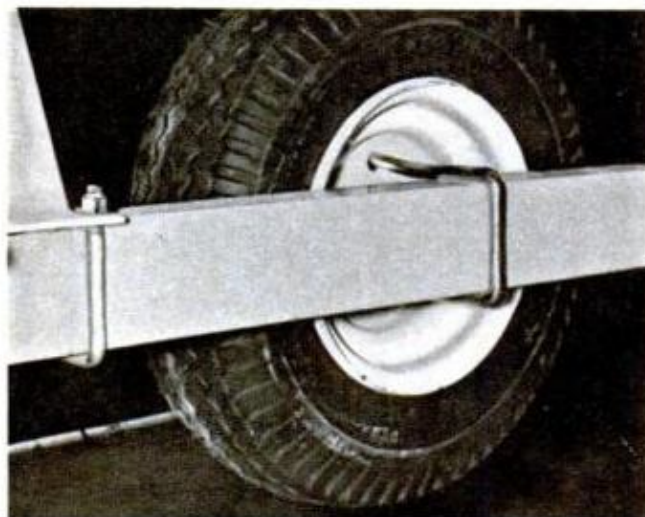
Dealer's Validation \_\_\_\_\_

Also at Sunoco and other leading service stations displaying the Kelly-Springfield sign.



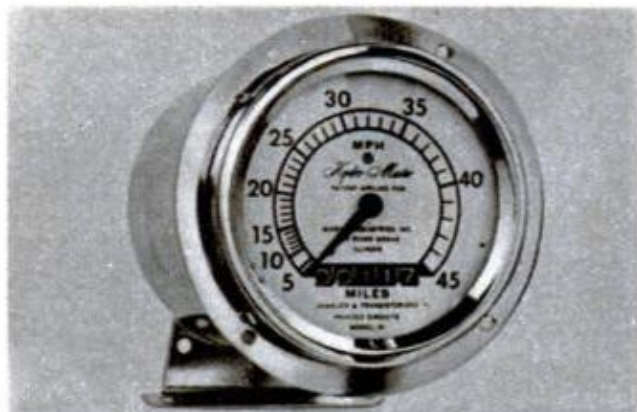


**SWING-DOWN LIGHT** for windshield mounting has two-compartment globe, each with a bulb. With both lit, it's a full 32-pt. anchor light; one is 20-pt. bow light. Perkins sells it for \$17.



**TRAILER ACCESSORIES** from Golden Rod include an inexpensive spare tire carrier (\$2) and a line of replacement fenders, primed for painting, which are sold in pairs from \$5.50 to \$8.90.

# New for Your Boat



**SPEEDOMETER RECORDS MILES** using a transistorized unit to convert pitot tube pressure to electrical values which are metered. Price is \$89 from Marine Industries, Barrington, Ill.



**FUEL-TANK TRAY** screwed to cockpit floor holds tank in place and keeps it off the floor. Elastic hold-down cord features quick-release hooks. Made by Tempo, it retails for \$4.95.



**WATERTIGHT TOOL CHEST** of rigid molded plastic is double-sealed to protect tools from spray. Measuring 6x6½x14¾ in., it's \$4.95 from The Crow's-nest, 16 E. 40th St., N.Y., N.Y.





# How to make a tom of a collins

Start with your favorite gin.  
Finish with 7-Up® for that  
Wet & Wild something that  
turns a Collins into  
a real Tom. Mix one that  
comes when you call.

®SEVEN-UP® AND 7-UP® ARE REGISTERED TRADEMARKS IDENTIFYING THE PRODUCT OF THE SEVEN-UP COMPANY. COPYRIGHT 1967 BY THE SEVEN-UP COMPANY.







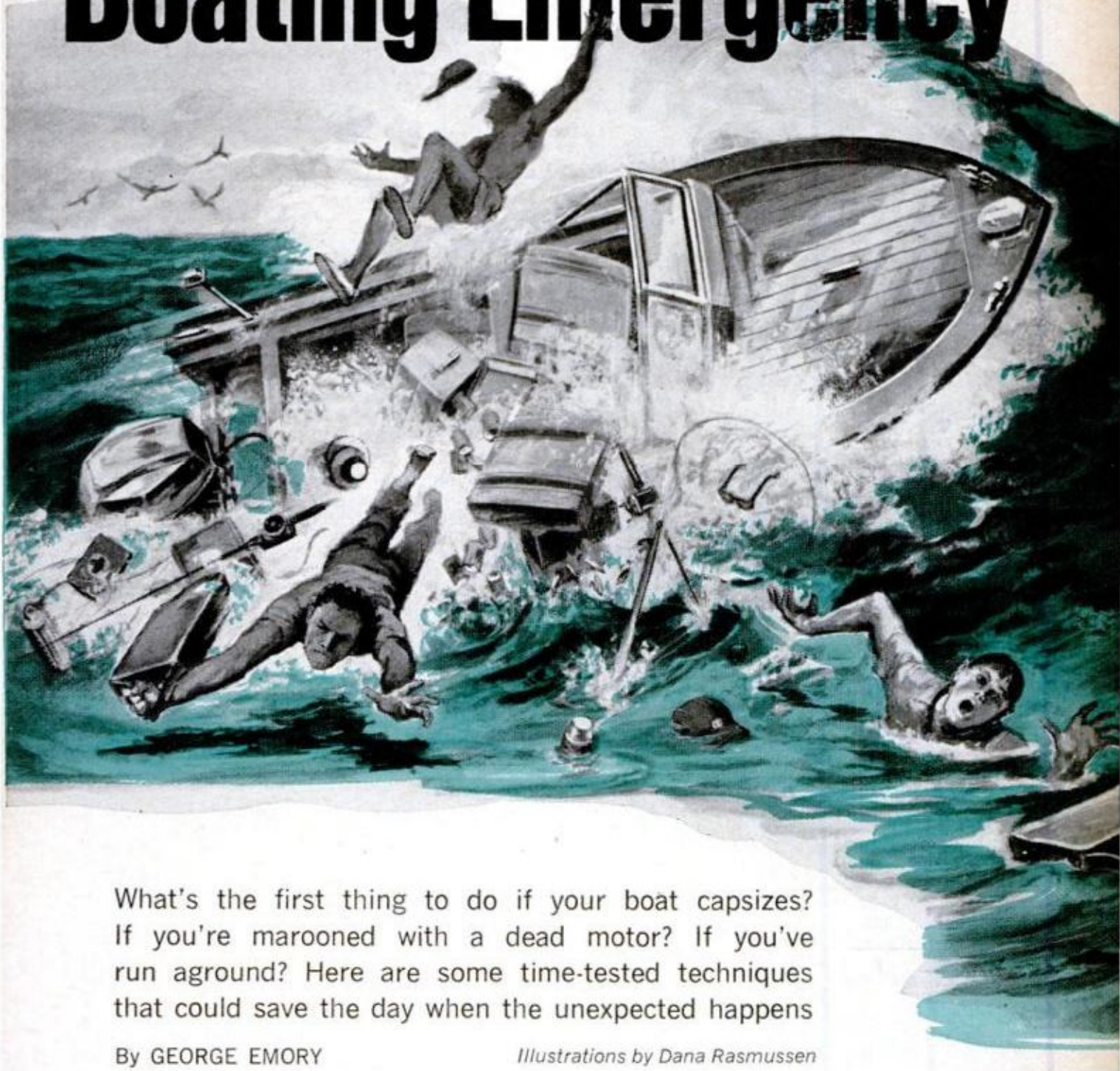
The crisp keen taste of the Northland.  
New L&M Menthol Tall. 100 millimeters tall.  
Taller than king size.





# How to handle a Boating Emergency

Popular  
Mechanics



What's the first thing to do if your boat capsizes? If you're marooned with a dead motor? If you've run aground? Here are some time-tested techniques that could save the day when the unexpected happens

By GEORGE EMORY

Illustrations by Dana Rasmussen

**T**HE FIRST LAW OF BOATING SAFETY would probably be: "Do everything you can to avoid an emergency." Know your boat and operate it properly; carry all the right safety equipment and know how to use it; keep your boat, motor and gear in top shape.

But when you *are* faced with an emergency (and it happens to the best of us), the first thing to remember is *don't panic*. Things are seldom as bad as they seem, and for every emergency there's a simple drill. Check the following pages for some important "what-to-do-if" rules.



## YOUR BOAT SUDDENLY CAPSIZES . . .



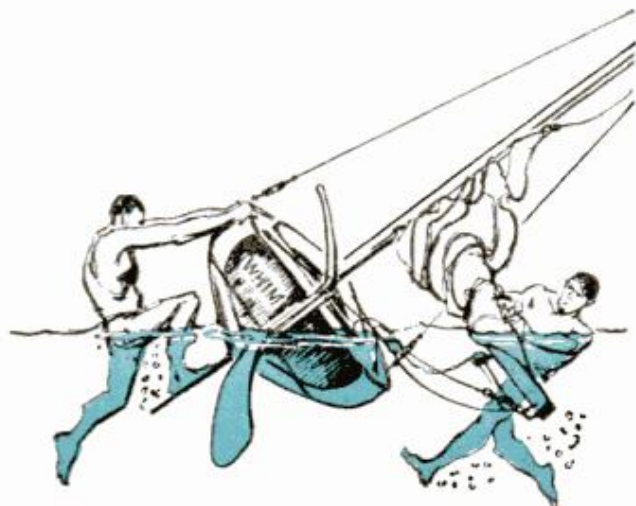
**COUNT HEADS IMMEDIATELY.** If anyone is missing, check behind or under the boat. Don't life preservers or grab floating cushions. Gather everybody around the boat and make them stay there. (Swimming for shore is risky. It's always farther than it looks.) To right boat, push down on one side to impart a roll-over motion. But be careful not to get hit.



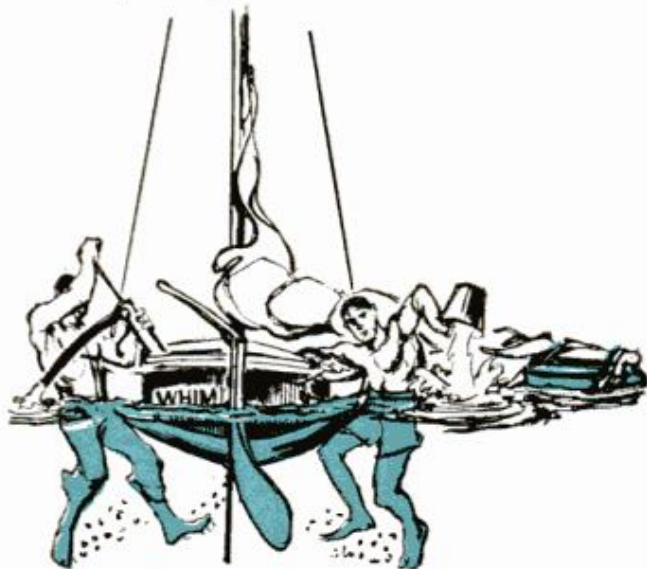
**ONCE RIGHTED, YOU CAN BAIL** out the hull provided the gunnel is even slightly above water. If transom cutout is submerged, have passengers bear down on the bow while someone bails the well. Use anything handy for bailing—drinking cups, tin cans, hand splashing or even the bilge pump if it wasn't lost during capsizing. After you've made a little progress, boost the lightest man aboard to bail from inside. It's slow, but it works.



**ROUND-CHINE BOATS** can be cleared of considerable amounts of water by rocking them from side to side. Spilled passengers grip opposite gunnels, and those on one side bear down while those on the opposite side let the boat rise so that water spills out over the low side. A few such rolls will remove enough water to allow one man to scramble aboard (over transom) and finish bailing from inside.



**RIGHTING A SMALL SAILBOAT** is easier than righting a runabout. Just place your feet on the centerboard, grip the gunnel with both hands and pull the boat right side up. However, if your boat has an aluminum mast which isn't completely sealed at the ends, slip a buoyant cushion under the tip as soon as possible after going over. This will keep the mast from sinking and turning the boat completely upside down, which will make it considerably harder to right. While you're still in the water, empty the hull as much as you can by splashing or bailing. Then re-board over the transom to avoid capsizing (unless you happen to be an old hand at it).



**WATER-FILLED SAILBOAT** may be likely to flop over again when you're bailing. To help prevent this (and to make the boat easier to right), sails should be dropped and centerboard lowered completely before you haul the boat right side up. With some hulls, it's possible to turn the boom into a stabilizing outrigger by lashing it to a cleat at right angles to the boat and placing a buoyant cushion under the end. The important thing to remember in any capsizing is not to exhaust yourself trying to do the impossible. If you can't right the hull easily, hold on and wait for rescue.



# YOU'VE HIT SOMETHING AND HOLED THE HULL . . .



**IF THE HOLE IS FORWARD** on a planing hull, it may be possible to keep it above water while running for shore simply by maintaining planing speed. In choppy water, it's a good idea to have somebody crawl up under the foredeck and stuff a rag into the hole or block the opening by pressing a handful of rags over it. Just hold a steady planing speed, avoid sharp turns and you'll have no trouble.



**HOLE NEAR THE CHINE** can sometimes be lifted above the water by shifting passengers and gear to heel the boat. Even if the hole doesn't rise above the waterline, the flow will be reduced by bringing it nearer the surface. As with any hole, block the flow by stuffing the hole with whatever you happen to have at hand—sweaters, jackets, bathing suits or other articles of clothing. Then head for shore at low speed, keeping the holed side up on turns and swinging wide to avoid taking on extra water.



**HOLE IN THE COCKPIT** which can be reached from inside should be plugged with rags or articles of clothing which can be held in place by having a passenger stand on them. (For that matter, boats have made shore from miles away with a small hole plugged by somebody simply pressing his foot over it.) If the boat has a self-bailer, use it. Have passengers bail or man bilge pump. Boat speed will depend on location of hole. Start slow and check flow as you increase speed. Aim for least leakage.



**HOLE UNDER FLOORBOARDS** which is inaccessible from the cockpit must be plugged from the outside, though shifting weight may also be of some help. Assuming the water is calm and you're a good swimmer, shut off the motor and go outside. You'll probably have to locate the hole by feel. If small, stuff a rag into it. Use a cushion or a pad of rags as a patch for larger holes, holding it snug against leak by drawing a rope tight around the hull. Then start bailing and make for shore. If possible, head for nearest beach, since a badly holed boat may sink at dockside before it can be hauled out, especially during off-hours.



**EMERGENCY PATCH** for a hole in cockpit can sometimes be made by wedging gear under a seat to hold preserver cushion against the leak.

**IF YOU CAN'T MAKE IT** to shore and you're in a boat that can sink completely (like a sailboat with a heavy keel), get as close to land as you can before going over the side in life preservers. Before you abandon ship, trail a long line astern with a float tied to the end; a plastic oil container might be a likely choice here. This float will serve as a marker for salvage operations. If you have time, also take a "fix" on land objects to help locate boat.

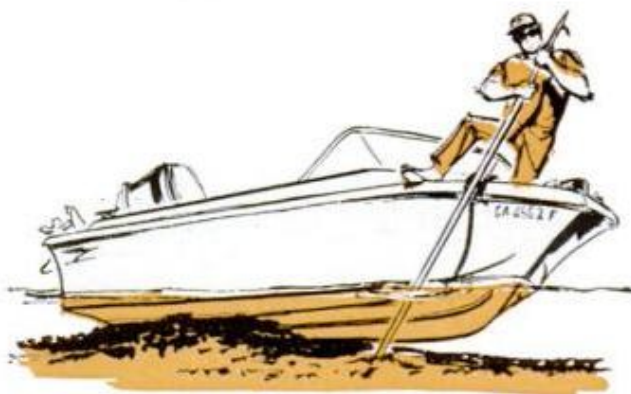




## YOU'RE HARD AGROUND ON A BAR . . .



**KILL THE MOTOR IMMEDIATELY** and check for hull damage, fuel-line leaks or spilled fuel, especially if the impact was hard. Then tilt up the lower unit or stern drive and make sure the cooling intakes aren't fouled. Before trying to push off, pump out bilge to lighten the boat and move passengers aft (assuming you've grounded at the bow). Use a paddle, boat hook or water ski to pole off, facing to the side or aft to avoid falling overboard.



**IF YOU CAN'T POLE OFF**, leave one person aboard who knows how to handle the boat and have everyone else who can swim go over the side. This can lighten the boat by as much as a quarter of a ton. To get free, squat with your back against bow, then push up and back as you straighten your legs. (Don't try it in a mucky bottom.) When boat is free, swim to it.

**IF YOU'RE GROUNDED AT THE STERN**, use a pole or anything else handy to pry the bow around so you're headed in the opposite direction. Remember that the best way off is almost always the way you came on, since your hull has already plowed the channel. No matter where you're grounded, chances are it rises still higher ahead of you. Use a rag pad over the gunnel to avoid marring it when prying. When headed in the right direction, use the same kind of prying action at the transom to walk the boat toward open water. If you have passengers, of course, move them up to the bow to take weight off stern while prying.



**IF THE BOTTOM IS SOFT**, shift passengers to one side to tilt boat. This raises the deepest point of hull (especially one with a deep-V) and may free the boat enough so you can pole back to deep water. When free, hand-crank motor with switch off and listen for sounds of internal damage that might be worsened by electric starting. If all sounds right, start the motor and check cooling outlet to make sure the system is working right. If you lost a prop blade and don't have a spare prop aboard, run for shore at lowest rpm that provides headway.

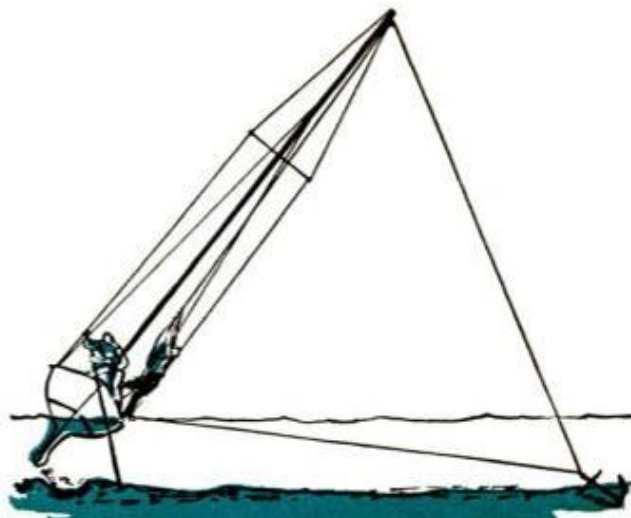


**IF YOU'RE ALONE** and grounded on a mucky bottom, there's a good chance you can work the boat free by rocking it from side to side. The safest way to do this is to stand in the cockpit with feet spread wide apart and rhythmically shift your weight from one foot to the other until you feel the boat begin to rock. Once you've got it rocking, throw your weight into the rhythm to make it rock harder. If you're grounded at the bow and have to rock from the foredeck, tie a lifeline around your waist. When the hull breaks free, pole off.





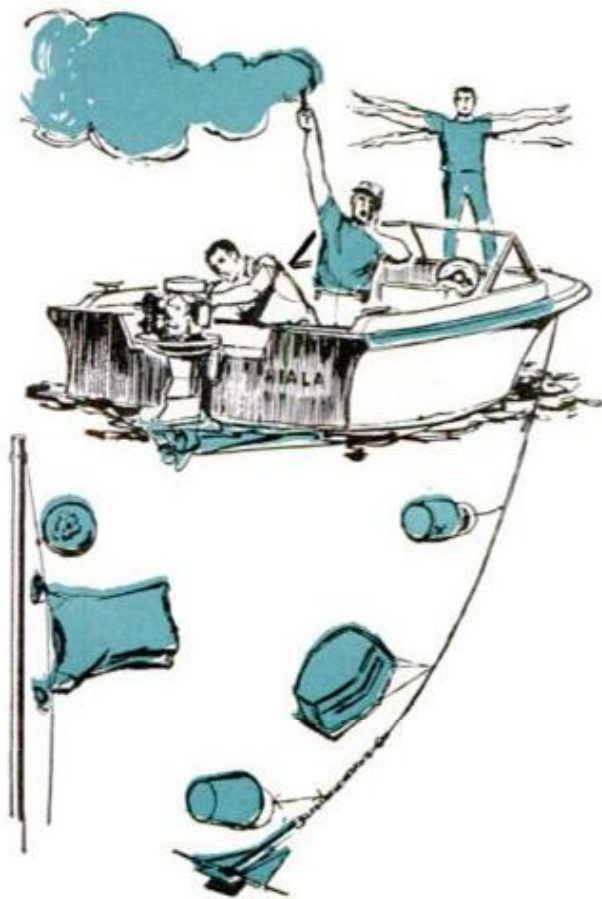
**IF AN OUTGOING TIDE** grounds your deep-V runabout or deep-keel sailboat on a sloping bottom, shift passenger weight and loose gear to the high side so that the hull will settle toward this side. If the boat settles on the low side, the incoming tide is likely to flow over the lower gunnel and swamp the boat instead of lifting it free. When the tide comes in, redistribute gear so hull trims out right.



**KEDGING OFF** grounded keel boat requires a dinghy to carry anchor out. Double lines, above, tilt keel up to make poling off easier. For more efficiency, use pulley block, below.

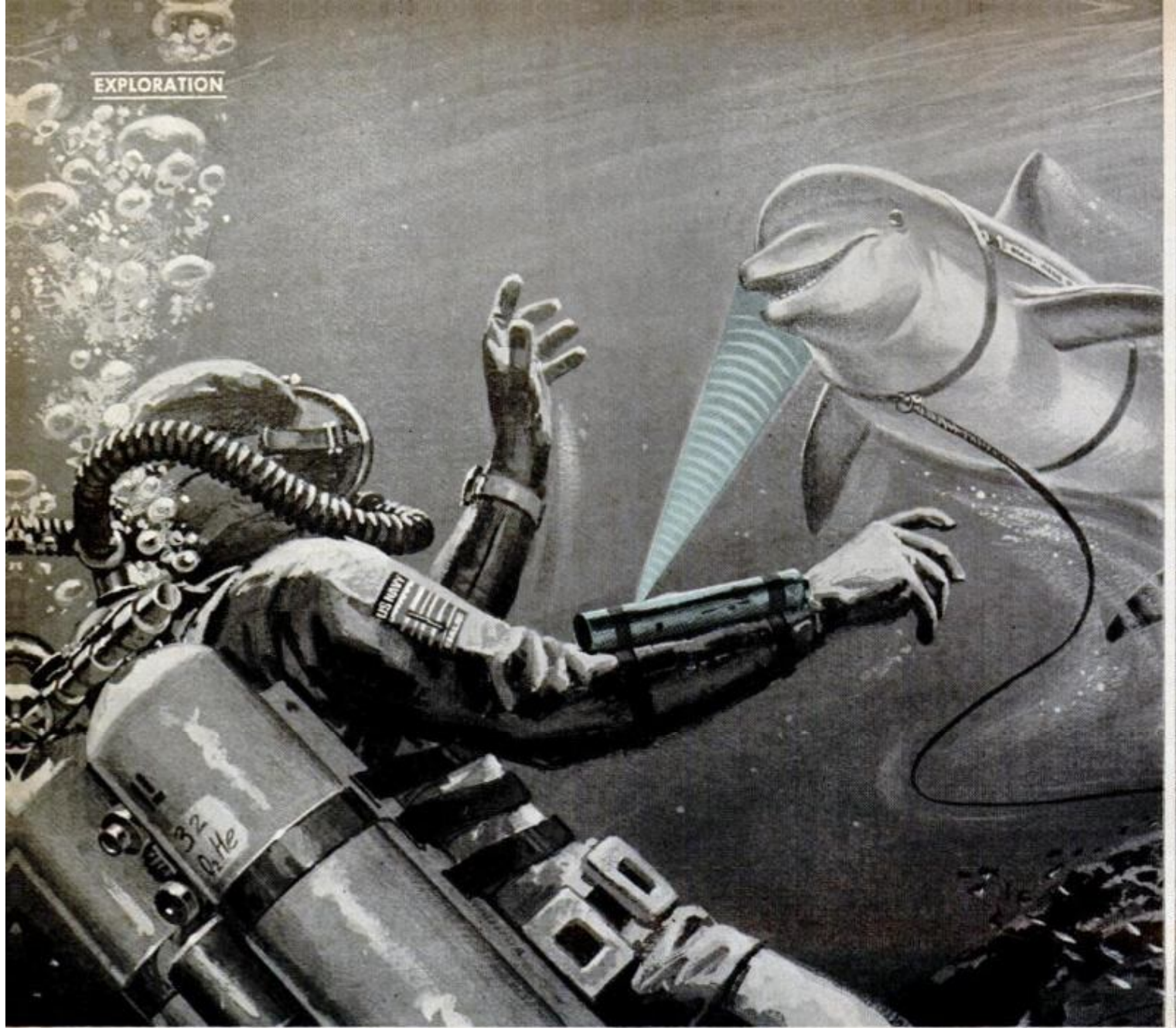


## YOU'RE ADRIFT WITH A DEAD MOTOR . . .



**DROP THE ANCHOR**, even if it can't possibly reach bottom. Before you do, though, tie any unneeded gear to the anchor line—an empty picnic cooler, the motor cover, even articles of clothing—to boost the sea-anchor effect. Dragging all this junk through the water on the anchor line will slow your drift, and this is mighty important if you're being blown toward open water or a rocky shore. To signal for help in daytime, face toward any boat likely to see you, extend your arms straight out at shoulder height and raise and lower them about once every second. This motion is clearly a signal and unlikely to be mistaken for a friendly wave. To make your signal even more obvious and visible over a greater distance, tie an article of bright-colored clothing to the end of a fishpole or paddle and wave it at about the same rate. If you have a horn or whistle aboard, sound long repeated blasts. Two other established emergency signals which any sea captain would recognize (though others might not) are a circle flown above a rectangle or an ensign (flag) flown upside down. Your best bet for signaling in any emergency is a flare or a smoke signal. Any boat in offshore waters, or even on a large lake, should be equipped with both. Marine stores stock flare kits from \$6 to around \$30. If you're a big-water boater, it's a good buy. ★★★



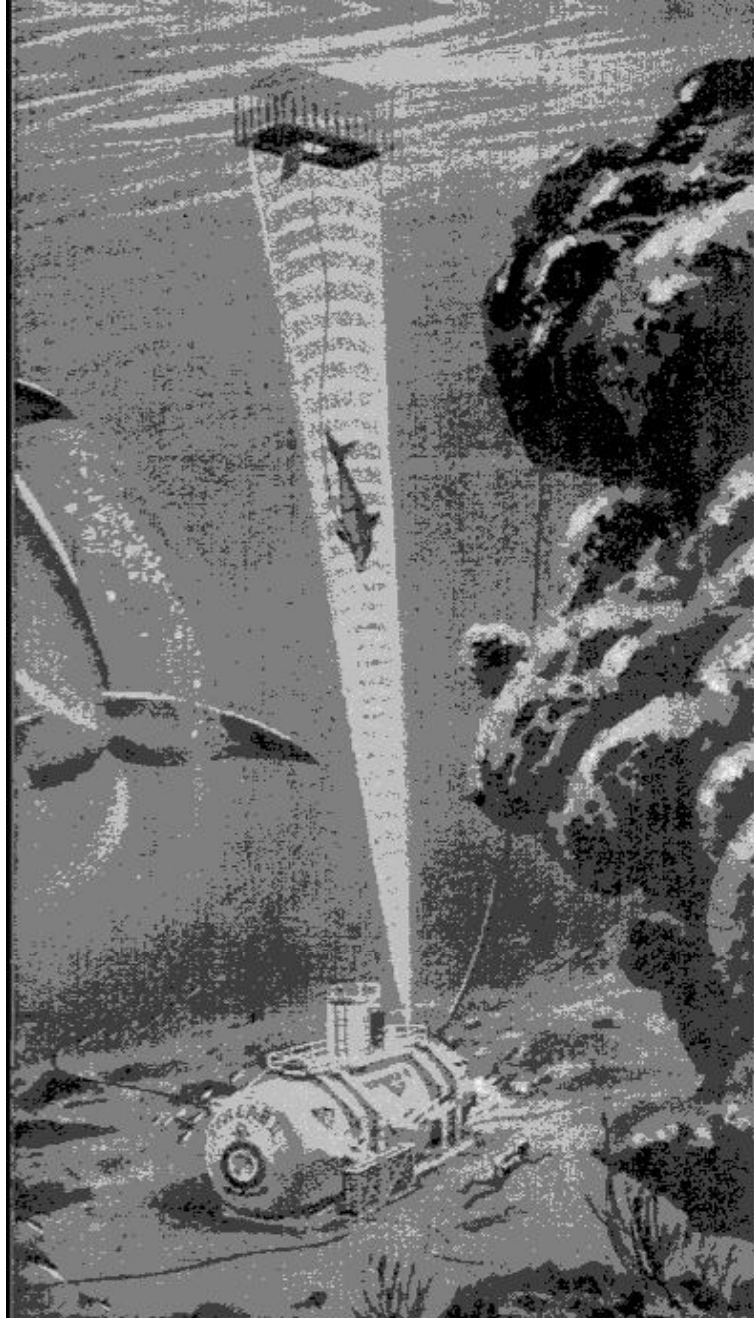


LIFEGUARD TUFFY swims to a stranded diver, dragging a homing line after him. Tuffy locates diver by sound

# *TUFFY—The Navy's Deep Sea*







signal from transmitter attached to the diver's arm

## Lifeguard

Friendly dolphins—the mammals with the high IQ—are being trained for undersea rescue missions.

By TOM STIMSON

Illustration by Howard Schafer  
All photos by U.S. Navy except as noted

**FRIENDLY DOLPHINS**, like friendly dogs, are easily trained. They respond to praise, enjoy being petted and are highly intelligent. Here one learns to home on acoustic device, like dog to whistle

JULY 1967

**"UNDERWATER EMERGENCY!** One of our divers has disappeared and he's almost out of oxygen! Please send Tuffy down to find him!"

Seconds later Tuffy's sleek, streamlined shape plunges down to the Sealab structure on the ocean bottom. Here a big plastic ring, dangling from a reel of line, awaits him. The canny porpoise pushes his snout through the ring and immediately speeds off into the darkness, trailing the line behind him. Moments later the lost diver comes walking across the sea bottom to safety, following the line Tuffy brought him.

That's the rescue that Tuffy's trainers expect him to perform during the Sealab III experiment planned for late this year. The simulated emergency will be a demonstration, but it could be in grim earnest.

The Sealab III aquanauts will live, and work, at depths of 400 feet or more where very little light filters down from the surface. It's conceivable that a diver who walks out into the darkness could become lost. Other aquanauts, searching for him, might not reach him before his oxygen is consumed. Nor would the lost diver dare an emergency ascent to the surface. That would kill him, for he's conditioned to the pressures of the deep. Decompression will require several long days when he ends his stay below.

At Point Mugu, Calif., F.G. Wood Jr. explains how Tuffy is being rehearsed for fast underwater rescue. "Woodie" Wood is head of the Marine Bioscience Facility at Point Mugu's Naval Missile Center. "Tuffy has been trained to respond to one kind of signal first, then to another. For instance, when an acoustic homing device is sounded at the Sealab structure, Tuffy will swim down to it from his floating pen on the surface. Here he'll pick up the ring on his nose. Meanwhile the 'lost' diver will have turned on his own sound signal, of a different pitch. Tuffy won't respond to it until he has the ring, then he'll swim right to the second signal.

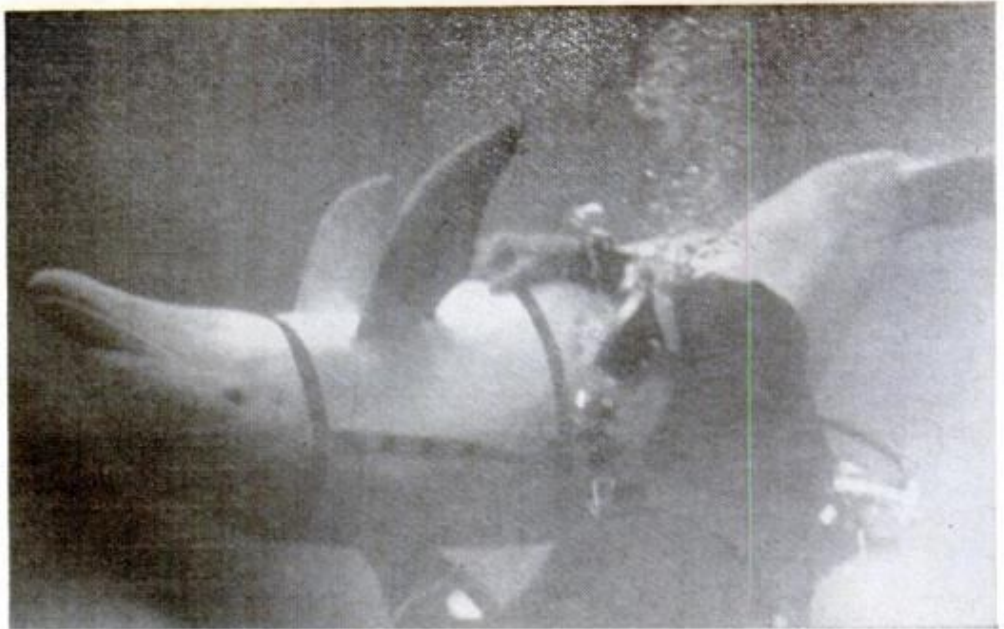
"Underwater, a human can't hear an



**DOCILE DOLPHIN** rolls over on back while diver adjusts his harness. Lifelines can be hooked onto harness, or dolphin can snare a hoop which has a lifeline attached and trail it after him

**DEPTH TESTS** proved Tuffy could go at least 550 feet deep. He tilted wheel set at that depth, turning off homing buzzer. Trainers believe he can go deeper

**TUFFY HOMES** in on "stranded" diver during practice run. Diver reaches for hoop which has lifeline. Homing signal device is attached to his left forearm



acoustic signal from very far away. And he can't determine its direction. A porpoise can detect the same sound more than a quarter of a mile away, locate it, and swim straight to it."

Tuffy the porpoise (actually he's an Atlantic bottlenose dolphin) is a key animal in an intriguing research program. The Navy is investigating the idea of teaching marine animals to do useful work. The idea isn't as far-fetched as it seems, for land animals that once were wild (such as dogs,

horses and oxen) have all been domesticated and taught tasks for which their special abilities fit them. It's hoped that the marine counterparts of some land animals can be trained to become useful team members in the Man-in-the-Sea program.

"You could almost say that some porpoises have been domesticated already," says Wood. "Last Fourth of July weekend we locked two porpoises, Tuffy and Peg, in their floating pen a quarter of a mile offshore, and then on the morning of the Fourth we found that the pen's gate had been opened. The two animals had disappeared.

"We started an emergency air-sea search and broadcast a plea for all small craft to be on the lookout for them. The porpoises had been trained to follow a small boat.

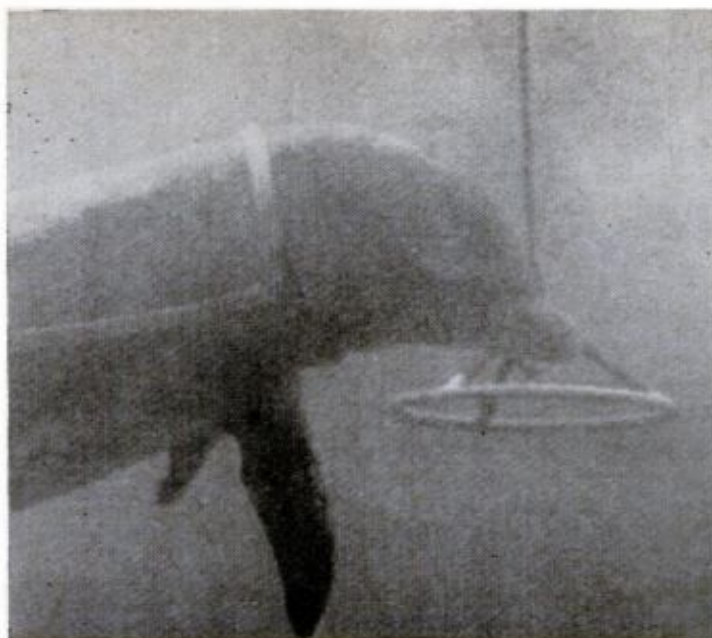
"The first break came the next day. A Navy helicopter with a wet-suited trainer riding as passenger sighted a porpoise 30 miles up the coast. This was Tuffy, easily identified by the crescent-shaped scar on his right side. The trainer dropped into the water close by and turned on his call signal to keep the porpoise close until the lab's boat arrived. Then the trainer helped maneuver Tuffy into a sling, to be hoisted safely on board.

"But Peg was still missing. There was one report that she had been seen off Anacapa Island, 15 miles offshore. Two

**'BLIND' PORPOISE**, its eyes covered with cups, can still locate and retrieve hoops by echo detection  
Marineland of the Pacific







days later she was seen again, following the wake of a small boat near the entrance of Port Hueneme only a few miles up the coast. Some of our lab people boarded the boat and led Peg the six miles back to Point Mugu, where she swam docilely into the floating pen."

Already, Tuffy has proved he can serve as an efficient diver's helper. He put on a star performance during the 1965 Sealab II experiment. Wearing a harness to which messages or small tools were attached, Tuffy would streak from the surface to the Sealab living quarters 200 feet below and make his deliveries, all in response to buzzer signals.

As part of the same program Tuffy would dive to an aquanaut on the bottom, wait while one end of a line was tied to his harness, and then seek out another aquanaut who was hiding in the depths about 50 feet away. This diver would detach the line and attach a message, then Tuffy would head for the surface. The entire underwater trip required only one minute and 10 seconds.

To learn how deep Tuffy could dive, the Point Mugu scientists once rigged up a buzzer that could be lowered from the surface. The buzzer, together with a mercury switch, was installed in the hub of an automobile steering wheel, which was suspended from the end of an electric cable. The idea was that

when Tuffy heard the buzzer he would swim down to the wheel and tilt it at least 30°. This would break the mercury contact and turn off the buzzer, telling the people at the surface that Tuffy had reached the depth at which the wheel was positioned.

"Tuffy learned to do this easily," says Wood. "Working on the surface, the trainer turned on the buzzer and Tuffy swam over to the wheel to investigate the noise. Then the trainer blew a whistle and rewarded Tuffy with a fish. Wanting another fish, Tuffy swam over to the wheel again. But this time there was no whistle, no reward, and so the porpoise knew he had to do something more. He nudged the wheel with his nose. The whistle was blown and he got another fish. Tuffy nudged the wheel again. No whistle, no reward. Eventually Tuffy tilted the wheel enough to turn off the buzzer. Then he got a reward.

"It took 12 tries for Tuffy to learn what was wanted, and the whole step-by-step training program was completed in 15 minutes. Then the wheel was lowered in the open ocean to succeeding depths, finally to 550 feet. Each time, Tuffy descended to the wheel and tilted it properly. We still don't know his maximum diving depth. The program will be continued in the future."

In a more recent experiment, dolphins

*(Please turn to page 178)*





# PLYMOUTH

## handling's a wow, economy a woe

By BILL KILPATRICK, Auto Editor

**A** MILKMAN in New York State is just the fellow auto advertising copywriters and car salesmen envision in their sweetest dreams. Answering *PM's* questionnaire about his new Plymouth Fury, the milkman wrote, "I feel like a million when I get behind the wheel."

You can almost see the ad, can't you? Beaming face, self-satisfied grin, hands gripping the wheel like a man reborn, glowing copy—the works?

One wonders, however, what sort of visions haunt the dreams of car peddlers when confronted by such indignant customers as the North Carolina office worker who wrote, "Have had three rear ends put in since I bought the Fury on Nov. 8, 1966." An ad that's

based on *that* statement would make interesting reading, I imagine.

Too, the ad men might well ponder how they'd handle this comment from a North Carolina businessman:

"Judging from the trouble I've had with the car, I'd say the factory needs to revamp its design department and change efficiency experts."

As regular readers of our *Owners Reports* know, those we survey aren't the least bit timid about sounding off. Buyers of the 1967 Fury, including the I, II, III, Sport Fury and VIP, for example, aren't hiding their lights under any bushels when they speak out in praise of the way their cars handle, a quality earning a Frequency-of-Mention Rating (FMR) of 49.8 percent, the way





**OWNERS PRAISED DASH LAYOUT,** interior styling, comfort, but some dislike ignition switch location



**BODY STYLE TOPPED LIST** of reasons for buying the Fury, although body workmanship was big complaint

# FURY:

they're styled (an FMR of 42.3 percent), and their comfort (36.3 percent). Nor are they bashful when it comes to beefing about poor gas mileage (22.1 percent), poor workmanship (15.4 percent), and wind noise (9.4 percent).

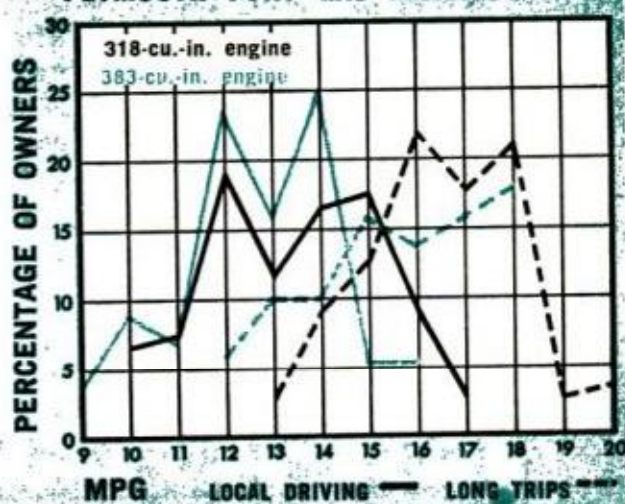
"Handles beautifully on highway and country roads," said a Missouri hatchery manager. These sentiments are echoed by a Nebraska teacher: "On the road, the car is part of you; you don't have to fight it to drive it."

A Michigan salesman, however, said, "My Cadillac gets better mileage than the Fury." Along the same lines, a Kansas farm manager said his Fury "... uses more gas than my six-cylinder Ford."

A summary of these and other likes, dislikes and general driving experiences of Fury owners surveyed by *PM* appears on the next page. Percent-

JULY 1967

## PLYMOUTH FURY GAS MILEAGE CHART

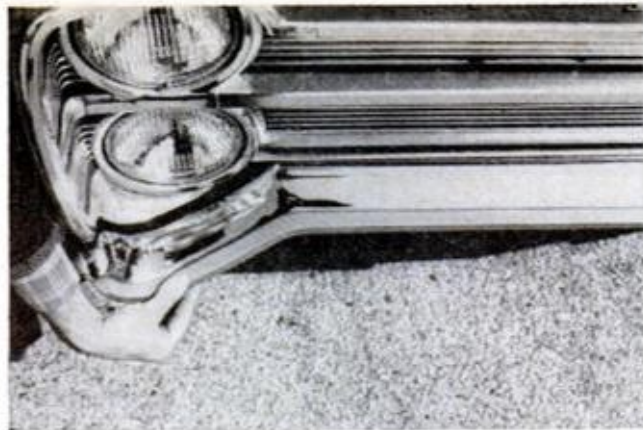


**LOCAL AND TRIP MILEAGE** for 318 and 383 engines were 13.4 and 16.6, and 13.0 and 15.8, respectively





**SPECIFIC WORKMANSHIP COMPLAINTS** included loose chrome and molding fit; example is rain gutter



**SMART, GRAY RUBBER BUMPER PROTECTOR** length of bumper merited praise for being inconspicuous

ages listed reflect the frequency with which owners mentioned specific items. The summary is based on 1,425,719 miles of local and long distance driving.

Fury owner comments pertaining to their praises and complaints about the car follow, again in order of frequency mentioned. Boldface asides are mine.

As mentioned, heading the list of owner praises is the car's handling.

"Easy to handle, even though it's a big car."—New Jersey teacher.

"Holds the road extremely well at high speeds."—Michigan secretary.

"Handles like a more expensive car."—New York apparel designer.

Next, owners have kind words for the Fury's styling.

"Beautiful car."—Kentucky farmer.

"Best styling in the low-priced field."—Minnesota bartender.

"A great ego-booster."—Nebraska educator.

Comfort came in for bouquets, too. "It's paradise after being cramped in some of the cars presently being made."

—North Carolina professor.

"High-backed bucket seats are extremely comfortable."—New York communications worker.

"Passengers have talked about how

*(Please turn to page 186)*

## Summary of Plymouth Fury Owners Reports\*

Total miles driven .....1,425,719  
Average mpg:  
318-cu.-in. engine .....15.0  
383-cu.-in. engine .....14.4

**Specific likes:**  
Handling .....49.8%  
Style .....42.3  
Comfort .....36.3  
Ride .....35.3  
Reliability .....21.9  
Economy .....18.9  
Power .....13.4  
Roomy .....9.0  
Road "feel" .....8.0  
Interior styling .....7.5  
Quietness .....7.0  
Dash design .....7.0

**Specific dislikes:**  
Poor economy .....22.1%  
Workmanship .....15.4  
Wind noise .....9.4  
Road noise .....7.4  
Brake action .....6.7  
Tire quality .....5.4  
Steering/unit .....5.4  
Dealer service .....4.7  
Ignition location .....4.0  
"Rattles" .....4.0  
Underpowered .....4.0

**Had mechanical trouble?**  
Yes .....51.6%  
No .....48.4

**What kind of trouble?**  
Windshield wipers .....14.3%  
Carburetor .....9.8  
Oil leaks .....9.8  
Transmission .....8.9  
Electrical .....8.0  
Power steering .....8.0  
Voltage regulator .....7.1  
Brake action .....6.3  
Brake drums .....6.3  
Ignition .....5.4  
Door fit .....5.4

**Dealer service satisfactory?**  
Yes .....66.4%  
No .....25.5  
"So-so" .....6.4  
"Not back yet" .....1.8

**Why the Fury?**  
Style .....35.6%  
Past experience .....34.2  
Price/value .....14.6  
Performance .....12.3  
Reputation .....8.2  
Know dealer .....6.8  
Handling .....5.9  
Ride .....5.0

Size .....5.0

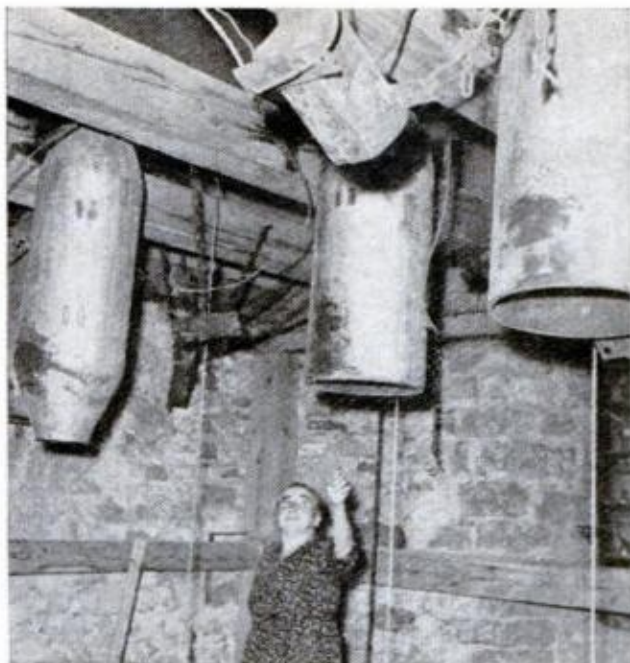
**Buy another Fury?**  
Yes .....87.6%  
No .....12.4

**Other cars owned:**  
Plymouth .....16.2%  
Chevrolet .....12.6  
Chrysler .....9.9  
Ford .....9.0  
Valiant .....8.1  
Rambler .....6.3  
Volkswagen .....6.3  
Pontiac .....4.5  
Dodge .....4.5  
Comet .....3.6  
Corvair .....3.6

**Age distribution of owners:**  
Under 20 .....1.4%  
20-24 .....5.0  
25-29 .....11.5  
30-34 .....10.1  
35-39 .....8.7  
40-44 .....15.6  
45-49 .....15.1  
50-54 .....9.6  
55-59 .....10.6  
60-64 .....5.5  
65 and over .....6.9

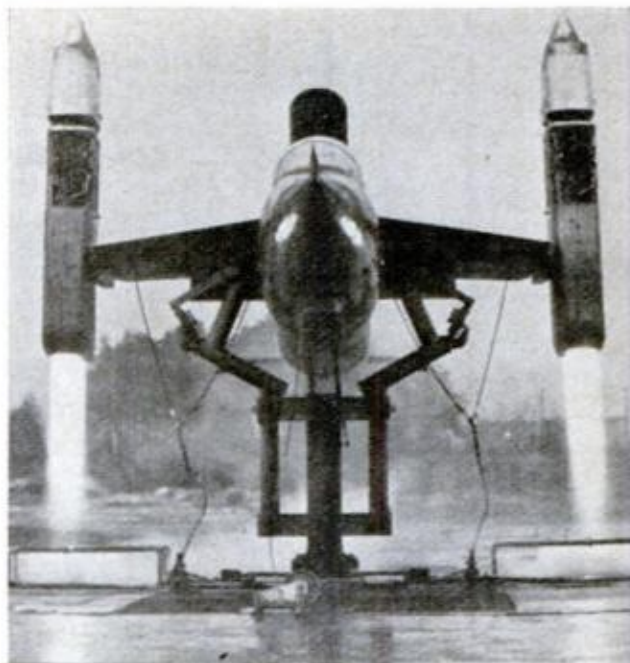
\*Where applicable, percentages may not equal 100 percent due to rounding and/or insufficient sample.





### Swords into plowshares

Unexploded bombs from a 1945 air raid on Pforzheim, Germany, have been disarmed, emptied of explosives and hung in a church belfry. The tone of the empty shells is very good for calling people to worship.



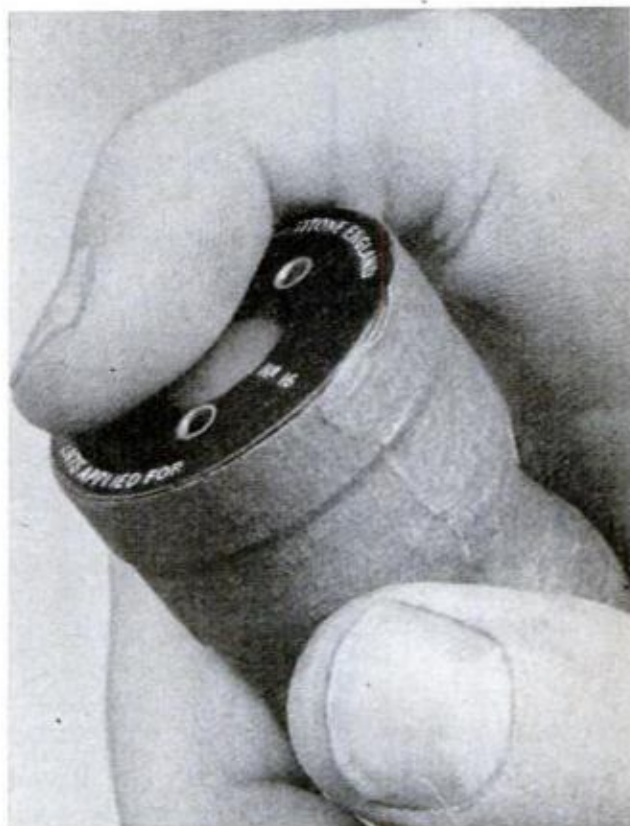
### Tied-down VTOL

Just as rocket engines are given static tests before flights, the Germans gave a new Dornier VTOL a ground test with the craft attached to a stand. Thrust measurements were taken as engines rotated from horizontal to vertical.



### London watchmen carry an alarming nightstick

A London firm has invented a nightstick that can trigger an alarm at police headquarters. A radio transmitter is located in the handle. Just a push of a button (right) activates the radio. A signal is transmitted that trips a relay and sounds an alarm. Help is immediately rushed to the officer. Burgot Automatic Alarms of London is producing the sticks. The firm hopes to manufacture a smaller version of the nightstick which would be fountain-pen size.





# Coming: Home Sound

Optical recording, once far too costly for amateur use, thanks to a tiny light-generating diode. Result:

By PAUL WAHL

## HOW OPTICAL SOUND IS RECORDED ON FILM



## HOW THE SOUND IS REPRODUCED IN A PROJECTOR



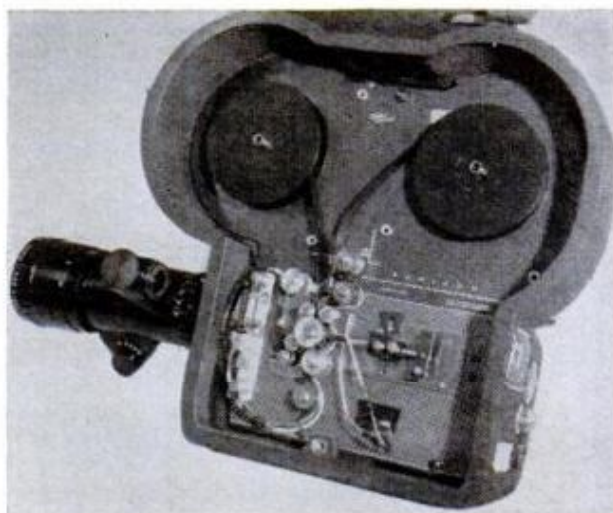
**I**MAGINE watching your own movies and actually hearing the roar of a speedboat as it flashes by on the screen. Or the sound of your son or daughter playing a musical instrument. Or the gay talk and laughter of people at a party. Such fascinating possibilities are not far off. A new system of low-cost optical recording promises to make 8-mm home sound movies practical for the first time.

Hollywood has been making talking pictures for more than 40 years, but most home movies are still silent. Cost is the reason. Today's lowest-priced sound camera sells for just under \$800 and uses special magnetically striped film.

The new sound system is based on a tiny electroluminescent diode pioneered by the Norton Co. of Worcester, Mass. Smaller than a match head, the silicon carbide diode changes electricity into light. It completely eliminates the complicated lamp, mirror and lenses that make

conventional optical sound too costly for 8-mm home equipment.

In the new system, minute electrical pulses generated by sound waves striking a microphone are converted by the diode



**BARELY VISIBLE**, a tiny Norton diode is wired into a standard Auricon camera for recording tests

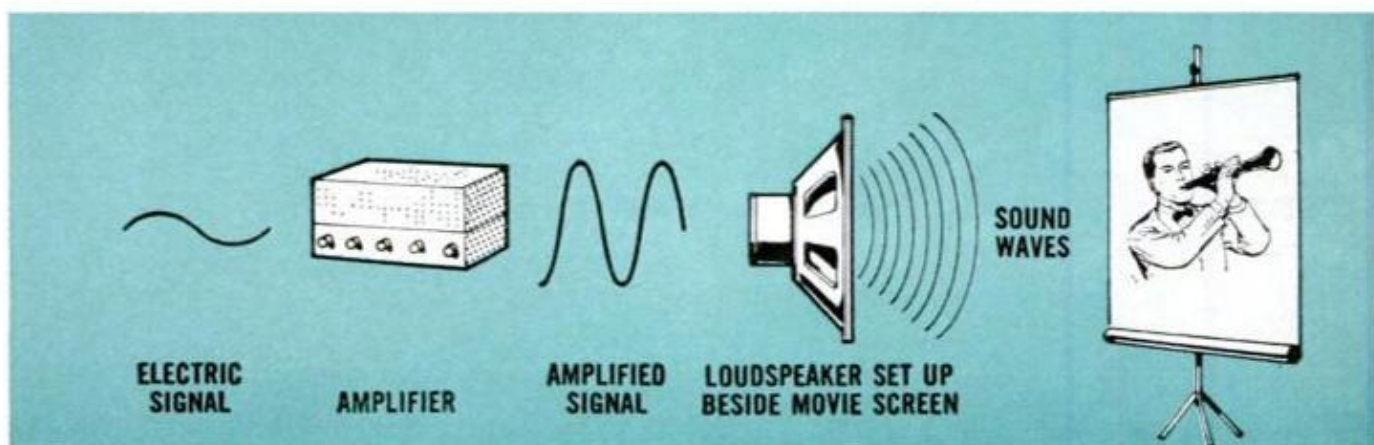
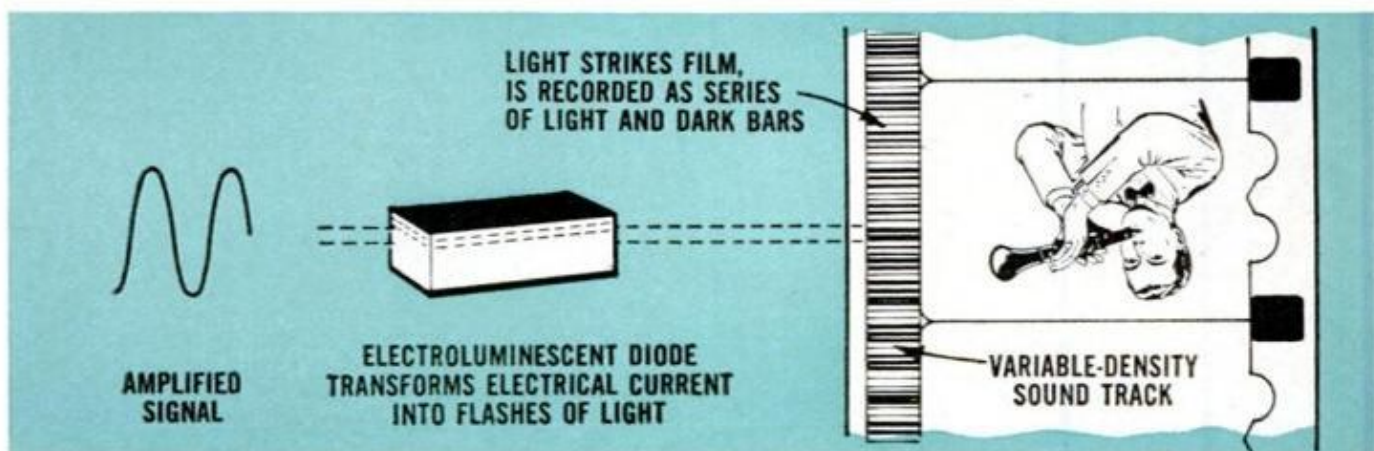
POPULAR MECHANICS



# Movies for Everyone

now promises inexpensive 8-mm sound equipment, Hollywood-type talkies shot right in your own home

Technical art by ZIK Associates, Ltd.



into flashes of light. The flashes vary in intensity according to the intensity of the electrical pulses. The flickering diode produces a series of light and dark bars along the edge of the film. These bars are

known as a variable-density sound track.

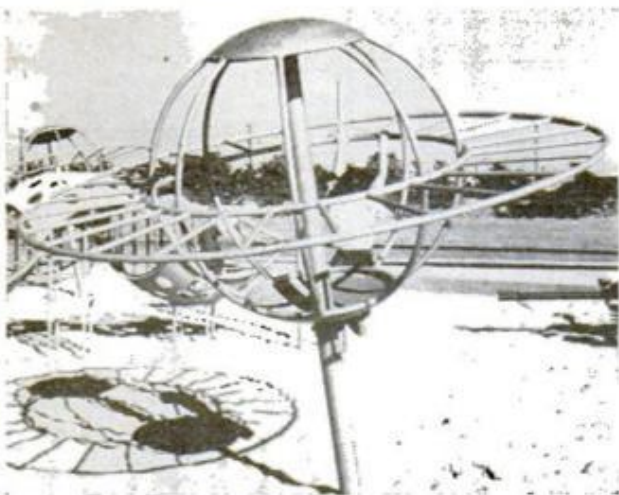
When the film is projected, a lamp inside the projector shines through the light and dark bars, recreating the original pattern of flickering light. The flashes are converted by a photoelectric cell back into electrical pulses. These, in turn, are changed into sound waves by the loudspeaker alongside the screen.

Because the picture and sound track are recorded simultaneously on the film, synchronization is perfect, and there is no need for a separate magnetic sound track.

Once in production, the diodes are expected to add less than \$25 to the cost of a sound camera using ordinary Super 8 film. The only other components you'll need will be a conventional microphone and amplifier for recording and a projector equipped for playback. How soon will sound movies actually reach home screens? Possibly in as little as one to two years, say hopeful engineers. ★★★

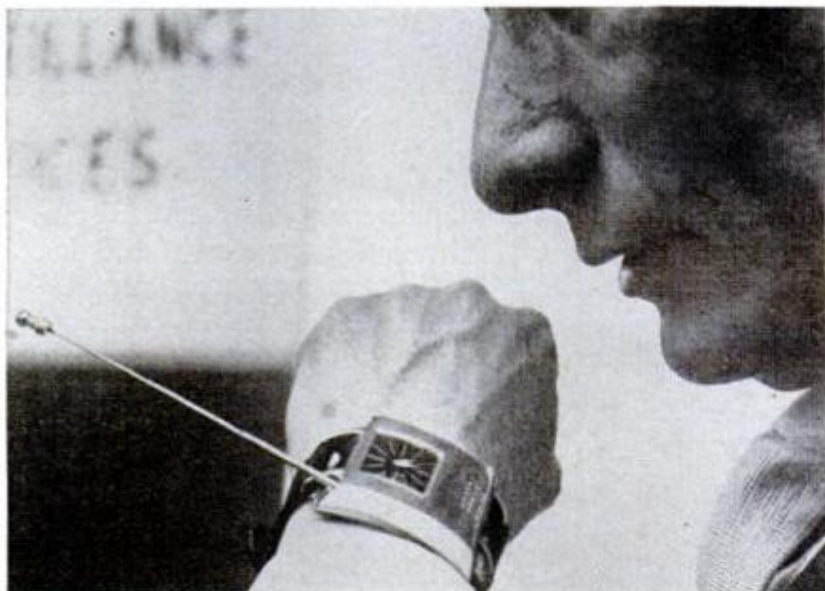
SMALLER THAN A MATCH HEAD, the diodes must be handled with tweezers, take up virtually no space





## Space for play

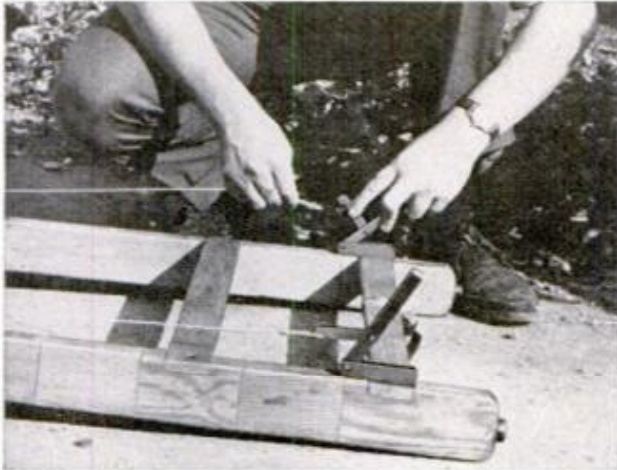
The residents of Wantagh, N.Y., call their playground "Cape Wantagh"—and with good reason. It's loaded with enough space vehicles to take dozens of young astronauts on imaginary voyages to the moon every day. There's even an unidentified flying object (upper left) that exercises youngsters' arms and shoulders while traveling to wherever flying saucers go. At left is a rocket climber and rocket slide (the wings are for sliding), and above are moon craters, for climbing under and over. The new playground was built on reclaimed marshland as part of an \$8 million recreation area for Nassau County on Long Island.



## Timepiece for talking

Anyone who reads comic strips knows that Dick Tracy has been using one of these for years. Now the wristwatch radio transmitter has moved out of the cartoons—like the flying belt and spaceship—to become an operating bit of hardware. Powered by an ordinary hearing-aid battery, the new wrist radio broadcasts on a preset FM frequency, putting the wearer in touch with anyone near a receiver on the same wavelength. When the telescoping antenna is extended, transmitting range is about 200 feet. The transmitter can also be used to activate a remote-control switch that will enable the user, for example, to turn on his house lights while he's still in his car or turn on television from his bed.





## Roll-up ladder fits in a car trunk

A 12-foot ladder that rolls up into a neat bundle small enough to fit in the trunk of a car (upper left) unrolls at the work site and holds people like a ladder should. The ladder is composed of hinged wooden sections which, when the ladder is unrolled to its full length, are held in place by wires that are pulled taut by ratchets (lower left). A center hinge enables the user to "bend" the 12-foot sidepieces and form a six-foot stepladder (right). Weight of the unit, which is a British invention, is 28 pounds.

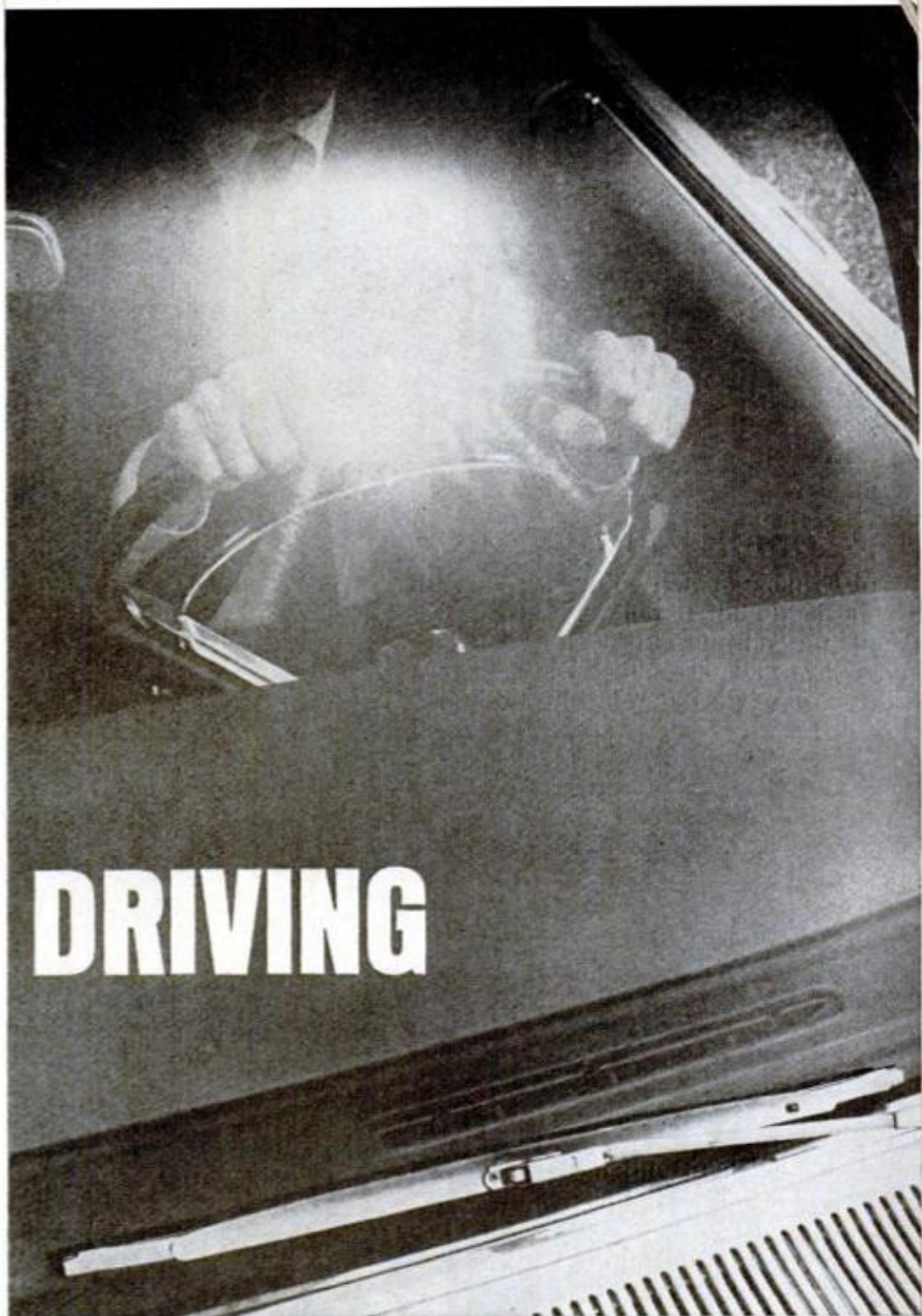


## Two real stoppers from Belgium

A bracelet attached to a driver's wrist (left) and a radar antenna both have one purpose: to stop the car before the motorist inadvertently gets into trouble. The bracelet monitors the driver's physical condition. If he falls asleep or shows the effects of too much celebrating, the control box sets off audible and visual signals. If the driver ignores them, gas is gradually cut off until the car stops. The radar setup applies the car's brakes if it gets too close behind another vehicle. Inventor of both devices is Jean Gebelen of Liege, Belgium.



# WHAT SUN GLARE CAN DO TO YOUR DRIVING



**A carefree day in the brilliant summer sun can leave you blind as a bat once the sun goes down. What's more, eye damage is cumulative and may take days to repair itself**

By **JIM BERRY**

*Illustrations by Roger Chapin and ZIK Associates, Ltd.*

**WE WERE DRIVING** home after a pleasant day and evening at a sun-drenched Cape Cod beach. Traffic was light, and I was concentrating on the white dashes of the median strip as I barreled down the dark highway preceded by the dim beam of my headlights. Then, the white dashes faded out. Suddenly, I heard a screech of terror from my wife and felt the car pitch

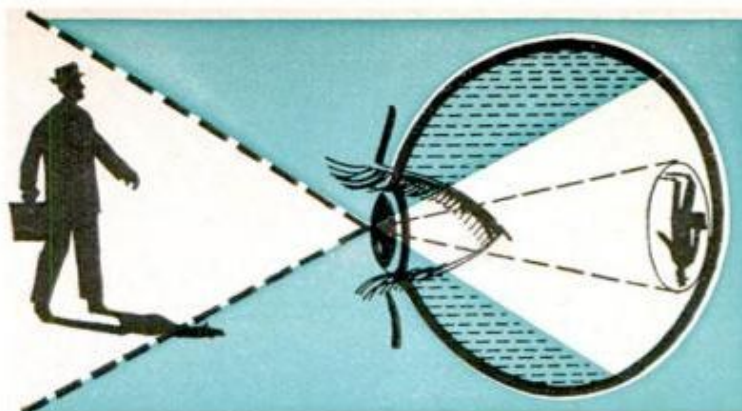
violently over the road's shoulder, through a barbed-wire fence and into a field.

At the point where the faint median strip had disappeared, the road curved to the left. But I had driven straight ahead. Toll: One badly scraped car and misaligned wheels and two badly shaken passengers.

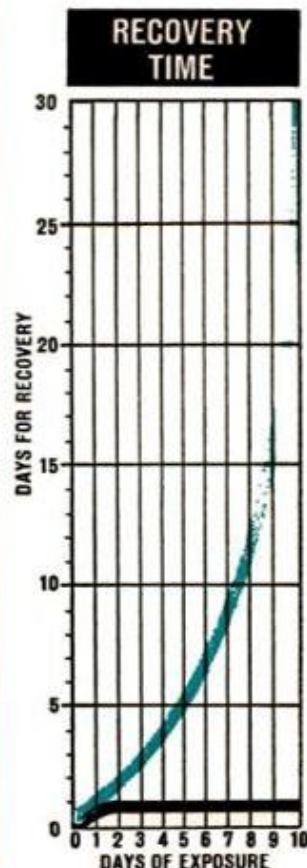
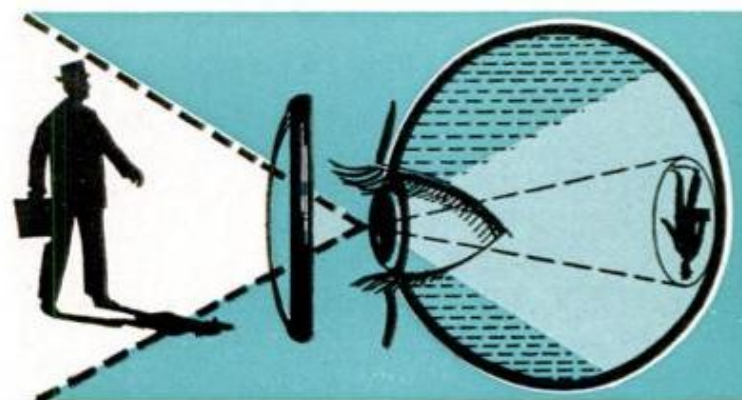
There was good reason why I missed



LIGHT  
SOURCE



LIGHT  
SOURCE



**LIGHT PASSES THROUGH** eye lens (top), strikes retina, bleaches out photosensitive pigment needed for night vision. Sunglasses (bottom) filter out glare, protect pigment. Graph approximates recovery time from glare

the turn. I—like millions of other unsuspecting drivers—had been a victim of what is becoming recognized as a dangerous and little-appreciated driving hazard—night blindness. My wife, who had worn dark sunglasses throughout the day, saw normally and spotted the curve. I hadn't worn sunglasses and—unknown to myself—had been practically blind ever since the sun had gone down.

Prolonged night blindness, while news to most of today's drivers, was first recognized in World War II as a dangerous killer.

As the war progressed, reports of deadly night accidents mounted. Pilots lost sight of the dim night horizon and crashed; Army truck drivers missed turnoffs and drove into ditches while on lights-out convoys; seamen couldn't see buoys and missed enemy patrols that normally should have been spotted.

To find out why, the armed services formed the Vision Committee, an emergency study group that probed the reasons for nighttime mishaps.

One of the committee's first studies took place at Florida's Pensacola Naval Air Station where ophthalmologists tested a group of Navy men who had spent leave time on bright Florida beaches. Every man flunked a simple night-vision test. Another investigation took place at Quonset Point, R.I., location of a lookout post staffed with servicemen handpicked for their keen sight. All were seriously blind at night; a few had only 10 percent of their normal night vision. Questioning revealed that the day before the test was given, the men had worked in bright sunlight shoveling snow.

Finally, adding all the gathered facts together, the Vision Committee fingered a simple cause for night blindness: sun glare. Its recommendation to prevent the affliction was equally simple: wear dark sunglasses in bright sunlight.

Other researchers looked further into glare's deadly effect on nighttime vision. In Atlantic City, N.J., a group of lifeguards not wearing sunglasses was tested for night seeing ability



every day for a week. Within two days after the swimming season started, the vision of these men had deteriorated by an average of 50 percent; some guards were more than 90 percent blind at night.

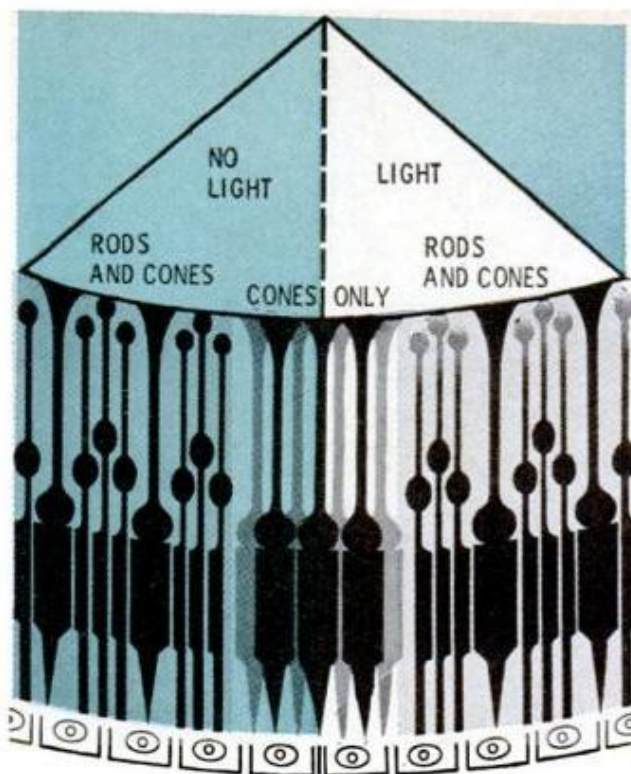
Two important facts emerged from the Atlantic City tests. First, people vary in their recovery time from glare exposure. Dark-haired people with dusky complexions suffer the least effect; blue-eyed blonds the most. Second, the longer the glare beams into unprotected eyes, the longer the time needed for normal night vision to return. Typically, a full week passed before the lifeguards' night vision returned to normal. But some men took a full month before they could see at night with their usual acuity.

The cause of night blindness due to glare lies in the activity of a photosensitive chemical called visual purple, or rhodopsin. The eye uses two sets of cells—cones and rods. In bright light, the eye sees with cones, which are concentrated in a pinhead-sized area of the retina. In dim light, cones are insensitive, and the rods—which are grouped around the cones and more lightly spread throughout the rest of the retina—take over. Rhodopsin, a chemical cones don't have, is what gives the rods their fine sensitivity.

Rhodopsin molecules, biologists have found, are highly unstable in light. When struck by even dim light rays, they split apart into vitamin A and a protein called opsin. This breakdown of rhodopsin molecules stimulates the rods' nerve endings, resulting in sight.

As rhodopsin breaks down, the rods manufacture more. In dim light, the rods reach a balance between depletion and production of rhodopsin. In strong light, regeneration of the chemical can't keep pace with its destruction, and the rods' supply completely bleaches out. The normal eye takes about 20 minutes to fully build up its rhodopsin quota again. But in the meantime, the eye is partially blind.

When glare—a dazzling flood of



**DURING DAY**, eye sees with cells called cones. At night, eye uses rods, sensitive to dim light and the source of rhodopsin production. Prolonged exposure to glare affects rhodopsin, causes night blindness

bright, reflected light that blankets the entire retina—strikes rods, another and imperfectly understood effect takes place. Somehow glare impedes the production of rhodopsin, perhaps by paralyzing the rods' nerves. Depending on the amount of glare absorbed, the eye needs anywhere from a few hours to a full month before manufacture of rhodopsin swings into high gear again. Until it does, night vision ranges from poor to practically nonexistent. Because daylight—or cone—vision is relatively unimpaired by glare, most people assume their night vision is also normal. Yet, they may in fact, be driving at night while dangerously blind. The ultimate form of this type of blindness is, of course, snow blindness.

Even sunglasses won't help prevent night blindness if they're not dark enough. This is also true of polarized glasses. If the eye can be seen through the colored lenses, the sunglasses won't filter out enough glare to protect eyes. Sunglasses should have other features,

*(Please turn to page 188)*



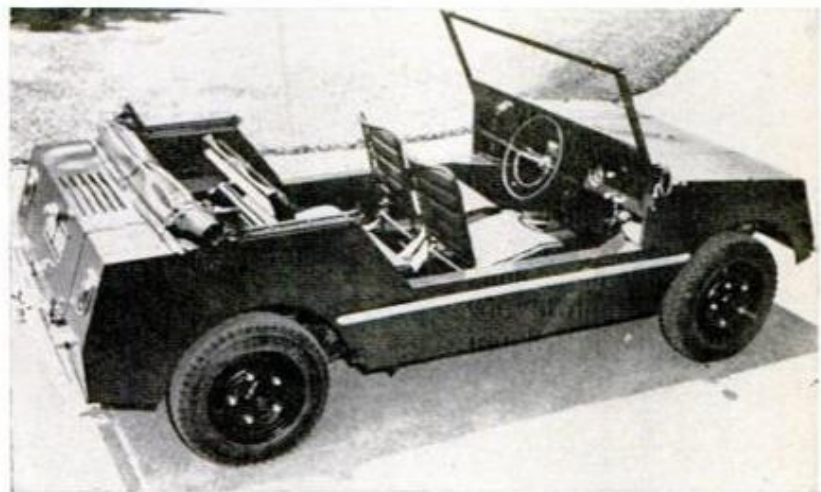


## Mini instruments for full-grown minstrels

Martin Zahl, a Berlin watchmaker, and his son give "small" musical recitals. They play violins that range in size from  $2\frac{3}{4}$  inches to 8 inches, plus a miniature grand piano, clarinet, concert zither, accordion and a complete set of percussion instruments. Mr. Zahl claims these are the smallest musical instruments in the world. They're played just like full-sized ones and have similar tones. The violins are carved from 300-year-old wood. Mr. Zahl says that he hopes to become a musical clown on television with his pint-sized instruments.

## Down-under VW

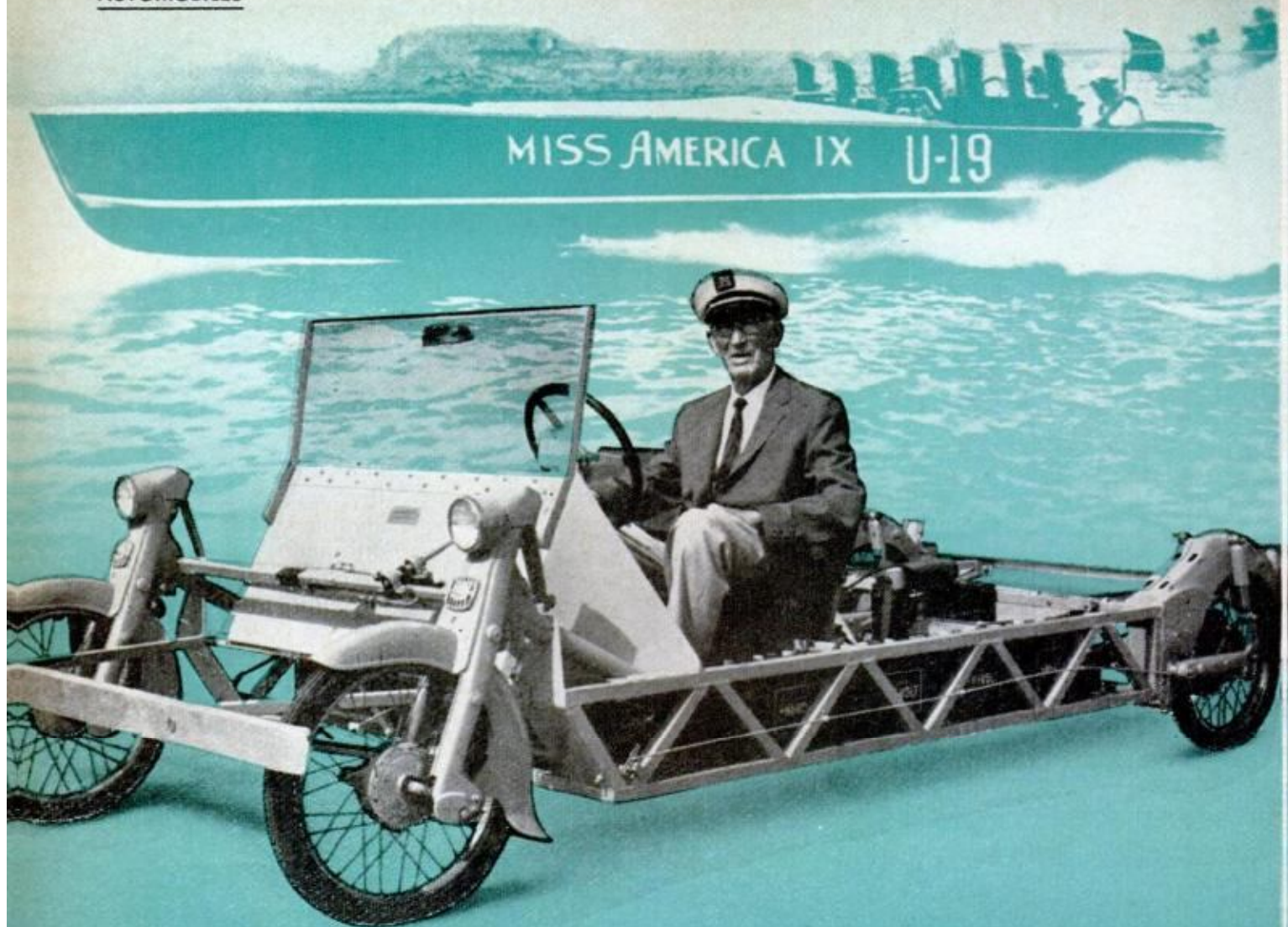
An off-trail version of the Volkswagen is being built for the back country in Australia. This new heavy-duty vehicle is equipped with swimming tanks for crossing rivers and lakes. It will also be equipped to tow a trailer. Name and price are not yet fixed, but the price is expected to be lower than that of the "Beetle." The car will be available soon from the Volkswagen plant in Melbourne, the firm says.



## Air-cushion gig

During a series of 10-day Mediterranean cruises from Gibraltar this spring, the Cunard liner *Sylvania* carried an unusual cruise launch—a nine-ton, 68-mph Hovercraft. The 48-foot air-cushion vehicle was used to convey passengers ashore or on sightseeing jaunts at ports of call. It can carry 38, and has a range of 230 miles. According to Cunard, ships in service out of U.S. ports may also be equipped with the Westland SRN6 sometime in the future.





## **Gar Wood:** **AN OLD SEA DOG** **IS UP TO NEW TRICKS**

**The world-renowned inventor and former speedboat king is still cranking out tomorrow's ideas. His latest is an electric car.**

By **JOHN FIX**

**F**OR YEARS a strange phenomenon has persisted among South Florida motorists traversing MacArthur Causeway, between Miami and Miami Beach. They stop on a shoulder of the road and sit gazing at a pine-girded blob of land in Biscayne Bay. At times they have been heard to mutter, "Wonder what the old boy's up to now," and occasionally a pair of binoculars will make a timid appearance.

For the blob of land is Fisher Island, the carefully guarded hideaway estate of multimillionaire inventive genius Gar Wood, who at one time was the world's greatest speedboat racer. His island has been the scene of strange goings-

POPULAR MECHANICS



on that have piqued the curiosity of South Floridians for nearly three decades. The 87-year-old Wood, who lives alone on the 230-acre island—except for a corps of servants and the daytime assistance of three mechanical engineers—holds more U.S. patents than any other living American.

Recently a rumor was confirmed: Gar Wood has perfected a commercially feasible, battery-powered electric automobile. Gar himself admitted that a bodyless prototype of such a vehicle was even then scooting about the paved roads of the island, always behind the screen of Australian pines.

Later, Wood released figures and permitted a few photographs. The auto, he reveals, is 9 feet, 10 inches in length and weighs 450 pounds, not including the batteries which weigh 65 pounds apiece. Those batteries are eight 12-volt lead-acid conventional storage batteries connected in series. They may be recharged from an ordinary house current at a cost of about 20 cents. The car has a top speed of 52 mph and is powered by two specially designed 90-volt, 2-hp d.c. motors.

Gar won't talk about the cruising range per battery charge for his vehicle until road tests are completed, but he chuckles as he remarks that if the results of preliminary tests were to be disclosed, excited auto bigwigs

would be sloshing a watery pathway to his door. And with the use of the more efficient (but considerably more expensive) batteries that have been developed in recent years, Gar points out, the range might be extended many times. Gar is trying to keep costs down and he hopes to be able to market a battery-powered auto with fiberglass body that will sell for less than \$1500.

The secret of the economy, speed and smoothness of Gar's electric auto is a simple patented device which he invented two years ago and put to work successfully in battery-powered golf carts, where jolting starts and battery heating have been dangerous and annoying problems.

The device is the Gar Wood Power Control Unit, and it works in conjunction with a foot accelerator. It has no rectifiers, no solenoids, no electric switches nor any electronic devices. It enables the battery-powered auto to glide quietly through five forward speeds and five speeds in reverse. A full voltage is fed continuously to the motors; changes in velocity are accomplished by a reduction of amperage. Side benefits are the extension of battery life and—since there is no heating—the use of lighter-gauge wiring.

The experimental auto bears a neatly engraved, chromed plaque labeling

**GAR WOOD** at wheel of one of the *Miss Americas* with which he won eight straight championships

**IN 1926**, Wood (right) and three companions raced from Miami to New York, beating fastest train then running





## Gar Wood

it as the "Gar Wood Super Electric Model A." Except for a scarcely perceptible motor whine, the Gar Wood Super Electric Model A is virtually noiseless. "We'll get rid of that with a fiberglass housing," promises the inventor. And, as anyone knows, the electric auto gives off none of the toxic gases of the combustion engine.

The news of Gar Wood's latest exploit in the automotive engineering field may come as a shock to a lot of folks who, if they think of him at all, somehow picture Gar Wood as a tottering shadow of the imaginative man who pyramided a \$200 invention of the hydraulic hoist for dump trucks into a \$50 million fortune and later built speedboats that set records.

The Gar Wood of today is as fascinating as his Fisher Island retreat. He rises at 5:00 o'clock each morning, breakfasts and bathes. Promptly at 7:30 he bobs jauntily down the pebble-strewn drive of his palatial home and vanishes behind the windowless doors of one of the island's huge workshops. There the wrinkled, white-thatched little man spends the day, making calculations, setting gauges, lazily watch-

ing curlicues of steel grind off a giant lathe or, just as often, fiercely arguing algebraic factors with a member of his staff. This is the pattern of tinkering that catapulted Wood from the obscurity of the Minnesota backwoods.

Gar Wood at 87 is physically active and more mentally alert than many men half his age. His memory for names and places and dates is uncanny. He can reminisce for hours on his intimate associations with such inventive greats as Henry Ford and "Boss" Kettering. His deep voice is as mellow and strong as when he was piloting power boats of his own design to world records 40 years ago. He drives his own car about the island and on the mainland, but cataracts—since removed—obliged him to give up the last of a series of 10 twin-engined Albatross amphibious planes. He has logged some 7600 hours of solo flying time in 36 years.

Gar Wood was born in Mapleton, Iowa, in a family of 13 children. His father had been a sea captain and when he grew restless for the sea, he took his family to Lake Osakis, Minn., bought a steamboat and operated a 10-mile trip up the lake for tourists. At 8, Gar was herding cows for \$40 a month.

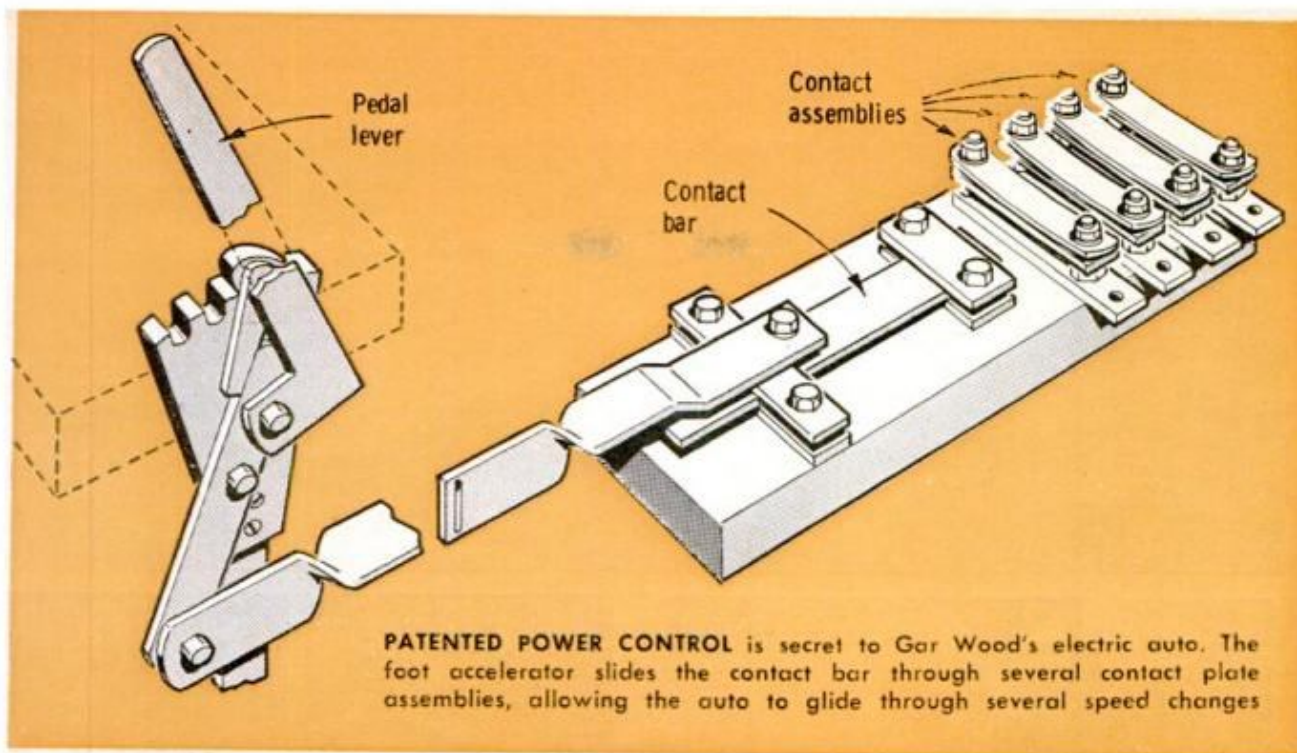
At 12, he was rowing fishermen about the lake for \$1 a day. At 17, he was piloting an inspection boat on a translake railroad construction job. It was on the latter that his inventive genius was awakened. He designed a down-draft carbureter—possibly the first of its kind—and was able to outrace the other inspection boats.

The Wood family moved to Duluth. Gar took a job with the local telephone company and in the evenings studied automotive engineering. When he figured out an easier way to cut V-blocks for engines, a jealous instructor had Gar kicked out of school. At

**GAR WOOD TODAY**, at 87, gets down to the workshop daily where he continues to create new designs, including electric auto







**PATENTED POWER CONTROL** is secret to Gar Wood's electric auto. The foot accelerator slides the contact bar through several contact plate assemblies, allowing the auto to glide through several speed changes

22 he went to St. Paul and opened a Ford dealership. He sold 10 cars the first year but was obliged to close down because he couldn't get adequate deliveries. Wood sued the district distributor and won the case in court.

Gar taught automotive engineering. He sold lightning rods to farmers. He invented an induction-coil device to demonstrate their effectiveness. In 1911, he won his first big boat race, the Mississippi Power Boat Regatta, with a speed of 32 mph—a world record.

One day while purchasing gears to build more lightning-rod demonstrators, Gar stumbled onto his first big invention and one that was to establish his fortune: the hydraulic hoist for dump trucks.

He had watched a burly truck driver painfully hoist the front end of a Pierce-Arrow truck, using a cumbersome rotary jack to angle it so that its load of coal would slide off.

Gar set to work. He spent 50 cents for a 4½-foot by 5-inch cylinder intended for use in a printing press. He bought a bottle of glycerine to use as hydraulic fluid, since in the bitter cold of a Minnesota winter, oil would assume the viscosity of tar. For two days he struggled with the idea for the hydraulic hoist. Then he had it. He

asked the coal company if he might use one of its trucks for a test. At the appointed hour the owner arrived at the company's dirty, ramshackle garage, accompanied by a group of partying friends, all elegantly attired and in gay spirits. Gar requested that they stand in the truck, to simulate the weight of the coal.

Gar inserted his hoist under a front axle, breathed a prayer and gave two mighty pumps. The front end of the truck shot into the air and precipitated all the fugitives from the party onto the greasy floor. No one was hurt; no one was angry. The laughing guests demanded repeated demonstrations.

Gar Wood made more than \$1 million on the lift the first year. Money kept rolling in enabling him to return to his early love, powerboat racing. He designed and built the *Miss Detroit* boats and 10 *Miss Americas* which he piloted to eight straight Harmsworth Trophy victories and five world speed records. Gar's speeds ranged from a 92.83 mph in 1928 to the then-fantastic 124.91 mph in 1932.

In the 1930s he designed a powerful launch for the Navy, demonstrating it personally for Franklin D. Roosevelt. Roosevelt was enthused but

*(Please turn to page 194)*





## Start your engines, and away we go—to nowhere!

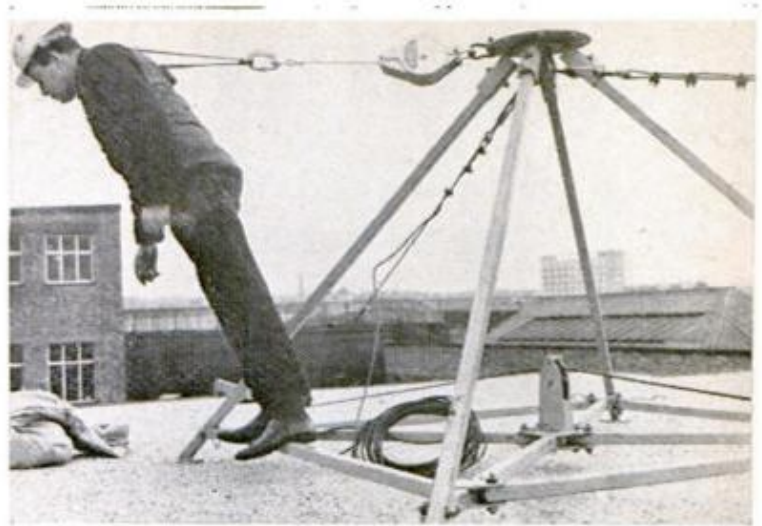
Complete with sound effects and a synchronized movie of the track, a racing-car simulator in England trains drivers on the intricacies of racing. The driver learns to use his accelerator, engage gears, apply brakes and steer around sharp corners on an authentic track. (It's Brands Hatch in the top photo.) The driver's reactions are transmitted to a transparent turntable at the rear of the projection screen. There's a complete layout of the track on the table (lower right) and, around the edge, is the scenic panorama of trees, grandstands and so on. The table tilts and turns, in response to the driver's movements, and the resulting scene is projected on the screen, giving him a realistic view of where he is going and how fast. If he goes off the track, a red light flashes at the edge of the screen.



## 'Sandwich wrap' for astronauts

Lightweight, compact and sturdy aluminized plastic sheets, five-thousandths of an inch thick, may be used for space rescue work. When folded, a sheet can fit in a pocket, but unfolded it can carry an adult, and its reflective surface retains more than 90 percent of the body's heat. This suggests other uses for campers, climbers and stranded motorists. The exact composition of the material is a government secret.





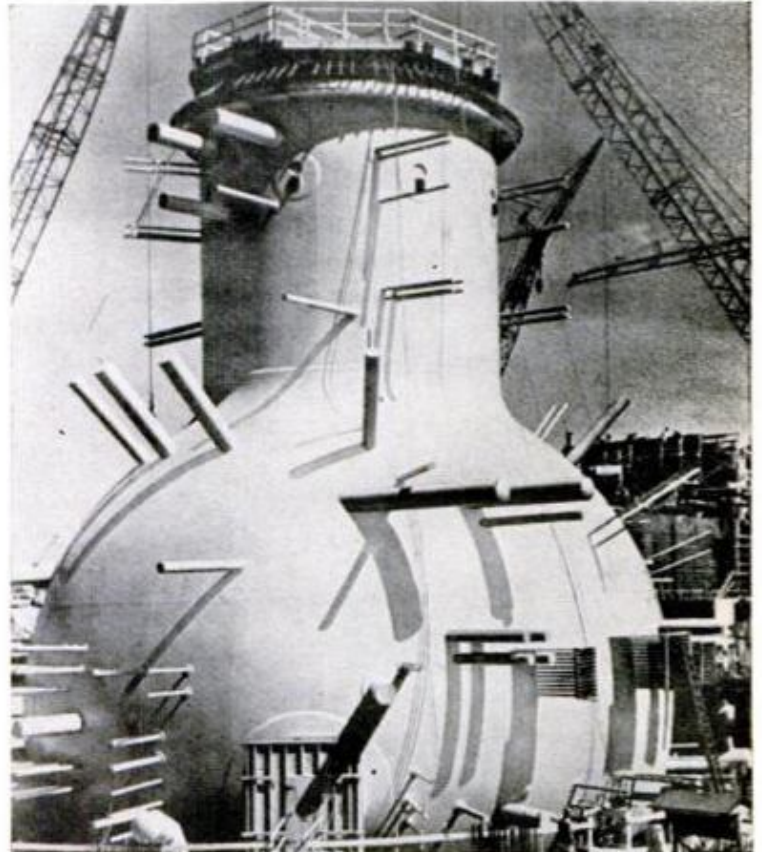
## Rooftop workers get a brake

British roof workmen are saved from falls by a free-turning but self-braking device that reacts to any sudden change in speed, like that caused by a fall from a ladder, and locks its cable to prevent any more from unspooling. The pyramid anchorage (right) is secured in place with special clamps at the end of wire ropes, and the let-out spool is attached to the top to allow the workman normal freedom of movement.



## Buff's buskins

Being a 5-foot, 1-inch soccer fan has its disadvantages, so a Yorkshire man designed metal elevators for his feet for watching the weekend matches. He found they have other uses, too, such as adding to his reach for washing his auto.



## Atomic flask

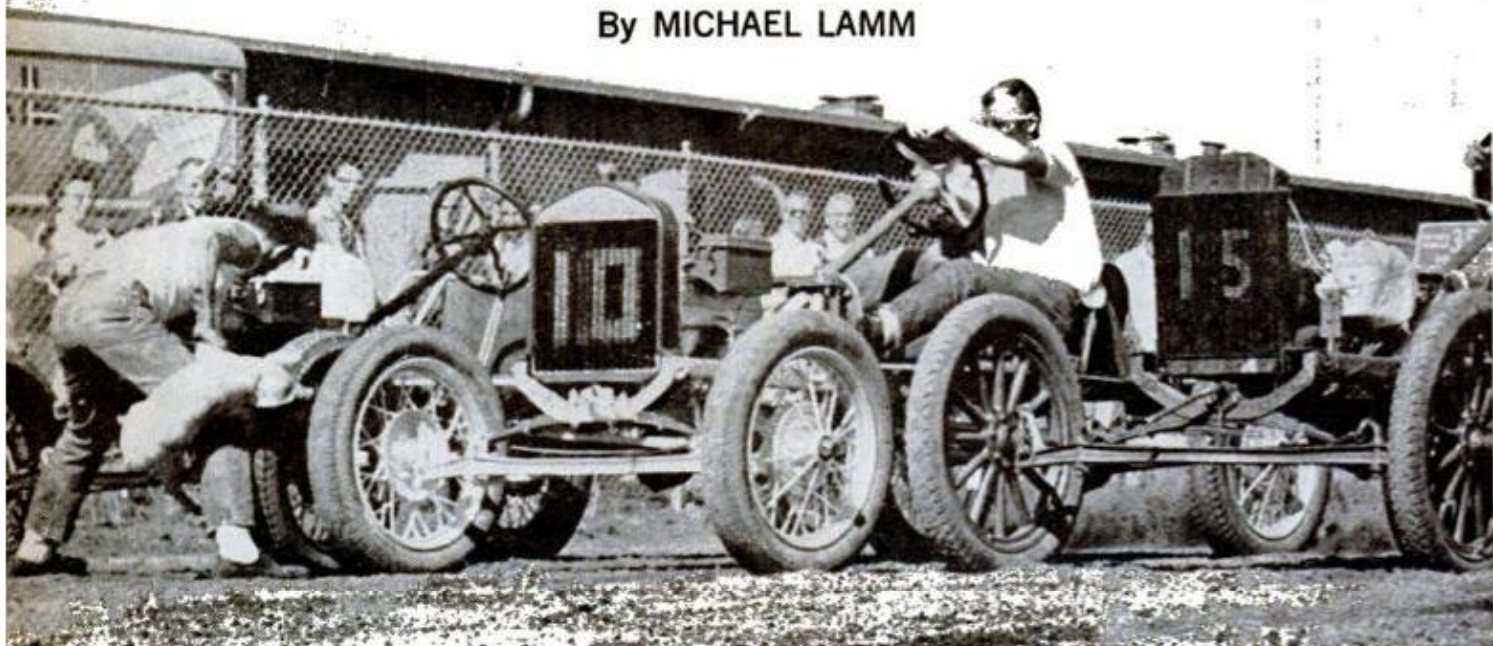
It's an old-fashioned shape, but in this case the contents are space-age stuff. The bottlelike housing is an atomic reactor constructed in New York State on the edge of Lake Ontario. The 650-ton powerplant, when completed in 1968, will produce 600,000 kilowatts of electricity, a power output that's equal to that obtainable from six million tons of coal.



# Hamming it up at

Stripped Model T Fords, drivers and pigs are all part of this zany race in Oregon

By MICHAEL LAMM



**IT'S ALWAYS A WILD START** as Model T Fords, drivers and pigs take off for a three-lap race at the Tillamook County Fair in Oregon. The whole race takes only 10 minutes, but it's an event that's anticipated all year

**SENSIBLE PIGS AGREE** that people who race Model T Fords must be pretty silly to begin with. But when race drivers insist on taking pigs along as passengers, it's a sure sign of failing judgment.

Yet pigs do race in Model Ts at the Tillamook County Fair on the Oregon coast. Each August, madness sets in as Tillamook residents stage what has to be the most ridiculous auto race in America.

Five stripped-down Model T Fords,

**A LE MANS START** sends drivers from the outside rail across the track to pig pens. Each driver picks a pig and heads for his vintage vehicle, hoping it will start



vintage 1918 to 1927, stand along the starting line with engines off. Ahead lies a one-mile dirt oval used for horse racing. On the inside rail, 10 pigs, weighing from 50 to 80 pounds each, wait in five pens. On the outside rail, five husky drivers listen for the starter's gun.

At the gun, drivers sprint across the track, grab a pig and crank the engine. They leap into their seats, make the pigs as comfortable as possible and speed off.

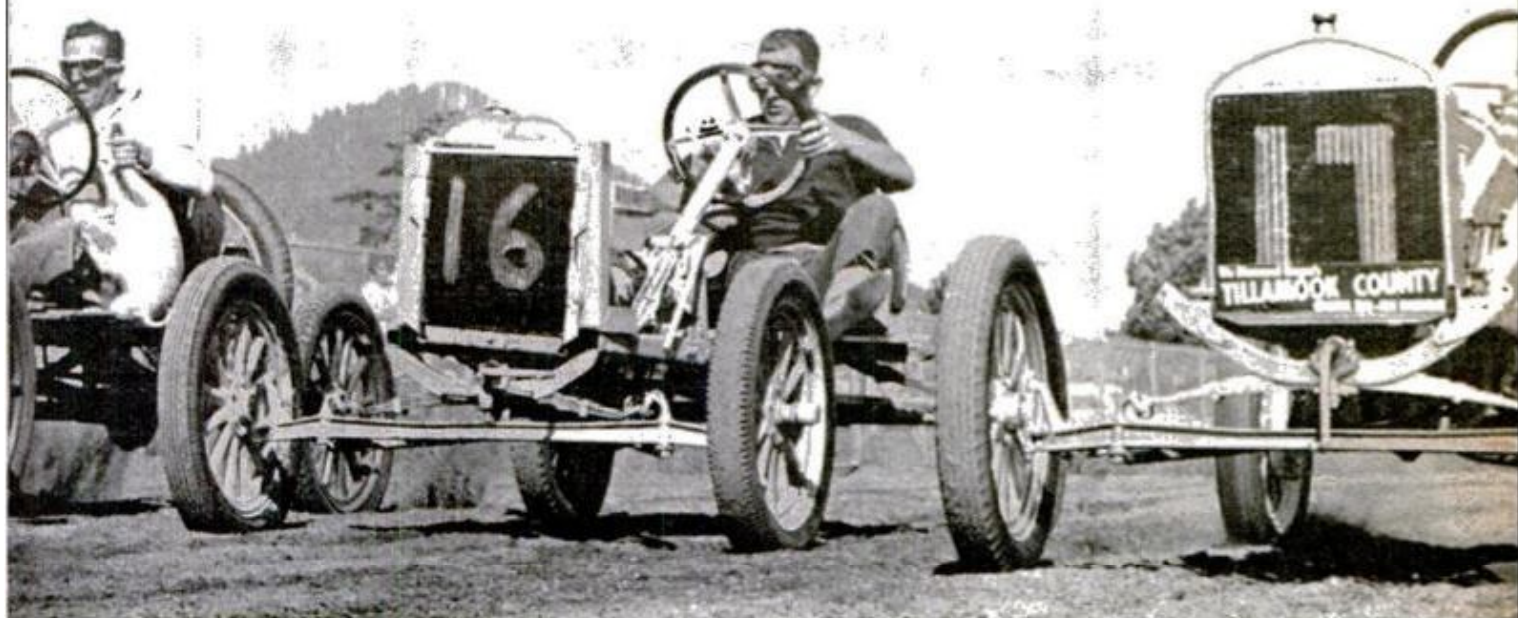
Finishing the first lap, drivers stop, turn

**EACH DRIVER** must crank the engine with one hand while he holds the wriggling porker with the other. Many times, pig and engine are very uncooperative





# a 'stock' car race



off engines, return pigs to pens, grab others, start engines and are off again. This is also done for the third lap.

For all this, there are no prizes—neither sow's ear or silk purse. Still the competition is fierce and it's quite an honor to win.

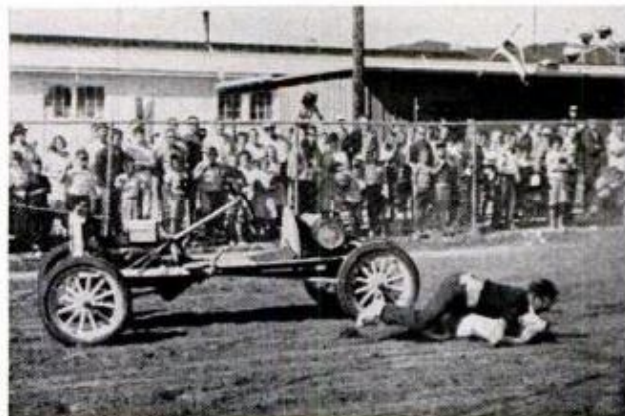
To continue this annual event, the county does subsidize the drivers somewhat by helping to purchase some parts.

Twelve Model Ts are race-worthy in this area. The cars are kept as nearly original as possible.

Pigs, likewise.

★ ★ ★

**IF PIGGY GETS AWAY** any time during the race the driver must stop and capture the escapee. The driver then returns to his vehicle and continues the race

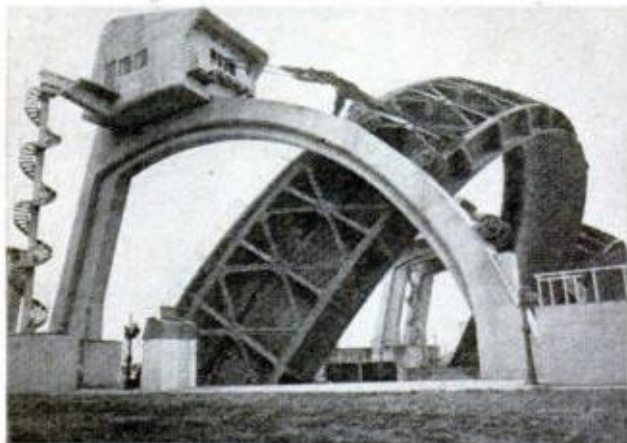


**AFTER THE FIRST LAP**, the drivers must stop, turn off engines, return pigs to pens and pick up their second riding companion for the second lap of the race

**FRIENDLY COMPETITORS** often don't park in an orderly fashion when it comes to replacing the second-lap pigs and picking up others for third and final lap







## Gates for the Rhine

Three large sluice gates—each 30 feet high—have been installed at the upper end of the Rhine River to control water flow and make the river more navigable. The half-cylinder gates are raised and lowered by electric motors.



## Probing secrets of pyramid

Suspecting that the Great Pyramid of Egypt contains tomb vaults that have never been discovered, scientists are measuring cosmic-ray paths that penetrate the structure and taping the results. They expect that computers, by analyzing the paths, will reveal the tombs.



## Twelve-door freight car

Twelve sliding doors built into the new Ramco All-Door Car allow easy loading and unloading of freight. The doors may be positioned to provide openings of almost 25 feet. Above, a load of lumber is swung into place.



## Year-round ski monorail

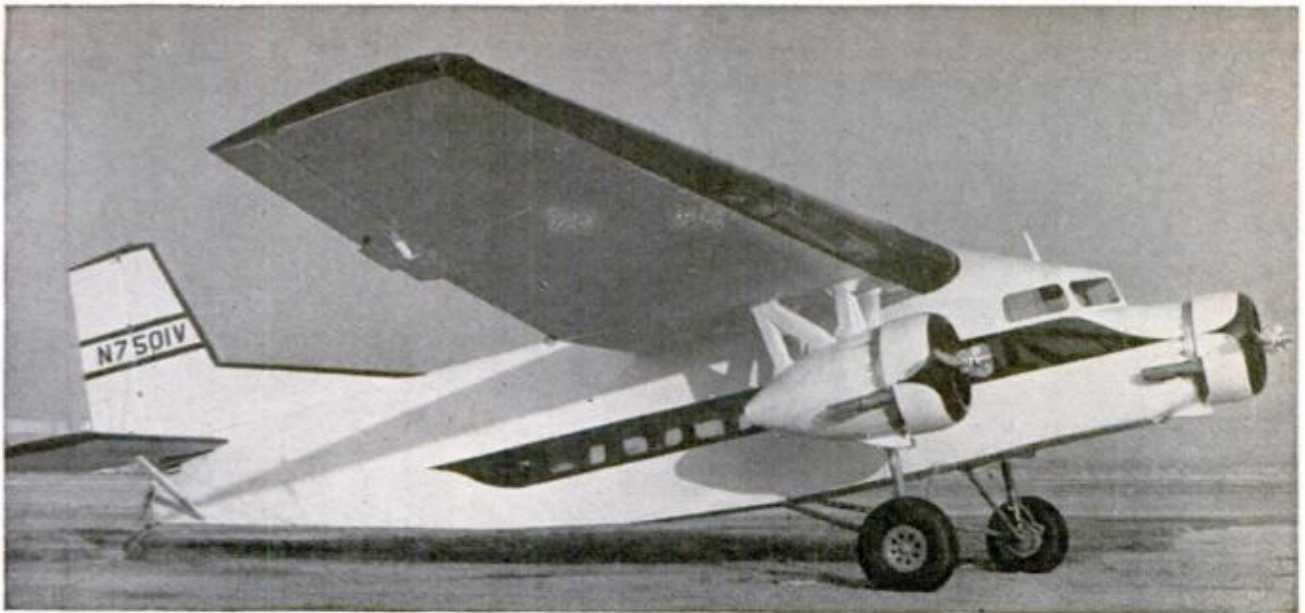
The skier's trip back up the hill is getting to be more and more comfortable—despite what he may encounter on the way down. This sleek, heated monorail is in service at Mt. Attitash, near Bartlett, N.H. The cars are also airconditioned for carrying summer tourists.



## Tight formation produces three-in-one look

A tight, follow-the-leader formation of three U.S. Air Force F-104 Starfighters produces the illusion of a superfighter with three pairs of wings and three tails. The 1500-mph interceptors are part of the Air Defense Command's 319th Fighter Interceptor Squadron at Homestead Air Base, Fla. The Lockheed planes, carrying missiles and cannon, patrol the Gulf of Mexico.





## Tin Goose returns in a STOL role

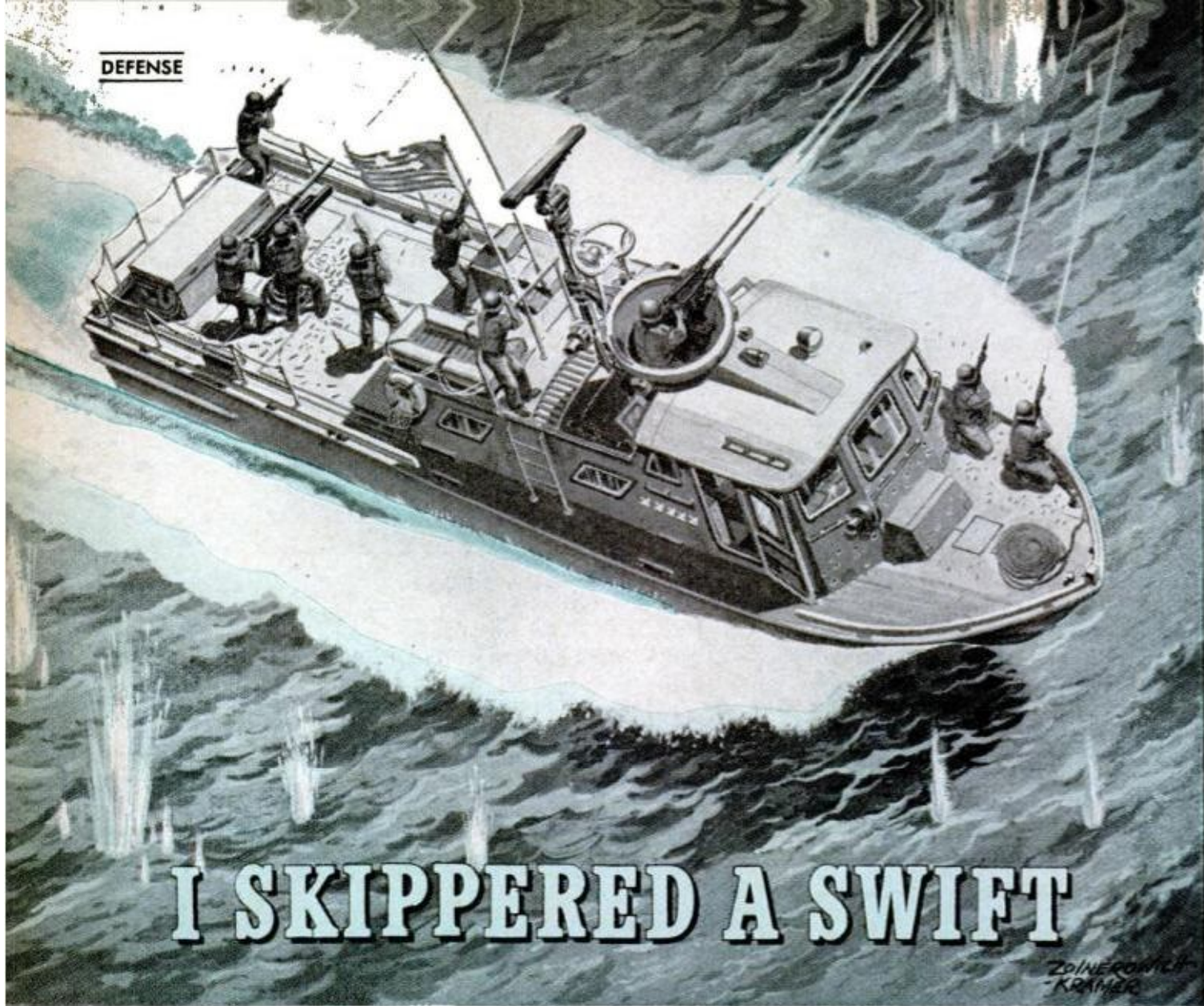
An up-to-date version of the famed Ford Tri-Motor—widely known as the “Tin Goose”—has appeared as the Bushmaster 2000, which can take off empty in 150 feet (600 feet while loaded). The new craft is a project of the late William Stout, designer of the original Ford plane; manufacturer is Aircraft Hydroforming, Gardena, Calif. The Bushmaster is described as a simple, grass-runway, freight-passenger airplane with high lift, plus short takeoff and landing capabilities. Its three 450-hp Pratt & Whitney engines push it along at a cruising speed of 130 knots. The plane is of all-metal construction, with corrugated aluminum skin riveted to the flanges of structural members. (Incidentally, 30 of the Fords are still in use.)



## His master's voice stretches five miles

Rusty, a guard dog at the Royal Aircraft Establishment, Farnborough, England, can respond to his master's commands from five miles away. Rusty wears a two-way radio on his back. So far, Rusty can't answer by radio, but they're working on a way to enable him to bark back.





## I SKIPPED A SWIFT

A combat veteran of the Vietnam waterways tells what it's like to fight in these speedy 50-foot boats

By LT. (J.G.) JIM STEPHENS

Illustration by ZIK Associates, Ltd.

**A**S USUAL, the situation went to hell fast. One instant, I was slouched back on the helm sipping a Coke; then I heard the first shot. And a second. *Phwiiiiip! Thweeee!* Snipers!

Small geysers spewed up around us as bullets smacked into the water.

I grabbed the AR-15 under the chart table and yanked back on the lever. A black-clad Vietcong rose from a large rockpile on a sandspit a few hundred yards away. Another bullet hissed over-

head. There probably were several other VC hidden in those rocks.

I flicked the safety latch to full automatic, and the gun roared to life. A half-dozen splashes walked through the light surf toward the black figure, and I blasted out the rest of the clip.

I shot a glance up and over my shoulder to see who was in the twin .50-cal. turret. The curly-haired 19-year-old radioman on lookout watch had already jacked back the slide handles of the heavy Brownings and swung the long black barrels toward the beach.

"Work over those rocks when we get turned around, Lackey!" I yelled up at

---

*Jim Stephens, an Iowa State University graduate, served on Swifts from August, 1965, to November, 1966. He is now news director for radio station KBUR, Burlington, Iowa.*

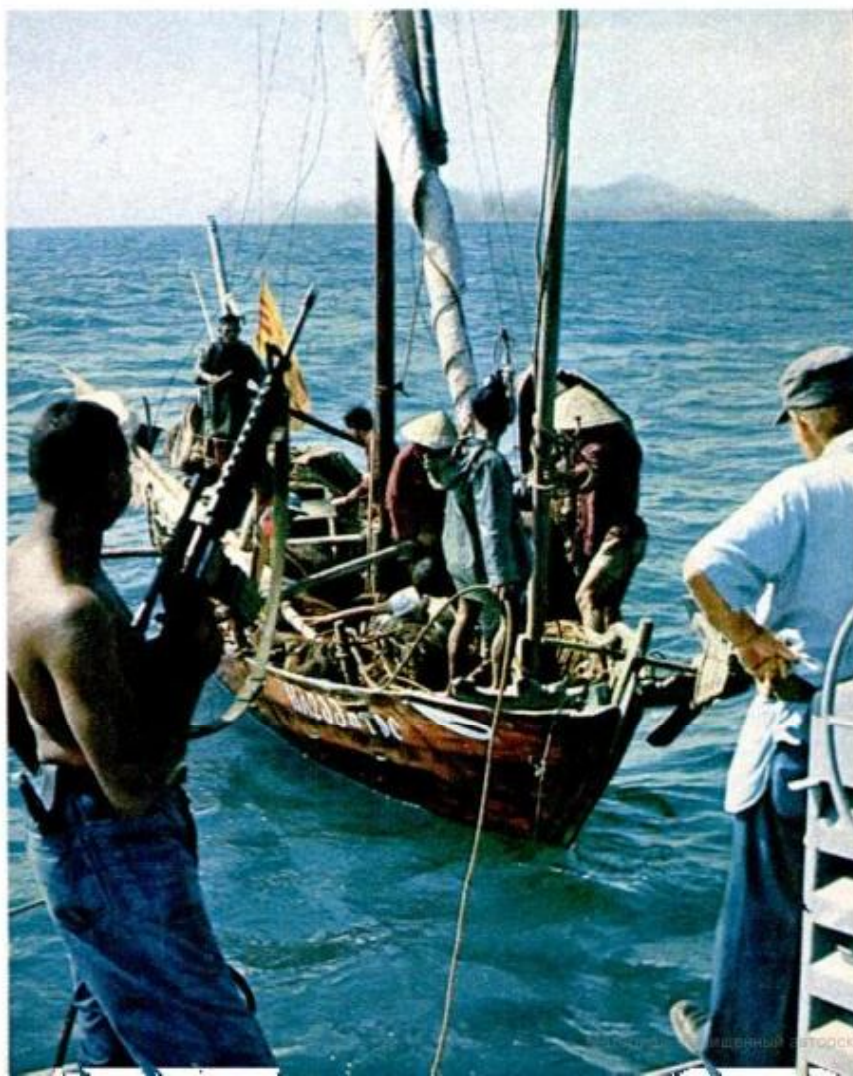


**SWIFT CREW** fires into known VC positions in Vietnam action. Swifts carry .50-cal. machine guns, an 81-mm mortar for lobbing white phosphorous shells onto beaches, plus rifles and other side arms. Their chief advantage, however, is their extreme maneuverability in shallow waters where only sampans play



**SWIFT SKIPPER**, Lt. (j.g.) Jim Stephens, at wheel of craft. He calls Vietnam action full of surprises between long stretches of dullness

**BOARDING ACTION**, typical duty of Swift crews, includes searching river craft, checking I.D. papers of natives. Before Swifts, VC had free access of river for transporting men and supplies. Sailor at left has sniper scope on his AR-15. Eyes on junk reflect fishermen's superstition that boats have souls and can "see" them through any difficulties







**SWIFT NO. 4** had dubious distinction of being first major U.S. Navy craft lost in Vietnam war. It was sunk by estimated 200-pound explosive charge—one of hazards of water fighting—in Southeast Asia in Feb. 1966

the turret. I pushed the throttles all the way forward, and wrenched the wheel over toward the open sea. The 50-foot aluminum boat leaped ahead as its two 480-hp diesels roared to full power. The Swift heeled over sharply, and whipped through a full 180° turn inside a hundred yards.

A hand closed on my shoulder. "I got the helm," said the seaman, slipping on his sound-powered phones. He slid into his battle station behind the wheel. "Mount 52 standing by, with high explosive and white phosphorous ready for the mortar."

"Good! Steady as you go. We'll whip by that rockpile and work it over."

A short time before, we had been routinely patrolling down the coastline, checking out 30-foot Vietnamese fishing boats. Seemed like it was always the same. Go aboard, search the boat, check everybody's identification, and maybe give out a few cigarets if you held up the boat awhile. It might go on like that for a couple of months. Complete boredom. And then. . . .

**BLAM, BLAM, BLAM, BLAM!** The radioman was putting his bursts right on target. The half-inch incendiary slugs spattered across the rockpile.

Just as the sandspit loomed off the starboard bow, small, black-clad figures leaped from rock to rock. More shots and more splashes came our way.

"Left full rudder!"

The twin .50s overhead swung about as the Swift heeled over again.

"Tell the bosun to load a round of phosphorous with all increments, and set the mortar at 12° elevation."

The helmsman swung around in his seat. "Mount 52 on target."

"Mount 52, shoot!" I ordered.

**BLAM!!** The speeding Swift shuddered as the mortar roared, spewing a cloud of gray smoke over the fantail. A brilliant flash lit up the rockpile like a giant flashbulb. Hundreds of streaks of flaming metal arched out in every direction from the fireball and enveloped a 30-yard circle. Four figures in black scurried down the sand toward a group of huts a few hundred yards away.



The bosun swung the barrel of his .50 toward the fleeing VC.

"Mount 52, cease fire, cease fire," I growled at the helmsman.

"Tell Orton I sympathize, but we can't take a chance of hitting that village. Left full rudder—we'll head back to Chu Lai. Secure G.Q."

The rockpile was still smoking as it faded from view over the froth of our wake. We apparently hadn't taken any hits. The Swift steadied on course parallel to the sandy shoreline at normal cruising speed for the hour-and-a-half run to base.

It's a remarkable boat, the Swift, and a brand-new type for fighting a brand-new kind of watery warfare.

Actually, that isn't quite true. The first Swift made its appearance—under another name—back in 1955 as a 50-foot crew boat to service offshore oil rigs in the Gulf of Mexico. It was spectacularly successful, combining high speed, great maneuverability, the ability to operate in either deep or shallow water, and excellent stability.

When we found ourselves deeply involved in Vietnam, it became apparent that the Vietcong were making major use of the rivers and coastal areas as water highways to move personnel, ammunition and supplies. An incredible

number of ramshackle homemade fishing junks ply these waters, and any one of them, at any given moment, could be loaded with arms instead of fish. We had virtually no way to stop them; you don't use a destroyer or even an 82-foot Coast Guard cutter to stop and search a six-foot reed boat sneaking close along the shoreline, at least with any degree of efficiency.

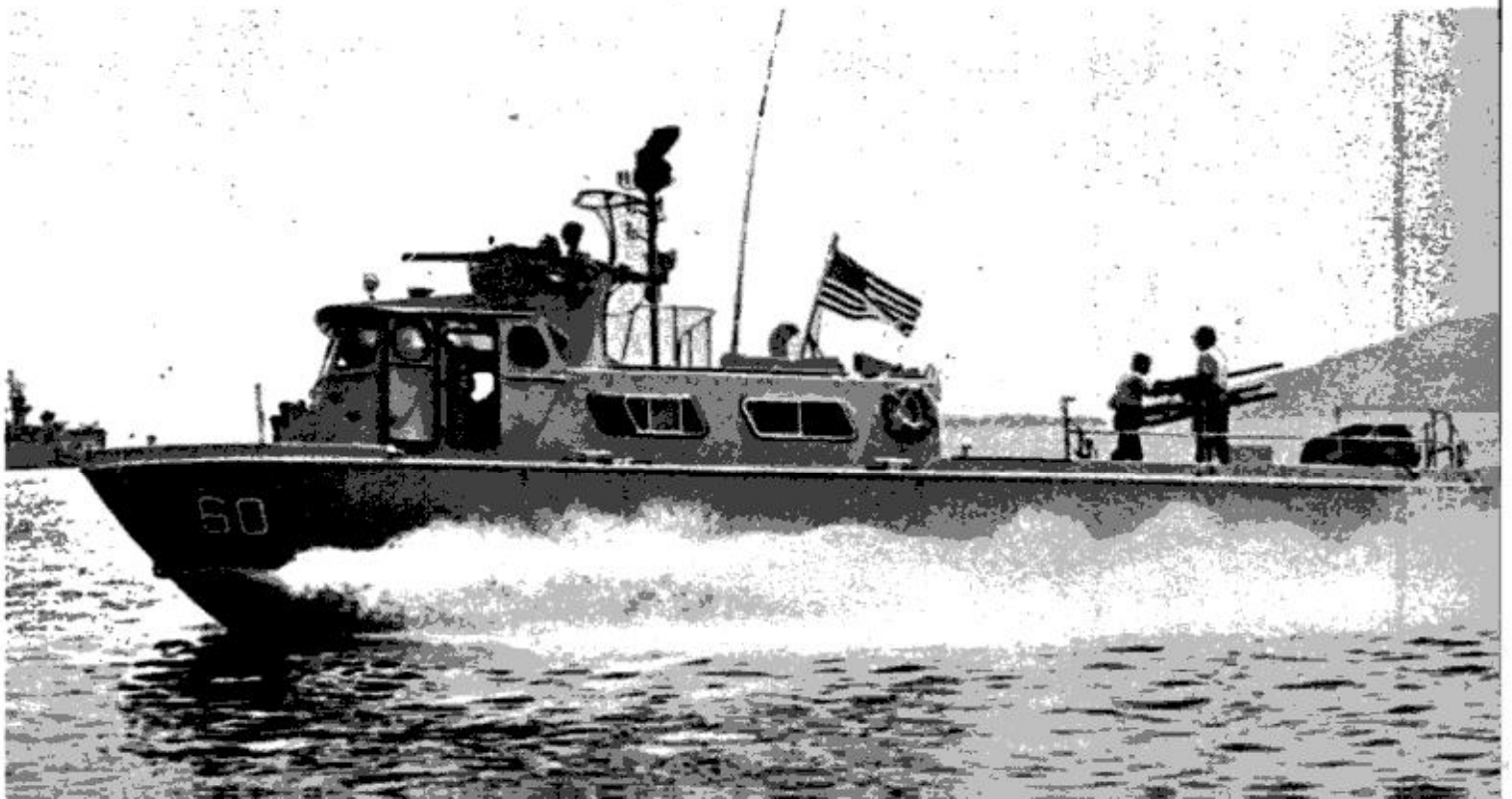
It turned out that the offshore oil boats, already designed and in production, met the ideal specifications for a patrol boat in Vietnam. About the only substantial change was to arm them with 50-cal. machine guns and an 81-mm mortar mounted horizontally as a cannon. On a similar crash basis, crews were assembled for what would be the Navy's smallest craft. As a result, I suddenly found myself in command of a Swift in Vietnam.

Obviously, the Vietcong both respect and detest our little fleet, or they wouldn't try to sink us with mines and harass us with sniper fire.

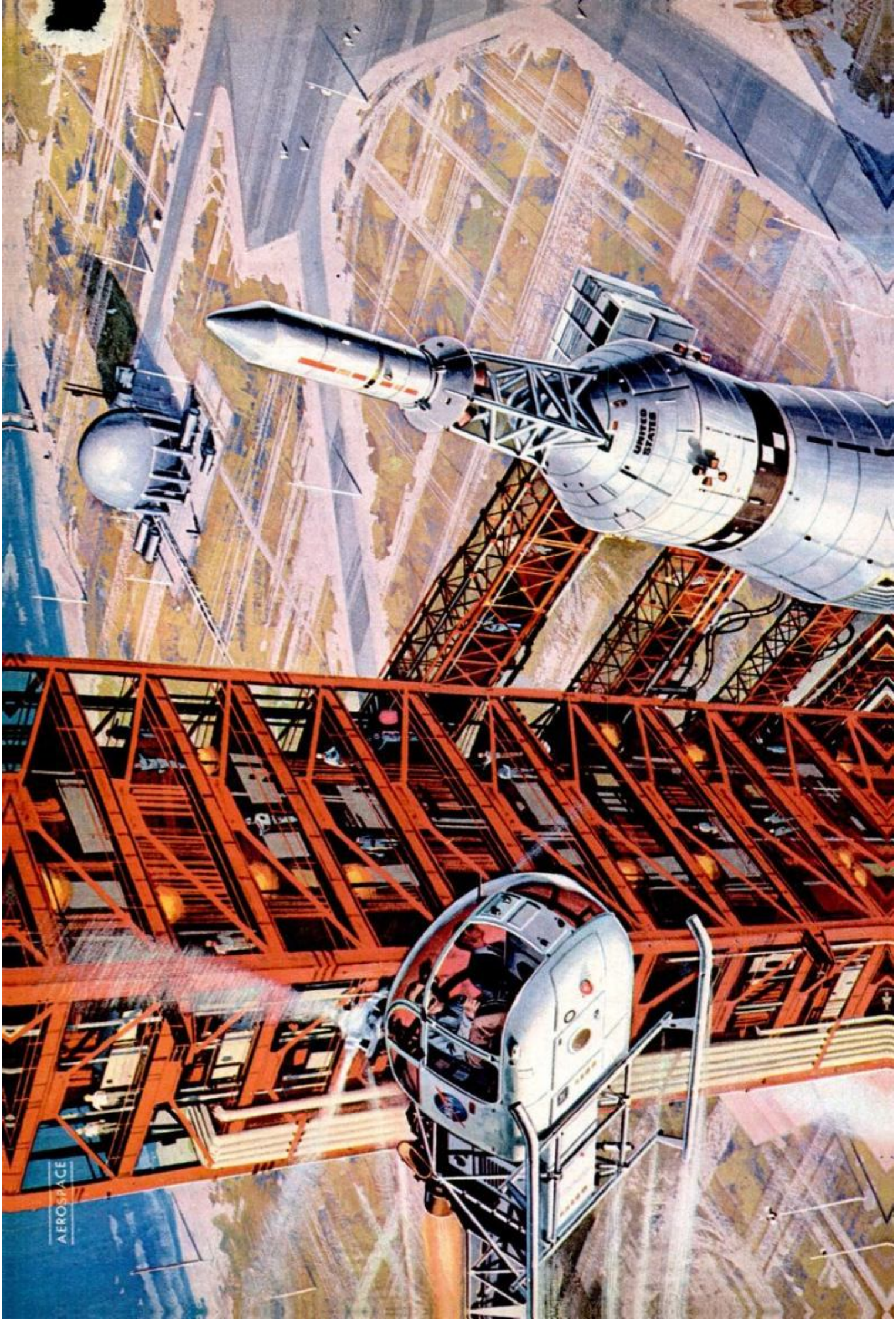
On our return to base after blasting the snipers, the afternoon fleet of Chu Lai fishing junks was getting under way. We eased through a quarter-mile forest of homemade reed-and-cloth sails. At the harbor entrance we slipped past

*(Please turn to page 192)*

**NAVY SWIFT** makes a high-speed run during practice maneuvers. Swifts were adapted from crew boat originally designed for servicing offshore oil rigs in Gulf of Mexico where they first appeared in 1955







AEROSPACE





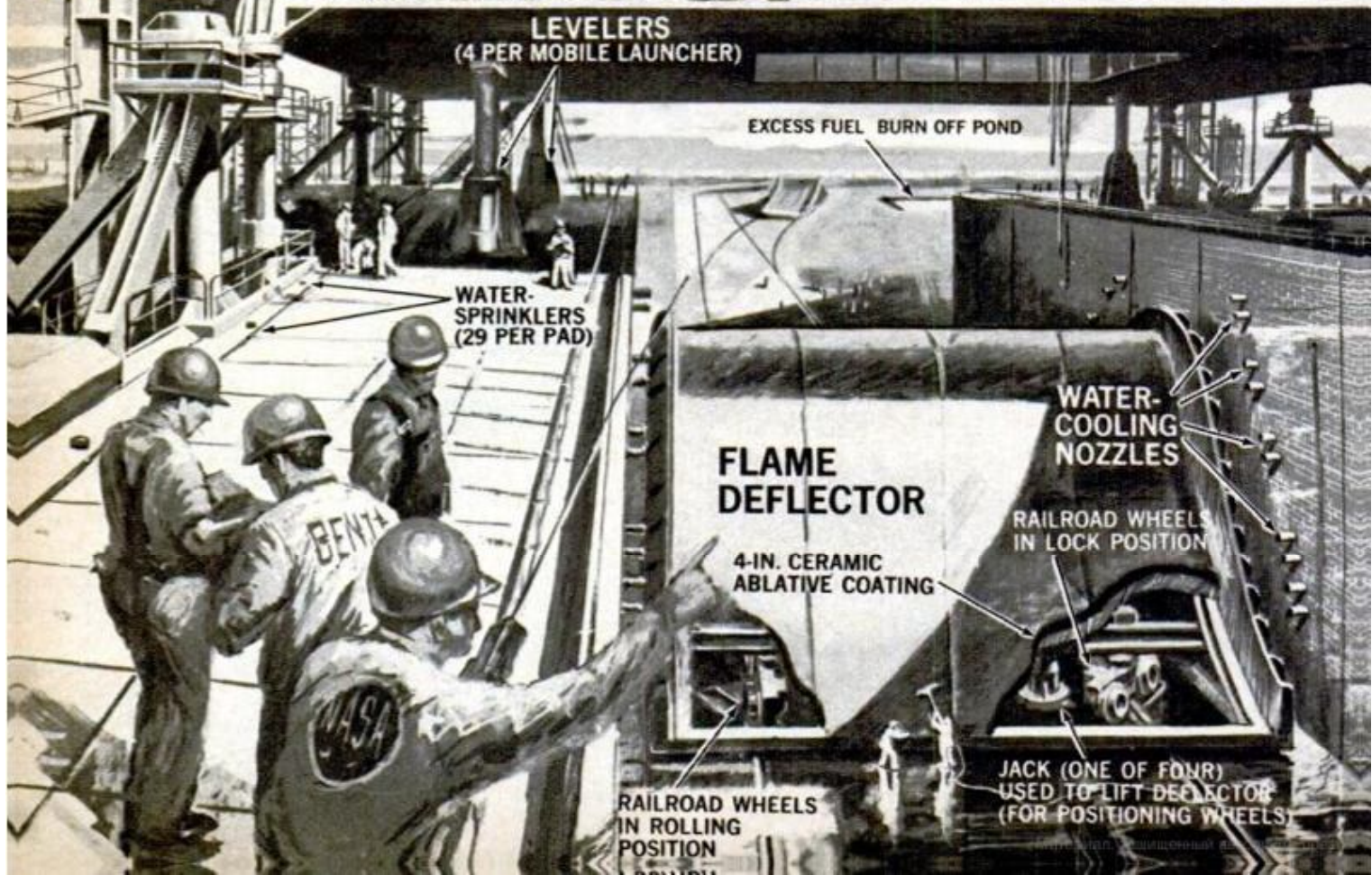
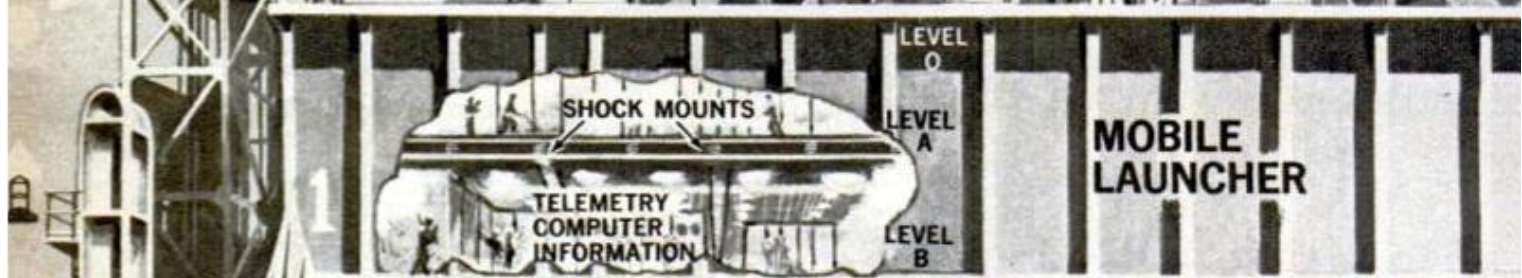
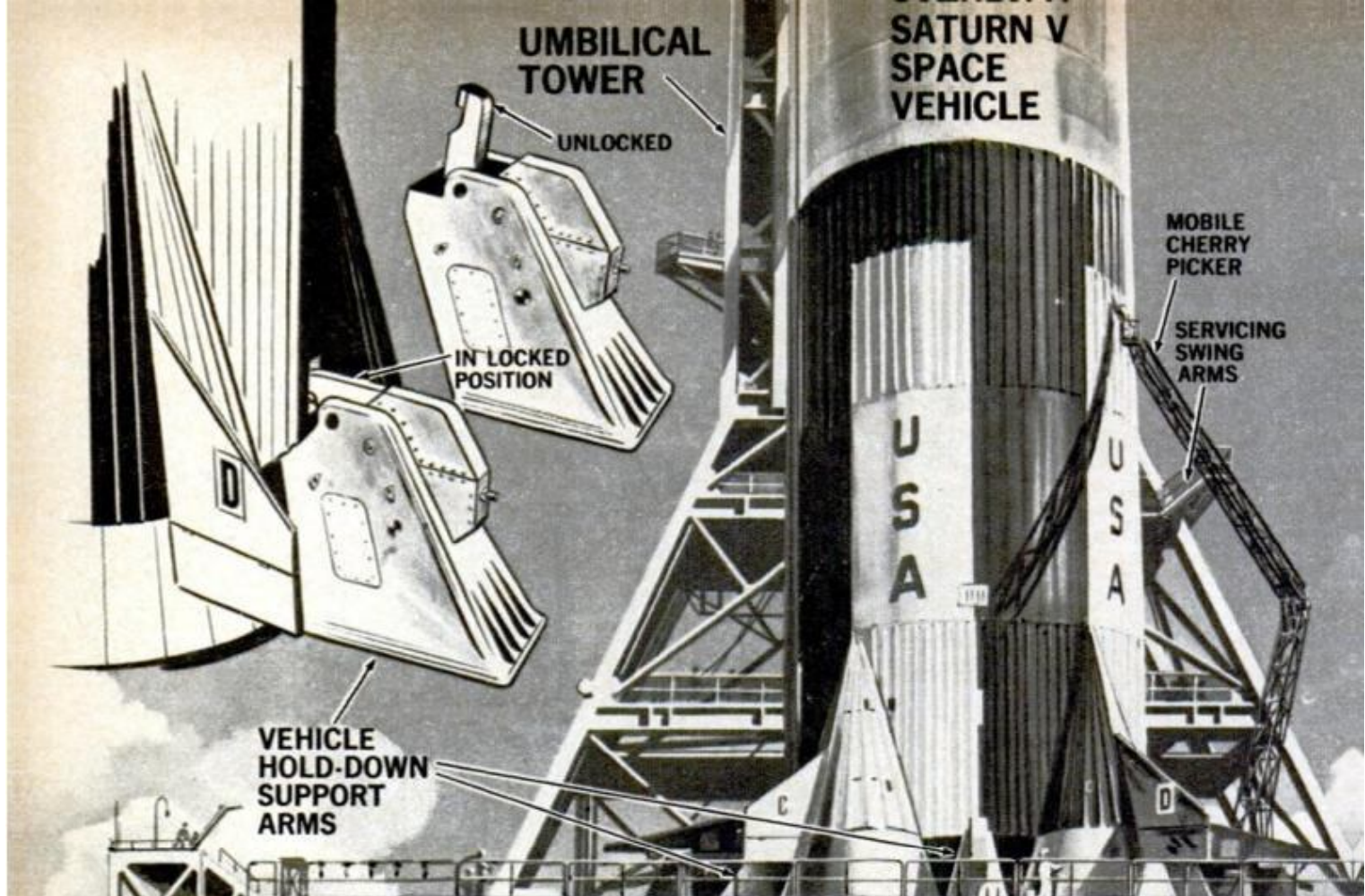
# THE STUPENDOUS SATURN V

## THE FREE WORLD'S LARGEST SPACE VEHICLE

PAINTED SPECIALLY FOR POPULAR MECHANICS BY FAMOUS SPACE ARTIST HOWARD SCHAEFER

Turn page for details







MOBILE LAUNCHER

SIDE 1

# Inside the World's Biggest and Hottest Pad

**J**UST GETTING IT to the pad is a problem. Saturn V, our monstrous moon rocket — due to be test-launched soon — is so big and its blast so powerful that they had to create an entirely new complex for it and a whole new set of rules.

Complex 39 is set apart and different from any of the other launch complexes at Cape Kennedy. First of all, the Saturn V isn't assembled on the launch pad, but in a gargantuan vehicle assembly building (VAB) three miles away. That's to insure that, among other things, when the vehicle is moved to the pad, the launch crew back in the control center at the VAB will be safe from the blast.

To make this move, entirely new machinery and new techniques had to be created. The three stages of Saturn V, plus the Apollo spacecraft, are mated in the VAB on a launcher, complete with umbilical tower. The mobile launcher, together with its tower and the vehicle, will then be picked up by a huge, specially made crawler-transporter that moves on eight tank tracks. The crawler can negotiate slight inclines and make turns,

*(Please turn to page 190)*

MOBILE LAUNCHER AND PAD MATING OPERATION

LAUNCHER GUIDE PIN

THREADED BOLTS FOR LOCK DOWN

72-IN.

MOVABLE DISC

LOCKING NUTS

LAUNCHER MOUNT MECHANISM

LAUNCHER MOUNT MECHANISM (6 PER PAD)

SERVICE TOWER MOUNT MECHANISM (6 PER PAD)

FIREBRICK

EMERGENCY EGRESS SLIDE

SERVICE STRUCTURE

CRAWLER TRANSPORTER

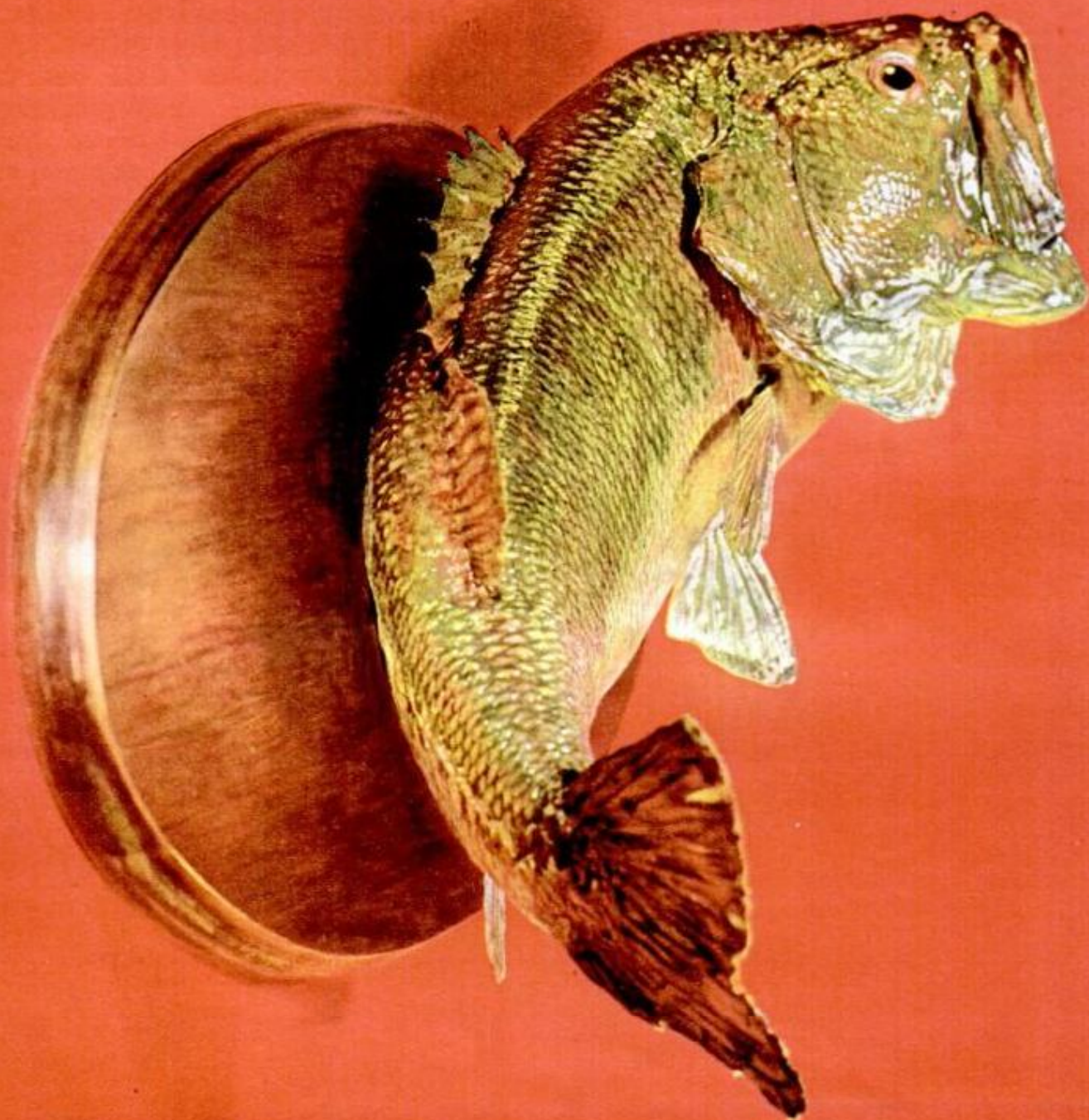
EMERGENCY EGRESS SHELTER



# 90 minutes to

Here's a new and easy way to preserve and display that trophy—be it son's first catch or your own prize lunker

By DANIEL C. FALES, Outdoors Editor



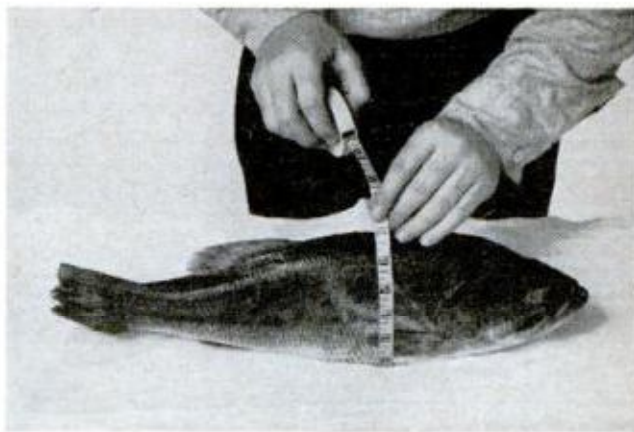
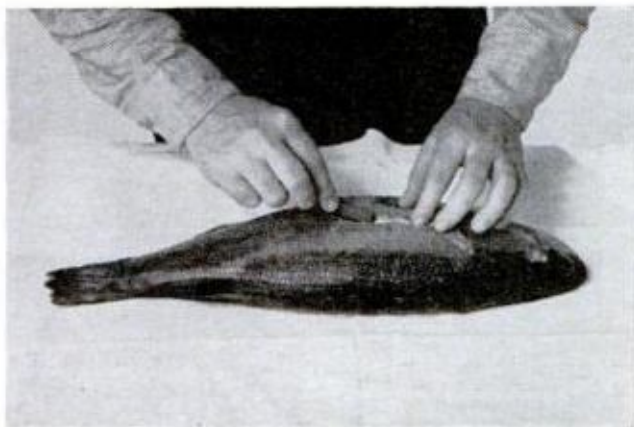


# mount your prize

**F**ISH MOUNTING has always been a dangerous business. Poisonous chemicals were needed. But now, Norman Meyer, noted taxidermist, has come up with mixtures safe as milk. I tried Norman's fish-mounting kit and found the work easier than I'd thought. Only fixing the head presented a problem. But once I learned the knack, I found that a good-size fish can be mounted in 90 minutes.

Before tackling your trophy, get the hang of the job by stuffing a smaller fish. Except for shears, mounting boards and additional paint, you need only what's in the kit. In the photos I'm working on a 5½-pound largemouth bass.

**STEP 1.** Note the color and the markings. It's best to take a color photo just after catching your trophy. The color will quickly fade once the fish is out of the water. Measure its girth and length. These measurements, notes and photos will be used in later steps when it's time to stuff the fish and during the final painting stage.



**STEP 2.** Lay the fish on wet newspaper keeping its fins and tail moist throughout procedure. Dry fins may crack and break. Pick the best side of the fish. Work on the opposite side. Cut down the middle of the fish from center of gills to center of tail. Don't cut too deeply or skinning will be hard to start.

**STEP 3.** Work the skin from the body with your fingers. You may need the skinning knife in stubborn spots. Free as much of the skin as possible on this side, working from head to tail. Skinning is easier if you wait several hours after catching your trophy. The fish can be frozen and then thawed in water before working. Freezing actually makes skinning easier once the fish is thawed.



**STEP 4.** Once the skin is free on this side, take the shears and cut the backbone at the tail. Use extreme care when you're gripping the bone with the shears. It's at this point that you can easily poke through the good side of the fish, ruining your trophy. Work as much of the flesh as you can away from the backbone with your fingers.





**STEP 6.** Scraping is very important. Remove as much of the flesh as possible. Clean the head completely. This is the hard part, but it's absolutely necessary. Once the fish has been thoroughly cleaned, work the preservative in powder form into the head cavity and into the skin. Then work the powdered preservative deep into the tail of your trophy.



**STEP 8.** Turn fish over and prop on blocks for desired shape. Spread moist fins and clip cardboard on each side. A small stick holds mouth open. Insert glass eye. Wipe fish clean with paint thinner. Varnish good side. Once positioned, do not move fish for a week. When dry, paint.



**STEP 5.** Continue skinning; this time from the tail to the head. Force the protruding fin bones from the flesh with your fingers. Large amounts of flesh may stick to the skin. This clinging flesh can be scraped off later. Now cut the backbone at the gills. Again be careful not to poke through the good side. Trim the fin bones with your shears.



**STEP 7.** Now you're ready to sew and stuff. Start at the tail. Using a crosshatch stitch, sew up three or four inches. Then stuff with mixture provided. At the mid-point, insert a board under stitching for mounting support. Stuff so fish equals original measurements. Pack the head before final stitching.



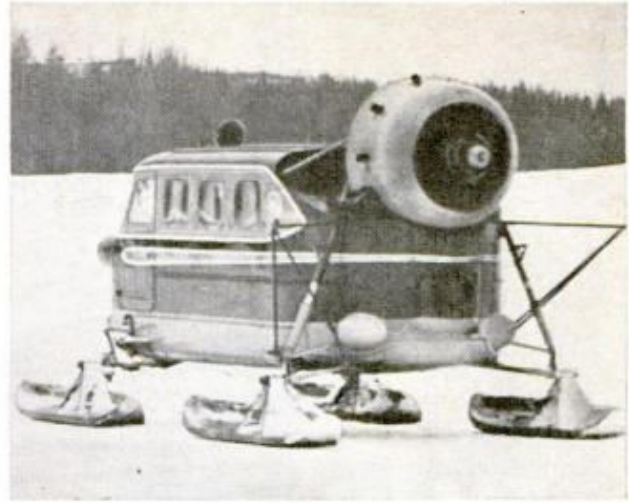
**THE FISH-MOUNTING KIT** has almost everything you need for the job. There's a cutting knife, paintbrush, scraper, artificial eyes, cardboard for the fins, needle and "thread," varnish and paint, powdered preservative and the stuffing mixture. Also included in the kit is a complete instruction manual. Not included are shears, a mounting support board for inside the fish and the panel on which you mount the trophy. You may also need more paint or different colors for different types of fish. Model-airplane paint is perfect. There are two mounting kits available—one for small fish up to five pounds and another for larger fish up to 10 pounds. The small kit costs \$6 while the larger is \$8.95. The kits are available by mail from Norman K. Meyers, Taxidermist, 3808 Reemelin Rd., Cincinnati, Ohio, 45211. He also has kits for mounting birds and reptiles, in the event that you want to try your hand at preparing other trophies, such as ducks or snakes. ★★★





## Amudphibious

A triple-threat vehicle, the TerraStar, operates on land, sea and mud. Designed for rough-country operation by the Lockheed Aircraft Service Co., it may see service in oil and mineral exploration, mapping and survey work, fire-fighting and other remote-site operations. It can also operate conventionally on roads.



## Pusher-prop sleigh

Made in Russia, a sleigh built to carry 10 passengers is pushed over the icy surfaces by a ducted propeller. The four pontoons also allow the vehicle to ride on water. The sleigh has a maximum speed of about 62 mph. It was shown recently in Helsinki, Finland, where it was photographed.



## Fold-up bicycle totes like a suitcase

Intrigued by a miniature bicycle he'd bought for his son that folded up when not in use, a London father set out to design one for an adult. The result was a bike that weighs about 25 pounds and folds into a compact shape that can be hand-carried. It has only one latch, one hinge and one securing catch. The saddle tube telescopes, the handlebars fold like wings, and the crossbar becomes the carrying handle (photo, right). The entire package can be stored handily in the trunk of a car or in a storage cabinet in a house.



# Shorty Tripod for

Those awkward near-ground shots get with this simple sliding camera

By WALTER E. BURTON

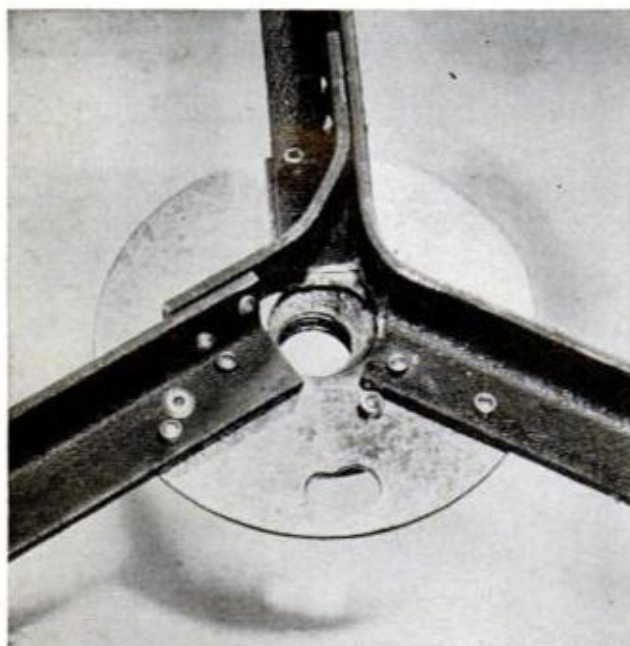
**L**OW-ANGLE SHOTS are impossible with a conventional tripod and are hard to manage with a hand-held camera. This squatty 16-in. stand lets you get your camera down to within an inch or so of ground level and holds it rock-steady on three spiked legs. For added stability, there's a pointed rod down the center that can be driven into the earth to anchor the stand for critical focusing or making time exposures. While the stand shown here is designed for outdoor use, an indoor version can be made by omitting the center rod and covering the legs with rubber crutch tips for a skidproof grip.

The column and sliding camera arm are  $\frac{3}{8}$ -in. pipe. By carefully reaming out a  $\frac{3}{8}$ -in. pipe tee, you can make it a perfect slip fit on the column for the camera arm. A thumbscrew through a tapped hole in the tee locks the arm at any desired height on the column.

The outboard end of the camera arm can be fitted with either an elbow, as shown in the photo, or a second tee, as shown in the drawing. The tee makes it easier to run a bolt up through the fitting to hold the camera. A standard tripod pan-and-tilt head can be mounted on top of the tee, or you can use one of the little ball-and-socket accessories that sell at photo shops for a couple of dollars. A knurled-head adjustment screw adds a nice touch to the assembly, but a long thumbscrew through the tee or simply a bolt with a wingnut threaded on it will do equally well.

The legs are lengths of steel angle joined at the center by a metal disc for a hub. I used a round electrical junction-box cover plate for the hub, but any steel disc about  $\frac{1}{8}$  in. thick and  $3\frac{1}{2}$  to 4 in. in diameter will serve. On top of the hub is mounted a pipe floor flange. The stand's column screws into this to complete the assembly. For compact storage, the legs can be unscrewed from the column when the stand is not in use.

The center stabilizing rod is locked by



**UNDERSIDE OF LEGS** shows how they are joined at the hub. Note that two of them are formed by notching and bending a single length of angle. This is stronger than using separate pieces. Third leg is braced with a tie strap, also for strength. Joints can be riveted, as shown here, or bolted or welded

POPULAR MECHANICS

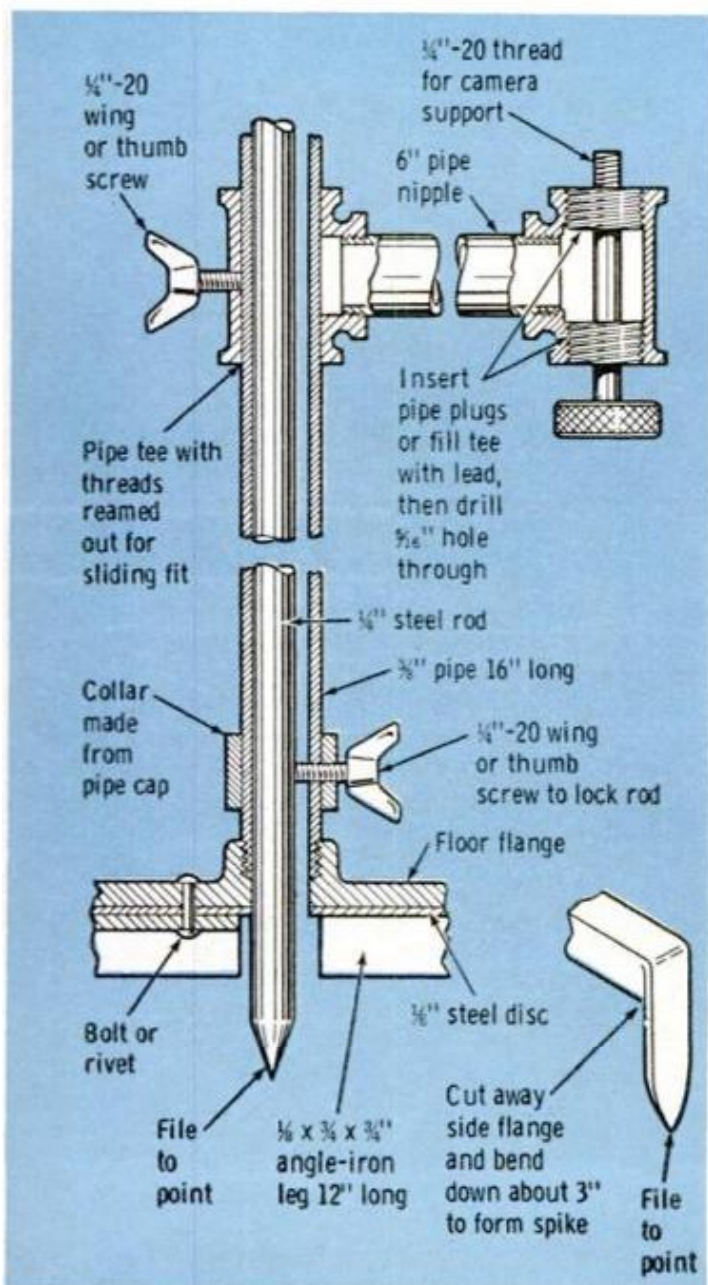


# Shooting Low

of insects and flowers are easy to mount made of pipe and angle iron

Technical Art by Graphic Presentations

a thumbscrew through the side of the column. To reinforce the screw, a collar is made by cutting the top off a pipe cap, reaming out the inside, and running a tapped hole through the side. The upper end of the rod can be fitted with a cap nut or two regular nuts locked together to form a head for tapping the rod into the ground with a stone. File points on the lower end of the rod and the legs. ★ ★ ★



# PHOTO HINTS



**LAY A STRIP OF HARDBOARD** over your developing trays and you'll have a temporary work counter without disturbing your chemicals. The trick comes in handy for jobs like cutting more paper halfway through a session of printing.—D. E. Anderson



**A KITCHEN MEASURING CUP** of ovenproof glass is ideal for mixing photo-processing solutions since it can be subjected to heat and cold for critical control of temperature. Mark levels for various film sizes with taped-on labels.—Robert Hertzberg



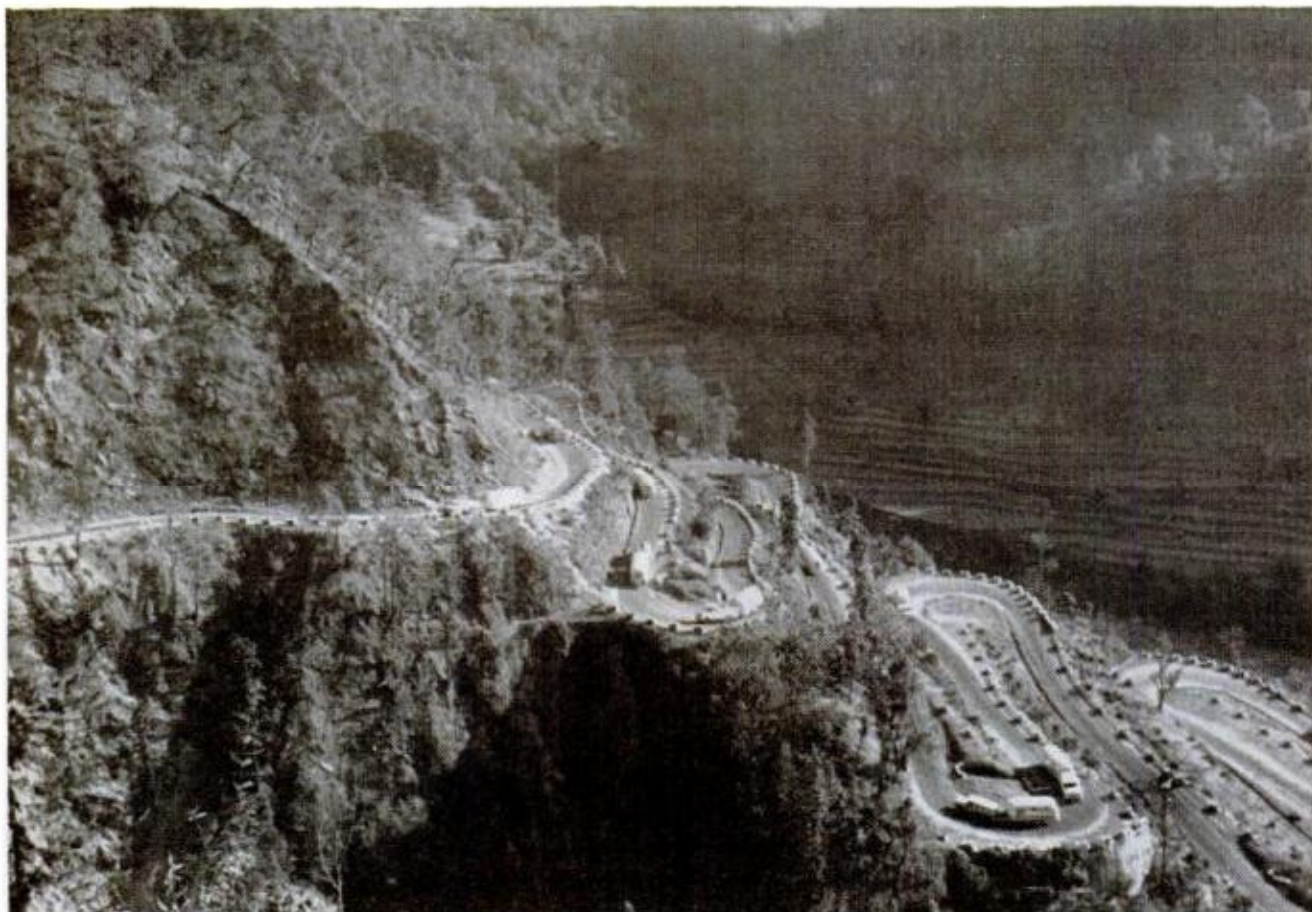
**WHITE LIQUID SHOE POLISH** makes a perfect ink for identifying your snapshots in photo albums. Applied with either a dip pen or a fine artist's brush, it stands out neatly against the black paper and will not easily rub or flake off.—William Swallow



# Mechanic for a round-the-world caravan shows How to keep 'em rolling when

His job—to keep 47 trucks and travel trailers on the move through 30,000 miles of mountains, deserts and rain-soaked jungles. He did it with lots of ingenuity, plus an occasional elephant

By MCGREGOR SMITH JR.



**SWITCHBACKS** in Nepal mountains are negotiated by members of the Wally Byam Round-the-World Caravan. This tough country calls for expert care of trailers and trucks, plus good preventive maintenance

**GREASE SEALS** in the differential must be replaced on the road as rugged driving tests every piece of machinery and equipment. Byron Versteegh handles jobs both big and little all along the 30,000-mile trip

**BYRON VERSTEEGH** is the kind of mechanic who must have kept the wagon trains rolling in the old West. Then he would have been called a blacksmith. Now he's chief service engineer on the Wally Byam Around-the-World Caravans. But his job is the same—fix anything that breaks down and improvise spare parts if necessary.

As mechanic for a 30,000-mile caravan from Singapore to Lisbon, Byron tackled some problems he'd never encountered before. What he did was "mother" 47 Airstream trailers and a





# the going gets tough

variety of truck makes across some of the toughest terrain in Asia.

In Bangkok, Byron visited five repair shops, while the other 105 members of the Wally Byam Caravan Club toured the sights. The only souvenir he bought was a box of rubber bullets for plugging holes in tubeless tires.

On the 1750-mile drive from Singapore to Bangkok, almost all of the 500 spare plugs in the caravan had been used.

At camp, Byron spent his time in the shade under our trailers and trucks. He poked around with a screwdriver and crescent wrench.

"You'll never make it, Mac," he muttered to me once, shaking his wrench like a scolding finger. "I don't care if you have double nuts and lock washers on your spring shackles, nothing's gonna stay tight on the roads we've been on! Now get under there and tighten every nut you can see. Just remember, you're dead if you don't take care of your rig."

Byron's concern for the well-being of our machines was like an uneasy conscience haunting us all. His hours

**CARAVANER** works on brakes and axle to make sure failures don't occur in tougher country. Preventive maintenance is one of Versteegh's cardinal rules. He's a mechanic who can hear when something's wrong



JULY 1967

wriggling on his back under our already battle-scarred vehicles was not just to plague us with loose nuts. He was looking for signs as elusive as the dusty trail of a Montana deer. He felt with the bright finger of a flashlight into dark corners of axles, frames and wheels. The signs he sought were microscopic cracks and shiny joints where metal had rubbed against metal. Both meant something might break soon.

By the time we reached Bangkok, we already had been baptized in mud. Our baptism was along 75 miles of monsoon-watered mud, knee-deep to an elephant. This elephant trail crossing the Kra Isthmus in southern Thailand was being widened into a road.

The hospitable Thai drivers of the bulldozers and graders towed our trucks and trailers across a few bottomless pits. Our winches and four-wheel drives had proven useless. We appreciated the service since the only alternative was for 20 or more caravanners to wade into the mud and pull on a nylon rope.

On the Kra we learned to remove

**STRENGTH OF WELDING** reduces the number of breakdowns in far-off lands. A power winch behind the front bumper comes in handy when several trailers fall off the road. Extra strength is very important



107



our load-leveling bars whenever the going got rough. Byron came close to a heart attack when a bulldozer dragged one rig across a small creek with steep muddy banks on each side. The load-leveling bars, which tie the truck and trailer frames together, were drawn up tight. The bars make the trailer "follow" and keep it from wagging at high speeds on good roads. But on this rough trail, the bars forced extra tons of weight on both the trailer and truck frames. As Byron watched, the rear wheels of the truck literally were lifted out of the water.

Immediately, Byron sent out an order over the Citizens Band radio in his truck. The 18 other trucks with CBs received word to take off their load-leveling bars until we hit asphalt again. These drivers passed the word along to others who had no radio.

Byron reached Bangkok without having to use his portable welder on a single broken axle or frame. He pronounced this accomplishment a major miracle. But still his favorite greeting to other caravaners was that unless they treated their equipment more kindly they were "dead."

Byron brightened noticeably whenever he tackled an unusual case. He attended two such cases during our crossing of the Himalaya Mountains

to Katmandu, capital city of Nepal.

The Rajpath Highway twists for 80 miles over three ranges. Its surface is asphalt, but it is often blocked by boulders and landslides. One trailer wheel struck a boulder and broke off. Not only did the wheel break and roll down the mountain, but the spindle on which the wheel was mounted broke too. Byron had never seen this happen before, but he met the challenge by improvising a new spindle to get the trailer down the mountain.

It was on this highway that serious trouble developed. A trailer-hitch ball disintegrated. The rig had just negotiated some steep mountain switchbacks and, suddenly, the ball let go. Only the load-levelers held the truck and trailer together. The driver managed to stop just at the edge of a 50-foot drop-off.

Byron gingerly jacked up one side of the trailer. He wedged rocks under its wheels and detached the truck. He climbed under the trailer and riveted a torn section of aluminum underbelly. Then he welded a new ball onto the hitch. As he fingered the fragments of the old ball, his blue eyes brightened.

"Now that's really something," he said, his voice a little awed. "Bet nobody ever saw that happen before."

Byron explained that the steel ball

**ONE AT A TIME**, trucks and trailers cross a shaky bridge over a small tributary of the Ganges River in India. Motorcycles and trail bikes are carried for quick transportation when camp is made at night







**ELEPHANTS** are used to tow rigs through mud or in event of breakdown near town with repair shop

had disintegrated from metal fatigue. Later, another ball sheered off at its base. Three more unscrewed and came off before Byron welded them all onto the hitches. This extra strength saved us a lot of trouble later on.

A few days later the right wheel of a trailer dropped through a hole on a muddy, wooden bridge. The dura-torque axle arm holding the wheel cracked. Byron came with his repair kit. This included a spare axle and his tape recorder.

That night Byron and Andy Charles,

caravan director, taped a report to the home office of Airstream trailers. The caravan served as a kind of engineering laboratory for the company.

"We were lucky today," the report began. "We broke only one axle. If we'd used leaf springs instead of dura-torques like we did in the old days on the African caravan, we'd have busted a couple of dozen.

"But don't get complacent," Andy added between gulps of steaming coffee. "Get a better valve in those commodes. I took my whole toilet out in New Delhi. I was working on it when Chester Bowles came by for a visit. In case you don't know, he's our ambassador to India."

While still in India, a catastrophe struck the caravan. The Versteeghs' service rig, a trailer body mounted on a truck and equipped with a complete machine shop, caught fire. It happened when a spark flashed from an ungrounded gasoline pump in a village crowded with thatched houses. Byron's wife, Joyce, heard the flames first.

"Fire!" she screamed.

Byron sprinted to the trailer door and opened it. Angry flames burst out. The hairs on his arm singed.

"Get the extinguisher from the cab,"

*(Please turn to page 196)*

## TRAVEL TIPS

**DON'T** load your trailer too heavily on the rear. Any surplus weight there only contributes to a nasty towing condition.

**DON'T** follow vehicles too closely. You now have two units to stop.

**DON'T** put too much weight on your weight-equalizing hitch bars.

**DON'T** overinflate your trailer tires. The trailer needs a little cushion.

**DON'T** tighten your wheel bearings too much. If in doubt, loosen them a notch. Your wheel bearings must have clearance for grease.

**DON'T** overload. Food and commodities can be purchased everywhere. No need to carry it.

**DON'T** forget your trailer battery. Keep the connections tight, water in it, and fasten it securely. Also, consider mounting an extra ammeter in view of driver and hook this unit into your trailer's battery charge line from your tow vehicle charging circuit.

**DON'T** forget to open a side vent window as well as a top vent for maximum air circulation when retiring for the night.

**DON'T** forget to inspect the doorstep on your travel trailer for weld cracks, bends and other hazards. Add a no-slip surface to your step.

**DO** become thoroughly acquainted with your trailer's brakes. Get in the habit of using the trailer hand-brake lever; you may need it to straighten out a sway.

**DO** mount two outside rear-view mirrors on your tow vehicle. Learn to back with them.

**DO** mount the outside mirrors as low as possible so you can view your trailer tires.

**DO** install large-capacity (at least three-eighths inch) safety chains on the trailer.

**DO** install good overload springs on the tow vehicle. By keeping it level, you maintain the best steering characteristics.



# SLOW TRAIN TO GREAT SLAVE

Canada's rugged new railroad is getting the lead  
(lots of it) out of the remote Northwest Territories

Text and Illustrations by Henry B. Comstock





**T**WO CENTURIES AGO a Hudson's Bay Co. explorer paddled and portaged 1500 miles across northwestern Canada. Young Sam Hearne's mission was to scout for possible mineral wealth. Upon his return to Fort Churchill, he filed a pessimistic report. Part of it read: "Near the shores of the Great Slave Lake, I found outcroppings of a metal with the look of silver. Unhappily, it proved to be lead. This is best left to the savages, who melt and

northern terminal at Hay River, plus 55 more on the branch from "Hay" to the Pine Point Mine. But I wouldn't see a telegraph pole from one end of the pike to the other. Instead, big microwave towers, combined with train telephones and walkie-talkies, keep the whole operating department as well informed as old hens on a party line. Engineers call in each time they pass a siding, so the dispatcher can plot his moves and tell inferior trains where to get off the main.

Next day, train 4353 eased out of the eight-track Roma yard, pulled by five diesel units. Collectively those growlers gave engineer Frank Zimmerman 8200 horses—more than enough to handle 120 empties, plus 6 water cars for work gangs.

The five diesels are necessary because, while there are only a few grades going north, most of the scenery is stacked against the trains coming back loaded with ore. For Pine Point is only 500 feet above sea level;

down here we were at 2000.

Fifty miles uptrack, we set out our first water car at Manning. How do you drop a car directly behind five diesels when the man who will throw the switch is nearly a mile away? First, you pull past the siding about 4800 feet. That puts the conductor close to the gate and he drops to the ground. Then you back up almost the same distance and wait for him to release the coupler. So it goes—*forward* and *reverse* by walkie-talkie command until the load is on the siding and the train tied together again.

The next eye-popper was at Mile 73 (no other name). There the GSLR leaps the broad Meikle River Valley with the most spectacular of its 41 bridges. Frank approached the spidery structure—160 feet high and half a mile long—with his controller switched to dynamic braking. Roof fans howled as they voided the heat whipped up by the traction motors he had converted



**MEIKLE RIVER TRESTLE** (left) is longest and loftiest of Great Slave Lake Railways 41 bridges. Remainder of route opens up Canadian Eskimo territory

shape it into fishing weights."

It was not until the 1920s that Canadian mining interests mapped a number of likely pit sites. But transportation was impossible. As an old hand put it to me recently: "That stuff ain't corn flakes, and we couldn't get it out until somebody built a railroad."

Now somebody has, and the world's largest-known cache of lead and zinc is being tapped and trundled to southern smelters—at 50,000 tons a month.

To see how the \$7-million Great Slave Lake Railway highballs the ore, I jetted to Edmonton, Alta., and ultimately arrived at the dispatcher's office at Roma.

At Wally Bednas's invitation I was introduced to a new brand of railroad-ing. Communications is the key to everything. There are 377 miles of single track between Roma and the line's



into generators to hold us to a crawl. Rumbling off the northern end, with half the train still on the downgrade, he cautiously picked up slack for a climb back to the plain.

This was not yet what Indians call "land of the little sticks." Everywhere, dense stands of spruce battled white poplars for a share of sky. The railroad has opened the door to 13 million acres of timber and another 6 million to farming.

We made a fueling stop at High Level. Northbound, the diesels were wringing a sixth of a mile from every imperial gallon. But, I was told, coming back the oil use would triple.

There's no need to describe the railroad's impact on what, four years ago, was a truckers' waystop. For High Level's new \$250,000 planing mill, three competitive grain elevators, and tiny building lots priced at a grand

apiece, were eclipsed by what I saw in Hay River next day.

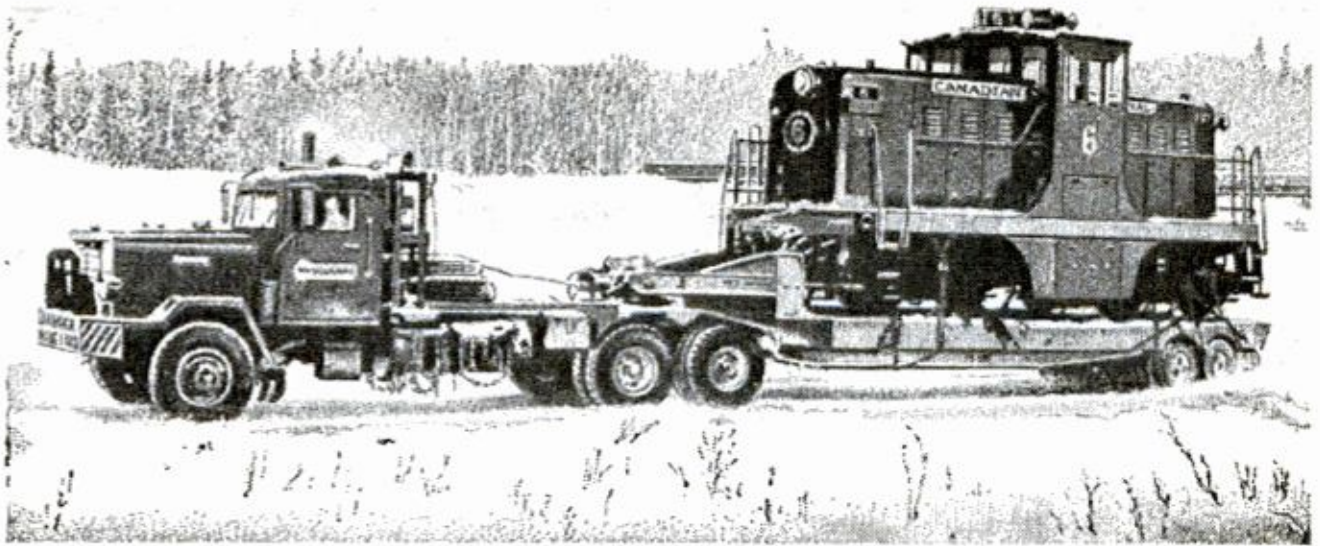
Hay River had been an important interchange point for truck-transported freight long before the GSLR reached it. In summer, diesel tugs towing impressive strings of barges, relay the traffic to other settlements on Great Slave Lake and in the Mackenzie Valley beyond. Also, the town is a trading center for 3000 Indians.

But that's the "Old Hay River." A new one is rising on a bulldozed hill well above the level of floods caused by ice jams each spring. Up here, there will soon be handsome churches and

**TRACKLAYING** was completed in 32 months, despite winter temperatures which sometimes dipped to minus 50° F. Hard-working, thrifty Portuguese supplied much of labor force, have since returned, much richer, to sunny homeland







schools, a large motel and a golf course.

It was a two-hour run from "Hay" to Pine Point. Above stunted conifers rose a trim little community, with public utilities, paved streets, shopping center and bowling alleys. Respectably far away, a mountain of rocky clay was rising, too. Already more than 70,000 truckloads of overburden had been dumped on the spoil heap. We cranked down 50 vertical feet to the floor of the pit's first ore cut.

There one of the men passed me a chunk of rubble no bigger than a cantaloupe, then quickly jumped aside. If he expected me to drop it, I disappointed him. But it wasn't easy, because that stuff was 70 percent pure lead.

Our other stop was at a concentrator which accepts raw ore at one end, thaws, and then crushes it. Finally, bubble-charged chemical baths coax lead and zinc from unwanted materials.

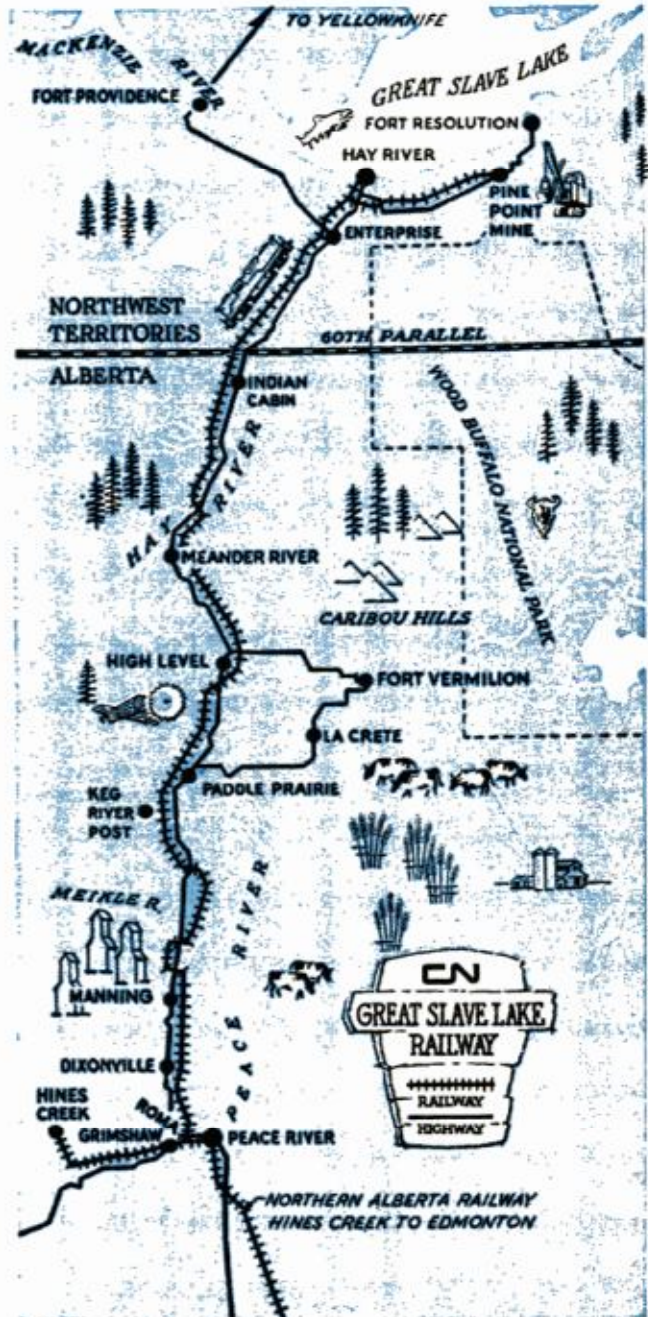
I was back at the yard only minutes before southbound 4353 was ready to ramble with 98 hopper and gondola loads. Most of the cars were consigned to Cominco smelters at Field and Kimberley, B.C.; others would wind up at Flin Flon, Man., and below the border at Great Falls and Black Eagle, Mont.

Watching the mile-long string of real-estate from the cupola, I called down to the skipper: "What's that 9000 tons worth in its present state?"

"Better than half a million dollars."

I thought to myself: *Poor Sam Hearne; born 200 years too soon.* ★ ★ ★

**FIRST DIESEL** into Northwest Territories was trucked over Mackenzie Highway before the track was laid  
**GSL RAILWAY MAP** shows route of area covered and principal points of interest. New communities have mushroomed along the way in wake of new railroad





# Control Power with

# fluid

Fluid-state devices—as small as miniaturized electronic parts or as big as a one-car garage—promise maintenance-free controls for washing machines, airconditioners, carburetors—even cars and ships

By MORT SCHULTZ

Art Concept by ZIK Associates, Ltd.

A UNITED STATES DESTROYER recently backed from its berth into a ship-cluttered harbor and paused.

Suddenly, to the bug-eyed astonishment of onlookers, it pivoted 180° on its own axis as easily as a baton spins on the fingertips of an expert twirler. In less than three minutes, it was heading for open sea.

Mariners watching the operation had reason to do double takes. They knew that a DD-class ship of the line normally needed plenty of leeway and at least 10 minutes to make a 90° turn. Ships, like cars, must go ahead to turn.

The destroyer itself is of little consequence. But the device deep in its bowels which permitted this nautical miracle—called a fluidic amplifier—has scientists and engineers excited.

If you haven't heard of fluidics, you will. It promises a whole new line of less expensive, more reliable and maintenance-free airconditioners, dishwashers, clothes washers, refrigerators—even automobiles.

What is fluidics? And how does it work? The industry is growing so rapidly, with new theories awaiting trial, even experts can't agree on a definition.

However, I got this most descriptive explanation from Lael Taplin, manager

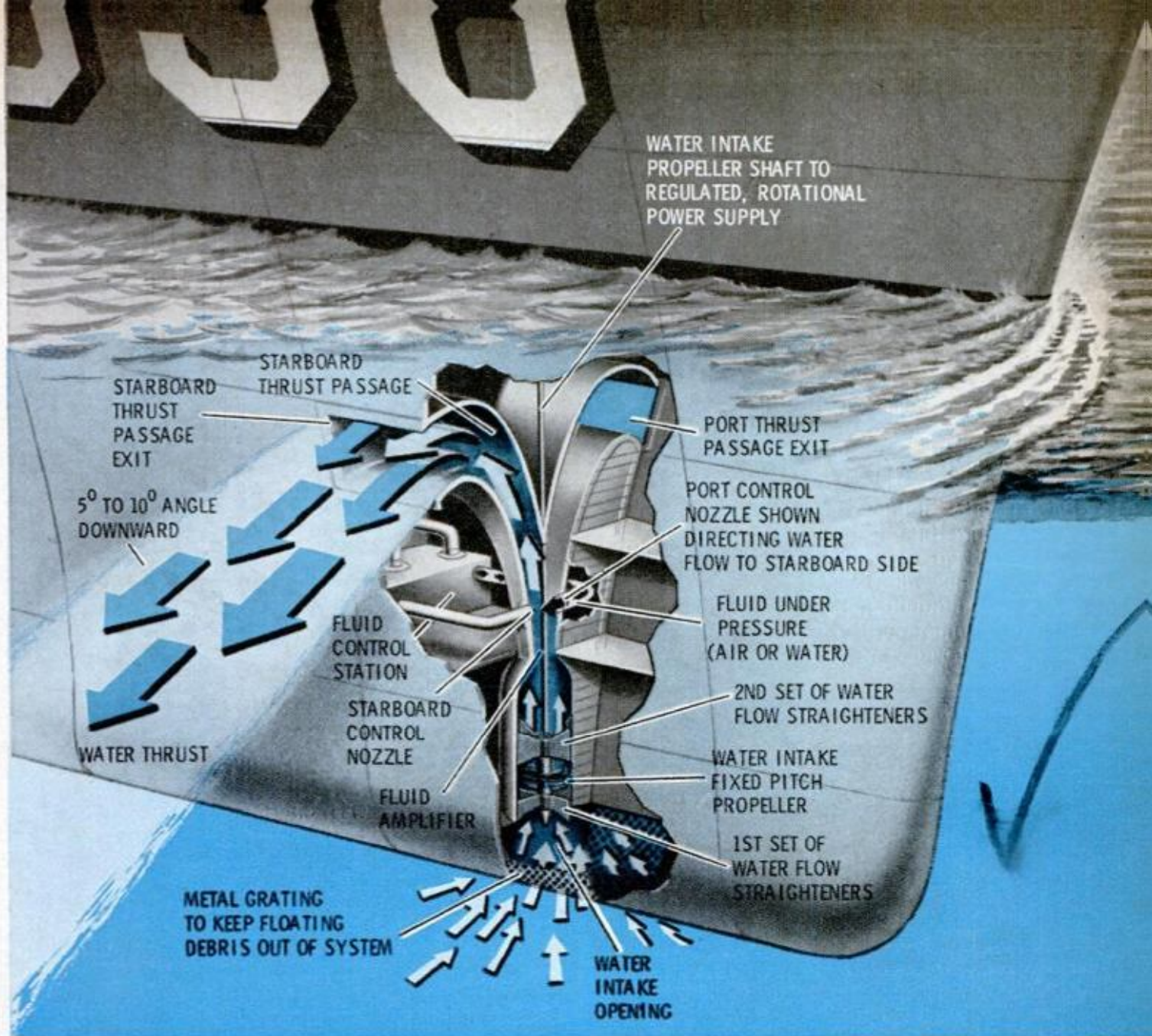
of energy conversion and dynamic controls at the Smithfield, Mich., research laboratories of Bendix Corp.: "Fluid-state devices and systems use the flow properties of liquids or gases moving through tiny networks of pipes or tubes to perform the functions of sensing, amplification and control. The action is similar to electron currents flowing in networks of wires and components."

To amplify, you need energy and a means of increasing that energy. In your TV set, for example, the 110-volt energy available at the wall socket is increased to 22,000 volts by a transformer. In a fluid circuit, energy is a relatively heavy flow of liquid or gas injected into the circuit usually by a pump or compressor. This main energy stream is then amplified and controlled by a much smaller amount of fluid or gas called a control jet.

In other words, as with electronic amplification, a small amount of energy is "inputted" into a circuit and amplified. Increased energy is then "outputted" to perform a function.

A fluidic device looks like an ordinary block of metal, glass or plastic. It can be as small as many microminiaturized electronic devices or—like the fluid control in the destroyer—it can measure 10 x 15 feet.

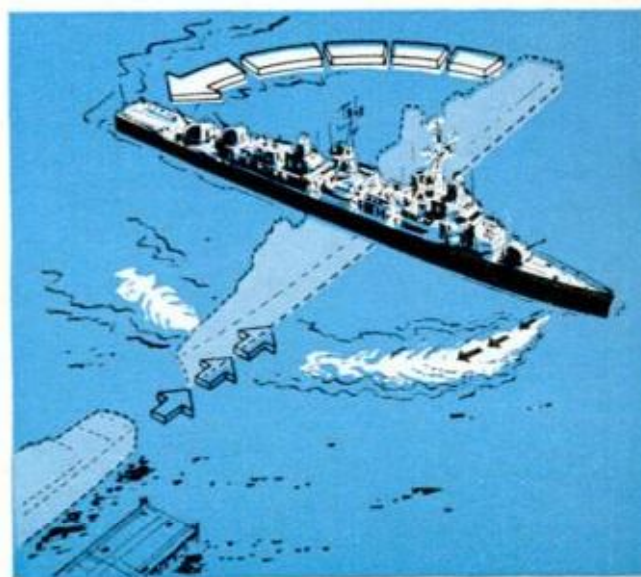




Slice one of these blocks lengthwise and you'll find a network of shallow channels drilled through the core, similar to what you would find if you cut through a block of termite-riddled wood.

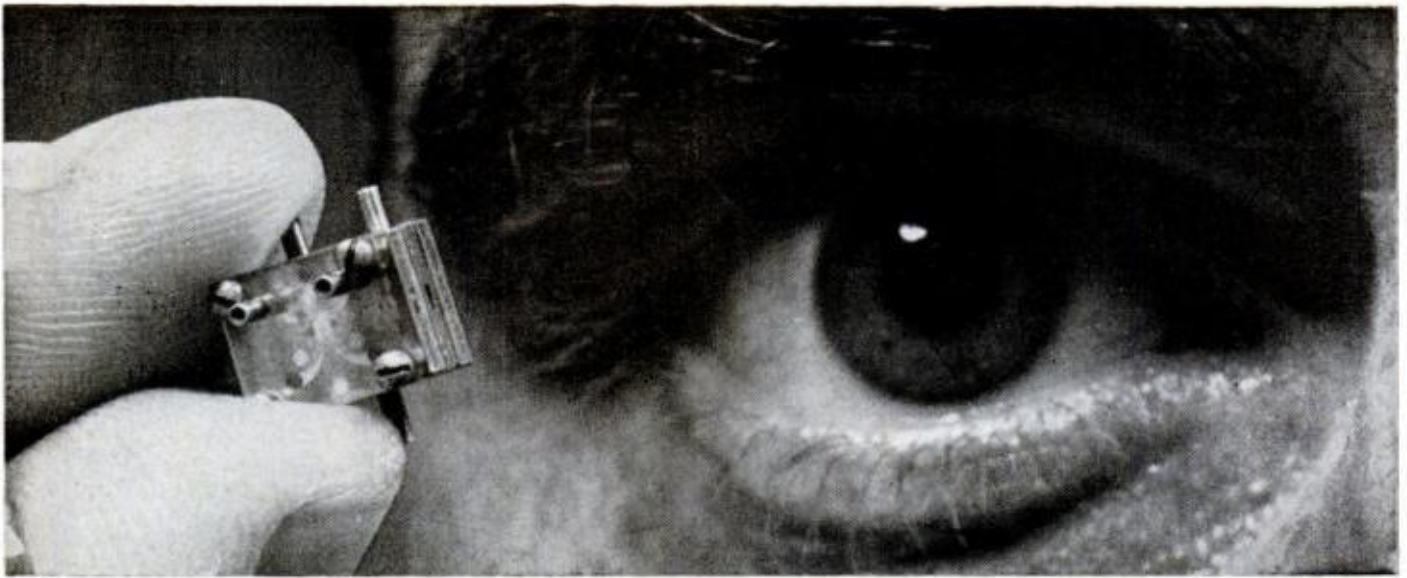
In the simplest type, the pattern resembles the letter Y. Its leg is the input and the arms are the outputs. Fluid is pumped into the leg. Tiny control jets aimed perpendicularly at it from either side amplify the energy and divert it to an output arm. If the left-hand control jet hits the stream, diversion is to the right. The right-hand control diverts energy to the left.

A graphic representation of fluidics in action is your garden hose. Turn it on and have someone hit the flow from



**HUGE FLUIDIC AMPLIFIER** for bow-thruster on U.S. destroyer enables the ship to be turned 180° on its axis. (DD-class ships generally require 10 minutes to make 90° turn while under way.) Drawing, top reveals it uses same principle as miniaturized amplifier





**MINIATURIZED AMPLIFIER** is comparable in size to electronic amplifier. Even smaller units are foreseen

the side with a stream of water from another hose. This gives the main flow a speed-up kick, diverting it to one side.

This description forms the basis for a major type of fluidic device called a bi-stable proportional amplifier. There are deviations, but all function by the use of one fluid stream to control and am-

plify a greater amount of fluid energy.

Another type of fluidic amplifier is represented by your toilet. When you flush it, a stream of water leaves the flush tank to push the main body of water around and out the drain. This demonstrates the principle behind a vortex fluidic amplifier, which uses control jets of fluid against the main swirling stream to amplify and control flow.

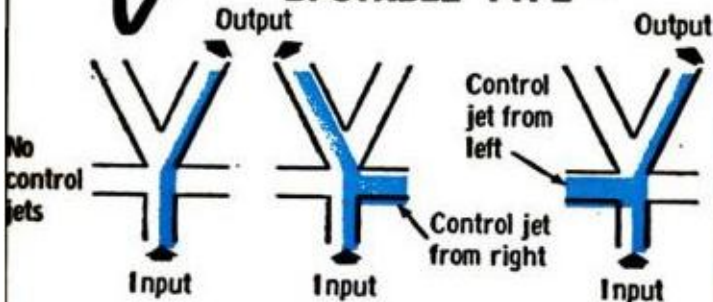
Such fluid energy can be used for switching, controlling, sensing or simply amplifying—with infinitely more reliability than pneumatic and hydraulic controls, because fluidic devices have *no* moving parts to wear out.

If you could ever peer into the hold of a Navy destroyer, you would be amazed at the absence of twisting shafts, sliding pistons and seesawing valves that make up a conventional bow thruster. Instead, you would find a steel hull that could, in time, do away with tugboats, because it provides a maneuverability in tight quarters—and in combat—never before achieved.

Cut through the core of the steel hull is that Y-shaped cavity we spoke of before. To turn, the pilot opens a valve directing a controlled jet of fluid perpendicularly against the main fluid energy coming through the leg of the Y.

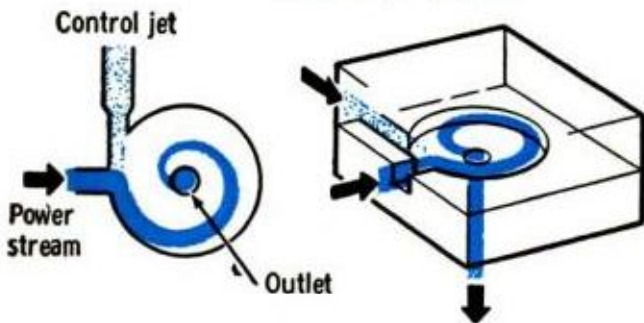
This jet creates a tremendous force (equal to 50,000 gallons of water) to the side opposite that which the ship will turn. Conversely, practically all fluid energy is diverted away from the

**BI-STABLE TYPE**



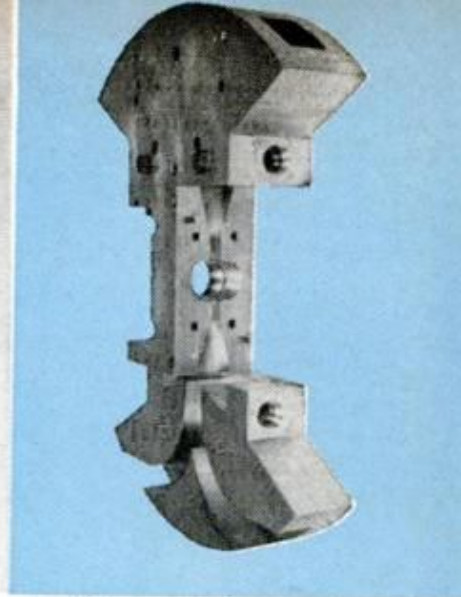
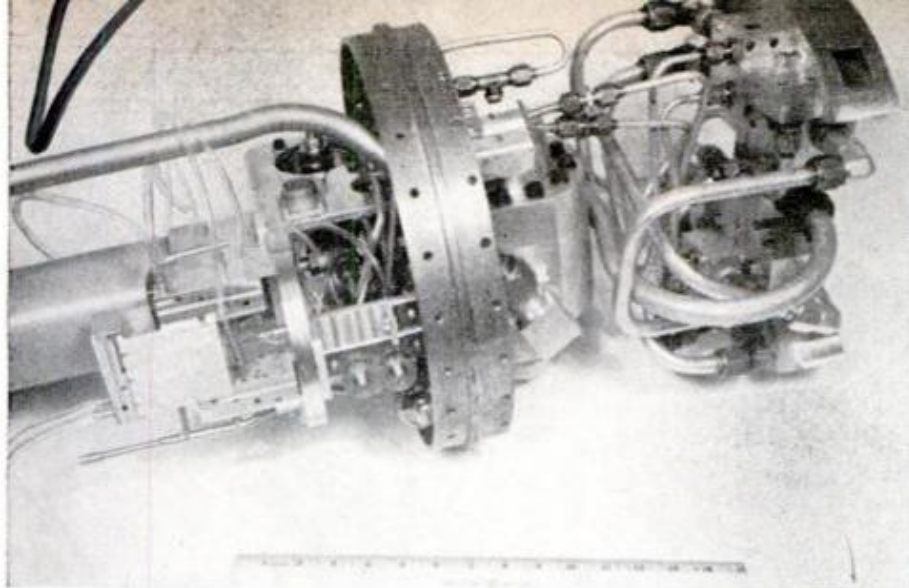
**POWER STREAM FLOW** is controlled by jet applied to the side of the base leg. Jet deflects stream to opposite arm, amplifies it

**VOLTEX TYPE**

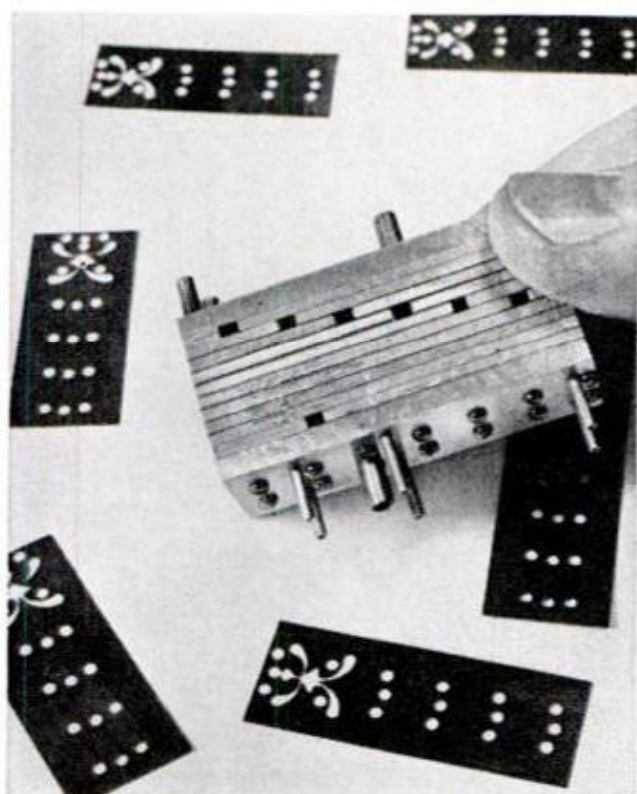


**CONTROL JET** accelerates power stream as it swirls out "drain." Vortex fluidic amplifiers are used horizontally or vertically





**LARGE FLUIDIC AMPLIFIER** above is used in Army missile (top left) to control roll. Three-stage amplifier (left) could be basis for a fluidic carburetor



other side of the big vessel.

The fluidic bow thruster was developed by the Bowles Engineering Co. of Silver Spring, Md., whose president, Dr. R. E. Bowles, helped pioneer fluid science in 1958 as a member of the Army's Harry Diamond Laboratories in Washington, D. C.

Fluidics has come a long way since then. It now stands where transistors stood 15 years ago—on the threshold of becoming the most important technological development in recent years.

Scientists have devised many ways to use the controlled output of fluidic circuits. For example, a fluidic guidance

system can control the course of a torpedo by shooting out jets of gas or sucking in water. This distorts the surrounding boundary layer of water and changes the frictional effects, causing the torpedo to turn. Similarly, fluidic circuits have been used to control the attitude of a rocket in flight.

Fluidic sensors have also been placed inside jet engines. Should a flame-out occur, interrupting flow of gas, a signal is sent to the cockpit immediately.

Electronic signaling devices used for this purpose have proved less reliable. They must be placed outside the engine because of the intense heat. They are affected by radiation, vibration and shock. Fluidic devices are not.

Fluidics does an improved job of regulating natural gas flow in a pipeline. There are no spark hazards to cause an explosion and no moving parts of normally used regulators to break down.

Most people have never heard of fluidics, yet it is one of the nation's fastest-growing industries, with an anticipated \$250 million gross market by 1970. The Russians and Japanese, too, are conducting full-speed-ahead programs in research.

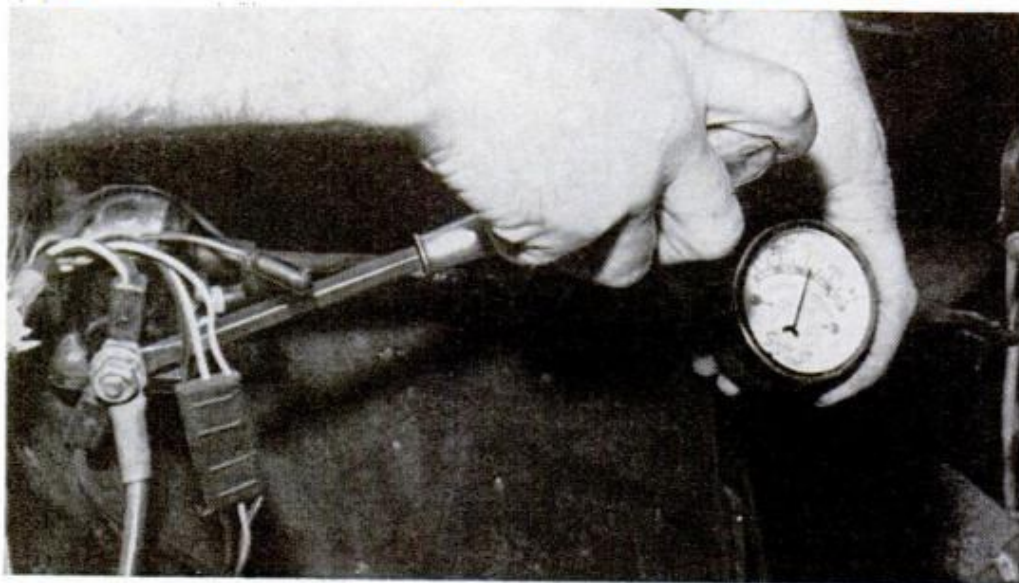
American firms engaged in fluidics work include, among others, Honeywell, Bendix, IBM, General Electric, Sperry Rand, North American Aviation, Martin

*(Please turn to page 184)*



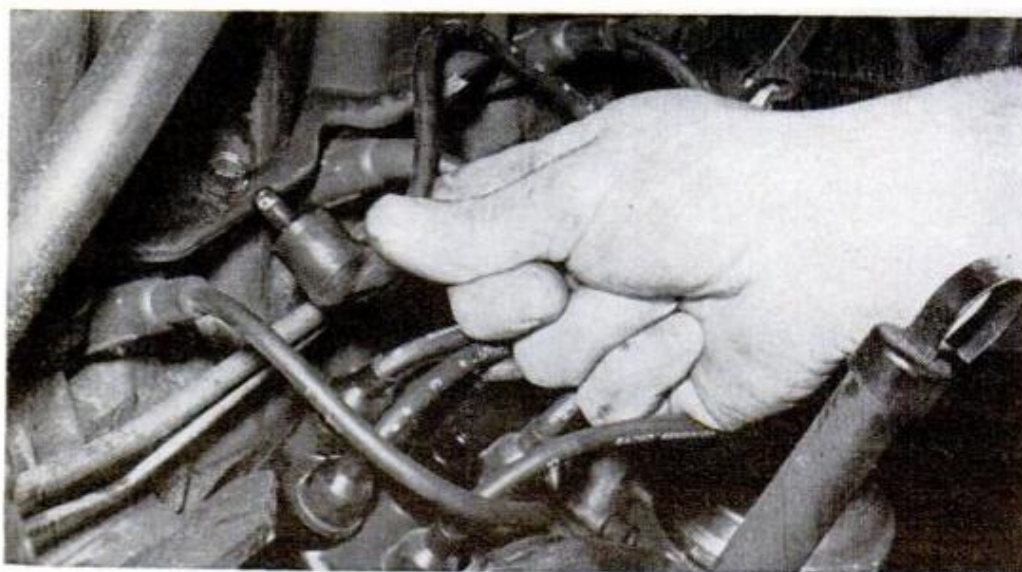
## If it isn't your battery or starter . . .

**IF YOUR ENGINE** is not turning over, use hydrometer to check battery. If it is good, check current draw of starter motor, as shown here. Place ammeter in circuit and crank engine by shorting across ignition switch to battery terminal of starter relay



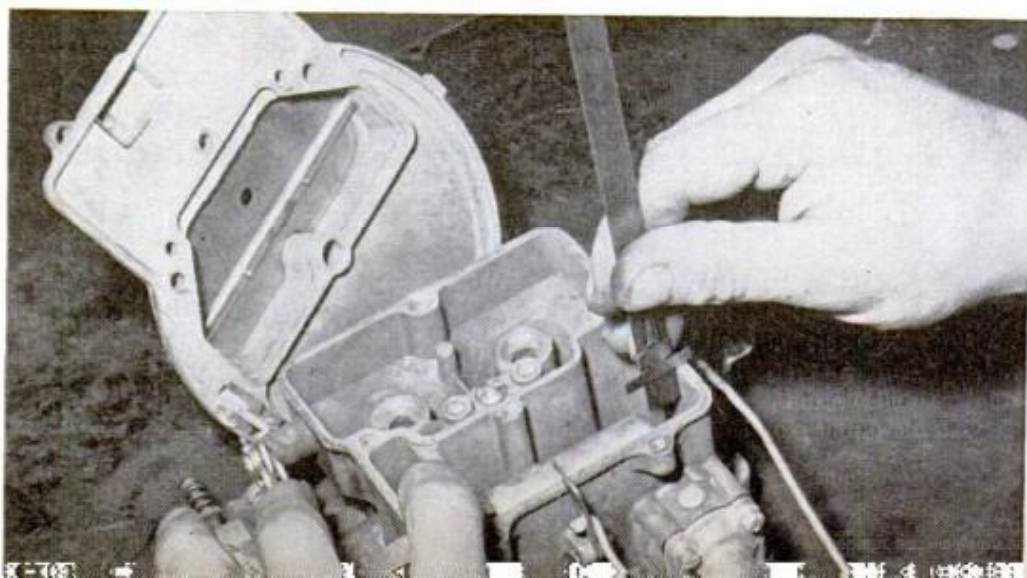
## . . . it's ignition . . .

**IGNITION SYSTEM** should be checked if engine still does not fire. High-tension lead from coil to center post of the distributor should be pulled and grounded as engine is cranked. Strong spark indicates good coil. Next check distributor and sparkplugs



## . . . or fuel system . . .

**FUEL-FLOW** problem is cause of your starting difficulty if you're getting ignition. Problem may be carb float adjustment which is being checked here; leaking float; sticky choke; faulty needle valves or accelerator pump; or the fuel pump or lines





# HARD STARTING

By MORT SCHULTZ

**W**HEN YOU HAVE a hard-starting or no-start problem, first make sure you're trying to start the engine according to your manual. Once you're certain it isn't flooded, *listen* to the way it won't start.

You'll hear—or won't hear—one of three things which tell you where to begin:

- The engine doesn't crank at all.
- The engine cranks too slowly to start.
- The engine cranks normally, but just won't start.

An engine that isn't cranking or is cranking sluggishly means you've got trouble in one of three areas: battery, charging or starting system.

The battery, often the weak link, is easily tested. Check its specific gravity with a hydrometer to determine the state of charge.

A run-down battery, however, could be the result of and indicates a malfunctioning charging system. Checking the charging system—which includes generator or alternator and voltage regulator—is an art in itself. (Next month's *Saturday Mechanic* will be devoted to trouble shooting the a.c. generating system.)

After checking your battery, it's time to get down to business. The logical approach will, without a hitch, pinpoint any *common* reason for hard starting. But knowing when *rare occurrences* are causing the problem sometimes takes more than logic.

(For example, older cars are frequently plagued by a buildup of carbon inside the engine which leads to sluggish cranking when the engine is *warm*. The motor sounds the way it would if the battery were dead. Yet, the car starts perfectly when the engine is cold. This is what I classify as a rare occurrence, and one that evades logical explanation.)

So, forgetting rare occurrences, with battery checked, look to the starting system if the engine doesn't crank or has no starting pep. One main cause of the condition is a starter motor that is pulling excessive amperage.

Recently I had a cranking problem. I hooked a meter into the starting circuit. My starter should normally draw 125 to 225 amps. It was drawing close to 400.

At the first sign of sluggish or no crank-

ing, then, the starter is a good place to start, assuming a good battery. Connect ammeter in the circuit and take an amperage draw test.

Often, replacing the brushes in the starter will cure the trouble. Even taking the starter off the car and letting it soak in solvent for a couple of hours to get rid of built-up oil and grease may do it. In the extreme, the starter may need rebuilding.

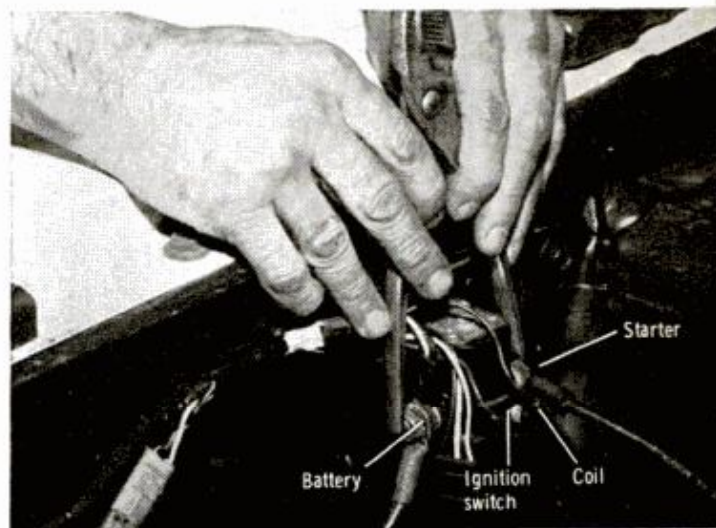
Two other parts associated with the starter may cause the problem, but these are relatively rare. One is the relay; the other, the neutral switch in those cars with automatic transmission.

In checking for a bad relay (most common trouble of the two), first short out the ignition switch-to-battery terminals with a screwdriver. If the engine now cranks normally, the problem is in the ignition-switch wiring or in the switch itself.

If the car doesn't crank, short across the starter and battery terminals with a jumper or pair of pliers. An engine that now cranks has a bad relay; replace it.

Do you have an engine that cranks normally but doesn't fire? You can lay odds the trouble is either in the fuel or ignition system. Once in awhile, however, it could be poor compression.

To isolate the trouble to the ignition or fuel system, start by checking your ignition system. Remove a high-tension lead from a sparkplug and hold it about 1/4 inch from a clean spot on the engine. Modern



**CHECK STARTER RELAY** by shorting across battery and starter terminals. It's bad if the engine cranks



cars have terminal ends sealed in a boot, so you'll have to use this trick: Put a screwdriver into the boot so it contacts the terminal and hold the screwdriver to ground. Don't grab the shank of the screwdriver. You'll be knocked flat.

One of two things will happen as you crank the engine:

- A good, strong spark will jump the gap. This means the starting problem is either faulty sparkplugs, a breakdown in the fuel system or bad compression.

- Spark will be weak or nonexistent. You have ignition-system problems.

If there is good spark don't rule out sparkplugs as a cause. According to any mechanic, bad plugs are a major cause of a no-start condition. So, remove a few plugs to make sure they are properly gapped and not fouled.

There are many reasons for fuel-system foul-up. The more common are: a sticky choke, little or too much fuel-pump pressure, misadjusted carburetor float, leaking float, bad carburetor needle and seat, plugged-up fuel line or filter, and a bad carburetor accelerator pump.

Let's run over the highlights of pinpointing prevalent fuel-system failures:

- **Sticky choke:** Manually operate the choke butterfly plate, checking for free and easy movement. Residue and dirt around the choke plate may be the cause of a sticking choke, or an internal choke part, such as the thermostatic spring or choke piston, could be damaged.

Another reason for poor choke action is improper adjustment. So, before ripping the choke apart, make sure it's adjusted according to manufacturer's instructions.

- **Bad fuel pump:** If pumping too force-

fully, your fuel pump could flood out the engine. If not pumping enough (usually the case), it won't feed sufficient gas.

The way to check pump action is to take a pressure test, checking the operation of the pump against specifications, which differ from pump to pump. If a pressure tester isn't available, though, remove the fuel line at the carburetor and crank the engine. If gasoline spurts, the pump is at least operational and not the cause.

- **Carburetor float improperly adjusted:** The float in your car's carburetor meters a predetermined amount of fuel to the cylinders. If the float is improperly adjusted, the engine usually gets too much fuel since the float won't permit the needle valve to seat.

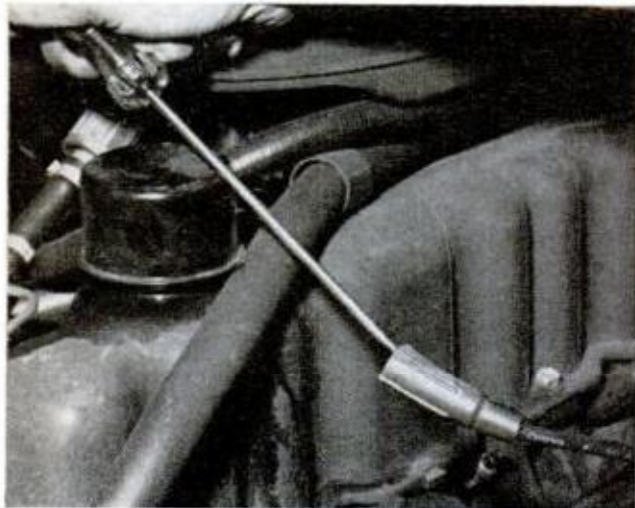
Each float is adjusted to an exact setting, depending on the carburetor. You need to know the float-level specification for your carburetor. Often, float level can be checked with the carburetor on the car.

- **Leaky float:** A pinhole in the float or a parted seam allows gas to leak inside, weighting the float down and keeping the needle off its seat. Result: flooding. To check for a leaking float, remove the part and shake it. Replace it if there's fuel in it.

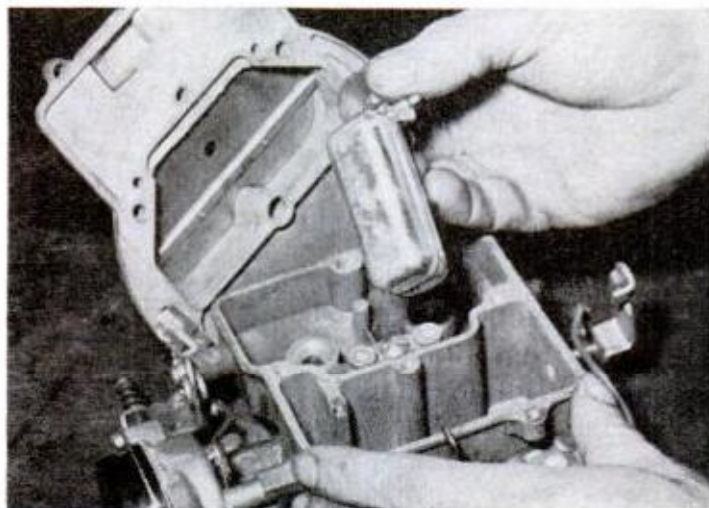
At this point, check needle and seat for damage and dirt. Might as well replace them anyway. With the float out, it's simple. The needle is attached to the float.

- **Plugged-up fuel line or filter and bad accelerator pump:** Look into the carburetor and activate the throttle. You should see (or hear) gas spurting into the venturis. If not, fuel filter (or filters) or fuel line is plugged, the accelerator pump is shot, or carburetor passages are clogged.

Replace the fuel filter(s) if you haven't



**A SEALED SPARKPLUG TERMINAL** can be shorted by touching screwdriver tip to contact, shank to ground



**LEAKY FLOAT IN CARBURETOR** floats low and holds needle valve off its seat, causing constant flooding



done so recently. If trouble persists, remove the fuel line and check for dirt.

Finally, check the condition of the accelerator pump. If things have gotten this bad, you may want to pull the carburetor off for cleaning and rebuilding.

As we said, too much or lack of engine compression can cause a cranking problem. Check it with a compression gauge. A reading of 10 pounds or more *above* normal indicates excessive carbon inside the motor. A reading of more than 10 pounds *under* normal means compression leakage at the head gasket, rings or valves.

Now let's assume you didn't get a good spark. You first try to isolate the problem to either the primary or secondary circuit of your ignition system.

Pull the center tower coil lead at the distributor, hold it about  $\frac{1}{2}$  inch from a clean ground and crank the engine. No spark or a weak one indicates trouble in the primary circuit which usually means a defective coil or condenser, an open circuit, bad points or improper dwell angle.

If the spark from the center tower lead is strong, but there was no spark at the sparkplug lead, it signifies problems in the secondary circuit—maybe a bad distributor cap or rotor or sparkplug wires.

Check for problems in the primary circuit as follows:

- Defective coil or condenser: A bad coil is easier to spot than a bad condenser. When you ground the coil wire, note the type of spark you get, if any. A short (about  $\frac{1}{4}$  inch or less) blue spark signifies a weak coil. A yellow or orange spark indicates a bad coil.

As for checking the condenser, when you inspect for an open circuit, as de-

scribed below, you will probe the distributor. If the test light doesn't light (or the jumper wire doesn't spark), a problem exists in the distributor—most likely a bad condenser or a bad pigtail wire. Replace the condenser anyway—it's cheap.

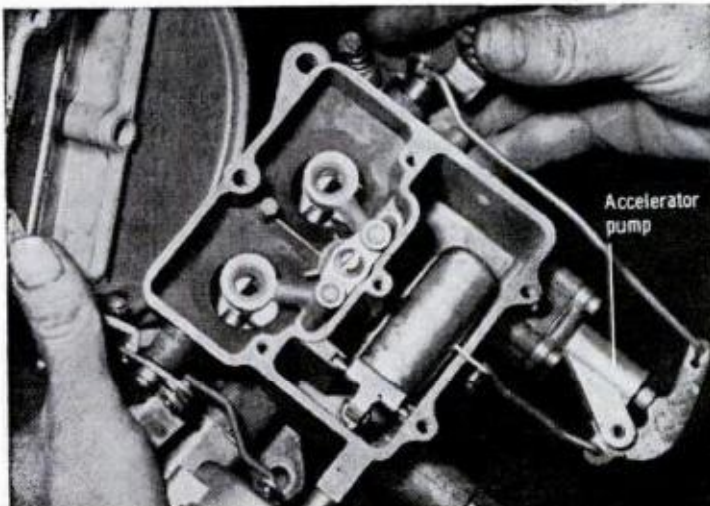
- Open circuit: An open circuit can be caused by broken or grounded connections, overloaded circuits, loose locknuts or the like. Here's a recognized checking procedure you can use:

Remove the distributor cap and block the contact points open with a piece of cardboard. Turn on the ignition switch and momentarily connect a jumper lead or test light from the distributor primary terminal to ground. If the test light doesn't light, there is a problem in the connection leading back to the ignition switch or a grounded circuit. Trace the circuit back from the primary distributor terminal to the primary coil terminal to the ignition switch—that is, all the way back to the battery until the open circuit is found.

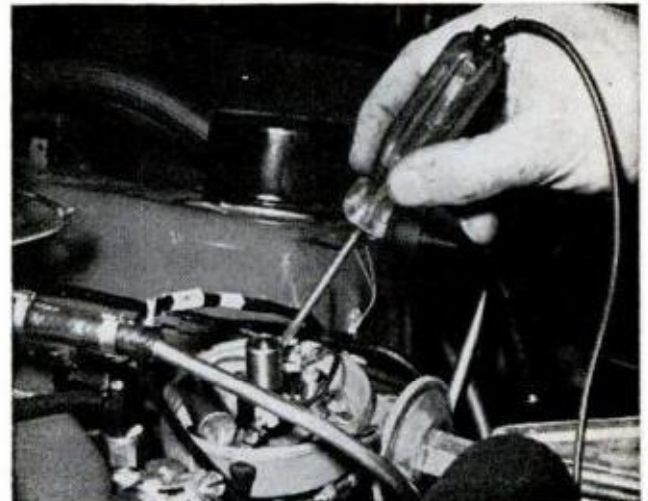
- Improper dwell angle: If the dwell angle is incorrect, or distributor contact points are misaligned or worn, the spark produced for cranking may be too weak to fire the fuel.

If trouble is indicated in the secondary circuit, you can often spot it visually. Look for a cracked distributor cap or corroded distributor cap terminals; a busted, pitted or burned rotor, and cracked, deteriorated sparkplug wires.

One way to check sparkplug wires, short of using an ohmmeter, is first to rule out other secondary circuit parts. Then, remove each sparkplug wire in turn at the plug and hold it to ground. Crank engine. No spark indicates a bad lead. ★★★



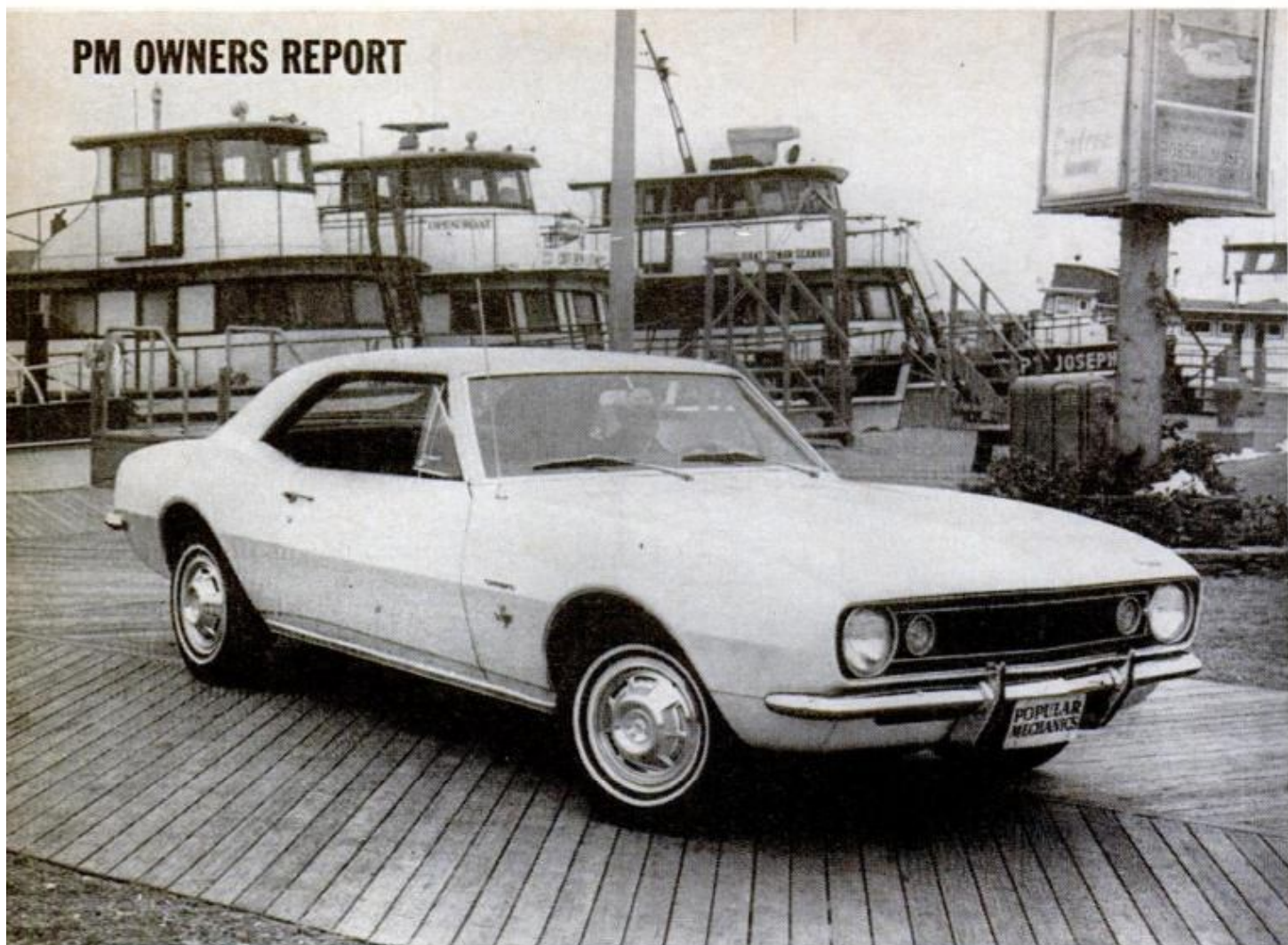
**FUEL SHOULD JET INTO CARBURETOR** when throttle is actuated. If it doesn't, check accelerator pump



**TEST LIGHT SHOULD GLOW** when connected from distributor primary terminal to ground with ignition on



## PM OWNERS REPORT



# CHEVROLET CAMARO

Computer analysis played a key role in designing Chevy's new sportster, but Camaro owners report just enough went awry to prove these electronic marvels aren't foolproof

By BILL KILPATRICK, Auto Editor

**C**CHEVROLET'S NEW CAMARO, perhaps more than any other of today's cars, is a true product of the computer age."

So says a recent press handout. But if the comments of many Camaro owners responding to *PM's* survey accurately mirror the results of this computerizing, there seems to have been a short circuit in one department.

According to the press release that quotes the Chevy chief engineer for

passenger cars, Donald H. McPherson, computers analyzing the rear suspension for the Camaro indicated that "by moving the shock absorbers outboard of the springs and mounting them nearly vertical, instead of the usual diagonal arrangement, the ability of the wheels to more closely follow and maintain contact with washboard road surfaces and during cornering was much improved."

All very well, and no doubt a daz-



zing example of our highly technological times, yet I should think Mr. McPherson and his colleagues might ponder such all-too-human comments as:

"Rear end hops and winds up like a yo-yo under normal acceleration."—Missouri draftsman.

"Traction from a dead stop is nonexistent."—Iowa grocery manager.

Complaints about the rear-suspension setup lead the list of Camaro-owner dislikes, "earning" a surprisingly high Frequency-of-Mention Rating (FMR) of 31.8 percent. To give you an idea of how many Camaro owners commented on this aspect of the car, the next most disliked feature—lack of rear-seat legroom—garnered an FMR of only 15 percent.

Camaro owners who commented on the car's behavior aft were often vague in expressing just what it is about the rear suspension they don't like, but the overall thought is that it's too light, "flimsy" and "skittish."

Somewhat paradoxically, however, owners placed handling second on

**STINGY TRUNK SPACE** was ranked fourth on dislike list, several owners feeling Chevy had cut it just a bit too fine. Associate auto editor Bill Hartford reported spare tire made space awkward to utilize



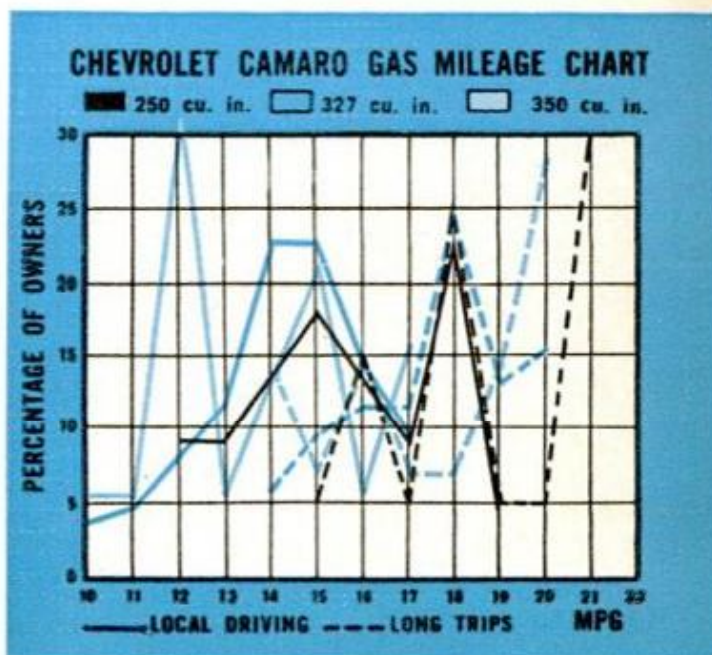
JULY 1967



**COMFORT**, particularly on long trips, was rated high by Camaro owners, many reporting the bucket seats as being the most comfortable they had ever sat in. A few didn't like the pushbutton seat feature



**INBOARD TURN** of rear fenders was deplored by many owners, saying it was a dirt and mud catcher that made it hard to keep the car clean. A few reported chipped finish as a result of wheel-thrown gravel



123



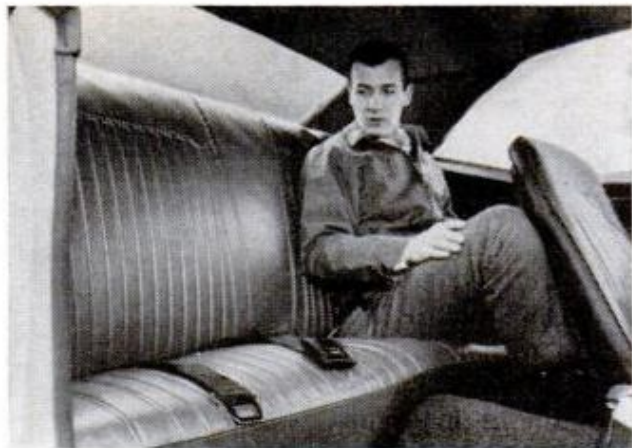
their list of Camaro praises, affording it an FMR of 62.9 percent. The conclusion would seem to be that suspension—like beauty—is in the eye of the beholder.

What owners surveyed by *PM* were lavish with was praise for the Camaro's looks and overall styling, heaping on the car's sporty appearance an FMR of 65.3 percent. Yet even here there was a pointed negative note: Many owners (an FMR of 14 percent) were quite outspoken in their disapproval of the rather severe inboard curvature of the rear fenders, claiming it resulted in a constant spray of mud and road dirt being thrown up by the tires.

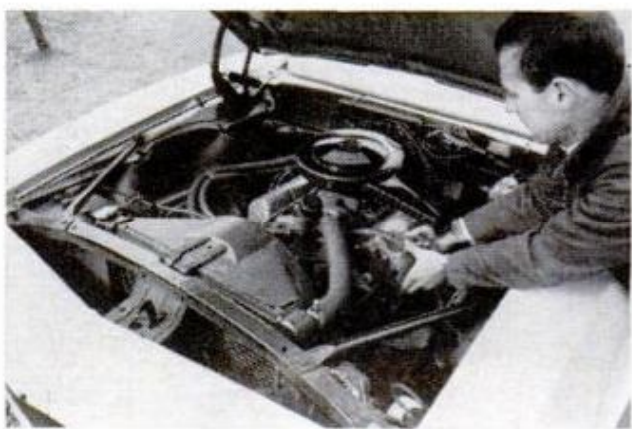
Another styling regret expressed by several Camaro owners is that Pontiac's Firebird had stolen their thunder; they had hoped the styling would remain strictly Chevy and Camaro.

A summary of the likes, dislikes and general driving and ownership experiences of Camaro owners surveyed by *PM* appears below. The percentages listed reflect the frequency with which owners mentioned specific items. The summary is based on 640,163 miles of

*(Please turn to page 174)*



**CRAMPED REAR-SEAT LEGROOM** "earned" many owner brickbats, was ranked second on dislike list. Yet Camaro was not designed to be a true four-passenger car. At best, seat is only short-hop convenience



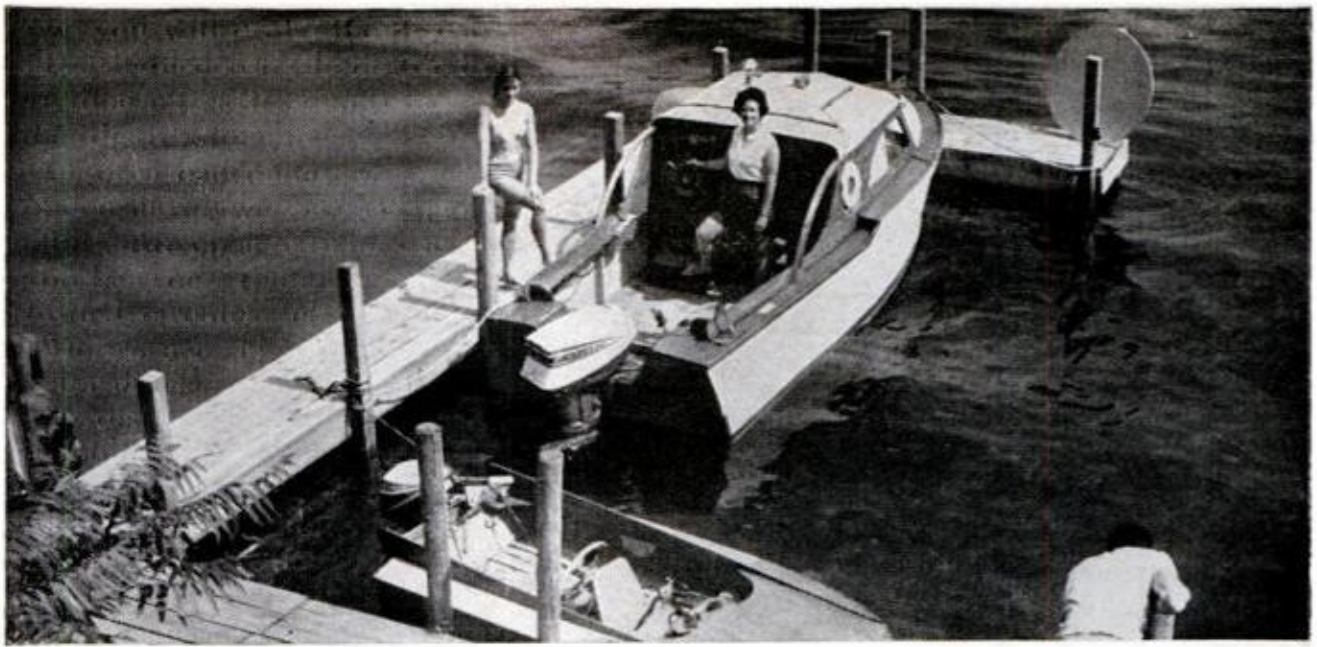
**327-CU.-IN. ENGINE** with 2-bbl. carburetor was most popular with Camaro owners responding to *PM* survey. Reports of engine trouble were few and most owners thought engine cranked out plenty of power

## Summary of Camaro Owners Reports\*

<b>Total miles driven</b> ..... 640,163	No ..... 39.7	<b>Camaro your only car?</b>
<b>Average mpg:</b>	<b>What kind of trouble?</b>	Yes ..... 42.6%
250-cu.-in. engine ..... 17.5	Headlight mechanism ..... 32.9%	No (own two) ..... 40.3
327-cu.-in. engine ..... 16.0	Transmission ..... 16.5	No (own three or more) ..... 17.1
350-cu.-in. engine ..... 16.0	Brakes ..... 10.1	<b>Other cars owned:</b>
<b>Specific likes:</b>	Carburetor ..... 7.6	Chevrolet ..... 45.9%
Styling ..... 65.3%	Clutch ..... 6.3	Oldsmobile ..... 12.2
Handling ..... 62.9	Speedometer cable ..... 6.3	Ford ..... 8.1
Power/Pickup ..... 29.8	<b>Dealer service satisfactory?</b>	Buick ..... 8.1
Performance overall ..... 21.8	Yes ..... 52.6%	Pontiac ..... 6.8
Economy ..... 16.1	No ..... 38.2	Cadillac ..... 6.8
Ride ..... 12.1	"Partly" ..... 3.9	Volkswagen ..... 6.8
Size ..... 10.5	"Not back yet" ..... 5.3	Chevy pickup ..... 6.8
Comfort ..... 10.5	<b>Why the Camaro?</b>	Corvair ..... 4.1
"Roadability" ..... 9.7	Style ..... 70.5%	Chrysler ..... 4.1
Interior styling ..... 8.1	Size ..... 21.7	Ford pickup ..... 4.1
<b>Specific dislikes:</b>	"Different" ..... 10.9	<b>Age distribution of owners:</b>
Rear suspension ..... 31.8%	Handling ..... 10.9	Under 20 ..... 12.2%
Rear-seat legroom ..... 15.0	Past Chevy experience ..... 9.3	20-24 ..... 25.2
Rear fender design ..... 14.0	Price ..... 7.8	25-29 ..... 18.3
Trunk too small ..... 11.2	GM reputation ..... 7.0	30-34 ..... 6.9
Rattles ..... 9.3	Economy ..... 6.2	35-39 ..... 8.4
Poor economy ..... 9.3	<b>Power options:</b>	40-44 ..... 6.9
Poor workmanship ..... 6.5	"None" ..... 50.5%	45-49 ..... 7.6
Poor rear visibility ..... 6.5	Steering ..... 46.4	50-54 ..... 8.4
Wind noise ..... 5.6	Brakes ..... 14.4	55-59 ..... 3.8
Headlights "stick" ..... 5.6	Seats ..... 3.1	60-64 ..... 1.5
<b>Mechanical troubles?</b>	Windows ..... 1.0	65 and over ..... 0.8
Yes ..... 60.3%		

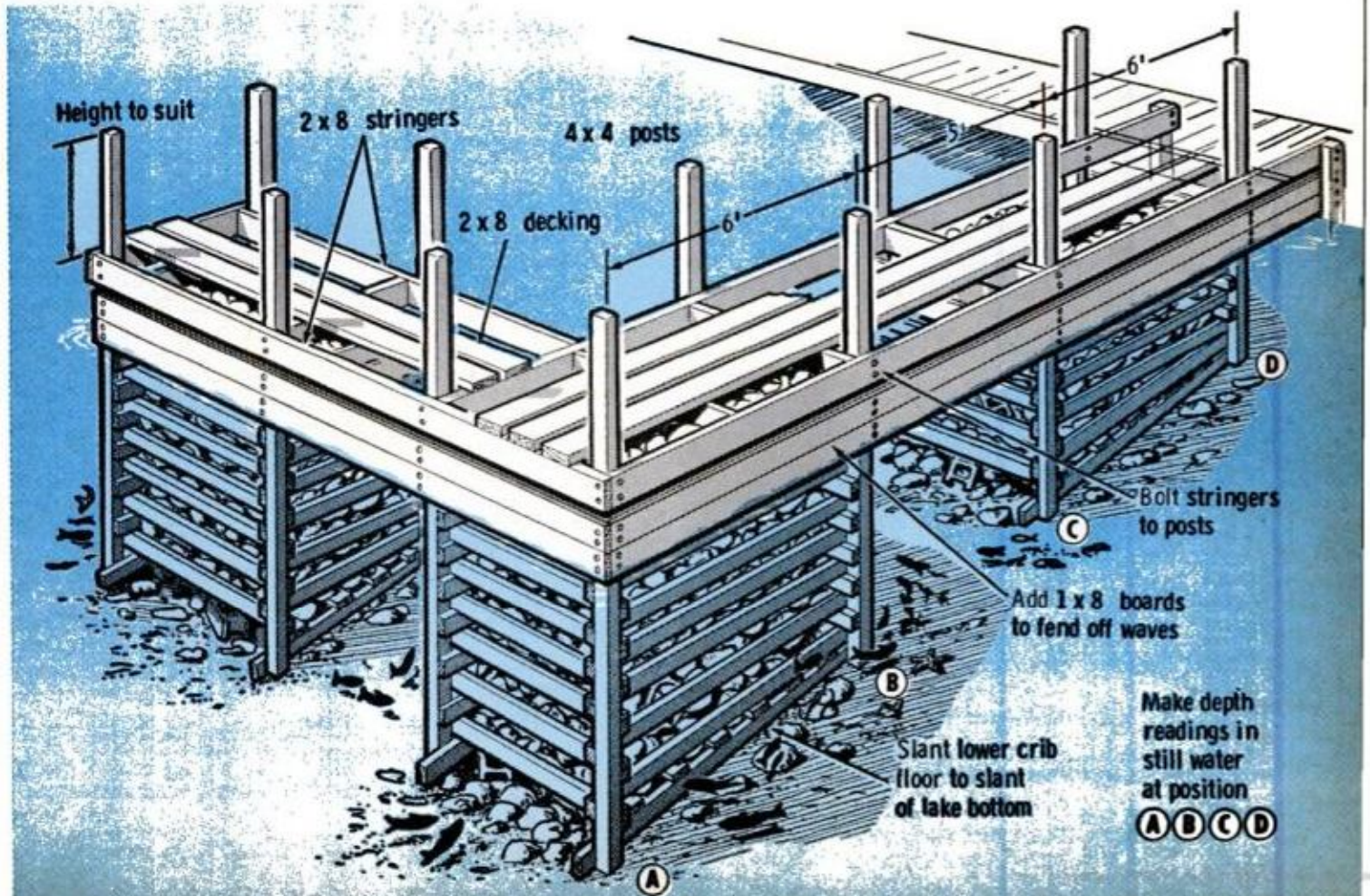
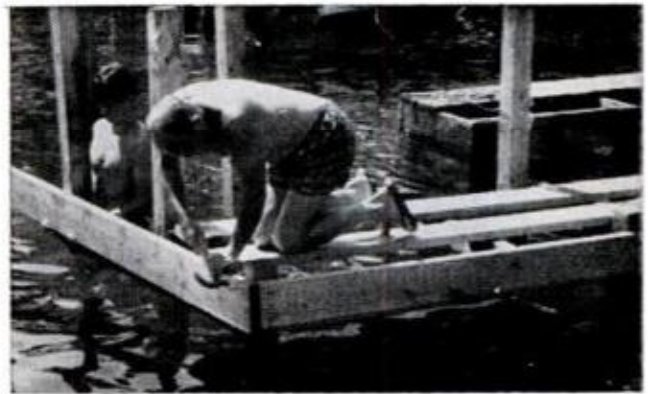
\*Where applicable, percentages may not equal 100 percent due to rounding and/or insufficient sample.



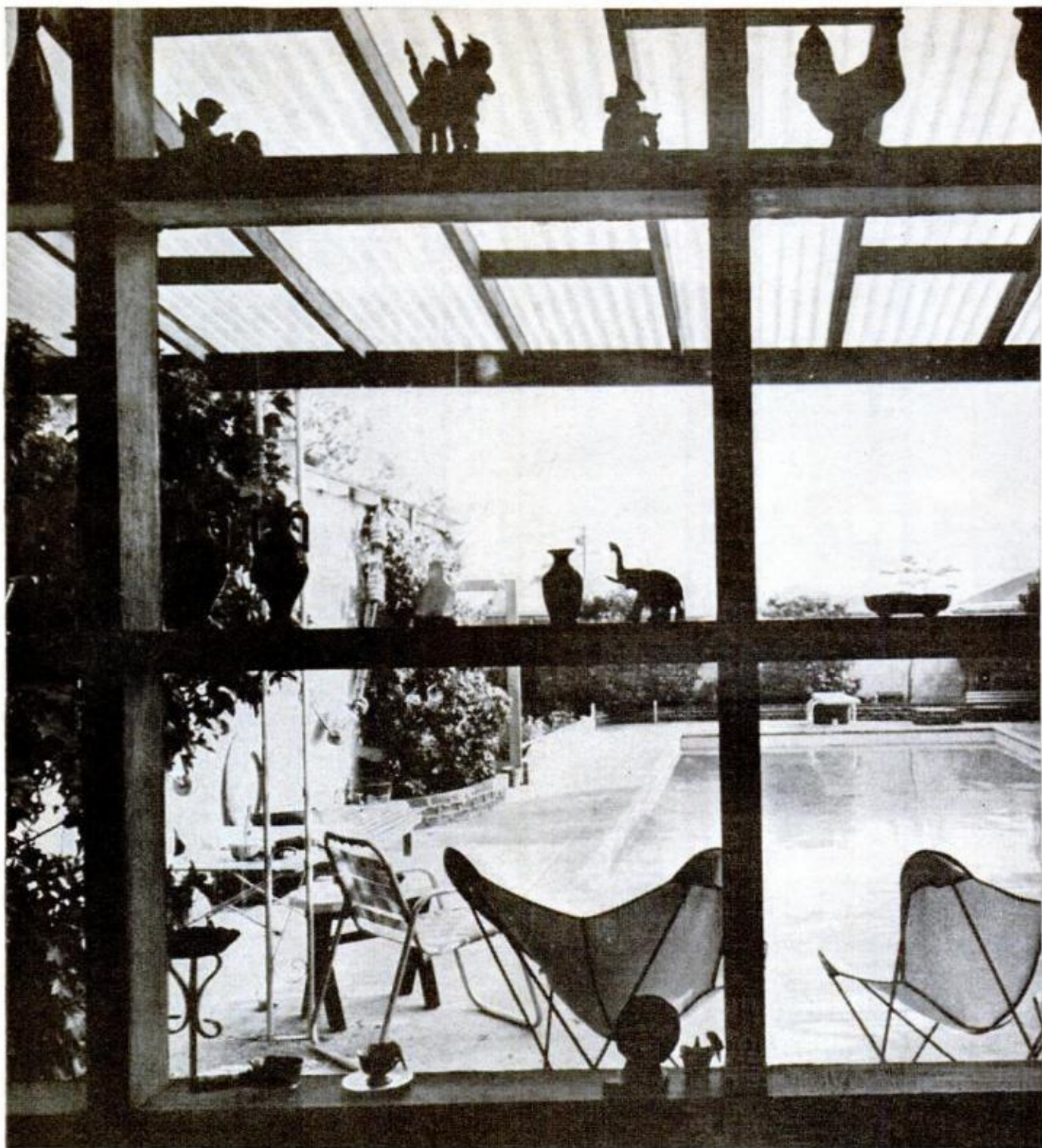


## Two-Ton Pier Is Solid as a Rock

WHEN LOCATED according to prevailing winds on your lake, this L-shaped crib pier not only offers plenty of docking space but provides protection for your boat. Each crib is built to fit the contour of the bottom and is anchored firmly in position by filling with stones, rocks or bulky pieces of masonry. When filling the cribs, place large rocks on the outside and smaller ones in the center where they won't fall out.—*Hank Clark*







*Technical Art by Donald Evans*

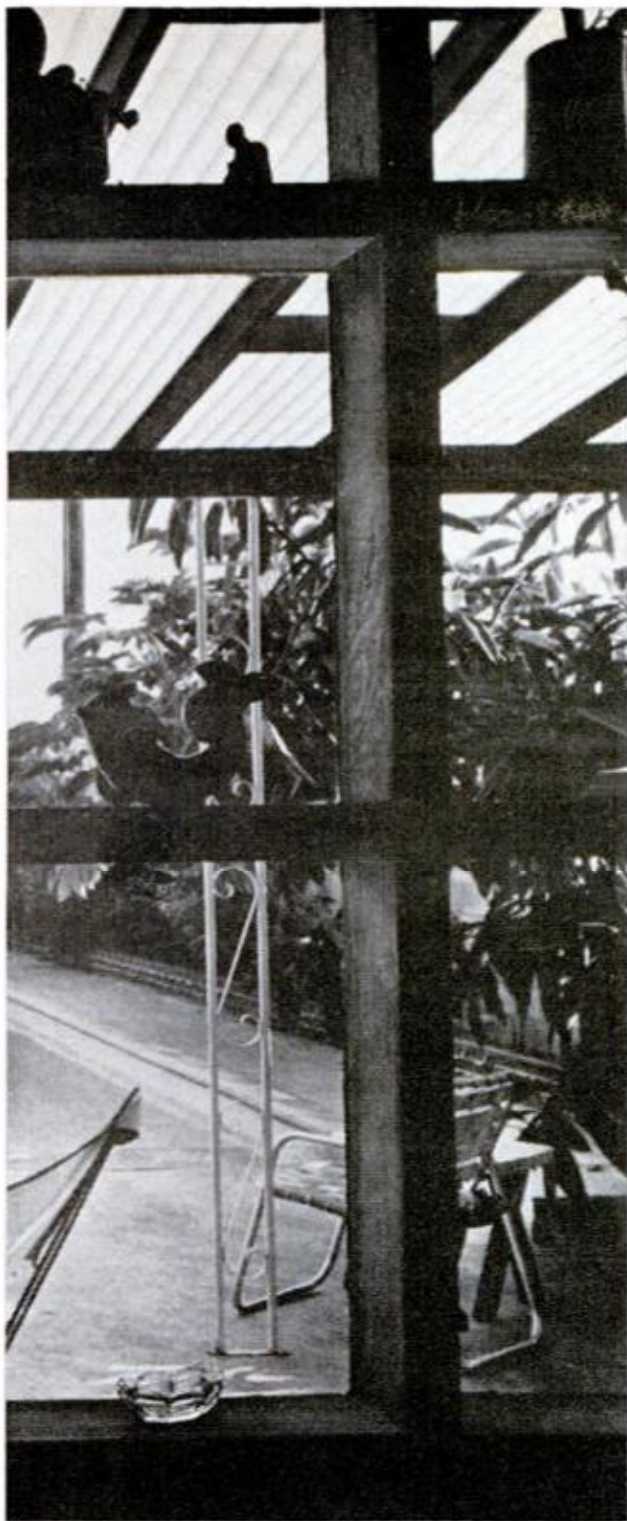
# COOL OFF WITH A COVERED PATIO

**A**DDING A ROOF to your patio needn't mean shutting out the sun entirely. Translucent fiberglass panels, available in a number of colors, will allow softened rays of the sun to filter through on bright days, resulting in cool, tinted shade.

These corrugated panels are quite easy to install, but there are a few special tips to keep in mind when planning your patio roof. To provide the desired coolness and control condensation, you should pay special attention to ventilation. Allowing for

POPULAR MECHANICS





**TRANSLUCENT ROOF**, left, makes use of Filon fiberglass panels over an egg-crate framework. The front header is supported by decorative metal posts, above



**ORNAMENTAL POSTS** have mounting flanges on both ends, are secured to concrete by driving tampons into predrilled holes. Use star drill or masonry bit for this

maximum air circulation and escape, as shown on page 129, will prevent "heat traps" which could make the patio uncomfortably stuffy on hot days.

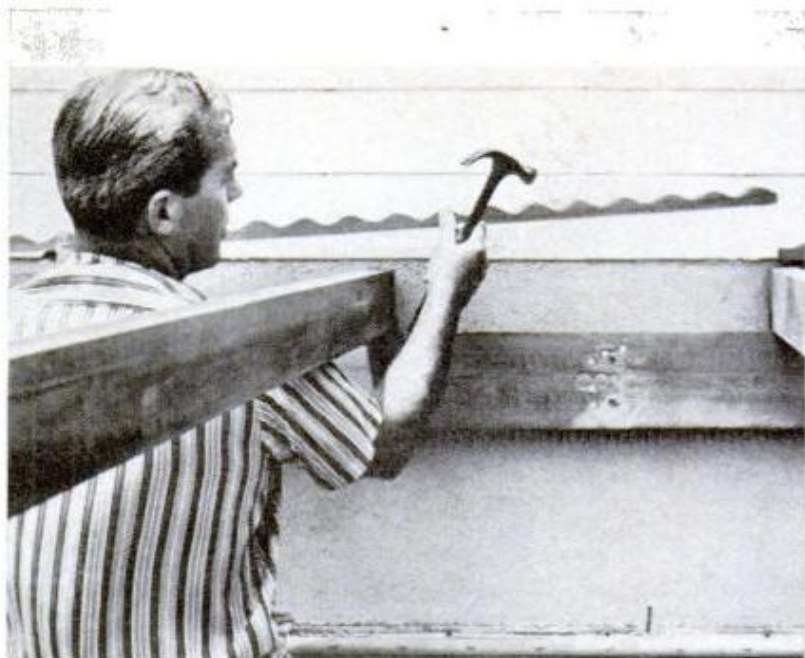
The roof should be set as high as possible—standard practice with all materials in this type of application. Also, plan your framing to take stock-size panels and you'll avoid having to cut to size. If necessary, the panels can easily be cut with a hand-saw (fine tooth, no set) or a power saw, using an abrasive blade. Mark cuts with a grease pencil.

The first step in the actual construction

is to install the supporting posts for the front header. To allow for adequate overhang, these should be set back about a foot from the front edge of the patio. If you are using ornamental metal posts, secure them to the cement with lead shields or tampons, drilling the necessary holes with a star drill or masonry bit.

If you choose wood, 4x4 posts can be installed by drilling a  $\frac{3}{8}$ -in. hole in the concrete or flagstone to a depth of  $2\frac{1}{2}$  in., then inserting a  $\frac{3}{8}$ x5-in. metal rod in it and drilling a corresponding hole in the bottom of the post. A patio surfaced with brick,





**INSTALL BACK HEADER** on the side of the house with lagscrews at every other stud. This 2x6 should be mounted as high as possible, allowing for a minimum of 1 in. drop for every foot between the wall and the front header. (In areas of heavy snow, this should be increased to 3 in.) Header runs full width of roof



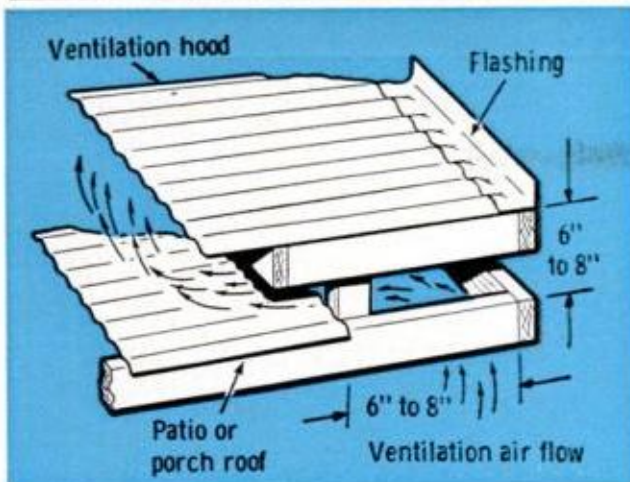
**CROSS BRACING** may be parallel or egg-crate pattern. For the former, install by toenailing or using framing anchors. With an egg-crate design, it's possible to nail directly through rafters into end grain of brace



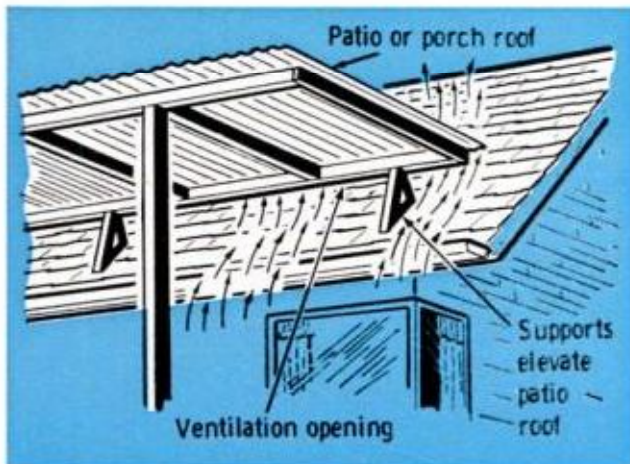
**PREDRILL NAIL HOLES**, locating them only at crowns of corrugations. Space 12 in. apart on rafters and every third corrugation along headers and braces. In windy areas, use 6-in. spacing and nail every other corrugation



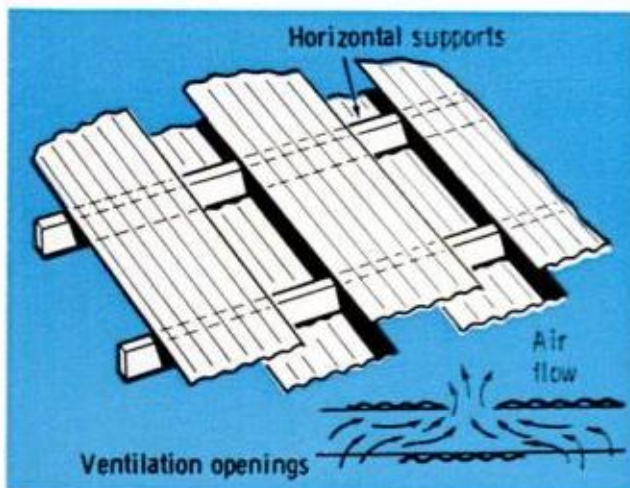
## VENTILATION DETAILS



**TO GAIN OVERHANG** where your house doesn't provide enough to cover the ventilation space, simply make a small-scale version of the main patio roof and use special corrugated flashing where it joins the wall. Frame this strip of miniroof with 2x4 rafters and 1x2 cross braces. To provide adequate protection, it should project a minimum of 12 in. and have a pitch matching that of the main patio roof



**TO GAIN HEIGHT** where it's impossible to drop the patio roof below the eave line of the existing roof, elevate the framing above the roof. This will permit warm air to escape between two roof surfaces



**ANOTHER METHOD** of ventilating the roof is to nail alternate panels to the underside of the frame, overlapping by about 4 in. to prevent rain from falling through. However, it's not quite as strong

gravel or other loose materials will require concrete footings for the posts. Make these about 8x14x14 in., and embed the rod in the wet cement.

An alternate method of securing the posts to concrete involves the use of 8-in. angle-iron brackets, either bolted to the existing floor or embedded in footings.

A 4x4 may be used for the front header if the span between posts is 10 ft. or less. The span can be increased to 14 ft. if you use a 4x6. Use flanges to fasten the header to metal posts, framing anchors with wood posts. For best ventilation, this header should be as high as possible, while still allowing for recommended pitch. If possible, the bottom surface should be at least 7½ ft. from the patio surface.

The 2x6 back header should be fastened to the wall of the house as high as possible, allowing a minimum of 1 in. pitch (3 in. in heavy snow areas) for every foot between back wall and front header. Anchor it to alternate studs with ½x 5-in. lag screws. With brick or stone walls, use 5-in. expansion bolts.

Rafter size depends on span. Use 2x4s for spans to 8 ft., 2x6s to 14 ft. and 2x8s to 20 ft. Cut them long to allow for overhang. They can be attached to the headers by toenailing, using framing anchors or notching over the headers. Rafters should be spaced to accommodate standard panel widths, allowing for an overlap of one corrugation at joints and two along the sides of the roof.

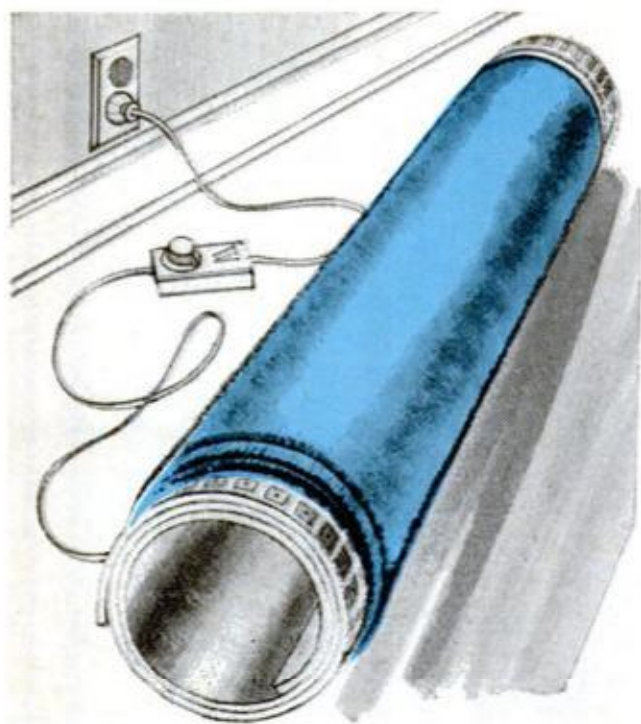
Cross braces can be either 2x4s or the same size as the rafters. Set the first line 4 to 6 in. from the back wall to provide a ventilation opening, then proceed with an egg-crate or parallel pattern, spacing them from 2½ to 4 ft. apart, depending on panel thickness. If you're using the optional corrugated wood support moldings, install these on braces and front header, and nail vertical wood molding on rafters. Then paint or stain the framework before installing the fiberglass panels.

Start applying the panels on a side that will allow prevailing winds to pass over the joint. If more than one course of panels is required, begin at a front corner and lap the ends 4 to 6 in. over the cross braces. Sandwich in a strip or two of nondrying mastic to waterproof all joints. Pre-drill all nail holes and use aluminum nails with Neoprene washers spaced 12 in. apart (6 in. in windy areas) to secure panels to the rafters.

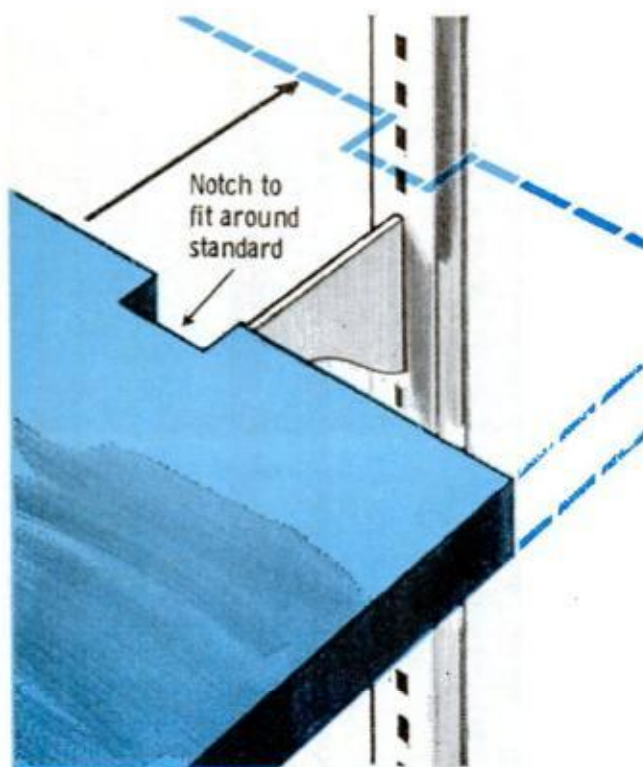
★★★



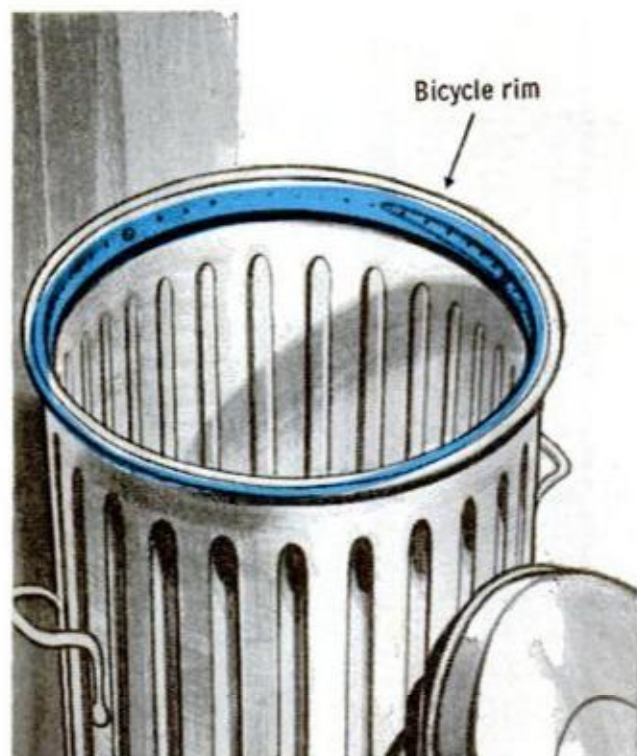
# Solving home problems



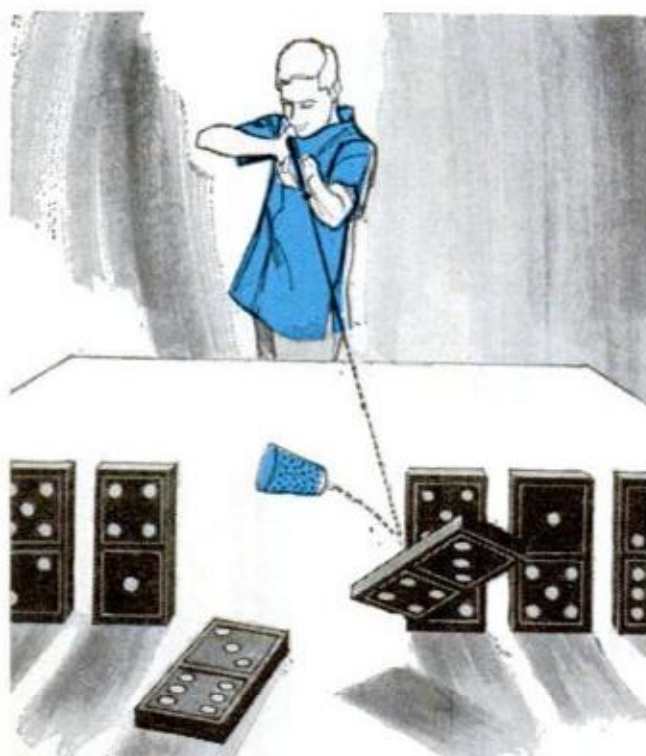
**USING AN ELECTRIC BLANKET** to warm a roll of linoleum so it can be unrolled without cracking not only does it in a hurry, but also softens the linoleum to the point where it will lie nice and flat



**BOARD SHELVES** supported by metal brackets can be made to hug the wall if they are notched to fit around the standards. Besides eliminating the gap, notches keep the shelves from shifting sideways

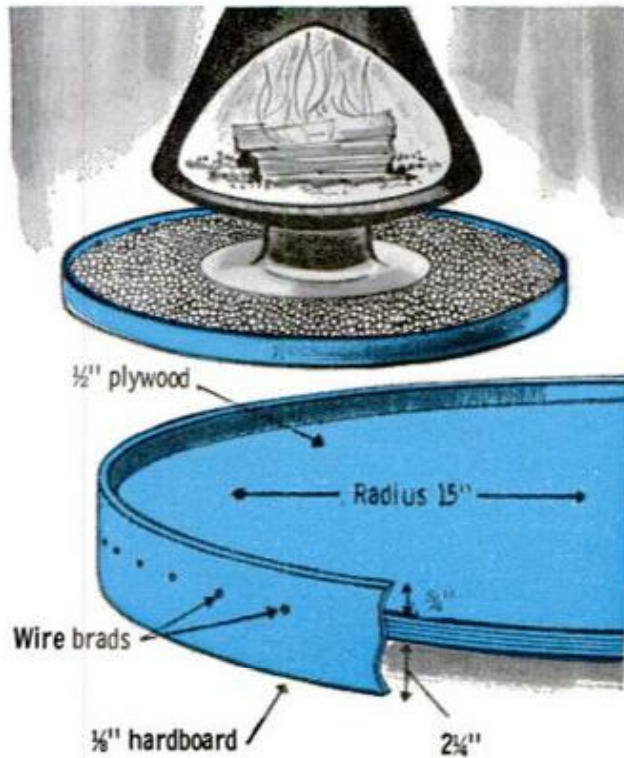


**YOUR LARGE GARBAGE CAN** will withstand the rough handling it gets if you force the rim of a stripped bicycle wheel inside the can's top and fasten with bolts. It retains shape so cover always fits



**DOMINOES MAKE FINE TARGETS** for rainy-day corkgun shooting when they are lined up with their backs to the marksman. Dominoes must fall face up to score and total number of dots wins contest

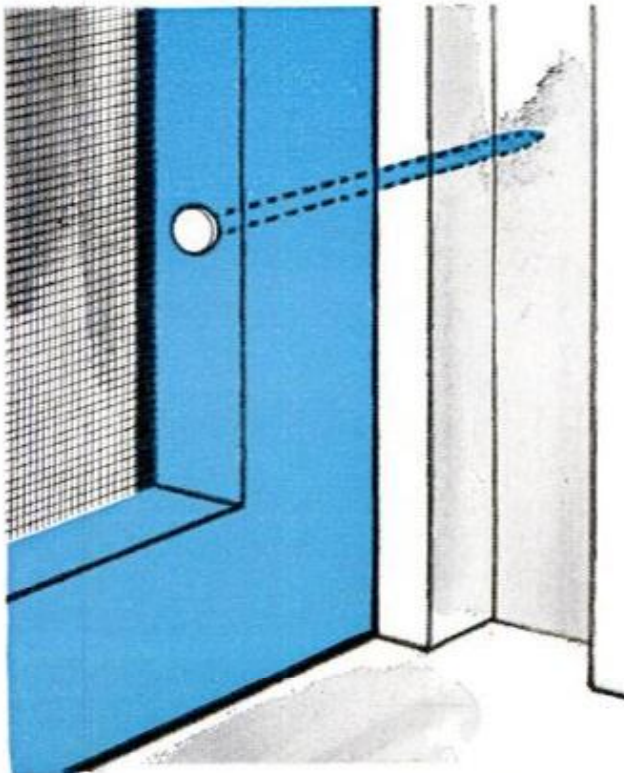




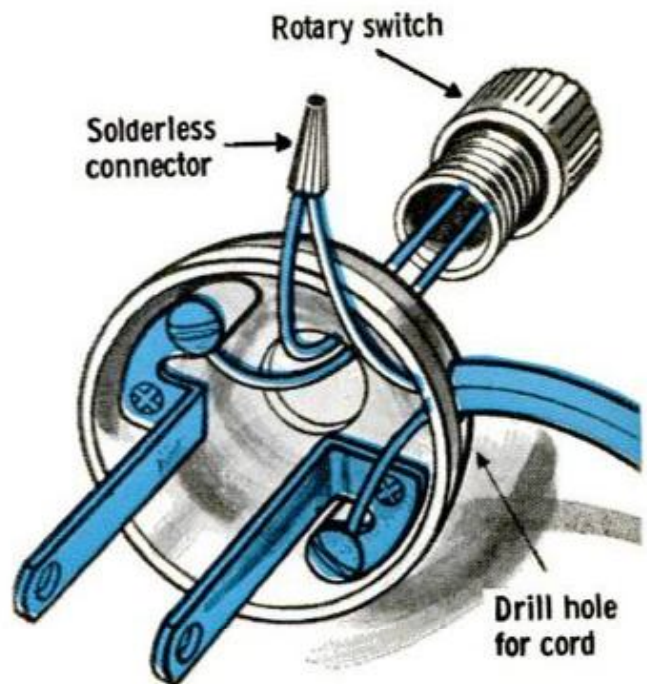
**ELEGANT BASE** for free-standing fireplace is made by nailing hardboard band around edge of plywood disc, placing a 2-in. chunk of insulation board under center and filling with layer of white stones



**NEAT PLACE-CARD HOLDERS** for a birthday party or other get-together can be quickly fashioned from common wire paper clips. Bend each clip as shown to form leg and slip card between



**LOOSE-FITTING NAILS** through each side of wooden screen will safeguard youngster against tumbling out window if he unlocks regular catch. Drill deep hole into window frame slightly larger than nail



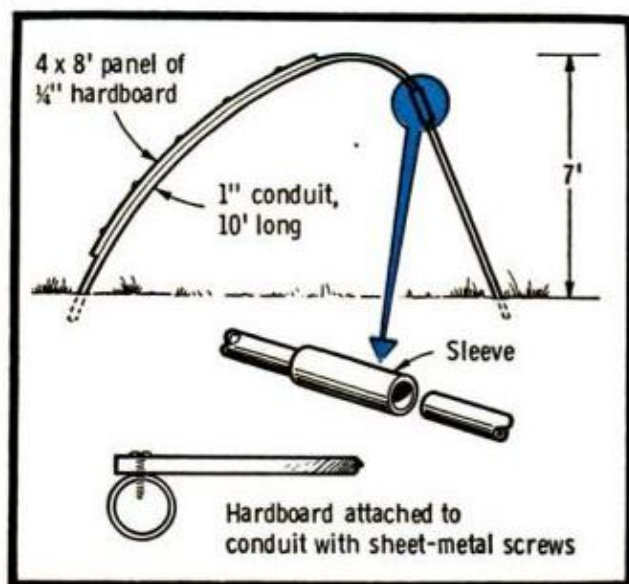
**HANDY SWITCH** for turning off a tool right at the outlet can be installed in any plug. Cement a rotary switch in the original cord hole; then drill a new hole in the side of plug and wire as shown



# Weekend Projects for your patio and lawn



Illustrations by Donald Evans and ZIK Associates



## One man's sunshade

Easily erected in a single morning, this sunshade will pamper the recluse in any man, allowing him to spend summer afternoons reading, musing or just snoozing away from boisterous kids and blistering sun. Fabrication of the shade should present no problem as the only material requiring extra care is the conduit—both curved sections should be uniformly contoured. Fasten the 1/4-in. Masonite panel with sheet-metal screws before forcing the rear legs into the ground. Then slip the rubber sleeves over the ends and insert the front legs. The whole thing can be dismantled quickly at summer's end.

## Vinyl-coated stones accent, even replace, lawns

Regardless of how often you weed, water and mow your lawn, you're probably still plagued with two or three problem areas—most likely those nearest walks or under bushes. With Leisure Lawns, a crushed stone material that is double-coated with vinyl, you can now bare an unsightly area and apply stones of a grasslike green, or you can pour stones of a color to accentuate that of your home. Processed by Valspar Corp. for Colored Lawn Stone, Inc., Phoenix, the stones can be had in twelve colors for \$2.95 per 50-lb. bag. Each bag will cover 5½ sq. ft. at a recommended depth of 1¼-in. Referring to the three photos at the direct right:

**A**—Remove 1½-in. of topsoil and apply a weed and grass killer. Tamp the surface smooth and lay a germination-preventing sheet of polyethylene over the entire area.  
**B**—At the base of trees and bushes, cut a circular area twice the trunk diameter. Perforate the sheet where it covers roots and pour the stones at one end of the area.  
**C**—Rake the stones toward the other end to force trapped air from under the plastic sheet. Then pour more stones and rake until the desired depth is reached.

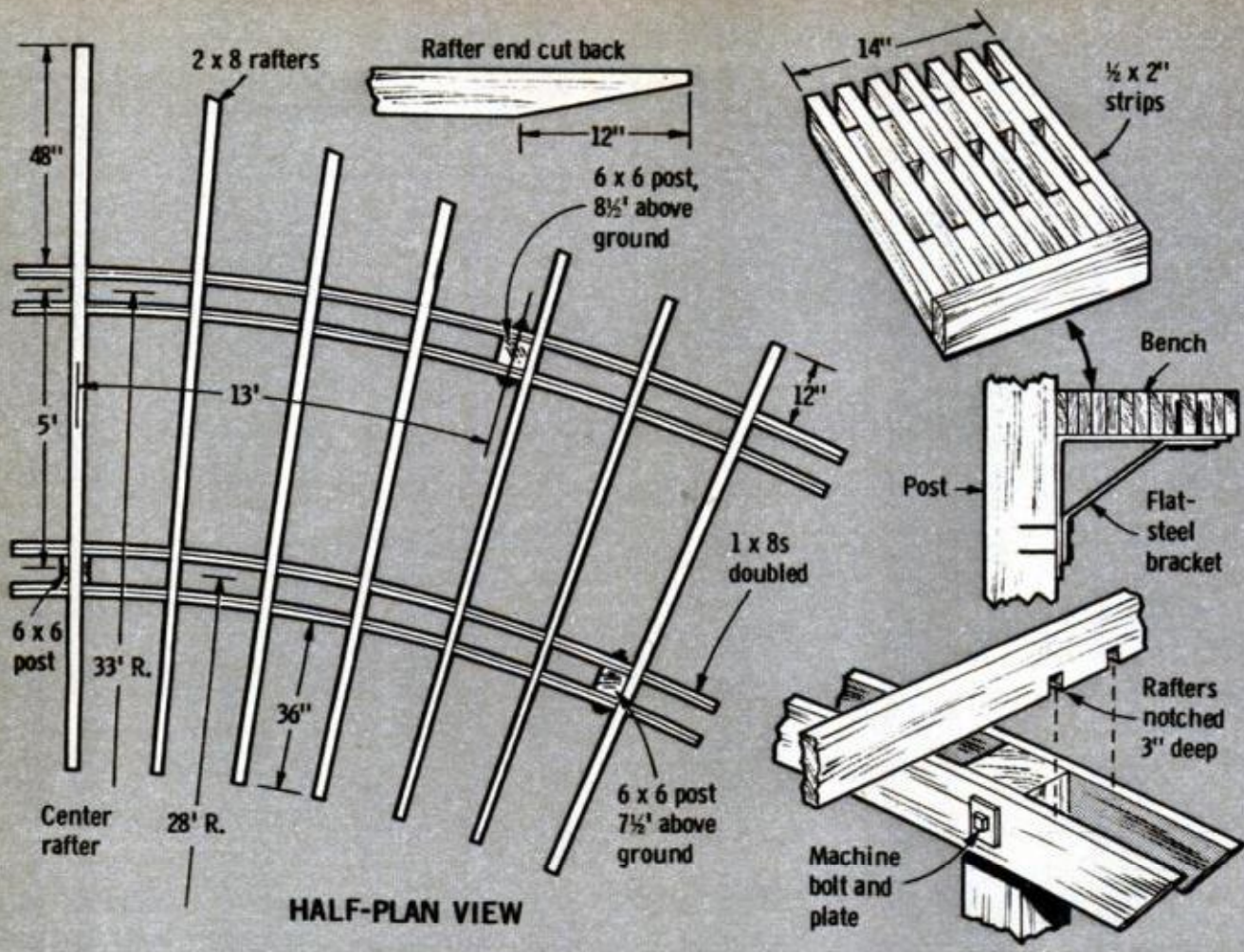




*(For construction details, please turn page)*



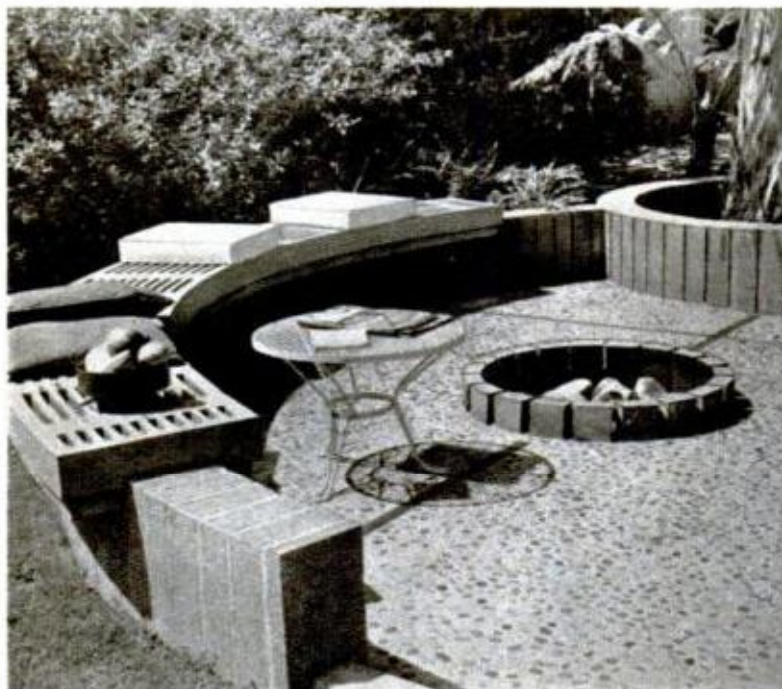




### High-style pergola for shady afternoons

Otherwise defined as a structure usually consisting of parallel colonnades supporting an open roof of girders and cross rafters, a pergola might be known more commonly as an arbor or trellis.

The only items requiring special attention are the posts, for each must face the center of the circle in order that they fall flat against the laminated 1x8s. Also, post anchors should be used to hold the post butts above their concrete footings. Designed by landscape architect Chandler Fairbank, A.S.L.A., of Portland, Ore., the pergola pictured on page 133 is made of Douglas fir and western red cedar.



### Barbecue center

A sure-fire bet to become a top attraction, a successful barbecue center like this must provide comfortable seating for half a dozen people and a pit large enough for a dozen shish kebab skewers. The clean and uncluttered design of this center is due in part to the use of only two primary materials—wood and concrete blocks. The seat is similar to that shown above, while the blocks are all standard 4x8x16-in. Note that the blocks for the pit extend above ground for nearly half their height, while inside the pit, the full height of the blocks acts as a firewall.

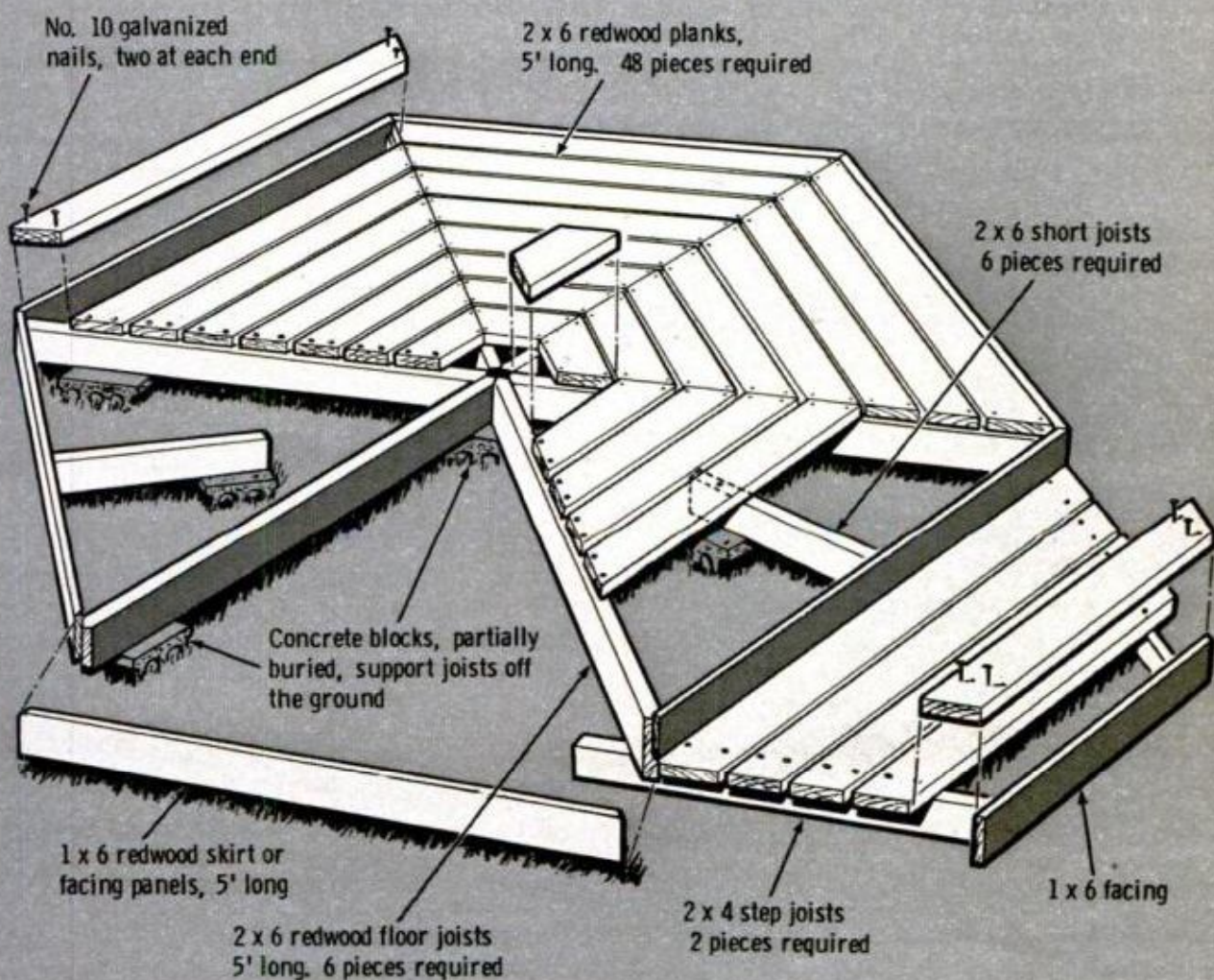


## Redwood deck

When staging an informal get-together, you'll draw compliments galore from admirers of this handsome setting—especially after you tell them you built it yourself. Made of durable California redwood, the deck was designed by William Kapranos, A.S.L.A., for the Simpson Timber Co.

First lay the foundation—easier than it seems, for neither blocks nor joists are attached to each other or to the ground. Just set them in place and align.

Carefully lay floor planks over joists and mark each cutline accordingly. Make each cut at a 60° angle, and nail planks and facing in place. Finally, while a finish isn't really needed, a varnished deck will be easier to keep clean. ★★★





# 3 HIGH SPOTS FOR

Adaptable to many family fun activities, these multipurpose units are designed to pack a lot of work and storage space in a small area. You can build them all or any one independently to suit your own needs

By **BOB JOSELYN**

Technical art by *ZIK Associates, Ltd.*

**A** GOOD HOBBY ROOM needs work and storage space that's flexible to accommodate many different family interests and activities, usually in a small space. The three units shown here are just about as versatile and compact as you can get. Each does double, triple or quadruple duty so it earns its keep in a variety of ways.

There's a multipurpose worktop that's a bench for hobby projects, a family game table, a large desk for homework or other

chores and a dining table for informal entertaining. Hidden under the table are motorized dispensers for wax paper and foil used in craftwork, slide-out racks for drying small glued or painted articles and retractable wastebaskets for quick cleanup.

A shelf-and-drawer wall unit provides storage for hobby supplies and display space for finished projects. Its plastic-topped counter serves as a work area or a snack bar. A clever method of mounting

## 1. Three-way workbench, desk and dining table

**THIS MULTIPURPOSE WORKTOP** is big enough to let youngsters finger-paint while mom cuts out designs on a jigsaw. Disappearing wastebasket and dispensers for foil and wax paper can be seen along front edge





# A HOBBY ROOM



## 2. Storage wall with shelves, drawers and a counter

**HOBBY SUPPLIES** are within easy reach in the combination shelf-and-drawer unit above. The counter, topped with plastic laminate, holds power tools and a portable TV, can also be used to serve party snacks

sliding trays between the shelves eliminates complicated drawer and cabinet construction. The third unit, a comfortable sofa, converts to a bed when you remove the bolsters at the back. Under the seat cushion there's a roomy cedar chest for storing clothes, blankets and sports gear.

Together, the three pieces satisfy most of the basic needs of a hobby room. Each, however, is designed as a separate unit and can be built independently. All three are freestanding—even the wall unit—so you can shift them around easily or take them with you if you move.

### Making the hobby table

An inexpensive, hollow-core flush door sitting on two fiber drums forms the basis



**SIMPLIFIED DRAWER CONSTRUCTION** saves a lot of work and time. The drawers—actually flat trays with dummy fronts—slide in metal tracks. Vertical spacers are fitted between the shelves to enclose the sides of the trays and support the metal tracks

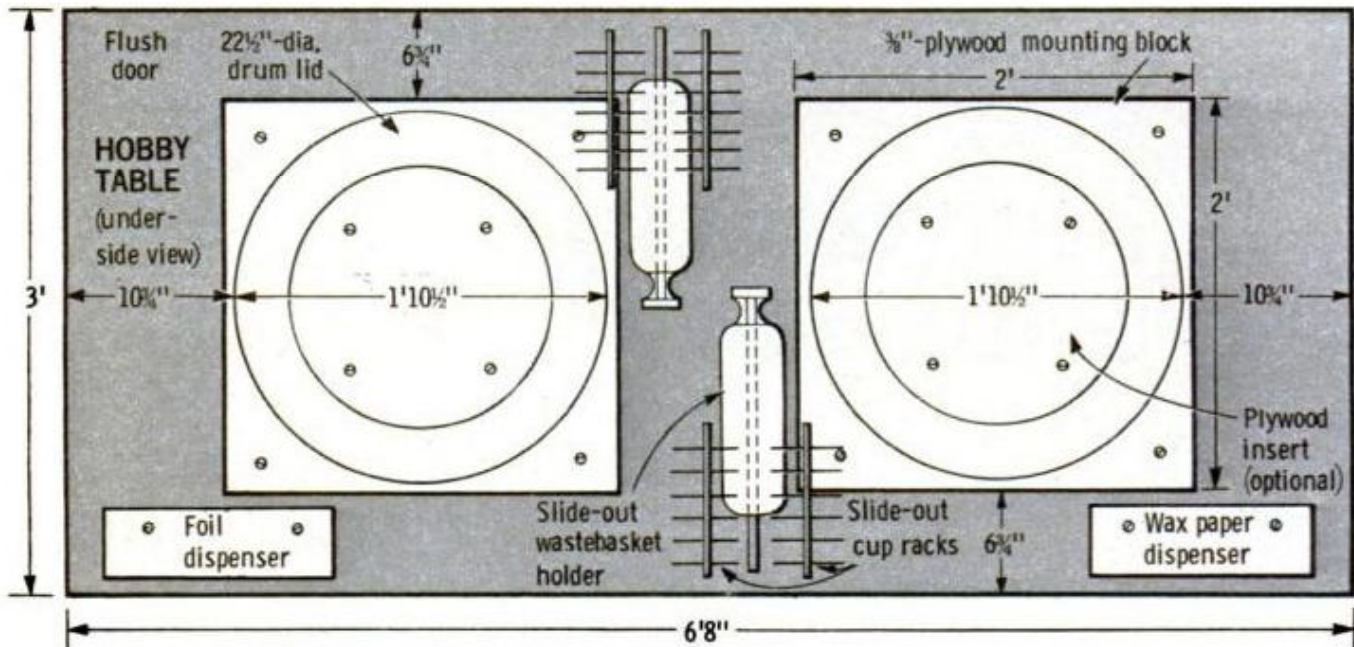




FIBER DRUMS form king-size "legs" for the hobby table. The metal lids are first bolted to plywood squares, then the squares are screwed to the underside of the top, as at left above. Plywood discs,



shown bolted to the lids in the drawing, are not a must, but help to add strength and form grooves to engage the tops of the drums. Drums are covered with decorative self-adhering wood-grained plastic



**CUT FOLD TAPE**

**HOBBY ROOM**

of this all-around work table. Not only do the drums make attractive supports, but they also serve as large storage bins for seasonal items that aren't needed frequently. The drums used here are 22½ in. in diameter and 27 in. tall. Such drums are available from moving companies and sometimes as discards from laundries and bakeries. They can also be obtained by checking the classified pages of your telephone directory for drum and barrel makers.

The metal lids of the drums are bolted to squares of plywood, which are in turn screwed to the underside of the door. This makes a better mounting than at-

tempting to fasten the lids directly to the hollow door. Cementing a sheet of ¼-in. hardboard to the door first will also give you a much better surface for holding screws.

The slide-out cup racks, wastebasket holders, and foil and wax-paper dispensers are standard items available at hardware and variety stores. The racks are positioned so that small articles can be suspended over the pulled-out wastebaskets in order to catch any drips of paint or glue.

When the door is placed over the drums, metal straps lock the lids to the rims, and the assembly becomes a rigid unit. The edges of the door are finished with wood tape glued on, and the top is covered with a plastic laminate that will



insure that you have an easy-to-clean, marproof surface.

### The storage wall

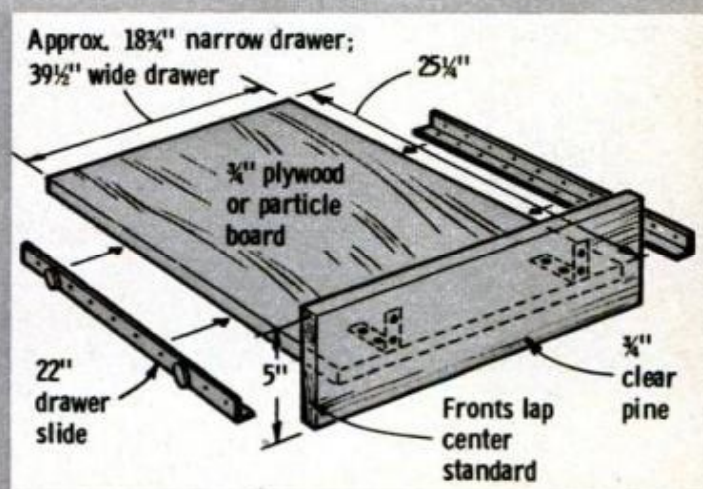
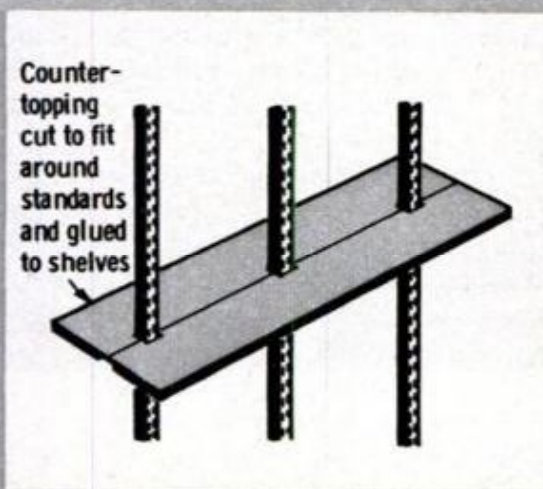
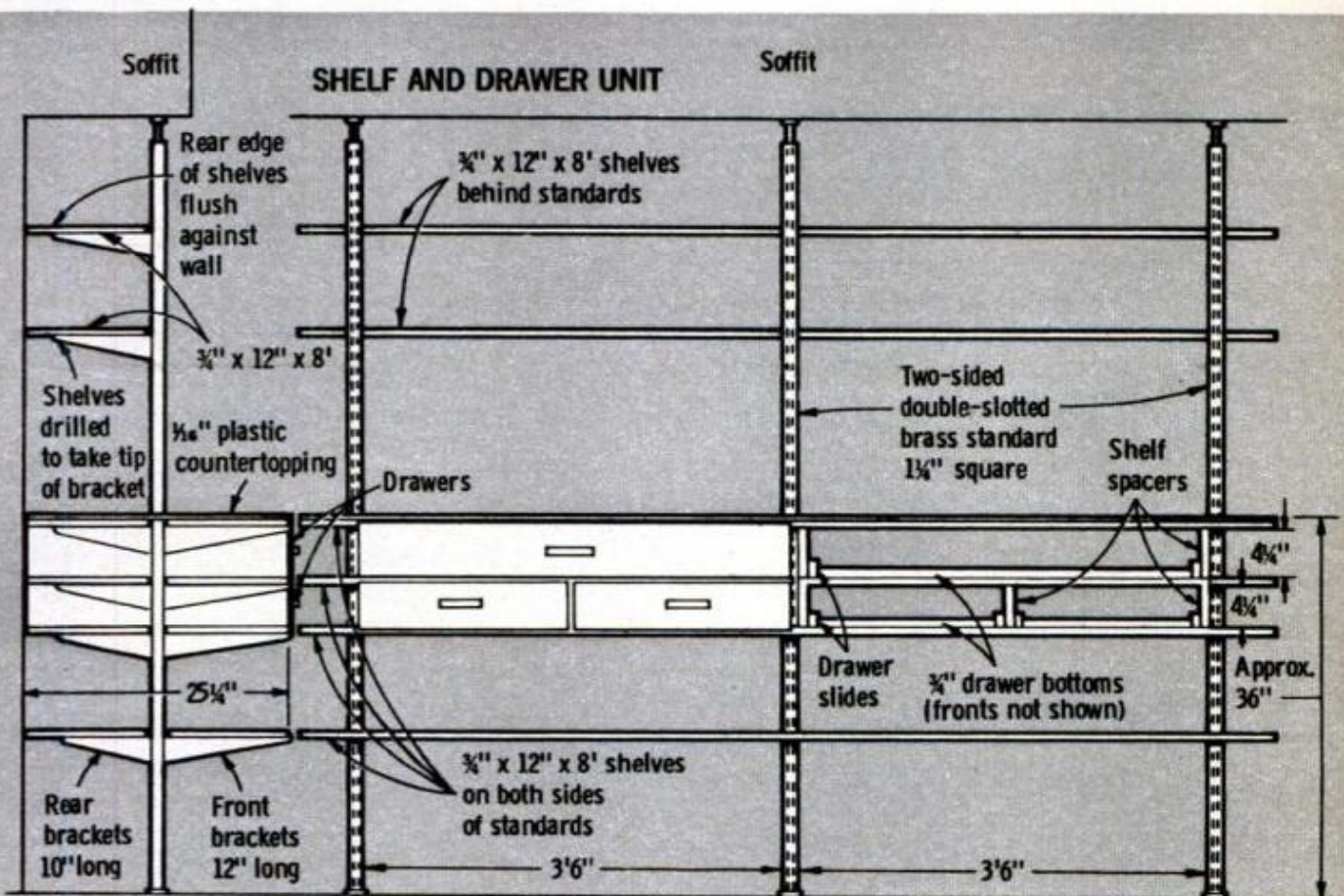
The shelf-and-drawer unit has the look of a built-in, but is actually supported solely on three portable shelf standards. These are braced firmly between the floor and ceiling by springs and have slots on two sides so that shelf brackets can be attached at both the front and back.

The upper part of the unit has shelves only in back, while the lower part has shelves on both sides to provide drawer space and a deep counter area. Note that two sizes of shelf brackets are used. The

front ones are 12 in. long, while the rear ones are only 10 in. long so they don't project beyond the shelves and strike the wall. This allows the back shelves to fit flush against the wall.

The drawers are merely sideless trays running in metal slides. This makes them extremely easy to build since only a front and bottom are needed for each. Spacers between the lower shelves support the tracks in which the trays slide. By filling the trays with rows of cigar boxes, coffee cans or small jars, you have compartmented storage for small parts without a lot of fussy carpentry.

The shelves that form the counter are







### 3. Quick-change sofa, guest bed and handy cedar chest

**REMOVE THE BOLSTERS** from the convertible sofa above and you have a 3-ft.-wide bed to accommodate an overnight guest. Blankets and other bedding can be kept handy right in the roomy cedar chest underneath

topped with plastic laminate like the hobby table. This is cut to fit snugly around the standards and to bridge the crack between the two shelves at the center so that you have a solid, unbroken counter surface. The unit should be completely stable, but if there's any tendency

**LEGLESS END TABLES** are hinged at the back so they can swing up for easy cleaning underneath. In the down position, they rest on angle-iron cleats screwed to the ends of the sofa and adjacent walls



for it to move when you pull on a drawer, it can be securely anchored by fastening the back shelves to the wall with metal angles.

#### Combination sofa-bed

As in the hobby table, a hollow-core flush door is the backbone of the three-way sofa-bed-chest. The door forms the bottom of the bed and the top of the chest underneath it. The chest is framed as shown with 2x4s, then covered with strips of aromatic red cedar. The somewhat unconventional sandwich construction used on the drop-down door enables you to have the handsome look of cedar paneling on inside and outside faces.

The flush door is fastened to the chest with four long bolts down through the top rails. The cushion is a 4-in.-thick slab of foam rubber. As shown here, it is covered with green felt, but any good, heavy upholstery fabric will serve. The wedge-shaped bolsters are also upholstered foam rubber, tapering from 8 in. wide at the bottom to 4 in. wide at the top. If it isn't possible to cut the shape from a single









# Build This

TO CLIMB, PUSH DOWN on the two control surfaces

TO DIVE, PUSH UP on both hinged control surfaces





It's a wild submarine steed that you can make in one evening for about \$5. And you don't need a ski-size motor—it "trolls" with minimum power

By **WALTER MORRIS**

Art by Graphic Presentations

# Underwater Aquaplane

**T**AKING A RIDE on this sleek little underwater sled is a lot like water skiing, but with more thrills. The photos below, taken at Silver Springs, Fla., show how it operates. By moving the control surfaces you can throw it into a sharp bank, do a slow roll or even flip over and run upside down. As for diving gear, you can get by with simply a mask, snorkel and fins.

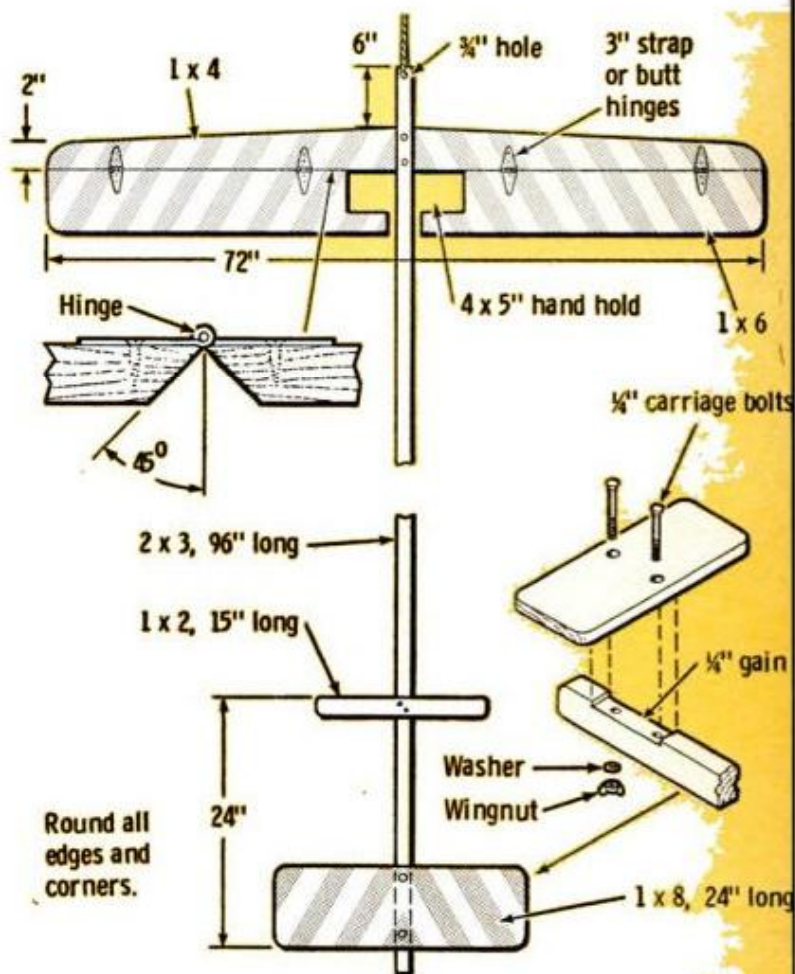
Construction is simplicity itself. Note that the use of wingnuts with carriage bolts makes it possible to take the aquaplane apart for easy carrying.

When "flying" this aquaplane, there are four safety rules to keep in mind: *Towing line*—the longer the better, to keep away from that spinning prop.

*Water depth*—the deeper the better, especially at anything above trolling speed.

*Traffic*—Stay well away from other boats; they can't tell you're towing somebody.

*Speed*—Hold it down; you can have as much fun at trolling speed as you can going fast (maybe more). ★★ ★



**YOU CAN BANK** by pushing one up and one down



**GOOD RUNNING DEPTH** is 2 or 3 ft. below surface





# HOW TO GET MORE OUT OF YOUR OUTBOARD



by Henry B. Notrom

**Wringing the best possible performance out of your motor needn't mean exotic modifications or high-priced extras. Here's the way it's done**

**I**F YOU HAD a racing mechanic to tune your outboard, how fast could it go? True, there's a theoretical limit imposed by motor, hull shape and propeller, but there are still quite a few things you can do to squeeze a little more speed out of your boat without spending a great deal of money. Getting more speed doesn't mean hopping up the motor with complicated (and expensive) modifications. You can get top power for almost any hull with a stock engine. Remember that outboard marathon racers run stock motors, and they're never short on speed. The big difference between their engine and yours is tuning. Speed demands an engine tuned to the finest edge. You



can get away with plus-or-minus adjustments for cruising or trolling, but when it comes to speed, a difference of a thousandth of an inch in adjusting plugs, points or carburetor can reduce top speed by a couple of miles per hour. Also, every component must be in top shape. An old set of plugs, which might be okay for cruising, is definitely out once you begin talking speed. The loss of spark intensity means loss of power, and loss of power means loss of speed.

A complete speed tune-up should include checking: compression, plugs, ignition system, carburetion (and the rest of the fuel system), plus the lower unit and the water pump. If you're really serious about speed tuning, you should have access to modern service equipment such as a compression gauge, a magneto tester and a synchronizer plate.

### First, a compression test

Start with a compression test. All the fine tuning in the world will not give you maximum speed if compression is low or uneven. It is vital that the cause of improper compression be corrected before you begin to tune. If not, tuning will be a waste of time.

To run a compression test, remove the sparkplugs, install a compression gauge in sparkplug holes and crank the engine through a minimum of four compression strokes to obtain the highest reading.

A variation of more than 15 lbs. per sq. in. between cylinders indicates a defect in the cylinder, such as worn or sticky piston rings, scored pistons or scored cylinders.

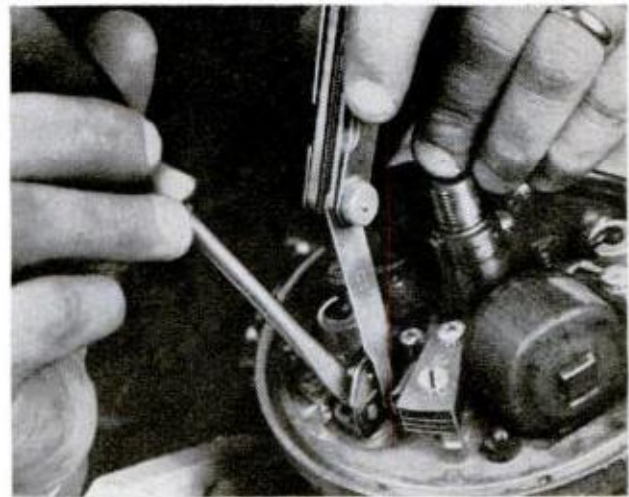
If I were forced to select one part of an engine that has the greatest effect on speed it would have to be sparkplugs. They must be:

- In class-A condition.
- The make and heat range called for by the manufacturer.
- Adjusted right smack on the nose. If the spec calls for .025 in., it doesn't mean .024 in.
- Tightened in their seats to the book specification (meaning tighten them with a torque wrench). Insufficient torque leads to loss of compression, and that means a loss of speed. Too much torque leads to an inability to dissipate heat, which can cause early destruction of plugs and possible engine damage.

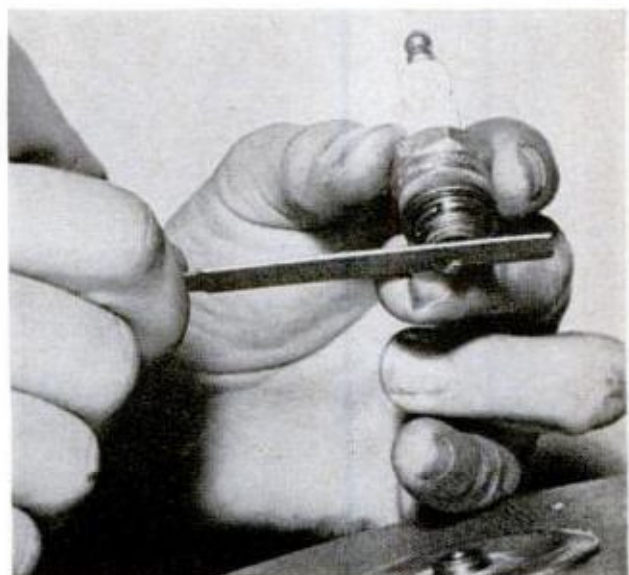
So much for the most important contribution to performance. Still, a foul-up



**MAGNETO TESTER** helps to determine whether a full spark occurs at just the right time. Ignition system and compression are critical factors for speed

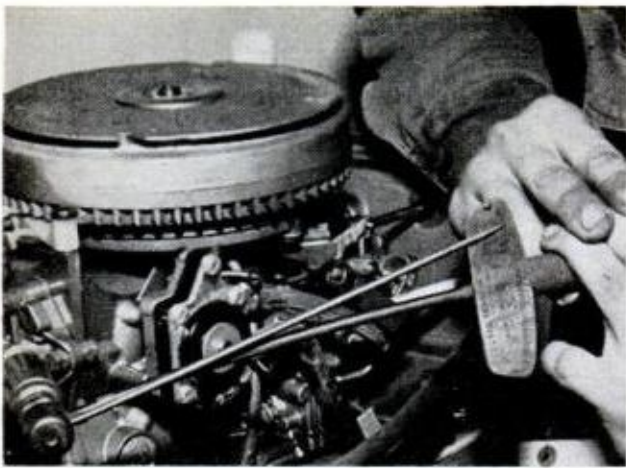


**POINTS** must be in top condition and gap should be meticulously set to proper specification. When doing this, adjust for a slight drag on feeler gauge

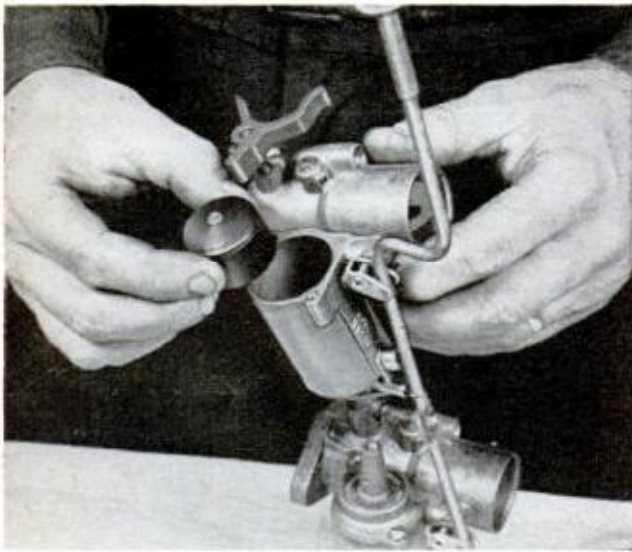


**SPARKPLUGS** have to be in perfect shape, also. File them clean and smooth, and make sure that the gap is right on target. Top speed demands top ignition





**SEATING PLUGS** properly is also important. If they are either too loose or too tight, you'll lose power and speed. Tighten as specified with a torque wrench



**CARBURETOR ADJUSTMENTS** must be exact to get the most possible "go" from your engine. Float shown has a spring on top that controls the needle valve



**HIGH SPEEDS** make efficient cooling even more important than normal, so drop the lower unit and check cooling system, especially pump and impeller

anywhere else in the ignition system will prevent a full spark from reaching the sparkplugs. Keep in mind that top speed requires feeding of a properly proportioned fuel mixture to the cylinders, correct compression of that mixture and maximum spark to ignite the mixture for full power. A spark that's half dead won't allow full combustion.

In checking the ignition system, every component must be tested and tuned according to the book. The exact ignition tune-up procedure varies in scope and specification from engine to engine, but here's the general approach:

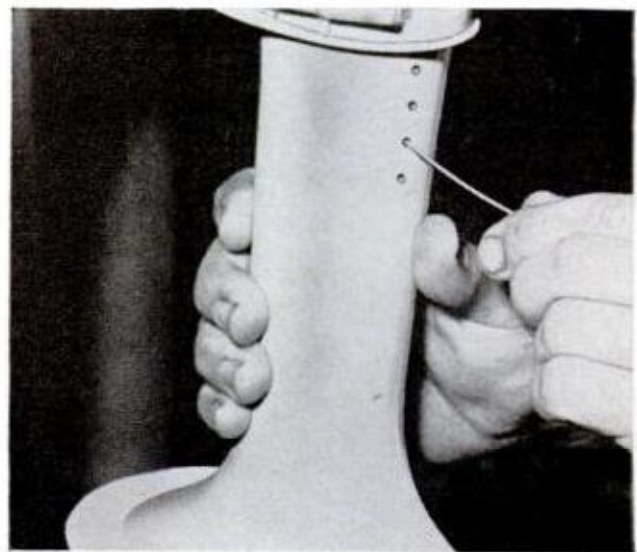
Start with the coil (or coils), testing for maximum operating amperage, high-speed output, secondary continuity, surface insulation and ground.

Go on to sparkplug wires (no cracks or splits), rotor and distributor cap. Check these areas for high-voltage leakage, continuity and resistance.

The condenser is then tested for capacity, leakage and shorts.

Finally, turn your attention to the breaker points. As with sparkplugs, there can be no compromising here. Breaker points must be in topnotch condition and adjusted to the exact specification called for by the book. A synchronizer or dwell plate is an absolute must in making these adjustments if your intention is to have an engine putting out maximum power.

Checking the carburetor involves thorough cleaning, inspection of parts and correct adjustment, particularly of the float-bowl cover. You might also double check



**WHEN RUNNING**, check the drainage holes in the lower unit occasionally to see that they're clear. You can remove clogging dirt with a short piece of wire



the speed adjustments of the carburetor (though most of them are "fixed" in today's engines).

If sediment, gum or varnish are present on carburetor parts, the carburetor should be taken off the engine, dismantled and thoroughly cleaned in solvent. Replace dirty fuel filters and make sure the needle valve isn't sticking in its seat.

Also, check the float-bowl cover for proper clearance as called for by specification. Usually, correct float-bowl cover adjustment calls for a distance from the face of the shoulder to the primary lever of 13/32 in. This check is made with the cover inverted. With the cover in an upright position, the distance between the levers should be 1/4 in.

Be sure to check the float itself. If deteriorated or saturated, replace it. Most floats have a spring that controls the needle valve. This, too, has to be properly adjusted, usually 3/32 in. from top of float to end of spring.

With the float in its bowl, make sure it spins freely. If anything is restricting the movement of the carburetor float, flooding will occur.

Finally, replace all gaskets with new ones. Carburetor gaskets have a tendency to swell in time, which impedes carburetor action.

Other parts of the fuel system that should be checked are the fuel pump and fuel lines. Leakage or restriction here impedes fuel flow.

### **Tighten everything**

Finally, make sure all parts are tightly assembled. Air leaking in through the base of the carburetor or some other attachment area will dilute the fuel and rob the engine of power.

There is only one more service area that should be emphasized—the cooling system. An engine revved for top speed demands complete, adequate cooling.

Drop the lower unit and disassemble the water pump. Make sure impeller, insert, faceplate and oil seals are in good shape, not worn or damaged.

While you're in the lower unit, check on gears and bearings. Take a look at the prop and prop shaft, too. If the shaft is bent, for example, you're not going to get full speed.

Once you've completed this tune-up, the engine is ready to go. From here on, it's up to the prop, the boat and you. ★★

JULY 1967

## **Outboard Clinic**

---

**Q.** *Try this one. A 1965 9 1/2-hp Johnson that bucks and misses at low speed. Checked the plugs at the end of a day and found the lower cylinder plug gasfouled. A mechanic suggested a hotter plug. What do you think?—C.S., Ill.*

**A.** I think that every outboard engine should be run with the plug specified by the manufacturer and no other. Using a hotter plug is like giving a guy aspirin for a toothache—it'll relieve the pain, but it won't get rid of the decay. As for what's causing the fouling, check the reed valve feeding the lower cylinder to see if it's off its seat. If not, could be that an ignition breakdown is providing too weak a spark to burn the mixture fully. If so, it's time for a full tune-up.

**Q.** *I'm ready to junk this motor of mine unless you can help. It kicks back when I go to start it and backfires into the lower unit.—L.P., Calif.*

**A.** There are only a few things that could cause this condition in an outboard, so the problem of locating the culprit isn't as difficult as you might think. Check for sparkplug wires reversed, flywheel key sheared, timing and synchronization way out of whack or reed valves that are either broken or not seating properly. After tracing down the problem, give the engine a careful tuning to make sure everything else is okay.

**Q.** *I own a 1957 Oliver 15-hp outboard which is in good shape. It runs great at high speed, but the trouble is that it won't idle. Can you tell me why?—B.H., Pa.*

**A.** There are many reasons why an engine will refuse to idle properly. The cause could be any of the following: dirty low-speed jet, ignition points improperly gapped or worn, sparkplugs improperly gapped or dirty. A tuneup should take care of the problem. If not, you'll have to start checking for a major problem like open reed valves and leaky seals.

---

**FOR PERSONAL REPLY** to your outboard motor question, write Outboard Clinic, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022. Enclose 25 cents in coin.



# Getting started in model rocketry

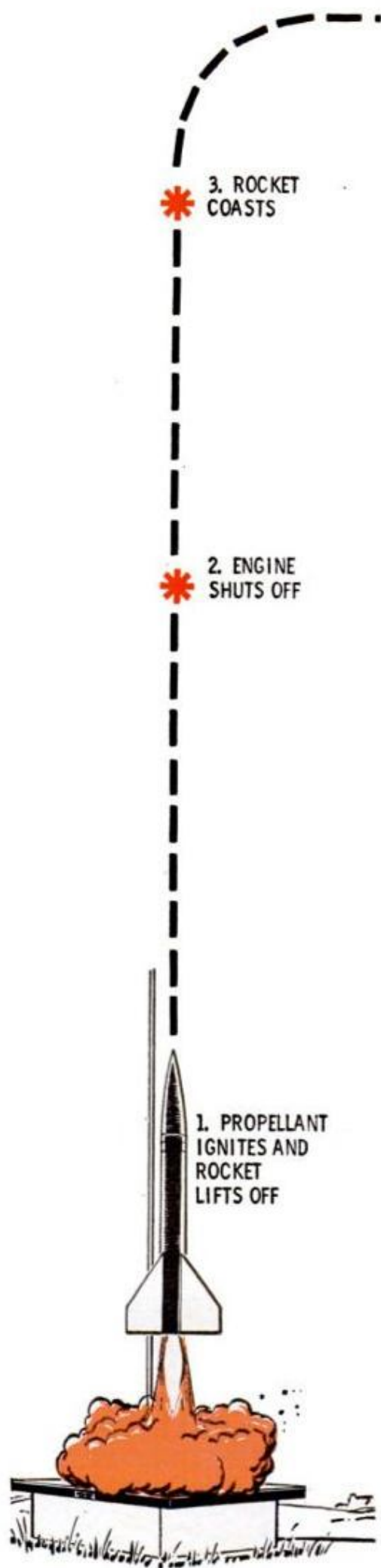
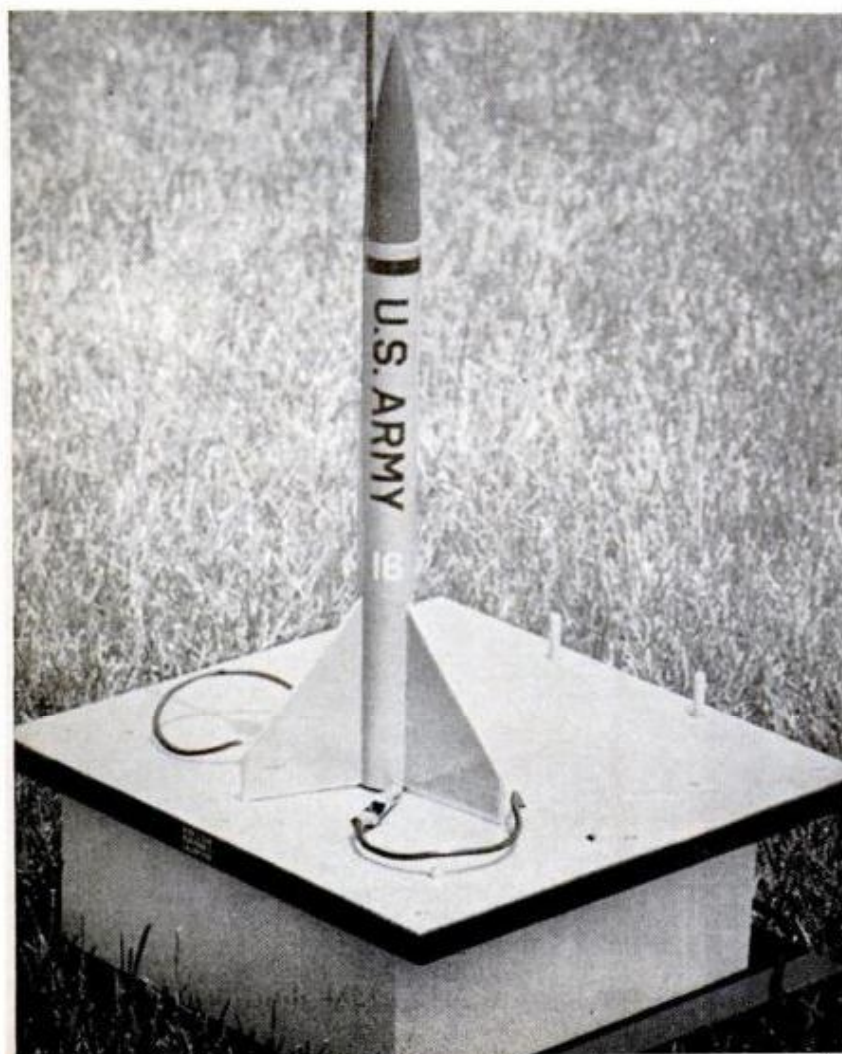
Here's how to build a battery-operated launcher, a remote-control firing station and a solid-fuel ship to make this modern hobby safe and exciting

By EUGENE FLORIDA

Technical art by Don A. Evans Illustration by ZIK Associates, Ltd.

**A**LL OVER THE COUNTRY dads are helping sons build model rockets for the same reason they used to monopolize their youngsters' electric trains. The fact is, for any age, there's a lot of thrill and challenge in fashioning a slim, gleaming, needle-nosed projectile and watching it streak skyward in a fiery blast of its engine.

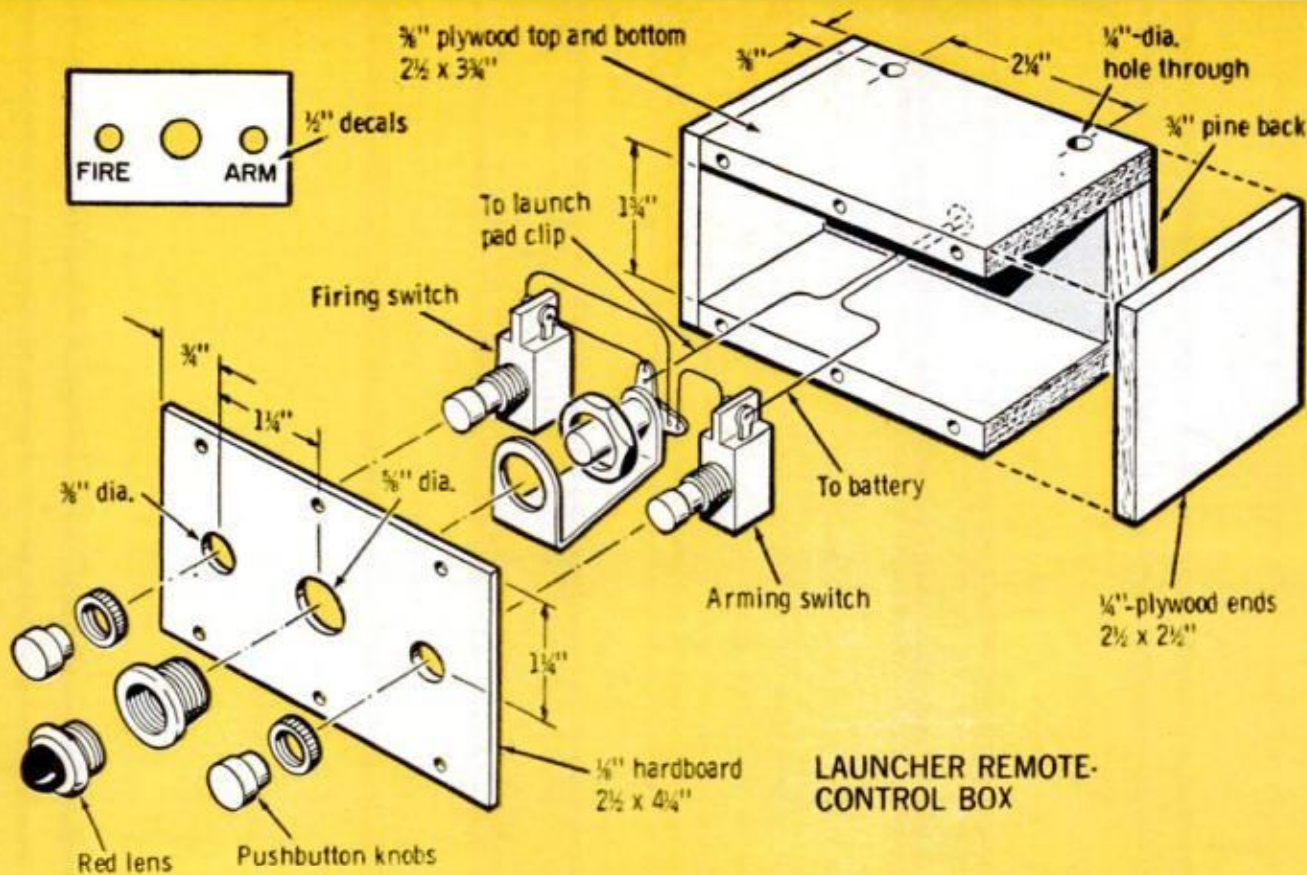
Today's model rockets come in a fascinating array of types and sizes. They're safe when handled with care and are easily assembled from kits and parts sold by hobby shops and mail-order houses. The rocket engines are simple cardboard tubes filled with a solid propellant that slip into place like a cartridge in a gun. Depending on the size of engine used, model rockets can reach altitudes of 1000 feet or more. The propellant is ignited electrically











LAUNCHER REMOTE-CONTROL BOX

by a special Nichrome wire, supplied with each engine, that heats to a glow when connected to a battery.

The remote-control launcher shown here adds to the fun and safety by allowing you to set up a rocket on the pad and then move well away for the actual firing—just as big rockets are launched.

The battery is built into the launcher's base, and the portable control box is connected to it

by 15 feet of wire. A clever two-button control eliminates any chance of firing the rocket accidentally—you have to have both buttons pressed at the same time to complete the circuit.

The launch rod used to hold and guide a rocket during the initial lift-off stage has a novel tilting feature that enables models to be fired at an angle as well as straight up. For easy handling, the remote-control box stores in the side of the launcher, and its wire is coiled neatly around the base.

While any rocket can be used with the

launcher, the model suggested here provides a lot of exciting action since it's designed for parachute recovery. At the height of its flight, an ejection charge blows off the nose cone, a miniature parachute pops out, and the rocket floats gently to earth. Just under a foot long, it's a trim-looking, yet simple, design that's easy for a beginner to tackle.

### Making the launcher

The launcher is topped with a 10-in.-square aluminum plate to protect the wood from the rocket's blast. The slot for the tilting guide rod can be cut with a metal-cutting blade in a saber saw or by drilling a series of  $\frac{3}{16}$  in. holes and filing out between them.

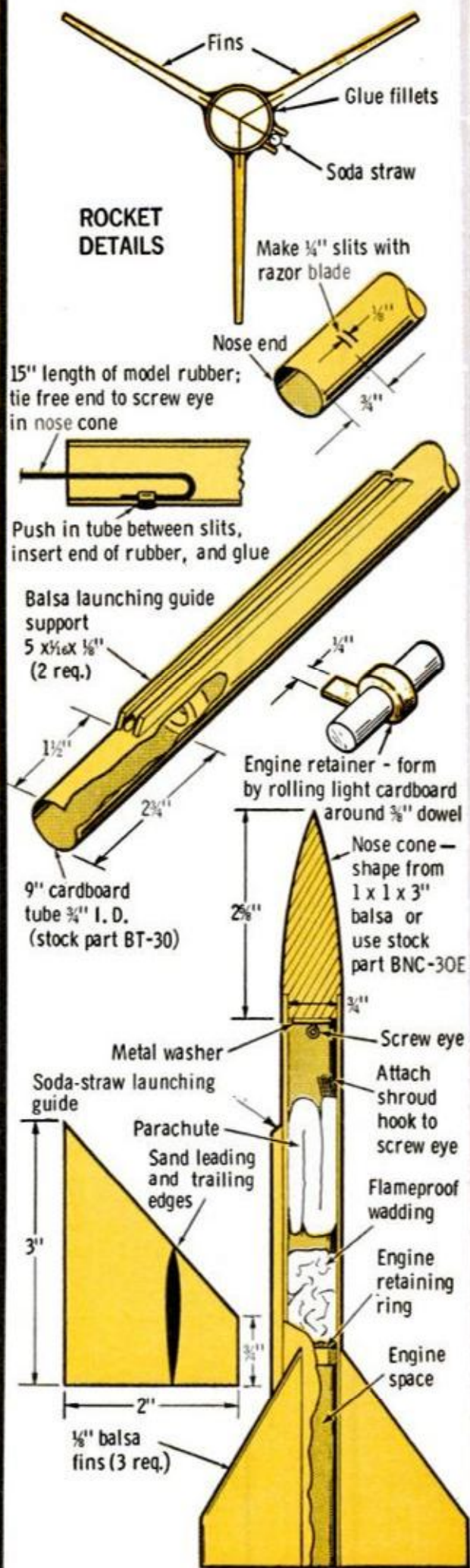
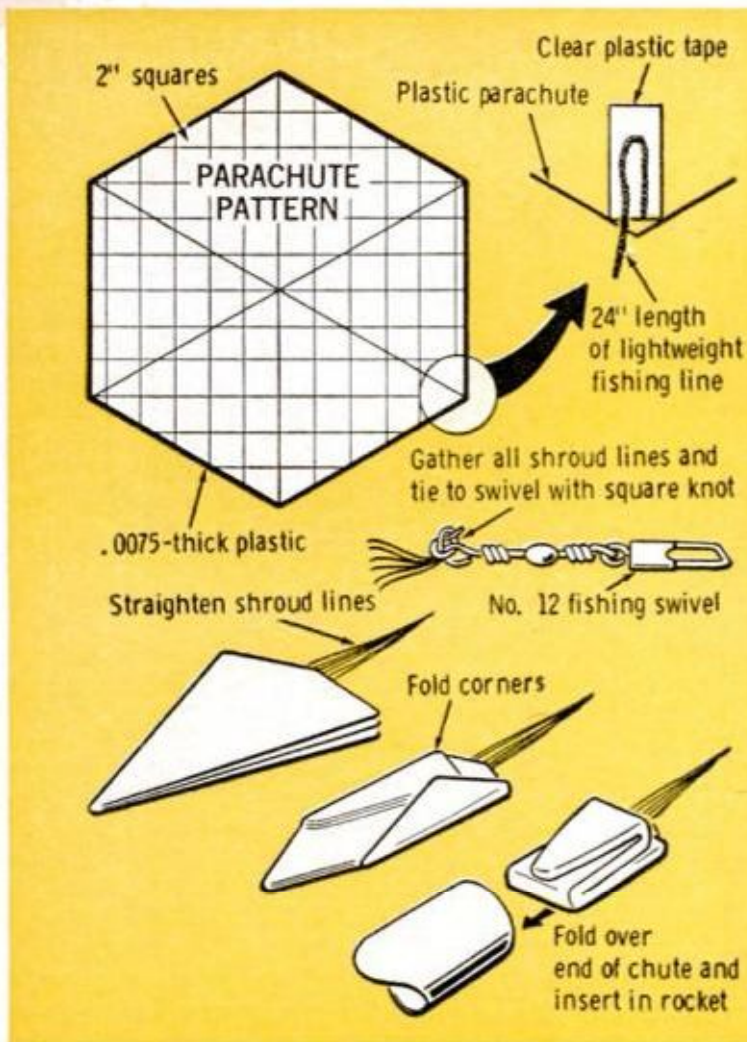
The full-width aluminum plate gives the launcher a sleek appearance but is not absolutely essential. If you prefer, you can fasten a smaller piece of metal, such as a coffee-can lid, in the center of the launcher to catch the blast.

Clamp the plywood top and bottom pieces together and drill both at the same time for all holes that line up. The sides are assembled as a unit first to form a

CUT  
FOLD  
TAPE

MODEL  
ROCKETS





box; then top and bottom are screwed on.

The tilting mount for the launching rod consists of a 3/4-in. dowel clamped snugly in a split block. Tighten the block just enough so that the dowel is free to turn but will hold in any position. This way, you can tilt the rod and it will stay until you move it. Half of the block is screwed rigidly to the base, and the other half is free to adjust pressure on the dowel.

For firing power, a 6-volt lantern battery is concealed inside the launcher. If you prefer, you can also use four regular 1 1/2-volt flashlight batteries wired in series to provide 6 volts. Two wires with alligator clips on the ends run up through the launching platform for connection to the rocket's ignition wire. To keep the blast out of the guide-rod slot, a small disc of metal with a hole in the center can be slipped on the rod. It will slide with the rod without hampering its tilting feature.

#### Connecting the control

The portable control box contains two normally open pushbutton switches and a pilot light. The circuit is arranged so that

*(Please turn to page 176)*



# New tools you should know about



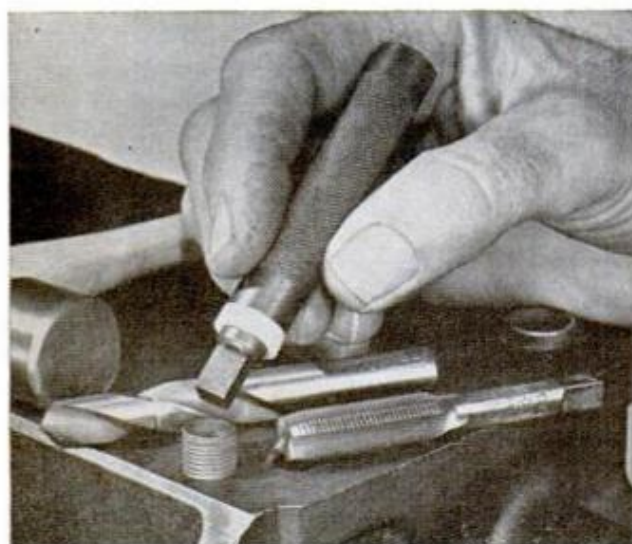
## Now Teflon coating on saws

A new and tougher Teflon coating than used on cookware is now being baked on a full line of Disston hand and pruning saws to make sawing easier than ever. Called Teflon S, this new coating by Du Pont allows your saw to glide through both tough and wet wood without binding. Blade remains clean, has life-long protection against rust or corrosion and can be resharpened without affecting Teflon action. H. K. Porter Co., Inc., Pittsburgh, Pa.



## Low-cost orbital sander

Ball bearings on the driving plate of Thor's new orbital sander provide a guarantee of long, trouble-free service to both the home workshopper and professional. UL industrially rated, this sander takes a 4½x6½-in. abrasive sheet which allows you to cut three strips out of each standard 9x11-in. paper. Priced to sell for less than \$15. Thor Power Tool Co., 175 State St., Aurora, Ill. Thor is also introducing a new two-wheel bench grinder with shaded-pole motor for \$18.88.



## Slimserts replace stripped threads

Stripped threads are no longer the aggravating problem they used to be. Now you need simply to drill out the old hole with a step drill, then retap it and turn in a threaded Slimsert that fits the original bolt. Made of stainless steel, these screw-type inserts come in sizes from No. 10 through ¾ in. in both U. S. (coarse) and SAE (fine). Proto Tool Co., Los Angeles, Calif.



## Pressure roller speeds painting

Equipped with its own 1-qt. paint container, this trigger-fed roller makes painting simpler than ever. Paint is forced through perforations in Dynel roller for continuous, even application. A special enameling sleeve slips over the Dynel one for an ultra smooth finish. Extra handy for boat painting. Sells for \$12.95 from Warren Pressure Rollers, 3015 Southwest Drive, Los Angeles, Calif. 90043.

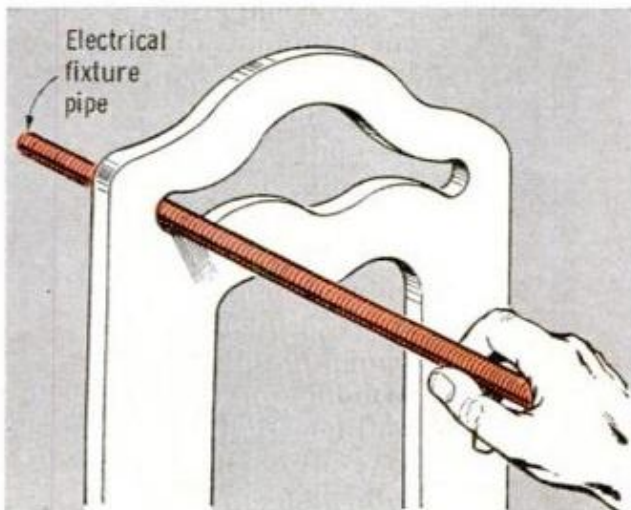


# HINTS FROM READERS



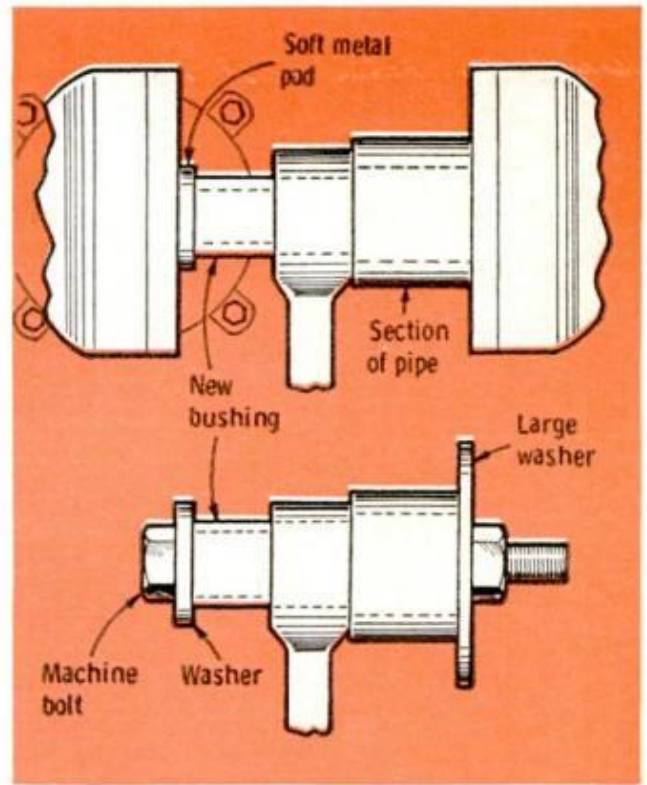
## Door spring corrals lumber

The waste space between the studs of a garage wall provides a natural out-of-the-way place to store odds and ends of lumber. But a mere cleat nailed across the studs to retain the pieces makes it difficult to remove long boards. The answer is a coil spring which will stretch—or unhook—to let you pull out any piece you want.—*John C. Schapps*



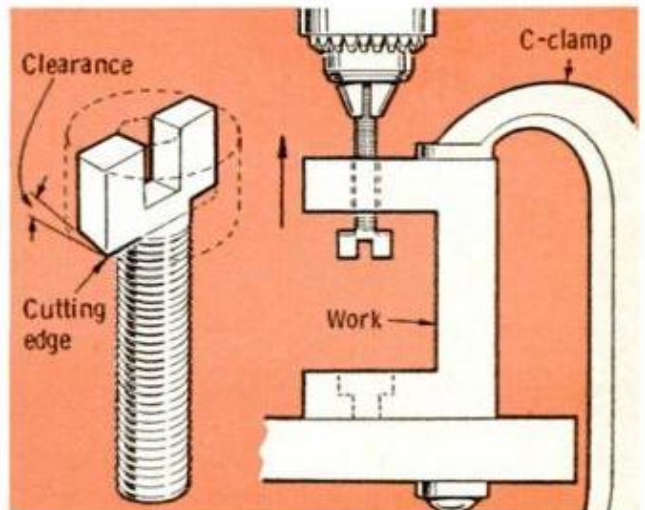
## Pipe pinch-hits for file

Not as good as the real thing, of course, but you'll find that a length of 1/8-in. electrical fixture pipe makes a good substitute for a round file when one is needed to smooth tight turns in scroll-sawed work. Burred threads on the pipe act like cutting teeth on a rasp.—*Victor H. Lamoy*



## Bushing ejects bushing

Many mechanics use a hammer and roundnose punch to drive out bushings. However, I have found a far better method whereby I use the new bushing to drive out the old one. The sketch shows how this is done in a vise with a short section of pipe and a soft metal pad to prevent damage. Another way to do it is with a bolt and large washer.—*F. Birch*



## Counterbore made from capscrew

When the job calls for "back counterboring," you can make the cutter from a socket-head capscrew. Grind head as shown and form cutting lips on the underside. Cutting is done by raising up on the spindle. At slow speed, the cutter will work in mild steel.—*Arthur Drummond Jr.*



# How to reroof your house with

Whether you want to switch to the distinctive look of hand wood shingles that are already on your roof, the laying of

## PART II

**M**ANY HOMEOWNERS still prefer the rustic, colonial beauty of a wood-shingle roof in preference to asphalt, and if your home has such a roof which needs reshingling with either red-cedar shakes or shingles, a little know-how is all it takes for you to do the job yourself with professional results.

Called the aristocrat of roofing materials, handsplit cedar shakes make a luxurious

roof of unsurpassed durability that will actually outlast the house itself. Shakes may be applied directly over the old roof if it's not slate, tile or "asbestos." Where the old roof is to remain, 6-in. strips of the old roofing are removed along the eaves and gables, and replaced with 1x6 boards before the shakes are laid. These boards provide a strong base at the perimeter, concealing the old roof from view.

### MAXIMUM EXPOSURE FOR WOOD SHAKES

TYPE	THICKNESS	LENGTH	DOUBLE COVERAGE	TRIPLE COVERAGE
Handsplit and resawn shakes	1/2 to 3/4"	18"	8 1/2"	5 1/2"
	1/2 to 3/4"	24"	10"	7 1/2"
	3/4 to 1 1/4"	32"	13"	10"
Tapersplit shakes	1/2 to 5/8"	24"	10"	7 1/2"
Straightsplit shakes	3/8"	18"		5 1/2"
	3/8"	24"		7 1/2"



**TRY TO DRIVE NAILS** flush with shingle's surface but not so hard that the nailheads will crush the wood



# wood shakes and shingles

split shakes or desire simply to add a new layer to the either type is an easy job for an ambitious do-it-yourselfer

By WAYNE C. LECKEY

Technical Art by ZIK Associates, Ltd.

Over-roofing, of course, has a number of advantages. It gives extra insulation. You don't have to worry about sudden rains while applying the shingles, and there's a lot less litter to pick up from the lawn and shrubs. But where you might be fixing up an old dilapidated house with a beyond-saving shingle roof, you have no recourse but to strip the roof and start from scratch. You have a choice of three kinds of shakes.

- *Handsplit and resawn shakes* have split faces and sawn backs. After cedar logs are cut into the desired length, blanks of proper thickness are split, and these then are run diagonally through a band-saw to produce two tapered shakes from each blank.

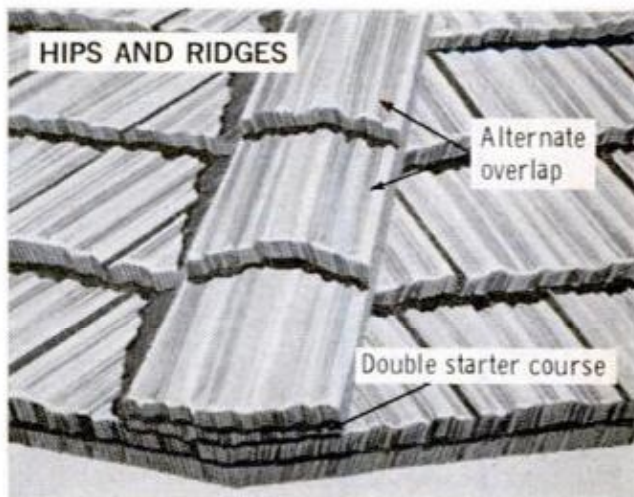
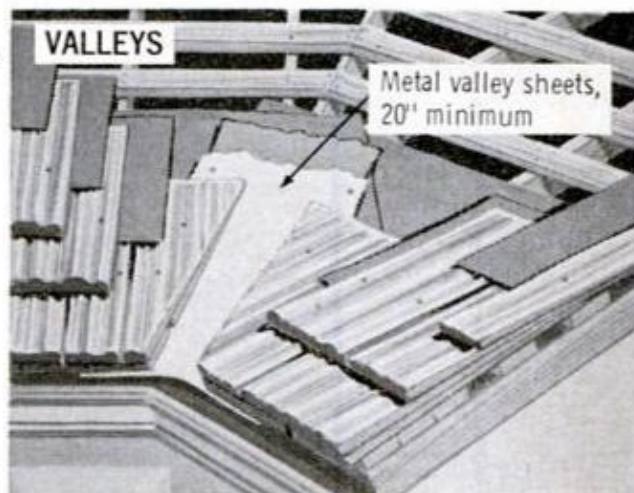
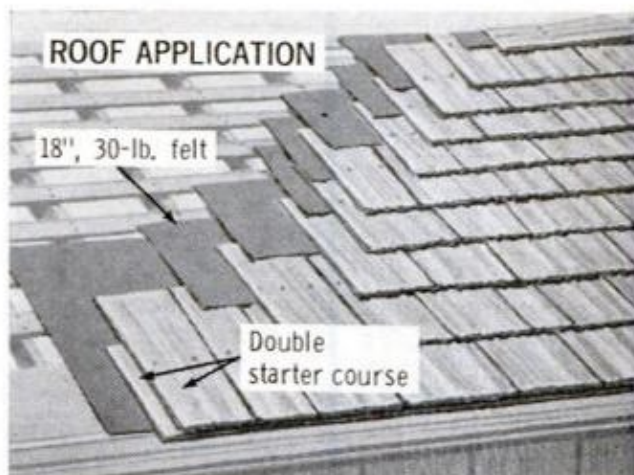
- *Tapersplit shakes* are produced entirely by hand, using a sharp-bladed knife called a froe and a wooden mallet. A natural shinglelike taper, from butt to tip, is achieved by reversing the block, end for end, with each split.

- *Straightsplit or barn shakes* are made in the same manner as taper-split shakes, except that the splitting is done from one end of the block only. This produces shakes which are the same thickness throughout.

## How to apply shakes

Shakes can be applied over open or solid sheathing, although in areas where wind-driven snow is encountered, solid sheathing is recommended. For good drainage, the pitch (slope) of your roof should not be less than one-sixth, or 4-in-12 (4 in. vertical rise for each 12-in. horizontal run). The correct weather exposure is important too, and the chart at the left gives the maximum exposure for standard 18, 24 and 32-in. shakes, in double and triple coverages. Note that the  $\frac{3}{8}$  x 24-in. shakes should be applied at 7½-in. exposure when the roof pitch is less than 8-in-12.

To begin, a 36-in.-wide strip of 30-lb.





roofing felt is laid over the sheathing boards at the eave line. The starter course of shakes is doubled, the bottom course being 15 or 18-in. shakes expressly made for the purpose. Wood shakes should extend 1 to 1½ in. out over the eave and

rake to form a drip.

After each course is completed, an 18-in.-wide strip of felt is placed over

the top portion of the shakes. Here the bottom edge of the felt is kept above the shake butts a distance equal to twice the weather exposure. For example, if 24-in. shakes are being laid at a 10-in. exposure, the felt should be positioned 20 in. above the shake butts. The strip will then cover the top 4 in. of the shakes and extend 14 in. onto the sheathing. The individual shakes should be spaced ¼ to ⅜ in. to allow for possible expansion, and the joint offset at least 1½ in. in adjacent courses.

Fasten each shake with just two nails and use only rust-resistant nails (hot-dipped zinc or aluminum) driven 1 in. from each edge and 1 or 2 in. above the butt line of the course to follow. A 2-in. (6-penny) nail normally is adequate, but longer nails should be used when shake thickness dictates. Drive the nails until the



heads meet the shake surface but *no further*; nails have less holding power when the heads are driven into the shake.

For the final course at the ridge line, uniform shakes are selected. A strip of roofing felt, at least 8 in. wide, is applied over the crown of all hips and ridges and shakes approximately 6-in. wide are sorted out to cover them. Two straightedges are tacked to the roof, 5 in. each side of the center line of the hip.

The bottom course of hip shakes is doubled and the butts are trimmed to align with the starting courses at the eaves. The first hip shake is nailed in place with one edge resting against the guide strip. Then the portion projecting over the center of the hip is cut back on a bevel. The shake on the opposite side is then applied and its projecting edge is cut back to fit. Shakes in following courses are applied alternately in reverse order. Weather exposure of the hip shakes should be the same as that for the roof shakes.

All valleys should be underlaid with 30-lb. roofing felt applied over the sheathing. The metal valley sheets should be at least 20 in. wide. Edges of the shakes are cut to run parallel up the valleys, approximately 5 in. apart. Base and chimney flashing units are laid with each shake course and counterflashed.

An adjustable exposure gauge on the edge of a shingler's hatchet speeds application in making it easy to measure correct exposure and run the courses straight.

#### How to apply red-cedar shingles

Red-cedar shingles are applied in much the same manner as shakes. Where they are to be applied over an old roof of wood or asphalt shingles, roof preparation is

CUT  
FOLD  
TAPE

ROOFING  
HOUSE

#### MAXIMUM EXPOSURE FOR WOOD SHINGLES

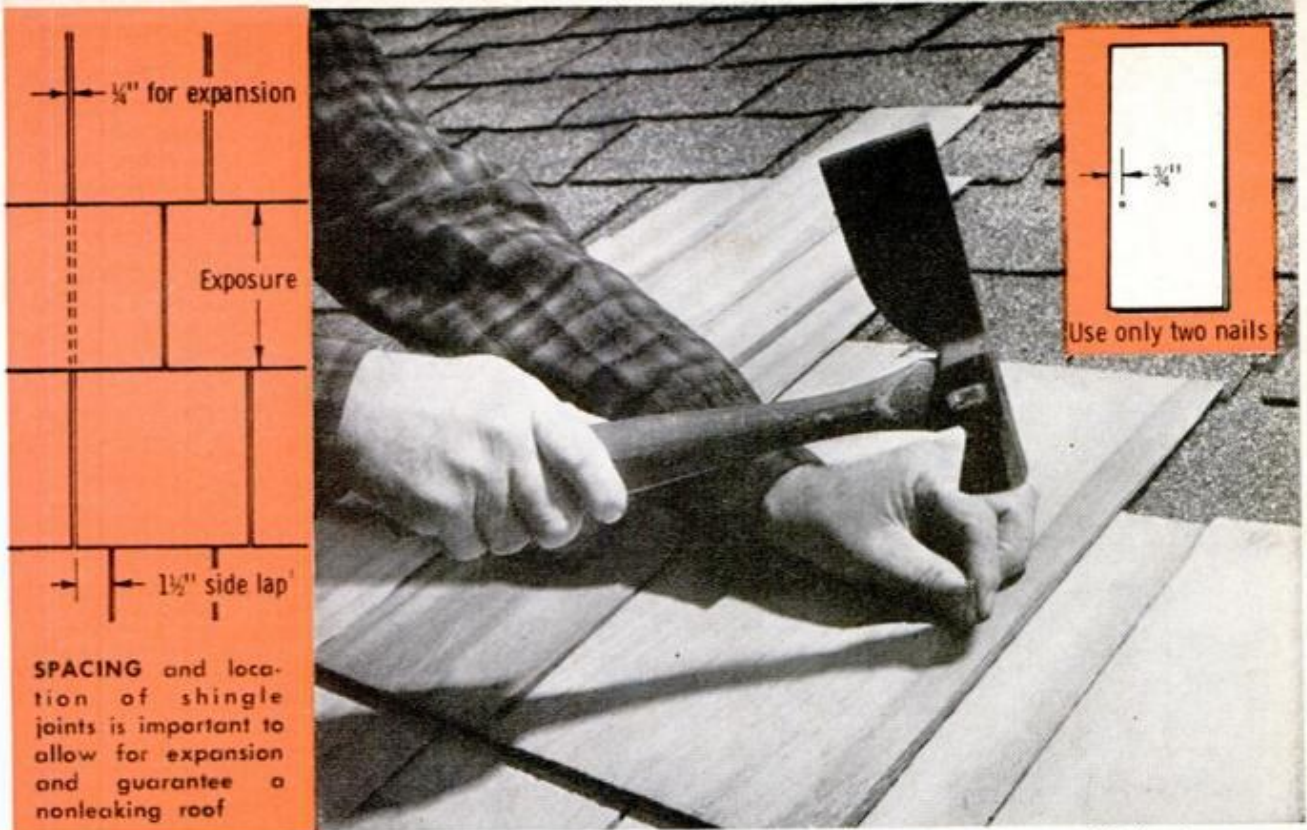
ROOF SLOPE	SHINGLE LENGTHS		
	16"	18"	24"
5 in 12 or steeper	5"	5½"	7½"
4 in 12	4½"	5"	6¾"
3 in 12	3¾"	4¼"	5¾"

#### NAIL SIZES RECOMMENDED

SIZE	LENGTH	GAUGE	HEAD	SHINGLES
3d*	1-¼"	14-½	7/32"	16 & 18"
4d*	1-½"	14	7/32"	24"
5d**	1-¾"	14	7/32"	
6d**	2"	13	7/32"	

\*3d and 4d nails used for new construction  
\*\*5d and 6d nails used for reroofing





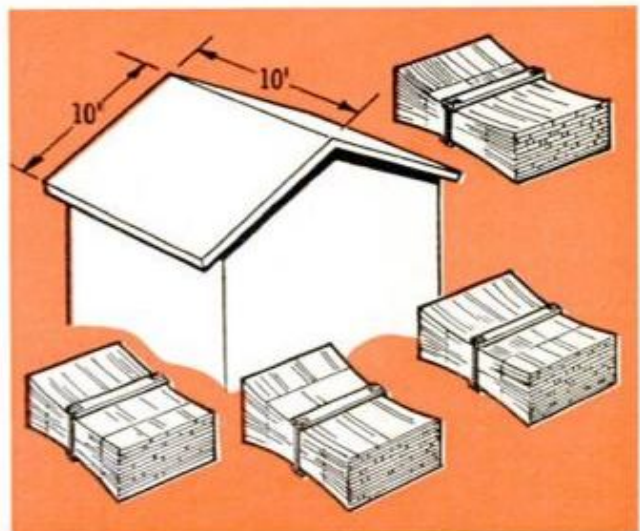
SPACING and location of shingle joints is important to allow for expansion and guarantee a nonleaking roof

**ONLY TWO NAILS** are used per shingle and are placed so they are  $\frac{3}{4}$  in. above butts of following course

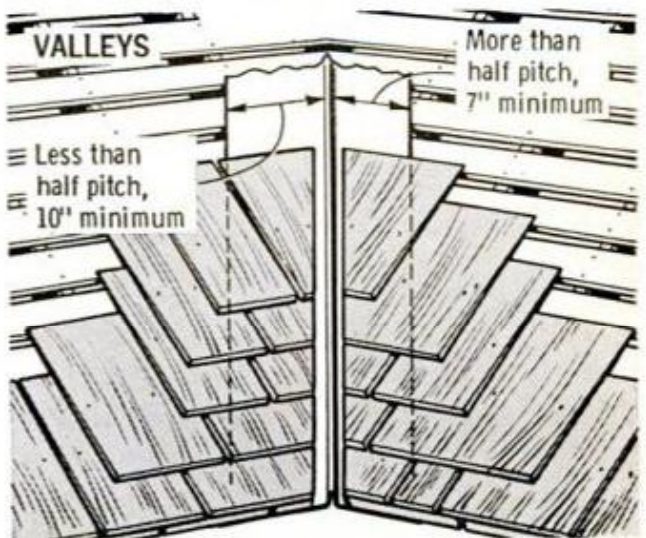
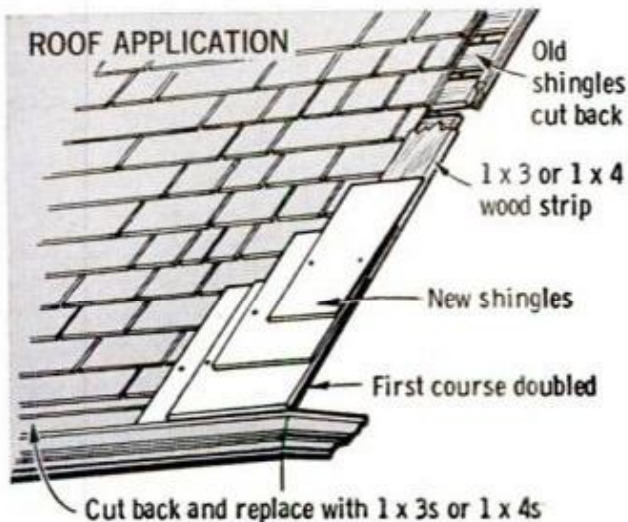
the same along the eaves and gables. In addition, a strip of lumber is laid in each valley to separate the old metal valley from the new, and the old ridge shingles are replaced with strips of beveled cedar siding, thin edge downward.

Normally, cedar shingles are applied in straight single courses, using a straight-edge to keep the rows straight and true. On roof slopes of 5-in-12 and steeper, standard exposures are: 5 in. for 16-in. shingles,  $5\frac{1}{2}$  in. for 18-in. shingles and  $7\frac{1}{2}$  in. for 24 in. shingles. If the roof pitch is less than 3-in-12, cedar shingles are not recommended.

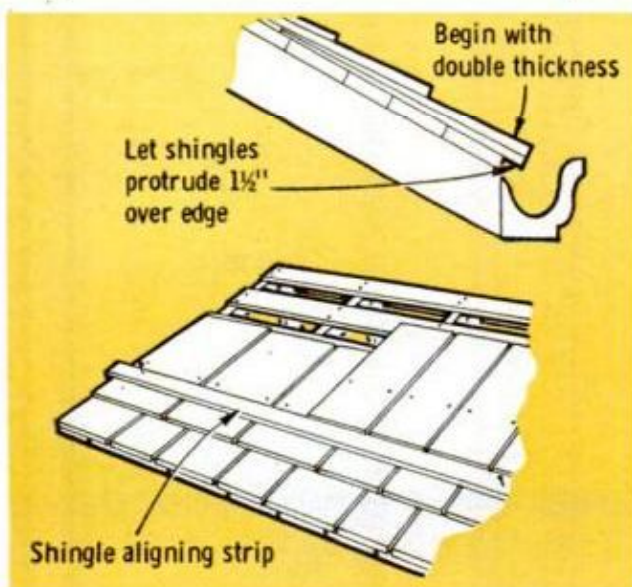
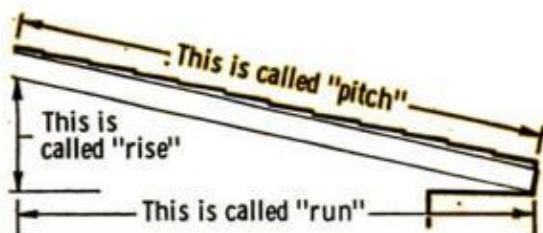
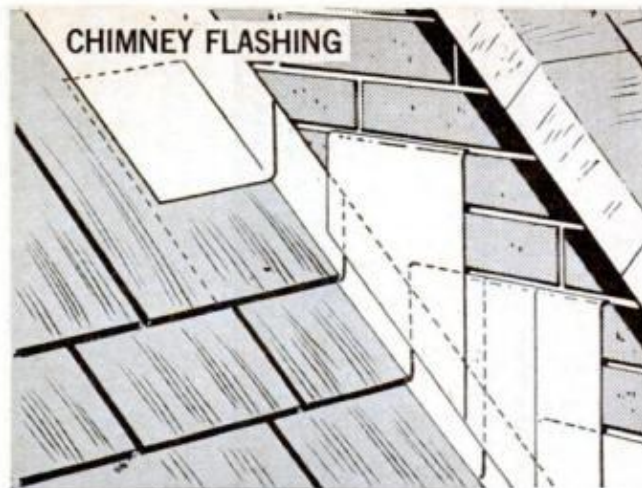
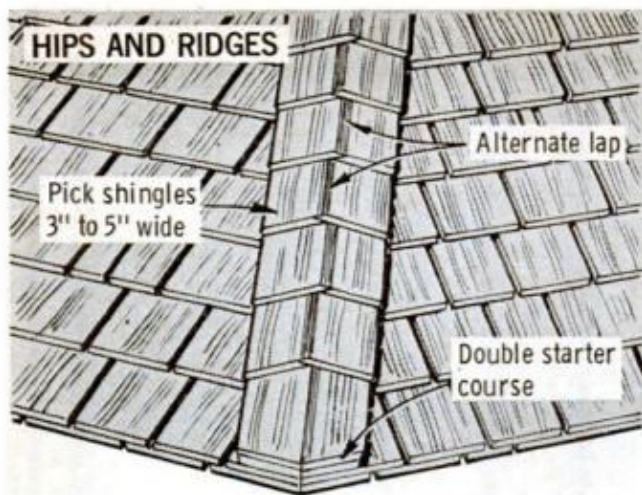
Like shakes, cedar shingles are doubled along the eaves, and the butts of the first course are laid so they hang over the edge



**TO ESTIMATE NUMBER** of shingles needed for your roof, four bundles, which are called a "square," will normally cover 100 square feet of roof area







1½ in. to insure proper rain spillage in the gutters.

Space the shingles ¼ in. apart and never have two joints in line if separated by only one course of shingles. Leave a side-lap of 1½ in. between joints in successive courses. Use only two nails per shingle, ¾ in. in from each edge, and locate them so the next course will cover the nails by at least ¾ in. The chart on page 156 specifies the right size of nail to use. As with shakes, the use of rust-resistant nails is most important. Drive the nails flush, but not so hard the nailheads crush the wood.

Hips and ridges are capped with factory-assembled units lapped to provide the same exposure as in the roof proper.

### How to estimate 'squares'

A "square" of shingles consists of four bundles, so called because they normally will cover 100 square feet of roof area.

To estimate the number of squares you'll have to order for your roof, first determine the square-foot ground area of your house (include eave and cornice overhang). Increase this total square-foot area by 8½ percent if the roof pitch is 5 in 12, 12 percent if it's 6 in 12 or 20 percent if 8 in 12. Then divide total by 100.

Where pitch is less than 5 in 12, allow for a third more shingles to compensate for the reduced exposure. And, add a square for each 100 lineal feet of hips and valleys. As for nails, figure 2½ lbs. per 100 sq. ft. of roof area.

Before you get on any roof, slip on a pair of tennis shoes. They'll not only give you good footing, but they'll keep from marking up your new roof.

For more information on application of shakes and shingles, we suggest you write Red-Cedar Shingle and Handsplit Shake Bureau, Seattle, Wash. ★★



# HINTS

FROM READERS

## Stronger dowel joints

Spiral-kerfed dowels make dowel joints that are twice as strong as smooth dowels. When clamping pressure is applied, excess glue trapped in the bottom of the hole works its way up the groove to provide a greater bond to the sides of the hole. Use your bandsaw to cut the spiral by tilting the table 20° and clamping a wood fence to it. Rotate the dowel slowly as you make a  $\frac{1}{16}$ -in.-deep cut.

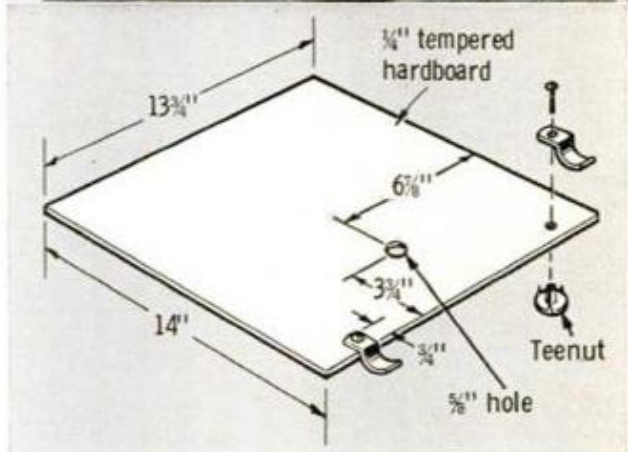
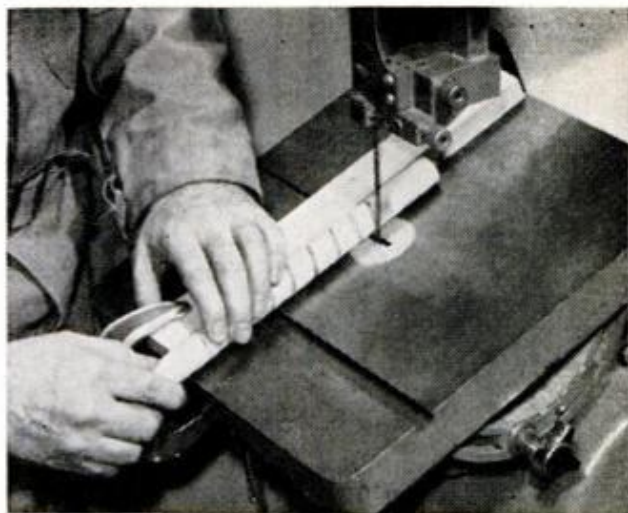
## VW dining shelf

A drive-in eatery need pose no problem for a Volkswagen when the weather is wet and cold, for with this roomy dining table you'll never miss the dashboard shelf of bigger cars. Simply let down the door of the glove compartment, clip on a tabletop carried with you and you have a king-size shelf that lets you dine in style—thanks to the level way the VW door opens.

The tabletop is a piece of  $\frac{1}{4}$ -in. hardboard cut to fit between the door hinges. A hole is drilled in it to admit the glove-compartment lock. Clips that hold the board to the door are made from 2-in. brass inside corners. Cut one leg off just beyond the first screw hole, and bend the other leg to follow the curvature of the glove compartment's bottom. Then attach the clips to the shelf with  $\frac{7}{32}$  machine screws and Teenuts. Discs of adhesive-backed flannel applied to the Teenuts will keep them from scratching the paint. Give the shelf a couple coats of enamel so it can be wiped clean with a damp cloth. The shelf will hold lunch for two with room to spare.—*Leonard Samuels*

## Gardening's a breeze

Although handicapped with crippling arthritis, Carl Alsbury, a retired farmer of Omaha, Neb., didn't let that stop him from harvesting his favorite fruit—strawberries. He laid wood tracks in his strawberry patch and built a chair cart that would straddle and clear the plants as he rolled up and down the rows. With the tracks partly buried to form irrigation "ditches," he watered the plants by flooding the rows. The T-shape tracks were made of treated 2x8s, 33 in. apart, with 2x2s nailed down the center.—*Pearl P. Pucket*





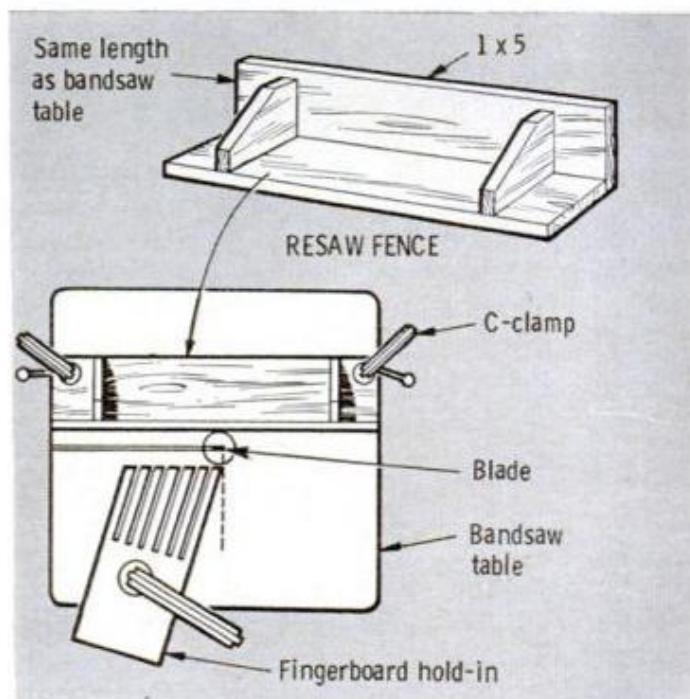
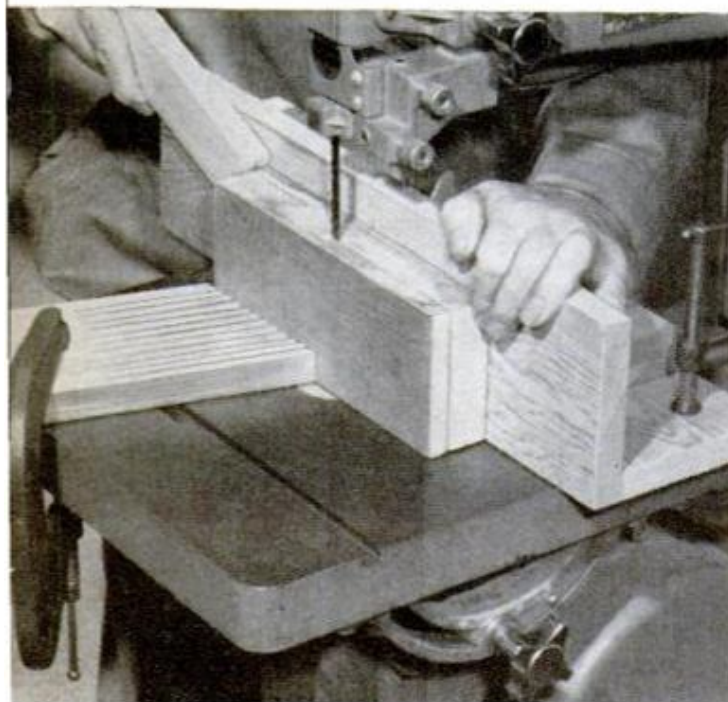
# Don't sell your bandsaw short

You'll be surprised at what your bandsaw can do if given the chance. Eager to join in the fun of making things, this underrated "wallflower" takes on new importance when you put these eight bandsaw tricks into practice in your shop.

By **MANLY BANISTER**

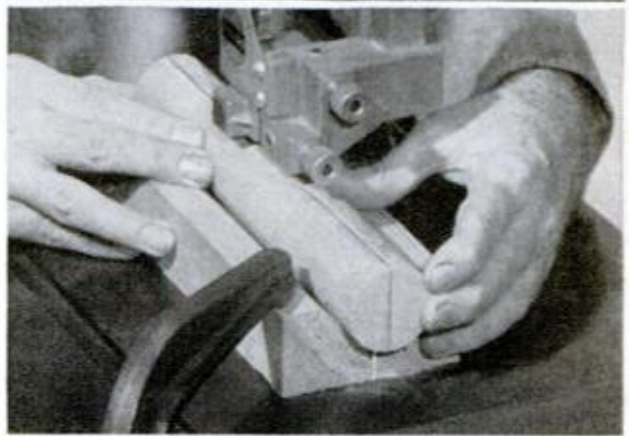
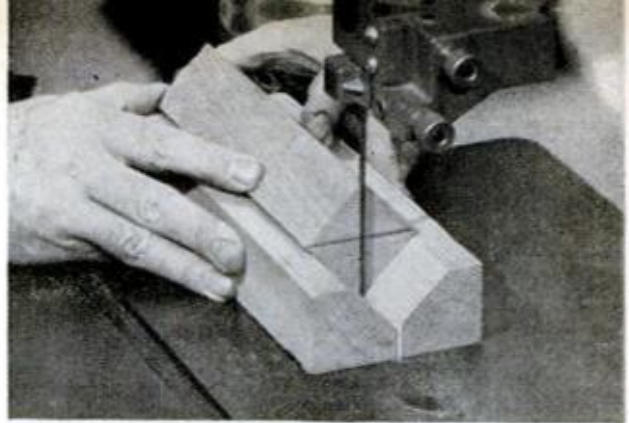
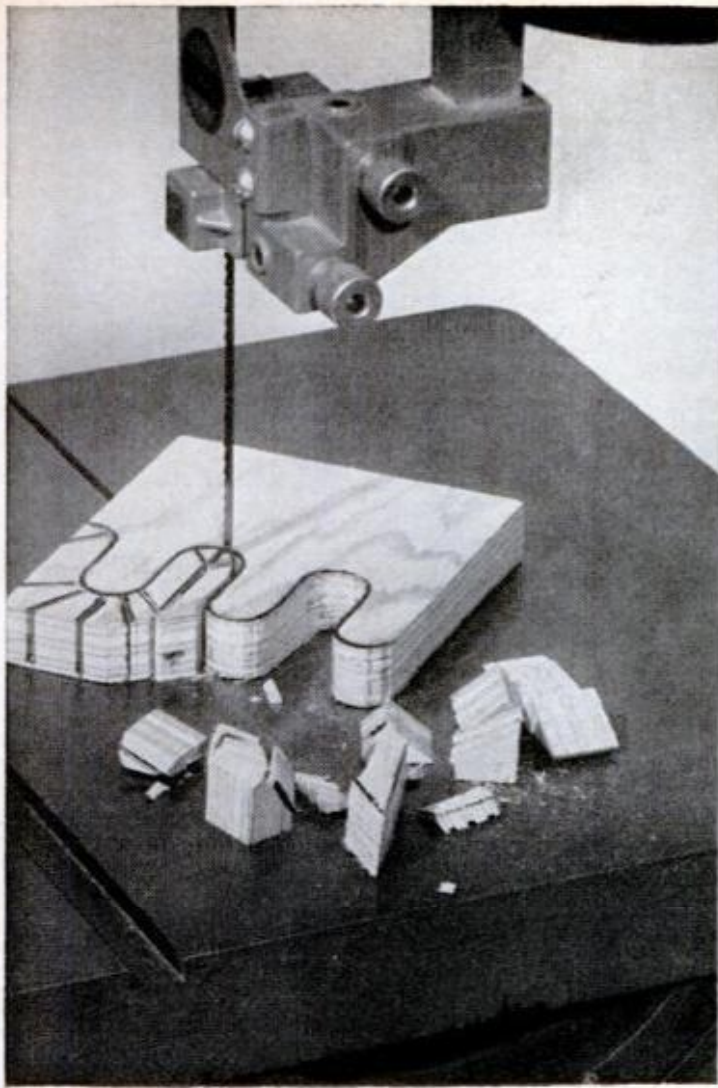
*Technical art by ZIK Associates, Ltd.*

**STILL THE BEST** and only tool for making curved cuts in thick stock, a bandsaw far outperforms the sabre saw in smoothness of cut, speed and tight turns. There's a trick to making tight turns even when using a narrow blade and especially when the work calls for turns as small as  $\frac{1}{2}$ -in. radius. A series of straight cuts is first made in from the edge of the work to the line of cut, dividing up the curve in segments as shown in the photo at the right. As you follow the curve with the saw, the waste falls free, giving the blade more room to make the turn. This stunt not only permits tight turns, but it keeps the blade from heating and burning the wood in negotiating turns of short radii

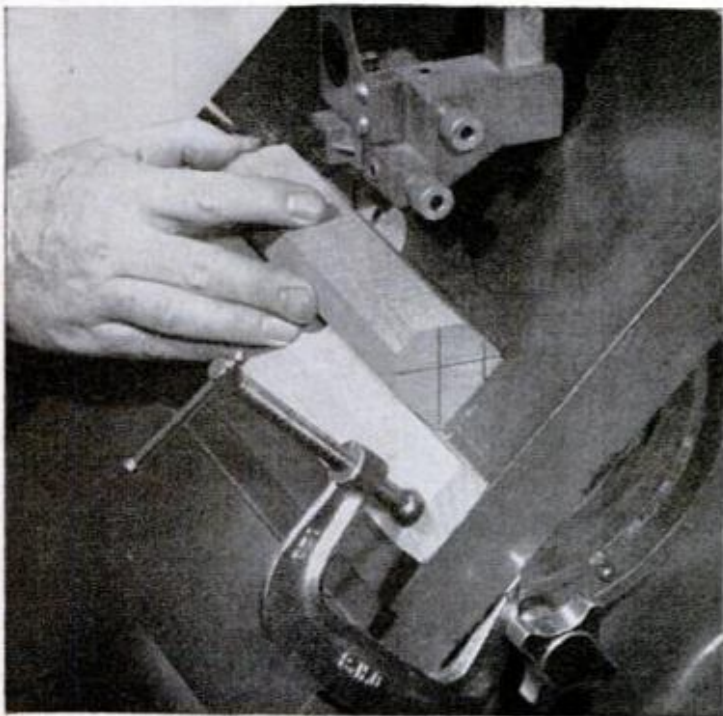


Edge-ripping wide stock into thin boards is a job only a bandsaw can handle. It requires the use of a wooden fence to support and guide the work on edge, plus a slotted fingerboard to hold the work firmly against the fence. A  $\frac{3}{8}$  or  $\frac{1}{2}$ -in.-wide skip-tooth blade is best, and a push stick is a must in feeding the work safely past the blade. Note the position of the hold-in board in relation to the blade. A series of parallel saw kerfs gives a spring action to the fingerboard when it presses against the work.

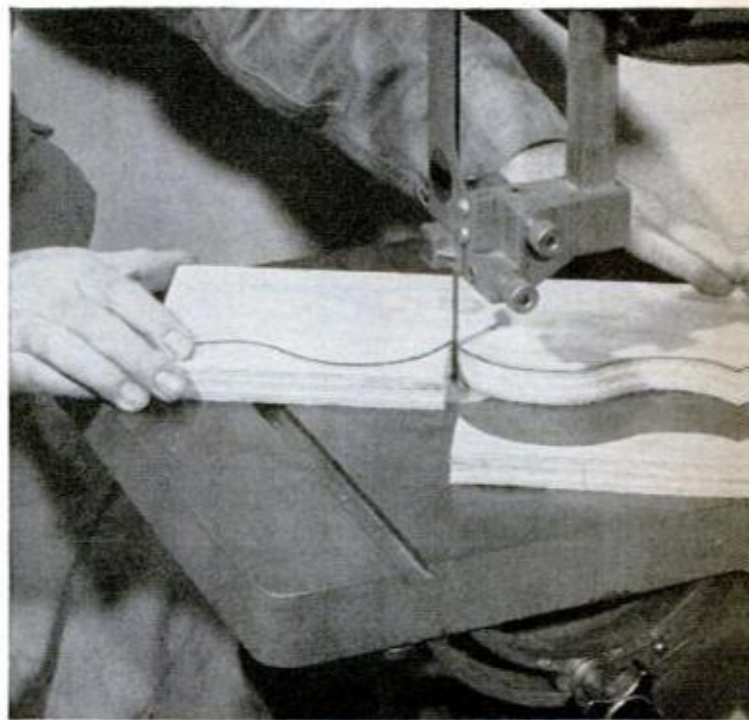




A wooden V-block cut on your circular saw to cradle the work makes your bandsaw extra handy for kerfing the end of turning squares, as well as splitting dowels and other cylindrical work down the middle. In each case, the block is clamped in position to the bandsaw table so the V-cut bisects the blade precisely.



With its table tilted  $45^\circ$  and a wooden fence clamped to it, your bandsaw provides a quick way of roughing turning squares "in the round" prior to mounting between centers. Fence is positioned so corners of work are ripped off.



To avoid becoming "pocketed" when cutting a scroll in which two curves meet, always saw in first from the edge to point of the pocket. Kerf frees waste when you reach pocket, eliminating backtracking. Complete the cut from opposite end.

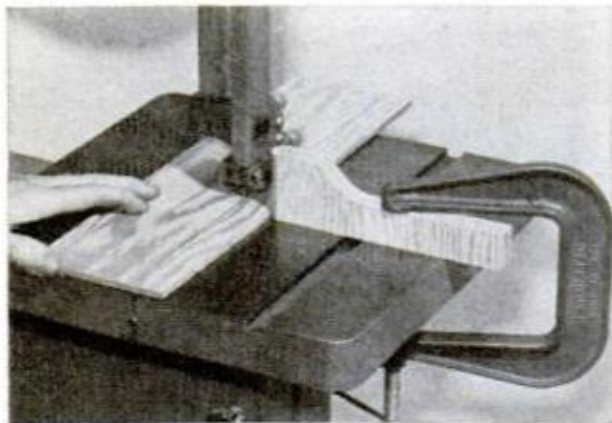
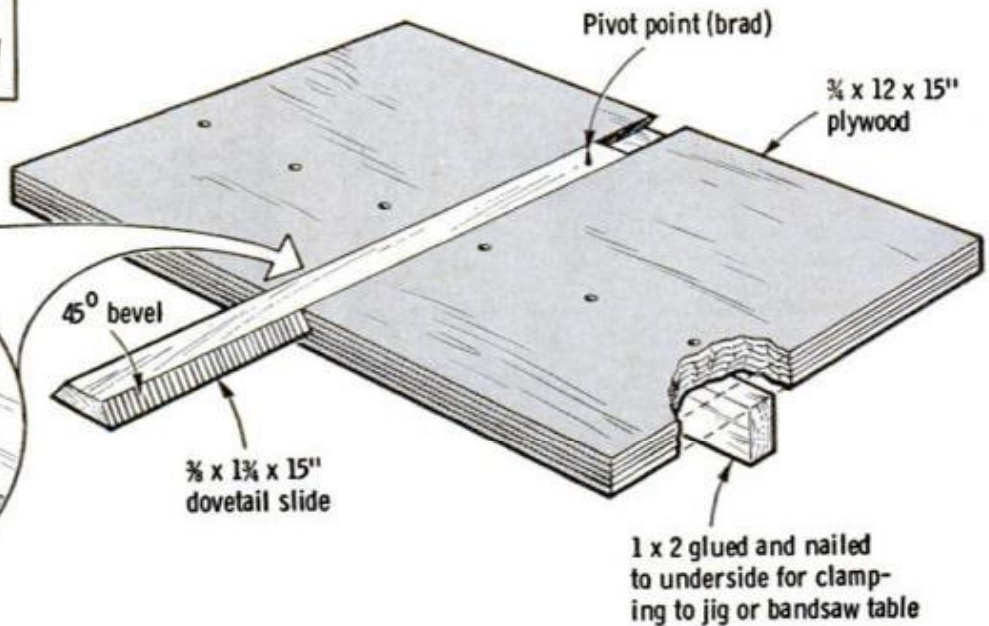
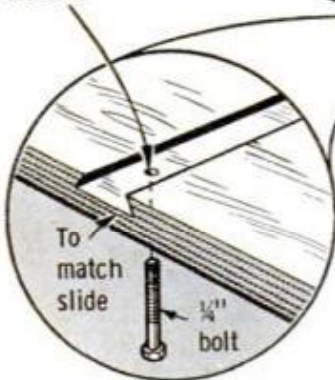




When it comes to cutting perfect discs of any size, you can't beat a bandsaw and a circle-cutting jig. With the work impaled on an adjustable pivot point, you cut a perfect circle by merely rotating the work. The drawing below shows how the jig is made and designed to clamp to the edge of the bandsaw table. Size of stock must be roughly the diameter of disc to be cut so blade is on line when it enters the wood.

**CUT FOLD TAPE** **BANDSAW KNOW-HOW**

Drill No. 7 hole, tap  $\frac{1}{4}$ -20 for bolt



When you find that the blade has a tendency to drift away from the cutting line when doing repeat ripping, a pivot fence clamped to the saw table will solve the problem. Having a rounded nose, the center of which is positioned to align with the front edge of the blade, the fence allows the work to be maneuvered to compensate for drift as the work is passed through the blade. The fence, of course, is located a distance from the blade equal to the width of the finished work. The work is held against the pivot fence at all times.



Mass ripping of identical widths on a bandsaw means less kerf waste than that created by a bench saw; this can add up to a considerable saving when cutting pieces in large quantities. If your saw is not already equipped with a fence, you can improvise one by clamping a wood strip to the table, using a try square to align it with the front of the table and parallel with the blade. A wide blade works best in straight ripping operations since it will not tend to drift as much as a narrow blade. It will always pay to switch to a wider blade. ★★

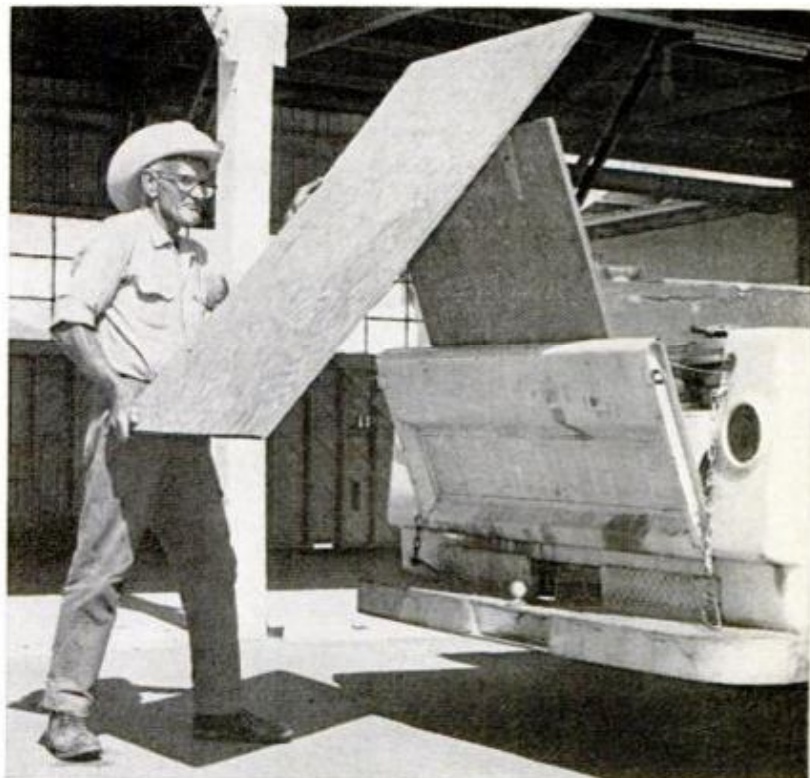
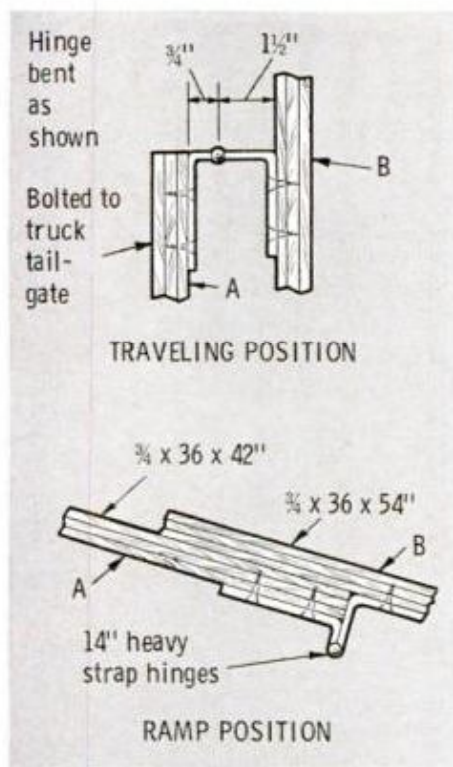


# Tailgate Ramp for Pickups

LOADING AND UNLOADING a heavy power mower from his pickup is a breeze for one California landscape gardener. He simply lets down the tailgate of his pickup truck and presto!—a ramp comes with it which lets him wheel heavy yard equipment up or down with the greatest of ease. When he's on his way, the ramp stands upright with the tailgate.

The two-piece ramp, consists of ply-

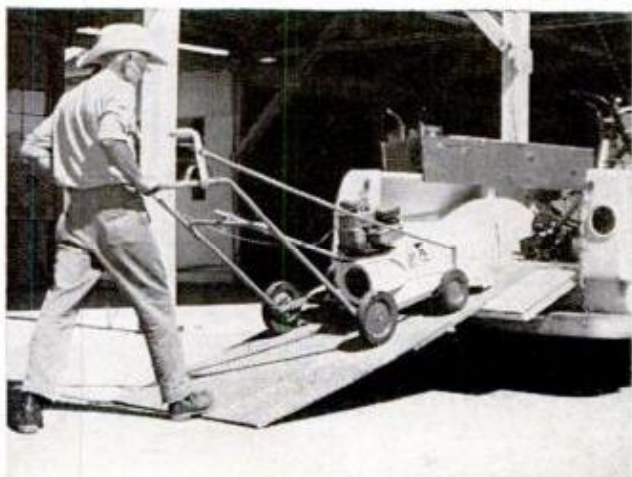
wood panels, A and B, which lap one another when in the lowered position. Panel A is permanently bolted to the inside of the tailgate, while panel B is attached to panel A with two sturdy strap hinges, the leaves of which are bent offset as shown in the drawing. Exterior-grade plywood should be used for the ramp, of course, and given a couple coats of porch and deck paint for added protection.—Hi Sibley



**ATTACHED RAMP** flops down as tailgate is lowered, above, right; gives rigid support to heavy equipment

**STOWED FOR TRAVELING** (right), ramp, which is bolted to tailgate, rides upright ready for instant use

**WHEN LOWERED** (below), ramp provides easy incline for wheeling heavy yard equipment into pickup truck





# PICKING THE

By STEVEN J. HOWARD

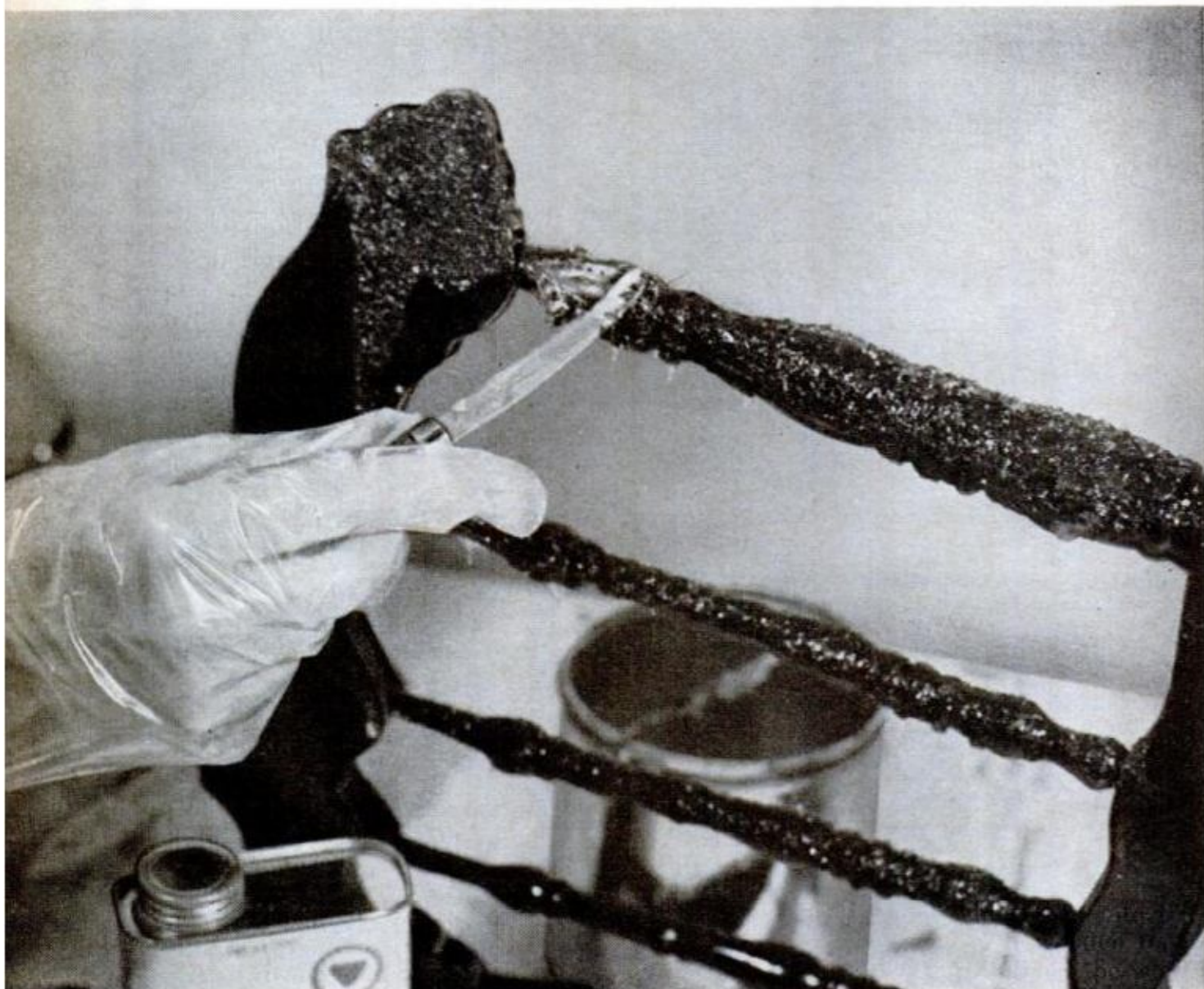
There are more to choose from than you might

**C**OMPLETE REMOVAL of old paint or varnish is usually the first and most important step in a good refinishing job. But it's not as simple as just buying a can of remover and sloshing it on. There are several types to choose from, and it's important to use the one made for your particular job. Picking the right kind can make the work go a lot faster and easier as well as give you better results. The following are questions most often asked about chemical removers together with their answers.

*When should you use a chemical remover?*

This depends on the size of the area and its condition. If the area is small and the old surface is still basically sound and not too thick, a light sanding may be all that's needed. Also, if you have to remove badly cracked or alligatored paint from a large surface, such as the side of a house, the manual heating and scraping method can prove just as fast and is certainly less expensive.

Chemical removers are at their best on



**PASTE-TYPE REMOVERS** stick to vertical or irregular surfaces like these chair rungs where liquid removers would drip off. But they're slower to apply than liquids and are not as suitable for flat surfaces



# RIGHT PAINT REMOVER

guess. For top results, you must know which one is best for your particular job

small, tough jobs like stripping built-up paint or varnish off old furniture and cabinets. Removers can also be used to advantage on relatively small household refinishing jobs, such as taking caked, old paint off trim, baseboards, window sash and stair treads.

*From brand to brand, is there a difference in paint removers?*

Yes, and it can get confusing. What may appear as comparable removers made by two different companies may not be comparable at all. In fact, two, three, or even four removers made by the same company may differ greatly.

The best way to identify different removers is by their chemical content. Some contain benzol, acetone and wax. These are highly flammable and tend to leave a waxy film on the surface that must be sanded off before the new finish is applied. They also work more slowly than other types.

Other removers contain a high content of methylene chloride and an emulsifier. They are not flammable and are relatively fast-acting. When the finish is removed, the surface is clean and ready for refinishing after some light sanding.

*Is chemical content the only difference between removers?*

No. Some types are thin and watery. Others are heavy-bodied liquids. Still others are in paste form.

*What are wash-off removers?*

They are primarily methylene chloride types that lift off the finish. The top layer of sludge is removed by skim scraping. Then the rest of the sludge is removed with water and heavy rags or a brush.

*I've heard that wash-off removers are faster than others because you wash most of the sludge away. Is this true?*

Yes and no. It is true you can remove the old finish faster than with a non-wash-off remover because little scraping is required. But in using water to get the speed, you wet the wood and it becomes



**LIQUID REMOVERS** are brushed on and allowed to stand. They come in two types—thin and heavy-bodied. Thin ones are suitable for flat surfaces only, do not penetrate as deeply as heavy-bodied types



**WASH-OFF REMOVERS** are wiped away with water and a cloth. They save some of the drudgery of scraping, but leave surface wet and shouldn't be used where a new finish is to be applied immediately

necessary to wait for the surface to dry completely before applying a new finish.

*Which is best—a liquid or heavy-bodied remover?*

This depends on the surface configuration. Liquid removers should be used on



flat surfaces only or you'll have a mess. They run and drip readily. Conversely, heavy-bodied removers, which are also liquid but heavier in consistency, cling to a surface without running off. This is a big advantage when you go to remove a finish from vertical or rounded surfaces.

Paste-type removers, which are even thicker than the heavy-bodied type, offer the same stick-to-anything advantage, but are a bit slower to apply.

*What about a liquid sanding agent?*

This is not really a paint remover at all. It's a bonding liquid that cleans and dulls enameled and varnished surfaces prior to refinishing. It does not remove the finish. You simply apply it, wait for it to get tacky, then put the new finish right over the old.

*What type of remover is best for removing varnish?*

Any paint remover will also serve as a varnish remover.

*How about lacquer?*

Some will remove lacquer, others won't. Generally, your heavy-bodied and paste-type removers will do the job—liquids won't.

*Will a paint remover remove shellac?*

No. The job is easily done, though, with



**THICK, GOOEY SLUDGE**, left after paint remover has softened and loosened the old finish, must be scraped off. Best tool for this is a broad-bladed putty knife. Be sure to wear gloves at all times

denatured alcohol solvent or shellac thinner and No. 2/0 medium steel wool.

*How long do you leave a remover on?*

Let the remover stay on the surface for about a half hour. Then test it. Stick your finger into the sludge, wearing rubber gloves. If it goes through to bare wood, the remover has done its job and you can scrape the finish off. If not, give the piece a second application of remover. ★★★

**QUICK FACTS ABOUT PAINT REMOVERS**

Characteristics	Types of Removers			
	Liquid	Heavy-Bodied Non-Wash-Off (Methylene Chloride)	Heavy-Bodied Wash-Off (Methylene Chloride)	Paste
Removes lacquer				
Removes synthetic baked finishes				
Removes latex paint				
Removes varnish and oil-base paints				
Penetrates deeply				
Is nonflammable				
Has low toxicity				
Washes off with water				
Requires scraping				
Works on vertical surfaces				
Works on horizontal surfaces				



# HINTS FROM READERS

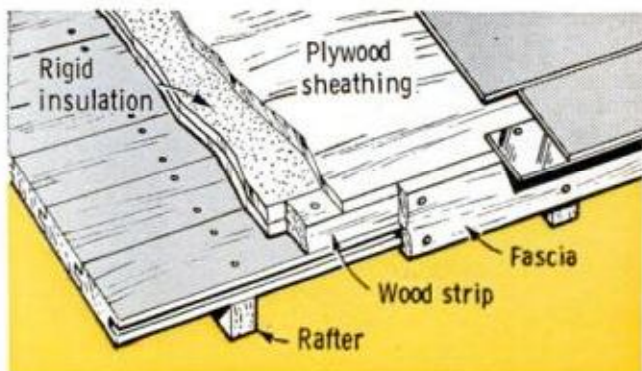
## Plywood arches brace forms

Concrete fill in footing and curbing forms won't force the boards out of line if you place these plywood arches along the forms at 2-ft. intervals. Cut from scrap, they're all made to fit down over the forms and cut to allow a 2-in. clearance at the top. The clearance lets you finish-trowel under the arches, which you can't do when the bracing is nailed across the tops of the forms in the normal manner. When it's time to remove the forms, the braces are simply yanked off.—*Arnold R. Whitney*



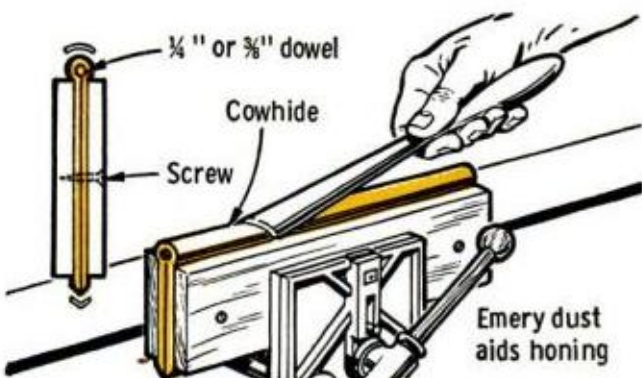
## Strip provides solid nailing

When rigid insulation is sandwiched between the deck boards and the plywood sheathing of a roof, it leaves nothing to which the fascia board can be nailed unless you first install a wood strip along the eave. The strip, which is the same thickness as the insulation, is nailed along the roof's edge, after which the insulation is butted against it.—*Victor J. Lamoy*



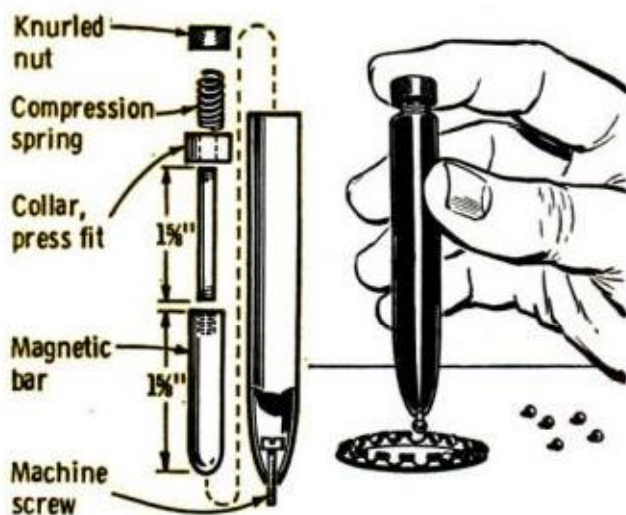
## Honing block for gouges

Carving gouges must be stropped on both inside and outside edges to be razor sharp. It's easy enough to do the outside on a flat piece of leather, but to do the inside you'll need a honing block like this which will take care of both concave and vee gouges. I made it by wrapping a piece of cowhide around a dowel and clamping it between two blocks.—*Jay Scriba*

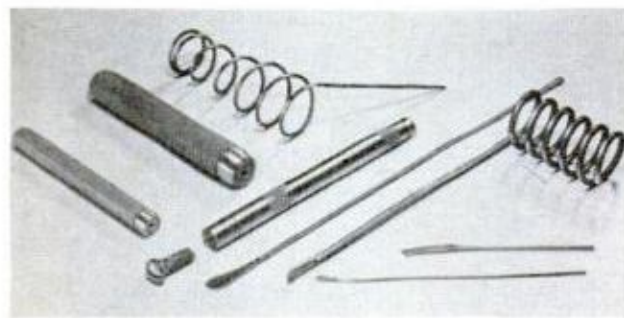
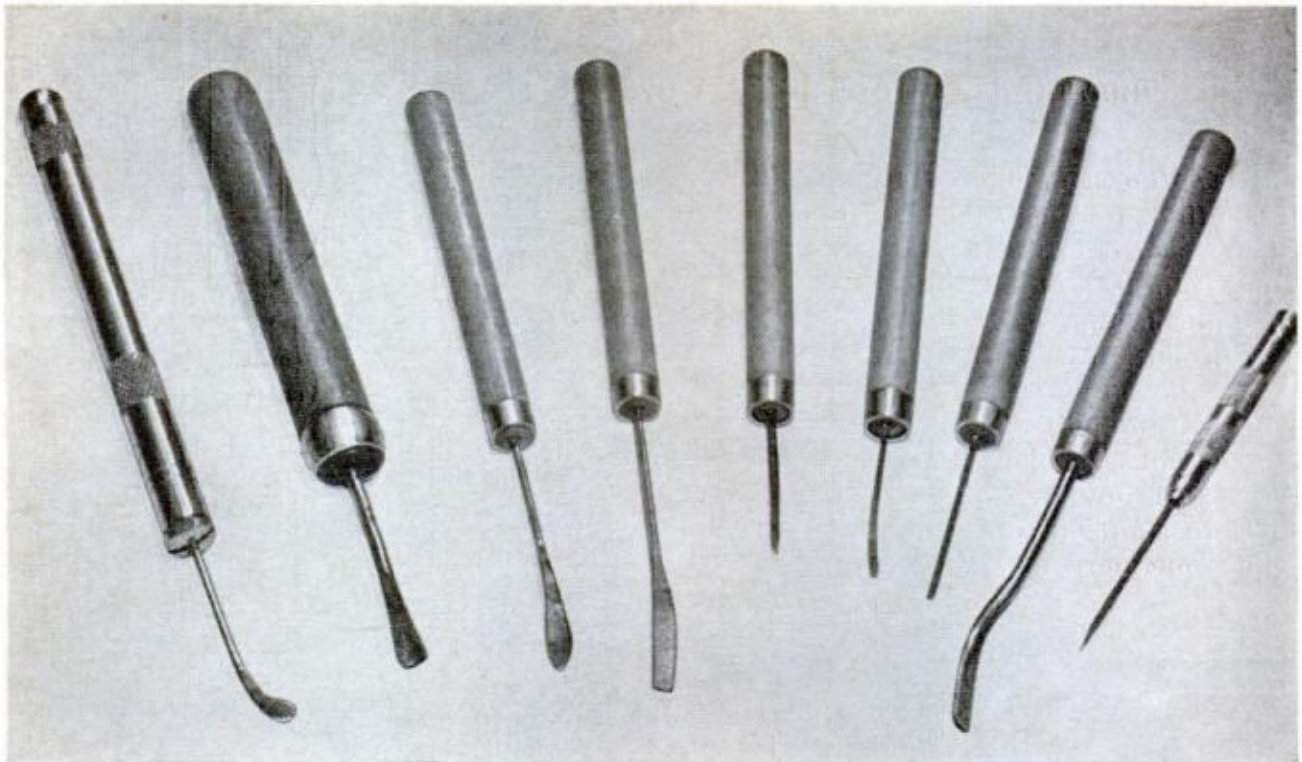


## Tool picks up bearings

Handy as can be when it comes to replacing the tiny balls in a bearing race, this homemade tool lets you pick them up one by one and deftly insert them in place. It's made from the barrel of a ballpoint pen and the detail shows how it works. A machine screw in the end of the pen becomes magnetized when a spring-loaded magnet touches it. Pressing the knob keeps the magnet in contact. When released, the screw tip drops its load. The magnet, which is a sliding fit inside the pen, is a steel rod, tapped for a machine-screw shaft and magnetized.—*Peter Legon*







COIL SPRINGS yield tough steel for wire tools. At the center is a homemade collet-type toolholder

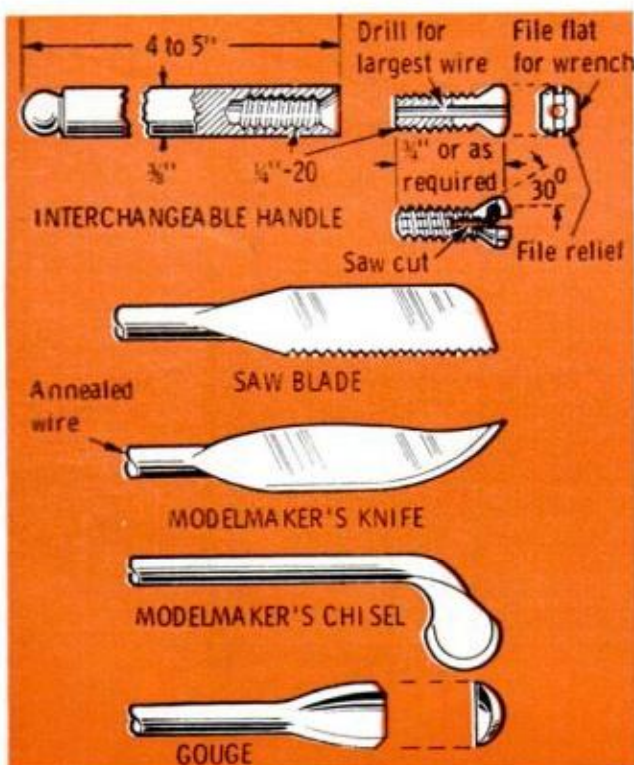
# Tools from Wire

YOU CAN TURN ordinary steel wire into a surprising variety of tiny, special-purpose tools for delicate jobs where conventional tools aren't suitable. Miniature knives, chisels, files, gouges, punches and scribers can speed many operations in carving, modelmaking and machining small metal parts.

While almost any steel wire will do, the best to use is the high-carbon type found in springs and musical-instrument strings. Most of the tools shown here are made from straightened-out coil springs—an excellent source of tough steel. For very small tools, music wire is ideal.

The first step is to anneal or soften the wire to make it workable. Heat it bright red, then let it cool slowly. Tools that do not need a great deal of shaping can be made directly from hardened wire without annealing. Points and edges can be ground on hardened wire, but be careful not to get the metal hot enough to lose its hardness in the process.

For tools like knives, saws and gouges, it's necessary to flatten the wire. You can do this by hammering after annealing or while the wire is still red hot. Form cutting edges by filing and honing, adding a

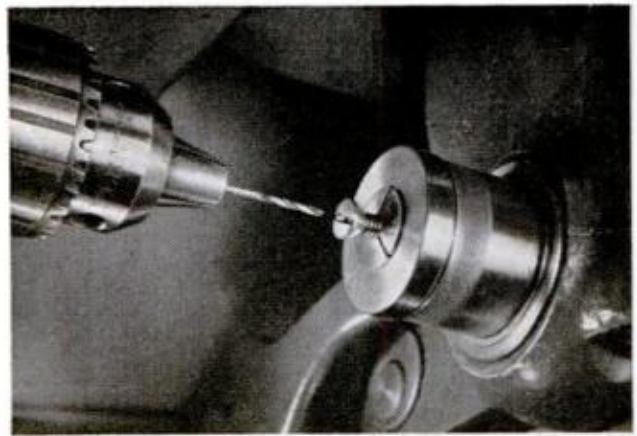




final honing after rehardening. Tiny file teeth can be cut with a cold chisel. Tap the chisel just hard enough to curl up a series of sharp burrs.

To reharden a finished tool, heat it until it's cherry red, then plunge it into cold water. Tempering, or drawing, consists of reheating the tool just enough to eliminate excessive brittleness and give it toughness. Polish a bright spot on the tool and note how it changes color as the piece is heated. As a rule of thumb, the tool can be quenched when it reaches a yellow or yellow-brown color. However, more specific colors usually recommended are a spotty reddish-brown for wood-cutting tools and dark purple to blue for saw blades, screwdrivers and needle-type instruments.

Handles for small tools can be made from hardwood dowels. Drill the ends for a tight force fit and press the shanks of the tools into the holes. The drawings also show how to make an interchangeable toolholder from  $\frac{3}{8}$ -in. rod and a fillister-head capscrew. The screw, drilled and slotted, is squeezed together as it is turned into the handle, gripping the tool firmly.—*Walter E. Burton*



**A DRILLED AND SLOTTED BOLT** makes a collet for holding wire tools. Drilling is easiest in a lathe



**AFTER HEATING A WIRE** to reharden it, quench it quickly in water before it has time to air-cool

## NEXT MONTH IN SHOP AND CRAFTS

**DISAPPEARING BARS.** You may want to build a home bar some day—and if you want it in the family room, you're in luck. The August issue details two bars that are unique, bar none, and made to order for such a room. One folds away and the other tucks away so they're out of the way between parties. We designed and built them especially for you and are presenting them in beautiful rotogravure, along with a galaxy of hobby-bar ideas for the rec room and kitchen.

**18 WAYS TO GET MORE FROM YOUR PORTABLE DRILL.** Stirring paint, polishing your car and removing rust with a wire brush are three well-known jobs for a portable electric drill. But these are a drop in the bucket when it comes to the multitude of things you can do with this handiest of all portable tools. Our August Toolesson shows you 18 additional tasks this "one-man band" can handle—besides drilling a hole.

**MAKE YOUR OWN METAL CASTINGS.** The ancient "lost wax" process, combined with modern equipment, makes it easy to custom-tailor just about any metal shape you need. Here a master pattern is carved in wax which is later removed from the mold cavity by melting. Process permits faithful reproduction in minute detail. You'll want to learn all about investment casting in the August issue.

**NEW PAINT WONDER: WATER-THINNED ENAMEL.** No longer must you switch in mid-job to an oil-base paint to do woodwork. New high-gloss water finishes not only save the fuss but—and here's the surprise—actually outshine and outwear the old standbys. Watch for this informative craft feature in the August issue.

**UPDATE YOUR OLD SHOPSMITH.** Early-model owners of this multipurpose tool can make it all the more versatile by replacing its legs with a boxlike base so it can do a two-way flip like its big brother, the Mark VII. Elevator blocks raise the lathe to a more comfortable working height. Complete plans are in the August issue.



## Installing CB Mini-Rigs

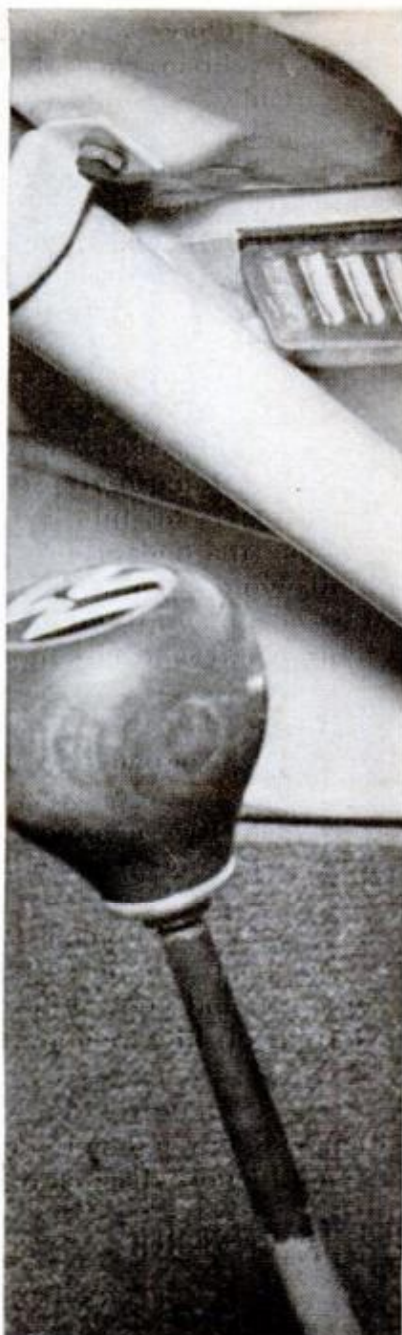
# Two-Way Radios You Can Tuck Anywhere

Slim and trim, new mobile Citizens Band transceivers are big in talk-power, yet small enough to go along for the ride, even in bug-size cars or pint-size boats

By BILL HARTFORD, KOD 5798



**BEST ANTENNA LOCATION** for omnidirectional radiation pattern is center of car roof. Compromise installation shown here gives pattern slightly directive toward front of car. Coaxial cable runs through roof to transceiver

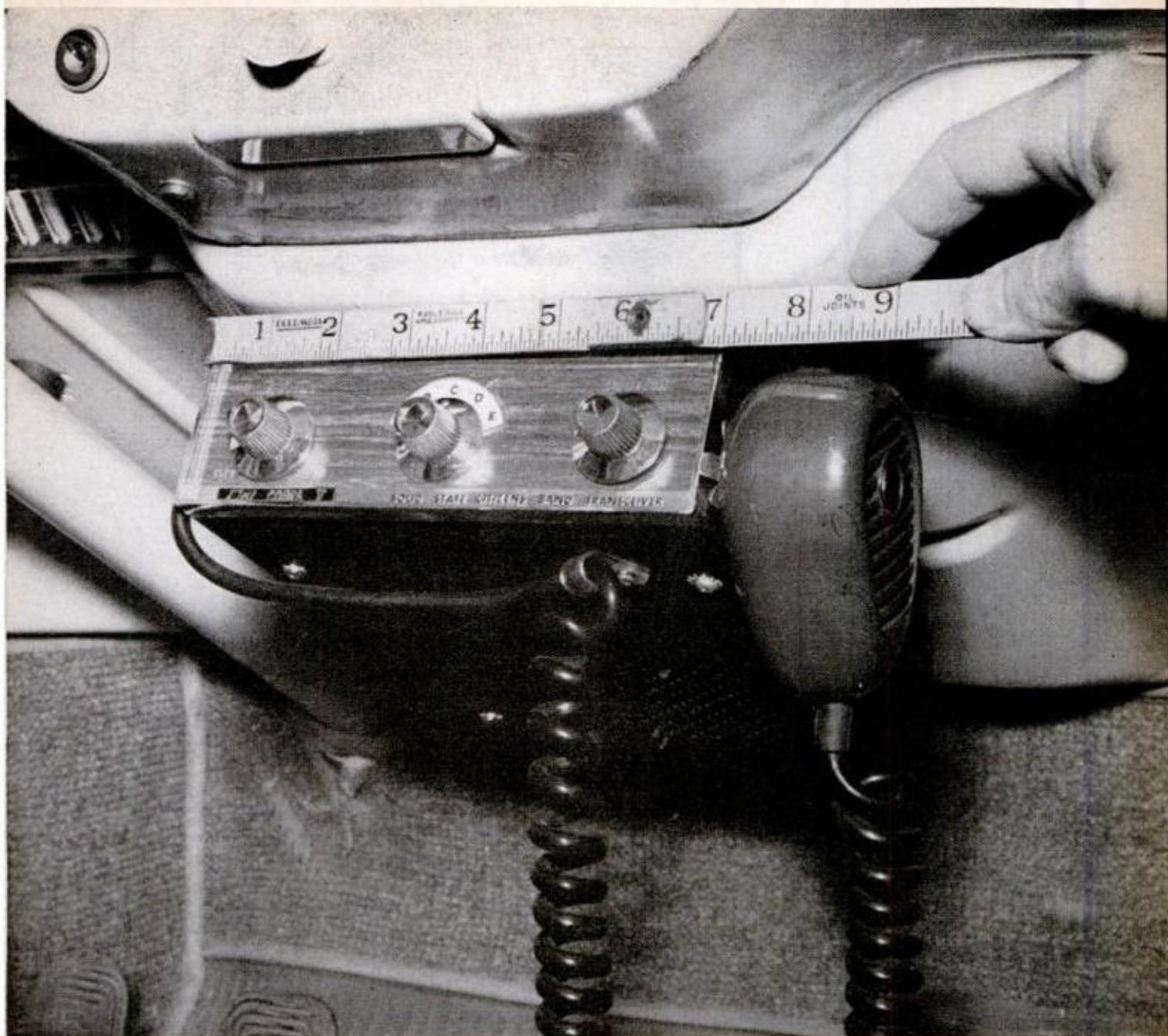


▲ **B&K COBRA** is a 5-watt transceiver that is typical mini-rig size. With its 6 $\frac{7}{8}$ -in. width and flat 2-in. height, it won't cause snagged-stockings complaints from female passengers



**CURRENT DRAIN** of the Cobra V in unsquelched standby is a scant 750 milliamps; transmitting, it's 1 $\frac{1}{2}$  amperes maximum—not even enough to make a noticeable deflection on ammeter





**W**ATCHING SKIRTS GO BY, you may wonder where the mini-madness will end. But when it comes to electronics it's not madness at all. "Think small" engineering has made possible achievements in industrial, military, medical and consumer electronics undreamed of before the vacuum tube went the way of the crystal radio. Scaled-down components and solid-state technology have sized down commonplace radio and television receivers and made sophisticated gear—pleasure-boat radar, for example—a more frequent sight.

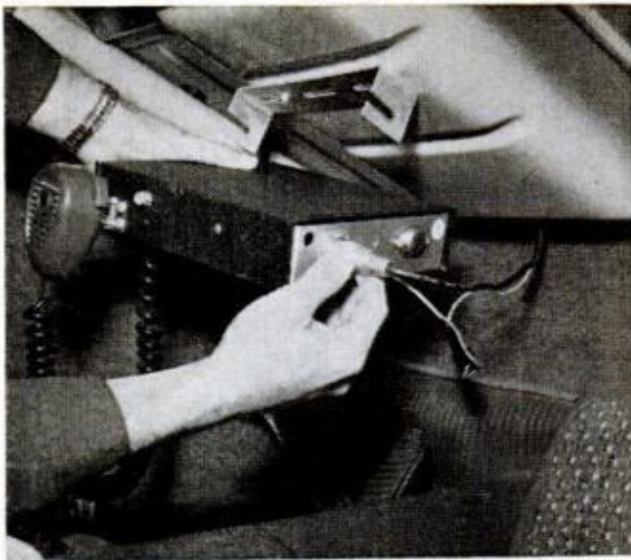
CB radio hasn't escaped the magic of miniaturization. It's easier than ever to equip your car for two-way communication despite center consoles, tape players, airconditioners and other add-ons that

gobble up almost every cubic inch of space around your legs.

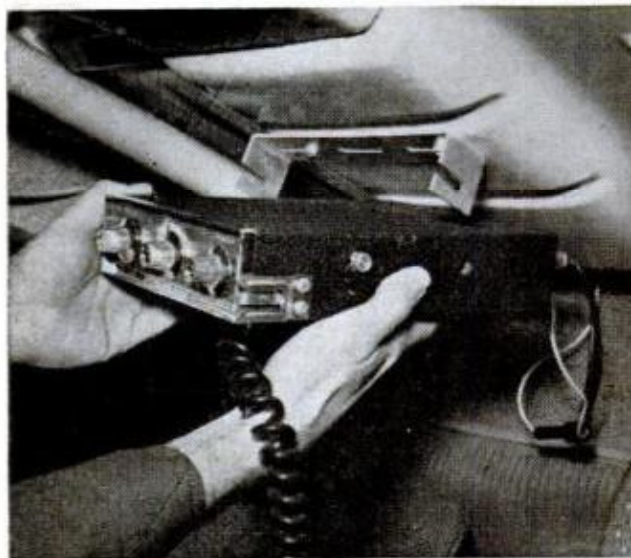
Compact solid-state CB gear also has the fringe benefit of consuming less power than your brake lights—nice to know since you first need those valuable amperes to move your power windows, lift your convertible top, condition the air and keep your electromechanical monster moving.

The CB transceivers that interest us here are all "Class D". This means that they comply with Part 95 of the Federal Communications Commission's rules and regulations. Most operate at the maximum allowable 5-watt input to the transmitter's radio frequency output stage. They are crystal-controlled to operate on any or all of the 23 channels within the 27-megahertz citizens band, and they range in price

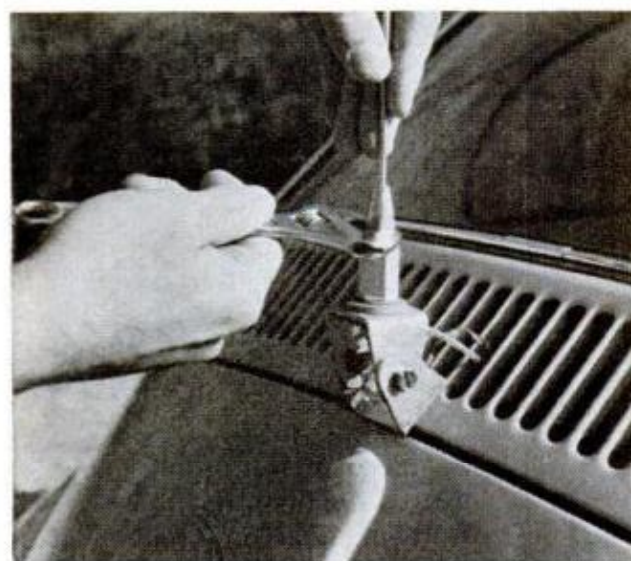




**ANTENNA AND POWER** are the only connections to rear panel of Citizens Band transceiver. Fused power lead picks up 12 v. from car's accessories circuit



**MOUNTING BRACKET** is secured under dash by two screws and transceiver slips into slots. Microphone slides into clip mounted on side of the transceiver



**HIGH-GAIN "JIFFY TOPPER"** antenna can be removed from base when not in use. Versatile antenna mounts often need no external holes; some attach magnetically

from a low of \$50 to more than \$200.

Happily, the number of channels for which a transceiver is equipped only slightly affects its size. A typical solid-state 23-channel rig is not much larger than the 5-channel Cobra V shown in these photos. Imagine holding five or six copies of *PM* in a pile in your hand and you'll get an idea of how small the latest mobile transceivers are.

If you don't already have the CB license you'll need before you go on the air with a 5-watter, send your application with \$8 to the FCC first thing. By the time you select a rig, install it in your car and are ready to hit the press-to-talk button, you'll be legal. There's no test to take; the only requirement is that you be familiar with FCC rules and regulations for Class D operation.

The first step in "going mobile" is to give your car the once-over. After you've planned your installation, it's a quick job to mount antenna and transceiver and make connections. The planning is important. Mount the transceiver where its switches will be accessible and the microphone clip where the mike can be used conveniently without interfering with car controls.

Antenna installation requires the most forethought for several reasons. The radiation pattern should be omnidirectional; that is, ideally, your signal should radiate with equal strength in all directions. Tests have shown that an antenna mounted in the center of the roof will come closest to being truly omnidirectional. When it is shifted to, say, the left rear fender, the radiation pattern becomes somewhat directional out from the right front fender. The rule of thumb is that antenna radiation will be greater in the direction of the greatest mass of automobile metal.

Accordingly, select a mobile antenna with a location in mind. Some mobiles have a base bracket that slips between the car body and trunk lid and bolts to the recessed flange. Others attach magnetically to the roof. Still others, combination CB and AM broadcast antennas, are cowl-mounted like those of most car radios. These antennas are kept to a maximum height of about 50 inches by incorporating a loading coil. Full  $\frac{1}{4}$ -wave whips—9 feet high—are usually bumper-mounted.

Running coaxial cable from antenna to

*(Please turn to page 181)*



What kind  
of man uses  
Vaseline  
Hair Tonic?



His host has just been shot "I saw her shoot him." "No! I just picked up the gun." "You're a liar..."



"I saw smoke pouring from the gun, my dear." "Impossible, you're the liar." How does he know?



.38 caliber cartridges are virtually smokeless.

Some men are hard to fool.



The man who knows how to take care of himself  
uses Vaseline® Hair Tonic.



CLEAN AND CLEAR



## CHEVROLET'S NEW CAMARO

(Continued from page 124)

driving—around town and on long trips.

Comments pertaining to Camaro owner likes and dislikes are quoted below, again in order of frequency mentioned. The boldface asides are mine.

As pointed out above, what owners are most happy with is the car's styling.

"Fell in love with the looks of it."—Delaware secretary.

"Eye-catching. Just plain sharp."—Indiana steelworker.

Owners like the way the Camaro handles, too. Even some of those who weren't too happy with the rear suspension had kind words for other handling aspects.

"Good maneuverability for city driving."—Iowa radio news director.

"Handles great at high speeds."—Mississippi college student.

Next on the list of praises were orchids for the Camaro's get up and go.

"Excellent passing pickup."—Arizona physician.

"Lots of pep, even with a Six."—Maine mechanic.

"Snappy takeoff."—Florida, retired.

### ► This gentleman is 75 years old. Oh you kid!

In addition to praises for the Camaro's scoot, owners have nice things to say about the car's all-'round performance.

"Everything—power, economy, quietness—goes together nicely."—Michigan lathe operator.

"Best performer on the road."—Ohio lab technician.

Ranked fifth on the list of owner likes was the Camaro's economy.

"Fuel economy exceeded my expectations."—Maryland electronics technician.

"Mileage with the Camaro is better than with the '65 Fury I traded in."—Kansas supervisor.

Switching to the minus side of the owner ledger, we've already cited appropriate owner complaints about the rear-end engineering. Next in sour volume were beefs about rear-seat legroom.

"I wouldn't torture anyone by making them sit in back for any length of time."—Montana student.

"Very little legroom."—Connecticut bacteriologist.

### ► Yeah, for very little legs. And that's all. The car's not designed as a multipassenger carrier.

Some of the sharpest owner criticism of the Camaro appeared in comments about the inboard curvature of the rear fenders.

"Extension of the rear wheels beyond the wheel housing makes mud flaps necessary."—Massachusetts student.

"Rear wheels throw gravel, mud, dirt and so on up against the fenders, chipping the paint."—Michigan factory worker.

Comments pertaining to the fourth-ranked item on the dislike list can be summed up simply by reporting that owners who mentioned it thought the trunk was much too small. Yet here again one is tempted to point out that a big trunk—like lots of rear-seat legroom—isn't the name of Camaro's game.

In fifth place on the gripe list were some salty comments about rattles.

"Rattles pretty bad for a new car."—Indiana assembly worker.

"Rattles more after four months than my Corvair did after three years."—Maryland computer programmer.

Back on the plus side, Camaro owners had nice things to say about the car's ride ("Smooth."—Louisiana secretary) ("Rides like a car costing much more."—Massachusetts truck driver) and overall size ("Just right for my needs."—Ohio plasterer) ("Perfectly proportioned for the type of car it is."—Colorado engineer). Camaro owners also praised the car's all-'round comfort, its "feel" on the road, and its interior styling.

Winding up the complaint list, many Camaro owners squawked about poor gas mileage ("Mileage should be better for a car this small."—Iowa salesman), the seemingly ever-present poor workmanship ("Bolts were loose, doors improperly adjusted, paint was bad, upholstery job was sloppy."—Minnesota locomotive engineer), restricted rear visibility ("Vision limited through rear window."—Alabama, U.S. Navy), wind noise, and—as reported by those who own the SS model—a certain amount of trouble with the "hide away" headlight mechanism.

Perhaps because the Camaro is an all-new car, PM's survey of its owners elicited rather positive, even colorful, comments. Apparently, the concept of a "personal" car involves personal feelings.

"I like everything about my Camaro."—Colorado receptionist.

"It's a dream."—Kansas entertainer.

"We're trading it for something else . . . anything."—Minnesota technician.

"All in all, General Motors has made itself an Edsel."—Mississippi student.

Harking back to our opening illustration of computers used in the design and engineering of the Camaro perhaps going somewhat awry (at least in many owner opinions), a Missouri draftsman said:

"Yes, I know it was engineered by computer, and after owning the results, I feel I don't have to worry about being replaced by pushbuttons."

A comforting thought, that. ★ ★ ★





## For You Who Know Good Tools . . . And Won't Buy Any Other Kind

If you're one of those discriminating hand tool users who know and demand only the best, chances are you're already a Channellock customer. You know the beauty of full-polished, drop-forged steel, the smooth working precision-made working parts, the fine, hand honed cutting edges that distinguish hand

tools by Channellock. What you may not know is the wide choice of Channellock quality tools available to you. You can treat yourself to an arm-chair visit with the entire Channellock family in our color catalog. Let us send you a copy, no charge.

TOOLS BY  
**CHANNEL LOCK**<sup>®</sup>

MEADVILLE, PA.



## MODEL ROCKETRY

(Continued from page 151)

the first button, labeled "Arm," turns on the power and lights the pilot lamp. Although electricity is passing through the ignition wire, the wire does not heat up because the current is being used by the bulb. The second button, "Fire," shorts out the pilot lamp so the light goes off and the wire gets red hot. If either button is pushed alone, the rocket can't fire.

Be sure to test out the control before firing an actual rocket. Follow the accompanying diagram for wiring the switches and lamp. Attach the clips on the launcher to a spare ignition wire without inserting it in a rocket engine. The wire should heat up only when both buttons are pressed. Pushbutton switches and 6 to 8-volt pilot-light assemblies are available at radio-parts stores or from mail-order houses like Allied Radio in Chicago and Lafayette Radio, Syosset, N.Y.

Solder all connections. Drill two holes down through the control box to match the holes in the top and bottom of the launcher. Short dowels through these holes pin the control box to the launcher when it's not in use.

### Making the rocket

While you can make your own rocket body, it's generally easier and better to start with a stock part. Commercial bodies are thin, lightweight cardboard tubes that come in different lengths and diameters. These and other rocket parts are available from Estes Industries, Inc. of Penrose, Colo., one of the biggest model-rocket supply houses.

The rocket shown here is based on a 9-in. body tube with an inside diameter of  $\frac{3}{4}$  in. This is Estes part No. BT-30. You can buy a stock nose cone to fit (Estes No. BNC-30E) or shape your own from balsa. The fins, parachute and other odds and ends are all homemade.

The only tricky part is installing the engine retaining ring. This is formed by winding a strip of  $\frac{1}{4}$ -in.-wide cardboard around a  $\frac{3}{8}$ -in. dowel until you build up a ring that will fit snugly inside the body tube. Apply glue to the strip as you wind. When the ring is complete, slide it into the body tube just ahead of the engine.

Since the rocket is designed to use  $2\frac{3}{4}$ -in.-long engines, position the ring  $2\frac{3}{4}$  in. from the after end of the body tube. You can use an actual engine to push the ring in place, stopping when the rear end of the engine is flush with the end of the body. Coat the inside of the tube with glue at the proper point first. Be sure the ring is firmly anchored as it must with-

stand much of the engine's forward thrust.

A short length of soda straw cemented to the side of the rocket provides a guide for the launching rod. The rod is inserted in the straw and supports the rocket at the desired angle on the launcher.

The parachute is made from plastic drop cloth or cleaning-bag material. Attach shroud lines and tie their ends to a small fishing swivel of the type that comes with a snap hook. Clip the swivel to a small screw eye in the end of the nose cone. Also run a length of rubber from the screw eye to the rocket body as shown. This keeps rocket and nose cone together when the parachute is released.

### Blasting off

The rocket is prepared for flight by packing the space above the engine with about  $1\frac{1}{2}$  in. of loose mineral-wool insulation. This protects the parachute from the hot ejection blast. Dust the parachute with talcum powder before inserting it in the rocket so it will slide out and open up easily without sticking. To prevent the plastic from taking a set, don't store the chute in the rocket for long periods. Keep it unfolded until minutes before use.

Rocket engines are rated according to the amount and duration of their thrust. The first few flights should be made with a modest  $\frac{1}{4}$ A.8-2 engine so you can become familiar with the rocket's characteristics at low altitudes. This engine has a 17-second thrust duration. Later, you can try a more powerful  $\frac{1}{2}$ A.8-2 engine with a 40-second thrust. Both engines have a 2 to  $2\frac{1}{2}$ -second time delay before the ejection charge. They should give flights of 100 to 200 feet or better.

Wrap the engine with masking tape to provide a tight fit inside the body tube. To attach the ignition wire, bend it at the middle to form a V with a rounded point, and press this point into the small hole in the back end of the engine. The wire is held in place by tamping a tiny wad of tissue paper into the hole on top of it. Attach the battery clips to the wire and you're ready to fire.

Before you blast off, here are a few final tips: In some states, rockets may be classed as fireworks and declared illegal so be sure to check the situation in your area before going ahead. In any case, never attempt to make your own propellant and use only engines recommended for your particular size and type of rocket. Don't launch a rocket at more than  $25^\circ$  from vertical or it may fly off dangerously close to the ground. Watch your eyes around the point of the 36-in.-tall guide rod, and stay at least 10 feet away from the rocket during a launch. ★★





**This is a GM Original:  
It keeps a cold engine  
from stalling.**



**This is a GM Replacement:  
It calms coughs  
due to cold, too.**

When you replace an Original GM Part with a bona fide GM Replacement, it's like getting another Original. Because GM Originals and Replacements are identical. In material, design and performance.

A comforting thought. Especially when the part has to be as sensitive as this vacuum break assembly. When the engine starts, this part feathers the choke precisely. Varies the choking through warm-up to assure smooth running.

For the best performance, use the best parts. GM Replacement Parts. They're available almost anywhere. And remember—good parts go with good service.

## **GENUINE GENERAL MOTORS PARTS**



**CHEVROLET • CADILLAC • BUICK  
OPEL • PONTIAC • OLDSMOBILE**

**United  
Delco**





## TUFFY—NAVY LIFEGUARD

(Continued from page 69)

at the Naval Ordnance Test Station at China Lake, Calif., have been taught to locate torpedoes and missiles lying on the ocean floor, making recovery easier.

The dolphin homes in on a beacon signal from the missile, then tosses a special hoop it carries over the missile or near it. The hoop breaks open; one half, being heavy, sinks to the bottom, and the other half, being buoyant, rises to the surface, uncoiling a wire attached to both halves. Divers can then follow the wire to the bottom.

Not only are members of the dolphin family extremely intelligent, they are also happy, friendly, playful individuals. They respond, like children or dogs, to praise and petting. And they also have a sense of humor. When a single spectator was standing at the edge of a raised circular tank in which a porpoise was swimming, the animal deliberately flicked its tail just at the right spot to shower the spectator with water each time it swam around the tank. It seems that a porpoise enjoys a practical joke just like anyone else!

### Highly developed sonar

One reason scientists are devoting a lot of study to the Atlantic bottlenose dolphin in particular is because they hope to learn more about its echo-locating system, or sonar, which is highly developed because this species lives in murky water. The animal emits a series of clicking sounds that are reflected back to it from objects, enabling the porpoise to swim to the object or avoid it, as it desires. It's been pretty well established that by sonar alone a porpoise not only can discover the size and shape of an object, but its composition as well.

One of the classic demonstrations of porpoise sonar was first made at Marineland of the Pacific, Los Angeles. Kathy, an Atlantic bottlenose, was blindfolded by pressing latex suction cups over her eyes, and even with this handicap she was able to swim normally without bumping into the sides of her tank. Still blindfolded, she was able to locate a thin metal rod and swim to it, pressing against the rod and causing a bell to ring. On this signal her trainer would throw a fish into the water about 12 feet away. Unerringly, Kathy swam straight to the fish and gulped it down.

In another demonstration the porpoise swam time after time between two metal rods scarcely farther apart than the width of her body, without touching them. Similarly, blindfolded porpoises have collected

floating hoops that were thrown into a pool. Still blindfolded, they have been able to hurdle a bar held above the water, at a different height for each jump.

Just like land animals, sea beasts are afflicted by a variety of ills. Pneumonia, diabetes, ulcers, enteritis and heart failure are among the afflictions that have been diagnosed. Occasionally an ocean animal suffers from sunburn or even mosquito bites.

Aside from the porpoises, a number of other marine animals are being considered for underwater work. There's even hope of employing some of the smaller whales for special tasks, such as hauling heavy cargoes along the bottom. Preliminary work with pilot whales at Marineland of the Pacific shows that they echo-locate in the same way as do porpoises, that they are intelligent, and possibly can be trained more rapidly than porpoises because they usually calm down more quickly after capture. Pilot whales (17 feet long, 3000 pounds) have been taught to leap high in the air for food and to perform other stunts. In fact, a big false killer whale at Marineland of the Pacific began doing out-of-water back-flip leaps after watching trainers teach this stunt to a porpoise. It was worked in as part of her regular performance from then on.

Sea lions (the "trained seals" of circuses and zoos) and some other members of the seal family may get regular jobs with the Navy, too. Sea lions have excellent eyesight, as research at Stanford Research Institute has shown, and very good directional hearing, although their sonar ability appears to be rudimentary at best.

All in all, don't be surprised if the Navy starts a brand-new kind of enlistment program in the future, for sea lions, dolphins and whales! ★★

Just Published . . .

### HOW TO REMODEL WITH DRYWALL

A PM How-to-Do-It Library Booklet

Here's all the information you need to do a first-class job with drywall in refinishing a basement, attic, room or merely repairing a wall: estimating and precutting timesavers; cutting and nailing techniques; ceiling and wall work, cutouts, bends; taping joints, filling cracks and holes; tools, supplies and predecorated boards. For your copy, send 35¢ for Booklet H103 to

Popular Mechanics Bureau of Information,  
575 Lexington Ave., New York, N.Y. 10022



# What did Lee have in mind when they gave permanent Lee-Prēst to Mr. Ryan?

She'll never have to iron shirts and pants again. Not with Lee-Prēst Chetopa Twills. The rough, tough polyester and cotton workwear. The workwear with the permanent press that's baked in. They always look great. No matter what the job. And Lee offers you more sizes and more stay-on-the-job features than any other workwear. Lee-Prēst Chetopa Twills. We guarantee they'll do the job. And if you don't think so we'll take 'em back. No questions asked.



**Mrs. Ryan.**



**Lee-PRĚST® CHETOPA TWILLS** KORATRON  
Guaranteed the hardest-working workwear

H.D. Lee Company, Inc., Dept. A, P.O. Box 440, Shawnee Mission, Kansas 66201. World's Largest Manufacturer of Union-Made Workwear. ALSO AVAILABLE IN CANADA.

JULY 1967

179





## It goes a lot further than the A. & P.

Have we got a customer in Kenya!  
The United Touring Co. runs 160 zebra-striped Volkswagen Station Wagons, taking tourists in and out of the bush.

The bush includes man-sized grass, seas of mud, craggy mountains, clammy jungles and an extinct volcano.

The bush does *not* include very many gas stations, water holes, repair shops or even paved roads.

None of which matter much to a VW.  
It doesn't need any water because the engine is air-cooled.

It gets wild mileage on 50c-a-gallon gasoline when and where it can find it.

The torsion bar suspension doesn't crumple when the going gets rough.

And the rear engine bears down for extra traction when it's needed.

So, even with tourists hanging out all 21 windows, the VW charges ahead.

Moral: There are dozens of lesser station wagons to choose from.

But anything less than a Volkswagen is just beating around the bush.





## INSTALLING CB MINI-RIGS

(Continued from page 172)

transceiver will very likely be the most difficult part of your installation. For the most artful job you'll want to snake the cable through your car body and this can take a lot of patience. In the Volkswagen installation shown here, the rear-engine ventilation louvers provided a convenient entry point for the cable, which was then snaked through the right-side roof channel and into the passenger compartment.

The easiest installation, on the other hand, is the cowl mount which requires a short cable and minimum snaking.

Most transceivers designed for mobile use require a 12-v. negative-ground system. Chances are you have it. For those cars that don't, you can get a converter that will boost 6 v. to 12 v. and even invert polarity if necessary. Lafayette Radio and E. F. Johnson, for example, supply converters with 1-amp. output. The Pearce-Simpson "Power-Match" has a higher output, handling loads up to 30 watts for sets that draw more than an ampere when transmitting. These transistorized power supplies are small enough to tuck behind any Detroit or Wolfsburg dashboard.

If your car does have the required 12-v. negative-ground system, it's a simple matter to connect the positive lead to the accessories side of your ignition switch.

Following is a list of CB manufacturers whose product line includes solid-state, Class D transceivers with dimensions much smaller than a breadbox:


- Allied Radio Corp., 100 N. Western Ave., Chicago, Ill. 60680.
- Amphenol Corp., 2875 S. 25th Ave., Broadview, Ill. 60153.
- B & K Mfg. Co., 1801 W. Belle Plaine Ave., Chicago, Ill. 60613.
- Demco Electronics, Bristol, Ind. 46507.
- EICO, Electronic Instrument Co., 131-01 39th Ave., Flushing, N.Y. 11352.
- Electronics Communications Inc. (e.c.i.), 56 Hamilton Ave., White Plains, N.Y. 10601.
- Hallcrafters Co., 5th and Kostner Ave., Chicago, Ill. 60624.
- Hallmark Instruments, Inc., 2620 Freewood Dr., Dallas, Tex. 75220.
- Heath Co., Benton Harbor, Mich. 49203.
- E. F. Johnson Co., Waseca, Minn. 56093.
- Karr Electronics Corp., 2250 Charleston Rd., Mountain View, Calif. 94041.
- Lafayette Radio Electronics Corp., 111 Jericho Tpke., Syosset, N.Y. 11791.
- Midland International Corp., 1909 Vernon St., N. Kansas City, Mo. 64116.
- Multi-Elmac Co., 21470 Coolidge, Oak Park, Mich. 48237.
- Olson Electronics, Inc., 260 S. Forge St., Akron, Ohio 44308.
- Pace Communications Corp., 24049 S. Frampton Ave., Harbor City, Calif. 90710.
- Pearce-Simpson, Inc., Box 800, Biscayne Annex, Miami, Fla. 33152.
- Polytronics Labs, Inc., 900 Burlington Ave., Silver Spring, Md. 20910.
- Radio Corp. of America, Harrison, N.J. 07029.
- Radio Shack Corp., 730 Commonwealth Ave., Boston, Mass. 02215.
- Raytheon Co., 213 E. Grand Ave., S. San Francisco, Calif. 02173.
- Regency Electronics, Inc., 7900 Pendleton Pike, Indianapolis, Ind. 46226.
- Sonar Radio Corp., 73 Wortman Ave., Brooklyn, N.Y. 11207.
- Squires-Sanders, Inc., Martinsville Rd., Millington, N.J. 07946.
- Texas Communications, Inc., 1601 W. Broad Way, Lubbock, Tex. 79401. ★★

## Sure beats smoking!




Enjoy Copenhagen: Place a small pinch between cheek and gum. No chewing.

United States Tobacco Company



45 seconds ago this drill press was a UNIMAT precision lathe!

UNIMAT is a vertical milling machine, surface grinder, polisher too—all in one compact unit. \$139.50! Write for free catalog, or send \$1 for 40 pg. handbook.



American Edelstaal, Inc., Dept. G-67, 358 Broadway, N.Y.C. 10013

Give your zip code when answering ads



## Cool Agent

MAC'S No. 13 is a specialist in eliminating radiator rust. This operator is guaranteed to rout it out—and keep it out. Result: clean radiator, cool motor, calm motorist. Ask for MAC'S No. 13 wherever automotive chemicals are sold.

**MAC'S SUPER GLOSS CO., INC.**  
Los Angeles 90042 • Cincinnati 45226



# GIANT 10 Ft. BALLOONS

**\$2.00** Guaranteed brand - new Gov't. surplus. Durable heavy-duty Neoprene rubber. Easily inflated with vacuum cleaner, auto air hose or fill with locally available Helium. Fly adv. signs high in sky. Visible for miles—terrific for attracting crowds to Sales, Fairs, Roadside Stands, Sports, Gas Stations, etc. 2' beach-ball size, 5 for \$1 — 4' size, 2 for \$1 — 10' size, \$2 — 16' size, \$5 — 28' size, only \$10. Sorry, no COD's.



**NOVEL PRODUCTS CORP.** 31 SECOND AVE., DEPT 208  
NEW YORK, N.Y. 10003

## AMAZING NEW ELECTRIC TORCH \$12.95!



**TERRIFIC INSTANT HEAT FOR ANYTHING!** Just plug into ANY 110 volt socket to L.T. Braze, hard solder, melt most metals. **Starts—stops instantly—Noiseless. THAWS—SWEATS—Pipes. Burns off paint. Starts charcoal fires—Replaces ALL OTHER Gas torches. A Million uses for CARS—HOME—FACTORY. Easy to use—no Training needed.**

**SEND ONLY \$3.00** and pay COD postg., or send \$12.94 for PP del. in USA. 10 day money back trial—Lifetime **BURNOUT** guarantee, if retrnd. Complete with supplies as shown. Available ONLY from **MIDWAY ELEC Dept. TPM-7, Kearney, Nebr. 68847**



car  
using  
oil?

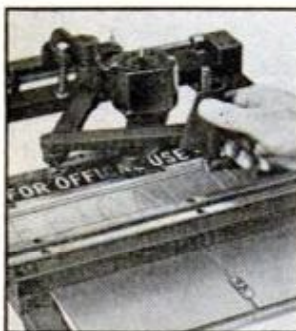


**add Casite**

## LAW FREE BOOK THE LAW TRAINED MAN

Write today for a **FREE** copy of illustrated law book, "THE LAW TRAINED MAN," which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for **FREE** law training book today.

**Blackstone School of Law, 307 N. Michigan Ave. Founded 1890 Dept. 50-B, Chicago, Illinois 60601**



## TURN A DIME INTO A DOLLAR

Step into new income dimensions with your own engraving business. Engrave and market nameplates, door-plates, signs, badges. Every business a prospect. Full or part-time. Write Dept. PM-7.

**SM SCOTT MACHINE DEV. CORP.**  
215 PROSPECT AVE.  
WALTON, N. Y. 13856

## \$70 AIR-GUN only \$29.95

Complete with chisel this 3 lb. Air-Gun rips into metal, chips concrete, drives pins, etc. Delivers 5500 2" strokes a minute. Operates on 3 to 5 hp compressor. Made especially for govt. and manufacturer made too many. At only \$29.95 ppd. while they last, a \$70 value.



**Meredith Separator Co.** Dept. PM7, 310 W. 9th St. KANSAS CITY, MO. 64105

## WATERPROOF YOUR BASEMENT



Dur-A-Epoxy handles like paint, adheres to any sound surface, wet or dry and will withstand hydrostatic pressure. It is non-flammable, no fumes or odor. May be added to portland cement for patching and coating swimming pools, walks, resurfacing and leveling any sound surface. Good for bonding and laminating permanently even seamless floors over asphalt tile or painted surfaces. Order direct \$5.95 qt. or \$20.95 gal. Postpaid. Mfg. of Epoxy and urethane coatings. **DUR-A-FLEX, INC., 269 Franklin Ave., Dept. PM-4, Hartford, Conn. 06114.**

*Live territories open for distributors.*

## New Portable LIGHT PLANTS

110-120 V. A. C. 1500 watts, 60 cycles. Weight 24 lbs. Size 10" x 5". Fanbelt driven from car, pickup or gas engine of 2 1/2 or 3 h.p. Operates 1/2" Drills, Saws, T.V. Brand new. Money back guarantee. Regular \$89.50 now \$49.50. With switch, pulley and voltmeter. Send check or money order.

**VIRDEN PERMABILT CO.**

Box 7066 (P.M.) Amarillo, Texas 79109

## TEST-SMOKE THE REVOLUTIONARY NEW Dr. Philip's Pipe

AT OUR RISK!

This extraordinary pipe features patented "double cooling" rings, and interchangeable tar absorbing ceramic bowls, guaranteed to give milder, cooler, drier, smoother smoking. Nothing like it anywhere in the world! Write today for our **FREE 30-DAY** trial offer. The **PHILIP'S Co., Dept. PMD-1, 99 University Place, New York, N.Y. 10003.**



## DO IT YOURSELF JIFFY ROOM

94 COLOR COMBINATIONS 9 DIFFERENT SIZE ROOMS & 4 EXCITING MODELS TO CHOOSE FROM

WE SHIP IN 48 HOURS

9x12 ROOM

\$355.00

INC. SHIPPING ROOF & DOOR

Extruded Anodized ALUMINUM

Choice of smooth or simulated wood grain ROOF PANELS IN COLOR

9x15 / \$380 9x18 / \$405 12x15 / \$405 12x18 / \$430 15x18 / \$455 FREE CATALOGUE

DEPT. 7-A EMERALD MFG. CORP. 794 Meacham Ave. Elmont, N.Y. 11003

## BUILD THIS . . . THERMO-ELECTRIC PORTABLE REFRIGERATOR

REVOLUTIONARY NEW SYSTEM  
SOLID STATE — NO MOVING PARTS  
OPERATES ON 12 VOLTS D. C. — LIGHT  
WEIGHT — LOW BATTERY DRAIN

**auto-boat-plane**



learn about THERMO-ELECTRICS by building this kit.  
3/4 CU. FT. CAP. — PARTS AVAILABLE IN KIT OR SEPARATE.

SEND for COMPLETE PLANS & INSTRUCTIONS

\$2.00 To: REFRIGERATION SPECIALISTS

P. O. BOX 5665 — JACKSONVILLE, FLA. 32207

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_



# LEARN GUNSMITHING

**AMERICA'S OLDEST** Complete Course. V.A. Approval. 2-year Curriculum. Degree of Associate in Science. **LARGE SHOPS, MODERN EQUIPMENT, COMPETENT STAFF.** Recommended by leading arms companies. Write Dean of Students—

**TRINIDAD STATE JUNIOR COLLEGE  
TRINIDAD, COLORADO**

# LEARN MEAT CUTTING



Train quickly in 8 short weeks at Toledo for a bright future with security in the vital meat business. Big pay, full-time jobs—**HAVE A PROFITABLE MARKET OF YOUR OWN!** Pay after graduation. Diploma given. Job help. Thousands of successful graduates. Our 44th year! Send NOW for FREE catalog. No obligation. GI approved. **NATIONAL SCHOOL OF MEAT CUTTING, INC., 50-W, Toledo, Ohio 43604**

# Print Your Own



Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, greeting, sympathy, prayer cards, etc. Save money. Pays for itself in a short time.

## Own a Printing Business

Good Profit. Raised printing like engraving too. Have home shop. We supply everything. Direct from factory, only. Easily followed rules. Write now for free details. **KELSEY PRESSES E-37 Meriden, Conn. 06450**

# Smoke Bombs, Flash Paper, Fuses

For jokes, tricks, many practical uses. Used on TV, stage, movies. **SMOKE BOMBS**—Each produces clouds of smoke. 3 for 50c. 12 for \$1.50. **SMOKE POWDER.** Same but for bigger effects. Dense clouds. 65c Package. 3 for \$1.65. **FLASH PAPER.** Brilliant flash. Produces little heat: often held in hand. About 15 sheets. 50c pad. 3 pads \$1.25. **FIREWORKS FUSE.** For experiments, joke, "fake bomb" effects. Burns 1 inch in 2 seconds. Cut to any length. 25-inches. 3 for 50c. Catalog of 2500 Novelties, Gadgets 10c. Add 25c on orders under \$3.00. Smoke items not sold in Michigan. **Johnson Smith Co., Dept. 211, Detroit, Mich. 48224**



# BASEMENT TOILET FLUSHES UP



TO OVERHEAD SEWER OR SEPTIC TANK. NO DIGGING UP FLOORS. INSTALLS EASY. Write **McPHERSON, INC. BOX 15133 TAMPA, FLA.**

# PROFIT IN YOUR SPARE TIME



**SMALL ENGINE REPAIR PAYS BIG!** Outboard • Powermower • Chain Saw • Tractor **MAKE EXTRA MONEY**—or fix your own engines and **SAVE!** Illustrated, easy-to-learn Home Study Course qualifies you as expert. Approved for Veterans. Write today!

**LINCOLN TECHNICAL INSTITUTE**  
SUITE 7E, 427 MARKET STREET, NEWARK 5, N.J.

# WANT MORE MONEY? GET INTO PHOTOGRAPHY

Coast-to-coast, high-paying jobs in photography are waiting for people with the "know-how" to fill them. You can quickly, easily qualify at home with the world-famous NYI Learn-by-Doing Method. Write today for free catalog. Also resident training in New York. Our 57th Year.

**NEW YORK INSTITUTE OF PHOTOGRAPHY**  
Dept. 49-7 10 West 33 St., New York 1, N. Y.



**TRAINS ANY DOG INSTANTLY!**

TRY HI-FIDO... Then Start Your Own Money-Making Business!

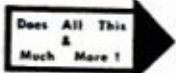
**PUPPIES, DOGS OF ALL AGES. NEVER FAILS! TEACHES STOPS**

Come (at all times!)  
Sit • Drop • Heel • Go  
Stay • Fetch • Hold  
Instant Point, etc.  
House soiling • Jumping  
Chewing • Barking • Biting  
Digging • Gun shyness  
"Busting" birds, etc.

20,000 satisfied users. Hundreds of unsolicited testimonials. Four demonstrations on Art Linkletter CBS-TV. Now prescribed by veterinarians, breeders. Simple hand sound device controls, teaches dogs like magic. Use at home or in the field. Leashless. Train your dog anything, near or far. Achieve far better results than professional trainers! Write, wire or phone for complete information. Fascinating!

**CANINE BEHAVIOR INSTITUTE**  
(213) 479-7606 11927 Montana Avenue  
Dept. PM-77, Los Angeles, California 90049

# MINI-DOZER



- SNOWMOBILE
- BULLDOZER
- LAWNMOWER

—Complete line of Attachments—

CATALOG 50¢ - PLANS & PARTS PRICE LIST \$5.00

**E. F. STRUCK CORP. CEDARBURG 1, WIS.**



# I-N-V-E-N-T-O-R-S WE NEED INVENTIONS

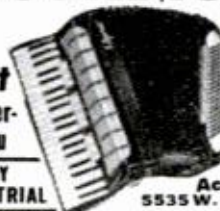
Sell your invention for cash—need money for Patent?—Are technical problems holding you back? Universal Inventions has helped inventors all over the world—just like yourself—why not you? Inventions provide the magic spring-board to sudden riches. **REMEMBER,** we either sell your invention or pay you a cash bonus. Write for details.

**UNIVERSAL INVENTIONS, Dept. 13, Marion, Ohio**

# ACCORDIONS • Big Discounts

Buy Direct Importer-to-You

5-DAY HOME TRIAL



**NEW ELECTRONIC MODELS**  
**SAVE 1/2** 42 "New Sound" Electronic and Standard models. Amplifiers too! All Famous Makes. Try before you buy—5-Day Trial. Easy Terms. Trade-Ins. Free Accessories. Money Back Guarantee. Free Color Catalogs, Handy Selection Guide, Discount Prices. Write **Accordion Corporation of America** 5535 W. Belmont, Dept. R-77, Chicago, Ill. 60641

# NEW CATALOG FOR THE WOODWORKER

Just like having a warehouse in your living room! Complete Catalog for Home Craftsman or Handyman. Imported Woods, Veneers, Tools, Hardware, Lamp Parts, Legs, Top Quality Kiln Dried Woods, Kits and other hard to find items. All at **BARGAIN PRICES.** Only 35¢ ppd.



# KAY-KRAFT MILLS

602 North 1st St., Dept. PM-6,  
Vincennes, Indiana 47591



**POWERFUL NEW INVENTION, ONLY 2" LONG  
SHOOTS THRU 100  
PAGES-THIS BOOK!  
'B-B SHOT'**



**MAKE THIS TEST . . .** Load your 'BB Shot' and fire against this magazine. Notice that it drives BB's through more than 100 pages. Though only 2" long x 1" in diameter, this pocket-size device has amazing power and accuracy. Use it for targets, pests and hunting. Scientifically designed for high power, operating ease and safety.

**FREE!** Get the 'BB Shot' now—we'll include an extra Velocity Cone and FREE Target, BB's and Automatic BB Dispenser . . . all for only \$1.98 ppd. 3 for \$5.00 ppd. Money Back Guarantee. Not sold to N. Y. C. residents or minors  
**GRAYSON CO. • Dept. C-70, 210 Fifth Ave., N. Y. 10**

**MONEY-BACK  
GUARANTEE**

Name.....  
Address.....  
City..... State.....

**\$1.98**  
ppd.

**WOOD  
VENEERS • TOOLS**  
Shop Equipment • Supplies  
**POWER TOOLS**  
at Lowest  
Discount Prices!

**SAVE MONEY** on finest domestic and imported hardwoods . . . all dimensions. Over 1500 items for the home craftsman and woodworking hobbyist. Lamp parts, upholstery supplies, tile, power tools at discounts.  
**NEW CATALOG READY**  
132 pages. Full Color. Send name, address and 35¢ to cover handling, and postage. Write . . .

**CRAFTSMAN** Wood Service Co. Dept. A-77  
2729 S. Mary, Chicago, Ill. 60608

For more information on articles and products write to the PM Bureau of Information for "Where-to-Find-It" list.



**TWICE AS MUCH FOR  
HALF THE PRICE!**

That's what you get with this unique Pick-Up Truck Cover that turns your pick-up into a camper, fully insulated. Outlasts any pick-up.

**Pick A Pick-Up** — any pick-up — and we can put a cover on it.

**Choose Your Cover** — high or low — plain or fancy — we've got it!

**Equip It or Strip It** — fancy trimmings, the extras . . . if you want 'em — We've got 'em — but if it's the lowest price in the business you're after — then you've come to the right place.

Over 170 assembler-dealers in the U.S.A.

**FREE!** A brochure of America's biggest line of Pick-Up Truck covers. (America's BEST line, too!) **SEND FOR IT TODAY!** (and the name of your nearest assembler)



**WINNEBAGO** Industries, Inc.  
Thermo-Panel Div. Box 152 P7, Forest City, Iowa

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**CONTROL-POWER WITH FLUID**

(Continued from page 117)

Marietta, Douglas Aircraft, Imperial-Eastman, Corning Glass and Giannini Controls.

Application of fluidics, though, is not keeping up with research. Richard A. O'Brien, manager of the Fluidic Products Dept. of Corning Glass, claims there are only 175 engineers in the United States who possess good fluidic application skills. "For fluidics to become a major technological field," he states, "the number of informed engineers must increase tenfold within 10 years."

Most concentration in converting knowledge to equipment is given to industrial and military needs. When the first inroad is made in the consumer area, there will likely be an upsurge. With what is now known, industry could probably develop a fuel-control system for your car that would make the carburetor as outdated as a Model T Ford hand throttle.

The new fluidic carburetor, according to Gerald L. McArthur of the Bendix Corp. Research Laboratories Div., would likely be a plastic or metal wafer about the size of a breakfast pop tart. Jets controlled by an accelerator-type device would direct fuel going into the fluidic carburetor directly to the cylinders.

The great advantage, as that for other fluidic parts being predicted for your car—transmissions, brakes, steering, voltage regulators—is the absence of moving parts. Who knows? We may someday get a car whose main systems, all fluidic, will relieve us of a major present-day headache—finding a good mechanic.

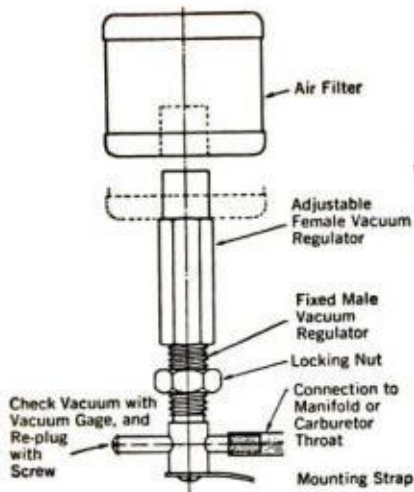
Most people encountering fluidics for the first time tend to compare it to electronics. The comparison limps. Fluidics is not electronics, and vice versa. Its chief drawback is that it operates in the thousandths-of-a-second range, while electronics operates at millionths and even billionths of a second. Fluidics, therefore, can only replace electronics for those applications where a relatively slow output is required.

As one General Electric official put it, "The real significance of fluidics is its ability to fill the gap between the capabilities of conventional mechanical controls and electronics. Fluidics is not just another way of doing something. It is the best or perhaps the only way to do some jobs and should not be considered for others."

In any case, the science of fluidics is now leaving its infancy and is becoming an adolescent. On reaching adulthood, it will join the term "transistorized" as a common household word.

★★★





★  
**SAVE  
 25%  
 ON  
 GAS**

## GAS-O-MISER

New, automatic manifold vacuum control . . . **PROVIDES** better winter starting, improved acceleration, smoother idle . . . and, 25% better gas mileage.

**PREVENTS** carburetor flooding, carbonized pistons, valves and spark plugs, motor oil sludge . . . and, virtually eliminates carbon monoxide at idle.

**EASY TO INSTALL**, fits any gas engine.

Send \$15.95 check or M.O. **WE PREPAY!**

(Please print name and address)

Satisfaction within 10 days or full refund.

**LEMPCO**

**GAS-O-MISER, Dept. PM  
 LEMPCO PRODUCTS, INC.  
 5446 Dunham Rd., Bedford, Ohio 44146**

**Do engines  
 turn you on?**

**THINK WHAT A  
 600 MPH JET  
 WILL DO!**



**United Air Lines free new booklet, "Move Ahead in Jet Age Aircraft Maintenance,"** tells how you can turn your interests into a secure job that pays well. Your experience with car engines may be all you need to start. You'd be working on the world's largest jet fleet. We'll train you. And we promote from within. With United, you'll have free air travel privileges and many other benefits. Openings are in various U.S. cities. **MAIL COUPON FOR FREE BOOKLET**

An Equal Opportunity Employer

**UNITED**

United Air Lines • Box 66140  
 Dept. PM-707, O'Hare Int'l. Airport, Chicago, Ill. 60666

Please rush my free copy of "Move Ahead in Jet Age Aircraft Maintenance."

Name \_\_\_\_\_

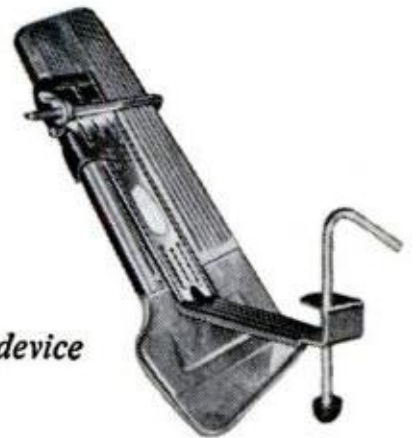
Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

JULY 1967

**Test your  
 automotive  
 I.Q.**



*When does this device  
 save footwork?*



*What does this symbol stand for?*

Use this accelerator depressor instead of your foot for fast engine warm-up, radiator cleaning and emergency recharging. The life preserver is the symbol of Quaker State Motor Oil—the best engine life preserver you can buy for your car. Quaker State is refined only from 100% Pure Pennsylvania Grade Crude Oil. It helps keep your car on the road, out of the repair shop . . . and saves you time and money. Quaker State your car to keep it running young. Remember to ask for Quaker State by name.



**Quaker State Oil Refining Corporation  
 Oil City, Pennsylvania**

185



## PLYMOUTH FURY

(Continued from page 72)

comfortable the seats are; plenty of leg-room in front and back." — Kentucky supervisor.

Ranked fourth on the praise list was the Fury's ride.

"Everyone has commented on the good ride."—New Jersey mechanic.

"Swallows chuckhole bumps."—Minnesota foreman.

Next, Fury owners seem to feel their cars are mechanically reliable and perform well.

"Sure covers the miles with no effort."—Oklahoma technician.

"May seem funny, but motor improves as it gets older."—New Jersey teacher.

### ► Not funny at all. I like to feel I do, too.

"Think it's a better engineered car all around."—Ohio electrician.

In sixth place on the list of Fury owner likes was good economy.

"Get better mileage than on my '64 Valiant."—Pennsylvania manager.

"Economical on gas."—New York jeweler.

"Downright miserly."—Ohio physician.

Contrast these orchids, however, with the onions many Fury owners hurled at the opposite side of the economy coin.

"Very poor mileage."—Montana retired.

### ► He's averaging about 11 mpg, which seems a bit thin.

"Despite extensive servicing, can't get the mileage I expected."—New Hampshire engineer.

"Too heavy on gas." — Pennsylvania mechanic.

In second place on the gripe list was the seemingly ever-present poor and/or indifferent workmanship.

"Pretty much slapped together with lots of body solder where there should be solid metal."—Rhode Island salesman.

"Poor body panel fit and sloppy interior work. Faded spot on back seat."—Michigan school counselor.

"Could tell they hurried at the factory."—Minnesota farmer.

Complaints about excessive wind noise were listed next, followed by similar gripes about road noise.

"Whistles everything but Dixie."—Indiana clerk.

### ► Does it know the tune?

"Wind noise in grille at 50-60 mph."—North Carolina manager.

"Every crack in the road can be felt and heard."—New Jersey bus driver.

"Have to speak very loud to be heard at highway speeds."—Minnesota foreman.

Ranked fifth on the dislike list was what many owners seemed to feel was poor brake action.

"Brakes groan and grab."—Indiana construction worker.

"Requires too much pressure; pulls to the right over 45 mph."—Minnesota maintenance foreman.

"Action seems soft."—Michigan teacher.

A comparatively rare bird showed up in sixth place on the gripe list—unkind words for the tires.

"Blew out one tire at 500 miles and replaced two at 1200."—Minnesota salesman.

"Tire companies should be made to do something about these two-ply tires. They're awful."—New York salesman.

Back on the plus side, Fury owners ranked power seventh on the praise list.

"Plenty when needed."—New York secretary.

"Pulls our 30-foot Airstream real good."—Iowa farmer.

"Has more than I can use, but it's there if I need it."—Ohio factory worker.

In eighth place in owner affections was the Fury's roominess.

"Even with my height (6 feet, 4 inches) I can extend my legs fully while driving."—Michigan controller.

"Easy for a big man to get in and out of."—Maryland salesman.

Other items earning Fury-owner praises were the car's roadability ("A fine all-round road car."—Ohio repairman), its interior styling ("Quality materials, nice trim." — Iowa engineer), its quietness ("Have to listen to hear the motor running."—New York clerk), and its dash layout ("Neatly done."—Nebraska banker).

Returning to the list of owner dislikes, in eighth place are various steering woes.

"Tends to oversteer."—North Carolina driver education instructor.

"Power steering was too sensitive."—Michigan airlines pilot.

### ► Had it fixed by his dealer.

"Had trouble with the power steering."—New York student.

Rounding out the complaint list were comments about dealer service ("Must return car to dealer numerous times to get any work done."—Ohio accountant), the location of the ignition switch ("I think it's stupid."—Michigan secretary), various rattles ("Irritating rattles under the dash panel."—Iowa factory worker), inadequate power ("A dog."—Indiana student).

Probably the most accurate summary of this year's Fury was offered by a New York salesman: "It's a big car for the price. Beyond that, you're on your own as to how well it serves you."

That about says it for all cars. ★★



## The Painkiller. For hemorrhoids that hurt.

You have probably heard of Nupercainal® Suppositories and Ointment by now. Nupercainal is the most effective and longest lasting painkiller of the leading products available without prescription. It is over eight times stronger than the most commonly used topical anesthetic preparation. Doctors have been recommending Nupercainal for over 33 years for hemorrhoids that hurt.

Over 8 times more pain-killing power than the most commonly used topical anesthetic.



## BILL TROUBLES ?

NOBODY REFUSED UP TO \$15,000.00

Bad Credit ■ No Problem ■ Not a Loan Co.

Send your name and address for FREE application to nearest office for faster service

● **ATLANTIC ASSOCIATES, Dept. 54** ●  
146 Westminster St., Providence, R. I.  
● 3312 N. Central Ave., Phoenix, Arizona ●

## "\$8,500 PROFIT MY FIRST YEAR

WITH INLAND 3-IN-1 RADIATOR SHOP"  
—John Burrus, Sr., Fredericksburg, Va.

Inland shop owners make good money testing, cleaning, repairing auto-truck-tractor radiators. You can too! Compact shop only 11'7" x 3'6". Inland, world's largest radiator equip. mfr., trains you free in 2 weeks or less. Pay-As-You-Profit purchase plan. Proved merchandising assures volume. Write for FREE BOOK, owner letters, details on program. Profitable dept. for garage or gas station.

**INLAND MFG. CO., Dept. PM-7, 1108 Jackson, Omaha, Neb., 68102**



NEW!

## BUY FACTORY DIRECT!

**119<sup>95</sup> WREN MINI-BIKE!**



For about 30c a day you can own your own mini-bike! Welded kits (with engines) complete for \$109.95! RUSH 25c for details on all models!

BIRD engineering, Box 427, Dept. PM-7, Omaha, Nebr. 68101

## FOUR-WAY

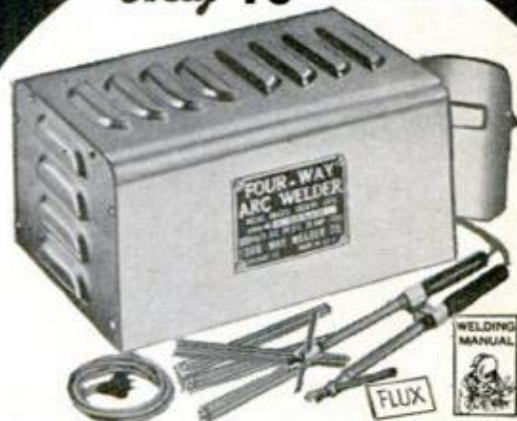
Best Low Cost  
Electric ARC WELDER  
MONEY CAN BUY

COMPLETE READY TO USE

5 YEAR  
GUARANTEE

10 DAY  
TRIAL

Only \$18.95 POSTPAID



WELD, BRAZE, SOLDER, CUT. Tops in performance and value. Ideal gift, educational, profitable, enjoyable. No experience needed. Use 1/8" welding rods and 1/4" carbons to make or repair auto bodies, fenders, trailers, boats, toys, furniture, farm equipment, garden tools, anything of metal, even aluminum. Operates on 110 V. line. Produces to 11,000°. Complete ready to use.

WORLD'S GREATEST WELDER VALUE. BRAND NEW. YOU CAN PAY MORE BUT YOU CAN'T GET A BETTER LOW COST WELDER. Over 500,000 in use by home owners, farmers, hobbyists and mechanics. 5 YEAR UNCONDITIONAL GUARANTEE. Simply return. We will repair or replace and ship free of charge. You Get: FULL FACE SHIELD, heavy metal cabinet, ground clamp, 12 ft. heavy cables, SPECIAL combination carbon arc torch & rod holder, carbons, welding and brazing rods, flux, solder, welding manual. ORDER TODAY ON 10-DAY UNCONDITIONAL MONEY BACK TRIAL.

SEND ONLY \$2.00 and pay \$16.95 plus C.O.D. charges on delivery,

or send only \$18.95 for postpaid shipment in U.S.A.

FREE Order from this ad & receive extra FREE \$2.00 gift of rods, flux and solder.

**FOUR-WAY WELDER CO.**

1810 S. Federal St., Dept. R2-G, Chicago, Ill. 60616

## train for Drafting Career in one year

Graduates of the *Tri-State Drafting and Design* Program employed by leading companies. Trained in everything from basic technical drawing to technical illustration and writing, they have entered into responsible positions in important industries. *Tri-State* also offers four-year degree programs in five fields of engineering... three areas of business administration. Accredited. Professionally-oriented college. Modest costs. Enter Sept., Jan., March, June. Write Director of Admissions for Catalog.



## TRI-STATE COLLEGE

477 College Avenue, Angola, Indiana 46703

## ENROLL—EARN YOUR DEGREE

of Bachelor of Bible Philosophy (B.Ph.B.), Master of Bible Philosophy (M.Ph.B.), Graduate of Bible Philosophy (G.Ph.B.), Doctor of Metaphysics (Ms.D.), or Doctor of Divinity (D.D.). Chartered by State, Correspondence Courses only. Please write for FREE BOOKLET.

## AMERICAN BIBLE INSTITUTE

Dept. PM, 408A W. 75th St., Kansas City, Mo. 64114

## 300 POWER.....



Complete Telescope Lens Kit only \$3.98 postpaid

Conquer Space, Explore the Universe. Planets, Moon craters, New Stars etc. Complete Lens Kit consists of 80 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, 300 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

**BUSSE SALES, DEPT. PM-98, Hartford, Conn. 06101**



## SUN GLARE AND YOUR DRIVING

(Continued from page 80)

too. The Medical Foundation, a Massachusetts medical research organization, recommends that you buy sunglasses with the following characteristics:

1. Flawless lenses. Glance through each lens at a pole or other straight object and turn the glasses around. If the pole or object appears to bulge or bend, the lenses have flaws that will distort images. Choose another pair.

### TEST YOUR RESISTANCE TO GLARE



**PRODUCTION OF RHODOPSIN**—the photosensitive chemical responsible for night vision—varies from person to person. Normally, full night vision returns from 15 to 20 minutes after the eye is exposed to bright light. Slow recovery time may mean a wait

2. Curved lenses. Side glare is as dangerous as head-on glare. Curved lenses prevent unwanted light from hitting the retina through the sides of your eyes.

3. Tint of gray or green. Red, yellow, or blue lenses can impair quick recognition of traffic and brake-light signals. Gray or green has little effect on color perception.

4. Equally dark lenses. If one lens is a shade lighter than the other, the result will be a loss of depth perception. Squint through each lens in turn with the same eye to test equality of tint.

of 30 to 45 minutes for full restoration of night vision. Strong, prolonged glare can result in night blindness that lasts up to a full month. The following test is for recovery time from short-lived glare:

Roll a newspaper into a large tube that both eyes can see through. Dim the lights in a room so you can just barely read the print of a book. Wait 15 minutes or so to accustom your eyes to the darkness. Then, through the tube, look close-up at a lighted 100-watt bulb for exactly five seconds. Turn off the bright light and—still looking through the tube—glance at the book. If your recovery time from glare is normal, you should be able to read the print in seven seconds. If your eyes need longer than this to recover, they're below average. When driving, go slow, or even stop to give your eyes time to get used to dark roads after stopping at a restaurant, passing through a well-lit town, or through a brightly-illuminated tunnel. ★ ★ ★

## You'll open up your world when you own the one with meaning!

# TRIUMPH

A Triumph is more than a motorcycle. To a rider it's an experience far beyond the ordinary. A Triumph's total performance ride gives you a spirit of adventure you'd never expect on two wheels. And the extra power of Triumph's famous OHV engine gives you a "take charge" feeling that can't be ignored. Open up your world by riding the one with meaning. See your Triumph dealer soon.

**NOW! Mail this coupon today for Free Catalog in color!**

West JOHNSON MOTORS, INC. P. O. BOX 275 Duarte, Calif. 91010	East THE TRIUMPH CORPORATION Baltimore, Md. 21204
---	---

Name \_\_\_\_\_ Age \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone Number \_\_\_\_\_ Dept. P \_\_\_\_\_





# HOT OR COLD, SALT OR FRESH!

Lubriplate Marine Lube 'A' meets your bearing and fitting needs when and where you want it. Lubriplate is extremely repellent to both salt and fresh water. It has high melting point, low cold test. Depend on help from the silent service, Lubriplate Marine Lube 'A'.

## LUBRIPLATE® MARINE LUBRICANTS

Lubriplate Division, Fiske Brothers Refining Co. • Established 1870 • Newark, N.J. • Toledo, Ohio



**KING MIDGET FOR 1967** • More powerful Kohler engine. Amazing performance. Faster, Smoother, Quieter. Many new features. World's Lowest Priced Car. Drive it for 75¢ per week. Owner demonstrators wanted. Send 25¢ for 32 page book, fully illustrated, dealer's price. Or send \$1 (refundable first order) for this plus service and repair manual and 16 5x7 photos of car and factory.  
**MIDGET MOTORS CORP., ATHENS 1, OHIO**



*Repair any watch*

### ... SWISS OR AMERICAN

Unique, modern Swezey System starts you making repairs right away. Develops skill step by step at home in spare time. Tuition \$5 monthly. Diploma awarded. Free sample lesson. No obligation.

**CHICAGO SCHOOL OF WATCHMAKING**  
Dept. 177, Fox River Grove, Ill. 60021

**If you own an  
outboard...  
you need this**



## FREE BOOK!

The "outboarder's bible" . . . a wealth of information about propellers and how they affect boat performance. Answers to "most often asked questions." Details on matching prop to hull, motor and use conditions, for more speed, better handling, increased skiing pleasure. Full color . . . 24 pages . . . absolutely free!

7-6

**WRITE NOW!**

**MICHIGAN WHEEL COMPANY**  
Dept. P, Grand Rapids, Mich. 49502

## EVERLITE\* World's THRIFTIEST Light Plants



THE CHAMPION **\$144.50**

**The Champion - 1200 watts 115 volts AC for only \$144.50**  
Unbelievable but true—Brand new production methods now make possible world's finest design in a service free alternator light plant at this unprecedented price. Plant puts out a steady 1200 watts of 115 volt AC power to run power tools, oil burners, pumps, TV, or anything that requires up to 1200 watts. Powered by a rugged 3 HP, 4 cycle, easy start gas engine with 1 year factory warranty. Complete with carry handle and shock mounts. Why fool with short life 2 cycle plants when you can buy this rugged top quality machine at our factory price.

Item # 1265 wt. 65 lbs. **\$144.50**

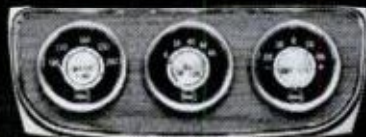
**MASTER MECHANIC MFG. CO., Dept. A-77 Burlington, Wis.**  
Southern Customers Write to Dept. A-77, Box 65, Sarasota, Florida

### Gurney asked for RAC instruments

Dan Gurney's All American Eagle racing team has chosen RAC instruments for all its Indy, Formula 1, stock, and Group 7 cars. RAC tachs, meters, gauges, and test equipment are available at leading auto accessory stores. Ask for RAC.



Temp-Chek Oil Pressure Ammeter





## THE STUPENDOUS SATURN V

(Continued from page 99)

all the while keeping the launcher, tower and space vehicle upright by a computerized level-sensing system and built-in hydraulic jacks.

In this way the "Colossus of Kennedy" makes its three-mile trip to the pad, the first leg in its 250,000-mile moon trip.

At the pad, the crawler-transporter reverses the process, crawling up on the pad, straddling the blast trench, and lowering the launcher and the unfueled Saturn onto six upright mounts, like Atlas setting the world on six pedestals.

Despite its size and monumental cargo, the transporter, with delicate precision, can set the launcher on the mounts within a deviation of plus-or-minus two inches horizontally. (It can raise or lower the launcher six feet vertically.) The horizontal slack is taken up by the mount mechanisms, which are braced two ways, the braces moving the mounts this way or that to align them under threaded bolts in the launcher. A large tapered center pin guides the bolts on the periphery toward the holes in the mount, the way the axle hub on your car guides the wheel toward the lug bolts when you're changing a tire.

Also, the top ring on the mount can be spun freely to help line up the holes beneath the bolts. That done on all six mounts, the transporter lowers the launcher the final few inches and the bolts are secured. Now the entire structure can withstand winds of hurricane force.

Once the launcher is secure, the crawler lowers itself away and moves out from under. Then, four support jacks, called levelers, are moved in to brace the launcher from the bottom. The vehicle up to this point, is empty, but when fueled and fully loaded for blast-off this summer it will weigh more than six million pounds. The launcher could sag under this load, hence the extra jacks to support it in strategic places.

Up on the top level of the launcher, called Level O, the vehicle rests on four hold-down/support arms that hold it suspended over the square blast hole in the launcher. Special pins in the arms flip over into notches in the vehicle and are locked in place, so the arms both hold the vehicle up and hold it down, in effect "pinching" it in place. At blast-off, the pins are unlocked and flipped back.

Tail-service masts, which contain servicing equipment and clambering space for men working on the tail of the vehicle,

# Get your own full-color print of the **SATURN V**

**THE FREE WORLD'S  
BIGGEST ROCKET**

**Beautifully printed on heavy  
paper suitable for framing.  
(Size: 19 by 25 inches)**

**\$1.25 postpaid**



-----  
**Saturn V, Popular Mechanics, 575 Lexington Ave., New York, New York 10022**

Please send me \_\_\_\_\_  
copies of PM's Saturn V  
painting. Enclosed find  
\$1.25 for each.

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



are tilted away before the blast-off.

Inside the launcher, two more levels, A and B, are filled with instrumentation and telemetry equipment, as well as with bracings to absorb the stress. The floors are also shock-mounted on springs.

After the launcher is secure on the pad, the crawler-transporter moves in with the mobile service structure, another open-framework tower similar to the umbilical tower, to give the ground crew 360° access to the vehicle at all levels during the preparation stages. It, too, is moved away before lift-off.

Below the launcher, in the blast trench, the 350-ton flame deflector moves on its wheels which ride on rails. When in position, built-in jacks raise the deflector momentarily while the wheels are turned 45° and set in notches. Thus braced at all four corners, the deflector remains firmly anchored beneath the vehicle during the fierce blast and flame at lift-off.

The deflector has a four-inch coat of ceramic ablative coating to absorb the searing heat from the five rocket engines which, depending on the length of time the vehicle remains on the launcher after ignition, could reach as much as 10,800° F. They say that if it stayed over eight seconds, it would melt the pad. To help allay some of this heat, the walls of the trench are made of firebrick, and a three-part watering system sprays the area during ignition and lift-off. Nozzles spray the flame deflector, a deluge system literally floods the top of the launcher, and smaller sprinklers are spread around the pad.

The first Saturn flight will be unmanned. However, should an emergency occur during countdown when astronauts are locked in the capsule, they'll fire the emergency rocket escape system and descend by parachute.

Should an emergency occur while the service platforms are still in position and the capsule not locked, the astronauts and workers can use the umbilical tower emergency egress system. They jump into a quick-ride elevator on the tower and shoot to the bottom of the launcher. There they will slide through a tunnel to a reinforced shelter at the base of the pad.

Complex 39 has two pads, and the vehicle assembly building has facilities for assembling four space vehicles at once. So when Complex 39 gets into full operation several shots may be overlapping one another in various stages of preparation.

The man-on-the-moon program, which begins with Saturn V, may become a shuttle-run operation. If so, Complex 39, at least in the beginning, will be the embarkation port for moon travelers.

And not a customs man in sight. ★★ ★

# Win a Workie-Watchie



Send us the most original use-of-the-month for Pliobond® adhesive and we'll send you this 9" Sony TV.

**PLIOBOND mends, seals, insulates, waterproofs. Bonds wood to metal to glass to cloth to plaster to rubber, etc.**

**Take it from there. Show us the most original Pliobond use and win something to watch while it dries.**

1) Describe in 50 words, or less, an interesting and unique use for Pliobond adhesive. Use entry coupon from local store, or plain paper no larger than 8½" x 11"

2) Send as many entries as you like to Goodyear Pliobond Contest, P O Box 9115, Akron, Ohio 44305. Send a label or other evidence of purchase with each entry.

3) Individual contests run in May, June, July, August, September and October, 1967. Winners will receive a Sony 9" portable TV set. These awards limited to one for each contest. Entries must be postmarked during the contest month in which you enter. All entries become the property of The Goodyear Tire & Rubber Company. None will be returned.

4) Entries will be judged by The Goodyear Tire & Rubber Company, and decisions of Goodyear will be final relating to questions about contest winners.

5) The contest is open to everyone in the United States and possessions or Canada except employees of Goodyear, the distributors and dealers of Pliobond adhesive and their immediate families. Contest is subject to Federal, State and local regulations.

6) All winners notified no later than November 30, 1967. A list of winners will be available if requested, and self-addressed, stamped envelope is enclosed.

**GOOD YEAR**  
CHEMICALS



**NEW** **DYNAMIC** MARK  
80 AMP **88**  
**INDUSTRIAL TRANSFORMER ARC WELDER**

IDEAL GIFT — EDUCATIONAL, ENJOYABLE, PROFITABLE

ANYONE CAN WELD, BRAZE,  
CUT, SOLDER, HEAT  
STEEL, BRASS, ALUMINUM,  
AND OTHER METALS.



Build and repair anything of metal. Save time & money with this BRAND NEW, PROFESSIONAL ARC WELDER! Rugged metal cabinet, baked Hammerloid finish. Ideal for home, shop, farm and industrial use. Expert work on FIRST job. POWERFUL glass insulated transformer welds 1/4" metals with 1/8" rods. 4 heat settings 20 to 80 amps. Operates on 110 Volt AC line fused for 30 amps. Complete with fibre glass helmet, electrode holder, ground clamp and cables, solder, assorted rods and simplified welding manual. **DOUBLE PROTECTION GUARANTEE.** 10 day money back trial plus full 5-yr. warranty. If inoperative return prepaid, we will repair or replace without charge.

ORDER TODAY, ONLY \$59.50 COMPLETE (220 V. \$61.50)  
**SEND ONLY \$6.00.** Pay balance plus C.O.D. charges on delivery or write for easy "PAY AS YOU WELD" Low Down Payment Plan. Welder details FREE.

**DYNAMIC WELDER CO.** 1808 SO. FEDERAL ST.  
Dept. D2-G  
CHICAGO, ILL. 60616

**HIGH SPEED  
DRILL BIT MIX**

**40** Drills **\$250** ADD 35¢ POSTAGE  
Only & HANDLING

A fabulous buy. You get 40 assorted, American made high speed drills. For 1/32" to 1/4" in varying lengths. All sharp and ready to go. Also 40 High Speed Wire Gauge Drills #60 to 80 for only \$3.95 ppd.

**CONSUMER BARGAIN CO.**  
Dept. PM-4, 15 Matthew St., Farmingdale, N. Y.

**BILL PROBLEMS ?**

**NOBODY REFUSED up to \$17,500.00**  
**FAST FRIENDLY SERVICE**

POOR CREDIT, No Trouble. NOT A LOAN CO.  
Send Your Name for FREE APPLICATION.  
**NATIONWIDE ACCEPTANCE - Dept. 98**  
930 F St., N. W., Washington, D. C. or  
1326 Plainfield St., Cranston, R. I.

**Now Possible To  
Shrink Hemorrhoids  
Without Surgery**

*...except in unusually  
severe or persistent cases*

Science has found a substance with the ability, in most cases—to relieve pain, itching and shrink hemorrhoids without surgery except in unusually severe or persistent cases. In case after case, while gently relieving pain, actual reduction took place. The secret is *Preparation H*®—the only hemorrhoid formula that contains *Bio-Dyne*®. Just ask for *Preparation H* Ointment or Suppositories.

**I SKIPPED A SWIFT**

(Continued from page 95)

barbed-wire-draped bunkers that guard these waters, and rounded the sandbar at the end of the channel. Two charcoal-gray boats, exactly like ours, were alongside the Swift pontoon. We eased in astern the two boats and slipped our lines over.

Crews from the forward boats were grouped about two stocky green-clad youths who wore patches showing a frog carrying dynamite—the insignia of underwater demolition teams.

I hopped over the lifeline and headed across the pontoon toward the group. The larger frogman was rumbling through an explanation of damage to one of the boats.

"Yessir, the cutlass bearing's definitely had the weenie, and you'll have to yank the shaft to see if that's bent too bad. The screws look okay, and it doesn't look like the bottom got hung up at all. Must not have been too awful shallow where you went aground."

After imparting the bad news to the skipper, they picked up their heavy air tanks and lurched toward the beach.

**Tropical paradise—with VC**

I looked around Chu Lai. To an unsuspecting eye, the place appeared to be a tropical paradise. Then I squinted across the river to where several children frolicked with a small dog. The night before last, VC snipers had stood at that very spot and fired clip after clip at us.

And it was near a sleepy little fishing village like this where Swift No. 4 had been blown out of the water, with heavy casualties to her crew. The boat was salvaged, but came up looking more like a ruptured sardine can than a fast patrol boat. The mine was estimated to contain 200 pounds of high explosive.

Soon a quivering diesel-fuel hose snaked across the deck to where the engineman was topping off our tanks below decks. The seaman struggled on board with several heavy metal boxes of .50-cal. machine-gun ammunition. The gunner had the forward turret littered with disassembled machine-gun parts. The radioman, with few post-patrol chores, was filling the fresh-water tank with two five-gallon jerry cans. The bosun slapped a fresh coat of grease on the sliding surfaces of the after gun mount.

"Dammit, that club's gonna be packed with Seabees before we even get off this boat," complained the radioman.

The bosun, his deeply-tanned face covered with the usual scowl, turned to him. "Sorry 'bout that, sailor. That's life on the little gray boats." ★★★





U.S. PLANES IN VIETNAM  
POPULAR MECHANICS



U.S. HELICOPTERS  
POPULAR MECHANICS

# YOU CAN OWN THESE PAINTINGS

## 30 U.S. PLANES IN ACTION

All beautifully depicted in two exciting lithographs of paintings done exclusively for Popular Mechanics by famous aircraft artist Ed Valigursky.

Now these beautiful lithographs can be yours.

"U.S. Warplanes in Vietnam" and "U.S. Helicopters in Vietnam" are full color reproductions depicting the various types of aircraft that are now seeing duty in that war-torn country.

Exciting and educational, the set, suitable for framing, is printed on expensive heavy weight stock. Measuring 19 x 25 inches, it can be hung in the library, den, children's room or just anywhere around your home.

Send \$1.95 to: Aircraft Paintings, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

POPULAR MECHANICS—AIRCRAFT PAINTINGS  
575 Lexington Avenue, New York, N. Y. 10022

I have enclosed \$ \_\_\_\_\_ for \_\_\_\_\_ copies of Popular Mechanics Aircraft Paintings.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Tape this ad to the back of your TV or Radio Set

## ALL TV-RADIO RECEIVING TUBES \$1.50

• ALL BRAND-NEW, First Quality. All Types Available. • Orders Shipped First Class Same Day Rec'd. • Unconditionally Guaranteed. • 24 Month Warranty.

Send \$1.50 for ea. tube + 50¢ postage & handling of entire order. FREE: Write for TV Test Chart and Tube List to Dep't. PM-77



UNIVERSAL TUBE CO. Ozone Park, N. Y. 11417

## More Security With FALSE TEETH At Any Time

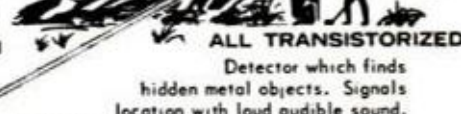
Do your false teeth embarrass you by slipping, dropping or wobbling when you laugh, talk or eat? Then sprinkle a little FASTEETH on your plates. FASTEETH holds dentures more firmly, more comfortably. This alkaline powder doesn't sour. No gooey, pasty taste. Helps check denture odor. Dentures that fit are essential to health. See your dentist regularly. Get FASTEETH today at all drug counters.

## FIND BURIED TREASURE!

10-DAY MONEY BACK GUARANTEE

### TREASURE PROBE

\$18.88 ppd



ALL TRANSISTORIZED

Detector which finds hidden metal objects. Signals location with loud audible sound.

To Order: Send cash, check or money order. Treasure Probe - Dept. PAB P. O. Box 3446, Granada Hills, Calif. 91344

## IMPORTED LOCK-BLADE KNIFE



FINE OUTDOOR KNIFE FOR SPORTSMEN AND EMERGENCIES. Opens with flick of finger and locks with a click into position. Blade can't shut when in use. PUSH BUTTON release. Handy pocket size, yet rugged. Fine quality polished stainless steel razor-sharp blade. PIERCES METAL. Narrow tapered blade with thick rigid backbone for heavy duty trouble-free use. Comfortable handle. Safety guards. Order now. Don't be fooled by cheap imitations. **DELUXE LARGE SIZE 7" BEAUTY Only \$3.98** Free Postage

\$1.88

STANDARD AMERICAN, Dept. 7-PMK, 1 Park Ave., N.Y. 10016, N.Y.

## SAVE UP TO 85% GOV'T SURPLUS and NEW EQUIP'T

Send 25c For Big Catalogs Showing Finest Bargains In U.S.A. On Surplus, Excess Inventory, Regular Factory Lines. SATISFACTION OR MONEY BACK GUARANTEE



### DIAL TELEPHONE

• (ITEM #715-P)... Same type phone used on all telephone systems. Use as extension to main phone or private systems. Furnished with 4-prong extension plug. Excellent condition. Shipping weight 8 lbs.

\$6.90

F.O.B. LINCOLN

\* Include money for postage and save on selection fees. Excess money refunded immediately



Lowest Prices On...

HYDRAULICS COMPRESSORS  
SURVEYING INST'S  
GEAR MOTORS  
WINCHES POWER PLANTS  
CABLE SPEED REDUCERS  
WELDERS BINOCULARS  
ELECTRONICS WEED SPRAYING  
TELEPHONES PUMPS HOSE  
MANY OTHERS

SURPLUS CENTER

PM-077

Lincoln, Nebraska  
Zip Code 68501



## Lasting window repairs



### DAP® '33' GLAZING

Best for setting glass in wood or metal sash, new sash or old, primed or unprimed sash. Won't harden, crack or chip like putty. Makes a neat, weathertight seal that lasts for years. Sold at hardware, building supply, paint and specialty stores.

DAP INC., Dayton, Ohio 45401 • Subsidiary of *Plough, Inc.*

#### HEAVY DUTY BALL-BEARING PUMP



**IRRIGATE • DRAIN • SPRAY • CIRCULATE** • Famous all-metal, rust-proof XB pump with stainless shaft. Use ¼ HP or larger. 1 HP for up to 5,200 GPH 60" high or 3,000 GPH from 25' well. 1¼" inlet. 1" outlet. For belt or direct drives. Only ..... \$12.95  
**Famous Type P** won't rust or clog. Bronze bearing. Hundreds of thousands in use. Up to 2,400 GPH. 1" inlet. ¾" outlet. Only ..... \$8.95  
 Postpaid cash with order. Money Back Guarantee.  
**LABAWCO, Box 9, Belle Mead, N. J. 08502**

Nothing 'cut' with this **COUPON** except grass the way it should be!

Send it to Bridgeport

Read why Manco-Locke Handles  
 Easier ...  
 Cuts Better ...  
 Costs Less ...



Send me **FREE Literature** on **MANCO Locke Highwheel Mowers**

... and also on Locke reel and rotary mowers. I'd like the name of closest dealer too.

(name)

(street)

(city)

(state) (ZIP)



**Manufacturing Cos., Inc.** 1075-M Conn. Ave. Bridgeport, Conn.

## GAR WOOD

(Continued from page 85)

Navy brass turned it down. That launch was the forerunner of the hit-and-run PT Boat, nemesis of the Japanese Navy.

Gar went on designing racing boats and expanding his industrial holding into a vast network of factories and assembly plants. During these years he competed for and won the gold racing trophies, valued at \$25,000 each, which stand in his Fisher Island mansion.

In 1944 the Air Force commissioned Gar to design a twin-hulled 120-ton plywood ship 188 feet long. The ship, for which Wood received \$350,000, was christened the *Venturi* and launched Nov. 14 1944. But before she could be put into use World War II came to an abrupt end. He bought the *Venturi* back for \$25,000. Then he looked for a place to berth her while he converted the ship into a super-luxury yacht. In 1946 he bought Fisher Island, formerly the palatial estate of the William K. Vanderbilts. The island's harbor became the home of the *Venturi*, and Wood set about spending \$600,000 fitting her out as the sleekest craft afloat, with four 16-cylinder diesel engines capable of turning up 4800 hp. In May, 1954, she broke up and sank in heavy seas. Gar and eight companions were rescued.

Twelve acres of the heavily wooded island are walled in. They contain the rock palace and 16 Vanderbilt chateaus.

Gar's mansion has entire rooms which were carted over from palaces in Europe. So too have many of the tenantless chateaus, but the latter are crammed with dismembered engines, tailpipes, carburetors and blueprints, interspersed with tarnished and dented racing trophies.

Two large buildings are the scene of the creative activity of Gar Wood and his associates, some of whom have been with him for 40 years. One is a huge laboratory where working models and full-size test pieces are assembled; the other, a magnificently equipped machine shop where Gar spends much of his time.

He had always been up in arms at the yearly array of continually heavier, costlier, more powerful automobiles, and more and more he became convinced that an electric car offered the ideal solution.

Then when the hue and cry arose from all quarters to put an end to the air pollution caused by the gasoline engine, to silence its noise, to reduce the bulkiness of the auto that was strangling our cities, Gar was ready.

He smiled quietly and announced the perfection of his Gar Wood Super Electric Model A. ★★★

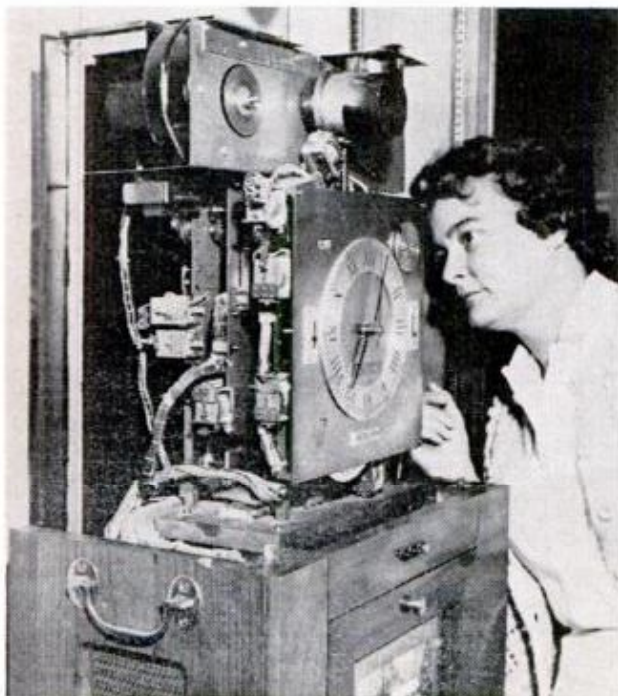


**NEWS BRIEFS**



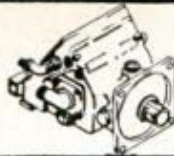
**Patriotic clock**

After working on it for five years, William Cassedy of Short Hills, N. J., has a clock that raises an American flag at sunrise, lowers the flag to half-mast on days of national mourning, plays music for special occasions and tells the day, month, phase of the moon and time of sunrise and sunset. There's even a small blower that makes the flag wave! The clock is electrically operated, and its functions are controlled by systems of relays and switches. Incidentally, the clock, which Mr. Cassedy calls the "most elaborate he could think of," tells time like any other clock.

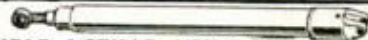


JULY 1967

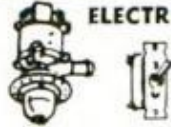
**GOVT. SURPLUS AND OTHER BARGAINS SAVE UP TO 90%**



**VICKERS HYDRAULIC PUMP**  
Variable displacement. Rated 3000 PSI @ 6 GPM @ 3800 RPM. Contains built-in bypass with adjustable pressure reg. Inlet port 1-1/16"-12. Outlet 3/4"-16. Exc. for all hydraulic applications. Approx. GOVT. COST \$485. Shpg. Wt. 16 lbs. **\$27.50**



**DOUBLE-ACTING HYDRAULIC CYLINDER**  
21-1/2" stroke, 2" bore, 1-1/2" shaft. Operating pressure 3000 PSI. Produces 10,000 lb. thrust. Ports are 1/4" pipe. Top clevis hole 1", bottom hole 3/8". Steel barrel. Completely rebuilt. Approx. GOVT. COST \$130. Shpg. wt. 18 lbs. **\$21.50.**



**ELECTRIC PUMP WITH CONTROL SWITCH**  
For boats, campers & trailers. Output 300 GPH. Can be used in fuel or water. 1/2" pipe bronze inlet. 12 or 24 V.D.C. Explosion-proof motor. Shpg. wt. 9 lbs. Complete with wiring diagram. Approx. GOVT COST \$200. **\$11.95**



**NEW! BIG! 1967 CATALOG**

Send 25c for amazing catalog with 1000's of bargains in hydraulics; electrical, marine, automotive items, etc. Order from ad. Prices FOB 50% deposit for COD. Must include your zip code number. Satisfying mail order customers thru-out the world since 1945.

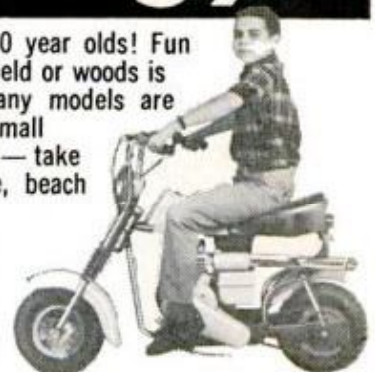
**AIRBORNE SALES CO. Dept. PM767**

8501 Stellar Dr. • Box 2727 • Culver City, Calif. 90230

**FOX MINI-BIKES**  
*Do-It-Yourself or Fully Assembled*  
**16 MODELS from \$59.50**  
2 1/2 hp to 5 hp

Simple enough for even 10 year olds! Fun and easy! Any empty lot, field or woods is your playground. And, many models are licensable for street use. Small enough to fit in a car trunk — take it camping, to the cottage, beach ... anywhere!

**BIG CATALOG \$1**  
Shows Bikes, Plans, Parts, Access., Pictures  
Colored Brochure only—25¢



**FOX CORP.** Box 797PM • Janesville, Wis. 53545

195



If the woman  
next door wishes  
her husband were  
more like you,

you must be  
smoking  
Field & Stream  
Pipe Tobacco.



To Make and Sell Ornamental Concrete Items  
You Need MOLDS

For Thorough Info  
On Over 300  
Different Molds  
You Can Buy And  
Use Plus Complete  
Start To Finish  
Professional Instructions  
RUSH \$2.00 for book



TURN CONCRETE INTO GOLD

CONCRETE MACHINERY COMPANY, INC.  
839 Lenoir Rd. - P. O. Box 99 - Hickory 2, N. C.

## HOW TO KEEP 'EM ROLLING

(Continued from page 109)

he yelled, spraying foam inside the trailer.

Joyce ran up with another fire extinguisher. Byron aimed it into the trailer, and the flames seemed to retreat.

"Drive her out of here," he shouted, as he battled the flames.

Joyce leaped into the cab and jerked the truck frantically into gear. The engine coughed. The burning truck shuddered and limped forward exactly 27 feet. Smoke poured into the cab and the engine quit, its wiring burned out.

"Jump, woman, jump!" Byron screamed.

Flames rose all around the trailer body. Joyce bailed out and ran. Byron grabbed her just as an explosive "whoosh" turned their rig into a fountain of flames. But the 27 feet Joyce drove the truck was enough. The flames missed the straw roofs and the gas pump. Joyce escaped with a second or two to spare.

After the fire, the caravaners held a meeting and collected clothes and groceries for the Versteeghs. Byron parceled out the few wrenches and hand tools he could salvage to others to carry. There wasn't much. Joyce and Byron traveled with Andy Charles for eight days.

Andy ordered a new supply of spare parts to be flown in from California. Andy solved the dilemma of getting Byron a new trailer by buying the rig of one couple who decided they had had enough of traveling around the world the hard way.

Several nights later, I passed Byron's rig. He was digging through a pile of parts in a dresser drawer.

"I heard your engine miss this morning," he said. "Have any trouble on the road?"

"No."

"You will. Get the gook cleaned out of your gas line. You're dead if you don't. Here's a present."

Byron held out a sparkling, new, fine-mesh gasoline filter. Joyce grinned and winked.

"You don't eat Indian groceries without cleaning them good first," Byron grumbled. "You ought to do the same thing for your engine whenever you use Indian gas."

So it went all the way to Lisbon. Byron always working, always tinkering, always checking behind us. Because of Byron we made it. And because of Byron I will always remember the rubber tire plugs, the load-levelers, the hairline cracks, the metal fatigue and the care that must be given good equipment. ★★★





go beyond 3-D with H-D



Discover new dimensions on live-action lightweights from Harley-Davidson. Like this hot, new M-65. And Harley-Davidson has real depth, from 65cc all the way up to 1200cc . . . all at prices that let you make the move. Check the Yellow Pages for your H-D dealer and add a new dimension to your life. It's time to move up to H-D!

**HARLEY  
DAVIDSON**

Материал, защищенный авторским правом



