

# POPULAR MECHANICS

## MAGAZINE

UNDERSTAND IT

PRINTED IN U.S.A.



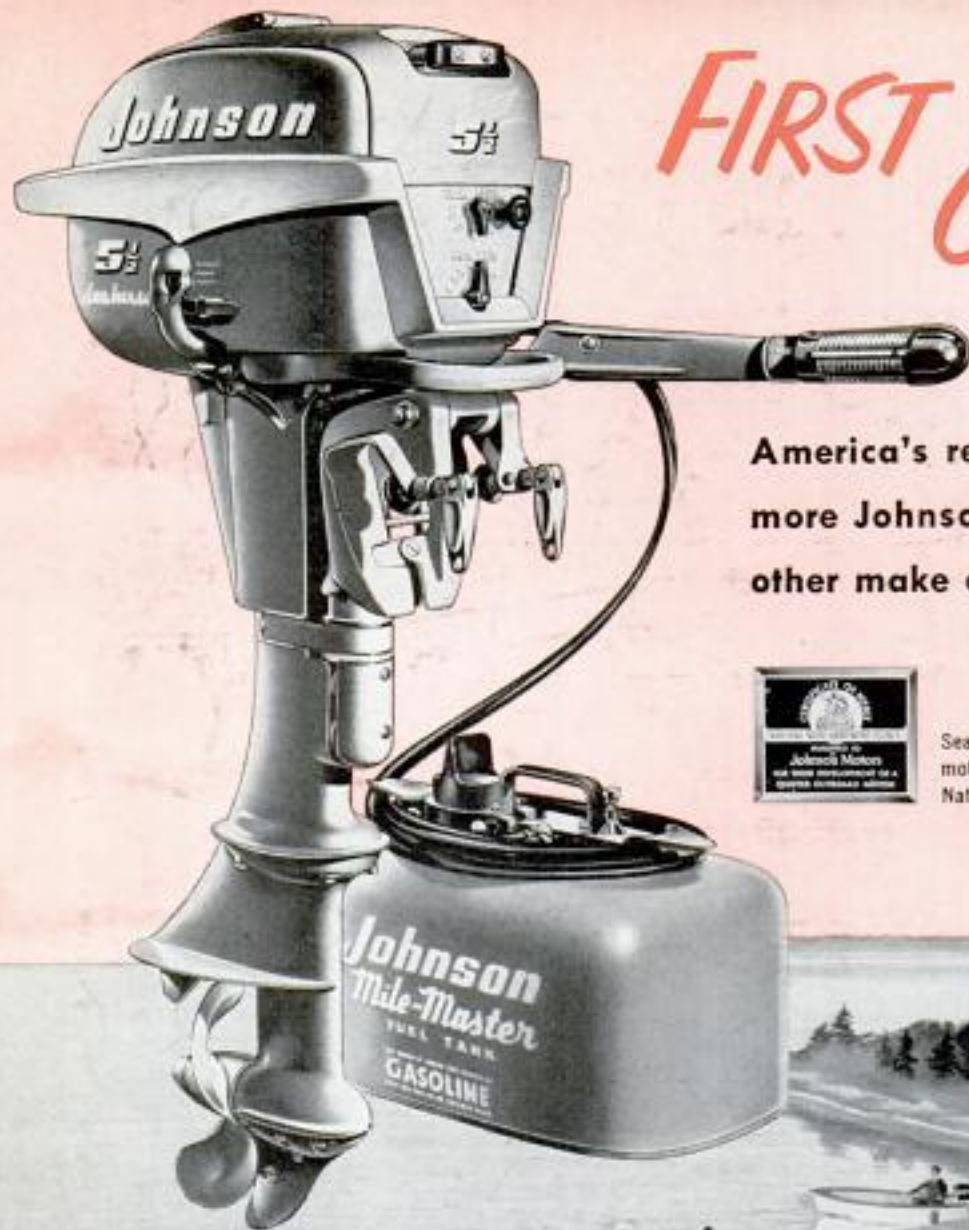
*Volkswagen Camp Car  
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What Can We Do About Smog?  
 READ WHAT OWNERS SAY ABOUT  
 THE '55 FORD

*For the Craftsman*  
 GARAGE DOOR OPENER YOU CAN BUILD

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# FIRST CHOICE!



America's resort operators buy 86% more Johnson Sea-Horses than any other make of outboard motor!



Sea-Horse 5 1/2—the only outboard motor ever to win a citation from the National Noise Abatement Council.



**SEA-HORSE 3.** Another fishin' favorite! Full 3 hp. in a 32-lb. twin! Angle-matic Drive slides thru weeds, skis over under-water obstructions, keeps on driving in inches of water!

Ask the men who operate America's fishing resorts! They *know* outboards... Johnson Sea-Horses are their choice—BY 86%! On plans for future purchases, their choice is Johnson by more than 2 to 1\*. Their favorite, of course, is the Sea-Horse 5 1/2—America's leading fishing motor. This is the model that offers modern "big motor" features with small motor handling ease. Plus Johnson's revolutionary "Suspension Drive" that brings *QUIET* to outboard boating. Your Johnson Dealer will show you. Look for his name under "Outboard Motors" in your classified telephone directory.

*\*From survey by "Resort Management"*

SEA-HORSE 25	Electric Starting ... 25 hp.....	\$525.00*
SEA-HORSE 25	... 25 hp.....	430.00*
SEA-HORSE 10	... 10 hp.....	310.00*
SEA-HORSE 5 1/2	... 5 1/2 hp.....	210.00*
SEA-HORSE 3	... 3 hp.....	145.00

*\*Includes Mile-Master Fuel System, Prices f.o.b. factory, subject to change. All ratings are OBC certified brake hp. at 1000 rpm.*

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In Canada: Mfd. by Johnson Motors, Peterborough

**Johnson** **SEA-HORSES**  
FOR **DEPENDABILITY**

# Compare The Cuts Of Pipe Tobacco

## See Why Edgeworth Smokes Coolest... Never Bites Your Tongue



Some brands give you shorts and bits which burn like tinder—fast and hot.



Others give you fine-cut shreds—good for cigarettes, but not so good for pipes.



Only Edgeworth gives you slow-burning "chunks" made for pipes and pipes alone.



### Edgeworth's Way with White Burley Has Never Been Equalled

Your true tobacco expert will tell you that white burleys are the world's coolest smoking tobaccos. Edgeworth is a blend of white burleys only—aged like fine wine, for years. Other tobaccos use white burley, too—but nobody else has yet found out just how to blend and process tobacco to give it the even-burning, cool-smoking character that Edgeworth "Ready-Rubbed" has maintained.

### What "Ready-Rubbed" Means to Your Smoking Pleasure

Old-time smokers knew the secret of cool, even burning. They carefully "hand-rubbed" their tobacco until it crumbled into chunks

YOU'RE SMARTER SMOKING

# Edgeworth

AMERICA'S FINEST PIPE TOBACCO FOR OVER HALF A CENTURY

## Made Right...Cut Right and Packed Right!



### Three Months in a Duck Blind

A duck hunter left an unopened Edgeworth pouch in his blind for three months. When he discovered it, the tobacco was still mellow and cool smoking!

of just the right size. Now Edgeworth does all this for you before the tobacco is packaged. An ingenious, exclusive process "ready-rubs" Edgeworth into chunks that pack right in your pipe, giving you a cool, leisurely smoke with never a touch of tongue bite.

Edgeworth tobacco leaves our plant with just the right moisture content for a cool, no-bite smoke. You can be sure every pouch will be that way when you open it, because only Edgeworth has the Seal-Pak pouch. Sealed air-and-water tight, it promises you fresher tobacco than any other type of pocket pack. No bulky corners in your pocket either.

### FOR A COOL MIXTURE TRY HOLIDAY

A blend of five tobaccos selected for mildness and aroma—in the Seal-Pak pouch.



## AT YOUR DEALER'S

Get this guaranteed "Olde London" Pipe and two full-size pouches of Edgeworth tobacco for only \$1.00. The pipe is fine, hand-rubbed imported briar... with genuine hard rubber bit... carbonized bowl for cooler smoking. If your dealer is unable to supply you, use this handy order blank.

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Mail with \$1.00 to "Olde London," Larus & Brother Company, Inc., Richmond, Va. Offer Good Only in U. S. A. **PM-7**

JULY 1955

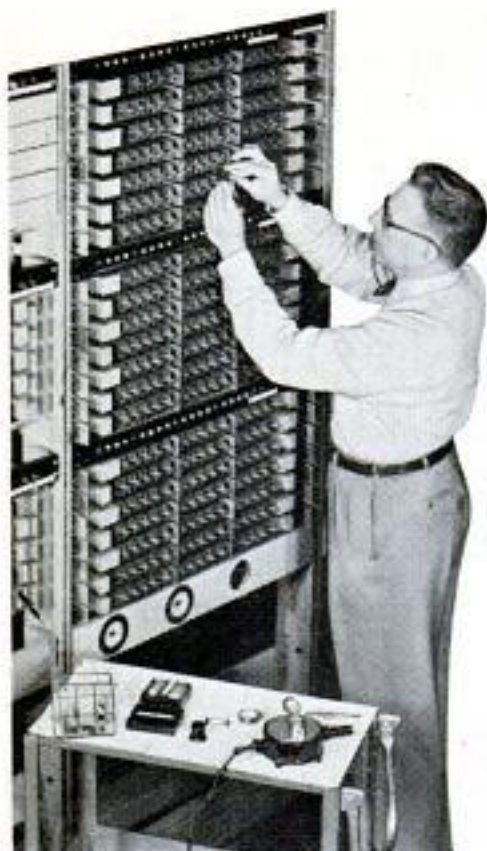
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## He's "fingerprinting" a relay contact

Bell Laboratories microchemists have perfected an ingenious new technique for "fingerprinting" relay contacts, the tiny switches on which a dial telephone system critically depends.

Using a portable test set, a chemist makes a plastic print of a contact. On-the-spot examination of the print with a microscope and chemical reagents quickly reveals the effects, if any, of arcing, friction, dust or corrosive vapors. While the chemist studies the print, urgently needed contacts continue in service. The findings point the way to improve relay performance.

This is another example of how Bell Telephone Laboratories research helps to keep your telephone system the world's best.



Above, Bell Laboratories microchemist applies plastic disc in heated clamp to relay contact. Imprint reveals contours of surface and picks up contaminants, if any. Part of portable test set is shown on table. Contacts, shown in small sketches, are of precious metal fused to base metal.



Preparing disc for microscopic examination. On-the-spot examination may reveal acid, alkali, sulfur, soot or other polluting agents peculiar to an area.



A microscopic look at disc often provides lead to nature of trouble. Unlike actual contact, print can be examined with transmitted light and high magnification.



Here the plastic disc has picked up microscopic lint that insulates contact, stops current. (Picture enlarged 200 times.) Traces of contaminants are identified in microgram quantities. Inert plastic resists test chemicals that would damage contact.

### Bell Telephone Laboratories

Improving telephone service for America provides careers  
for creative men in scientific and technical fields



# Popular Mechanics Magazine

Registered in U. S. Patent Office and Canada

H. H. WINDSOR, Founder

H. H. WINDSOR, JR., Editor and Publisher



## Next Month

MAJ. ARTHUR MURRAY, climbing into the rocket plane X-1A, has been farther from the earth than any other human. He's visited the fringe of space some 17 miles out. Next month Major Murray takes you along for a ride in the X-1A. You'll suddenly drop out of a B-29 at 30,000 feet, hear the roar as the rockets ignite. You'll feel the little plane shake as it accelerates up through the speed of sound. Then quite suddenly you'll hear only the sounds inside the cockpit, for you're traveling too fast for the roar of the rockets to reach you. Up in the stratosphere you'll have the eerie feeling of weightlessness as you slowly level off and start down for a dead-stick landing. Don't miss this exciting feature

Information not listed on articles in the index, starting on page 58, frequently is listed in the WHERE-TO-FIND-IT LIST, which is available to readers without charge. A copy may be obtained by writing to the Bureau of Information, Popular Mechanics, 200 E. Ontario, Chicago 11, Ill.

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# Texaco Tips On Car Care



## ← How to prevent engine misfiring

When dirt and moisture accumulate on the porcelain, spark plug functioning is often impaired. They can short out, cause your engine to misfire. To prevent this from happening, simply wipe plugs regularly with a dry cloth. Keep your spark plugs clean, and they will give you better performance.

## How to enjoy smoother driving

Just treat your car to *Marfak* chassis lubrication. *Marfak* is super-sturdy . . . clings fast to vital points of wear and friction . . . seals itself in, seals out dirt, dust and road water. And *Marfak* protection is longer lasting! It gives you *cushiony* comfort for 1,000 miles or more. Get *Marfak* chassis lubrication today. See your Texaco Dealer . . . the best friend your car has ever had.



**MARFAK**  
Lubrication



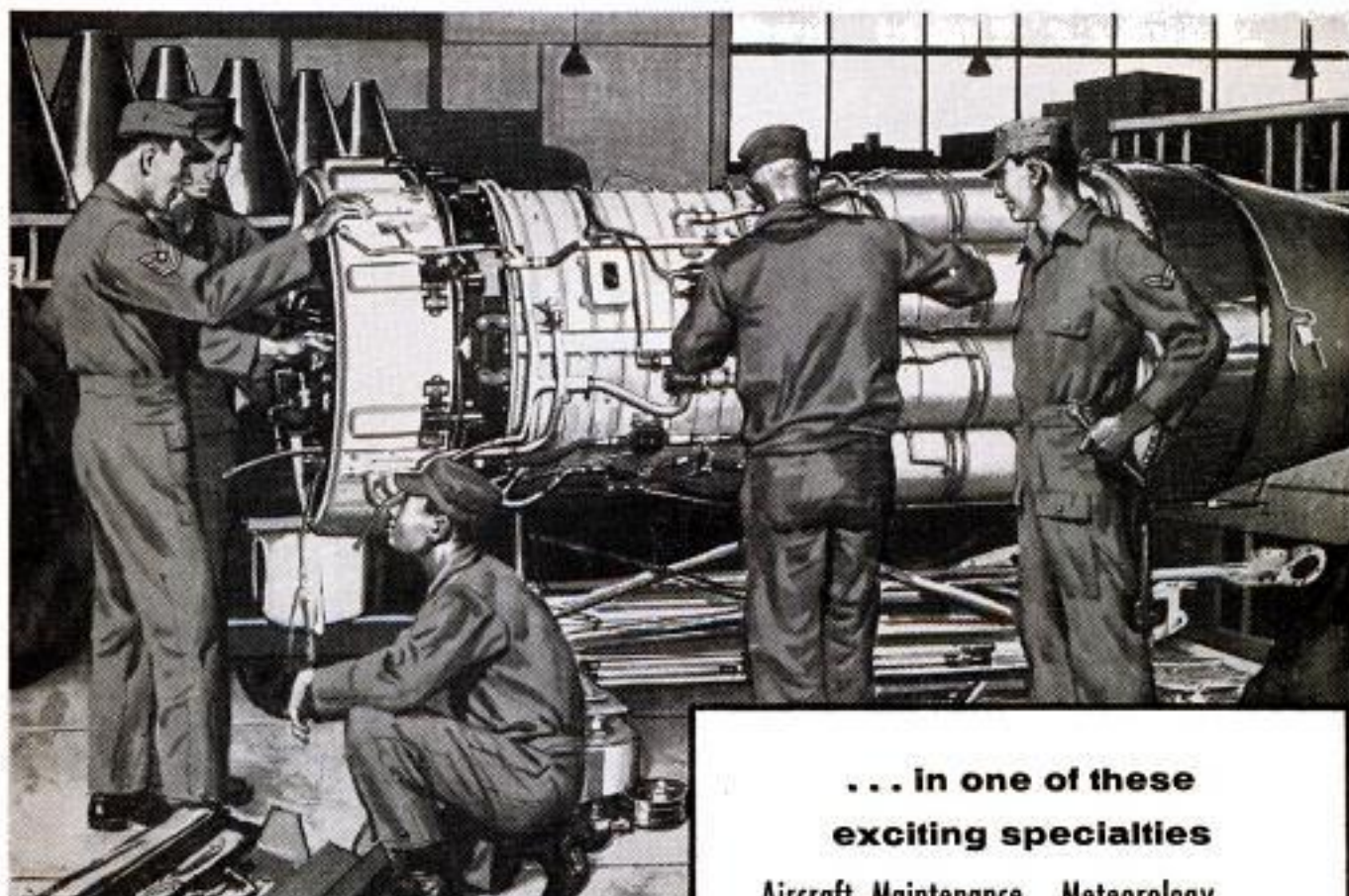
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## ACROSS THE DESK



With a deep personal sense of loss we record the death on May 4 of Frank L. Brittin, editor of the Radio, Television and Electronics Section of *Popular Mechanics*. A member of the magazine staff since January 1920, he had been a frequent contributor of radio articles even before that. His last article appeared in the June 1955 issue.

Mr. Brittin literally grew up with radio



and enjoyed a nationwide reputation as a pioneer editor in this field. He was probably instrumental in leading more young men into the world of radio (as thousands of letters in our files testify) than any other American.

Born in Springfield, Ill., Mr. Brittin built the first radio receiver in Illinois' capital city. In earlier years he was a registered pharmacist, and always maintained his contact with that profession although radio became his prime interest as "ham" and as editor. He received his ham amateur short-wave license in 1915 and was one of the early members of the American Radio Relay League. His own station was W9-DCX. Mr. Brittin was a senior member of the Institute of Radio Engineers and of the National Association of Science Writers.

(Continued to page 8)



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JULY 1955

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at Home in Spare Time

**Fast Growing Field offers  
Good Pay, Interesting  
Work, Security**

Get into a field where you can do important work, have a secure future. Electrical appliance repair offers OPPORTUNITY FOR YOU. Every wired home has an average of 8 electrical appliances. Up to 10 million new appliances are being sold every year. Owners pay well to keep them in repair and enjoy the convenience they provide. That means a fast growing need for trained men.



## Learn and Earn with Tester You Build

Our training includes the parts to build a sturdy, portable appliance tester following our illustrated, easy-to-understand instructions. This multi-use tester helps you locate electrical defects quickly and easily, equips you to do professional trouble-shooting. You use it to learn electrical appliance repair techniques. Gives you the practical training of actually building the tester and a valuable piece of equipment for future use.



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(Continued from page 6)

## European Heliports

Almost within the shadow of Paris' famous landmark, the Eiffel Tower, a new heliport is under construction on the roof top of a new building, 117 feet off the ground.

As soon as the Bir-Hakeim Heliport is completed, helicopters will be able to land right in the heart of Paris—just a 15-minute taxi ride to the Opera.

The new airfield on the banks of the Seine will consist of a concrete platform covering a good portion of the top of the new garage now being built, and later more of the roof-top space of the adjacent Palais des Sports will stretch out to 16,800 square



yards for the small planes to land and take off.

Paris' new heliport is another link in the growing chain of helicopter service with which airline officials will soon connect up the main capitals of Europe on a commuter-like service.

At present, Sabena, Belgian Airlines, has been successfully operating Europe's only international helicopter service, but other airlines are beginning to catch on. Sabena's American-built Sikorsky S-55 doodlebugs carry only seven passengers, plus a pilot, and link Brussels with Lille, France, twice daily; Brussels-Rotterdam (via Antwerp) three times daily; Brussels-Bonn, Germany, twice daily; Brussels, Eindhoven, Holland and Duisburg-Hamborn, Germany, three times daily; and operate daily flights to Liege, Maastricht, Dortmund and Cologne, Germany.

While the copters sometimes use regular airports to land, frequently the tiny craft will sit down on the newly constructed heliports. For example, the planes come

(Continued to page 10)

# ARE YOU TOO OLD TO LEARN?

*not at all, scientists say*

New tests show that: your ability to think increases with age; your powers of deduction are greater; your judgment is better.

In the I. C. S. files are thousands of cases of men and women of every age. Their successes, their promotions, their raises prove that men and women past school age can learn!

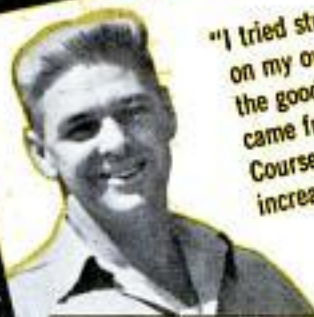
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Technician</li> <li><input type="checkbox"/> Auto-Engine Tune Up</li> <li><input type="checkbox"/> Automobile</li> </ul> | <p><b>AVIATION</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Aeronautical Engineering Jr.</li> <li><input type="checkbox"/> Aircraft &amp; Engine Mechanic</li> </ul> <p><b>BUSINESS</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Advertising</li> <li><input type="checkbox"/> Bookkeeping and Accounting</li> <li><input type="checkbox"/> Business Administration</li> <li><input type="checkbox"/> Business Correspondence</li> <li><input type="checkbox"/> Public Accounting</li> <li><input type="checkbox"/> Creative Salesmanship</li> <li><input type="checkbox"/> Federal Tax</li> <li><input type="checkbox"/> Letter-writing Improvement</li> <li><input type="checkbox"/> Office Management</li> <li><input type="checkbox"/> Professional Secretary</li> <li><input type="checkbox"/> Retail Business Management</li> <li><input type="checkbox"/> Sales Management</li> <li><input type="checkbox"/> Stenographic-Secretarial</li> <li><input type="checkbox"/> Traffic Management</li> </ul> <p><b>CHEMISTRY</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Analytical Chemistry</li> <li><input type="checkbox"/> Chemical Engineering</li> <li><input type="checkbox"/> Chem. Lab. Technician</li> <li><input type="checkbox"/> General Chemistry</li> <li><input type="checkbox"/> Natural Gas Prod. &amp; Trans.</li> <li><input type="checkbox"/> Petroleum Engineering</li> <li><input type="checkbox"/> Plastics</li> <li><input type="checkbox"/> Pulp and Paper Making</li> </ul> | <p><b>CIVIL, STRUCTURAL ENGINEERING</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Civil Engineering</li> <li><input type="checkbox"/> Construction Engineering</li> <li><input type="checkbox"/> Highway Engineering</li> <li><input type="checkbox"/> Reading Struct. Blueprints</li> <li><input type="checkbox"/> Sanitary Engineering</li> <li><input type="checkbox"/> Structural Engineering</li> <li><input type="checkbox"/> Surveying and Mapping</li> </ul> <p><b>DRAFTING</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Aircraft Drafting</li> <li><input type="checkbox"/> Architectural Drafting</li> <li><input type="checkbox"/> Electrical Drafting</li> <li><input type="checkbox"/> Mechanical Drafting</li> <li><input type="checkbox"/> Mine Surveying and Mapping</li> <li><input type="checkbox"/> Plumbing Drawing and Estimating</li> <li><input type="checkbox"/> Structural Drafting</li> </ul> <p><b>ELECTRICAL</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Electrical Engineering</li> <li><input type="checkbox"/> Electrical Maintenance</li> <li><input type="checkbox"/> Electrician <input type="checkbox"/> Contracting</li> <li><input type="checkbox"/> Lineman</li> </ul> <p><b>HIGH SCHOOL</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Commercial <input type="checkbox"/> Good English</li> <li><input type="checkbox"/> High School Subjects</li> <li><input type="checkbox"/> Mathematics</li> </ul> | <p><b>LEADERSHIP</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Foremanship</li> <li><input type="checkbox"/> Industrial Supervision</li> <li><input type="checkbox"/> Leadership and Organization</li> <li><input type="checkbox"/> Personnel-Labor Relations</li> </ul> <p><b>MECHANICAL AND SHOP</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Gas-Electric Welding</li> <li><input type="checkbox"/> Heat Treatment <input type="checkbox"/> Metallurgy</li> <li><input type="checkbox"/> Industrial Engineering</li> <li><input type="checkbox"/> Industrial Instrumentation</li> <li><input type="checkbox"/> Industrial Supervision</li> <li><input type="checkbox"/> Internal Combustion Engines</li> <li><input type="checkbox"/> Machine Design-Drafting</li> <li><input type="checkbox"/> Machine Shop Inspection</li> <li><input type="checkbox"/> Machine Shop Practice</li> <li><input type="checkbox"/> Mechanical Engineering</li> <li><input type="checkbox"/> Quality Control</li> <li><input type="checkbox"/> Reading Shop Blueprints</li> <li><input type="checkbox"/> Refrigeration</li> <li><input type="checkbox"/> Sheet Metal Worker</li> <li><input type="checkbox"/> Tool Design <input type="checkbox"/> Toolmaking</li> </ul> <p><b>RADIO, TELEVISION</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Industrial Electronics</li> <li><input type="checkbox"/> Practical Radio TV Eng'ing</li> <li><input type="checkbox"/> Radio and TV Servicing</li> <li><input type="checkbox"/> Radio Operating</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Television Technician</li> </ul> <p><b>RAILROAD</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Air Brakes <input type="checkbox"/> Car Inspector</li> <li><input type="checkbox"/> Diesel Locomotive</li> <li><input type="checkbox"/> Locomotive Engineer</li> <li><input type="checkbox"/> Section Foreman</li> </ul> <p><b>STEAM AND DIESEL POWER</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Combustion Engineering</li> <li><input type="checkbox"/> Diesel-Elec. <input type="checkbox"/> Diesel Eng's</li> <li><input type="checkbox"/> Electric Light and Power</li> <li><input type="checkbox"/> Stationary Fireman</li> <li><input type="checkbox"/> Stationary Steam Engineering</li> </ul> <p><b>TEXTILE</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Carding and Spinning</li> <li><input type="checkbox"/> Cotton, Rayon, Woolen Mfg.</li> <li><input type="checkbox"/> Finishing and Dyeing</li> <li><input type="checkbox"/> Loom Fix'g <input type="checkbox"/> Textile Des'ing</li> <li><input type="checkbox"/> Textile Eng'g's <input type="checkbox"/> Throwing</li> <li><input type="checkbox"/> Warping and Weaving</li> </ul> <p><b>MISCELLANEOUS</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Domestic Refrigeration</li> <li><input type="checkbox"/> Marine Engineering</li> <li><input type="checkbox"/> Ocean Navigation</li> <li><input type="checkbox"/> Professional Engineering</li> <li><input type="checkbox"/> Short Story Writing</li> <li><input type="checkbox"/> Telephony</li> </ul> |
|--|---|--|--|--|

Name \_\_\_\_\_ Age \_\_\_\_\_ Home Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_ Working Hours \_\_\_\_\_ A.M. to P.M. \_\_\_\_\_

Occupation \_\_\_\_\_ Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

(Continued from page 8)

into Brussels' big airport only as a transit stop to allow passengers to get off and board regular airliners bound for other points in Europe; but the main stop is at Brussels' new heliport which looks something like an auto parking lot near a skyscraper office building in downtown Brussels. The helicopter floats down like a floating leaf in the midst of heavy traffic in the business district.

Riding one of these international helicopters between Europe's cities like an international commuter is like no other air ride you've ever experienced.

Once the plane comes in for a landing, passengers get on while the whirling props overhead continue revolving. A door slides open and you climb aboard, carrying your own luggage. And then it's just a matter of minutes before the helicopter is ready to take off again, going up vertically.

Conversation becomes almost impossible due to the noise of the motor. It's possible to get in touch with the pilot, who sits in an enclosed compartment overhead, by means of a telephone receiver.

Once in the air, winds buffet the tiny craft and one gets the same swaying motion of a sky-high Ferris-wheel cabin, which the helicopter's cabin strongly resembles.

But the view is wonderful, since the

plane never flies much higher than between 300 to 400 feet off the ground, giving a good visibility of around 800 yards. You are just high enough to be able to see clearly cars moving like snails along white-ribbed highways. Passing over farm lands, you can see in miniature cows and livestock grazing in the fields. Passing over a cathedral or coming up over a great city, you get a bird's-eye view, being able to make out sharp detail which you could never really get from a commercial airliner.

Since distances between European capitals are much shorter than in other parts of the world, European businessmen particularly are beginning to see the advantages in hopping a helicopter instead of a train to travel a few hundred miles.

Arthur R. Pastore, Jr.,  
Paris 6e, France

#### Correction

Oklahoma Testing Laboratories of Oklahoma City call our attention to a statement in the article "Treasure Hunter Builds Midget Sub," in our April issue, which they state is erroneous. The article said the Laboratories reported the submarine hull "stood up under 1900 pounds' pressure during laboratory tests." Actually, say the Laboratories, samples of glass fiber

(Continued to page 14)

## New greaseless way to keep your hair neat all day



Prevents dry, unruly  
"orang-utan hair"

New Vitalis keeps hair in place and prevents dryness with V-7, the greaseless grooming discovery.

You never have an overslick, plastered-down look. Try it. You'll like it.



ANOTHER FINE PRODUCT  
OF BRISTOL-MYERS

## New VITALIS® Hair Tonic with V-7®

# I WILL TRAIN YOU AT HOME FOR GOOD PAY JOBS IN RADIO-TELEVISION

J. E. SMITH has trained more men for Radio-Television than any other man. OUR 40th YEAR.

**America's Fast Growing Industry Offers You Good Pay—Bright Future—Security**

## I TRAINED THESE MEN

"Started to repair sets six months after enrolling. Earned \$12 to \$15 a week in spare time."—Adam Kramlik, Jr., Sunnyside, Pennsylvania.

"Up to our necks in Radio-Television work. Four other NRI men work here. Am happy with my work."—Glen Peterson, Bradford, Ont., Canada.

"Am doing Radio and Television Servicing full time. Now have my own shop. I owe my success to N.R.I."—Curtis Stath, Ft. Madison, Iowa.

"Am with WCOC. NRI course can't be beat. No trouble passing 1st class Radio-phone license exam."—James W. Parker, Meridian, Mississippi.

"By the time I graduated I had paid for my course, a car and testing equipment. Can service toughest jobs."—E. J. Streitenberger, New Boston, Ohio.

Training plus opportunity is the PERFECT COMBINATION for job security, good pay, advancement. In good times, the trained man makes the BETTER PAY, GETS PROMOTED. When jobs are scarce, the trained man enjoys GREATER SECURITY. NRI training can help assure you more of the better things of life.

**Start Soon to Make \$10, \$15 a Week Extra Fixing Sets**

Keep your job while training. I start sending you special booklets the day you enroll, that show you how to fix sets. Multitester built with parts I send helps you make \$10, \$15 a week extra fixing sets while training. Many start their own Radio-Television business with spare time earnings.

### My Training Is Up-To-Date

You benefit by my 40 years' experience training men at home. Well illustrated lessons give you basic principles you need. Skillfully developed kits of parts I send (see below) "bring to life" things you learn from lessons.

**AVAILABLE TO VETERANS UNDER G. I. BILLS**

## You Learn by Practicing with Parts I Send

Nothing takes the place of PRACTICAL EXPERIENCE. That's why NRI training is based on LEARNING BY DOING. You use parts I furnish to build many circuits common to Radio and Television. As part of my Communications Course, you build many circuits, including low power transmitter shown at left. You put it "on the air," perform procedures required of broadcast operators. With my Servicing Course you build modern Radio, etc.; use Multitester you build to make money fixing sets in spare time while training. You can stay at home, keep your job, learn Radio-TV in spare time at low cost. Mail coupon for book showing other equipment you build and keep.

**The Tested Way To Better Pay!**

**2 FREE BOOKS SHOW HOW MAIL COUPON**



**Television Making Good Jobs, Prosperity**—Even without Television, Radio is bigger than ever. 115 million home and auto Radios are big market for servicing. 3000 broadcasting stations use operators, technicians. Government, Aviation, Police, Ship, Micro-wave Relay, Two-way Radio Communications for buses, taxis, trucks, R. R. are growing fields. Television is moving ahead fast.



About 200 Television stations are now on the air. Hundreds of others being built. Good TV jobs opening up for Technicians, Operators, etc.



25 million homes now have Television sets. Thousands more are being sold every week. Get a job or have your own business selling, installing, servicing.

### Radio-TV Needs Men of Action—Mail Coupon

Without obligating you in any way, I'll send an actual lesson to prove that my training is practical, thorough; 64-page book to show good job opportunities for you in Radio-TV. Terms for NRI training are as low as \$5 a month. Many graduates make more in two weeks than total cost of training. Mail coupon now. J. E. SMITH, President, National Radio Institute, Dept. 5GA, Washington 9, D. C. OUR 40TH YEAR.

### Good for Both—FREE

MR. J. E. SMITH, President, Dept. 5GA, National Radio Institute, Washington 9, D. C. Mail me Sample Lesson and 64-page Book, FREE. (No salesman will call. Please write plainly.)

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

Address.....

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

**VETS** write in date of discharge.....

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**How to Be a Success in RADIO-TELEVISION**

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washes cars like magic  
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SPRAY**

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COMPLETE KIT  
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**BUILT-IN  
SUDS CHAMBER!**

**NEW 3-WAY FOUNTAIN BRUSH  
WASHES CARS, PORCHES, FLOORS,  
SCREENS, WINDOWS—QUICK, EASY!**

Now!—order your famous **AEROMAT FOUNTAIN BRUSH** direct from the factory and save \$3.00. The new, improved 1955 model is better than ever—gives you quicker, more thorough washing action. Simply attach it to your garden hose and wash your car sparkling clean in minutes! Wonderful for washing windows, screens, floors, walls, porches, outdoor furniture, too. Has built-in suds chamber . . . drop in a Magic detergent pellet supplied with your brush, turn on the water and start in! No hard scrubbing! No back straining—the hi-pressure **ROTARY SPRAY ACTION** loosens and removes all film and dirt! Easy—fast—it's fun!

## FREE TO YOU—10 CAR WASHES!

New for 1955—a 3-section fountain handle makes the new **AEROMAT** handier than ever! Each section is one foot long. Use 3 sections for washing cars, walls, windows. Use 1 or 2 sections for close work. Easy to store. Bristles made of **DUROSTYRENE**—soft, silky, won't scratch or mar surface. Yours free of extra cost—a generous trial supply of **AEROMAT** Magic suds pellets—enough for 10 car washes. Extra pkgs. available—12-wash size for 59 cents and 24-wash size for \$1. Order your **AEROMAT** brush today—use the handy coupon. Try for 5 days—if not satisfied you get immediate refund. Send only 1.98 check, cash or m.o. Or order **COD** plus 44c postage. **RUSH** the coupon **TODAY!**

No. 444 . . . . . 1.98

75,000 sportsmen gladly paid \$3.95 for this famed hunting knife from Western Germany. However, a new shipment has just arrived—too late for the past hunting season. We're sacrificing these superb knives at **HALF PRICE**—only \$1.98. It's the bargain of the year! The rugged beauty of this splendid knife has already won recognition for design in sports circles on the Continent. Its blade is actually sharp enough to shave with! Genuine leather scabbard is metal tipped. The tough Solingen Steel by Korium assures years of rugged service. Length: 10 inches. Send only 1.98 plus 12 cents postage for 5-day home trial. Check, cash or m.o. Test it—if not completely satisfactory, return it for full refund. Get yours now at **HALF PRICE!** Makes a wonderful rec room or den decoration, too. But order **TODAY!** **COD's** plus 25c fees. **Rush** the convenient coupon!

No. 80 . . . . . 1.98

## SACRIFICE!

**Black Forest  
Hunting Knife**

now  
 $\frac{1}{2}$  price  
**1.98**

Reg.  
**3.95**

**10  
INCHES  
OVER-ALL**

with  
leather  
sheath

**Solingen Steel**

**RUSH!**  
for  
**FREE  
HOME  
TRIAL**

**THORESEN'S, Dept. 6-G  
352 FOURTH AVE., NEW YORK 10, N. Y.**

Please **RUSH** me the items checked on 5-day trial. I must be satisfied in every respect with the merchandise or I will return it within 5 days for full refund.

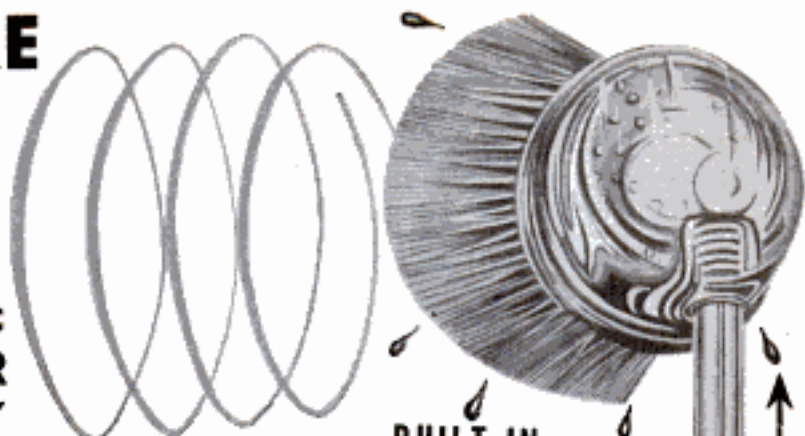
Payment enclosed. Send postage.  Send C.O.D. plus charges.  
 No. 444. Car Washer & pellets. (1.98). (COD—2.42).  
 No. 80. Black Forest Knife (1.98 plus 12c—total 2.10). (COD—2.23).

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

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

Also send \_\_\_\_\_ large pkg. (s) Magic suds pellets at \$1 each. (24 car washes).  
 Send \_\_\_\_\_ pkg. (s) at 50c ea.—enough for 12 car washes.



# INVENTORS

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

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

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

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

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## CLARENCE A. O'BRIEN & HARVEY JACOBSON

*Registered Patent Attorneys*

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**Dims Shine  
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 Doesn't Show**



Also available  
 in Canada

Finishing touch for every shave!  
 Neutral tint - crisp scent!

**MENNEN**  
 AFTER-SHAVE TALC  
**FOR MEN**

(Continued from page 10)

were given compressive-strength tests and tensile-strength tests but "we did not know, nor were we ever told, that this material would be used in the manufacture of the sub... we had nothing to do with the hull."

**To the Editor:**

I have received the book and plans for the PM Precut House and am very thankful for the fast service.

I have seen all the homes that universities have made as research for low cost and short cuts but the Precut House beats them all 95 to 1. You have come up with an answer people like myself have been dreaming of for years. Words just cannot express the feelings we had when we opened our package. Mr. Dempewolff ought to get a medal for the greatest service to "American Average Man" since television came out. Thank you, Mr. Dempewolff.

John Zilick,  
 Lackawanna, N. Y.

**To the Editor:**

I have been a constant reader of *Popular Mechanics* for more years than I like to remember! I had a copy of the July 1906 issue until about a year ago, when I foolishly loaned it to a friend and, of course, never got it back!

I send in items occasionally when I spot something original or unusual. I also have a transformer still in service that was built from an article by Frank L. Brittin that appeared in the 1923 issue for July.

I place great confidence in your articles and always accept them as authentic.

It is with this thought in mind that I would like to correct a statement in the March issue. There are thousands of people who will, or have, read this article, and will get the wrong impression from the statement.

Referring to page 141, re jails, in the second paragraph, the author states:

"They chose a tiny island a mile and a half off the California coast."

This leads one to believe that Alcatraz is out in the Pacific Ocean. Very wrong!

Alcatraz Island is in San Francisco Bay and can be seen plainly from Golden Gate bridge, not far from Angel Island, which is also in the bay. Ferry boats going from San Francisco to Sausalito pass quite close to Alcatraz.

The third bridge across the bay is now under construction, and will span the bay from Richmond to San Rafael.

Keep up the good work on *Popular Mechanics*, I sure enjoy it.

R. A. Lambert,  
 Los Angeles, Calif.



# THESE MEN ARE GETTING PRACTICAL TRAINING IN **ELECTRICITY**

—ELECTRONICS

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**A.C. and D.C. MOTORS  
GENERATORS  
SWITCHBOARDS  
CONTROLLERS  
WIRING JOBS  
APPLIANCES  
ELECTRONIC UNITS**

*(Shown at left—Instructor explaining operation and testing of a large Motor Generator in our A.C. Department.)*

# AND **TELEVISION-RADIO**

*On Real:*

**TELEVISION SETS  
RADIO RECEIVERS  
F.M.  
(Frequency Modulation)  
ELECTRONICS  
RECORD CHANGERS  
AUTO RADIOS  
PUBLIC ADDRESS Systems**

*(Right — Instructor helping students check the wiring and trace circuits of television receivers.)*



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**Largest, Oldest, Best Equipped School Of Its Kind In The U. S.**

Whether 17 or up to 45 years of age, prepare for your future now. Don't be satisfied with a "No Future" job. Train the Coyne way for a better job in a field that offers a world of opportunities in the years ahead.

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JULY 1955

15

# 17 pt. Self-Cleaning Plug Alone Shows 8 hp Gain and 7 mph Greater Speed!

**Eddie Edmunds**  
CHASSIS DYNAMOMETER CHART

Make of car is..... Year.....  
Model..... No. Cyl.....  
Is engine 5..... (check, cash or money order)  
Name.....  
Address.....  
City..... State.....

**Power Test**  
At 2000 RPM - 10000 RPM

Type of Spark Plug	LIFE-TIME		Conventional	
	HP	MPH	HP	MPH
17 pt. 17	32	75	24	68
17 pt. 16	31	74	23	67
17 pt. 15	30	73	22	66

Apply for more facts on LIFE-TIME on cover and insert each page.

**Recommendations**

Sign complete name on top of spark plug box and return to LIFE-TIME Spark Plug Co. with your address label on insert for more facts.

1955-56 *Frank Williams*



**Tustin Auto Parts**

110 West Main Street, Tustin, California Phone ELectric 1-3333

Continental Mfg. Co.  
Spark Plug Division

Dear Sirs:

In December, 1954, in Orange County, Calif., the following test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super.

Run at	After road plug	After LIFE-TIME
2000 RPM	24.0	32.0
3000 RPM	23.0	31.0
4000 RPM	22.0	30.0
5000 RPM	21.0	29.0

These are the results of the test. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super.

The above test was conducted in an electric testing room at the rate of 100 miles per hour. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super. The test was conducted on a 1951 Buick Super.

Yours truly,  
*Frank Williams*  
General Manager

## HOW 17 PT. FIRING WORKS

Note electrodes closely. A circular arcing area (four concave segments). Gap being the same from all points. Electricity has property of arcing from coldest point. Current also arcs more readily from apex of two planes than from the face of a flat, metallic surface.

Note that there are 16 apexes (where two planes meet) — all the same distance from the center electrode. Normal heat and spark erosion are spread around the entire 360 degrees and around the whole circumference of the center electrode.

## FULL ROTATING SPARK

allows overall cooler electrode temperature for greatly increased life. Hotter spark prevents fouling, yet the rotating and cooling effects minimize the common faults of burning, erosion, blistering and insulator failure. Compare this principle with the conventional 2-point spark plug design.

- **PLATINIUM-NICKEL ALLOY ELECTRODES**—Metallurgists' first major step beyond platinum aircraft plug electrodes. Arcing points of this material have continued to function after the equivalent of 129,000 car-miles.
- **SPECIAL SINTERED CORUNDUM INSULATOR**—Made of gem-like mineral which conducts heat 20 times better than ordinary porcelain. Special shape is designed to vaporize and exhaust wet carbon and oil.



- **INDIVIDUAL INSPECTION**—Each LIFE-TIME Spark Plug is tested for firing in oil and for resistance to 30,000 volts/CM.
- **PERMANENT GAP**—After months of use LIFE-TIME Spark Plugs make at exact factory pre-gap.
- **SELF CLEANING FOR LIFE**—Confined gases exploding in chamber formed by multiple electrodes reclean arcing surfaces with each firing stroke.



**NOW...  
ORDER REGISTERED SET  
FOR YOUR CAR AT POPULAR PRICE!**

Dealers and Distributors: The LIFE-TIME Spark Plug is now in full production. Write for full details. Distributors: Please inquire as to status of your territory.

## 50,000 CAR MILES!

Before LIFE-TIME development, the spark plug was the most often replaced part of your car. Engineers agreed that "creeping paralysis," gradual electrode disintegration, carbon buildup, widening gap, could waste one gallon in ten. The LIFE-TIME Plug has now gone far beyond the life of the average set of tires, the average battery. This plug still fired clean, hot and steady at 50,000 car miles!

Most spectacular spark plug research breakthrough in 50 years allows us to include this unique and unprecedented warranty with every set of LIFE-TIME Spark Plugs. We GUARANTEE GREATER GAS MILEAGE — GREATER ACCELERATION — A MAJOR POWER INCREASE — OR YOUR MONEY BACK.

## YOU RECEIVE BY MAIL

this registered set of LIFE-TIME Spark Plugs in proper series (heat range and gap) for the car you indicate in coupon. Now AVAILABLE FOR AMERICAN & EUROPEAN PASSENGER CARS, TRUCKS, BOATS, FARM EQUIPMENT, INDUSTRIAL ENGINES.

LIFE-TIME Spark Plug Division,  
CONTINENTAL MANUFACTURING CORP.  
Washington Blvd., at Motor Ave.  
Culver City 57, California

Destination Please mail postpaid..... 60000 (Registered) of LIFE-TIME Spark Plugs in proper heat range and gap for my car at introductory price of 50¢ per plug (out of stock \$2.98, out of stock \$7.50). 10¢ per set, balance C.O.D.

Make of my car is..... Year.....  
Model..... No. Cyl.....  
Is engine 5..... (check, cash or money order)  
Name.....  
Address.....  
City..... State.....

## 8 HORSEPOWER GAIN!

Dear Car Owner:

The real test of a spark plug is "What will it do in my own car?" Take the above dynamometer test on a 1951 Buick Super. It shows an 8 horsepower gain with Life-Time 17-point plugs. This was a 12 1/2% hp gain at 2000 RPM. You don't need a dynamometer with Life-Time plugs. You can feel the difference both in your ride and your pocketbook. Try a set and let me hear from you about them. Many thanks!

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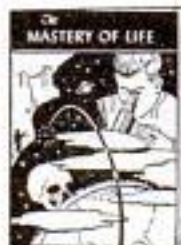


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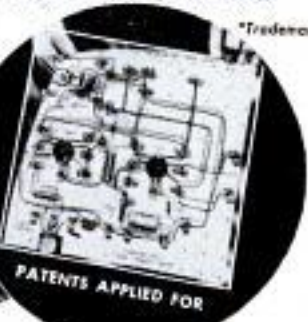
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650-16(8)	6.62	710-15	5.82	750-17	10.32	825-20	18.92
700-16	6.02	760-15	5.82	825-15	12.92	900-20	17.92
750-16(8)	7.82	800-15	5.92	600-20	9.02	1000-20	17.92
550-18	4.52	820-15	5.92	650-20	9.82	1100-20	19.92
550-17	3.72	670-16	5.32	32x6(8)	12.02	1100-22	18.92
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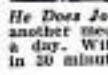
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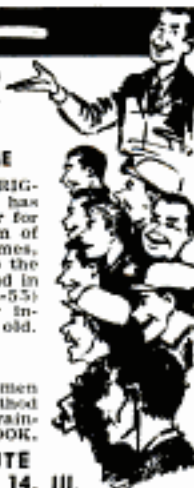
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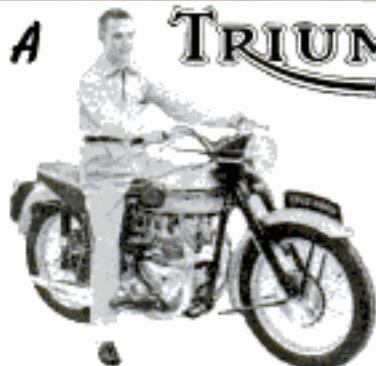
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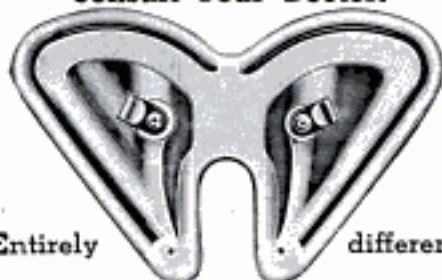
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### EXPERIMENTS PROVE FISH ARE ALMOST BLIND

Here is the most startling discovery that the scientists unearthed: most fish—of ALL species—have very poor eyesight compared to birds and mammals. Some are almost blind! No wonder, then, that you can use the most attractive dry lures—yet go home after a day's fishing excursion with little to show for it but a sunburn!

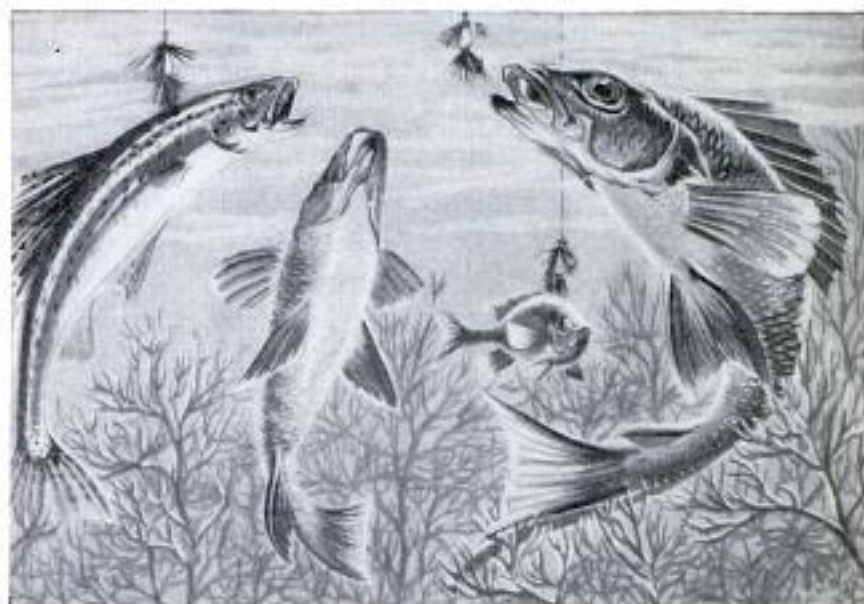
It doesn't make much difference how good the bait is you use nor how hungry a fish may be—if he doesn't SEE it, if he can't DRAWN to it, you won't get a nibble! And test after test proved that unless you get the lure right under the fish's nose, you simply cannot attract him to your hook!

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**BE** Appointed state notary public now. Write, Stationers, Helotes, Texas.

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I want to send you proof of the wonderful pulling power of Popular Mechanics classified pages. What's your proposition? Write me today. Include literature if possible. F. W. Johnson, Manager Classified Advertising, Popular Mechanics Magazine, 200 E. Ontario St., Chicago 11, Ill.

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**SELL** Popular Mechanics and all other magazine subscriptions. Free catalog, supplies. Subscription Service Company, Dept. A, P.O. Box 2070, Birmingham, Alabama.

**MAKE** Money helping others get out of debt, stop garnishments, save jobs, re-establish credit. Details. Borum 86, 411 West Walnut Street, Kalamazoo, Michigan.

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#### AGENTS WANTED

**LOWEST Wholesale prices.** Thousands of name brand items. Free literature. Parker Distributors, Box 55, (Dept. C) Williamsbridge Sta., New York City 67.

**\$125 WEEKLY! 176% Profit!** New, wonder Dow-Corning car polish. Cleans, glazes, weatherproofs year 'round! Write United, 1035 East 10th St., Brooklyn 30, N. Y.

**PROVEN Money-maker.** Brand new product sells on 5 minute demonstration. Market and profit unlimited. Nationally advertised. Satisfaction guaranteed. Free details. Hoke Tool Works, Dept. B, Raeford, N. C.

**WHOLESALE Catalog!** Appliances, cameras, watches! Anelag Industries, Rochester 1, Wisconsin.

**AMAZING New whirlwind seller.** Medicated lotion. Stops itch. Insect bites, chiggers, poison ivy, sunburn. No rub off. Great repeater. Wonderful profits. Free details. Guerrieri, 2921-P N. Clark, Chicago 14.

**CLEAN, Shine autos** the easy way with \$2.00 Dustex. Chemically treated long lasting dirt removing cloth. Write for selling plan. Dustex, 2616 Harrison, Waukegan, Illinois.

**60% PROFIT** On cosmetics — Famous nationally advertised Hollywood Cosmetics pay 60%! Make \$25 day up! Hire others. For free samples, details, write Studio Girl, Glendale, Calif., Dept. PM-65.

**EARN \$150.00** Per week, giving away stainless steel tableware. Nueblings-M. Sicklerville, N. J.

**MAKING** Fast dollars easy. Attractive nameplates sell themselves. Request personalized sample. Stan Roberts, Engraving, 2118 Lee, Cleveland, Ohio.

**\$5 TO \$10** An hour. I've did it. I'm disabled now. Real genuine offer. Complete information only \$1. Lucas, 2200 Carson St., Pittsburgh 3, Penna.

**30,000,000 WOMEN** Want amazing new automatic refrigerator defroster. You sell 8 out of 10 on sure-fire free trial. \$250.00 weekly profit not uncommon. Rush postcard for guaranteed plan. D-Frost-O-Matic, Dept. H-102, 173 W. Madison St., Chicago 2, Ill.

**YOUR Own business**—Used suits \$1.30, overcoats 65c, mackinaws 35c, shoes 12½c, ladies coats 30c, dresses 15c. Enormous profits. Catalog free. Moro, 1218AA South Jefferson, Chicago 7.

**HAVE** Your own business, buy wholesale, make big profits. Free general mds. catalog. Jay Norris, Dept. P, 445 Broome St., New York.

**PRINTING.** Advertising salesmen—Excellent moneymaking sideline selling decalcomania name plates, small quantities. Automobile initials, sign letters. Free samples. Balco, XL, Boston 19, Mass.

**GOLD** Or silver letters, numbers. Windows, doors, trucks. 1" to 6". 500% profits. Free samples. Atlas-T, 544 West 79th, Chicago 20.

**MAKE** Extra money. Sell front door name plates to friends, neighbors. Retail \$1.98; you make \$1.00! Free selling kit. Modern Engraving Co., P.O. Box 194, Boston 14, Mass.

**\$1.00 PROFIT** Selling \$2.95 photo enlargement deal. Allen Studio, Riegler Bldg., Little Rock, Ark.

**AGENTS** — 300% Profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 431-D North Clark, Chicago.

**INCREASE** Your income—Personal initialed buckles, belts, cap badges. Free information. Hook-Fast, Box 480 (PM), Roanoke, Va.

**CASH** In on toilet trouble—Sell plastic flush valve guide. Write for sales plan. Guide-O-Valve Co., 1616 Broadway, Redwood City, Calif.

**YOUR Ad** in this space will get some good agents for you. Yes, I'll prove it. Write for Folder "A" right now. F. W. Johnson, Classified Advertising Manager, Popular Mechanics Magazine, 200 E. Ontario St., Chicago 11, Ill.

**SELL** Sunshine cards, the name quality has made famous. No investment or experience necessary. 21 card deluxe tall slim assortment sells on sight! Imprints. Currier-Ives, religious, gift wraps, many others. Samples on approval, write: Sunshine Art Studios, Inc., Dept. PM-7, Springfield 1, Mass., Pasadena 1, Calif. (Note: East of Rockies address Springfield office.)

**CALENDARS.** Advertising novelties, matches. All styles, including religious, varnished. 12 sheet, girls. Hundreds of advertising novelties, book matches, etc. Fleming Calendar Co., Sales Division, 6539 Cottage Grove, Chicago 37, Ill.

**BUY Wholesale** thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Herchel Station, Buffalo 16-A, N. Y.

**BIGGER** Profits selling greeting cards. Get list of sensational factory surplus bargains. \$1.25 boxes for 50c, \$1 boxes for 35c—while they last! Big line new 1955 Christmas cards, stationery, gifts. Assortments on approval. Personalized samples free! Midwest Cards, 1113 Washington, Dept. 557-B, St. Louis 1, Mo.

**CASH** In plenty! Exciting new-towel deal, details. Leff Distributors, Kawkawlin, Michigan.

**NEED** More money to live on? Increase your weekly income \$20 to \$25 or more in spare time. Supply Rawleigh Products to consumers. Also openings for full time dealers. Write Rawleigh's, Dept. G-DD-PPM, Freeport, Ill.

**MAKE** More money showing Elmira greeting cards this Christmas! Why more? Because Elmira offers more variety; beautiful cards for every taste, every purse. You get heart-warming, old-fashioned favorites and smartly simple ones for today's tastes. No matter who you sell, Elmira has a style to please everybody from grandmother to young Mrs. Executive. Send today for free personalized samples, catalog and sparkling assortments on approval with personalized stationery, imprinted napkins and lovely gift wrappings! Elmira Greeting Card Co., Elmira 198, N. Y.

**AGENTS-Salesmen:** Sell beautiful hand-colored plastic enlargements and sensational new personalized photo compacts, rings, bracelets, lockets, etc. Experience unnecessary. 40% advance commissions. We deliver, collect. Wonderful sideline. Better full time. Free sample outfit. Novel Portrait Co., 3343 North Ave., Chicago, Ill.

**AT Last!** Something new and sensational in latest tall Christmas cards. Make extra money fast! Show satins, velours, metallics. Gets easy orders. Pays up to 100% profit. 30 free samples. With name 50 for \$1.50. Big line, Amazing convertible pen-pencil, napkins, gifts, stationery. Several \$1.00 boxes on approval. Puro Greetings, 2801 Locust, Dept. 540-J, St. Louis, Mo.

**SELL** Christmas cards—\$1.00 and \$1.25 assortments of 21 cards. Big line, 200 items. All occasion cards, popular "slims," religious, children's cards. Gift wrappings, gifts, gadgets. Amazing profits. Bonus plan. Experience unnecessary. Free imprinted Christmas card and stationery samples, selling plan, catalog. Write today for samples on approval. Free \$1.00 gift for promptness. Hedenkamp, 361 Broadway, Dept. PM-37, New York.

**BEAUTIFUL** Feather pictures. 200% profit! Free sample. Apartado 9036, Mexico 1, D. F.

**NEW** Plastic mending tape. Just press on! Repairs clothing instantly. Lightning seller. Samples sent on trial. Kristee 72, Akron, Ohio.

**MAKE** Money introducing world's cutest children's dresses. Big selection, adorable styles. Low prices. Complete display free. Rush name. Harford, Dept. P-2341, Cincinnati 25, Ohio.

**NEW** Tall Christmas cards pay 75c profit on \$1.25 assortment. 40 exclusive name-imprints \$1.25; gift wraps by-the-yard; 30 for \$1 assortment; 250 new fast sellers. 5 assortments on approval. \$1.95 gift for promptness. Cardinal, 1400 State, Dept. 79-R, Cincinnati 14.

**150% PROFIT** Selling 500 name and address labels at \$1 retail. You keep 60c profit. Free selling kit. Bruce, Box 71-Y, Boston 1, Mass.

**CALIFORNIA** Sweet smelling beads. Sensational sellers. Particulars free. Mission, 2328 FR, W. Pico, Los Angeles 6, Calif.

**RUN** Spare-time greeting card and gift shop at home. Show friends samples of our new 1955 Christmas and all-occasion greeting cards and gifts. Take their orders and earn to 100% profit. No experience necessary. Costs nothing to try. Write today for samples on approval. Regal Greetings, Dept. 78, Ferndale, Mich.

**NEW** Bathrooms deodorizer. Hangs on wall. Banishes odors bathroom, kitchen. Lightning seller. Samples sent on trial. Kristee 73, Akron, Ohio.

**WHOLESALE** Catalog! Appliances, cameras, watches. Postcard. Selbyco, Decatur 258, Illinois.

**WHOLESALE!** Nationally advertised products. Davis, 750-K, Tilden, Flint 5, Mich.

**UNLIMITED** Market. No competition. Big profits. Authentic wood carvings imported direct from Africa. 100% profit, write today, free details. Kempo, Box 4098, San Diego 4, California.

**AGENTS** Wanted for newly invented 6 colored bulb flashlight \$1.15. Car visor carryall \$1.35. Famous electric shaver \$1.85. Terrific sellers. Make \$200 weekly. Free advertising supplied. Write, Turner Company, 1170 Broadway, New York 1, N. Y.

**ALUMINUM** Masticote liquid roofing brings big orders and big money. Madison Paint Co., Mfgs. Dept. P8557, Cleveland 2, Ohio.

**MAKE \$50, \$75, \$100** Extra money. Sell friends new tall style Christmas, all occasion greeting card assortments. Unusual gift wrappings, novelties. Profits to 100% plus cash bonus. Write for feature boxes on approval, 77 free samples personal Christmas cards, stationery. New England Art Publishers, North Abington 733-E, Mass.

**EARN \$46.80** A day! Sell Car-Olo, amazing silicone, wax treated cloth. Cleans cars with one wipe. Fantastic automotive market wide open for this sensational profit-maker! Start earning immediately! Send for free sales kit. M & M, Dept. M-3, 842 Third Ave., New York City 22.

**EARN \$200** A week and up! Amazing profits are yours selling Seal-Tite, miracle puncture-proofing discovery! \$1.98 tube stops flats forever. Sure-fire appeal to America's 50,000,000 motorists! Complete sales kit free on request. M & M, Dept. M-2, 842 Third Ave., New York City 22.

**EASY** Handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

**EARN \$30** A day! Sell Dab-It, amazing pocket-size, stick-form, "no ring" spot remover. Works like magic! Guaranteed! M & M, Dept. M-1, 842 Third Ave., New York City 22.

**CLOSEOUT.** Retractable ball pens. Assorted colors. \$14.00 hundred postpaid. Pencil type ball pens, \$4.00 hundred. Samples of four retractables and dozen pencil type \$1.00. Crescent Sales, 150-PM Broadway, New York City 38.

**AMAZING**—Dry pressing cloth. Requires no dampness. Housewives wild about it. Sells like hot cakes. Wonderful profits. Free sample with details. Dry Method Pressing, 6116 Selma Ave., Hollywood 28, Calif.

**NEW** Way to make money! Sell nothing, yet make \$132 or more weekly. Postcard brings all details free. Topval, Lindenhurst 91, N. Y.

**BUY Wholesale!** 100,000 name brand products! Save 65%!! Big profits selling others spare time! Free catalogs. National Buyers Service, Box 428EE, Oakland, Calif.

**CHRISTMAS** Card agents: Write for our samples. Wade Greetings, Box 3006, Greenville, Miss.

**WHOLESALE** Catalog! Appliances, cameras, watches! Cam Company, 6806PM 20th Ave., Brooklyn 4, N. Y.

**SENSATIONAL** Money maker. Amazing new liquid mends almost anything. Volume seller. Write for proof and particulars. Indiana Labs., Dept. PM75, Elkhart, Ind.

**EASY** Money selling the new Pro Candid 35 mm. cameras. Your area is open for anyone to cash in on these fast-selling cameras. Selling kits furnished, cash commissions guaranteed. For complete information write Beaurline Industries Inc., 500 N. Robert Street, St. Paul 1, Minn.

**IS \$250** A week worth a postcard to you? Then rush card for free details of new spray-on-window light filter needed by all factories, stores, institutions, etc. Big-profit quantity orders, re-orders. Glass-Tint, 220 S. State, Dept. G-304, Chicago.

#### BUY IT WHOLESALE

**WHOLESALE!** Musical instruments, phonographs, recorders, watches, appliances, etc. Discounts to 75%! Large catalog 50c (refundable). Strauss Music Company, 25-33 Lafayette, Paterson 23, N. J.

**BUY** Surplus wholesale. Catalogue 25c (refundable). Box 22 BW, Thomasville, Penna.

**BUY** It wholesale. Appliances, cameras, tools. Rush 50c for catalog to Edward Clemens, 318 W. Bridge St., Morrisville, Penna. (Refundable.)

**BARGAINS.** Joblots, close-outs, 2000 items. Save to 50%. Clothing, hosiery, toys, toiletries, gifts, jewelry, television, etc. Get acquainted. 25c brings wholesale catalog plus free \$1.00 merchandise certificate. Reliable Jobbing, 311-B North Desplaines, Chicago.

**WHOLESALE** Catalog! 30-80% discounts! Typewriters, appliances, housewares, watches, jewelry, etc. Consolidated Distributors, 21-20 Lafayette, Paterson 15, New Jersey.

ONE Million articles wholesale. Directory \$1.00. Johnson's, 3262-F Medina, Fort Worth, Texas.

INDIVIDUALS. Nationally advertised merchandise. Wholesale. Tremendous discounts. Kingsley, Chepachet, Rhode Island.

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DISTRIBUTORS—Large profits. Terrific repeat orders. Unique Italian brooms, details free. Write P.M. Peacock, 915 Bryant, San Francisco, California.

FISH Hook. New, different, fast seller. \$1.00 retail. Big profits. Details free. Kayenvee Enterprises, Box 335M, Oskaloosa, Iowa.

MAKE Easy money. Sell famous \$3 CO-2 fire extinguisher. Wholesale or direct. Past sales, liberal profits. Fire Killer Mfg. Co., Dept. E, 115 W. 17th Street, Hazleton, Penna.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 850 N. Dearborn, Dept. 17, Chicago 40, Ill.

\$5 TO \$10 An hour. I've did it. I'm disabled now. Real genuine offer. Complete information only \$1. Lucas, 2300 Carson St., Pittsburgh 3, Penna.

SELL World famous Goodyear liquid roof preserver for old leaky roofs. No expense necessary. Two average orders daily pay you \$211.00 weekly. Write H. V. Hulse, P.M. Consolidated Paint & Varnish Corp., Cleveland 13, Ohio.

MAKE 300% Profits! Sell Door Spy. America's new one-way door-viewer. Sample \$2.00. Profit-making details free. Unique Products, 23-53 Lafayette, Paterson, New Jersey.

AD Matches! Sell amazing designs—10, 20, 30, 40 and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men; women; full, part time. Buy nothing! Sales kit furnished. Match Corp., Dept. PM-67, Chicago 32, Illinois.

ADVERTISING Book matches—Cash in on big demand; sell union label matches. Cuts for all businesses and political parties. Free powerhouse selling kit, low prices, protection guaranteed on repeat orders. Cash commissions. Superior Match Co., Dept. M-755, 7530 Greenwood, Chicago.

START Your own business on credit. Your own boss. 1135 of our dealers sold \$5000 to \$30,000 in 1954. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary, pleasant profitable business backed by world-wide industry. Write Rawleigh's, Dept. G-U1-PPM, Freeport, Ill.

BUY Wholesale thousands nationally advertised products at big discount. Free "Wholesale Plan." American Buyers, Hertel Station, Buffalo 16-J, N. Y.

GOOD Man can make \$3,000.00 next 90 days. Every house in town wants amazing NiLite glowing curbside house numbers. Automatic selling plan pays profits everyday. Write today for details free. NiLite, 175 W. Madison, Dept. K-80, Chicago.

WILL You wear new suits and topcoats without one penny cost and agree to show them to friends? You can make up to \$30 in a day even in spare time, without canvassing. Stone-Field, 532 South Throop St., Dept. D-926, Chicago 7, Illinois.

BASKET—Earrings: Straw, bamboo, cutshell, hat-baskets with miniature fruit. Sombreros, covered wagon, guitar, saddle, fruit wagon, bird in glass cage, glass cup-saucer. Trial 3 dozen handmade pairs \$15.00. Lastufka Products, Box 10248, Tampa 9, Florida.

LIGHTNING. The fastest selling portable adding machine in the nation offers big opportunities to increase your earnings. Don't delay, write today for colored photo and full details. Lightning Adding Machine Sales Co., 234 W. 37th Pl., Los Angeles, Calif.

BIG Money-making opportunity. Exclusive line work uniforms, jackets, pants, shirts, coveralls. Advertising embroidered. Every business prospect. Outfit free. Master Div., 568 Water, Ligonier, Ind.

HOME Agency. Power mowers. Cut rate deal. Delivered. Farmco-51, Excelsior Springs, Mo.

IF You have sold or are now selling made-to-measure clothing, the Strand line, with a value-packed worsted line at \$45 retail, is a must! Even spare time men make quick sales and big profits with this fine quality line. Complete selling kit free. Strand Tailoring Company, Dept. M, Baltimore 3, Md.

EASILY Make \$30 daily. Automatic toilet bowl cleaner sells itself. Write Box 61, Belleville, N. J. No-risk sample \$2.35.

ADVERTISING Specialty directory locates sources. Eliminates jobbers \$3.50. Hofert, Utilities Bldg., Chicago 4.

SENSATIONAL Money maker. Amazing new liquid mends almost anything. Volume seller. Write for proof and particulars. Indiana Labs., Dept. PM75, Elkhart, Ind.

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EDUCATE Yourself with progressive cross word puzzles. Dictionary furnished. Calco, Drawer 988, East Chicago, Indiana.

BE A real estate broker. Study at home. Write for free book today. GI approved. Weaver School of Real Estate, 2018P Grand, Kansas City, Missouri.

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LOCATE Anyone: Nearly 200 professional ways outlined. \$2.00. Worthington Instructions, Box 144, Newtown Square, Penna.

BECOME A doctor of psychology or metaphysics. Learn secret of contentment, happiness. Win degree of Ps.D. or MsD. Correspondence only. Free book. College of Universal Truth, 5038-C Broadway, Chicago.

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SECRET Investigation. Experience unnecessary. Investigators particulars free. George Wagner, M125 West 86th, New York 24.

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MEDICAL Laboratory technicians in great demand. We train you in your own home. Catalogue free. Imperial Technical Institute, Box 973-J, Austin, Texas.

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BLUEPRINT Reading for machine and building trades. Train at home. Learn to read blueprints with confidence in 10 easy lessons. Earn more pay. Literature free. Belton School, 1059-V North Lawndale, Chicago 51, Illinois.

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COMPLETE Your high school at home in spare time with 58-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. KB45, Drexel at 58th, Chicago 37, Ill.

SQUARE Peg in round hole? Dissatisfied? Restless? Unhappy? Do psychological tests at home. Uncover true abilities, aptitudes. First time available. Low cost. Details free. Write Psychologic Testing Institute, Dept. 247, 201 N. Wells, Chicago 6, Ill.

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CRIMINOLOGY Membership now available. \$5. Free details. American Association of Criminology, Box 1122, Boston 3, Massachusetts.

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**CALIFORNIA** Reports big future for you in San Fernando valley! Send dollar for illustrated brochure. Progress, Box 345, Van Nuys, California.

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IF Interested in artist frames, canvas, canvas boards, Red Sable brushes, etc., be sure to get our money saving price lists before buying. International Sales Co., 414 E. Baltimore St., Baltimore 2, Md.

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**BEFORE** Advertising get instructive Ad-Guide and Ratebook, 10c. Ideas developed. Advertisements prepared free. Chicago Advertising Agency (Established 1900), Chicago 4.

**NAMES:** Accurate, latest, birth lists; prospective bridegrooms; Cleveland homeowners, 100, \$1.00. Information free. Crowley's, Pearl Road, Route 3, Chardon, Ohio.

**WANT** More business? Here's an amazing opportunity to increase your sales. Talk to thousands of interested readers of "Mechanica Popular." Our Spanish Edition covers the Latin American countries like a blanket. They're real mailorder buyers. Classified rate 75c per word. Try an ad in our next issue. Classified Advertising Department, Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Ill.

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**MAILING** Lists, most any classification, 1000 names \$5.00. 1000 your circulars mailed with ours \$4.00. 5000 your circulars printed and mailed \$12.95. Write Dixie Mailers, King, North Carolina.

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**RUBBER** Stamps by professional craftsmen. 3 lines \$1.00. Price list. South Coast Press, P.O. Box 2074, San Bernardino, Calif.

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**SEND** For free catalogs today! Big values—Low priced rubber stamps, printing all kinds, any style, size, quantity. Delivery prepaid. Satisfaction guaranteed. Esco 175 Print, Holt, Dayton 7, Ohio.

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**RECONDITIONED** Typewriters, duplicating, printing devices. \$25.00 up. Supplies. Appliances. DixieGraph, King, N. C.

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**PRESSES**, Type cabinets, supplies. List for stamp. Lincoln Press Company, 230-F Hartwell, Fall River, Mass.

**PRINTING** Presses, type, supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

**HAND** Presses; cutters; cases; type. Open Saturdays. Damon & Peets, 56 Beekman St., New York City.

**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.

**CLOSING** Out new type—Half price. Owen Stout, Paoli, Indiana.

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**MAKE** Your own self-molding rubber stamps and printing cuts. Plexirubber. Argyle 1, Wisconsin.

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500 3/4x2 1/4 **FOUR** Line gummed stickers 50c. Red border \$1.00. Moritz Printery, Saginaw, Mich.

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100 **LETTERHEADS**, \$1.00, ±6% Envelopes same, two colors, \$1.50. Broadbrook, Botsford, Conn.

**ADS** Running under this heading sell printing. Ask me for proof. I'll gladly send you amazing facts. Ask for Folder "P." F. W. Johnson, 200 E. Ontario St., Chicago 11, Ill.

1000 **ADDRESS** Labels, \$1.00. 500 note-heads or envelopes, \$3.75. 1000 business cards, \$3.50. 3x6 circulars, \$2.50 per 1000. Postpaid. Bruno, 89-44 97th St., Woodhaven 21, N. Y.

1000 8 1/2x11 **PRINTED** Letterheads, \$6.00 postpaid. Weeping Water Printing Co., Weeping Water, Nebraska.

**FREE** Printing catalog. 1000 business cards \$1.99. Leatham, Everton, Missouri.

1000 **ENGRAVED** Business cards \$2.95. Free samples. Pioneer, 210-5th Ave., New York 10.

100 8 1/2x11 **WATERMARKED** Letterheads postpaid \$1.00, envelopes same. R. Hussey Printing, Abbeville, Miss.

**OFFSET** Printing \$6.50—1000, 8 1/2x11, 16 lb. National Letter, 1463 Broadway, New York 36.

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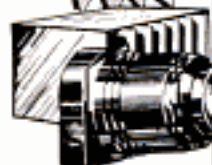
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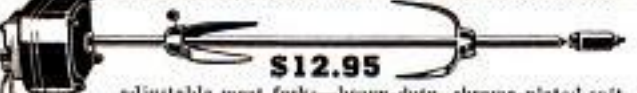
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Start of the Daytona 160-mile race. Tim Flock (R.Front) and Lee Petty (L.Front) finished 1-2 in Champion-equipped Chrysler 300's.



**THE FLORIDA INTERNATIONAL GRAND PRIX OF ENDURANCE**—Sebring's AAA-sanctioned, 12-hour race for sports cars—was won this year by Phil Walters and Mike Hawthorn in a Champion-equipped Type D Jaguar. They finished 25 seconds ahead of a Ferrari driven by Phil Hill and Carroll Shelby. The Ferrari, also running on Champions, was first on Index of Performance.

The winning Jaguar (19), owned by Briggs Cunningham and fitted with Champions, roars into an early lead from the LeMans type start.

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# POPULAR MECHANICS

JULY  
1955

WRITTEN SO YOU CAN UNDERSTAND IT  
VOL. 104 NO. 1

## WHAT CAN WE DO ABOUT



Girl sealed in helmet tests smog for eye irritation

# SMOG?

By Thomas E. Stimson, Jr.

**M**OTORISTS IN SMOGGY Los Angeles are the guinea pigs in research that may produce more miles per gallon for every driver.

More than that, the research promises to reduce one of the most important causes

of air pollution in several of our busy cities.

Stanford Research Institute, seeking the causes of smog, learned that about seven percent of the fuel you feed your car is thrown away. About one gallon in every tankful goes out the exhaust pipe unused.

Mountains near Los Angeles tower above inversion layer that causes blanket of smog to smother the valleys





Area in color is often covered with a tent of smog during months from July to November. Mountain barrier restricts air flow

Projector measures ozone in the air by beaming ultraviolet rays which the gas absorbs. Ozone is one of the constituents of smog



On a national basis, this loss amounts to \$1,000,000,000 per year.

Other investigators showed that the average engine is efficient only when accelerating or cruising. It wastes up to 25 percent of its fuel when idling in traffic. During deceleration from high speed the waste amounts to 60 percent or more.

Next, Prof. A. J. Haagen-Smit of the California Institute of Technology found that the hydrocarbons in this wasted fuel combine with nitrogen dioxide (also present in the exhaust) in the presence of sunlight and form ozone. Ozone is a highly reactive pungent gas. It irritates the lungs and eyes, causes tires and other rubber products to deteriorate and combines with still other hydrocarbons to form other irritating constituents of smog.

In Los Angeles this situation is regenerative. That is, deposits of gum build up quite rapidly in automobile carburetors during smoggy weather. The so-called gum includes dust, rubber particles and oil vapor from the exhausts of other cars. The gum restricts the flow of carburetor air and enriches the mixture, thus increasing the amount of unburned fuel that goes into the atmosphere.

In extreme cases, the air-fuel ratio becomes so unbalanced that cars continually stall in traffic. One garage reported that 30 cars limped in for carburetor service during one smoggy morning alone. Another garage had 20 customers with the same complaint in a day, some with brand-new cars that had been on the streets less than a week. In each case, gum caused by atmospheric pollutants had collected around the throttle plate and upset the air-fuel ratio of the carburetor.

It is estimated that the 2,000,000-plus cars in the Los Angeles area discharge some 300,000 gallons of raw, unburned gasoline into the air every day. During an atmospheric inversion this automotive smog makes the difference between a relatively clear day and a day in which visibility is cut to a mile or less.



Smoggy atmosphere at right is creeping steadily across the city and soon will obscure the mountains at left

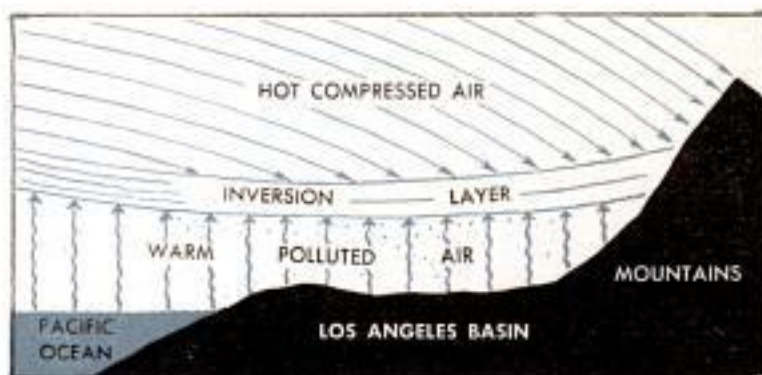
The problem is being attacked in several ways:

1. The Southern California Air Pollution Foundation is sponsoring road tests of a catalytic converter, a device that traps hydrocarbons in the exhaust. Six automobiles are being driven 20,000 miles each in the test. Trials show the converter is at least 80 percent efficient when first installed, but its efficiency decreases after 2000 miles. Further studies are being made. It is estimated that this type of muffler would retail at \$30 to \$50.

2. A manufacturing concern has devised an "afterburner" that is installed behind the muffler. It burns all raw hydrocarbons, delivering relatively harmless gases. The afterburner is being tested on 10 city buses. Initial reports say it is extremely effective.

3. A major oil company is marketing a detergent type of gasoline that automatically washes gum from critical areas in the carburetor. While not a cure-all, the detergent gasoline tends to keep the air-fuel mixture from the carburetor at the ratio to which it was adjusted.

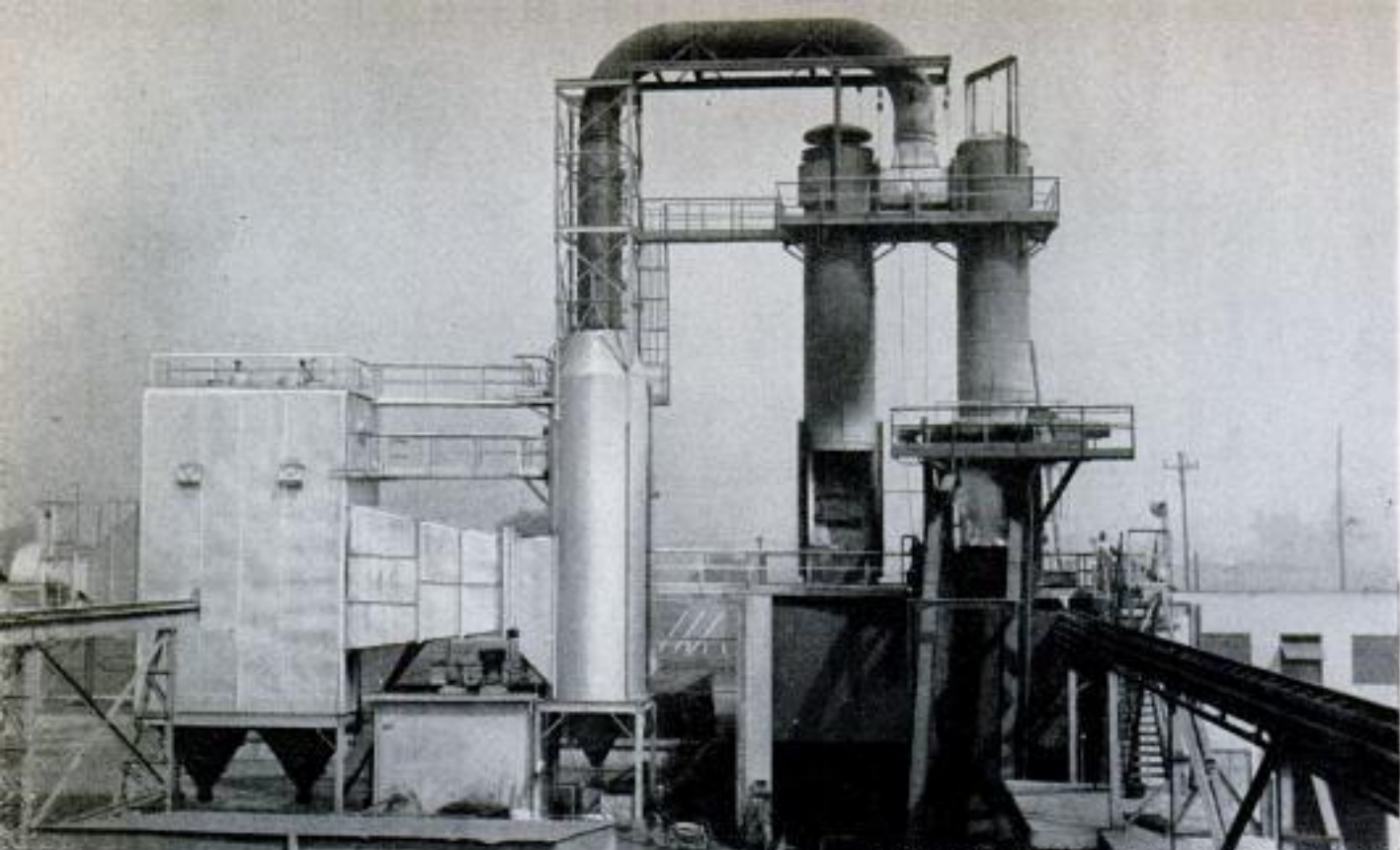
4. Motorists are being advised to set the idle adjustments on their carburetors to as lean a mixture as is practical and to keep



Blanket of air above the ground is hotter than the ground itself. This creates an inversion layer which the warm polluted air cannot penetrate. Mountain barrier and lack of wind clamp lid on city

Smog also damages plants. Seven hours in a smog chamber, which duplicates atmospheric smog, curled leaves of bean plants





Los Angeles County Air Pollution Control District photo

As part of smog-abatement campaign, precipitator at left traps particles in smoke from an industrial furnace

their motors tuned for maximum efficiency.

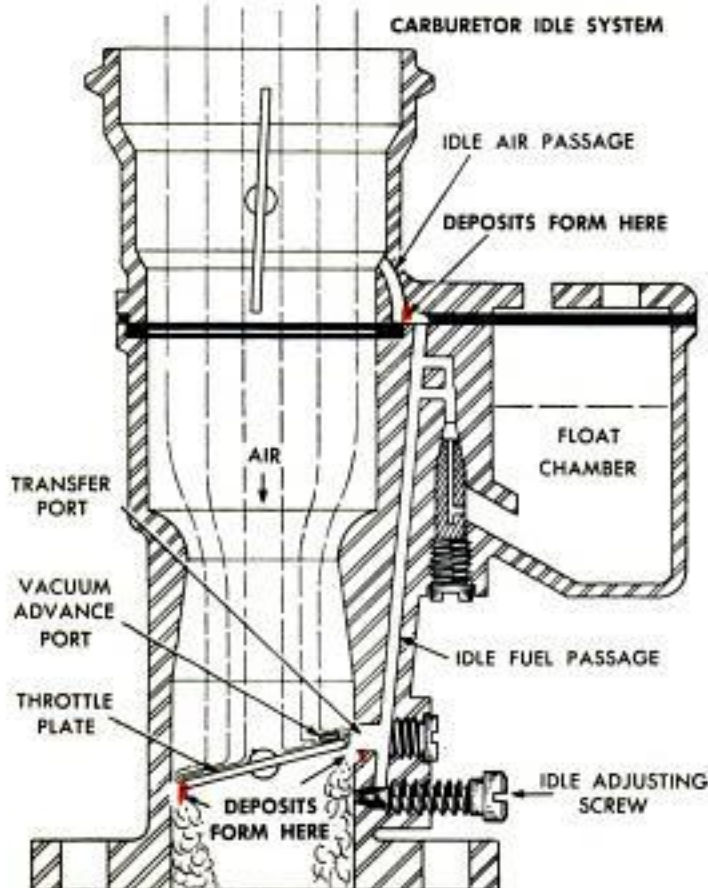
5. Research departments of the major automobile factories are seeking more-efficient designs of carburetors. General Motors is said to be testing one modification that automatically restricts the flow of fuel during deceleration by as much as 90 percent, giving almost three percent greater over-all economy. Not yet in production, it might sell for \$25 or less. Chrysler is making experiments along similar lines.

Catalytic mufflers and afterburners are temporary stopgaps compared to a carbu-

retor that would meter gasoline so efficiently that all of it would be burned in the combustion chambers. The long-range program is for better carburetion so motorists will get more miles per gallon at the same time that automotive smog is materially reduced.

Los Angeles is the outstanding example of how bad smog can become, but it is not the only city in which smog is a problem. Garages in New York, Chicago, Detroit, Pittsburgh and San Francisco, among other cities, are reporting carburetor troubles due to rapid gumming, a product of smoggy conditions.

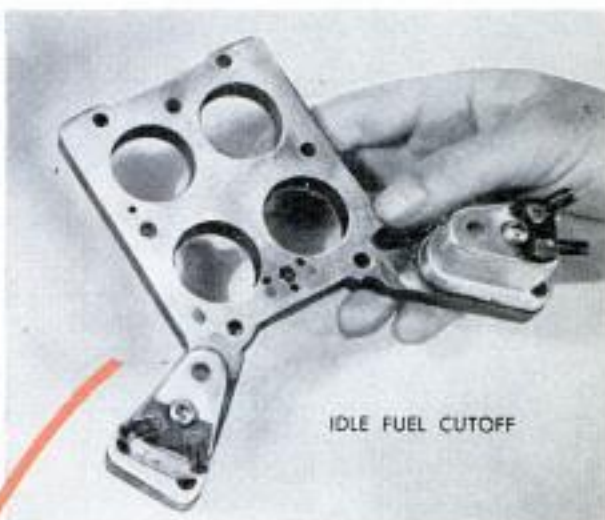
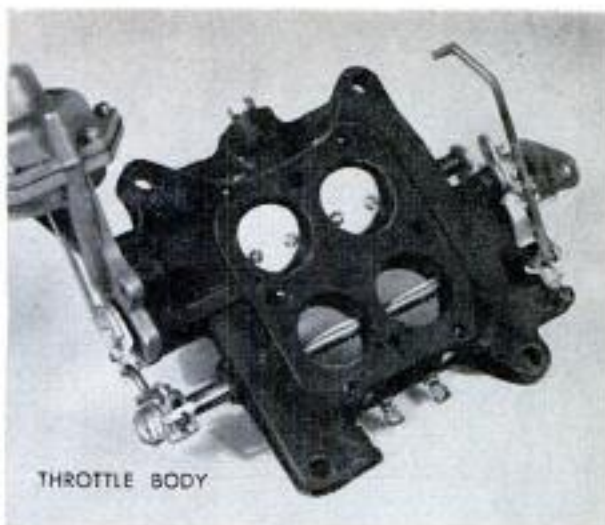
← Red spots show where gum forms in carburetor, restricting air and enriching mixture. Deposits form faster during smoggy weather. Below, muffler oxidizes unburned fuel, discharging carbon dioxide, water



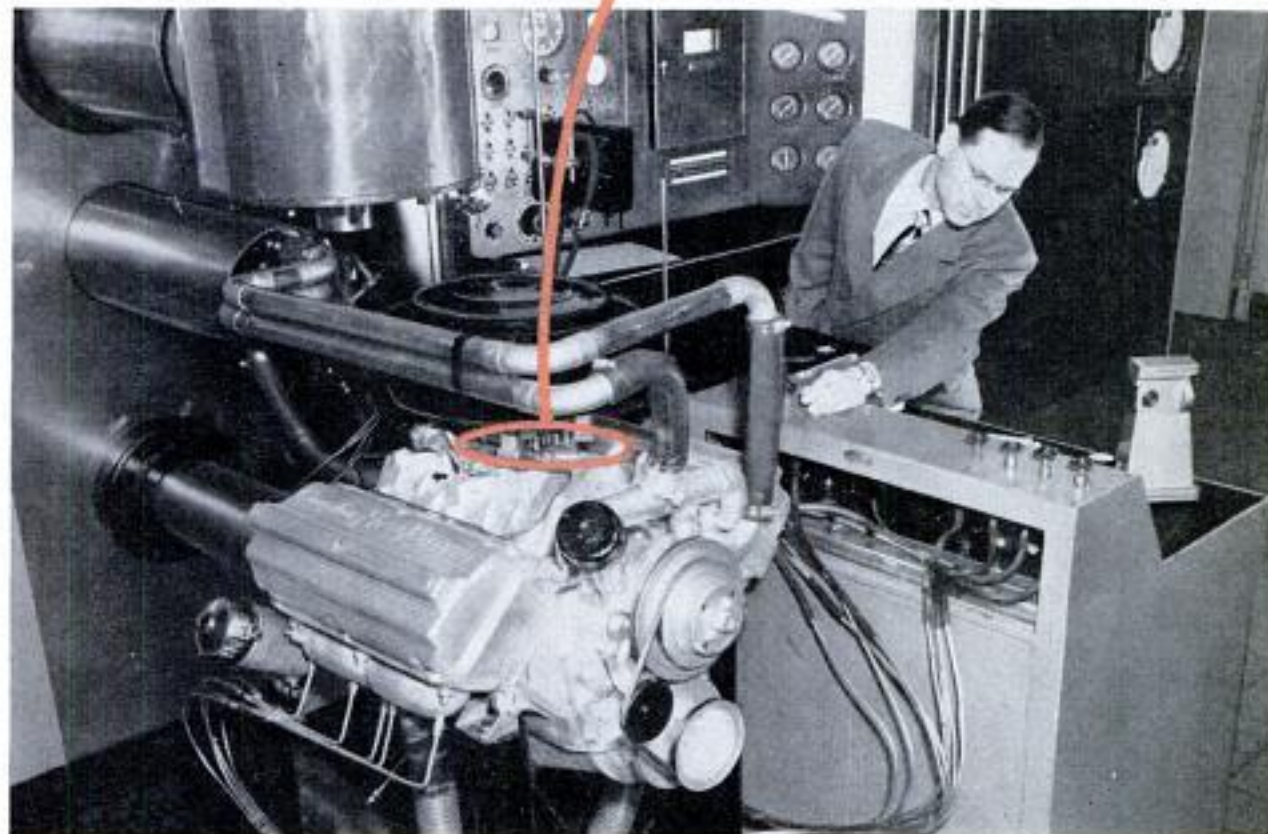
Of course smog is not caused by inefficient automobiles alone. Air pollution results principally from the various combustion processes required by civilization. Depending on local industries and fuels, the things that cause smog may vary.

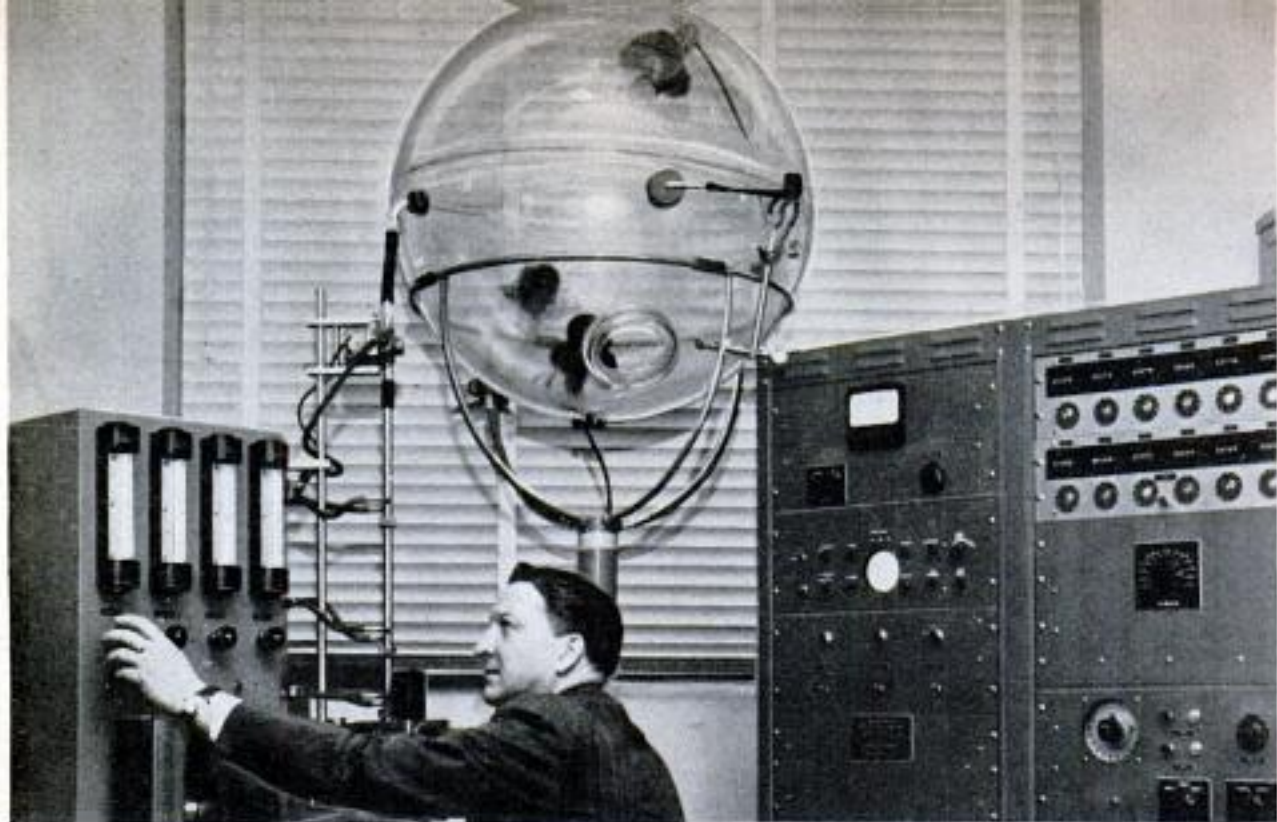
It is estimated that the 5,000,000 people in the Los Angeles area burn about 58,000 tons of natural gas, fuel oil, gasoline and rubbish every day. This enormous amount of combustion plus some contaminants from industry results in the daily discharge into the atmosphere of about 3000 tons of pollutants. This is exclusive of carbon dioxide and carbon monoxide. Of this total, more than 1000 tons are produced by motor vehicles. Another 400 tons reportedly arise from gasoline refining and marketing operations. The more than 1,000,000 backyard rubbish incinerators produce another 500 tons of smoke and gases.

Normally, all products of this combustion are dispersed by the winds. Principally from July to November, however, there are times when a temperature inversion clamps a lid over Los Angeles. Then the air 500 to 4000 feet above the surface becomes hotter than at the ground. Combustion products can't rise through the hot air. The occasional lack of wind, plus the mountains to the east, makes the condition worse. Until the inversion ends or lifts to a higher altitude, Los Angeles must breathe and rebreath a limited supply of air.



Idle fuel cutoff is installed below throttle body in experiments by Chrysler Corp. It reduces unburned carbons in exhaust gas by bleeding air into carburetor vacuum. Tests may determine whether this will cut smog





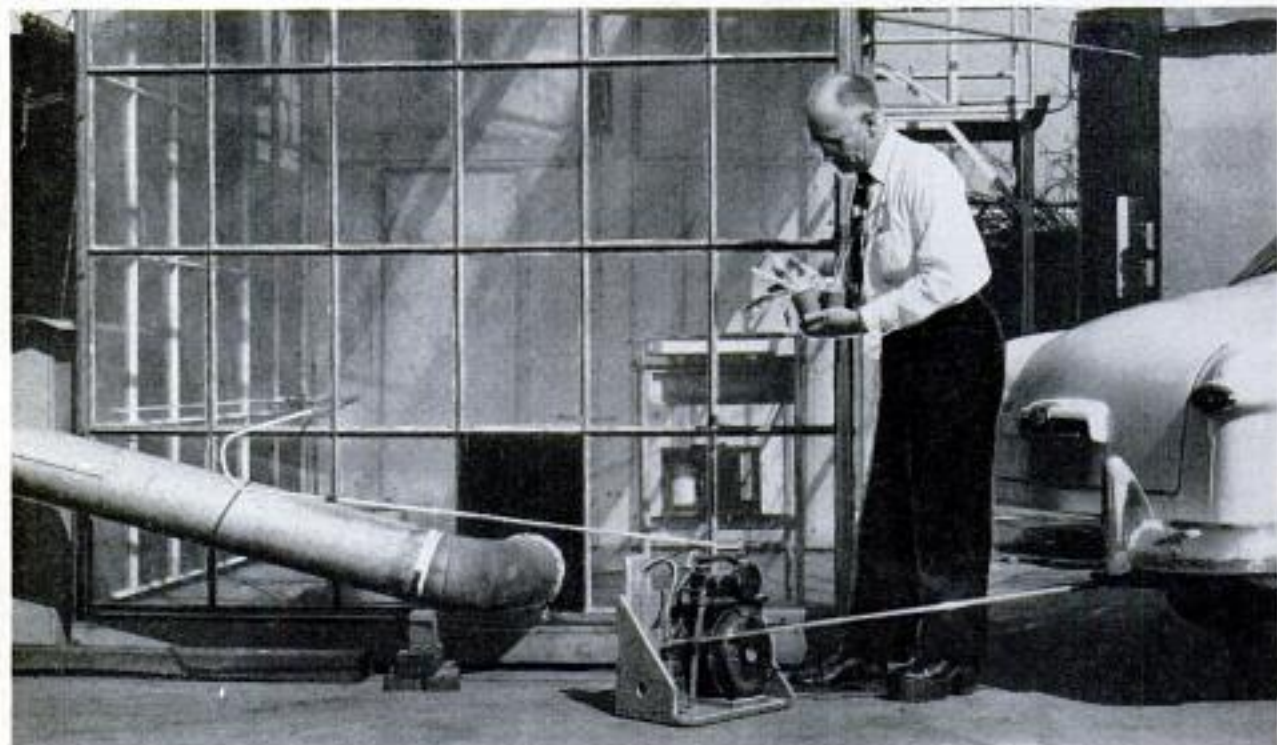
Plastic bubble with attached instruments not only can count airborne particles but also can measure their size. Below, jars filled with exhaust gases are exposed to sunlight, which changes exhaust into ozone



The inversion has been compared to an umbrella held over a person smoking a cigarette. When the umbrella is high overhead the smoker enjoys his cigarette; when the umbrella is lowered to his shoulders he suddenly finds that he is choking in the smoke. One solution is to stop smoking. Yet this is something no large city can afford to do. Cities exist on their industries.

(Continued to page 250)

Exhaust is pumped directly from car into greenhouse to determine effect of automotive smog on growing plants



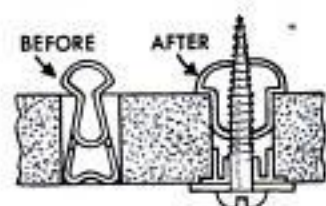


## Miniature Cabaña Shields Bathers

Sun in the eyes and sand in the hair are eliminated for bathers by a portable sunshade and headrest. A little awning adjusts to any angle to control the amount of shade on the face. The head shelf is also adjustable. Beneath it is a glovelike compartment to hold suntan lotion and other odds and ends. The sturdy metal frame of the sunshade folds up to act as a handle for the combination unit which comes in bright colors.



## Fastener For Walls Clinches Behind Plaster



Curtain rods, pictures and other items can be anchored solidly to plaster walls with a new fastener. The fastener anchors

itself in any wall from  $\frac{3}{8}$  to  $\frac{3}{4}$  inch thick. An awl is used to punch a hole in the wall. A screwdriver with a  $\frac{1}{4}$ -inch blade is used to ream out the hole. The fastener is inserted and tapped flush. Driving home the screw causes the fastener to clinch against the back of the wall and expand to fill the hole.

## Diamond-Producing Press Forms Genuine Garnets

Garnets have been produced synthetically by the same General Electric Research press that recently formed man-made diamonds. The precious dark-red stones were made by subjecting hornblende to a temperature of about 2200 degrees Fahrenheit and pressure greater than 375,000 pounds per square inch. Garnets in the natural state are found in beds of hornblende, a green mineral. Dr. Robert Wentorf, Jr., the scientist behind the venture, found it necessary to dehydrate the hornblende by chemical means before the garnet crystals could be produced. Wentorf has also reversed the process.

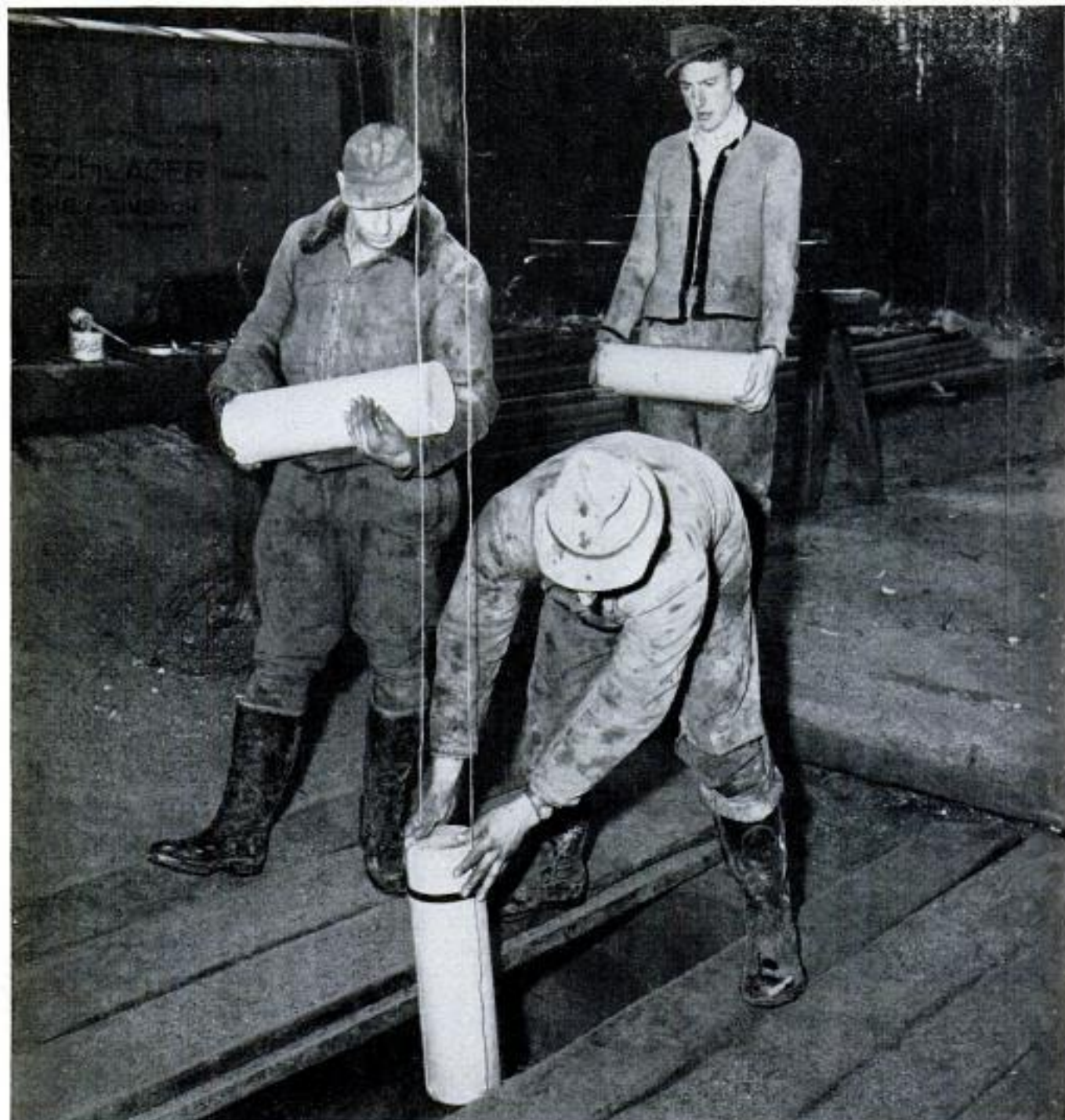
## Plastic Eyeshades Without Lenses Guard Against Reflected Glare

Plastic eyeshades that do the job of sunglasses but don't contain lenses are making a hit in resort areas. The eyeshades keep out glare and give you a clear forward view. Slots in the sides and tops provide ventilation and allow side vision. Adjusting screws assure a comfortable wearing position. The shades, originally designed for salt-water fishing where ocean spray fogs standard sunglasses, are also handy for golf, shooting, sunbathing and grandstand use.



## Liner Keeps Water in Ponds

Farm ponds, swimming pools, drainage ditches and irrigation canals can be built economically with a new lining material. The liner comes in rolls and provides a waterproof, rotproof base for a stream or pond. One side is coated with mica, the other with sand, to facilitate cementing.



Workmen lower cylinders of powerful explosive into 1000-foot shaft where 4400-pound charge was detonated

To help German scientists prove Europe and Africa were one continent before there was a Mediterranean Sea, the U. S. Army Signal Corps staged an

## EARTHQUAKE BY REQUEST

By Pfc. Fred Weymer

**S**HORT-WAVE radio signals flashed across Western Europe one morning a few months ago. Seconds later, a massive charge of trihexogene exploded 1000 feet below the ground near Bad Tolz, Germany, sending a shock wave racing through sub-

strata rock toward the tentacles of seismographs in France, Germany and Austria.

Geophysicists from the University of Munich, assisted by the United States Army Signal Corps, set off the artificial earthquake to prove a famous and contro-

versial theory: Before the upheaval of the Alps, Europe and Africa were joined by land and there was no Mediterranean Sea.

The belief was born with the discovery of Heidelberg man, near Heidelberg, Germany, in 1907. The excavation which produced the lower jawbone of 500,000-year-old *Homo heidelbergensis* also contained the bones of tropical mammals. Elephants and rhinoceroses amazingly like modern African animals shared the half-million-year-old German grave. The animals had lived in the Pliocene period, when Europe was enveloped in a tropical climate. "It seems logical," says a Heidelberg geologist, "that as Europe cooled, the tropical animal life either migrated southward or became extinct."

Migration southward was ruled out by early geologists. To believe that the animals migrated to Africa was to suppose that the Mediterranean Sea was no barrier. And yet—why this amazing relationship between the African and European mammals? Was it pure chance, or had a passage existed between the two land masses?

The question lay dormant for years. Then, in the 1930s, scientists began to determine the age and origin of the Alps. The mountain range was young, they found, still in the process of upheaval. Its jagged peaks, not yet rounded by erosion, were still rising. The Alps' age? Five hundred thousand years, the age of Heidelberg man.

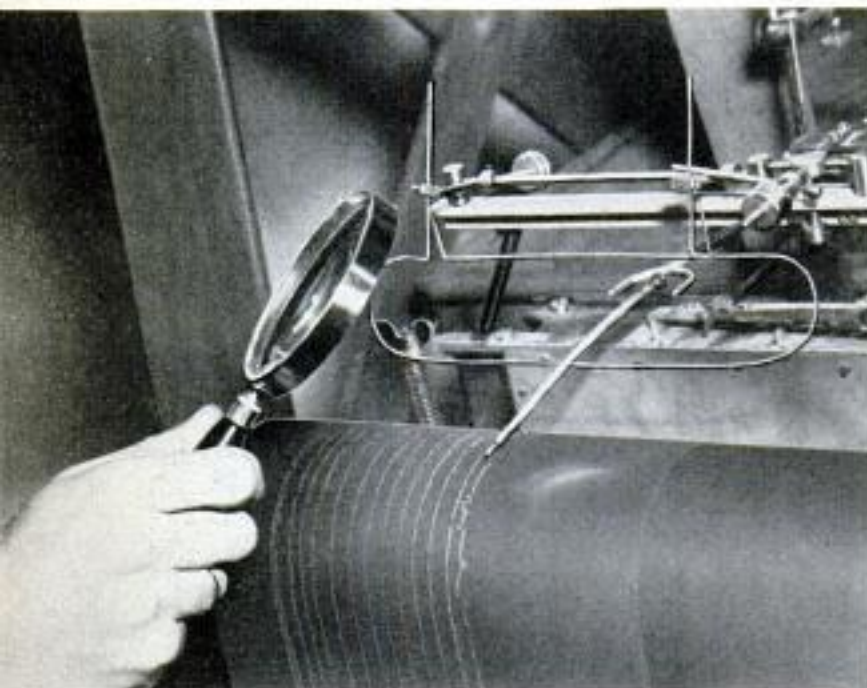
Here, perhaps, was a clue to the missing link between Africa and Europe. The rising of the Alps may have pulled a once-existent dry area of land away from Africa, creating the cavity which is today the Mediterranean Sea.

A puff of earth and rock, right, shoots 150 feet into the air as the charge explodes at the bottom of 1000-foot shaft. Map shows detonation point and seismographs that measured speeds of shock waves





Bavarian State Geologist Helmut Vidal talks by radio with one of the 49 seismograph stations. He is inside transmitter truck. Signal Corps Sergeant William Griffith operates a teletype



Wavy lines being traced by seismograph needle result from explosion many miles away. Length of time it takes for shock wave to reach seismograph indicates density of the substrate. Below, mobile radio transmitter was located at explosion site



Dr. Hans Reich, chairman of the University of Munich's Geophysical Institute, had planned and experimented for eight years to prove that Africa and Europe were once a single continent. With the assistance of the United States Army Signal Corps School in Ansbach, Reich and his associates staged an artificial earthquake. By metering the effects of the blast on well-dispersed seismographs, he hoped to determine the nature of the Alps' foundation. If Doctor Reich's theory was correct, the Alps' foundation would not be deeply embedded in the crust of the earth. It would be a superficial structure, of the same substance as the floor of the Mediterranean.

The Ansbach Signal School, under the direction of Col. S. P. Fink, began preparations for the test by placing 4400 pounds of trihexogene explosive 1000 feet down an abandoned oil well. Signal-school men were charged with erecting and maintaining a precision communications system between the Bad Tolz site and 49 seismographic stations within a 31-mile radius. By comparing the periods of time necessary for the explosion's impact to traverse the known distances from point zero to the various seismographs, the geophysicists would be able to determine the structure of the area's ground formation. Shock waves travel at 8000 yards per second through the hardest rock and only 3500 yards per second through the softest. Precise timing was vital.

The most important functions of the American troops were to flash a signal forewarning the receiving stations of the exact time of the explosion and to synchronize with the detonation a split-second notification to activate all seismographs. Later it was found that an accuracy within  $\frac{1}{50}$  second was obtained.

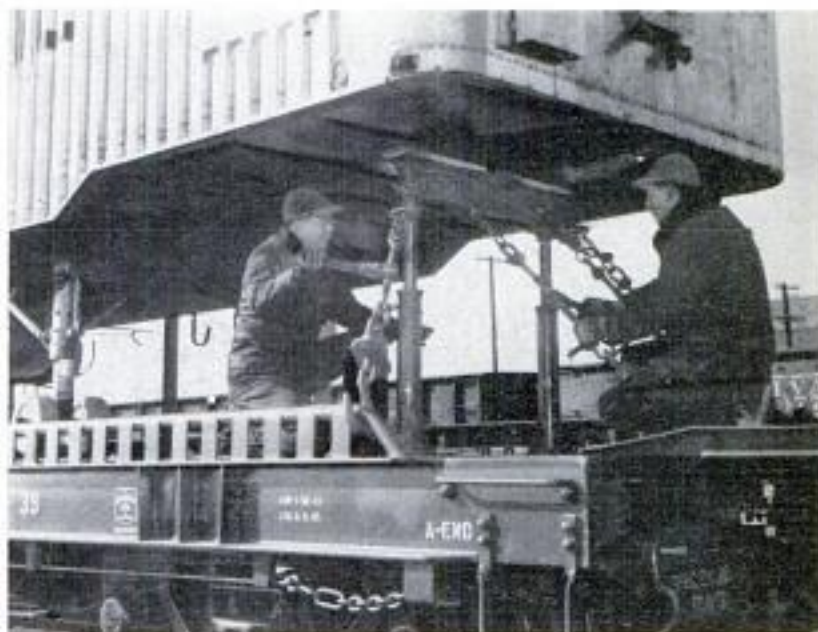
Careful analysis of seismograph records indicates that a continuity does exist between the floor of the Mediterranean Sea, the surrounding dry land in Africa and Europe, and the Alps. The German scientists believe this supports their theory that the upward thrust of the Alps pulled surrounding land, especially on the southern side, northward and upward, leaving the Mediterranean cavity. ★ ★ ★

# TRAINLOADS OF TRAILERS

EVERY NIGHT hundreds of semitrailers are rolling between New York and Chicago—on railroad tracks instead of highways. "Piggy-back" freight transportation is not new; railroads have been moving their own trailers on flatcars for some time. Now the Pennsylvania Railroad has inaugurated daily service of this type for common-carrier trucks—those that belong to independent trucking companies. The trucker's own tractor delivers the trailer to the loading dock. There it is backed aboard the train. The special 75-foot flatcars have hinged bridges which swing down to fill the gap between cars during the loading. The fully loaded train carries 100 trailers. Leaving late at night, it makes the 903-mile run on a time schedule that assures early second-morning delivery of the trailers at the other end of the line. There the trucking company picks up its own trailers for immediate delivery of the freight or for transfer to its own terminal. The railroad has built terminal facilities for parking, weighing, loading and unloading of the trailers at Chicago and Kearny, N. J., at a cost of about \$400,000.



Trailer is backed right up terminal ramp and onto the flatcar, then down length of train to its own berth on one of the special cars



Steel jacks support the front end of each trailer. Eight chains, four in front and four in rear, anchor the trailer frame to the guard rails on the flatcar. Steel chocks immobilize the wheels. Below, solid trainload of trailers reaches destination after 903-mile run





Gunite pool fits beautifully into grounds. Back wall of the pool forms a terrace at the rear of the home

## ***A Pool for Your Back Yard***

**By Richard F. Dempewolff**

**M**Y WIFE WILL BE BACK from a trip in time for her birthday this week and I want to surprise her with a 40-foot swimming pool. Acorn shape. How about it?"

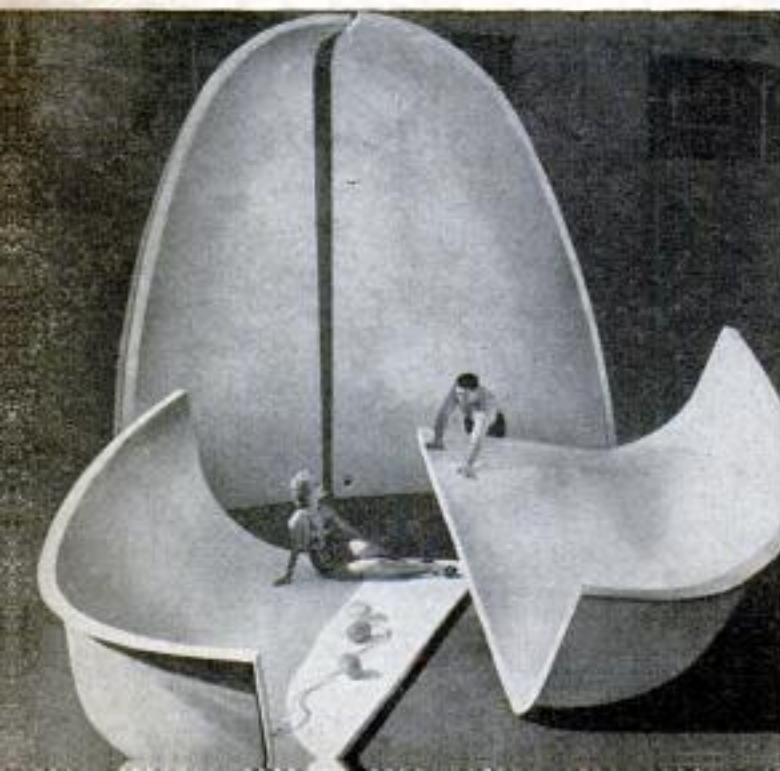
This question recently was put to Herman Silverman, president of Sylvan Pools in Doylestown, Pa. Consulting his calendar, Silverman did some fast calculating. "Sure," he replied. "Why not?"

Next morning a crew of Sylvan men arrived on the site and began digging and shaping the huge excavation. A day later

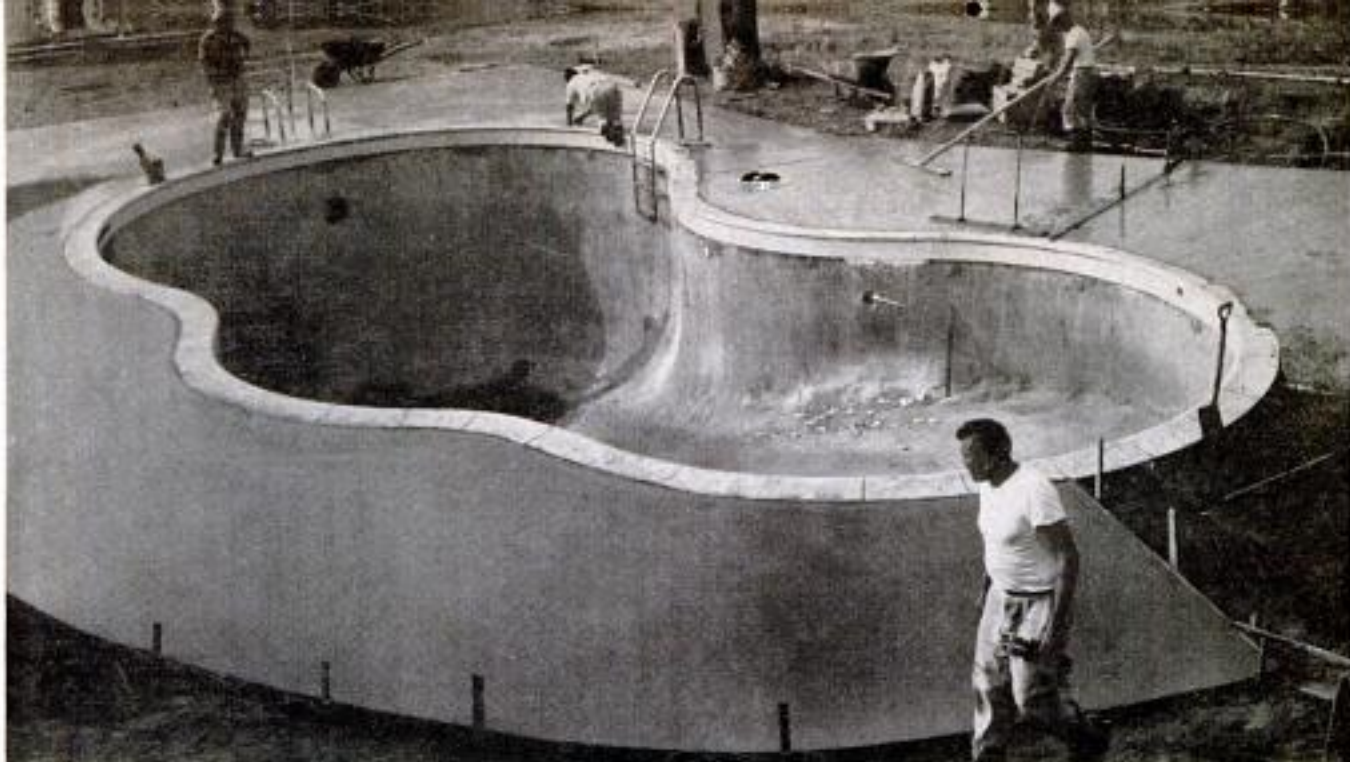
a second crew was scrambling around the hole, welding reinforcing rods into a big mesh basket. On the third day a steady stream of trucks rumbled in with "hard pack" concrete in a stiff mix that kept a 15-man mortar crew jumping. The stuff set almost as fast as it was worked into place. And on the fourth day the big, one-piece, reinforced-concrete pool—complete with waterproof-wrapped presents bobbing on crystal water—was ready for occupancy and the birthday party. The bill? Well, there are automobiles that cost more.

Sections molded of glass fiber are bolted together and lowered into an excavation to form a 30-foot pool

SCINDER-ELLA  
↓



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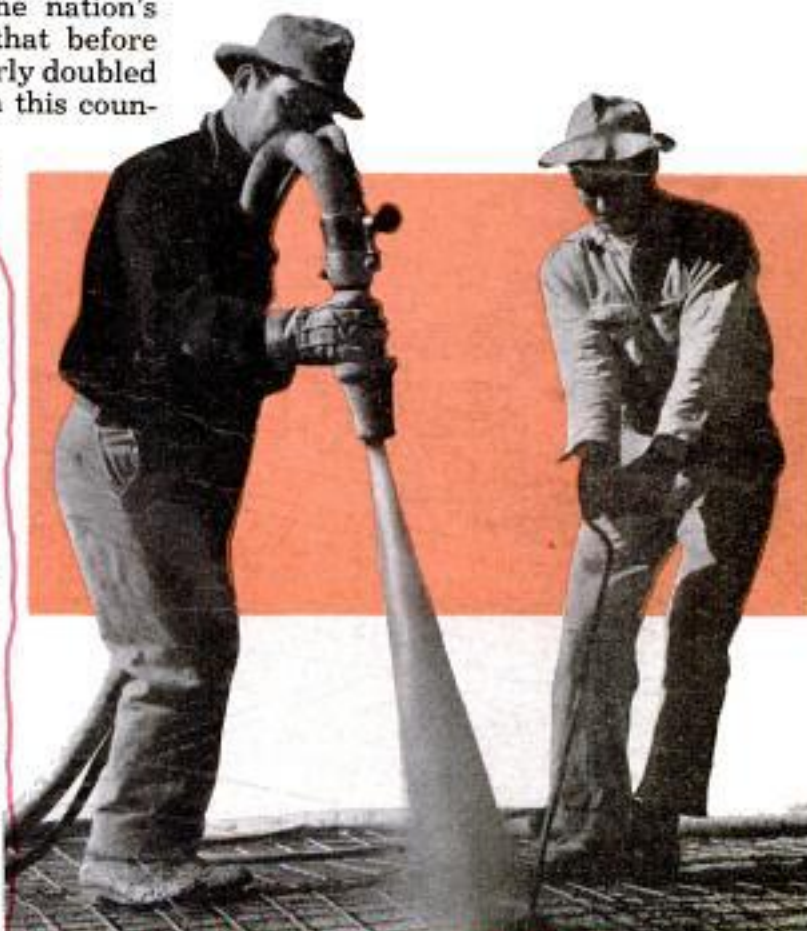
Typical low-cost, free-form Gunite pool is finished off with a coping and a broad deck around the edge

Today the luxurious private swimming pool you've dreamed of putting in the back yard may not be as much of a daydream as you think. New miracle materials and speedy techniques (many introduced this summer for the first time) have so simplified building and cut costs that residential pools are springing up across the country in a record aquatic free-for-all. Nearly 10,000 dunking enthusiasts acquired private "swimming holes" last year, according to *Beach and Pool*, the industry's publication. Silverman and some 350 of the nation's other pool builders calculate that before 1955 runs out they will have nearly doubled the 28,000 pools now existing in this coun-

try. Most will be in back yards. Most will cost about the price of the family car. A typical West Coast price list for a Gunite concrete pool installed complete with coping (rim edging), diving board, chrome ladders, filtration system, skimmer and tile trim, reads like this:

Size	Cost
15 by 30 feet	\$2900.00
18 by 36 feet	\$3250.00
20 by 40 feet	\$3400.00

Right, dry sand and cement come through hose under air pressure in Gunite system. Nozzle adds water and sprays concrete over reinforcing rods



Beach + Pool + Swimming  
425 4th Ave.  
N. Y. 16, N. Y.

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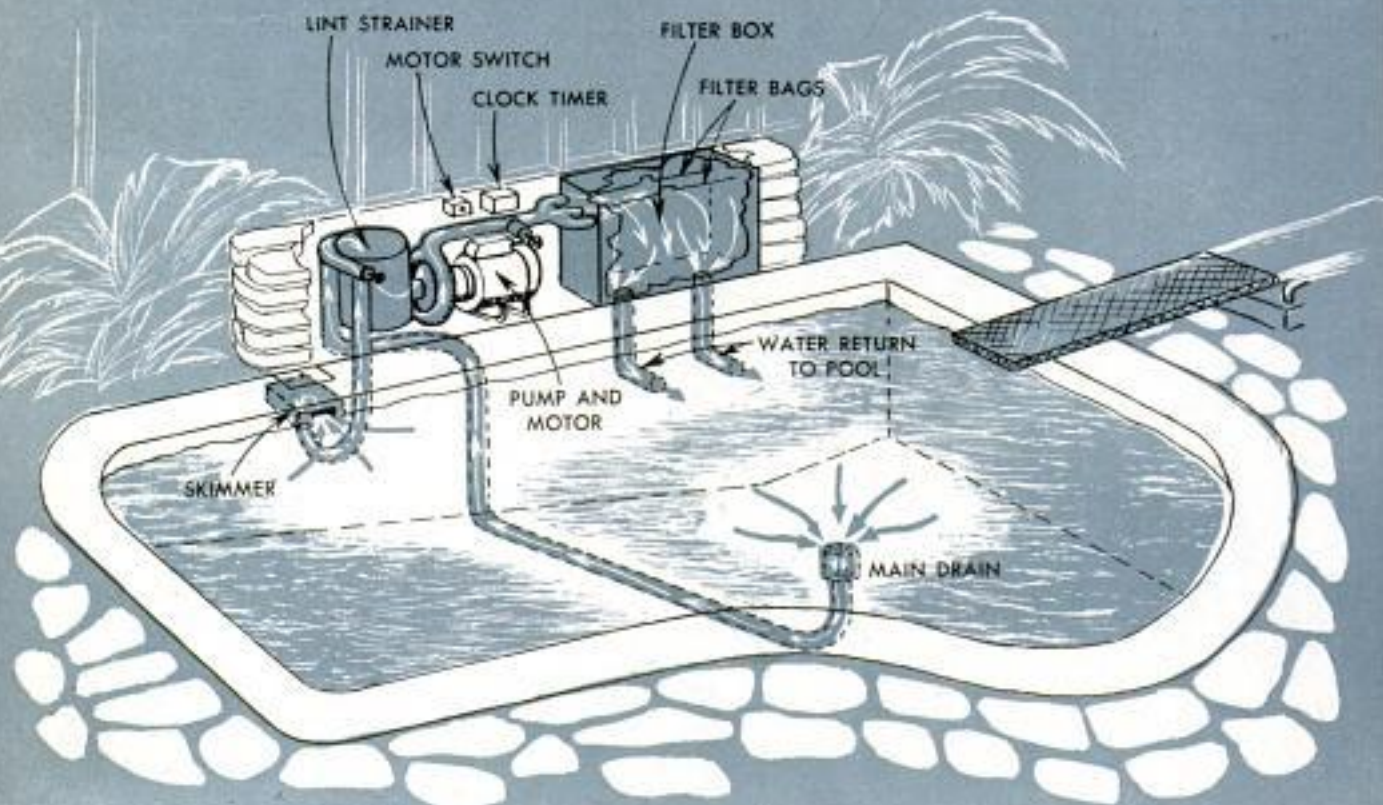
Prefabricated aluminum pool is delivered by truck to your back yard and lowered into place by crane. Backfilling and paving result in pool shown at left



In the East, where the pool craze is just beginning to produce the volume that brings prices down, the same pool with all the fixings would run an extra \$1000 or more.

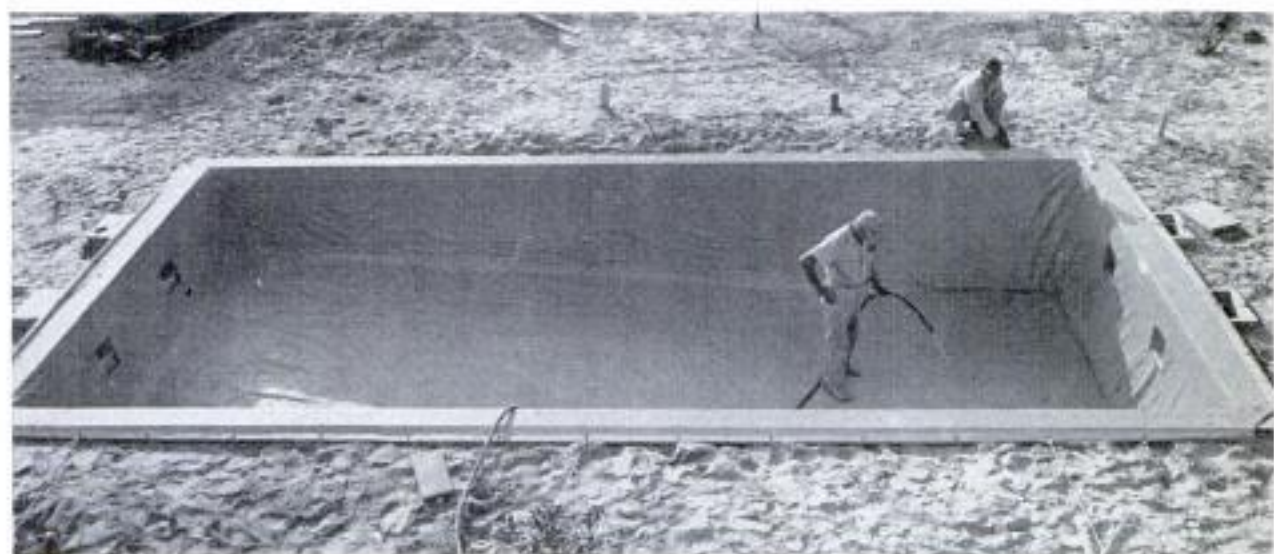
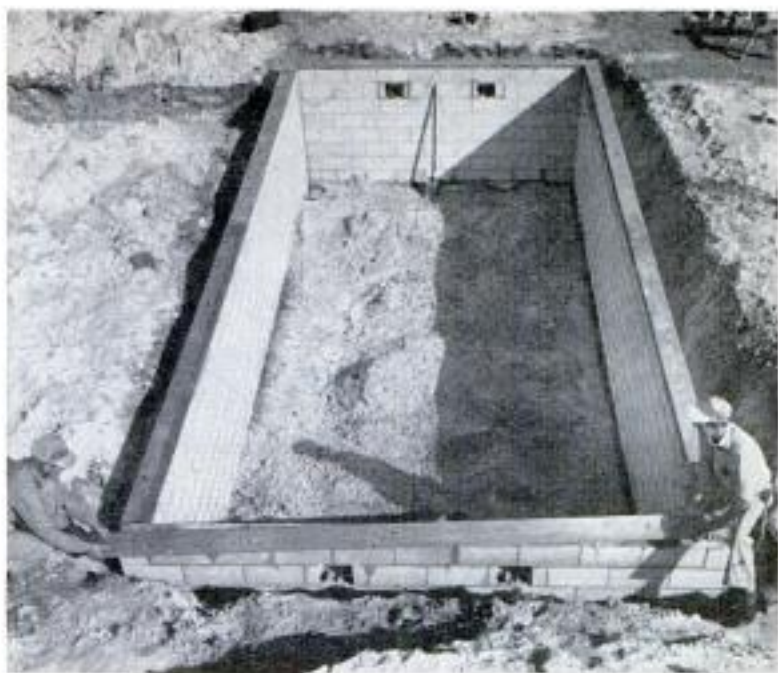
But these figures merely hint at "what's cooking." They refer to only one type of popular pool. You can pay more or a lot less. This year's swimming-pool parade has a dizzy assortment of sizes, shapes and

Here's a typical filter and skimmer installation for a large pool. Skimmer pulls off floating objects and filter takes foreign matter out of water itself





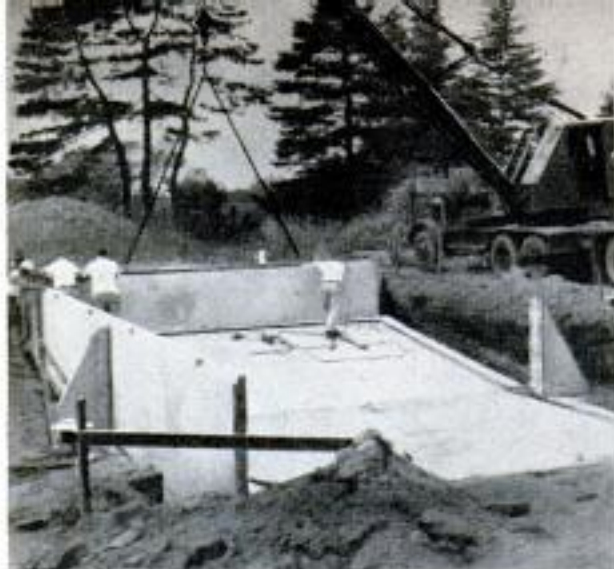
You can build this pool for less than \$1000 if you do the work yourself. The foundation, right, is built either of concrete block or wood framing. Boards are bolted to top of foundation to hold the plastic liner. Liner, below, is available in sizes up to 20 by 40 feet, with ready-made ports for underwater lights and the drainpipe. Heavy pipes slipped through the hem of the liner hold it in place. Resulting pool, bottom, costs less than most pools built by contractors—but the water feels the same!



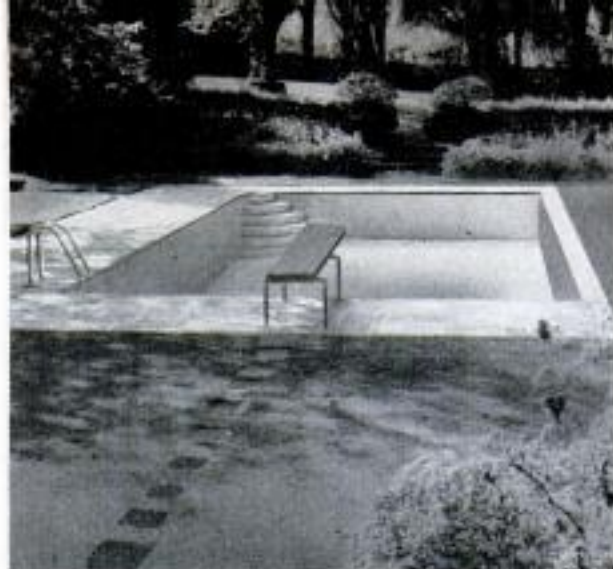
wonder materials. Some will ride piggyback to your door in one piece or several. Others may be sprayed in place, hoisted in place, punched in place, painted in place or unfolded like a blanket.

In Los Angeles, a brand-new glass-fiber pool developed by Anthony Brothers is being prefabricated in one gigantic oval chunk—34 feet long, 16 feet wide, with a 7-foot depth at the diving end. Delivered to your site on a flat-bed trailer truck, it is hoisted into a prepared hole that has been molded to pool-bottom contours. Plastic pipe connects it to the water supply, drain and filter systems. Then the hole is backfilled and you're in business. The whole process





Floor of another type of pool is poured at the site, but walls are precast slabs bolted to heavy buttresses



Precast steps are set in place and a deck poured. Deck of any pool has a big effect on its appearance



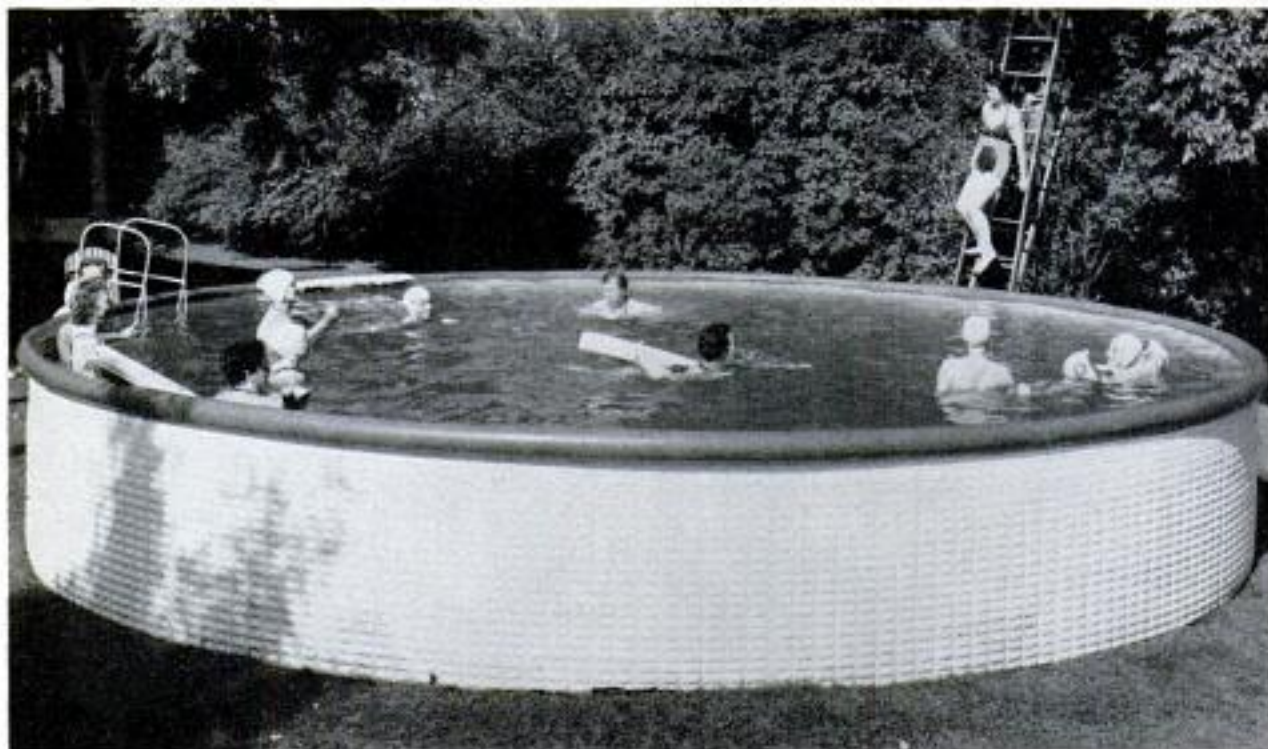
Plastic pool in a small size can be built for less than \$500. Liner is fastened inside a wooden frame

takes three or four days, and cost runs about a third less than a similar-size pool in concrete.

Another glass-fiber pool comes rumbling by truck up to your door in four mammoth sections, nested like a pile of giant saucers. Included in the package are a filter system, color trim for the rim, gaskets, bolts and a repair kit. Called "Cinderella," and produced for national distribution by California's Paddock, this 15 by 30-foot phenomenon is assembled on a scaffold above the hole and lowered into it after all connections are made. It, too, takes a crew of men about four days to install at a cost considerably less than concrete. The makers like to point out that it's rustproof, can't pit or chip and needs no paint. They claim it will last a lifetime if properly maintained.

These aren't the only eye openers in the

Here's the tot's wading pool grown up! Plastic tank 22 feet in diameter has sides of plastic-coated steel wire





Indoor-outdoor pool is popular on the West Coast. Outdoor side of this one is covered with glass-fiber canopy

swimming-pool business. Your big 20 by 40-foot pool may come in a cardboard carton no bigger than the case in which a table-top TV set is delivered. That's the way the new Bilnor Bakelite pool lining is packaged. It fits right into a prepared hole that can be buttressed either with concrete blocks—like a house foundation—or with plain wood framing, depending on how permanent an installation you want. If you build the foundation and support work yourself, this type of pool can be installed for well under \$1000.

For the man with swimming-pool ideas and a bathtub pocketbook (\$350), Doughboy Industries has a new inflatable plastic family pool that sits in a circular cage of wire mesh to keep it rigid. Actually, it is a big version of the wading pools that have become a familiar sight in American yards.

(Continued to page 240)



Indoor side of the pool has steps that lead up into the carpeted living room. There is a boom in these elaborate pools as well as the less expensive ones

Pool with dog-leg shape was fitted into a very small area behind the home, with room left for a garden

Douglas M. Simmonds photo



# Detroit Listening Post



By Leo Donovan

**I**T MAY BE vacation time for you, but in Detroit the tool-and-die shops are working feverishly turning out the tools that will stamp out your 1956 car.

Deadlines are earlier in most cases this year because all car makers are intent on getting to market before mid-December.

Chrysler and Imperial dealers were advised to get their orders into the factory by July 1 for the cars they expect to sell through mid-October. They were told that the 1956 models will be out around November 10, a week earlier than last year. Dealer previews are expected early in October.

Because the industry spent so much on tooling for 1955 models, some observers felt that changes in 1956 would have to be so-called face-lifts only. They reasoned that 1955's new bodies and engines would have to be amortized through the 1956 models—but it's not coming out quite that way.

Tooling costs for some lines of 1956 cars will be upwards of \$100,000,000. And a considerable amount of face-lifting surgery can be had for that kind of money.

## Rumors About Studebaker

Studebaker, a brave, front-runner in styling since the end of World War II, is expected to be among the first out with its 1956 line. And the new styling is said to be markedly different from its predecessor. Some sources predict that Studebaker is dropping the graceful torpedo lines and is going to a higher hood and rear-deck lid to look more like the rest of the industry. However, these same sources promise, it will still retain some of the delicate "Italian-ish" styling that was so loudly acclaimed when it was introduced.

The rumor also is that the new hood will feature a forward-placed ventilating cowl and that the front grille will be a large oval.

If you want more gossip, the story is that Ford will make available three different types of wrap-around windshields next year and that the sweeppear chrome molding of the Fairlane line will be moved to the rear a little (more like the Dodge per-

haps?). The instrument panel is said to group all dials within a single cluster.

Chevrolet undoubtedly will have a new grille, although the company insists that the public has not objected to the simplicity of the current egg-crate Ferrari-like grille. Chevrolet will probably introduce a four-door hardtop of its own. It is also expected to put up a stronger battle with Ford for the station-wagon field.

## Four-Door Hardtops

More than Chevrolet will be introducing four-door hardtops in 1956. It looks as though everybody will have one, if tool-and-die deadlines are met. Chrysler's model will be strengthened by a huge U-shaped aluminum structural member under the front seat. It is rumored to be one of the largest aluminum pieces ever used in an American automobile.

Chrysler divisions from the Imperial down to the Plymouth are probably going to switch over to the 12-volt system for 1956. The Chrysler stylists have been working hard again this year and they promise surprises even after 1955's all-new look.

Torsion-bar suspension, reintroduced to the industry by Packard this year, may possibly be adopted by others in 1956 or 1957.

There will be marked improvements in transmissions and brakes for 1956, but for the truly big sensations there you'll have to wait until 1957 or 1958, say the experts.

At one test track recently, a car equipped with experimental brakes was stopped from 80 miles per hour within an amazingly few feet and without the customary panic-stop lurch so common to present brakes, one source reports.

Colors are not expected to be any more subdued in 1956 than this year, but some manufacturers, listening to dealers complain that they can't move certain two and three-tone combinations, may lessen the variety. Ford and some other companies have already dropped some of the more extreme hues from their offerings.

And in place of costly color-harmonized interiors, at least one manufacturer will make available neutral shades as standard upholstery material—they will go with any and all exteriors. If you wish you can get the more colorful plastic upholstery but at extra cost.

Quietly and without fanfare, the American Motors' Metropolitan seems to be selling. The company has announced that it has ordered 20,000 more of them for delivery from the British manufacturer. This will bring the total number of Metropolitans imported into this country and Canada up to 40,000. That makes it the top-selling foreign-built car in this country, outselling even the fabulous Volkswagen.



## Where Stylists Are Kings—the Turin Auto Show

With a reputation for being the show where stylists reign supreme, the 1955 Turin Show didn't disappoint anyone. Italian designers and builders, and those of 13 other nations, put their newest creations on display at this famed exposition. The emphasis was on the long, sleek look. Sloping hoods and prominent tail fins were

common. One such design was the *Streamline* (below) by Ghia of Turin. Another exhibit was a Lincoln *Indianapolis* (above) with body by Boano of Italy. It has 225 horsepower and is said to have cost \$30,000. Three huge chromed exhaust pipes seem to come straight out of the front fender. The rear fender has a scooplike opening.



## Russia's 1956 Model Automobile Even Has an Automatic Transmission



Scheduled to go into full-scale production in 1956, the new Volga automobile will be built in the Molotov Auto Works in Gorky, Soviet Russia. The car is similar in appearance to many American and European cars. It is said to have automatic lubrication, automatic transmission and a rear seat that forms a bed.



## CAMPING IN A VOLKSWAGEN

**T**HERE ARE CARS, and there are cars—and then there's the Volkswagen!

As one enthusiast described it: "The VW is not just a car, it's a disease. And a contagious one at that!"

Volkswagen sales are surprising everyone except persons who have driven the

Another Kombi model is an ambulance that will hold two stretcher cases, one sit-up case, plus attendant



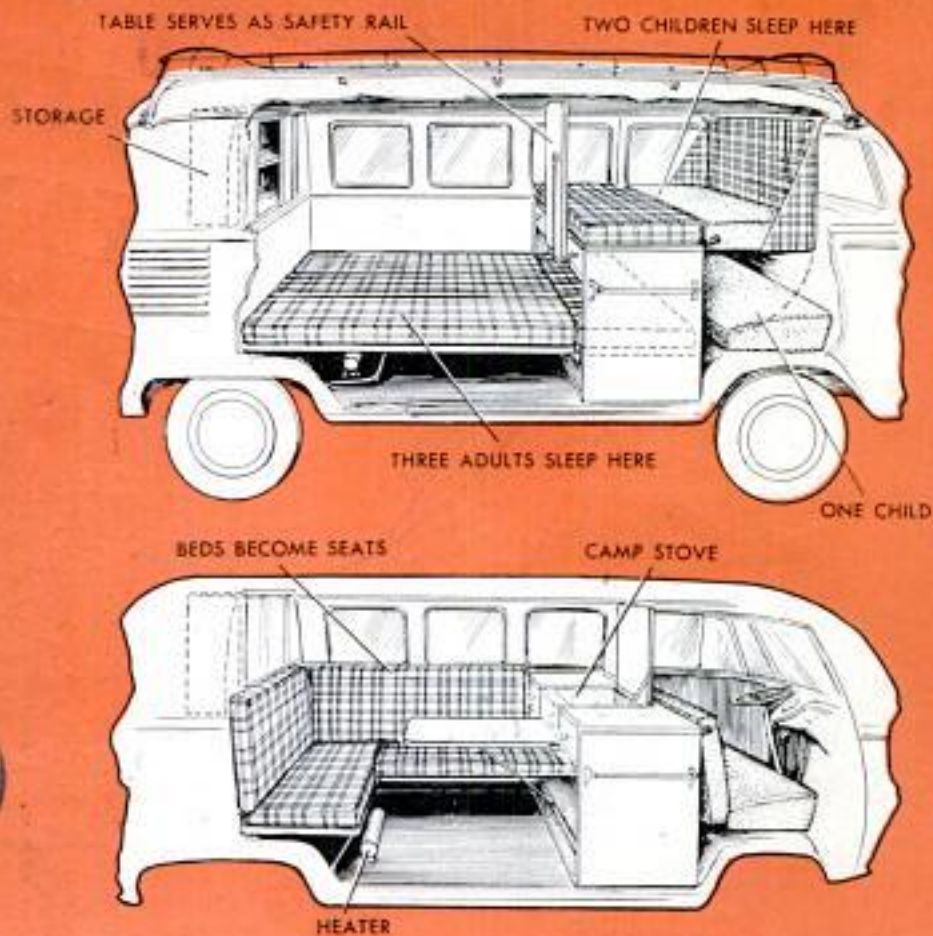
homely German vehicle. In 1953, only 1200 VWs were sold in the United States. In 1954, VW sales totaled about 6000. Early figures for 1955 show VW dealers may sell 9000 in the first six months, as many as 15,000 for the year!

Everybody recognizes the beetle-shaped Volkswagen sedan, but the commercial models are less familiar. One of them is an eight-passenger station wagon-bus combination known as the Kombi or Micro Bus, depending upon the luxury you want.

An ingenious offshoot of the Micro Bus is the VW Camper—a camp on wheels. The two bench seats behind the driver are removed (it takes only a few minutes to loosen the wing nuts) and an extra-cost camping unit lifted inside. When opened the unit provides sleeping space for three adults, plus two or three children. There's a shelf for a two-burner gas stove, the tank of which tucks under the seat.

Other conveniences are a door-mounted wash cabinet and a clothing locker that sits on the rear shelf over the engine.

The beds are made up of foam-rubber mattresses and plywood panels. The same parts fit together to form a settee during the day as well as dinette benches for



At left is Volkswagen's Camper. Cabinet on door holds washbasin. Sketches show day and night setups

meals. A colorful awning extends out from the roof, which has a big luggage rack.

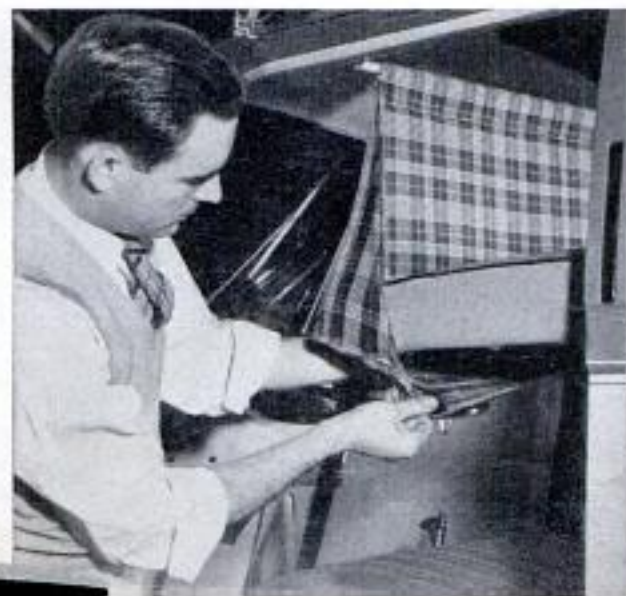
What does such a setup cost? The Kombi itself sells for \$2095, delivered in Chicago (less at ports of entry), the Micro Bus for \$2195, and the Micro Bus De Luxe with a fold-back sunshine roof and other luxury features costs \$2745.

The camping unit complete with luggage rack, awning, washstand, clothes locker and other items lists for \$525. You can buy the beds and table alone for \$240, if you prefer to rough it a little.

Back cushion of the driver's seat lifts up and fits in curtain pocket to become mattress for child's bed

Power plant for the Micro Bus is the same as for the Volkswagen sedan: An air-cooled, four-cylinder, horizontal-opposed engine that hides in what Americans expect to be the trunk. Suspension is by torsion bars on all four wheels, each independently sprung. Top speed on a fully loaded Camper is around 50 miles per hour. Gas consumption is about 30 miles per gallon. What about spare parts? Take along an extra fan belt—that's all you need. VW engines normally go 100,000 miles without an overhaul! ★ ★ ★

Dining table swings up to act as a safety rail for children (top of page). Drawers hold dishes, cutlery



# OWNERS REPORT ON THE FORD V8



## ***They Like Its Power:***

"I like the added power -- there seems to be no end of it."

*Oregon machine operator*

## ***And Its Styling:***

"I like the two-tone paint and chrome styling. The bright colors are sensational."

*Washington, D.C. housewife*

## ***They Don't Like Rattles:***

"Body is poorly assembled which causes many rattles throughout the car."

*Georgia store manager*

## ***And Door Operation:***

"Can't get front doors to close without slamming at least twice. Rear doors close fine."

*Texas telephone worker*

Road tests alone can't tell the whole story of a new car. You've got to use it for weeks to learn its good and bad points. PM asked 1000 owners about the 1955 Ford. Here is what they told us





Best-liked feature, say the owners, is Ford V8 performance—its ability to take steep hills in stride

## OWNERS PRAISE FORD'S POWER, STYLING

*By Ford Owners*

**W**HY DO PEOPLE buy Fords? What has made it the top seller so far this year? We asked 1000 owners of the 1955 Ford these and other questions.

The most-frequently given reason why owners bought a Ford is its styling. They like the way the car looks.

"The thing that convinced me to buy a

Ford was the new design with its outstanding colors."—Arkansas millwright.

And many others agreed. In fact, 27 percent of the owners in our survey list styling as the single thing that most convinced them to buy Ford. Second most-frequently mentioned reason is past experience with Fords. The third reason is financial—the

## CLYMER TESTS THE FORD V8



**T**HE CAR TESTED was the Fairlane V8 Fordor sedan with Fordomatic transmission and power pack, which includes the 8.5:1 high-compression head, dual mufflers and four-barrel carburetor. It develops 182 horsepower. The test was from Albuquerque, N. Mex., via Taos to Denver, Colo., a

*By Floyd Clymer*

total distance of 417 miles.

The new V8 engine of 272-cubic-inch displacement is 33 inches larger than the 1954 model. The OHV engine is oversquare, with a 3.62-inch bore and 3.30-inch stroke, resulting in low piston speed and low wear.

(Continued to page 234)



Retouched photograph, above, demonstrates how Ford's rear-view mirror has a double-swivel action to adjust to fit any driver



Above, some owners report that the wrap-around windshield design causes them to bump their knees on the doorframe when getting into the front seat. Below, Clymer roughs up the Ford a little! He rates its roadability and handling above average



Ford dealer came up with the best deal or trade-in allowance.

"I bought this Ford because I drove my 1953 Ford 44,000 miles with no expense except tune-ups. Never added any oil."—Georgia owner.

"I got a wonderful deal. The Ford dealer gave me \$1495 for my 1953 Chevrolet."—Wisconsin stockbreeder.

What do the Ford owners like most about their new cars? The majority of them (59 percent) say power and performance.

"We just made a 1000-mile trip. I drove from 95 to 110 miles per hour much of the way and it never seemed to hurt it a bit. You can drive it at any speed to 110 and it handles well."—Montana carpenter.

"My average speed on the highway is around 85 to 90. I have driven this car on a fairly level road with the speedometer showing 120. I drive a car hard and this Ford will really take it."—Georgia farmer.

#### What Don't They Like?

By far the most-frequent complaint is body rattles with 29 percent of the owners listing this complaint. Incidentally, 20 percent of the Ford V8 owners made no complaints at all.

"There are more rattles in this Ford than I had in my 1952 car after driving it for 2½ years. There is an awful squeak around the steering column which the dealer hasn't been able to get out as yet. The doors have large gaps around them and rattle very much."—Minnesota accountant.

Next on the list of complaints is gasoline consumption of the V8 engine. There are 18 percent who don't like this.

"After three trips to the dealer for service, chiefly on gas consumption, there is little or no improvement. I get 10.7 miles per gallon in the city and 13.6 on trips."—Kansas owner.

Third most-frequent complaint is the poor fit and operation of the doors. Seventeen percent mention this fault.

"Can't get the front doors to close without slamming at least twice. Rear doors close all right. Not satisfied with gasoline mileage."—Texas telephone employee.



## TEST DATA

1955 FORD V8 FAIRLANE  
Four-door Sedan with Fordomatic and 182-horsepower  
optional Power Pack

### Driver's Blind Spot

Farthest point 26'10"

Nearest point 17'5"

### Acceleration Test

¼ mile from zero - - - - -	17.3 seconds
½ mile from zero - - - - -	29.9 seconds
0 to 30 miles per hour - - - - -	4.9 seconds
0 to 60 miles per hour - - - - -	13.9 seconds
Top speed by speedometer - - - - -	112 miles per hour

The 162-horsepower model was about  
6 miles per hour slower

### Economy Test

#### Constant-Speed Mileage

At constant 30 m.p.h. - - - - -	21.1 miles per gallon
At constant 50 m.p.h. - - - - -	19.2 miles per gallon
At constant 60 m.p.h. - - - - -	16.9 miles per gallon
At constant 75 m.p.h. - - - - -	13.6 miles per gallon

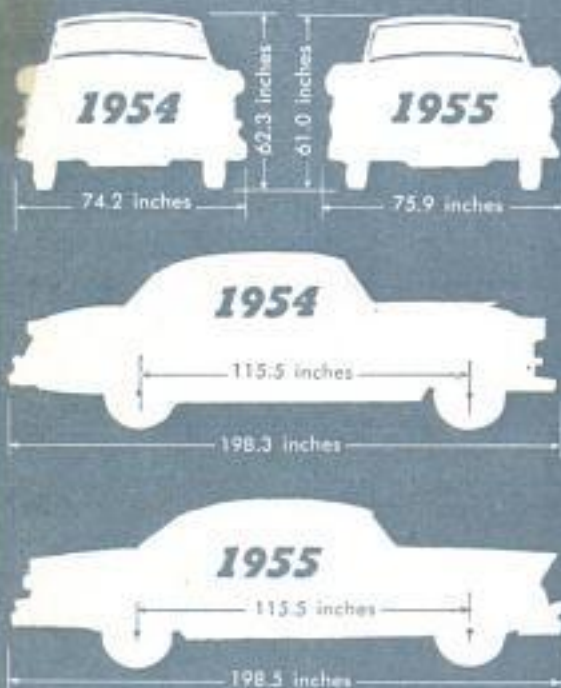
#### Cross-Country Mileage

Albuquerque to Taos, N. Mex. (fast driving) - - - - -	14.9 miles per gallon
Taos to Denver, Colo. (over La Veta Pass, some snow, moderate speeds) - - - - -	18.1 miles per gallon

(Premium gasoline used)

The 162-horsepower model with 2-barrel carburetor averaged about 1½ more miles per gallon, using regular gas, than the above figures.

### Comparison with 1954 Ford



Road tests are fine, but the true test of an automobile is daily operation by the owner. That is why *Popular Mechanics* brings you two reports each month: 1. The Owners Report, a frank, uncensored resume of what the owners have learned about their cars; and, 2. a road test by the veteran test driver, Floyd Clymer

"In upper New Hampshire, our roads are not too good during the spring. Frost heaves make traveling very tough with lots of potholes, too. This Ford really irons out the bumps, makes riding a pleasure."—New Hampshire store owner.

"Holds the road at high speeds. Takes curves and mountains in marvelous fashion. Wish they could reduce the darting back and forth at slower speeds in power steering. It is not noticeable at high speed."—Oregon automobile mechanic.

The following quotations describe the other best-liked features of the 1955 Ford in order of frequency of mention:

"I like the interior styling. It relaxes a person to get into a stylish interior."—Rhode Island dairy farmer.

"Visibility is great. Can see all four corners of the car easily from driver's seat."—Illinois landscaper.

"The wrap-around windshield gives more visibility, but is blurry where it bends."—Utah engineer.

"Brakes are the best. No fading at all on panic stops."—Wisconsin truck driver.

"I like Ford's excellent dependability. Has given no trouble despite zero winter weather."—Utah farmer.

"Game wardens probably use a car harder than any other type of law-enforcement officer. We soon find faults after driving a car at high speeds on logging roads, in fields, through mud and snow. All in all, the Ford stands up well to punishment."—New Hampshire conservation officer.

"I like the very good automatic transmission. It is the smoothest."—New Hampshire Air Force member.

### Owners Like Bright Colors

There has been so much comment about the bright colors on this year's models (of all makes, not just Ford) that we asked the owners to comment on the subject. A whopping majority (87 percent) of the owners like the new color treatments. Only 10 percent dislike them and 3 percent have no opinion. Here is a selection of quotations:

"I like them. Autos should not be drab."—Maryland plant manager.

"They look ready and alive."—Virginia insulator.

"Bright colors don't show dirt."—Louisiana owner.

"It gives customers a wide variety of choices."—North Carolina secretary.

"They are for young people."—Colorado civil engineer.

"Bright colors are safer. More noticeable on the highway."—Idaho forestry worker.

"Modern colors give pride of ownership."—Indiana salesman.

(Continued to page 230)



Permanent wing-tip fuel tanks mounted on some of the new Constellations will add two hours of flying time

## Super-G Gear Adds to Range and Safety

WING-TIP FUEL TANKS, "weather eye" radar and engine analyzers are features of TWA's new Super-G Constellations.

The wing-tip fuel tanks, first to be used on civilian transports, each carry 600 gallons and add 600 miles or two hours of flight to the range of transcontinental planes. Planes thus equipped will be the longest-ranged commercial aircraft during 1955, according to TWA.

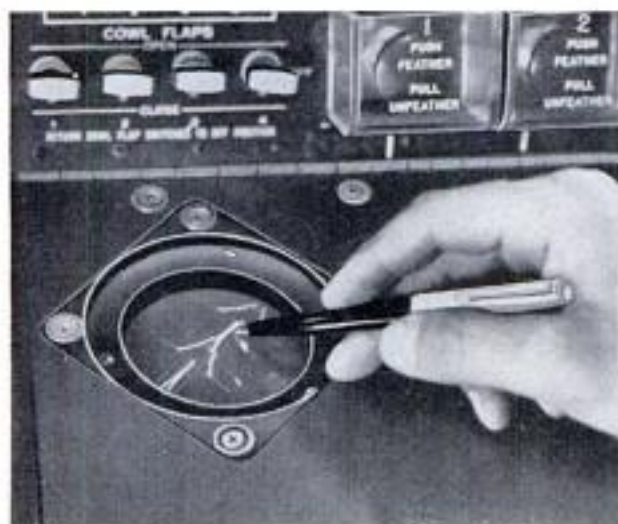
Turbulent weather up to 150 miles ahead can be seen by each pilot, thanks to the weather-eye radar. This will enable him to avoid storm centers without drastically altering his course.

Flashing pictures on the screen of the aircraft-engine analyzer give the flight en-

gineer a running account of engine operation. By twisting a dial, he can watch the performance of any one cylinder or all the cylinders in a particular engine. Green wave-form patterns produced on the screen represent ignition voltage. Faulty spark plugs, cylinders, valves and fuel injectors change the shape of the pattern. Defective parts can be spotted in the air and replaced immediately upon landing.

Flight engineer at control panel can check on the performance of any cylinder by watching analyzer

Pencil points to flashing arc made when cylinder fires. This is the screen of the engine analyzer





## Electric Hoe Shatters Soil With Vibrating Tines

Home gardeners now can use electricity to cultivate their flower beds and vegetable gardens. A new electric hoe (left) mulches the soil to a depth of 1½ inches. The hoe has 11 spikelike tines attached to a disk. When the disk vibrates, the tines shatter the soil into a fine mulch. In addition to cultivating, the hoe can be used to prepare areas in the lawn for reseeding, and to work peat moss, fertilizers and soil conditioners into the soil. Two sizes are available, one weighing seven pounds and having a four-inch diameter, the other nine pounds with a six-inch diameter.

## Transistor Automobile Radio Slashes Battery Drain

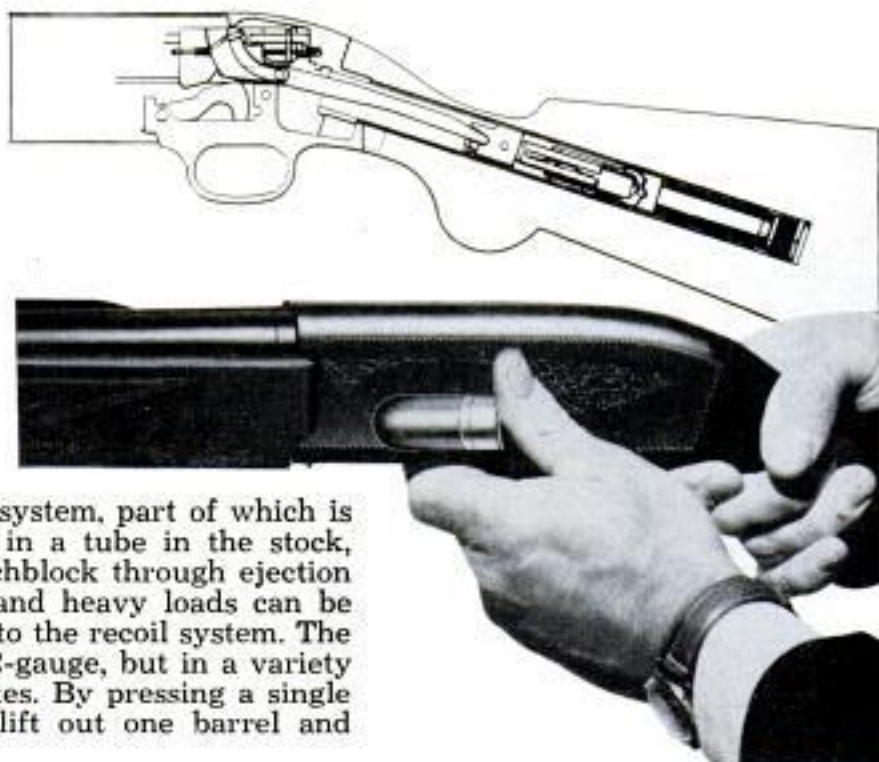
Car radios will be smaller and will require much less electricity in 1956, Chrysler reports. The new radio, available in the 1956 Chrysler cars, will be tubeless, the conventional electronic tubes being replaced by 11 tiny transistors each about the size of a pencil eraser. These transistors will last for the life of the car and will never need to be replaced. No vibrator, rectifier or transformer is required by the new set and, since these parts account for most car-radio failures, the new sets are said to be remarkably trouble-free. But the reduced current usage is where the big advantage comes. The new transistor set uses only one tenth as much electricity as the conventional tube set.

## Drugs Stunt Insect Growth

"Peter Pan" chemicals that prevent insects from growing up and reproducing are being tested by Department of Agriculture scientists at Beltsville, Md. Some prevent cell division. Others slow down the insects' metabolism. In one test with just piperonyl butoxide, only three percent of DDT-resistant flies reached adulthood. The growth-inhibiting chemicals are not toxic to humans and animals, the scientists report.

## Semiautomatic Gun Loads Two Shells

Sportsmen have a new shotgun available—the Browning "double" semiautomatic. The gun has the advantages of a double gun with the trim lines of a single barrel. The two shells are loaded through a port on the left side of the receiver. The first shell moves automatically into the chamber and the second remains visible in the port. The short recoil system, part of which is in the fore end and part in a tube in the stock, floats the barrel and breechblock through ejection and loading. Light loads and heavy loads can be fired without adjustments to the recoil system. The gun is available only in 12-gauge, but in a variety of barrel lengths and chokes. By pressing a single latch the sportsman can lift out one barrel and replace it with another.





Village of Moran, in one of the most beautiful spots in the country, had its view cut off by dam in foreground

For a look at the Teton Mountains  
hidden from its view since 1916,

## *An Old Town Packs Up and Moves*

By Richard W. Emery

ONE DAY NOT long ago the old-timers at Moran, Wyo., put on their specs and read the notice from the Department of the Interior. About five paragraphs down they came to this sentence:

"As part of the project, all buildings now located in the town of Moran will be moved five miles north to Colter Bay."

The old-timers looked at each other, snorted and read the notice again. This

Moran's 110 log cabins, some of them built by homesteaders, were ordered to be moved five miles to new site





couldn't happen to the old town which got its start in the rip-roaring 1880s, when the surrounding Jackson Hole country lived with a six-shooter on its hip.

But the notice meant business. Moran's general store, restaurant, gas station, post office, photo studio and 110 log cabins were to be moved.

Moran's new location is on the shore of Jackson Lake, which stretches 15 miles along the east flank of the Teton Range. And there, for the first time since 1916, the town again will have a view.

Back in the '80s when the first white men eased into the location and set out trap lines for beaver, Moran had a wonderful view. Right in front was the shimmering lake, five miles wide. Across the lake reared the jagged Tetons. The view was still there when Frank Love homesteaded at Moran about 1895. It was still there when Benjamin Sheffield, a cattleman, started the Teton Lodge at Moran in 1903. And it was still there in June 1914 when Charles Fesler arrived as a trapper, unaware he'd still be there 40 years later as the town's storekeeper.

Two years later, in 1916, the view was gone. A towering dam across the Snake River, in Moran's front yard, had put the view out of business. Summer tourists complained.



"Fine place to build a town, under a dam," they said.

"We was here first," the old-timers replied.

Thirty-seven years passed before Moran got the official hotfoot. A \$5,000,000 development by the Grand Teton Lodge and Transportation Company got government approval and a contract was signed. Moran would be moved to a lake-shore tourist village to be carved out at Colter Bay. So, also, might buildings of Square G Ranch and Jenny Lake Lodge, both located several miles south of Moran. And up on a hilltop, a mile from the present historic site of Moran, 200 construction men swarmed in and started building a three-story, multi-winged, reinforced-concrete lodge and 22 outlying guest cottages.

Moran's old-timers visiting the construction scene learned the hilltop resort would accommodate more than 600 guests. Summertime of 1954 found the first guests there, while major construction of the central lodge continued.

Moving the old town to a new site, where visitors again would have an unobstructed view of the lake and magnificent mountain peaks, long had been considered by the Grand Teton Lodge and Transportation Company. Many of Moran's log cabins were built by the company in 1930 to match in appearance old homesteaders' cabins remaining from the town's earliest years. The five-mile haul to Colter Bay will be accomplished by truck. Buildings which cannot be hauled intact will be taken in sections or will be torn down and rebuilt.

When the moving job is done and the builders finish their work, the Colter Bay resort and the nearby hilltop Jackson Lake Lodge will accommodate many more visitors than have been able to squeeze into Moran. The multimillion-dollar Jackson





Lodge and cottages, now under construction near towering Tetons will accommodate more than 600 persons

Lake Lodge will conceal its reinforced concrete, presenting outer surfaces which will look like weathered wood.

Builders are achieving the camouflage by using etched plywood for concrete forms. When the concrete has set, its surface has the grain markings of the wood. A penetrating acid stain reacts chemically with the concrete to give a permanent finish.

Precast lightweight concrete joists manufactured in Salt Lake City were trucked in and fastened in place as floor supports in the central lodge. The central building will require 11,000 cubic yards of concrete, and the entire job will use the grand total of 370,000 square feet of plywood—enough to cover more than eight acres.

The finished building will be 500 feet long and 200 feet wide. Visitors will find a huge lounge with a wall of windows facing the Grand Tetons. Other facilities will include retail shops, a convention hall that will seat 600, a coffee shop as well as dining rooms, and 46 guest rooms on the third floor. Two central boilers in the



Etched plywood is used for the concrete forms of the lodge. Concrete takes on the wood's grain pattern. Texture is enhanced with special stain

Precast concrete joists 20 feet long support the floors of the lodge. Reinforcing bars in the concrete are welded to the steel roof trusses





For a magnificent view of the jagged Tetons, visitors will look right through a window wall in the lodge

The past still lives at Moran. Banging triangle still means chow, just as it did for cowboys during roundup



basement of the lodge will heat the entire development. The guest cottages, many of them already built, are of frame construction, with the exterior walls covered with asbestos shakes.

There are those among Moran's elder citizens who take a dim view of the whole town-moving project. Arnold Fryk, a bearded prospector who "holes up" at Moran in summertime to get away from the heat of Death Valley in California, says he and his burro will look out of place in the swanky new atmosphere.

"Too much fixin' and fussin' for me and Gert. We'll be leavin'."

Charley Fesler, staunch citizen and long-time owner of Moran's only grocery store, admits he fought the big change bitterly, but says he accepts it now.

"If they want a cement hotel up here in log-cabin country, I guess they can have it. They've paid for it, sure enough. Folks have got mighty modern, and these modern folks have got to be accommodated. We've got to give way. One thing ain't going to change, though, and I told 'em so! These mountains ain't going to change. They were here before the cement hotel came and they'll still be here when it's gone!" ★ ★ ★



## Gauge Tells Ratio of Fat to Lean in Live Animals

How much lean meat is there in a live hog? Swine breeders and packers are continually trying to answer this question. Livestock buyers can make a good guess, but it's still a guess. Now two Purdue University scientists have developed an instrument which measures the thickness of fat and lean in live animals. The same instrument can be used in packing plants to check the ratio of fat to lean in carcasses.

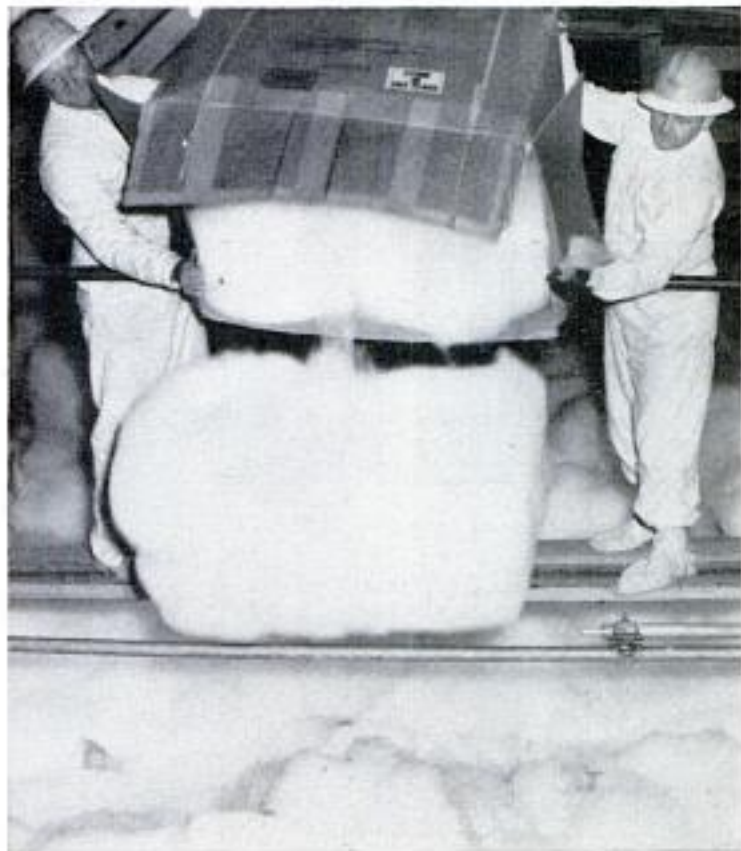
A delicate electrode is inserted beneath the skin of the animal. When the electrode contacts muscle, meter shows a great increase in electrical conductivity. Thus each layer of fat and lean can be checked. During research, 3000 measurements were made with the instrument without harm to the live animals. However, the instrument is expected to be especially useful in determining fat-lean ratios in carcasses.

## Glass-Fiber "Clouds" Remove Radioactivity

What appear to be clouds in a scene at the Hanford Atomic Products Operation are actually masses of fibrous-glass filter. A bed of glass fibers 7 feet deep and 56 feet long will serve to remove radioactive particles from exhaust gases at the Washington plant. General Electric, which operates the plant, will use the more efficient and less costly glass filter to replace earlier sand filters.

## Chemical to Combat Cancer

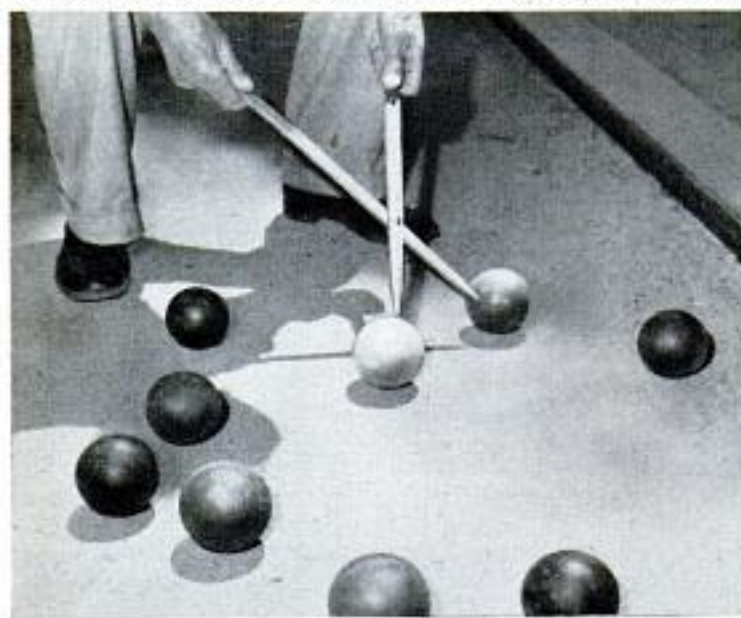
Scientists at the University of Wisconsin have isolated pure crystals of a chemical which makes cells divide and grow. The chemical is called kinetin. It is hoped that a slightly altered kinetin will block rather than promote the uncontrolled cell division which is so characteristic of all forms of cancer.



# Outdoor Billiards



A 4-3 lead for Black is marked on scoreboard. Pegs above the numbers indicate Red's score; pegs below keep count on Black



When balls are close, a scissorknife measuring device is used to determine the ball that really scores. Below, first ball thrown by A hits sideboard and rolls to within inches of cue ball. B follows with a shot that nudges A into second place



**T**ABLE BILLIARDS and lawn bowling are combined in a unique sport that's played almost every day in Oakland, Calif. Oldsters of 80 and boys of 65 meet regularly in a corner of the city's Mosswood Playground to test their skill at ground billiards.

Few tyros can best the veterans of the Mosswood league, some of whom have been playing the game ever since they were doughboys and brought it over from France after World War I. The 40-some men of the Oakland teams are all close to being champs. Competition is keen in the lively but non-strenuous matches.

Although ground billiards combines many of the skills and rules of table billiards and lawn bowling, it calls for something else—long hours of practice and expert knowledge of the particular course. Hoping for hot competition, the Mosswood players recently challenged several table-billiard and lawn-bowling champions to a match. The visitors soon learned that their special skills meant little in competition with the elderly sportsmen who play the game every day.

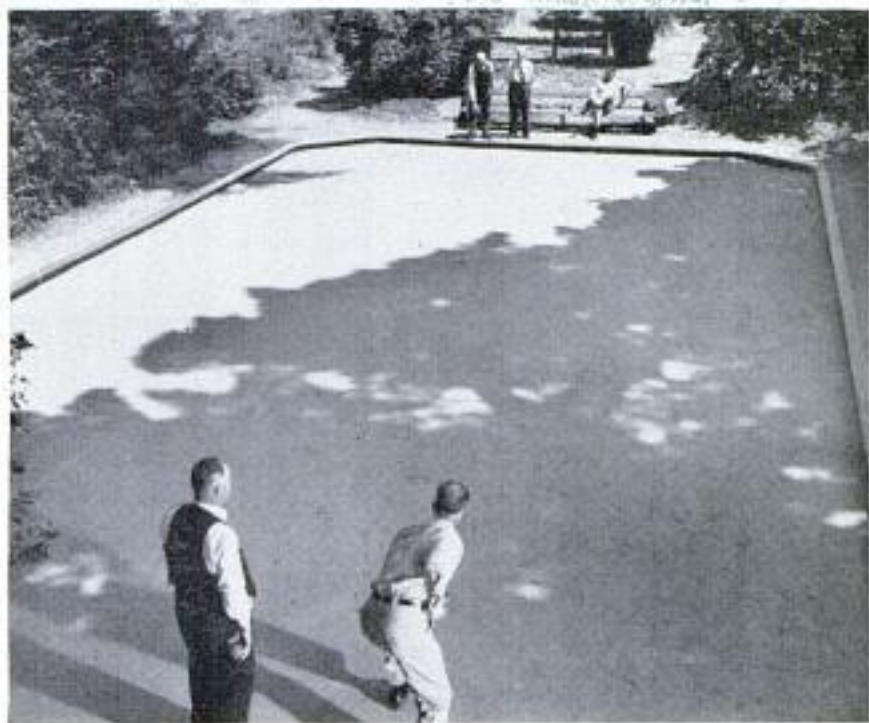
The game is not complicated. There are two men to a team, and partners stand at opposite ends of a 30-by-60-foot court fitted with small sideboards. Two competing players at one end start the game by rolling small wooden balls toward a cue ball at the opposite end. Each attempts to place his balls closest to the cue ball (as in lawn bowling). The sideboards are used for "cushion shots" (as in table billiards). After each of the two men has rolled his quota of four balls, play continues from the opposite side.

Before each game the court is dusted with a thin coating of sand to smooth the surface. But minute mounds and hollows remain to squash the scores of those who are not as well acquainted with the court. ★ ★ ★



Ground billiards, imported from France by World War I doughboys, requires a keen eye, skillful rolling and ears deaf to sideline kibitzing

A game starts. Player and his opponent get into position at one end of court while their respective partners wait at the other end for their turns



## Trailers Spread Three Fertilizers at Once



Three basic plant foods can be forced into the soil at one time by a new machine developed to spread liquid fertilizers. The Flo-Mix machine consists of two trailers that can be hauled behind a tractor. The first trailer carries tanks for potash and water concentration, liquid phosphate and compressed air, as well as steel cutting blades and tubes to feed the fertilizer to the soil back of the blades. The second

trailer carries a tank of anhydrous ammonia, which flows to the feed tubes through a hose. The compressed air forces the liquid fertilizers into the soil in the cuts made by the steel blades. A small compressor driven by the trailer wheels maintains pressure. Gauges regulate the flow of any one or all of the three elements—phosphate, potash or nitrogen—from the tractor seat.

## Rubberized-Plastic Signs Along Colorado Highways Outlast Steel 10 to 1

Colorado highways are being marked by all-plastic highway signs that are rubberized to withstand the rough treatment such signs often get. Actual tests show that the flexible signs last 10 times as long as the standard enameled-steel type. Highway engineers state that the major cause of sign damage is the thoughtless hunter who bangs away at highway signs to test his marksmanship. Bullets puncture steel signs uncovering the bare metal which

soon corrodes. With the plastic sign there is no damage other than the small holes themselves. Trucks and cars that sideswipe signs do no damage to the new type of sign as it flexes with the blow, returning to its original shape instantly. The signs have also been proven extremely weather-resistant. Although they cost 10 percent more than the standard type, the plastic signs are expected to save the state thousands of dollars because of their longer life.



*see corrected A*

# BBC Puts Inventors

on TV



Copyright by Merkuria

Designer, right, explains his unsinkable lifeboat. Either side is right side up, engine operates both ways

By David Scott

**I**NVENTIONS ARE the stars of one of the most popular television shows in Britain.

The Television Inventors' Club of the British Broadcasting Corporation has been on the air for seven years. During this time more than 7000 inventions have been submitted to the club, of which 580 have been shown on the air. A quarter of these have caught the eyes of manufacturers and many are already in production.

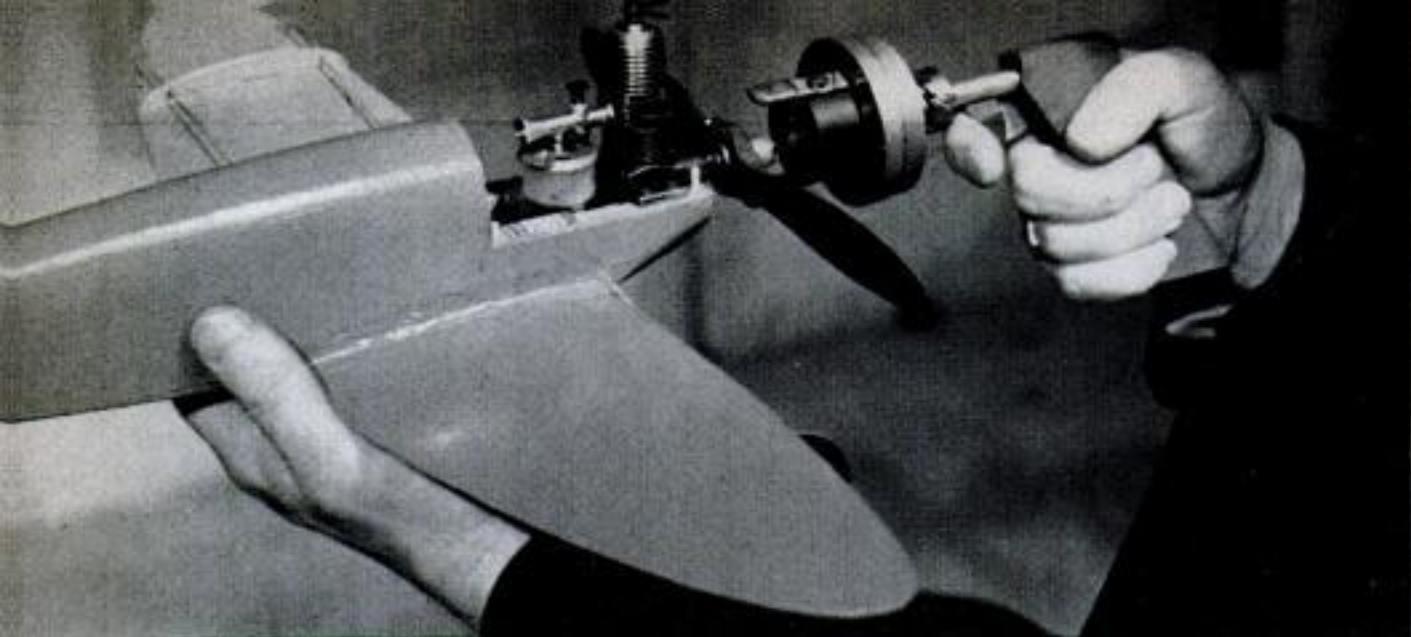
The inventions range from a simple shirt stud which allows for the shrinkage of the collar, to a compressible ship's fender which eases a 24,000-ton vessel against a dock.

A number of British inventors have hit the jackpot through the program. One of

them actually did it with a better mousetrap, and the world has already beaten a path to his door to the tune of over a million sales. Years of patient observation taught the inventor that a mouse twists its head when approaching the bait and nibbles from below. His trap therefore springs when the bait is lifted—not pushed down.

A tidy profit was also made by the inventor of a stair elevator for invalids. A moving step, carried on rails, is drawn up the staircase by a cable and winch. More than 500 inquiries poured into the BBC when this device was shown on TV.

The biggest problem of the organizers of the club is to select the inventions for the



Photos by Peter H. Jones

Model-airplane-engine starter has a spring-driven flywheel, wound by hand, which is released by the trigger



Sliding jaw on a one-handed monkey wrench permits quick adjustment to correct size. A thumb-controlled ratchet tightens the jaws



Truck for a shovel makes light work of heavy loads. Shovel is cradled in a light framework which rolls along on wheels

Yarn winder is made from an egg beater. Rotating carrier for skein has adjustable arms and clamps to table



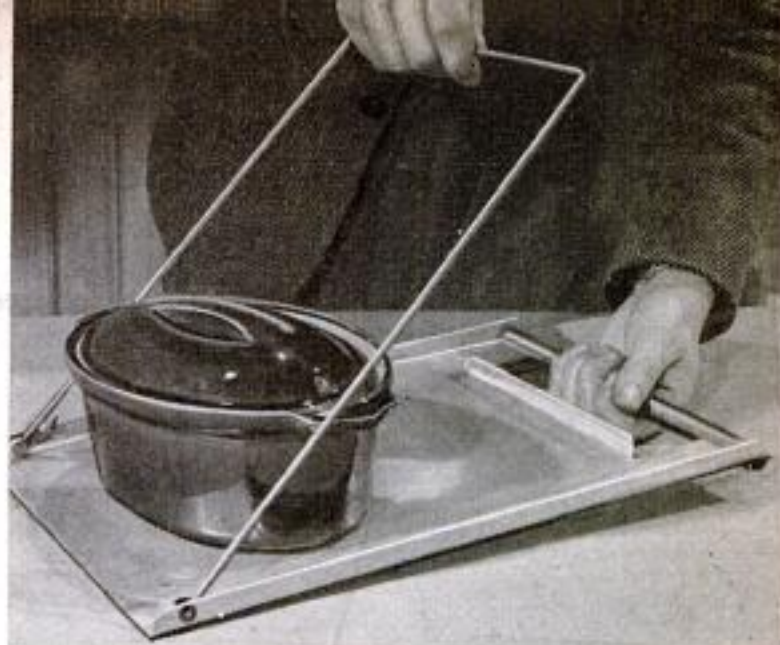
light material





Photos by Peter H. Jones

**When musician presses pedal, electromagnet attracts steel tab on the music, arm swings to turn the page**



**Hot dishes and pans are easily removed from the oven on a tray. Two front handles take weight of both ends**

monthly program. Each broadcast reaps an average harvest of 200 new applications, most of which come in immediately after the show. Of these, about 40 percent are rejected outright because they are repetitions of previous contributions, obviously lack commercial prospects or are simply unsuited for television viewing.

The surviving 60 percent are submitted to technicians in various fields. A panel of specialists from industry and business is maintained. The inventions may also be shown to technical journalists who are likely to know of the existence of similar inventions.

To be approved, the idea must be patentable. A clever idea sometimes is turned down when it is apparent that any handyman could knock together the invention in half an hour at home.

Usually about 60 inventions manage to survive these hurdles each week.

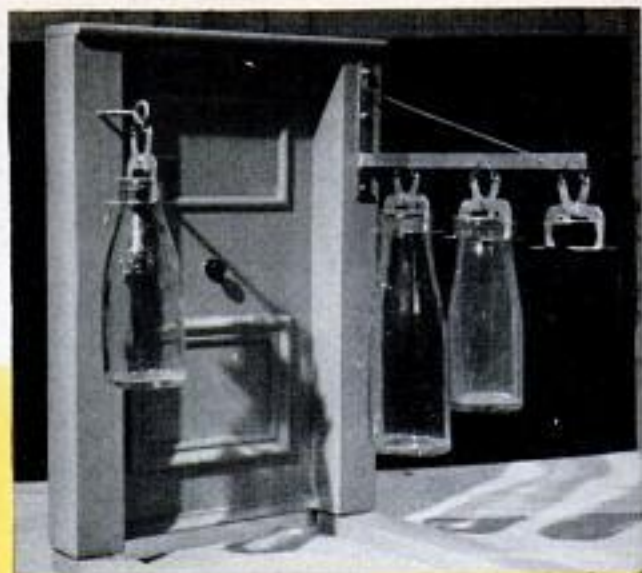
**Trumpet silencer placates neighbors during practice. Mute contains a microphone which is connected through an amplifier to earphones on the musician**





Photos by Peter H. Jones

Ironing board for the tired housewife has a built-in seat. When she's through with her ironing she folds the board and seat flat. Board can be used as desk



Milk-bottle holder protects bottles from animals and careless children. Hanging clips automatically grip the necks of bottles pushed up between the jaws

Clip holds a strip of wallpaper flat while paste is applied. Clip then is reversed to align the paper on the wall. Household items are especially popular when shown by Inventors' Club on television

Seat of stool is suspended on two sets of four coil springs, cushioning seat and permitting extended reach without tipping



Copyright material

They are subject to further examination which weeds out about half of them. The finalists, numbering perhaps 30, are then invited to the studio for a preview. Here the inventors demonstrate their ideas before the panel. When the last ax has fallen, 12 or 15 of them are left to appear on the next program.

Some of the inventions that fall by the wayside, of course, are screwball ideas. One budding inventor offered to demonstrate his one and only cure for fog dispersal, but this miracle was never submitted. No more was heard, either, from an inventor who claimed to have developed a chemical substitute for a parachute!

Another creative genius didn't get very far with his "door engine," which was supposed to convert the power used in opening and closing doors into useful energy. In the same class were roller skates especially designed to roll uphill.

Emphasis is on ideas with clear commercial possibilities. Sometimes an idea appears worthwhile but obviously won't pay off. No one, it was felt, would pay cash for gloves with a transparent watch panel in one wrist, or hand lights for cyclists to indicate turns at night.

One of the biggest successes on the program was a cigarette economizer which made an ordinary smoke last 35 minutes. It consisted of a slotted tube around the cigarette which retarded combustion between puffs.

Another success was an automatic dance instructor. Students stood on a raised glass panel and placed their feet on colored footprints cast on the glass by lights from below. The footprints varied in color and speed according to the dance step, and flashing arrows warned where the next would appear.

The entertainment value of the show is not neglected. Once a bull was brought into the studio to show the use of an animal gag which pried the creature's mouth open to permit easy dosing with medicine. Despite the severe misgivings of BBC officials for

### Jupiter Sends Out Radio Waves

Radio astronomers at the Carnegie Institute of Washington can hear intermittent radio waves from the planet Jupiter. It is the first recorded reception of such waves from one of the other planets in our solar system. The waves were described as having the appearance of short, random bursts of static resembling thunderstorm interference on your radio set. Although the explanation of the signals is still speculation, it is believed that they are caused by disturbances in the atmosphere of Jupiter.

JULY 1955

Mechanical hod picks up and carries stacked load of 20 bricks. A single brick beneath pile acts as a pallet



the safety of costly TV equipment, the act proceeded calmly for a time. But the beast grew restless when approached by the nervous inventor, who never before had been so close to a bull.

The program organizer, who had a farm background, took over. By now, though, the animal was so unnerved that it dragged him across the studio. The cameramen were quick to exaggerate his plight by a series of trick panning shots which increased the effect of pandemonium. Needless to say, this particular program drew a tremendous response. ★ ★ ★

### Cancer-Detection System Uses Sonar, Radar and TV

Principles of sonar, radar and television are combined in a new device used for detecting cancers and other tumors, cysts and goiters. Called the Somascope, it is an ultrasonic photographing device expected to give good pictures of internal growths in areas which cannot be seen by X ray or fluoroscope. The ultrasound beamed at a patient is reflected and the echo waves are converted into electrical signals which produce a picture on a TV screen.

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# Inflated SPORTS BOAT Mounts OUTBOARD



**YOUR CAR TRUNK** will hold an eight-foot sports boat that inflates from a compact bundle. Minutes after arriving at your favorite lake you can be scooting across the water, pushed by an outboard motor mounted on the plywood transom of the rubberized-nylon boat.

Pulling a lanyard triggers a carbon-dioxide cylinder that inflates the craft in a few seconds. Inflation with a hand pump takes about five minutes.

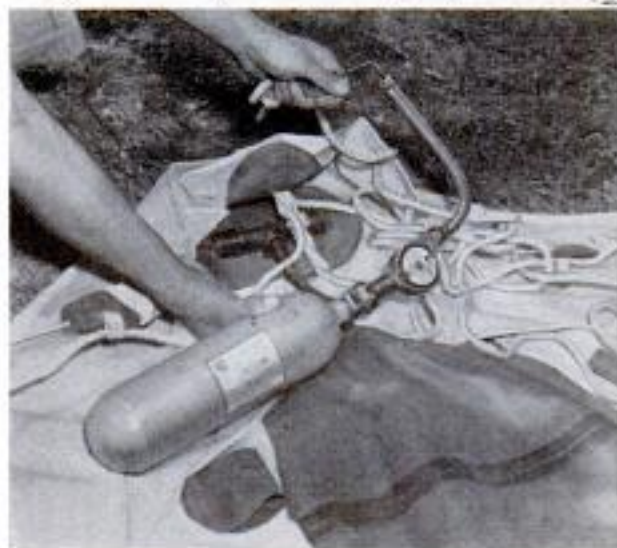
The light weight of the 30-pound boat makes for easy portaging. Included with the production model is a carrying case with shoulder straps, leaving both hands free for carrying the motor and fishing equipment or guns.

Another feature of the craft, recently unveiled in Miami, will be a transparent Mylar window in the bottom of the bow section. Designed for underwater viewing, it will be handy for skin diving.

The inflated boat serves a dual purpose on land. You can turn it upside down and use it as a bunk. Raised at one end, it becomes a camper's lean-to. ★ ★ ★

Deflated boat weighs only 30 pounds. The craft has two seats, plywood transom, is made of treated nylon

Carbon-dioxide cylinder is used to inflate boat. Gauge indicates pressure. Hand pump can be used





A three-horsepower outboard motor pushes the inflated boat along the surface of the water at a brisk speed

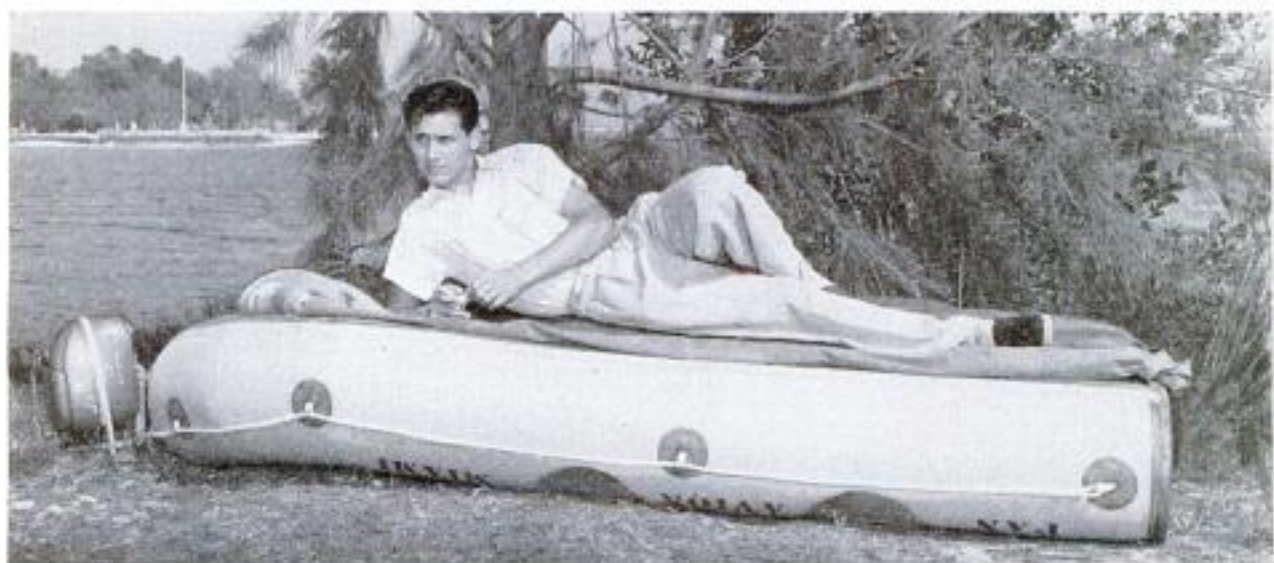


Pulling a lanyard attached to the carbon-dioxide cartridge causes the boat to inflate within seconds



Boat can be hauled out of the water, turned upside down and tilted, and used as a lean-to for camping

The boat, inverted, also serves as a hammocklike bed. It's roomy enough; dimensions are 8 feet by 38 inches





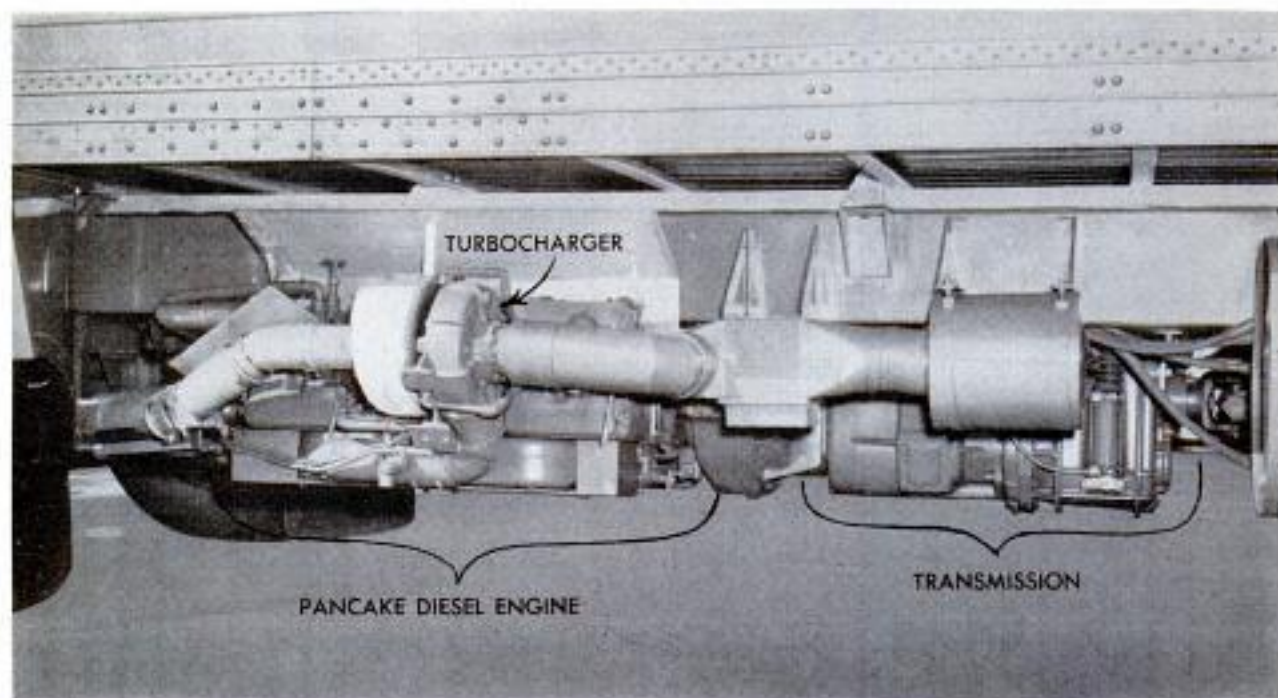
All four front wheels steer. The tractor not only pulls a load, it carries a 10,000-pound load on its back

## Semitrailer Has Four Front Wheels and Flat Diesel Engine

Powered by a pancake-type diesel engine mounted amidships under the frame, an experimental truck is undergoing tests on the West Coast. Built by the Pacific Intermountain Express truck company, the tractor has two sets of front wheels on tandem axles to reduce the weight per wheel. Both sets of front wheels turn in steering. The 235-horsepower Cummins

diesel features a combination turbocharger and exhaust system which reduces engine noise to a minimum and virtually eliminates the emission of black smog particles into the atmosphere. The tractor not only pulls a load, but it also carries one on its back. A 16½-foot box is mounted directly behind the cab. The engine is mounted under this box where it is easily accessible.

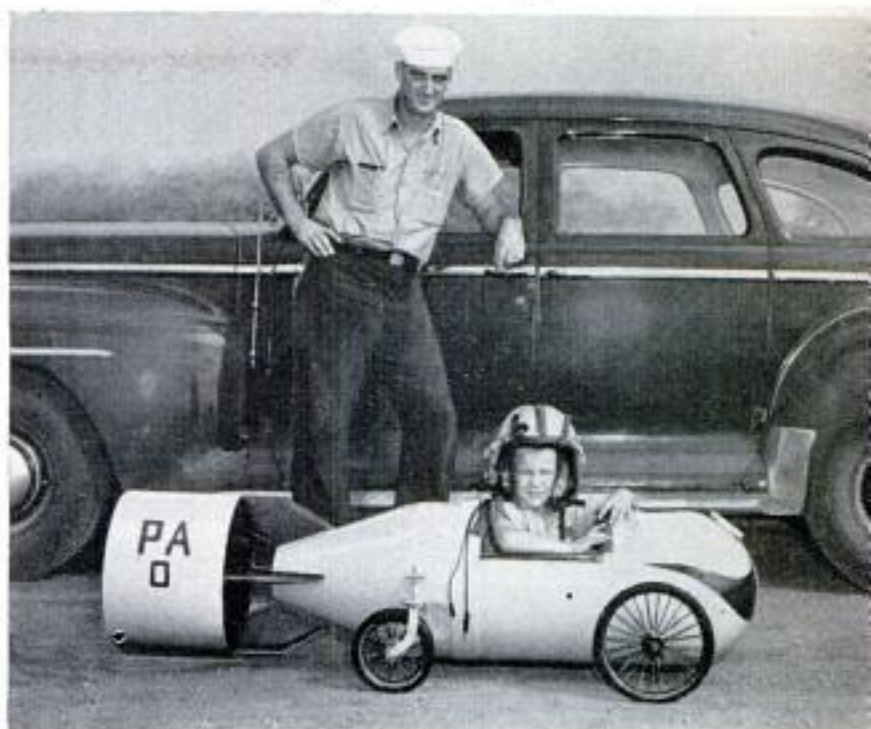
Mounted under the big box body, the pancake diesel engine has a turbocharger to reduce noise and exhaust



# ***Kid Stuff? Not to These Lucky Youngsters!***

## **Salvaged Bomb Makes Juvenile Space Ship**

Its central structure a discarded 500-pound aerial bomb, a juvenile "space ship" gives two-foot-power transportation to Gene Montoya of Honolulu. The space ship was built by Gene's father, D. L. Montoya, in a single week end at a cost of less than a dollar. The surplus bomb is lined with rubber padding and the wire wheels are from another juvenile vehicle.



## **And Here's the Back-Yard Helicopter!**

Junior now can take a ride in his own helicopter. A new sidewalk vehicle with a frame of steel tubing is complete to a free-moving overhead rotor. The pint-size pilot sits in a bucket seat and powers his craft with foot pedals which turn a chain drive connected to the front wheels. The aircraft-type steering wheel turns both the rudder and the rear wheel to guide the craft as it "hovers" over driveway and sidewalk.

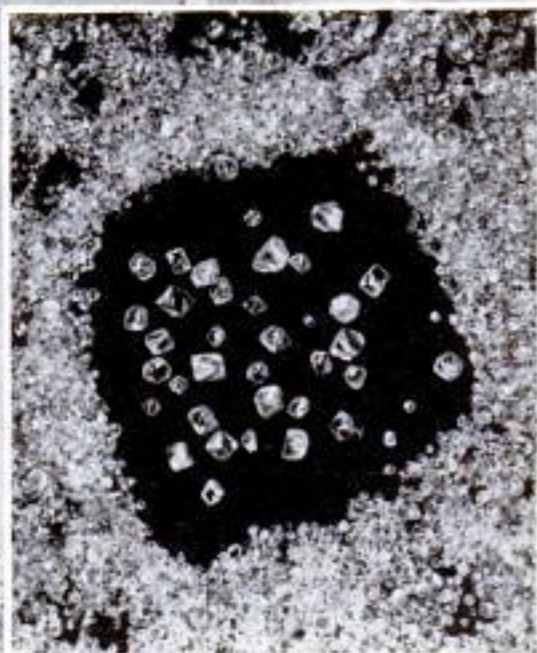
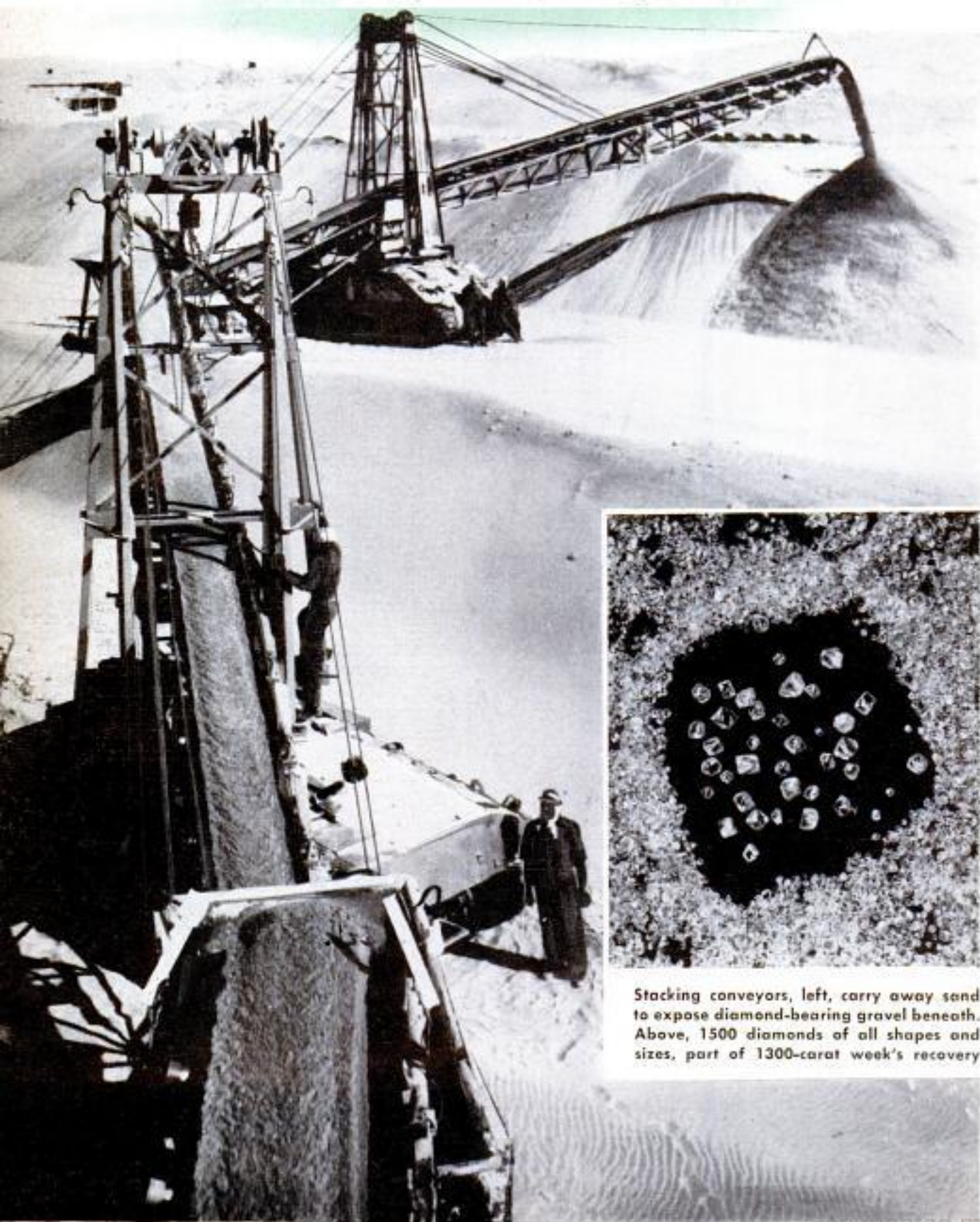
## **Last, But Not Least— The Back-Yard Handcar**

Back-yard railroading — handcar style — has come into its own with introduction of the "Yardbird," a scaled-down handcar operating on a miniature track. The Yardbird is chain and crank driven, and will hold two children. Basic diameter of the 40-foot track furnished with the handcar package is 12 feet, but additional packages of track are available for enlarging the layout.



*Desert Harvest . . .*

# DIAMONDS UNDER THE SAND



Stacking conveyors, left, carry away sand to expose diamond-bearing gravel beneath. Above, 1500 diamonds of all shapes and sizes, part of 1300-carat week's recovery





Photos by Consolidated Diamond Mines of South Africa, Ltd.

Sherman tanks pull sand-moving equipment. Tanks also provide chassis for rotary scoops, portable conveyors

**D**IAMOND HUNTING is big business along the seaboard of the Namib Desert in Southwest Africa where the Orange River empties into the Atlantic Ocean. Mobile conveyors and Sherman tanks pulling huge scoops remove sand as deep as 70 feet to uncover diamond-bearing gravel.

The diamonds were apparently released from the tops of old volcanic pipes inland and carried by the Orange River to the sea. Waves threw the diamonds onto gravel beaches which became buried in sand.

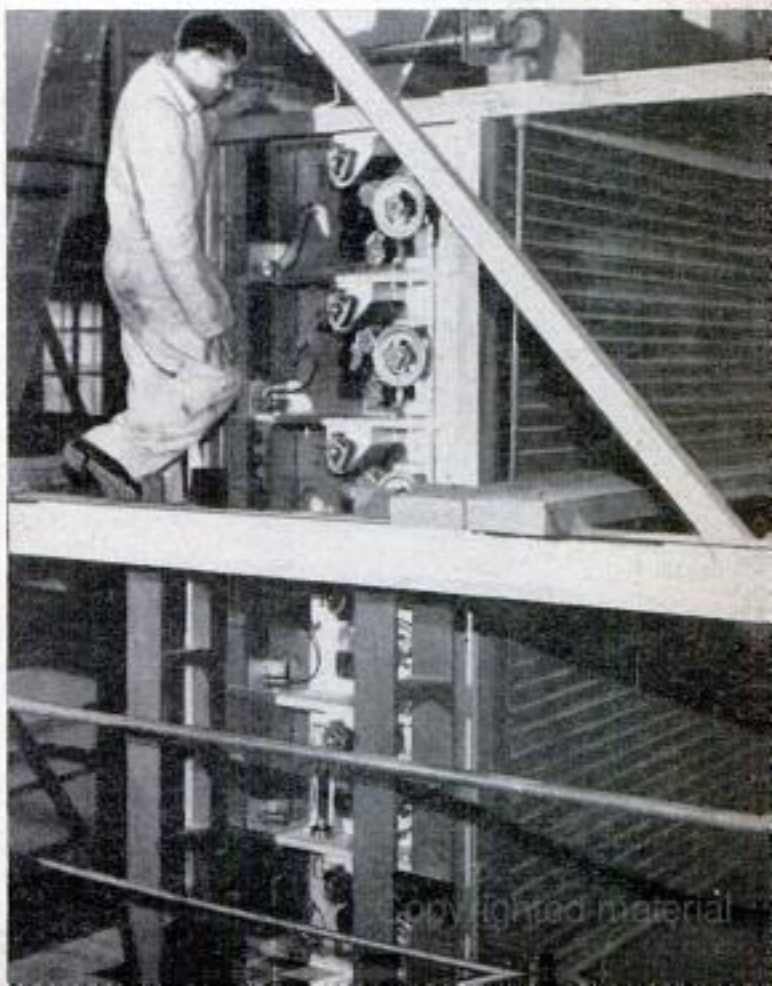
Before an area is mined, prospecting trenches are dug to determine the value of the gravel beneath the sand. The sand is removed and the "cemented" gravel bed is torn apart by drilling and blasting. The gravel is taken to the refinery, where it is crushed, washed and screened. It is then fed into a heavy liquid that causes the lighter matter to float and the heavier matter, including diamonds, to sink. The material is washed across a tilted, moving, grease belt. The diamonds stick to the grease belt and the waste washes off. The belt is continually scraped, grease added.

Another method of separation is the electrostatic process. Diamond concentrate passes through an electrical field and receives a charge. Waste, generally conductive, loses its charge to earth immediately and falls. Diamonds retain their charge long enough to be deflected. ★ ★ ★

Native worker displays a large diamond he found in the gravel. Few diamonds are collected this way



Gravel suspended in heavy liquid washes across grease belt. Diamonds sink, stick to belt. Electrostatic separator, below, relies on conductivity differences





## Three-Film Camera Gives Operator Choice

Photographers who find color film in their cameras when the light requires black and white, or who want slow films and have fast, will welcome the three-film camera invented by Samuel Noble of Detroit. The 35-mm. camera can be loaded with three different films at the same time. Any one of the three can be brought into operation by revolving the back. Development took 6½ years.

## Starter for Power Mowers Operated By Foot

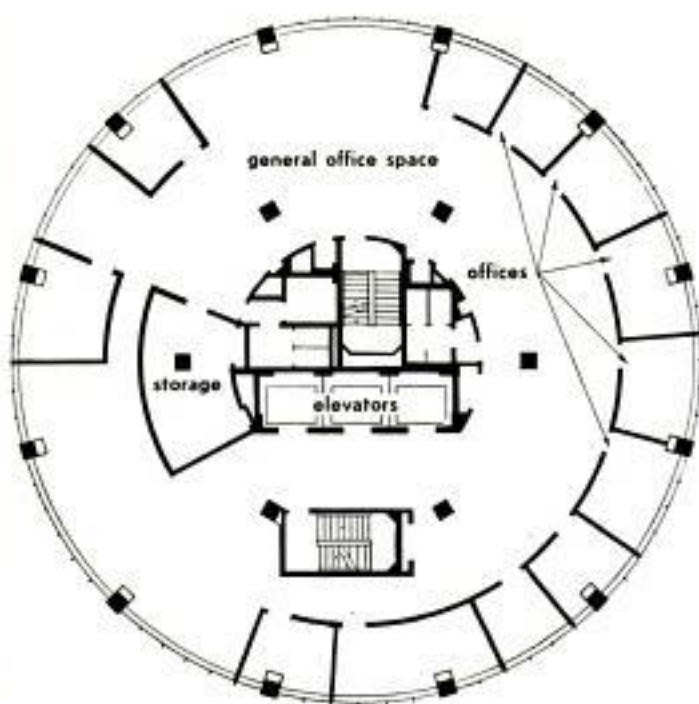
Rope-jerking to start a power mower is a thing of the past if you use a new electric starter. You simply press a button with the tip of your toe to start the engine. The starter, which operates on a six-volt, seven-plate battery, is similar to an automobile starter. When the button is pushed, a chain drive turns an overriding clutch on the engine crankshaft. The clutch disengages automatically. The battery produces about 400 starts.



## Round Office Building Has Service Rooms in Center

Savings of 13 to 20 percent in outer-wall construction, as well as more efficient heating and air conditioning are claimed for a round office building to be built in Holly-

wood, Calif. The 13-story, \$2,000,000 structure will have elevators and service rooms in the center, with office space around the perimeter. A model has been built.



## Miniature Sounding Instrument Measures Depths From Rowboat

About the size of a small suitcase, a new electronic instrument can be used from a rowboat to chart the depths of rivers, lakes and shoal waters. The instrument is an echo depth sounder, a portable version of an instrument used by the Navy for signaling and detection. A sending-receiving unit is lowered over the side on a short pole. It sends out an ultrasonic signal which bounces off the bottom and returns. The time interval is measured by the instrument and converted into a reading in feet or fathoms. An experienced operator can even identify schools of fish with the instrument. It is designed for utilities companies and engineering firms which lay pipelines and cables.

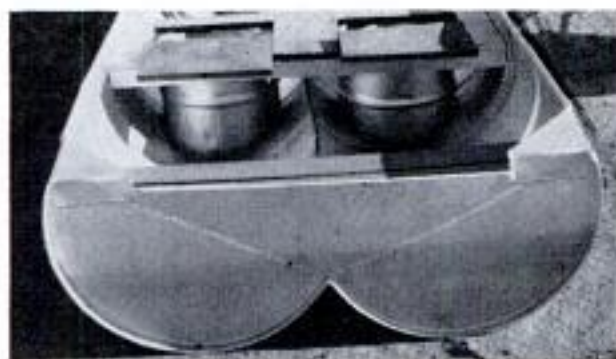


## Soldiers Build Boat From Old Oil Drums

Three oil drums cut open lengthwise and welded together end to end form a twin-hulled boat built by A/2C Eugene Smith and A/2C Douglas Dellefield. Also used in the boat was scrap metal for the bow and stern and scrap lumber for seats. The 11-foot, 120-pound boat has two 10-gallon grease cans built under the center seat. One serves as an insulated icebox and contains a five-gallon lard can packed in glass fiber. The other 10-gallon can serves as a bait well. Needle holes piercing the bottom of the boat supply the well with four inches of fresh water at all times.

## Sturdy Paper Garbage Bags Eliminate Handling of Cans

Large paper bags chemically treated to resist moisture take the backaches out of garbage collection in Hartford, Conn. The bags fit inside conventional garbage cans, hold 40 pounds of wet garbage or 80 pounds of dry rubbish, and are removed without moving the can. Eight inches higher than a garbage can, the bags can be folded over to seal off flies and odors or grasped at the top for carrying. Use of the bags speeds garbage handling, makes it quieter and saves on maintenance of cans and collection equipment. In Hartford, use of the bags enabled 20 men to do the work of 29.



# Titanium Strike in Mexico

By Clifford B. Hicks

Exploratory tunnels carved into mountainsides have proved existence of 25,000,000 tons of rich ore. Map shows location of strike in southern Mexico. Other dots indicate smaller sources of ore



Geologist Willis Seaman, left, one of the prospectors, examines diamond drill cores with the mine superintendent





Mexican miners drive tunnel deeper into mountain. Ore will be trucked to coast for shipment to this country

**I**N SEPTEMBER 1953, three men showed up in the primitive village of Pluma Hidalgo, high in the mountains of southern Mexico.

The rugged Sierra Madre range runs like a jagged spine down the length of the country, and the mountains here, near the base of the spine, are covered with the lush vegetation of the tropics. For centuries, bearded prospectors have been exploring the reaches of these slopes.

The three men—in appearance old-time *yanqui* prospectors—excited little curiosity. Day after day they disappeared into the jagged mountains.

Then, some weeks later, the old-timers staked out claims to the biggest deposit of rutile (rich titanium ore) ever discovered in the Western Hemisphere. At least 25,000,000 tons of rich ore lie there, ready for the taking, according to estimates.

These were no ordinary prospectors.

Leader of the group was 82-year-old Donald B. Gillies, former vice-president of Republic Steel Corporation and now a mining consultant for the same firm. His associates were W. A. Seaman, a retired professor of geology, and Ward A. Broadfield.

The three experts found their bonanza of rutile in an area which had been combed over by countless other prospectors.

Republic Steel has started development of the Pluma Hidalgo lode at a time when the federal government is vitally interested in titanium for defense.

Already Republic has proved more than 25,000,000 tons of ore by carving exploratory tunnels into the mountainsides. Engineers and native miners found ore so fantastically rich that in one place it actually is 95 percent rutile.

Republic plans to build a concentrating plant near the ore bodies. It should be in



**SHEAR SCRAP**



**MACHINE CHIPS**

*Republic Steel photos*

At present, titanium is so expensive that even shear scrap and chips are saved and recharged into furnace



When titanium sponge is crushed for the furnace, a powdery residue is left. Machine above compresses powder into pellets so it too can be used. Below, first step in processing ingot is to skin off surface imperfections, assuring high-grade metal



operation within a year, turning out 2000 tons of concentrate averaging 95 percent rutile each month. But weather and terrain have a habit of fouling up the best of plans in this part of the country. Roads are impassable to anything but Jeeps, strong trucks and the sure-footed burro. Distance is measured in time instead of miles.

The discovery of a vast new source of ore won't guarantee a sudden splurge of titanium products. About four years ago titanium was cast in the role of the gee-whiz metal of the future. Its personality seemed to more than fill the role. Twice the weight of aluminum, it is four times stronger than most aluminum alloys. It resists corrosion from most acids. For many years investigators believed that titanium, because of its extremely high melting point, would stand up under elevated temperatures better than most other metals.

So what has happened? Titanium, instead of filling the role of shining hero, has taken on some of the characteristics of the villain. Its disposition in many ways is downright cantankerous.

Although titanium has a high melting point, continued exposure to high temperatures apparently tends to make it brittle. Fatigue stresses—continued vibration while under load—may cause titanium parts to snap.

Though it's one of the most abundant elements in the earth's crust, titanium wasn't extracted in any quantity until 1940, when the Kroll process was fully developed. It's a batch process, and a relatively small batch at that.

These personality quirks have had their effect. Finished shapes of titanium now are selling for



TITANIUM SPONGE



PELLETS

Sponge is a clinkerlike material which is crushed for furnace. Fine particles are squeezed into pellets

about \$20 a pound, compared with stainless-steel shapes ranging from 35 cents to \$1 a pound.

Within the past several months, some of the problems that seemed insurmountable have been solved and others are on their way to solution. New processes for the continuous production of titanium now seem possible, though they haven't been achieved to date.

Today, ingots up to 26 inches in diameter and weighing 4000 pounds are coming from the melting furnaces. Methods of heat-treating and annealing have been worked out, forgings of almost any desired shape now are possible, and the temperamental metal has succumbed to new techniques in forming, machining, grinding,

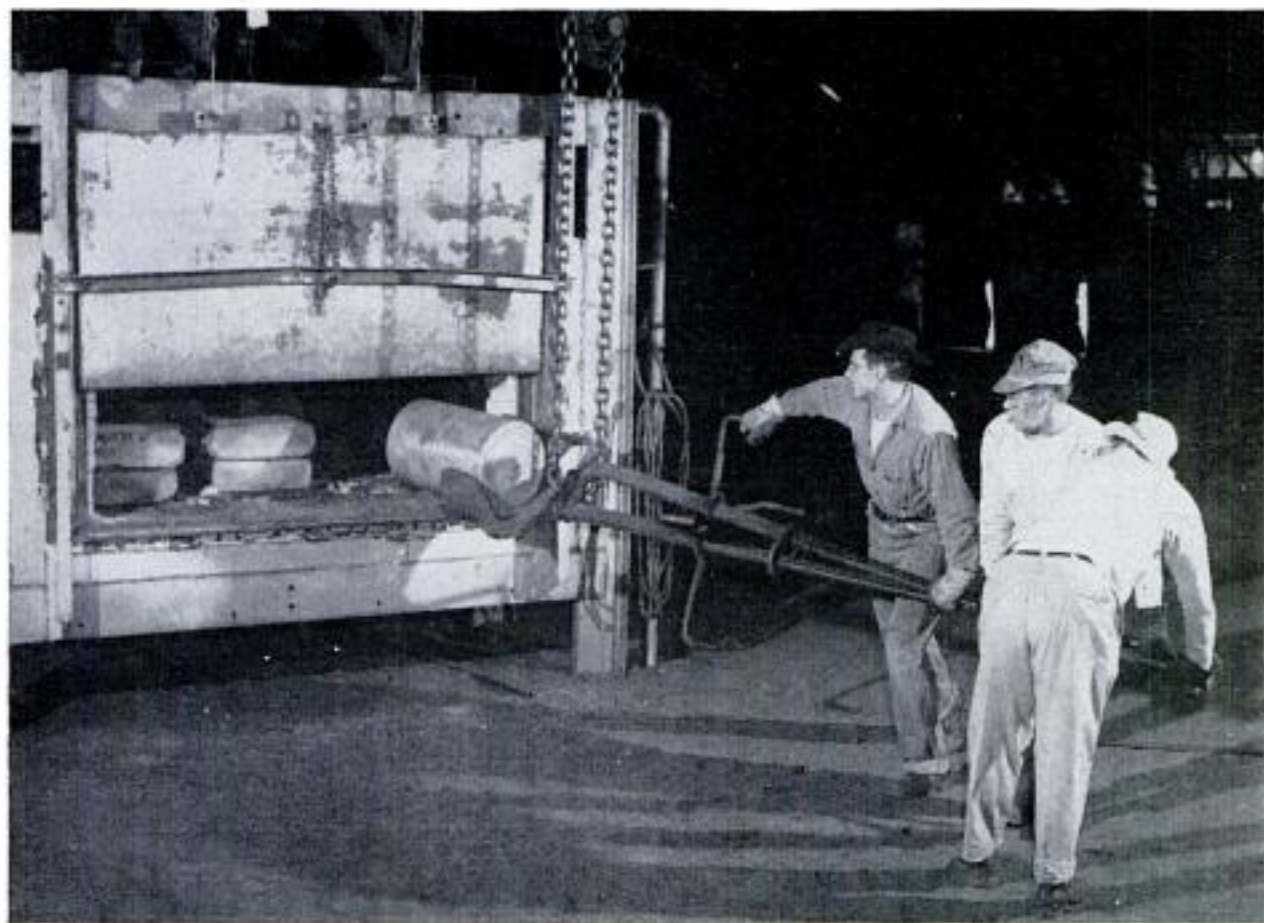
welding and other methods of fabrication.

Sponge must be crushed before it is charged into a furnace, resulting in a small amount of powder of "fines." A new machine compresses these fines into pellets which then can be charged into the furnace.

The attitude of researchers toward this mysterious metal now has come full circle. Once regarded as the child-wonder of metallurgy, it went through a phase of deep depression and now is back on top. One authority estimates that 500,000 to 2,000,000 tons of the stuff will be produced annually in the 1960s.

If this prophecy of large-scale use comes true, there'll be a big market for those mountains of ore in the Sierra Madre foothills of southern Mexico. ★ ★ ★

Ingot is removed from furnace. It next will be forged into slab. Partially forged slabs can be seen in furnace



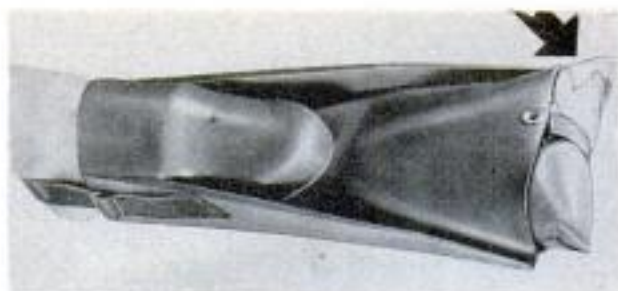


### Aluminum Harness and Holder Ease Load of Big Bass Drum

Aluminum shoulder bands are part of a new harness and holder for bass drums which is lightweight and easy to put on. A feature of the holder is a double-race ball-bearing fitting on the drum attachment that permits the instrument to be spun for a spectacular effect. The equipment was invented by Joe Waters, Jr., a student at the University of Southern California and a member of the kilted San Fernando fire-department band.

### Latch Locks Heavy Doors

Heavy sliding doors can now be latched securely with a sturdy bracket. A hook which fastens to a plate in the doorway is mounted on a tightener. The cogged tightener has a handle and is locked with a dog. The entire bracket is installed with three wood screws and three carriage bolts.



### Air Pillow Buoyo Swim Fin

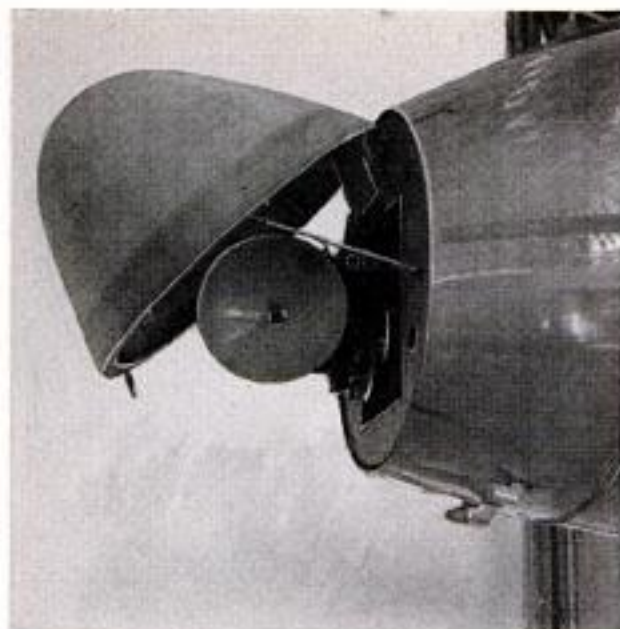
Swim fins equipped with a small air-filled pillow (arrow) in each forepart don't drag on the feet of the swimmer. The pillows, seven inches wide at the front and three at the back, fit into pockets in the paddle ends of the fins. They give the fins a buoyancy which eases swimming and prevents the fins from drawing the feet downward when the swimmer is resting in the water.

### Compact Kit Plates Metal

Two miniature batteries contained in a metal case provide the electricity for a compact, economical, electroplating set. Attached to the battery case is an anode which is placed in the electroplating solution. Another wire leads from the battery case to a crocodile clip and a hooked copper wire for holding rings and other small objects in the solution. The instrument applies a silver, copper, gold, rhodium or chromelike finish.







## Radar in British Transports Will Warn of Storms

Airborne weather radar, similar to that in use on some United States airlines, is planned for the Bristol Britannia transport planes on order by British Overseas Airways Corp. The radar antenna is installed in the nose of the Britannia prototype now under construction, and the hooded scope



is in the cockpit. British airborne weather radar will detect storms 50 miles away, enabling planes to alter their routes.

## GI Phone System Carries 12 Calls on One Cable

Twelve phone calls, each on a different frequency, share the same cable in a new Army telephone system. Repeaters at intervals along the cable boost weakened signals and give each unit a 200-mile range. Several systems can be linked to form a hookup of about 1000 miles. Miniaturized

parts reduce the size and weight of the rugged, weather-resistant equipment, which is housed in units like large suitcases that can be handled by one or two men. A similar four-channel terminal, also new, weighs 178 pounds and occupies 5½ cubic feet. The cable can be laid, strung or buried.

Repeater unit is used to amplify conversations, boosting range of the system to hundreds of miles

Terminal units are assembled into stacks. Combining several of the systems gives range of 1000 miles



## Scale Prints Label To Record Weight

Weight, price per pound and total price are printed on package labels by a new meat scale. The machine also prints the name of the product and a coded date. A rack above the scale holds plates which print the names of different commodities. The operator places the commodity name plates in a slot, weighs the product and presses keys to record the computed price that is registered on the scale. Other information, including the price per pound, is printed automatically. The system eliminates chances of error in reading, remembering and recording the weight, saves time and provides an attractive label. Each section of the commodity name-plate cabinet holds as many as 105 different plates.



## Pyramid-Shaped House Defeats Winter Snow and Summer Heat

"Crawl space" in a new Swiss house appears to be directly beneath the attic. The pyramid-shaped structure has no upright exterior walls, and stands on four pillars which support it high above the ground. It is designed especially for mountainous country. The elevation of the building al-

lows snow to fall clear of it, keeps it cool in summer and free of dampness and solves construction problems caused by uneven ground, according to the architects. It is also said to be warm in winter. The house cost about \$10,000 to build.





### "Orange-Peel House" for Campers Fits on Small Trailer

Developed in Germany, a portable shelter for camping or trailer travel looks like a gigantic orange—and peels apart almost like one. The parts of the shelter are shaped much like the segments of an orange peel. One person can fasten the segments together to complete the shelter in 15 minutes. The parts of the shelter including the floor are made of plywood. When the shelter is disassembled, the parts can be stacked on a small trailer for the trip to the next camping site. The collapsible house has two windows and a door. In Germany the "orange house" sells for about \$150.



Top, attractive camper stacks the parts of the portable shelter on a small trailer. There are eight of the segments and the floor, all made of plywood

Above, parts are laid out and floor assembled first. Segments are mounted on the floor and clipped to each other. In 15 minutes the home is completed

Left, finished shelter can serve as temporary home for campers and tourists. It also can be used as a beach house. A door is built right into one of the segments

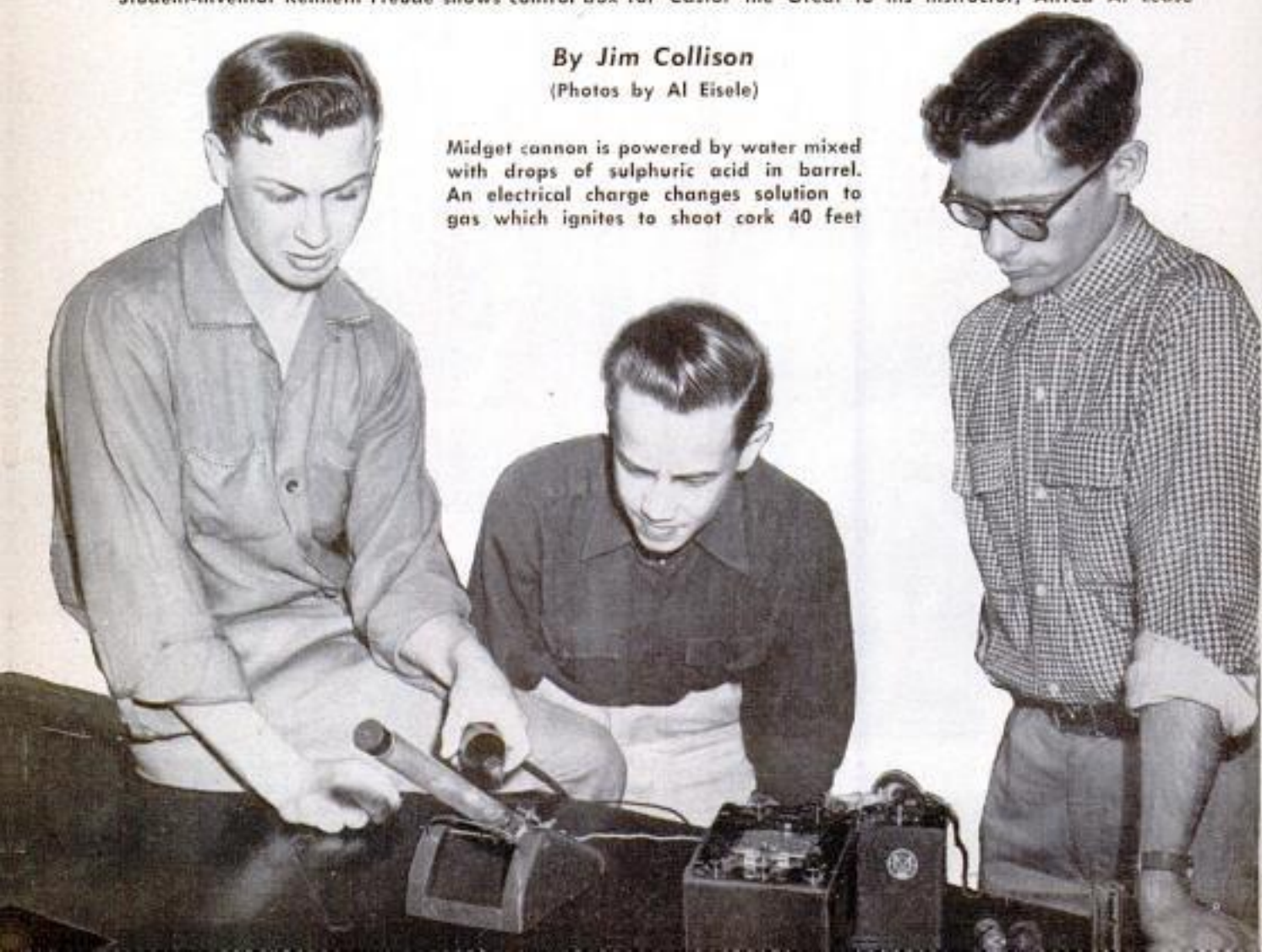


Student-inventor Kenneth Freude shows control box for Castor the Great to his instructor, Alfred A. Lease

**By Jim Collison**

(Photos by Al Eisele)

Midget cannon is powered by water mixed with drops of sulphuric acid in barrel. An electrical charge changes solution to gas which ignites to shoot cork 40 feet



# High-School Robots Learn the "Three Rs"

**A**N ELECTRONIC THINKER—a completely mechanical robot—built by Robert Kotsmith, 16, and Michael Chmielewski, 17, high-school juniors at Foley, Minn., is passing exams of a factual nature that would stump any uneducated robot.

The machine, built during a period of 10 months at an estimated cost of only \$120, understands and answers the human voice. The Thinker answers mathematical questions, gives data on current events and history, writes and even learns new facts it does not already know.

Even to persons well versed on scientific progress, this project seems astounding. Foley science instructor Alfred A. Lease says this of his students: "Their accomplishments would make some college graduates look on with envy."

When I walked into the chemistry laboratory of Foley High School, Lease and the

two inventors were putting the Thinker through its trial performance. It had just written its first word: M-A-R-C-H. This was the month in which it was completed. As I walked in, the machine was writing L-E-A-S-E, clearly, in nearly square letters, slanted slightly left, about an inch high.

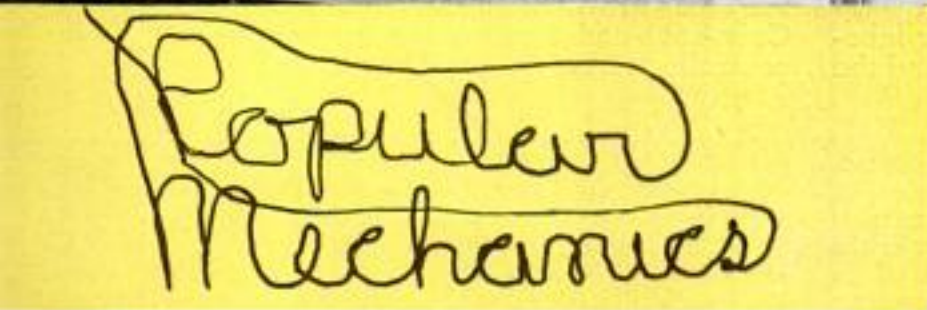
"Ask it any question you like," suggested the students.

The machine has three units: The main compartment, about six feet long, three feet wide and four feet high, contains the "brain"; the second unit holds the counting and spelling mechanisms, and the third houses the writing apparatus.

On the central brain unit are five switches and five warning lights to indicate which switch is on. These switches control the areas in which questions can be asked. Cube-root and square-root answers, each controlled from a separate switch, are

This train obeys voice signals spoken into mike. It is controlled by small black box which contains the "electric brain." Sound waves are converted to electrical waves and sent to train's directional set





Writing unit of Thinker, above, names a president. It also told what magazine would carry its picture

Inventors of Thinker watch pointer spell out name of President Eisenhower. Number dial is just below

given on the numbered unit. There is a switch for longhand writing and one for answering current events. The fifth switch directs multiplication answers.

On the number-letter unit, one dial points to numbers 0 to 9, to a period, and to Yes and No. Another dial points to letters A to W. The mathematical answers are given through this unit along with answers that are spelled out. In the writing unit a pen, hovering over a stack of paper, is held and directed by two metal "seesaw" fingers.

I asked the machine for the square root of 98. (In asking questions through a microphone worn about the neck, each inquiry must be prefaced with "Now . . .")

"Now . . ." Lease ordered, "give me the square root of 98." As he said this he pronounced the words distinctly and counted on his fingers. Pronunciation must be clear and syllables counted since inquiries must be limited to ten syllables.

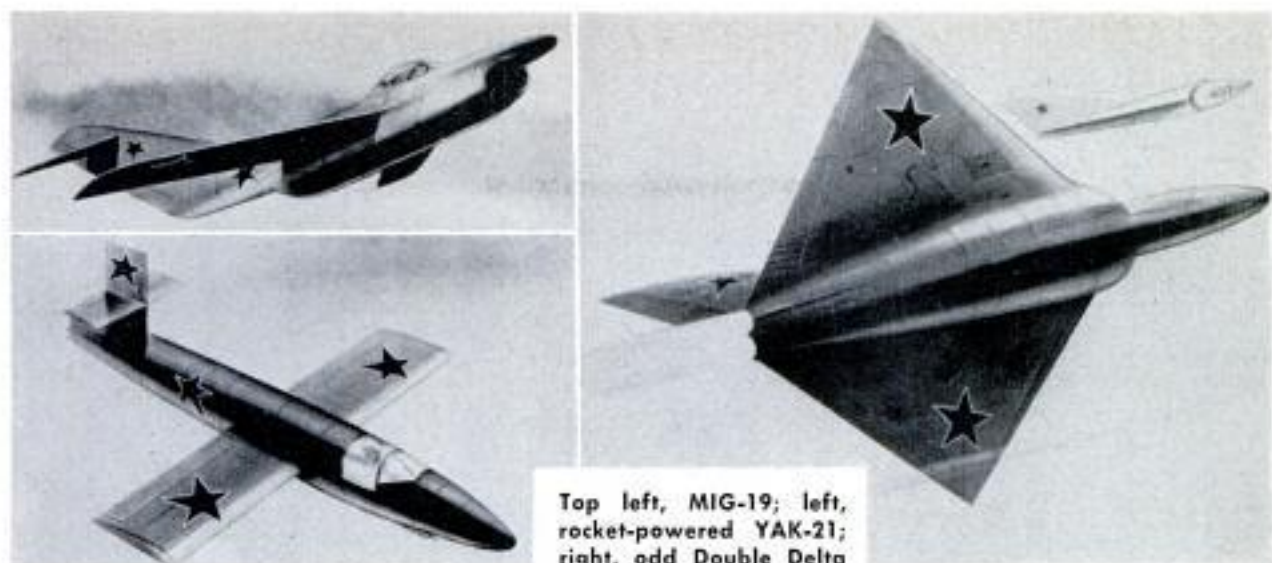
Slowly the number dial pointed out the answer. First to 9. Then to the period. Next to 8, and then back to 9. That was the correct answer, 9.89. I asked for the square root of 177. Again, the correct answer: 13.3. All

(Continued to page 218)

The Snail, a mobile wire-caged machine, follows a light beam. Inventor Versal Cross holds flashlight



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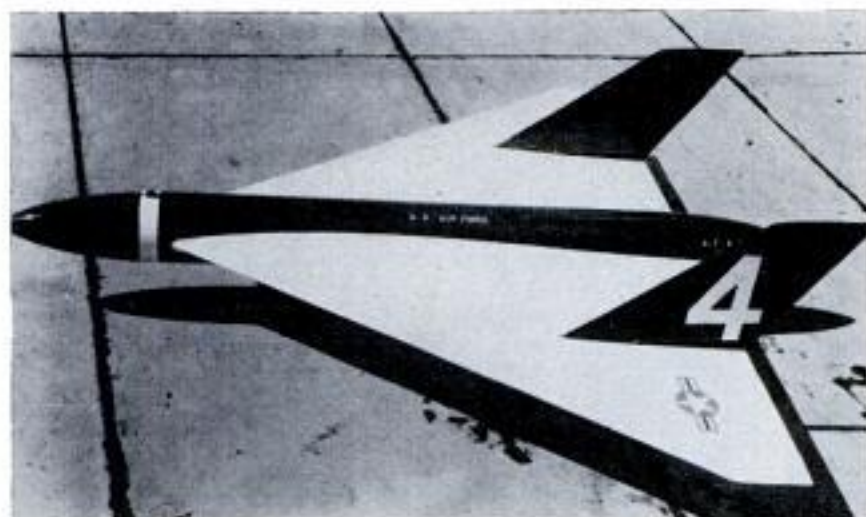


Top left, MIG-19; left, rocket-powered YAK-21; right, odd Double Delta

## Twin Jets and Rockets Power Russian Aircraft

Artists' conceptions of Russian military planes, based on known features of the aircraft, are available for American study. The sleek MIG-19 is an all-weather fighter with swept-back wing and high horizontal stabilizer. It is powered by two side-by-

side turbojet engines, as is the Double Delta, with a rhomboid wing. Resembling a guided missile, with unswept wings and tail structure, is the YAK-21, rocket-powered and capable, like the Double Delta, of extremely fast, almost vertical climb.

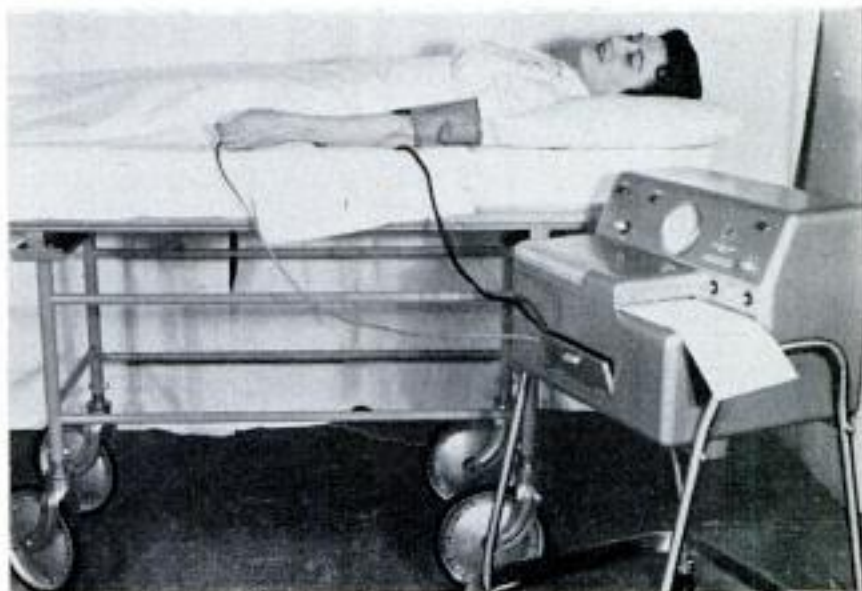


## Tow Target

With its twin vertical stabilizers and modified delta wing, the U. S. Air Force's Del Mar Delta tow target bears a resemblance to the Navy's Cutlass fighter. The Del Mar Delta can be towed at 600 miles per hour, providing high-speed target practice for Air Force pilots and gunners. Like other modern targets, the Delta not only registers hits, but records misses.

## Blood-Pressure Recorder

Blood pressure is recorded automatically at set intervals by an instrument that sounds an alarm if the patient is in danger. Used for post-surgery and cardiac cases, the unit records both diastolic and systolic pressure at selected intervals of 30 seconds to one hour. A buzzer, bell or light system connected to the machine is used to warn the nurse of a dangerous change in the patient's blood pressure.



## WHAT'S NEW FOR



**ROTISSERIE** powered by electric motor fits over a roaster pan or an electric roaster oven, thus can handle a 12-pound turkey or meat 10 inches in diameter. The 1500-watt element provides ample heat to cook rotating meat plus vegetables in pan below  
Westinghouse Electric Corp., Mansfield, Ohio

**TONGS** enable you to reach shelved items without using a stool or stepladder. The wooden, cork-tipped tool can unscrew light bulbs, retrieve lost objects, aid dusting  
Gaymarth, Inc., Chilmark, Mass.



**CLOCK-RADIO-HEAT CONTROL** turns up the heat in the morning, later awakens you with music. At night, a setting on the panel will turn off the radio and the heat after you've retired. The control is part of a package heating system  
General Electric Co., 840 S. Canal St., Chicago 80







**GREASE SEPARATOR** consists of a heat-resistant-glass pitcher into which you pour roast drippings or soup stock. The grease floats on top of the liquid and stays in the pitcher as you press a release button and pour out the greaseless liquid underneath

Jepco, P.O. Box 94-E, Oakland 4, Calif.



**OUTLET STRIP** can be plugged into at any point along its length. Special outlets may be affixed anywhere along the strip by pressing a small lever. The strip ends need for bothersome extension cords

Building Electric Products Co., Electrostrip Division, 7810 Joseph Campau Ave., Detroit 32, Mich.

**CHINA RACK** holds a complete dinnerware service in a compact space. The rubber-coated rack has space for dinner plates, salad plates, saucedishes, cups and saucers. Cup hooks eliminate the need for separate hooks in the cabinet or awkward stacking of cups on shelf

Wooster Rubber Co., Wooster, Ohio



JULY 1955



**TUBE SPRAYER** holds a half gallon of solution in a plastic cylinder. Piston rod projects from its base. To pump it, you press down on the cylinder. A strong spring brings piston back after each stroke

Donaldson Co., Inc., St. Paul 14, Minn.

**FLYTRAP** lures and kills with liquid coating on platformed pylon. Pylon is dipped into container each day to apply fresh dose of poison

Pittsburgh Coke & Chemical Co., 1970 Grant Bldg., Pittsburgh 131, Pa.



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Bell scientist checks test equipment used to bounce microwaves back and forth for 40 miles in metal tubes

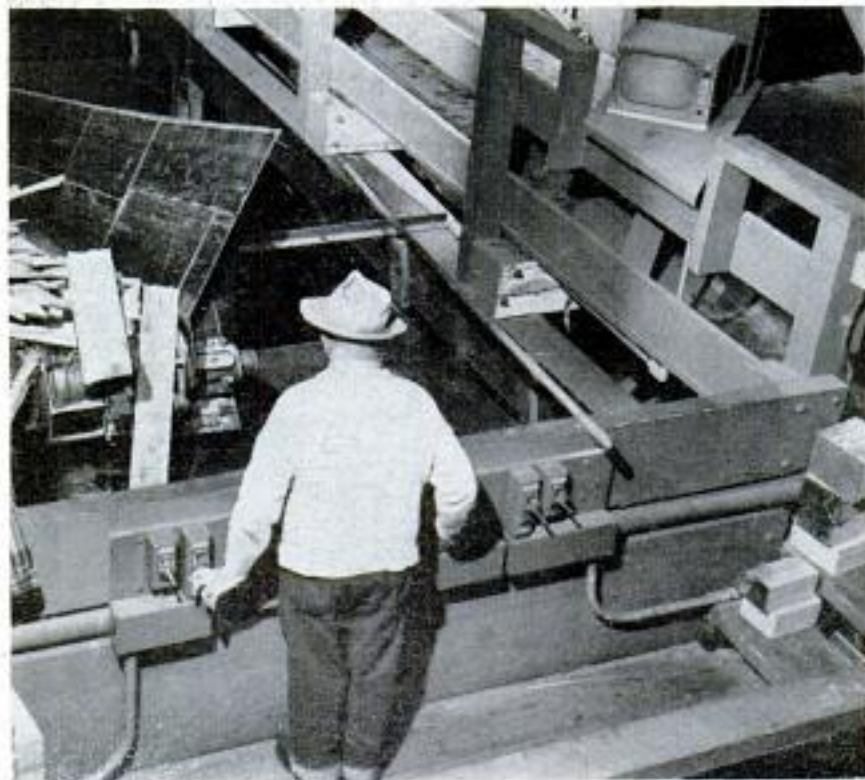


The flexibility of the coiled-wire tubing permits it to be laid over long distances and rough terrain

## Long-Distance Microwave Pipe Carries Many Television Programs

Tens of thousands of cross-country telephone calls along with hundreds of television programs may someday be carried in a single two-inch metal tube. The long-distance wave guide, developed by Bell, could be buried underground and would funnel extremely short microwaves up hill, down dale and around corners. It is constructed of thin copper wire, tightly

coiled like a spring under pressure and wrapped inside a flexible outer coating which holds the wire in place. In laboratory tests, microwaves have been carried for 40 miles in a metal tube with the same loss of strength encountered when the waves travel 12 miles in a coaxial cable. The system uses microwaves shorter than any previously used in communications.



## Closed Circuit TV Speeds Mill Work

Operations in a big Longview, Wash., lumber plant are speeded by closed-circuit television that allows one man to work as if he were in two places at the same time. The controller of two conveyor belts can watch the transfer point of one belt directly from his control spot, and the other, on another floor, through a TV screen. He is able to keep a smoother flow of material from the sawmill to the pulp chippers by switching from one conveyor belt to the other. He also can sort waste materials moving on the conveyors.



## Fire-Fighting Helicopter Hovers Over Downed Aircraft

Helicopters may soon be serving as "fire trucks" of the air. The Piasecki Helicopter Corp. has proposed that fire-fighting kits be installed on the large H-21 helicopters. These airborne fire trucks would be used to fight fires resulting from aircraft accidents. Since most airports are constructed on real estate of low value, the runway approach zones are often wooded or

swampy. Such areas are difficult to reach by ground fire-fighting equipment, but could be reached by helicopter. The helicopter could hover over a downed aircraft, shooting a fire-fighting foam into the blaze. Firemen could be lowered by hoist to rescue personnel trapped in the plane. Such helicopters could also be used to fight fires in towers, in tall buildings and ships.



## Safety Door Opener

One of a series of door-control machines developed by the National Pneumatic Co., Inc., is a pneumatically operated unit. Pulling the cord operates the door-swinging mechanism (see photo at left). Use of air pressure eliminates the danger of an electrical system in risk areas.

## Plants Glow Like Fireflies

Green plants emit light much the same as fireflies. Scientists at the Oak Ridge National Laboratory have discovered that plants emit a faint red light that cannot be seen with the naked eye. They have produced the luminescent substance in the laboratory by combining the extracts of boiled green plants with a chemical from hog kidneys.



Even the Sahara Desert, Siberia and the rainiest of jungles have to look to their laurels when Uncle Sam starts talking weather. Just take that July day in Death Valley when it was 134 degrees in the shade!

# IT'S OFFICIAL . . .

## U. S. WEATHER CAN BE WILD

By Henry White Pierce

**R**ECORD HEAT SEARS MIDWEST"  
... "Snow Causes Worst Traffic Jam  
in City's History" ... "Hurricane Sweeps  
Carolina Coast" ... "18 Dead in Eastern  
Cold Wave."

These and similar headlines are splashed across thousands of front pages each year. But the most widely publicized weather stories are seldom the most severe. The New York snowstorm of Dec. 27, 1947, and the blizzard of '88 both look pretty feeble beside some of the nation's really rugged snowstorms. The heat records set in so many Midwestern cities during the summer of 1954 can't hold a candle to the all-time record for the entire country.

When it comes to rough, tough, knock-down drag-'em-out weather, the United States can give a good account of itself in any quarter of the globe. True, this country doesn't hold too many world records—the Sahara Desert and cold Siberia offer stiff competition. But with the help of its large land area, its high mountains and its extension in latitude, the nation takes top honors in some types of weather and gives the rest of the world a run for its money in others.

The United States is a part of the snowiest continent on earth. It includes the windiest point on earth where records are kept. Its heat record comes within two degrees of the record for the world. And its prairies have a range from summer heat to winter cold that is exceeded only in the vast heartland of central Asia.

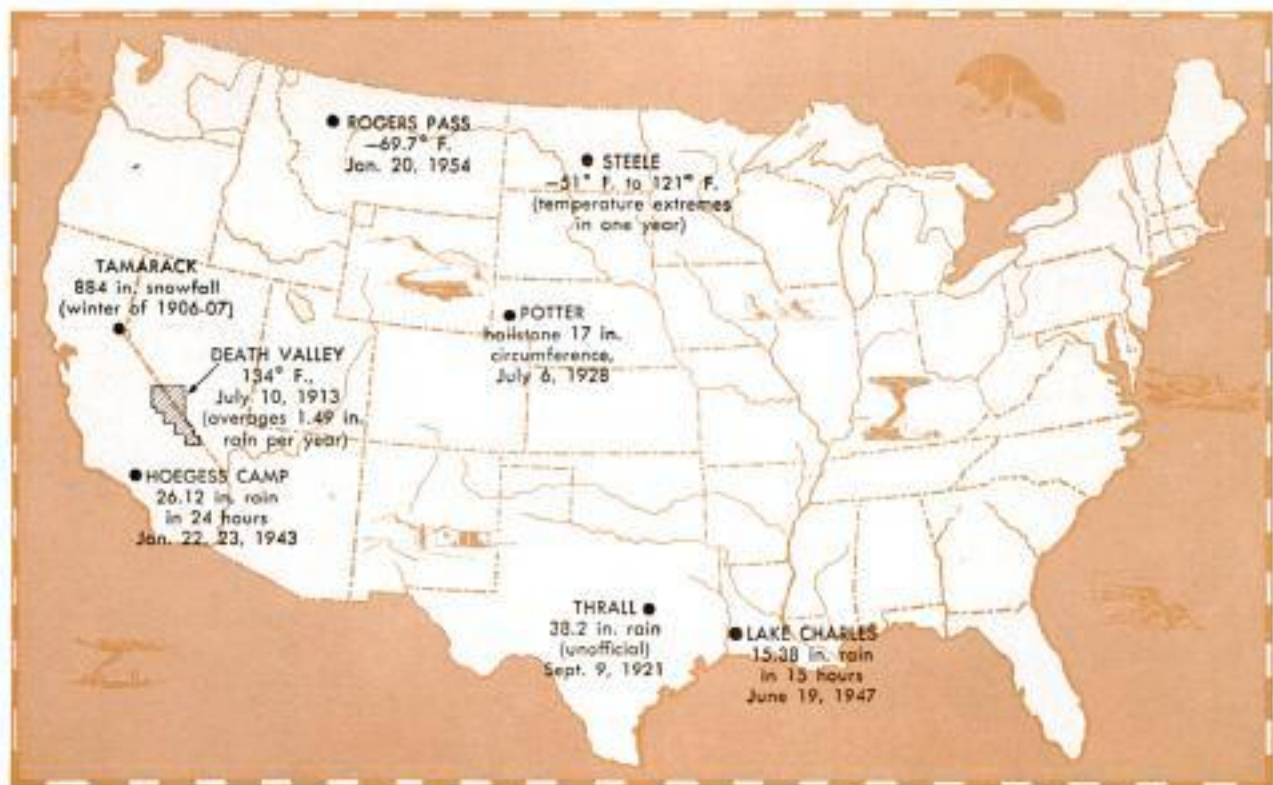
Most record-breaking weather in the United States occurs in lonely mountain and desert regions and in localized sections of the Southeast. That's why the real extremes generally don't get the publicity accorded the nation's more widespread and destructive weather caprices.

Take the weather in remote Death Val-

ley, for instance. Death Valley, located in southeastern California and extending into Nevada, comprises one of the world's hottest deserts. The internationally famous explorer Roy Chapman Andrews has called it the one region of the United States which rivals the Asian deserts in heat and aridity. Rightly so, too. The heat record for Death Valley—also the record for the United States—comes within two degrees of the record for the world. On July 10, 1913, the temperature at Greenland Ranch edged its way up to 134 degrees in the shade! The world's record, held by the Libyan city of Azizia, is 136.

Death Valley also holds the nation's record for dryness. The average annual precipitation at Greenland Ranch, where records have been kept most consistently, is 1.49 inches—less than half as much as New York gets during an average single month! This puts the United States among the major contenders as far as dry weather goes. Even the most withering deserts of the Middle East can't do much better. The average annual precipitation at Cairo is two inches, and when arid Bagdad gets less than four inches it's a dry year indeed.

The United States doesn't do too badly in the heavy-rainfall field, either. The storm which brought seven inches of rain to Chicago during a single day in October 1954 made headlines at points as far apart as Tokyo and London. After all, anything more than an inch of rain in 24 hours is, by Northeastern and Midwestern standards, worthy of newspaper comment. But many southern United States cities have been drenched with more rain than hit Chicago. On June 19, 1947, Lake Charles, La., was visited by a 15.38-inch downpour in 15 hours—as much as many Great Plains cities get in an entire year! The official 24-hour rainfall record for the United States is held by Hoegess Camp, Calif. On January 22 and 23, 1943, Hoegess Camp got 26.12 inches of rain. However, a special survey at Thrall, Tex., on Sept. 9, 1921, showed 38.2



inches of rainfall in 24 hours. This was not official. The world's record: 46 inches at Baguio, Luzon, Philippine Islands, on July 14 and 15, 1911.

The coldest weather in the United States is experienced by persons living in the region of the northern Rockies. The residents of such towns as Fraser, Colo., Big Piney, Wyo. and West Yellowstone, Mont., frequently shiver under the nip of "autumn's" first frost in early August—sometimes even in July. September brings temperatures in the low 20s and January sometimes produces readings of minus 50 and 60.

The official all-time record low temperature for continental United States is a numbing 69.7 degrees below zero recorded at Rogers Pass, Mont., on Jan. 20, 1954 (until last year the record had been 66 below zero, recorded at a ranger station in Yellowstone Park). Compare this with Alaska's record of 78 below recorded at Fort Yukon on Jan. 14, 1934. Then compare it with the official record for the entire world—90 below zero at Verkhoyansk, Siberia, on Feb. 5 and 7, 1892!

The cold record for the United States falls quite a way short of the world's record low. With snow, though, it's another story. Many regions of the United States combine low winter temperatures with high winter precipitation to a degree equaled in few parts of the world. The result: Enough snow accumulates in some mountain areas to bury entire cabins.

Generally speaking, an average annual snowfall of 100 inches is considered heavy.

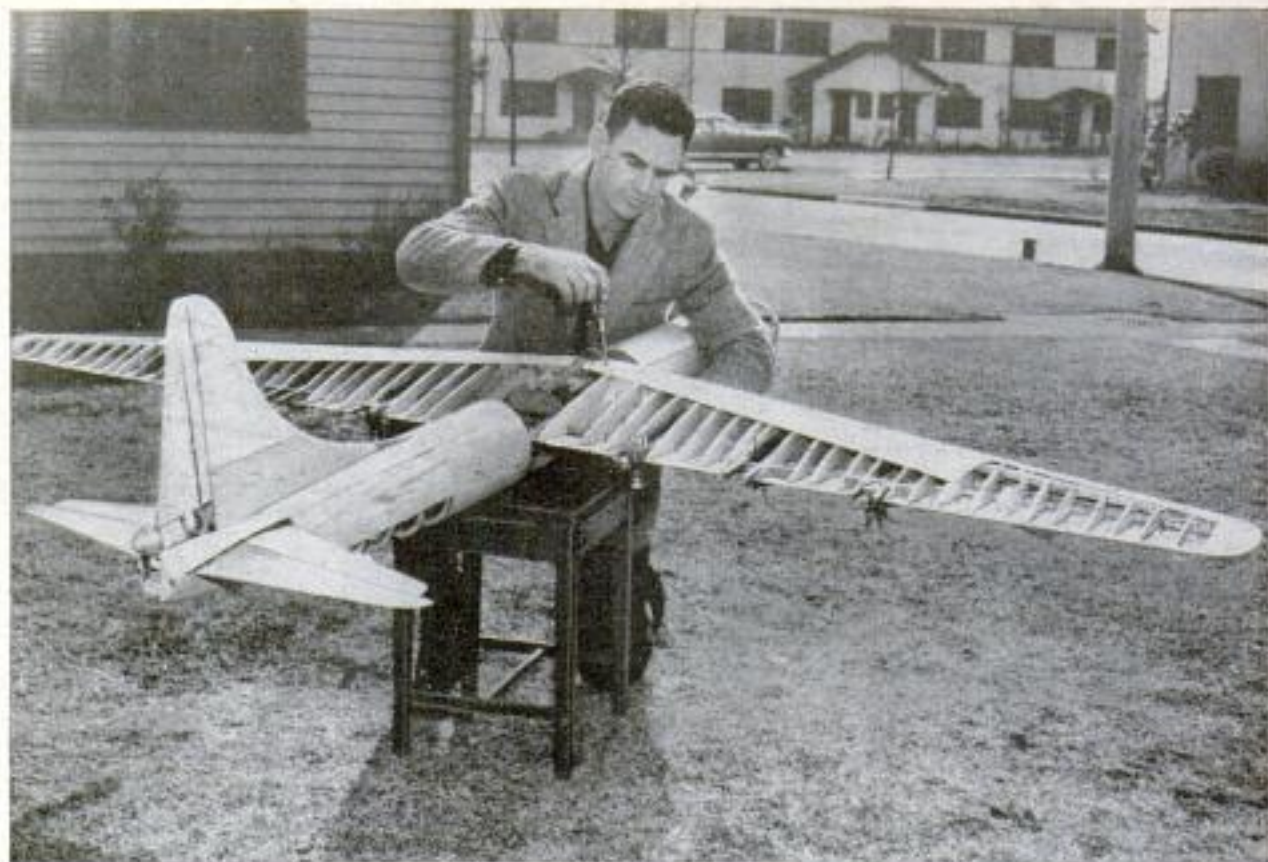
New York gets an average of 37 inches and Chicago gets 36 inches. Buffalo, in the snow belt of the Great Lakes, is buried under 74 inches in an average year.

The snowiest part of the United States is the mountain region of the West Coast. Large sections of the Sierra Nevada and Cascade ranges are frequently blanketed under snow 20 feet deep—and that doesn't include drifts. As might be expected, this region holds the record snowfall for a full year. During the winter of 1906-1907, Tamarack, Calif., was buried under 884 inches—over 73 feet! California also holds the record for short, hard snowstorms—60 inches in one day at Giant Forest.

Perhaps the most distinctive severe-weather feature of the United States—of north-central United States especially—is its capacity to range from extreme summer heat to extreme winter cold. It is one of the few nations on earth where temperatures lower than 50 below zero and higher than 120 have been officially recorded in the same place. Residents of the town of Steele, on the northern North Dakota prairie, have bundled up against a winter minimum of minus 51. And the same people, in this same town, have endured a record high summer temperature of 121 degrees in the shade.

Here's one record the United States probably has all to itself. The largest hailstone ever officially measured and recorded fell at Potter, Neb., on July 6, 1928. The oversize stone weighed a pound and a half and its circumference was an amazing 17 inches!

★ ★ ★



### Scale Model of B-36 Has Nine-Foot Span

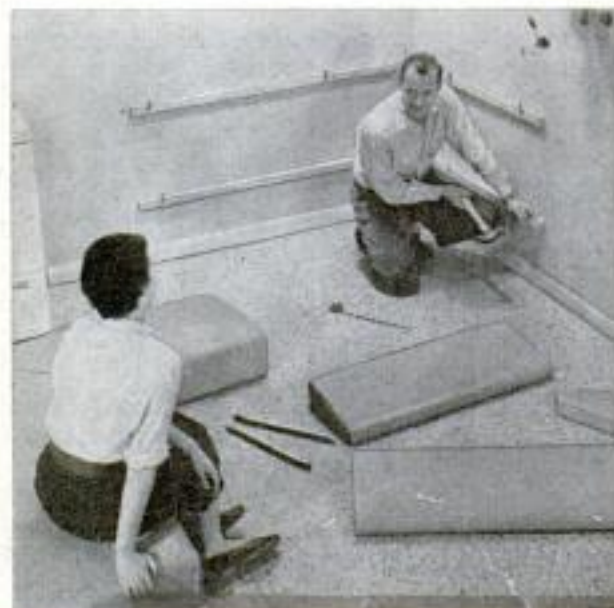
With a nine-foot wingspread and six gasoline engines, Maj. John A. Vanderpoel's scale model of an intercontinental B-36 bomber is a king-size project. Vander-

poel, with the Far East Air Force in Tokyo, has spent more than \$100 on the model. Other dimensions are 77 inches, length, and 26 inches, rudder height.

### Prebuilt Dining Nook Fits Corner of Room

Amateur carpenters have no trouble installing a modern dining nook that fits into a kitchen corner. Horizontal wall strips nailed in place over the studs, together with wrought-iron legs, support the backs and seats. Fabriclike plastic covers

the upholstered cushions, which snap out for cleaning and redecorating. The upholstery wipes clean of most food and liquid stains. A plastic-topped table with wrought-iron base completes the set, which is shipped in knockdown form.



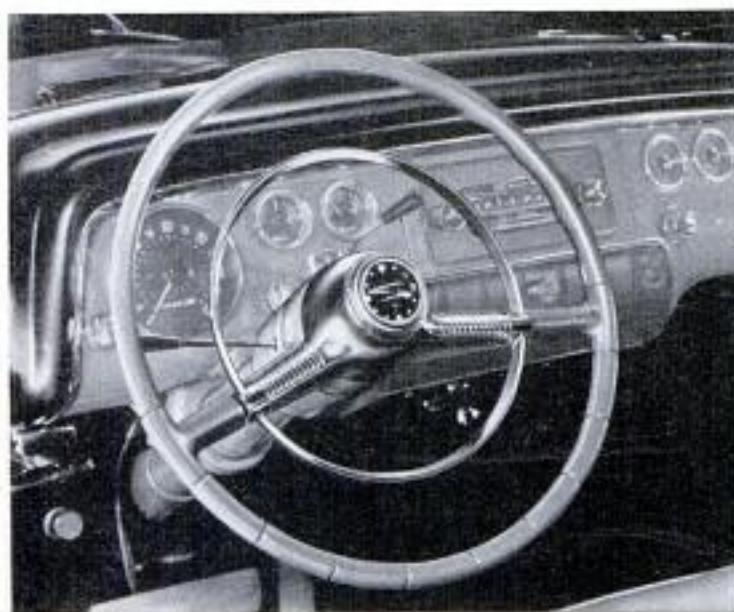
## Dodge's LaFemme Is First Automobile With a Gender—It's Female

If Dodge starts a trend with its LaFemme hardtop, license blanks will require owners to state the sex of their cars! Designed for the woman, LaFemme is truly feminine. Its interior is pink throughout. Mounted on the backs of the front seats are two matched pink leather accessory cases. One contains a pink leather handbag with matching lighter, compact, lipstick and other items. The other holds a pink rainwear outfit, including umbrella, that matches the upholstery. The car has an engine, a transmission and a differential, none of which is pink!



### Self-Winding Car Clock Mounts Inside Horn Ring

Replacing the ornament in the center of the horn ring, a self-winding automobile clock does not use any electricity. Normal rotation of the steering wheel keeps the movement fully wound, although provision for manual winding is provided, if necessary. Because the clock is fully wound all the time, it has excellent accuracy. It cannot be overwound and will run for nine days after a full wind. The dial is illuminated at night. A red arrow on the crystal can be set to keep track of elapsed driving time. The clock is available on 1955 Plymouth cars.



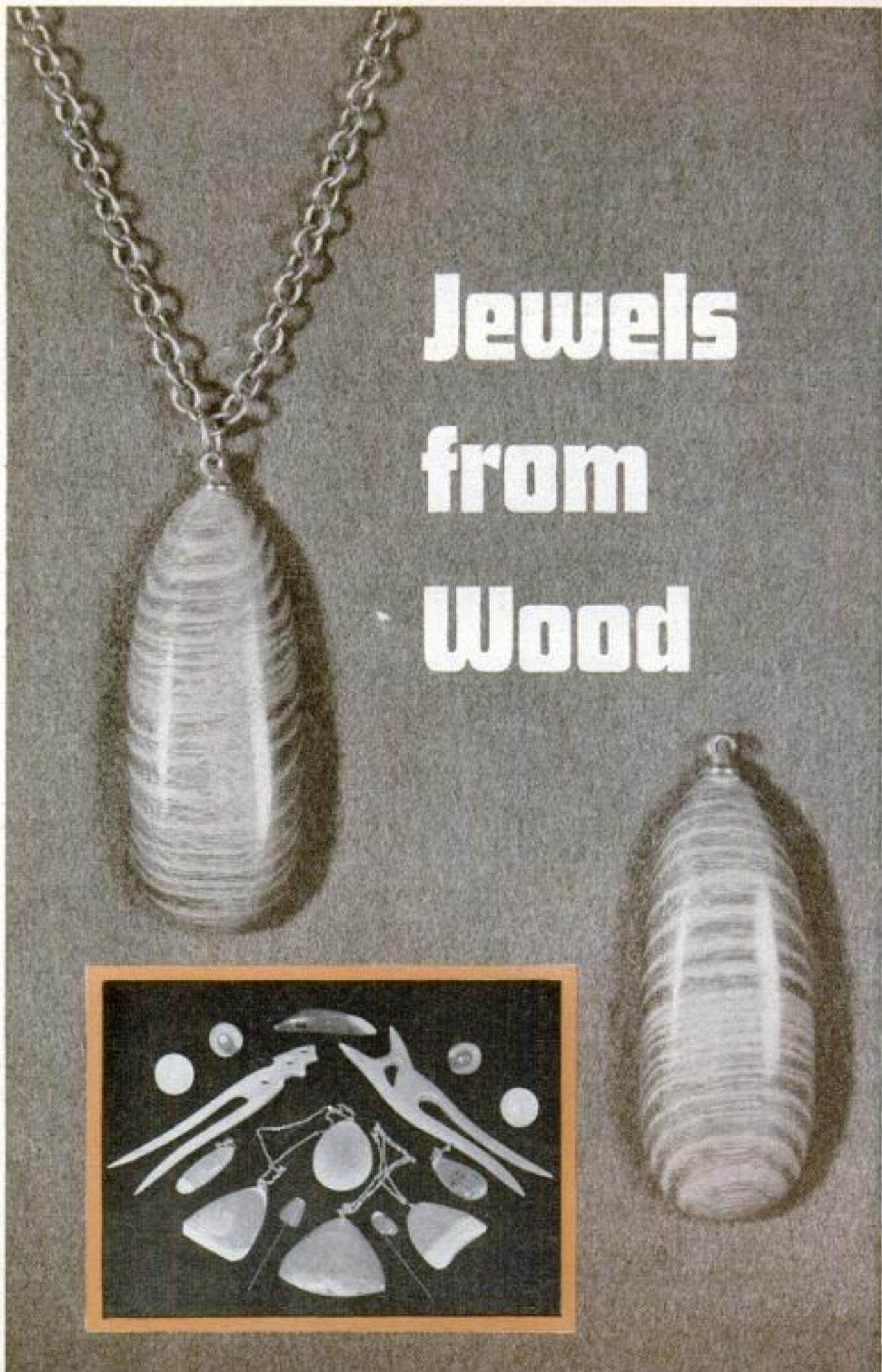
### Performance Computer For Airplanes

Designed for operation by aircraft engineers rather than computer specialists, a new Aerolog performance computer will calculate the rate of climb, speed, lift coefficients and climb angles of any airplane, according to its manufacturer, Link Aviation, Inc., of Binghamton, N. Y. The computer is of self-contained console design, so that it can be moved to engineering office or laboratory. A unique feature of its operation is that it can be changed from one problem to another and back again in a matter of minutes without "forgetting" the essentials.

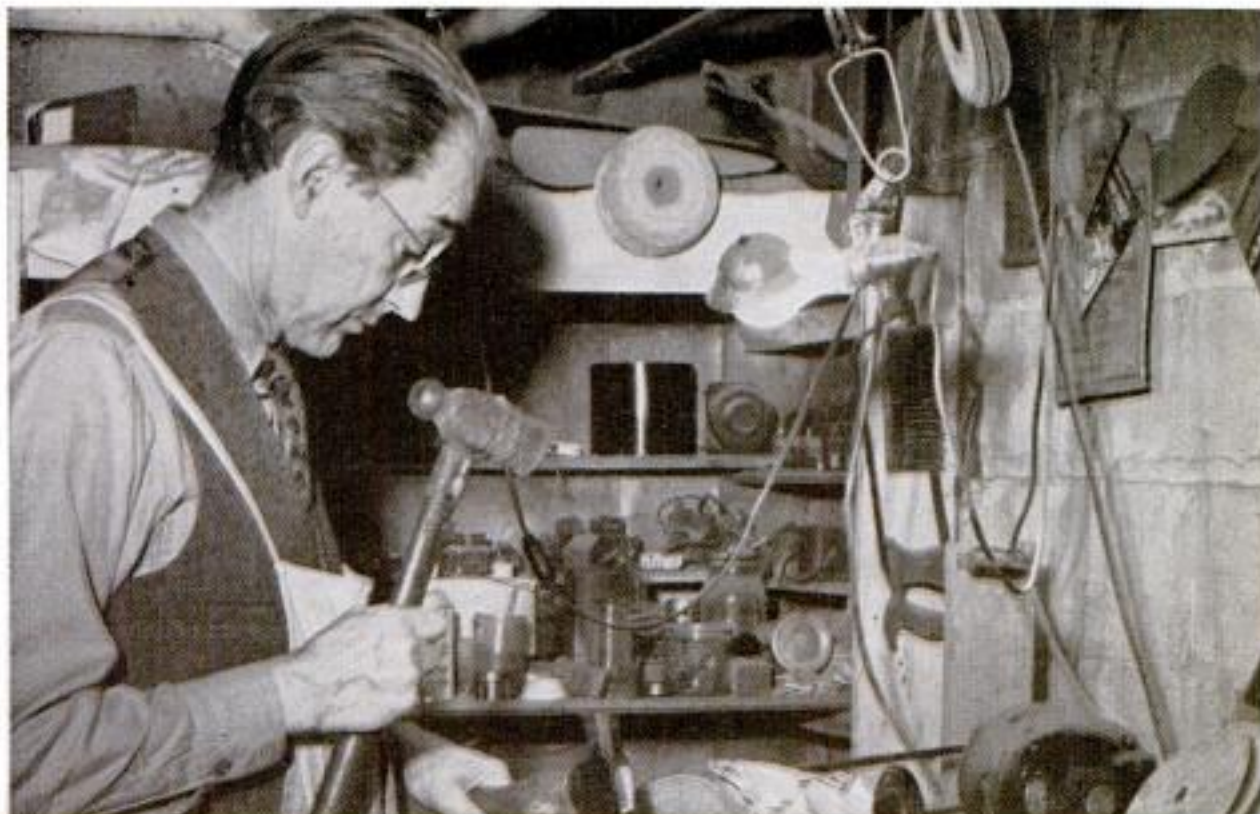
☛ There are about 450 volcanoes in the world today.



# Jewels from Wood







Hobbyist Arthur S. Gray at work in his basement. Samples of his wooden jewels are shown on the facing page

**WHEN CARPENTERS** By **Walter E. Burton** into unusual shapes. He tried a few ribbed or notched handles. Then he began smoothing the ribs into rounded segments to see the effect.

chopped a doorway in the wall of an old building in Ohio a few years ago, they put Arthur S. Gray on the track of a new hobby—making wooden jewels.

The whole sequence started when an Osage-orange tree stood right in front of the new entrance. So down it had to come. Gray, an inveterate hobbyist, collector and craftsman, knew that the Osage-orange wood was almost as hard, tough and flexible as tempered steel. When he saw the workmen hauling the tree away to be burned, he offered to take it off their hands. He hauled it home, cut it up and stacked the pieces away to season. Today, it is the basic raw material for his hobby of making gems of wood.

The wood is a beautiful yellow color. It is very hard, yet not so dense as some other hardwoods. It splits easily and must be worked with care. It will hold an edge or a point better than bamboo or almost any other nonmetal.

As the strips of Osage wood seasoned in Gray's basement, end cracks developed. By splitting the strips along the cracks, Gray discovered a source of graceful letter openers. He made all sizes and shapes, over 200 of them with no two alike.

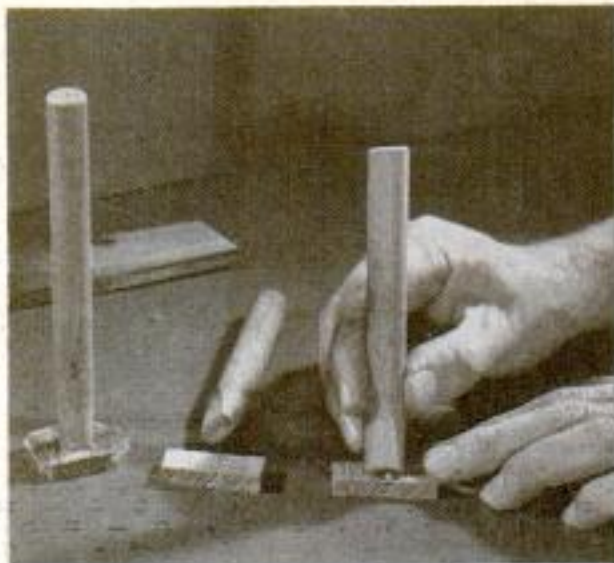
At this point, he thought he had just about exhausted the uses of his cache of Osage wood. But, like any hobbyist, he decided to experiment. He began to fashion the handles of the wooden letter openers

The transformation was startling. Each of the rounded, domelike segments shimmered like a gem. The grain structure of the wood displayed an iridescence that made it look more like a semi-precious stone than wood.

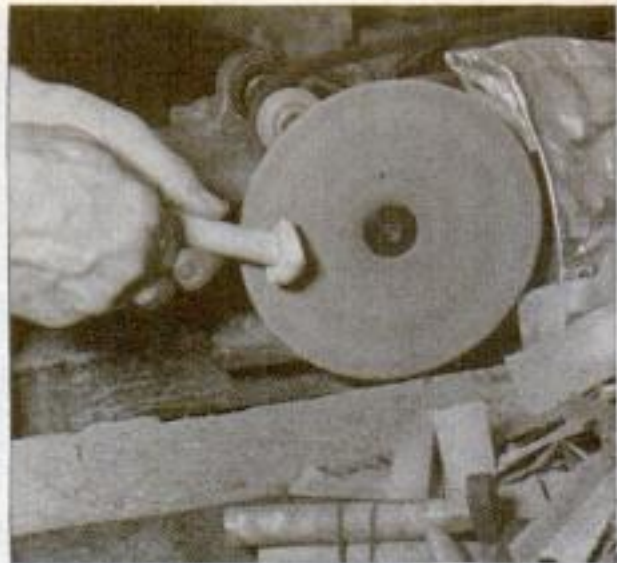
Here, Gray knew, was a whole new field for his hobby activities. He would turn this beautiful wood into jewels.

He began to experiment with buttons, pendants and other forms. He had to work out much of the new art step by step, for he could find few references to guide him—no accounts of how others may have made wood jewels. He had to discover that a pendant for an earring or a necklace should be cut with the grain running crosswise in order to produce the best effect. Through trial and error, he worked out a method of producing a glasslike polish on his wood jewels. A chemist friend helped by preparing a silicone-wax mixture to produce the final luster.

Gray studies each piece carefully to determine its jewel possibilities. Often he has to rummage through hundreds of scraps before he comes across a piece suitable for the project he has in mind. Then he must determine, almost as carefully as a diamond cutter, the best way of cutting the piece into jewel blanks. To produce the



After carefully selecting the grain formation that he wants, Gray glues the wooden blanks onto handles



Second step is grinding the blanks roughly to shape on the disk sander. Osage-orange wood is very hard



Third, Gray clamps the handle in a vise and works the blank into the desired form with abrasive cloth

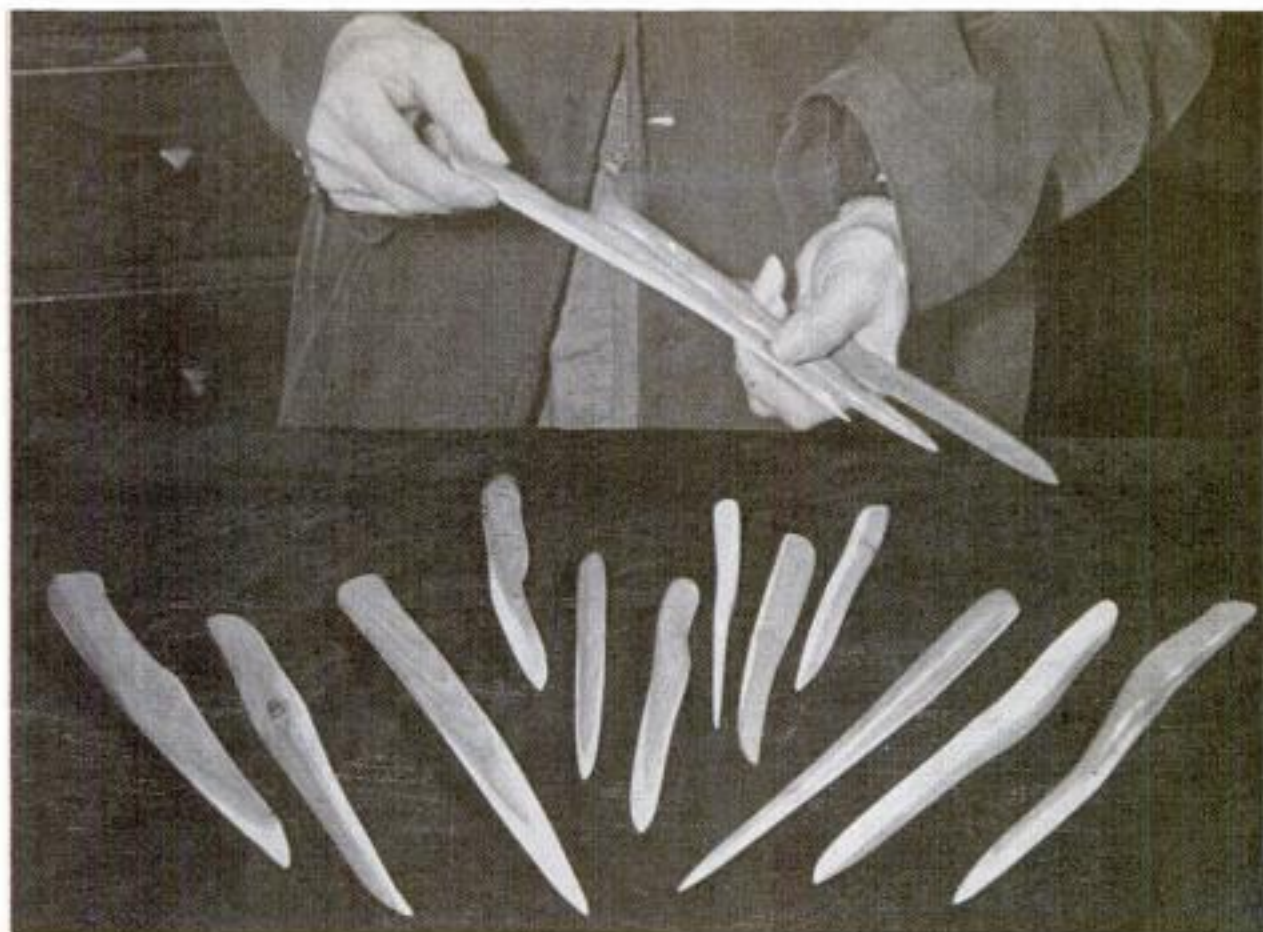


Fourth, using another piece of Osage-orange wood, he burnishes the surface until it becomes glasslike

Fifth, after burnishing, the wood is dipped in the clear lacquer, below. Later, it is polished with wax

Sixth, the final step is attaching the pin or clip. Here, Gray is inserting the tip ring in a pendant





First products of Gray's work with Osage wood were scores of letter openers, such as these shown here

best effect, the grain must run in just a certain way. For instance, in two teardrop pendants, both having the grain crosswise, the laminations (annual rings) forming the pattern may slope downward in one, upward in the other and there will be a considerable difference in the brilliance of the two jewels.

Processing consists of converting the wood blank into a shape that usually is convex on the side that will be in view. The surface must be flawlessly smooth. Sometimes, the piece is worked so the end grain forms the main pattern. Round and oval buttons, teardrops and modified triangles are among the shapes Gray has found most suitable for cuff links, earrings, necklace pendants, stickpins and brooches. He has developed some interesting hair ornaments in free-form and other modern shapes.

In his basement shop he has wood, ranging from tiny blocks to sizable boards and sections of tree limbs and trunks, stored everywhere. His wood-seasoning chamber is stocked with pieces in various stages of drying. To determine whether a particular specimen has seasoned thoroughly, he simply smells it!

"When you no longer can detect the sap odor, the wood is ready to use," he explains.

Besides using Osage, Gray makes wood

jewels from such woods as buckeye, white maple, red ivory, cocobolo, ebony and ironwood. Most costly of these is the rare red ivory from Africa. It costs around \$30 a pound and because it is very dense, a pound does not contain very many cubic inches. Many softwoods produce jewels as beautiful as hard types. Some favorite cabinet woods, such as walnut, are failures as jewel material.

Gray is a purist in the making of wood jewels. He uses no stain on them. There are no glued joints. He selects the blanks so there will be no cracks or other flaws. The finish looks flawless. The making of a typical jewel, say a round button or a teardrop piece for a cuff link or earring, goes something like this:

From a piece of wood that he has carefully selected for grain pattern and freedom from cracks and other blemishes, he splits a block. With a handsaw in a miter box, he cuts it to length and usually works it further to form a blank that remotely resembles the finished jewel in shape. He flattens the surface that is to become the back of the jewel and glues to this surface the end of a handle made from a length of wooden dowel or a similar stick.

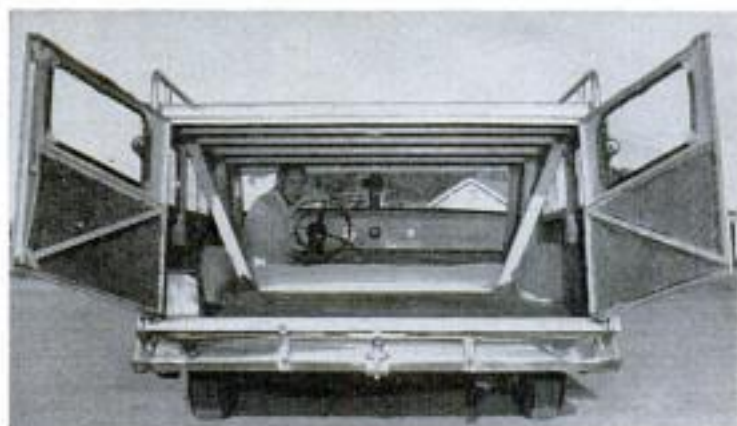
After the glue has set, Gray grinds the jewel roughly to shape on a disk sander.

(Continued to page 212)



### Custom Station Wagon Carries Tons Atop Roof

Loads of two tons or more can be hauled atop a special station wagon built by J. D. Peters of Chula Vista, Calif. The roof is only 54 inches above the road, just the right height for transferring cargo from a loading dock or highway-truck bed. Peters assembled the wagon from a Cadillac chassis, Crosley doors and side panels, Chevrolet fenders, Plymouth taillights and some additional sheet metal. The roof is heavy steel deck plate supported by strong steel box columns that



attach to the frame. The interior is 80 inches wide and the car has 120 square feet of useful floor space inside and out.

### Handle Turns Reflector to Adjust Floodlight on Building



You can direct light where you want it with an adjustable floodlight that fastens to the side of a building. A handle at the base of the eight-foot standard allows the reflector and its 200-watt bulb to be moved up, down, right or left. The floodlight is designed for use by railroads, on farms, in back yards, in camps and on construction projects.

Waste brown mud left over after the extraction of alumina from bauxite ore has been found to contain 47 percent lime, a promising new and economical source of agricultural lime.



# KEEPING UP WITH THE ATOM



**T**HE first atom smasher using the new method of "strong focusing" is now in operation at Cornell University (see photo). The electron synchrotron accelerates atomic particles by spinning them around a circular path, and strong focusing, by keeping the particles on a narrower path, produces much higher energy. The new machine has been operated at 575,000,000 electron volts and is designed to reach 1,500,000,000.

☆☆☆

Dwindling oil and gas resources will put atomic energy in a place of vital importance by the end of this century. The "squeeze" on oil and gas fuels will begin to be felt by 1975, and our primary power source will be fluid fuels from coal in the last decades of the century, according to Dr. Lawrence R. Hafstad, physicist on the staff of the Chase Manhattan Bank of New York, who was the first director of the Reactor Development Division of the Atomic Energy Commission.

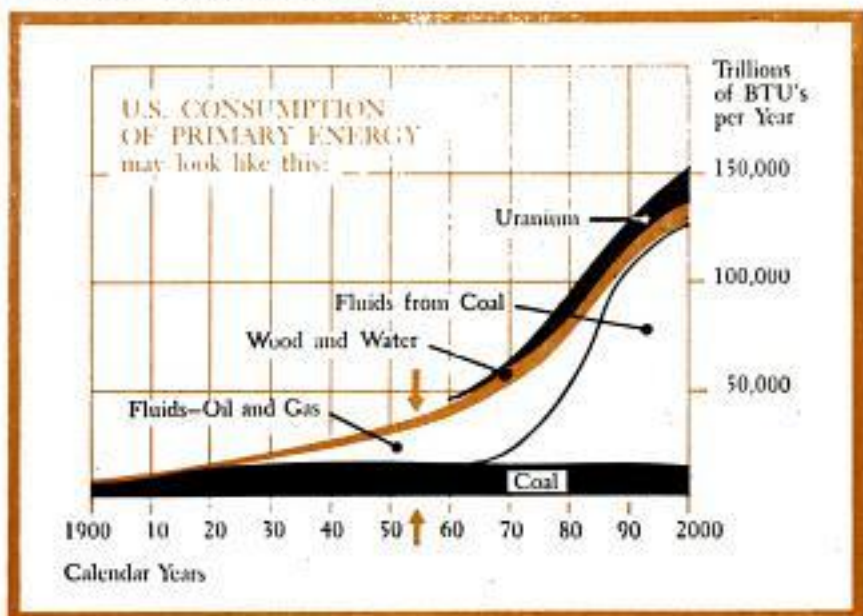
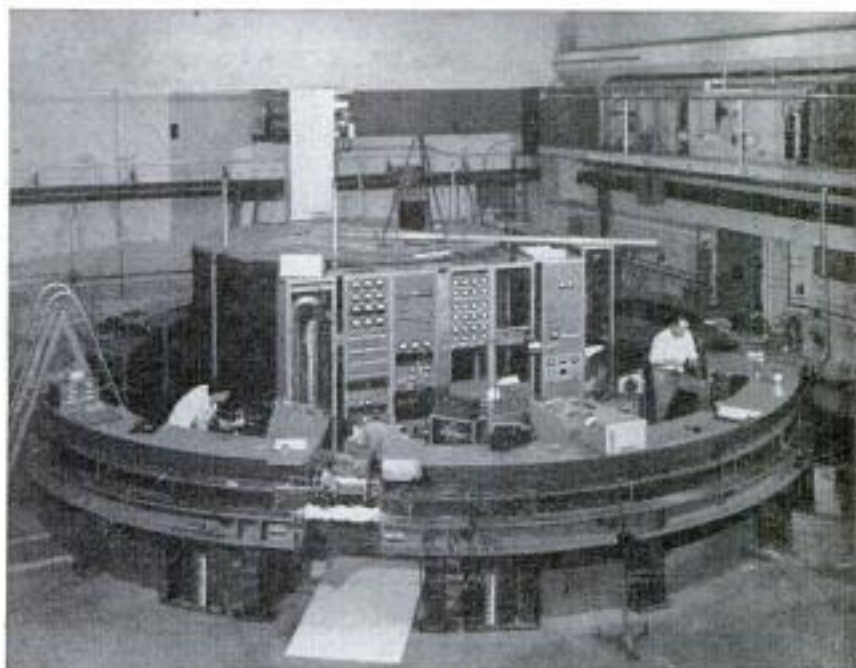
Doctor Hafstad's chart shows the energy demand in the United States from 1900 to the year 2000.

"The portion that runs up to about 1953 is past history," he says. "From 1953 to about 1975 are extrapolations by the government agency which has been studying our fuel reserves. I have attempted further linear interpolation up to the year 2000." The chart shows that the amount of energy consumed in the form of coal has remained almost constant, and that power derived from water and wood have been insignificant.

"The really important increase," says Doctor Hafstad, "has been in the fluid fuels, oil and gas. But since we consume these in our oil burners, our automobiles, trucks, airplanes and so on, unfortunately it is in the fluid fuels that this nation will first run out of energy. By 1975, or sometime thereabouts, the long-awaited squeeze on fluid fuels is likely to make itself felt. At that point, it is almost certain that we will have to convert coal into a fluid fuel.

"In one pound of fissionable uranium there is as much energy as in 2,600,000 pounds of coal. There is at present at least 20 times as much energy in known reserves of uranium and thorium

(Continued to page 216)





Hunting party uses several trams on Chicle Road to penetrate the heart of game-crowded Yucatan jungle



"Engineer" readies his "locomotive" for jungle run. Below, hunter rides back to Puerto Morelos after downing a pheasant



## Mule-Car Railroad Penetrates Jungle

THERE IS NO other railroad in the world quite like a 25-mile, 20-inch line in the territory of Quintana Roo, Mexico. It extends from the decaying village of Leona Vicario, deep in the Yucatan jungle, to Puerto Morelos, a cove on the Caribbean Sea. Chicle workers in the jungle village depend upon it as a link with the outside world.

The road was built nearly 50 years ago by an Englishman who hoped to cash in on the rising demand for chewing gum. He established a settlement and imported rails with which he built a line to the sea. Then he brought in several little tram cars and a dozen small Spanish mules to pull them. But his chicle-producing project collapsed, he died, and jungle choked the little right-of-way. The line was restored when the Mexican government persuaded the local chicle workers to organize a cooperative. Chicle camps were built along the railroad, and trotting mules pulled the little trams to transport chicle, men and supplies through the jungle. Now anyone can use the road, including American hunters after jaguars, lions and wild fowl.

## Grooved Tape Recording Plays for Eight Hours

**YOU CAN ENJOY** eight hours of uninterrupted music with a record player that combines features of disk and tape.

The recording itself is on vinyl tape. However, the sound is engraved in grooves as on disk records rather than magnetically.

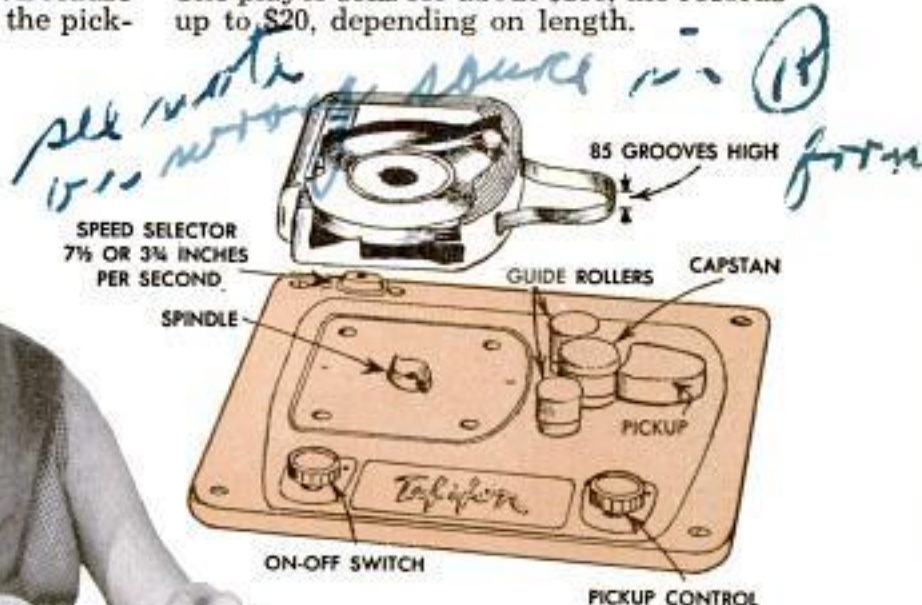
Protected from dirt and handling inside a plastic case that looks like a fat book, the tape uses the continuous-play system. It never needs rewinding. As it unwinds from the outside of the reel, the tape winds back on the inside automatically.

The sound track is about 85 grooves high, forming a band about 1/2 inch wide. Because the sound track always goes past the pick-

up stylus in a straight line there is no tracking error.

To play the tape, you place a Sound Book, as the recording is called, over the spindle as you would a disk record. Then you pull out a short section of tape and slip it over the playing wheel or capstan. The recording is ready to play, the pickup stylus moving into the first groove automatically. A footage scale lets you select any passage you wish.

Because the tapes are pressed, they are cheaper than magnetic-tape recordings. The player sells for about \$100, the records up to \$20, depending on length.



Now on sale in this country, the unusual grooved-tape record player was invented in Germany. Forty different Sound Books (like those below) are now available



# STUDENT SET NO. 2 OPERATES SPEAKER

By Jay Stanley

## MATERIAL LIST

A material list for Set No. 1 (described in *PM*, May 1955) will be mailed if you send a self-addressed and stamped envelope to Radio Department, *Popular Mechanics*, 200 East Ontario St., Chicago 11, Ill. A blueprint of Set No. 1 is available for 40 cents. No blueprint or material list is available for Set No. 2, described here. The following parts are all you need to convert Set No. 1 into Set No. 2:

- One 6AQ5 tube; one 7-pin mica tube socket
- Four 5-prong rim-type coil forms 1113B
- One 62G093 Knight standard output transformer 8000-3.5 ohm (T4)
- Two red knobs
- One 4-inch GE 400D speaker
- Two audio transformers 1:3 step-up (T2 and T3)
- One vernier-drive dial, National type K
- One 250-ohm 1-watt resistor (R10)
- One volume control .5 meg. (R11)
- One electrolytic capacitor 5 mfd., 25 v., Sprague TVA 1203 (C13)
- One tubular capacitor .01 mfd., 400 v., C-D 4S1 (C14)

IN THE MAY ISSUE we explained how to build Student Set No. 1—an excellent performer that tunes standard-broadcast stations with plenty of earphone volume.

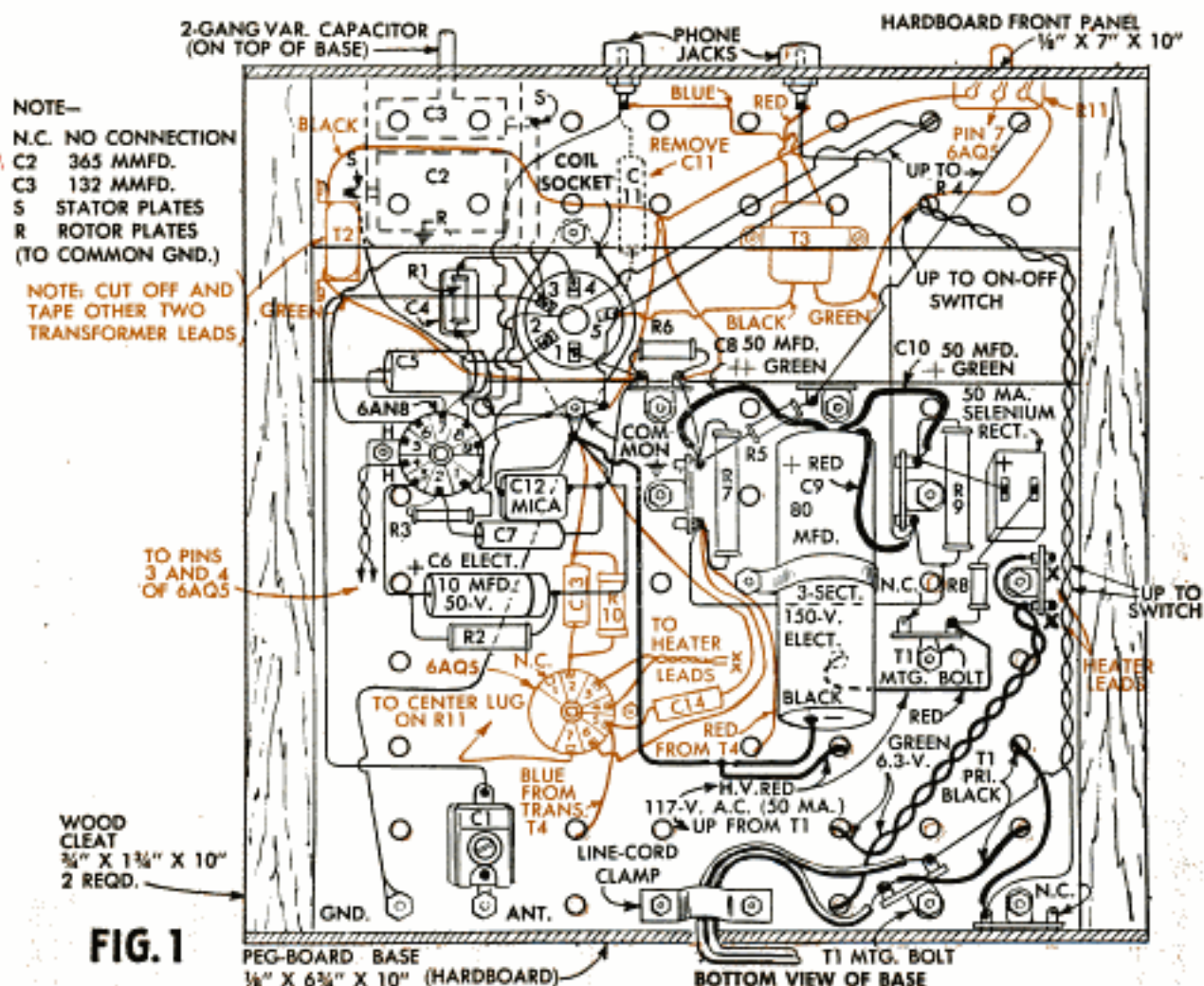
This month we add a few parts to the May set and convert it for tuning short-wave bands down to about 15 meters with loudspeaker convenience. No drastic changes need be made in the original set.

With these additions you can receive amateurs, foreign stations, aircraft and ships, plus other short-wave broadcasts.

A high-gain transformer-coupled audio output stage is added to provide the extra power needed to operate the loudspeaker. This stage uses a 6AQ5 beam power tube. It boosts the signal so much that a volume control is added to avoid excessive volume on the broadcast-band signals and on some short-wave signals as well.

When you add the new parts, follow the layout closely. Otherwise, hum troubles may result. Transformer T3 should be lo-

Colored ink is used in the diagrams to identify the parts and data needed to convert Set No. 1 to Set No. 2





# AND TUNES SHORT-WAVE BANDS

cated as shown. If it is moved across the chassis close to the 110-volt line or the heater leads, there may be excessive hum pickup.

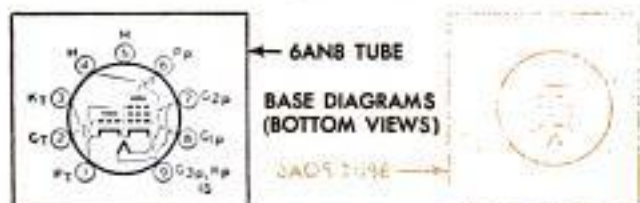
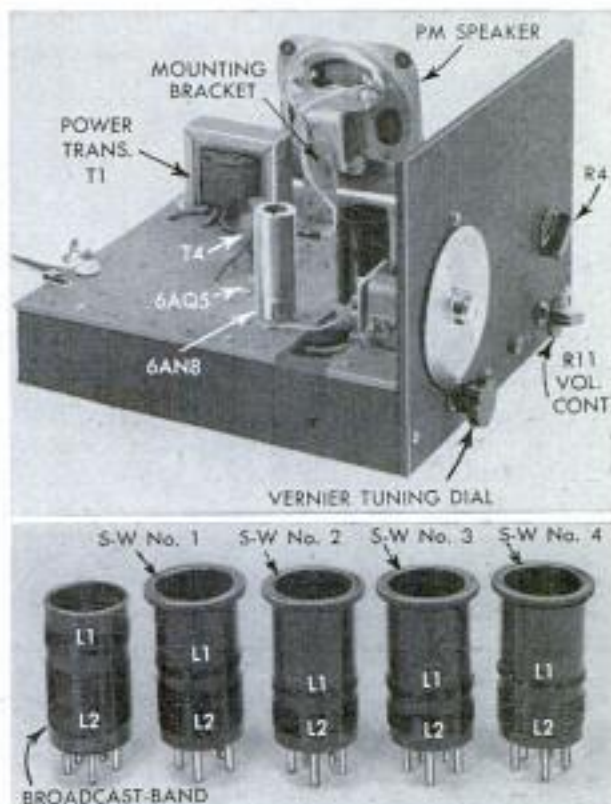
The speaker location is fairly critical. Don't mount it on the front panel. To do so may introduce "microphonics," caused by vibrations from the speaker reaching the detector tube.

Wiring the amplifier unit is simple and straightforward. Be careful to make correct connections at tube socket and transformers.

On the schematic (Fig. 2) and the pictorial (Fig. 1) diagrams, parts added for the second set are shown in color. Parts retained from the first set are in black.

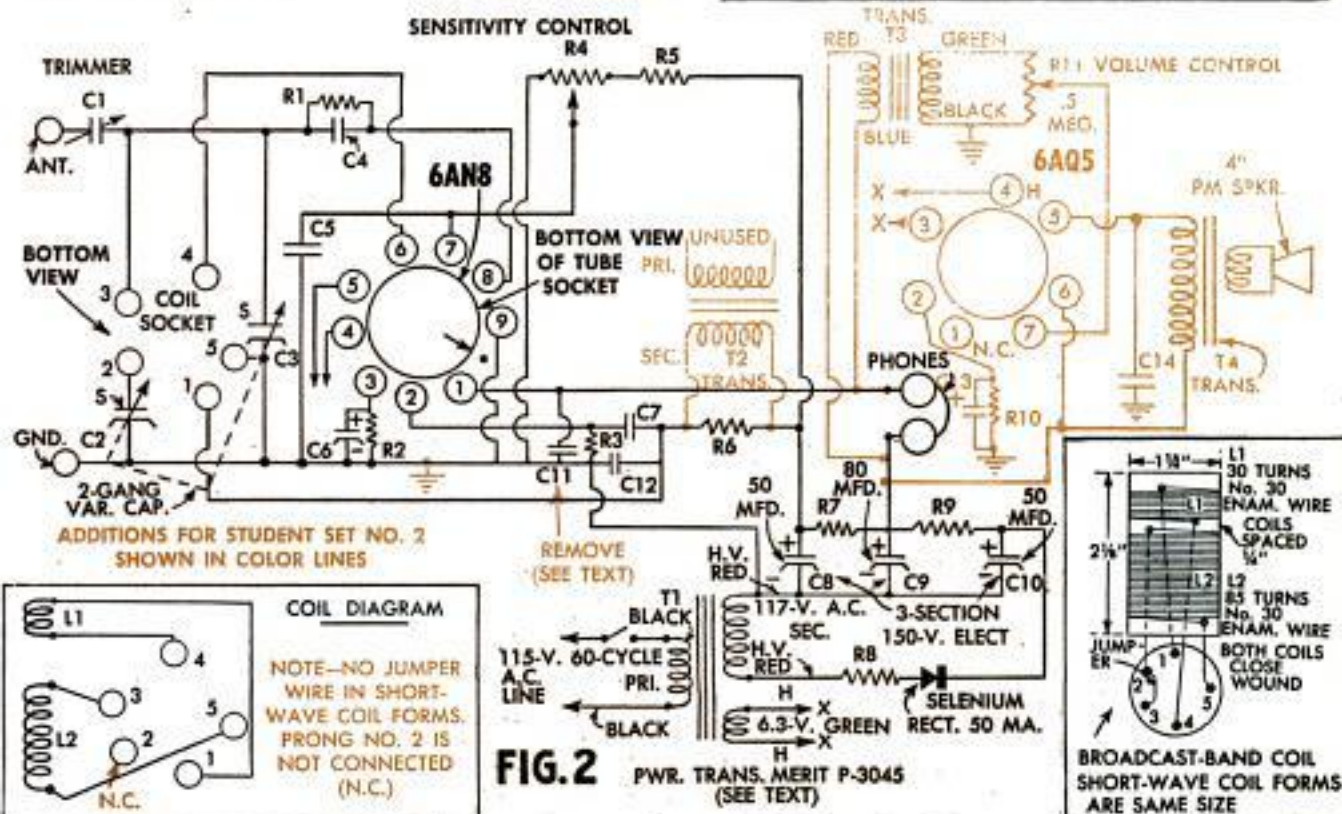
The coil from Set No. 1 covers the broadcast band. The added short-wave coils are similar except that the jumper inside the forms is omitted.

This is done so that in short-wave tuning only the smaller section (C3) of the two-gang capacitor is connected into the circuit. The reason is that short-wave signals tune more sharply than broadcast-band

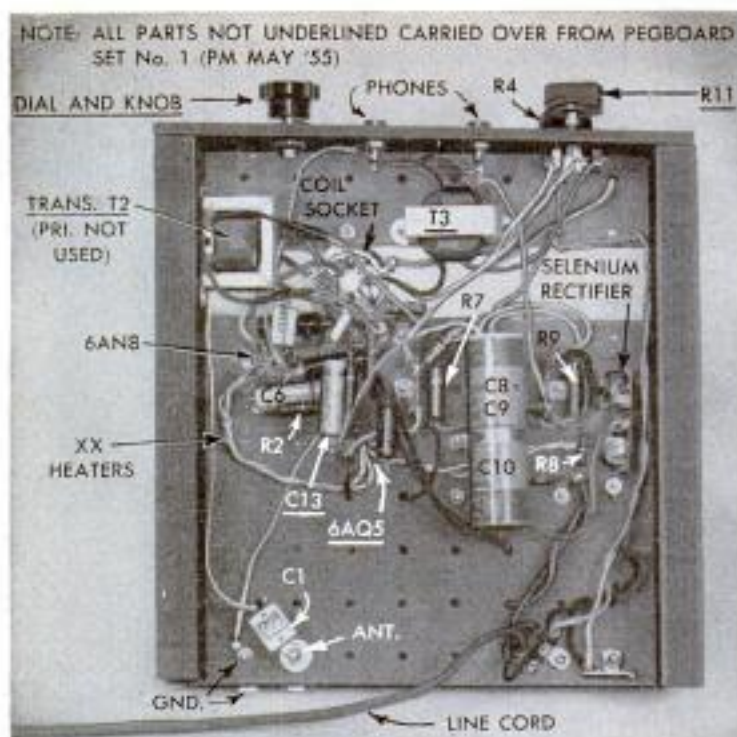


COIL CHART			
	L2	L1	Wire
Broadcast	85 turns	30 turns	#30 enameled close-wound
S-W No. 1	36½ turns	7½ turns	#26 enameled close-wound
S-W No. 2	19½ turns	5½ turns	#22 enameled close-wound
S-W No. 3	9½ turns	4 turns	#22 enameled close-wound
S-W No. 4	5½ turns	3 turns	#22 enameled spaced out

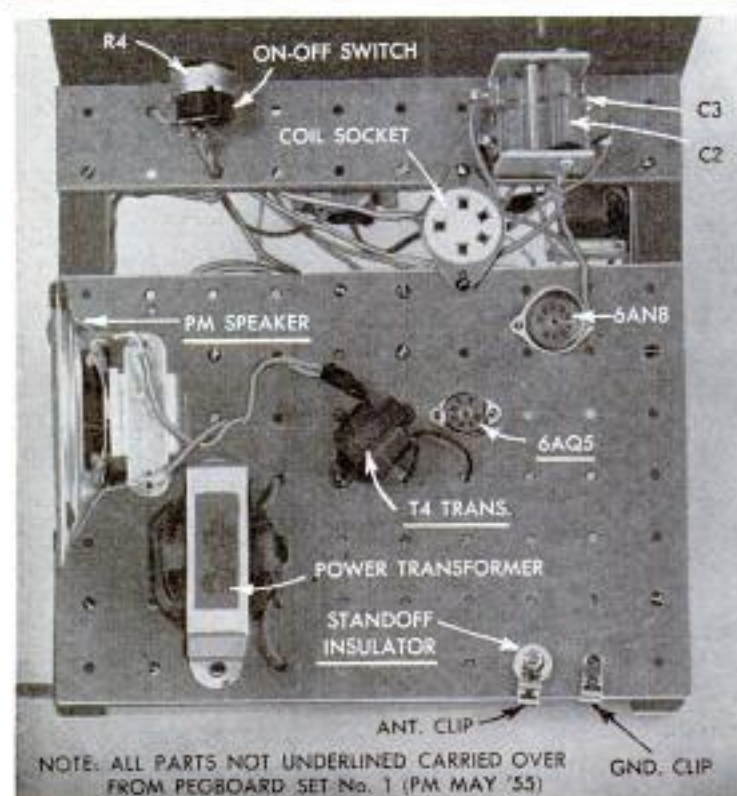
NOTE—L1 and L2 are all spaced ¼" to 1 in. on form



**FIG. 2** PWR. TRANS. MERIT P-3045 (SEE TEXT)



CAPACITORS	
C1	= 40-80 mmfd. trimmer (mica-type ceramic base)
C2 & C3	= 2-section superbet-type tuning capacitor. C2 = 305 mmfd.; C3 = 132 mmfd.
C4	= .0001 mfd. mica fixed capacitor
C5	= .05 mfd. 400-V. tubular paper type
C6	= 10 mfd. 50-V. electrolytic
C7	= .01 mfd. 600-V. tubular paper
C8, C9 & C10	= 3-section elect. 150-V. C8 = 50 mfd.; C9 = 80 mfd.; C10 = 50 mfd.
C11	= .01 mfd. 600-V. tubular paper
C12	= .00025 mfd. mica type
C13	= 5 mfd. 25-V. electrolytic
C14	= .01 mfd. paper fixed capacitor
RESISTORS	
R1	= 470,000-ohms, 1/2-watt carbon
R2	= 2700-ohms, 2-watt carbon
R3	= 470,000-ohms, 1/2-watt carbon
R4	= 0-25,000-ohm vol. control with switch (Mallory U29 midget linear taper)
R5	= 100,000-ohms, 1/2-watt carbon
R6	= 270,000-ohms, 1/2-watt carbon
R7 & R9	= 1000-ohms, 1-watt carbon
R8	= 22-ohms, 1-watt carbon
R10	= 250 ohms, 1-watt carbon
R11	= .5 meg. volume control



signals. Prong 2 in the short-wave coils is not connected. The top coil turnings on L2 go directly to prong 3 as shown at the lower left-hand corner of Fig. 2.

Sharp tuning of short-wave signals makes a vernier tuning dial necessary. The one in the set is a National type K, an inexpensive but good vernier dial. However, it is difficult to mount. There are two dials which are easier to mount and align although more expensive. These are the National type A (0-100 rotation) and the Millen type 10039. The beginner may prefer to use one of these.

Regeneration control is trickier on short wave, so T2 is added across the detector plate resistor. This transformer (the secondary winding of a standard audio transformer) raises the plate voltage on the detector-tube stage and provides a more favorable ratio between that and the screen voltage, increasing gain and making control smoother.

Capacitor C11 may not be needed in Set No. 2. It should be taken out if experiment shows that removing it makes no difference in reception. However, get the set working first with C11 in.

Poor insulation can cause considerable signal loss on short wave. Loss is minimized by mounting the trimmer condenser and antenna lead-in on a small standoff insulator as shown in photos on this page.

Local broadcasting stations can be picked up with a 10-foot length of wire as an antenna. A short antenna is preferred because it increases selectivity on broadcast band. For short-wave stations, an outside antenna is needed, especially for DX reception. An L-shape antenna of about 60 feet of wire works well. If you have more space, the longer the better.

If dead spots are experienced in some parts of the bands, "loosen" the antenna coupling by opening up the trimmer condenser C1. On the highest frequency bands (particularly with coil 4) some tunable hum may be apparent over part of the tuning range. This is usually caused by antenna length and its closeness to other objects. You can often eliminate it by changing the length and location of the antenna. Be certain you use a good ground. It, too, helps reduce hum. ★ ★ ★

# the POPULAR MECHANICS CRAFTSMAN



Above, bright sun on snow as shown in this shot of the Grand Canyon produces excessive light reflection and normal exposure must be varied accordingly. Below, natives in foreign countries provide good subject material when shooting with color, especially if you can get them to pose in colorful dress

## LOAD UP with COLOR

VACATION TIME means camera time. Together they mean time for color film, for there's no better way of capturing the beauty and grandeur of a scenic vacation trip than with color film.

There are no secrets to taking good vacation pictures, although few really good pictures just happen. Essentially it's a case of knowing your camera, using your imagination and planning each shot. Composition-wise, your pictures should always tell a story and the best way to do this is to include people, trees, buildings and local points of interest. These serve as important





Left, fishing boats in foreground in Monterey Harbor provide focal point and improve composition. Below, off-center vantage point always makes a more interesting picture than dead-center, as seen by this carriage shot taken at Mackinac Island



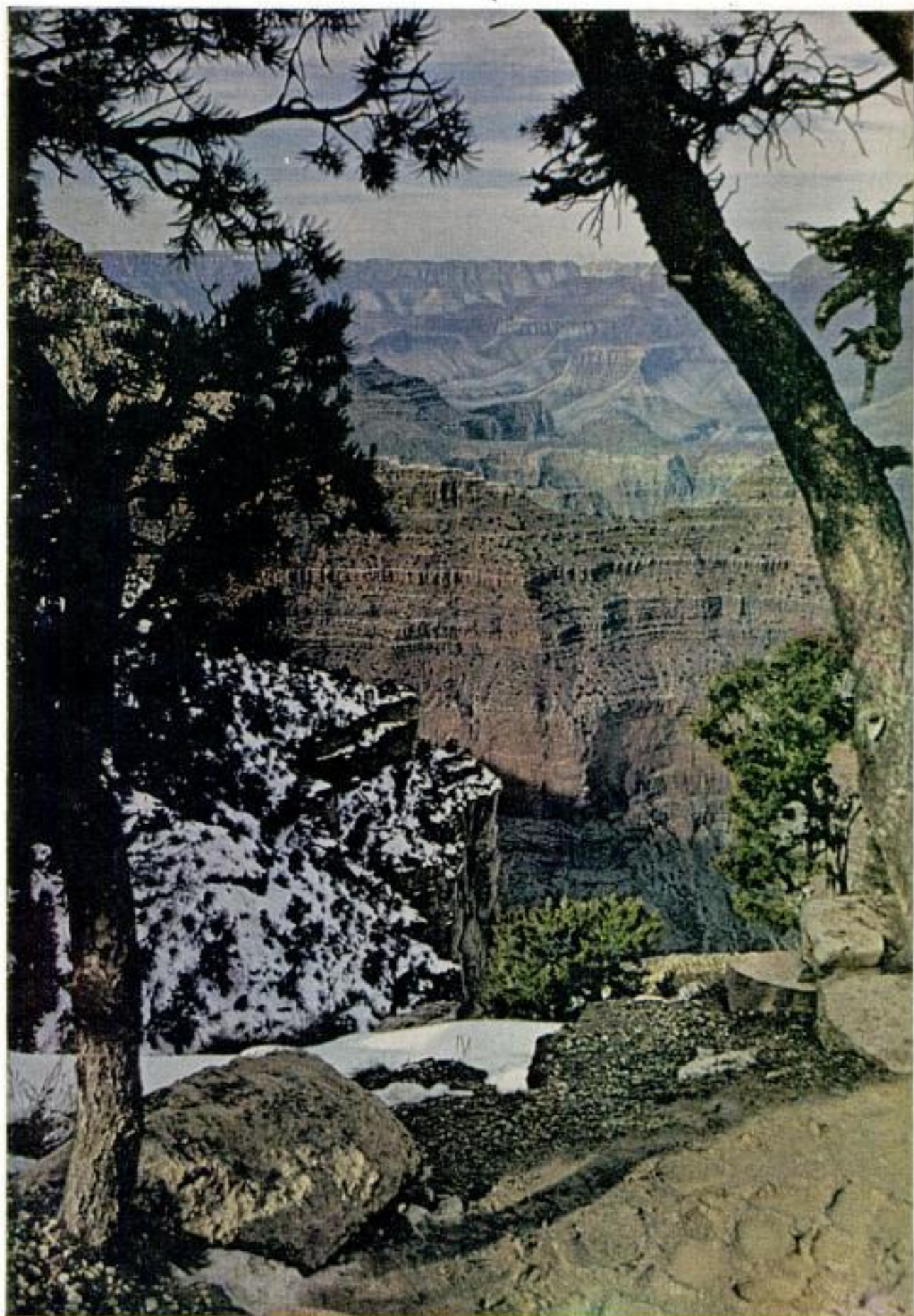
props which help to make the picture. But avoid posing people and don't let them spoil your shot by looking directly at the camera. Get yourself in the picture occasionally but here again, busy yourself by doing something, such as lighting a cigarette, talking to local citizens or buying something in the market place. Public buildings, churches, statues, memorials and parks are all good subjects of local interest that make good pictures since they carry identification. Here, composition is important and you should learn to recognize whether the subject matter indicates hor-

izontal or vertical composition. If your camera takes square pictures, it doesn't matter. In general, better composition can be obtained when shooting horizontal pictures, such as buildings, by moving the camera to an off-center position.

Don't be afraid to use film. It's actually only a fraction of the expense of a vacation trip. Try the same shot from different vantage points and vary the exposure as the professionals do. You've probably traveled a long way and you certainly don't want to return to tell your friends about the "ones that got away." ★ ★ ★

Whitecaps make a salon picture of otherwise common shot of ocean taken from Cypress Point, Carmel, Calif.





**This beautiful shot of the Grand Canyon photographed from the south rim is an excellent example of framing. The border of trees in foreground adds a dramatic effect. Generally, the frame must be large enough to register as a shape in the composition and kept out of focus. Occasionally, in the case of an arch or gateway, you can back away somewhat to keep the foreground in focus. Frame objects also can be used to identify locale**

JULY 1955

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Copyrighted material



Original vanity was framed in inexpensive woods and finished as you see it here with plastic veneer. Matching chairs and mirrors are made in duplicate

*Modern  
Furniture*

# DOUBLE VANITY DESK

By John Bergen

**F**INE WOODS and conservative modern lines fit this double vanity desk into almost any arrangement of room furnishings. The simplest type of frame construction and drawer joinery make it easy to build, even with a small shop and limited equipment. At the start you have a choice of materials. You can use fine cabinet woods, such as cherry, birch, or primavera in solid stock or plywood faced with any of these three. The selection of wood depends on the color desired. Or you can use a less expensive wood, such as white pine or poplar, and face all exposed parts with a plastic veneer. The original vanity, pictured above, was made by the latter method.

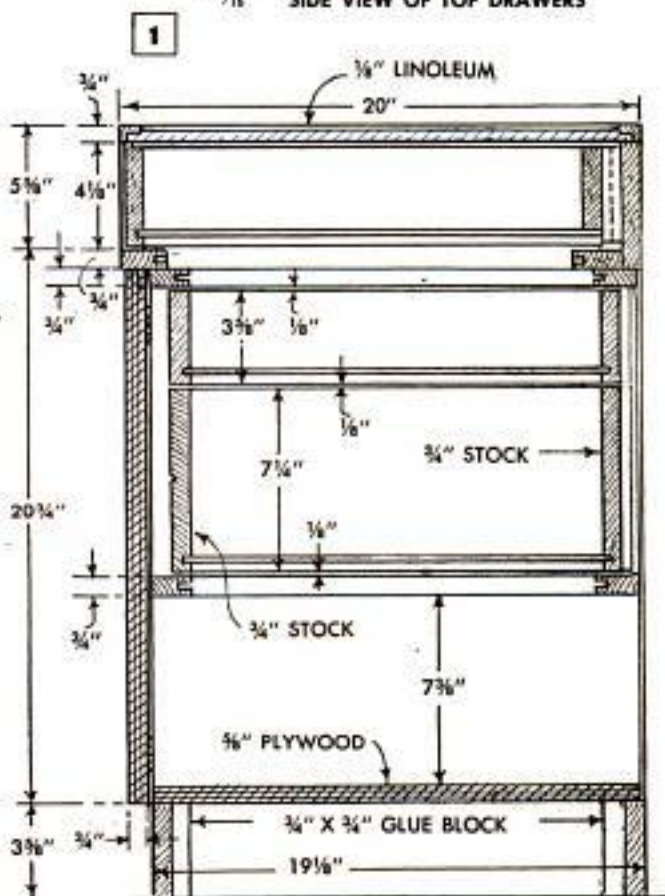
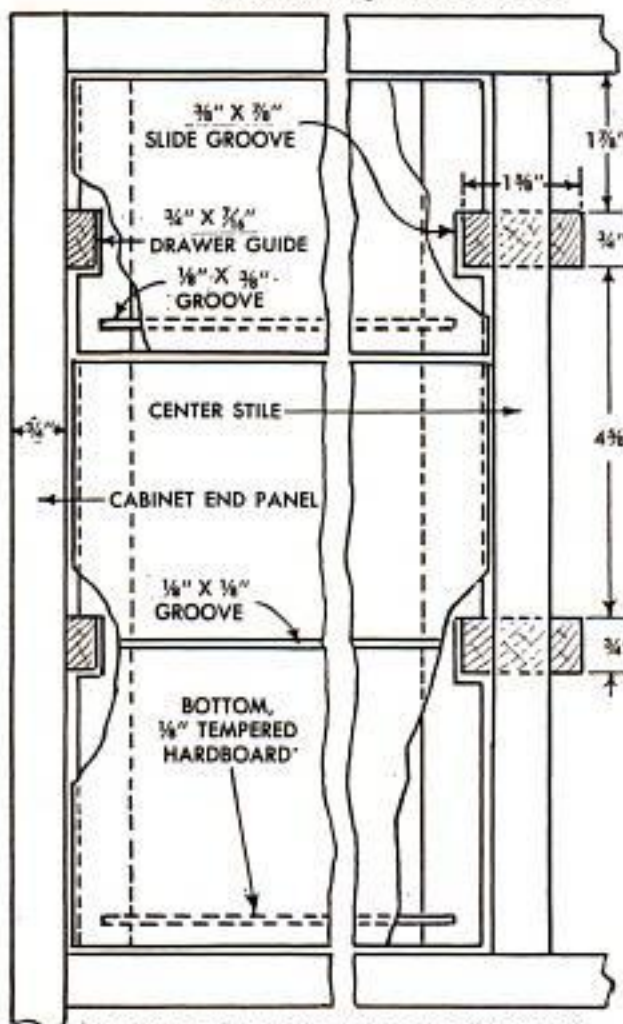
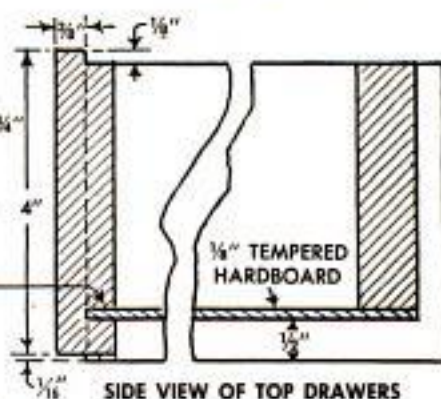
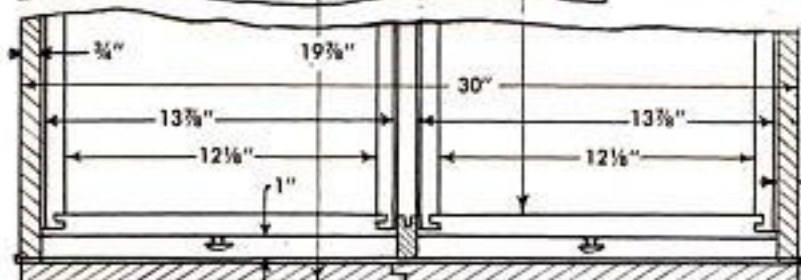
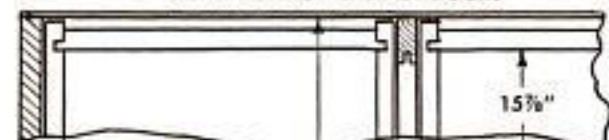
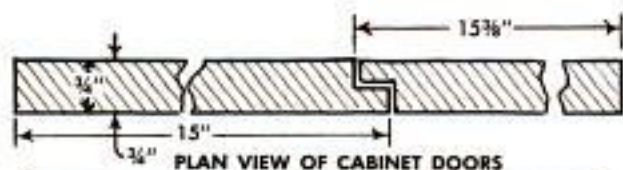
Details of the cabinet-frame construction, also the top and drawers, are given in Figs. 1 and 2. Note first that the upper three drawers are of the flush type and are exposed, while those below in the cabinet, or pedestal, are housed behind doors. Build the lower part of the cabinet first. This unit consists of the base, bottom, side panels, back panel and drawer framing. These parts assemble into the unit pictured

in the photo in Fig. 1. All parts except the drawer framing are cut from plywood. Note that the base is inset on three sides the thickness of the plywood panels and doors. The top section, Fig. 2, consists of the top proper, a full-length back rail, end rails, and the drawer framing. Note especially in the perspective view in Fig. 2 how these parts are joined and that the top is flush at the back, ends and front. The top on the original piece was made from a  $\frac{3}{8}$ -in.-plywood panel and covered with linoleum. The edges are finished with a strip of solid stock rabbeted and mitered as in a lower right-hand detail, Fig. 2. An alternate method of finishing the top, using a plastic laminate with edgings of the same material, also is shown. The sides of the drawers in the lower cabinet are grooved before assembly. Each drawer slides on a strip attached to the inner face of the end panel and on the center guide which is attached to the center stile. The slide grooves engage the guides as in the lower left-hand detail, Fig. 1. A clearance of  $\frac{1}{8}$  in. is provided between the drawers as in the lower right-hand detail, Fig. 1.

The drawers in the top section slide on flat rails and center guides which are a part of the top-section framing. The cut-away view, Fig. 2, shows how this framing is assembled into a unit and then attached to the lower cabinet, or pedestal. Assemble the top section completely before making and fitting the drawers.

The legs which support the overhang at

Upper edge of all panels must be sanded or planed flush with the frame so top section will fit

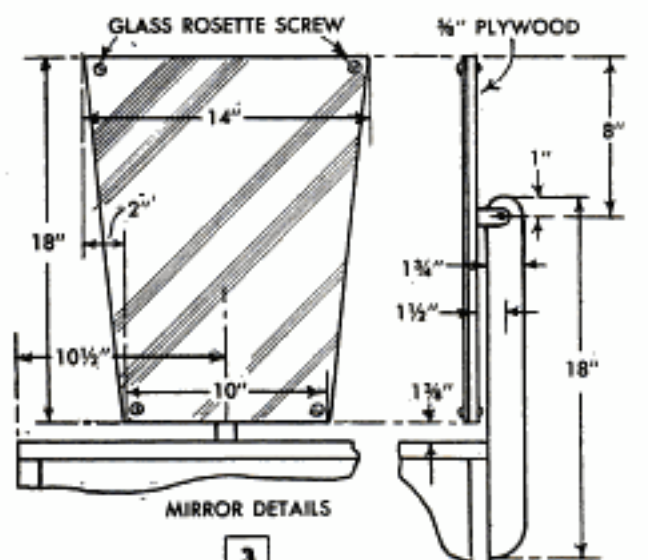






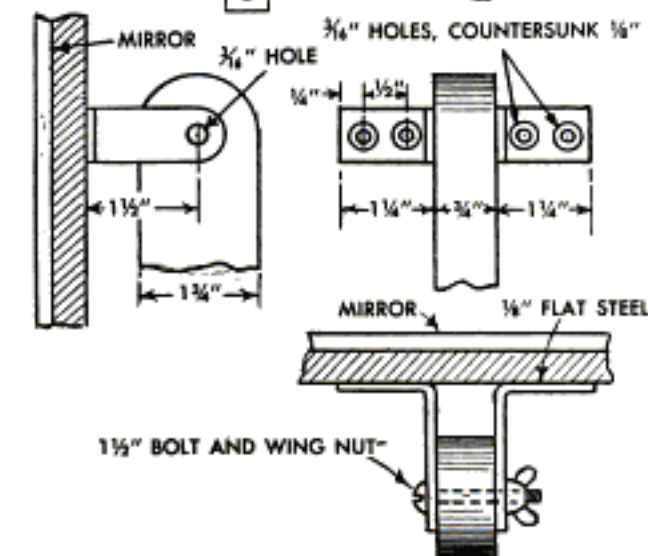
each end of the top section are 5 in. wide and  $1\frac{1}{2}$  in. thick. If solid stock has been used in the construction of the cabinet, then the legs should be cut from one piece of  $1\frac{1}{2}$ -in. material. However, if the cabinet is to be finished with plastic veneer, then each leg can be built up to the required thickness by gluing two pieces of  $\frac{3}{4}$ -in. stock face to face as indicated.

Figs. 3 and 4 detail the twin mirrors and matching chairs. These units, of course, are optional. The mirrors may be attached to the wall as pictured on page 148, or pivoted on brackets attached to the back of the top cabinet section as in Fig. 3. In either case, the mirrors should be backed with  $\frac{5}{8}$ -in. plywood. The chairs are of the swiveling type, the seat frame being mounted on a ball-bearing swivel, or fixture, as detailed in Fig. 4. The exposed legs and back braces are cut from wood that can be natural-finished to match the cabinet. All other parts of wood are covered by the upholstering materials. Upholstering consists of a simple padding and outer covering welted and tacked.

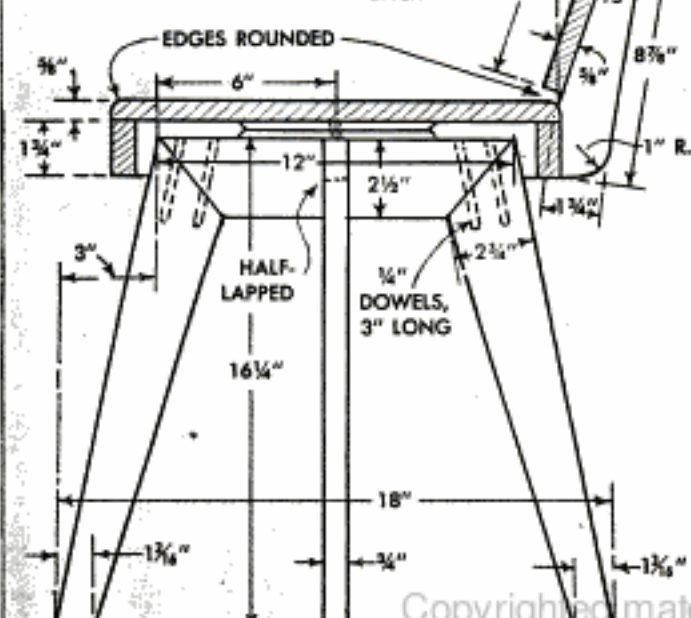
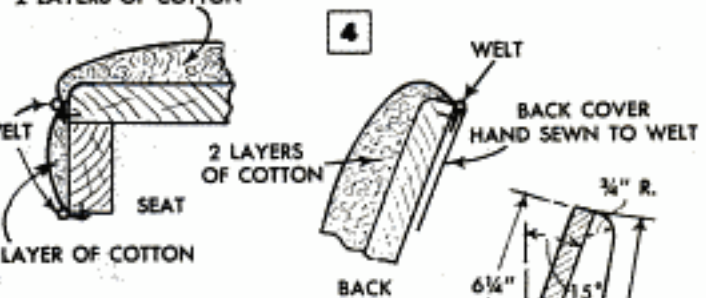
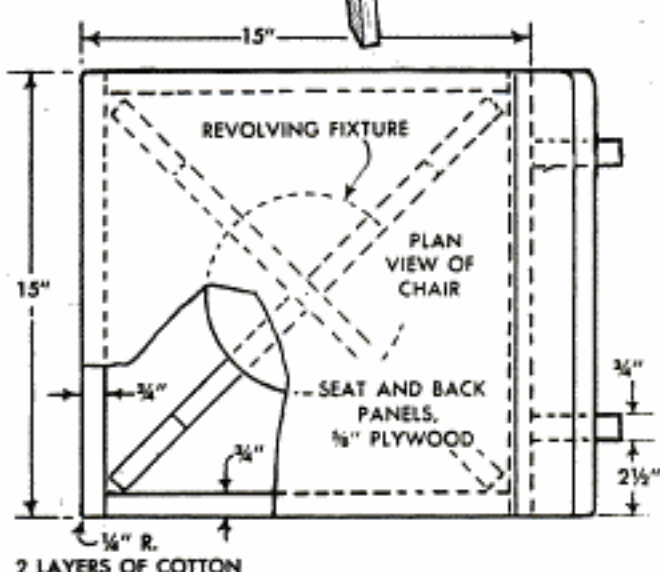
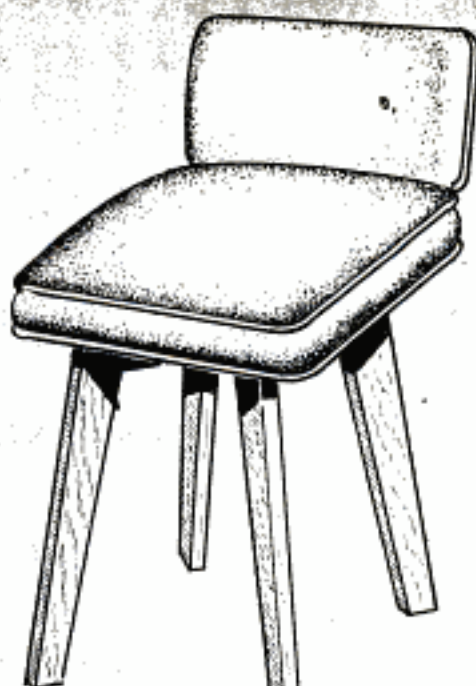


MIRROR DETAILS

3



MIRROR BRACKET



# ENCLOSE YOUR FRONT PORCH



Packages too large for the mail drop can be placed in the milk compartment. Label compartment to indicate use

**I**F YOUR HOUSE has an open front porch, enclosing it in glass will bring several distinct advantages. First, it will be an additional room—year-round, if heated, or comfortable for many extra weeks before and after the summer season, if unheated. In addition, it will serve as insulation, keeping the adjacent rooms of the house warmer in winter and cooler in summer. And, finally, it will improve the appearance and value of your property.

As every porch presents its own peculiar problems, it is impossible to give complete directions for enclosing any particular

porch. However, you will find that most of the details and general dimensions given in the story are applicable to your own porch with very little modification. In addition to these details, you also will find cabinets that facilitate the delivery of mail, newspapers, milk and packages.

The first consideration in making the enclosure is adapting the original columns for the installation of the window frames. Although the columns sometimes can be squared-up by nailing boards to them, the best procedure most often is to replace them with square posts. Make the posts



Photo above shows porch with original round columns. Note in left-hand photo how old columns have been replaced by square box-type columns to facilitate window framing. Doorway has been rough-framed with 2 x 4s. Window frames are already installed on the side



Here's how newly enclosed porch looks from the outside. Compartments flanking door make neat arrangement

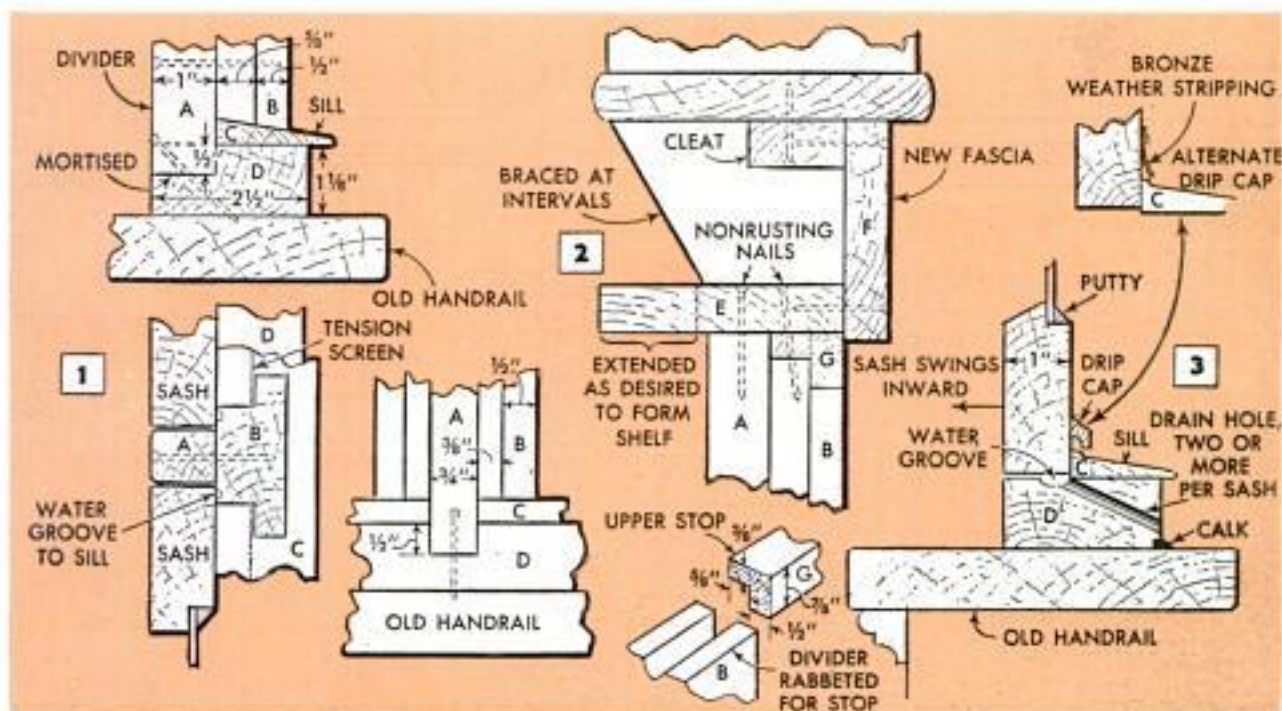
from 1-in. lumber, as in the photo above Fig. 3, applying water-resistant glue to the joints and using nonrusting nails to fasten them together.

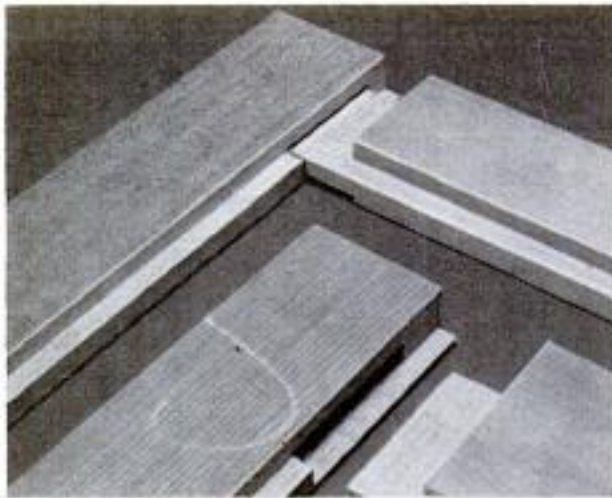
Although you can enclose your porch with almost any type of glazed unit—anything from double-hung sash to storm doors—the least expensive way is to make your own sash. Single-pane casement sash are the simplest to make, and these are hinged to close into frames made as in Figs. 1 to 3. The sash should be made of lumber at least 1 in. in actual thickness with the corner joints mortised and tenoned, as in the photo on page 154.

If the original handrail is in good condition, the window frames can be built up from it. Although the length of the



New square columns to replace round ones are made as above





Corner joints of window sash are mortised and tenoned as above. Inside edges are rabbeted for pane

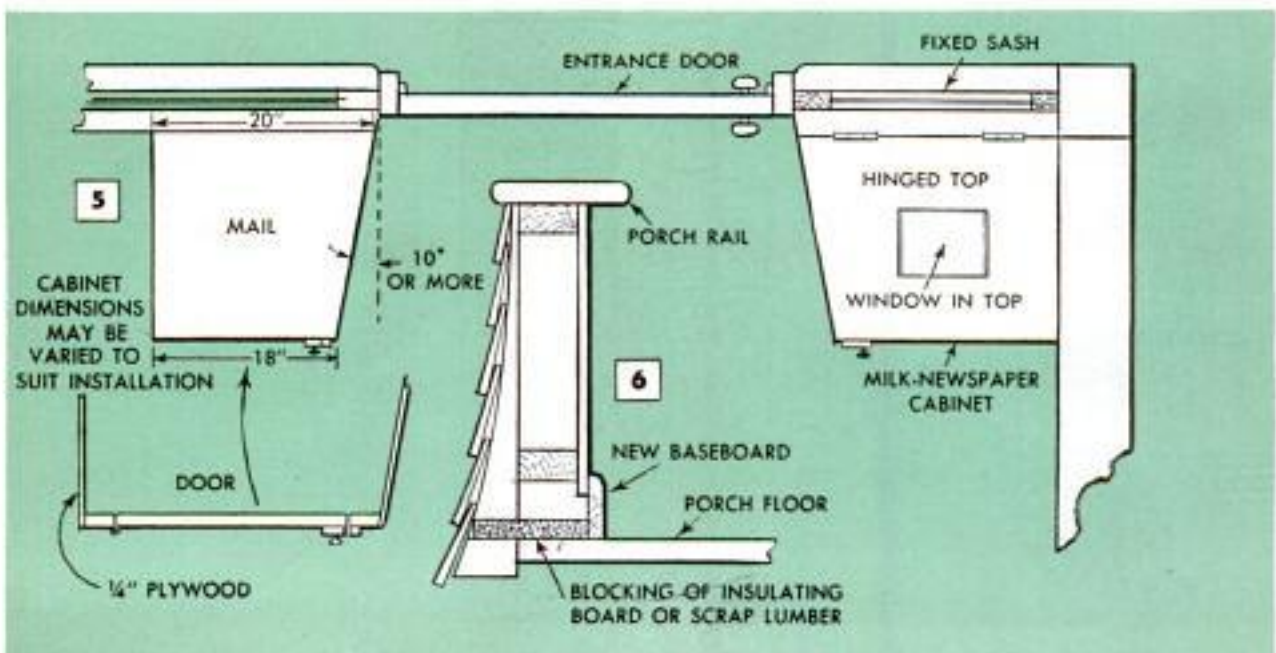
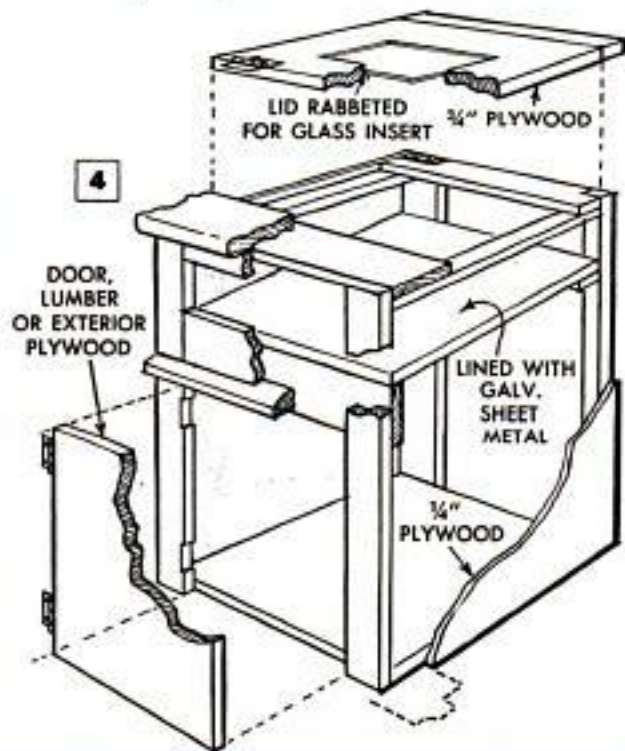
Photo below shows how sills directly above compartments are fitted with triangular-shaped blocks to drain water away from compartment door. See Fig. 7

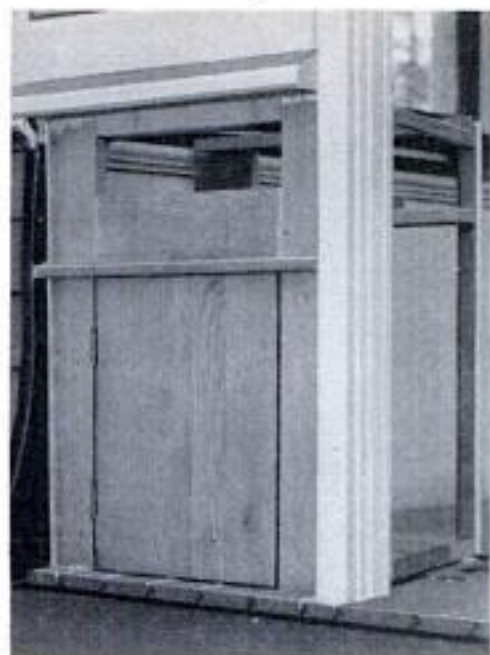


frame members will vary according to the size of sash used, the dimensions given in Figs. 1 and 2 may be used in all cases. Note that the various parts are keyed so they may be identified in each of the drawings.

A new fascia, detail F in Fig. 2, is added, its width determined by the particular installation. Several vertical braces should be added at intervals to strengthen the framing, and the horizontal board, detail E, may be ripped to fit almost flush with the face of the sash or left wide to form a shelf.

The water grooves cut in part B, Fig. 1, together with the water groove and drain hole in part D, Fig. 2, combine with the drip cap to make the sash watertight. Apply calking compound around all fixed sash





Partially finished newspaper-milk compartment is shown at left. Photo at right shows finished compartments

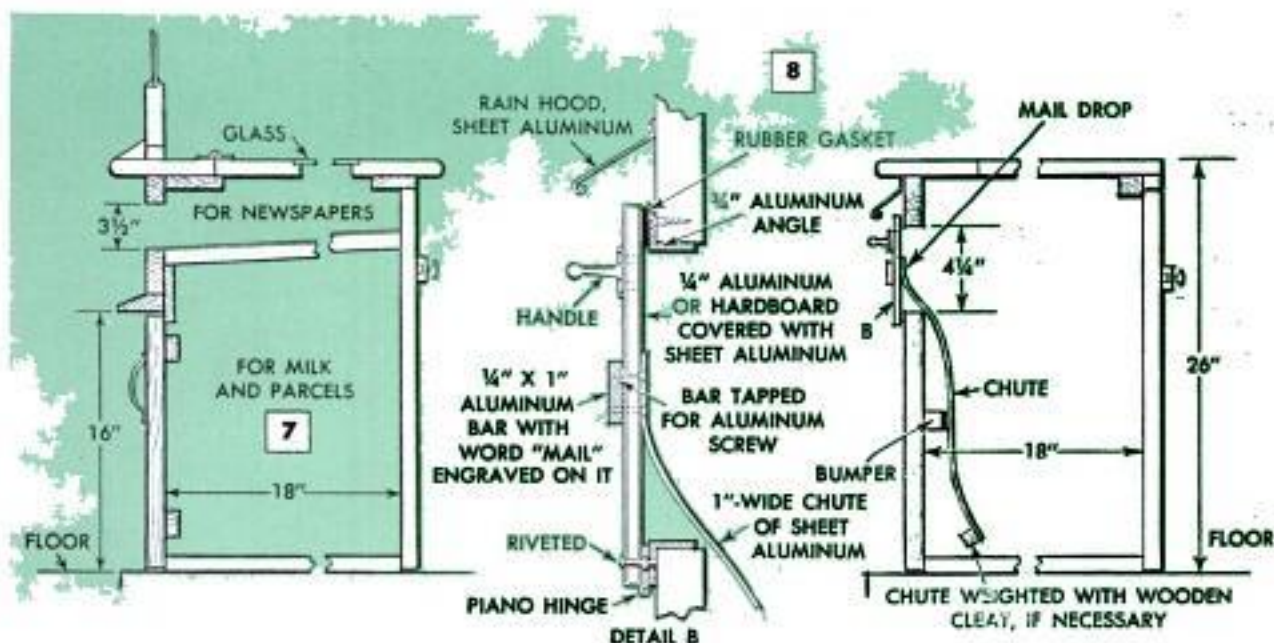
and at any other points where water may enter.

Figs. 4 to 8 detail the compartments which may be built on both sides of the entrance to simplify deliveries. One, detailed in Fig. 7, has a special slot for newspapers and a cabinet for milk and parcels. The other, Fig. 8, consists of a mail drop and chute. Both compartments are fitted with doors for easy access from inside the porch. Construction of the cabinets is simple, as shown in Fig. 4, although dimensions and even the design given for this particular installation may have to be varied. The mail-drop opening is  $4\frac{1}{4} \times 11\frac{1}{2}$  in., with a usable height of  $3\frac{3}{4}$  in. because of the chute.

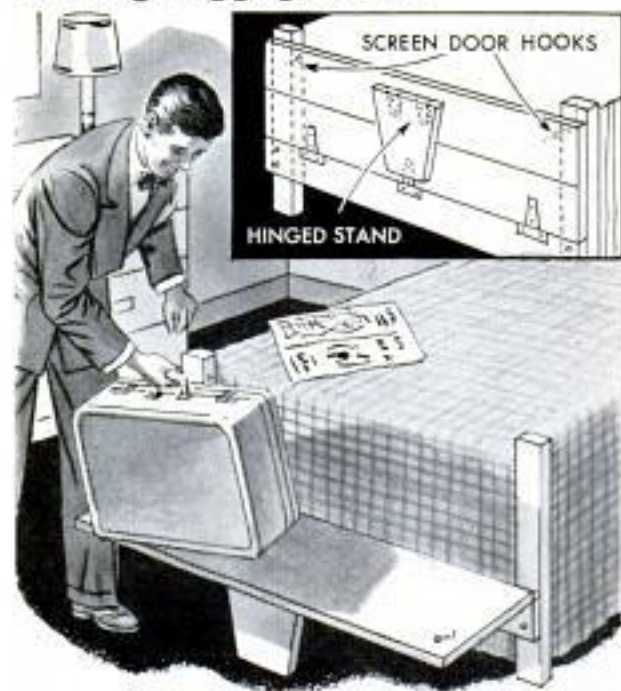
Even though the original porch rail is covered with siding, you probably will find that it was provided with drain openings near the floor. These can be sealed with a blocking of thick insulating board or lumber, as shown in Fig. 6, and the addition of a new baseboard. ★ ★ ★



Sheet-metal mail chute is formed as above



## Foot of Motel Bed Folds Down Forming Luggage Stand



To save space in his rooms and as an added convenience for his patrons, one motel owner has provided a folding luggage stand on the end of each bed. The shelf of the stand is 1-in. pine hinged to the end of the bed, and it is supported when in the lowered position by a hinged leg. The stand is held in the raised position by screen-door hooks. If the beds are of the Hollywood type, with no posts, then 2 x 4s connected by a sturdy crosspiece should be attached to the bed to act as a support for the luggage stand.

Don Brooks, Lombard, Ill.

## Masking Tape on Paint Can Provides Brush Holder



A quickly improvised holder for a lettering or striping brush can be made by attaching a strip of masking tape across the open top of a paint can. The bristle

end of the brush is slipped under the tape, the handle rested on the can rim. When the painting job is finished, the tape is simply discarded.

G. E. Hendrickson, Argyle, Wis.

## Veneered Furniture Fretwork Restored With Hardboard

Untempered hardboard is used by the owner of one woodworking shop to restore the fretwork on antique and modern fur-

niture. Because  $\frac{1}{8}$ -in.-thick veneers of high-quality walnut, mahogany and other hardwoods are not always available,  $\frac{1}{8}$ -in. hardboard, sawed or routed to match the patterns of broken or missing panels in furniture, provides an excellent substitute. Orange shellac is used to provide a match for the darker hardwoods, while white shellac can be used to simulate pine.

## Pipe Used as Carport Columns

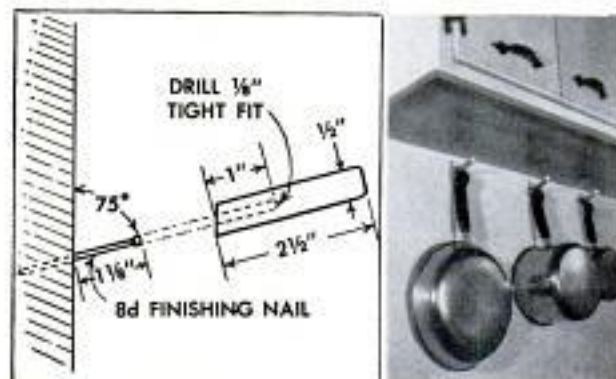
Steel pipe used as supporting columns for patio roofs and carports has the advantage of slender appearance as well as longer life compared to wooden posts used for the same purpose. Floor flanges are screwed to the ends of lengths of 2-in. pipe. Wood screws are used to fasten the flanges to wooden overhead beams. On concrete slabs, the flanges are fastened in place by using regular expansion sleeves in holes drilled in the concrete.



## Pegs Driven Onto Finishing Nails Quickly Attached to Wall

Decorative pegs on which pots, pans and other lightweight objects are to be hung can be attached quickly to a wall by driving them onto finishing nails. Angles are cut on the ends of  $2\frac{1}{2}$ -in. lengths of  $\frac{1}{2}$ -in. dowel and holes are drilled in the centers of the angled ends. The holes should be slightly undersize for an 8d finishing nail. The depth of each hole should be slightly less than the length of the projecting portion of the nail, so the nail will be forced into the dowel when the latter is tapped onto the nails already driven into the wall.

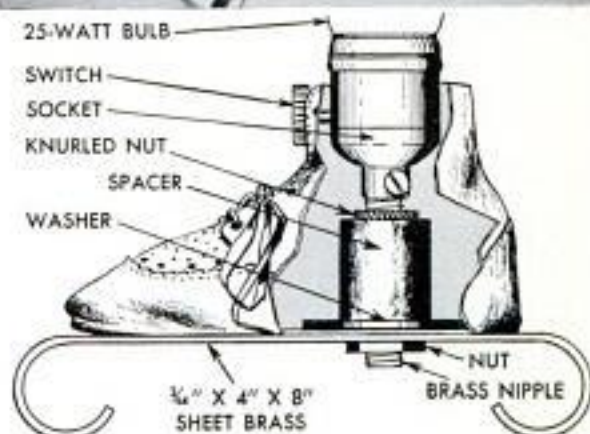
Bruce Porter, Clarendon Hills, Ill.





## Baby-Shoe Lamp

Baby's first shoe, a memento treasured by mother all her life, can be made into a decorative boudoir lamp, where it will be useful as well as ornamental. Such a lamp could be made as a gift that she would enjoy receiving. The base of the lamp is a 4 x 8-in. piece of  $\frac{3}{16}$ -in. brass. The ends of the base are bent to the proper shape by rolling the last  $1\frac{3}{4}$  in. of each end around a  $\frac{1}{2}$ -in. iron rod. After the base is bent, the shoe is placed on it at an angle and its position traced on the brass. Then a point is located in the center of this outline that will place the lamp socket directly over the shoe's upper, and a  $\frac{3}{8}$ -in. hole is drilled through the base at this point. With the base drilled, the parts of the lamp



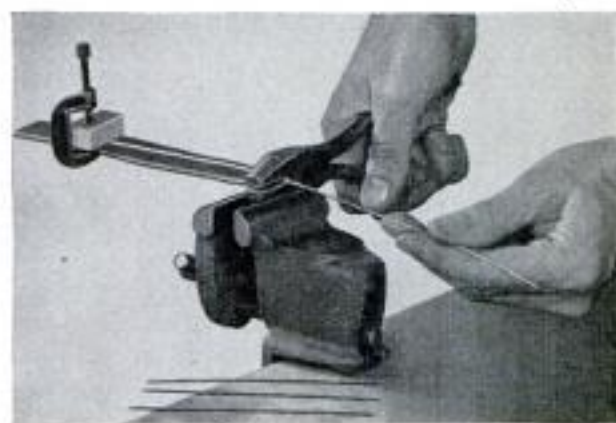
are assembled as shown in the detail. Finally, cotton is stuffed into the toe of the shoe, it is laced part way up, and then both the shoe and the brass are given a coat of clear varnish. Any small clip-on shade could be used.

J. Harley Hosack, Hartford, Conn.

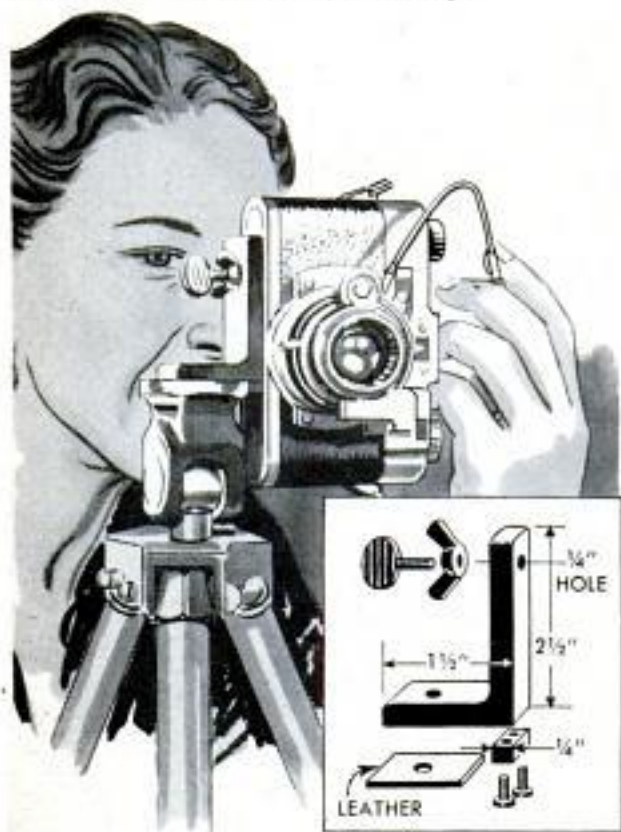
## Gauge and Pliers Clamped in Vise Cut Wires to Same Length

A gauge and a pair of side-cutting pliers clamped in a vise will permit cutting a number of pieces of wire to equal lengths. The gauge is a strip of sheet metal, bent at right angles on one end to permit it to be clamped in a vise along with one jaw of the side-cutting pliers. A block of wood and a C-clamp provide an adjustable stop. The end of the wire is held against the stop and cut off with the pliers.

☞ To prevent an ice tray from sticking in the freezing unit of a refrigerator, rub the outside with salad or cooking oil.



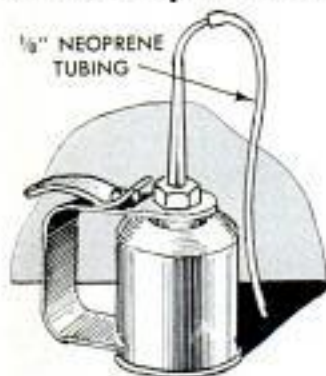
## Angle Bracket Modifies Tripod To Hold Camera Sideways



An angle bracket is used by one camera enthusiast to mount his candid-type camera on a pan-head tripod at 90 deg. from the regular position. This permits taking vertical pictures and allows the camera to be tilted up or down by the swivel handle. A 1-in. section cut from a steel angle forms the bracket. One leg of the bracket has a hole drilled and tapped in it to receive the  $\frac{1}{4}$ -20 tripod screw. The other leg has a hole drilled in it through which a  $\frac{1}{4}$ -20 thumbscrew is turned into the camera. A wing nut on the screw tightens the camera snugly against the bracket. A  $\frac{1}{4}$  x  $\frac{1}{4}$  x 1-in. block is screwed to one end of the tripod side of the bracket to prevent its turning. A leather pad between tripod and bracket prevents screw from loosening.

Edward J. Bickel, Chicago.

## Oil-Can Spout Extended



Oil cups in hard-to-reach locations, such as on the blower shaft of a forced-air furnace or behind the wheels of a lawn mower, can be lubricated by extending an oil-can spout with a length of  $\frac{1}{8}$ -in. plastic

tubing. To enlarge the end of the tubing to fit the spout, soak it in hot water to soften it. Then insert an ice pick or other pointed tool to expand it. The translucent plastic permits seeing the amount of oil being sent to the cup.

W. G. Waggoner, Sacramento, Calif.

## Ball Used as Photo "Dodger"

A small sponge-rubber ball used as a "dodger" for photo-enlarging work will eliminate the chance of getting an out-of-round shadow on a print. Fit the ball over the end of a length of wire and use in the same manner as the usual disk. Unlike a disk, the ball will cast a round shadow no matter which way it is turned.



## Uses for Foil Food Containers

Empty aluminum-foil pie and cake pans, in which many bakeries package their products, can be put to good use as containers for popcorn, candy or other delicacies. In a workshop, the foil containers make excellent disposable containers for small amounts of stain, paint and other liquids.

## Plaited "Beehive" on Mailbox Advertises Honey Products

A plaited basket made to resemble a beehive is used by one farmer as a unique roadside advertisement to acquaint motorists with the fact that he is in the honey business. The hive was plaited intact, then an opening was cut to permit it to be fitted over the mailbox.

Grover Brinkman, Okawville, Ill.





WTM '57

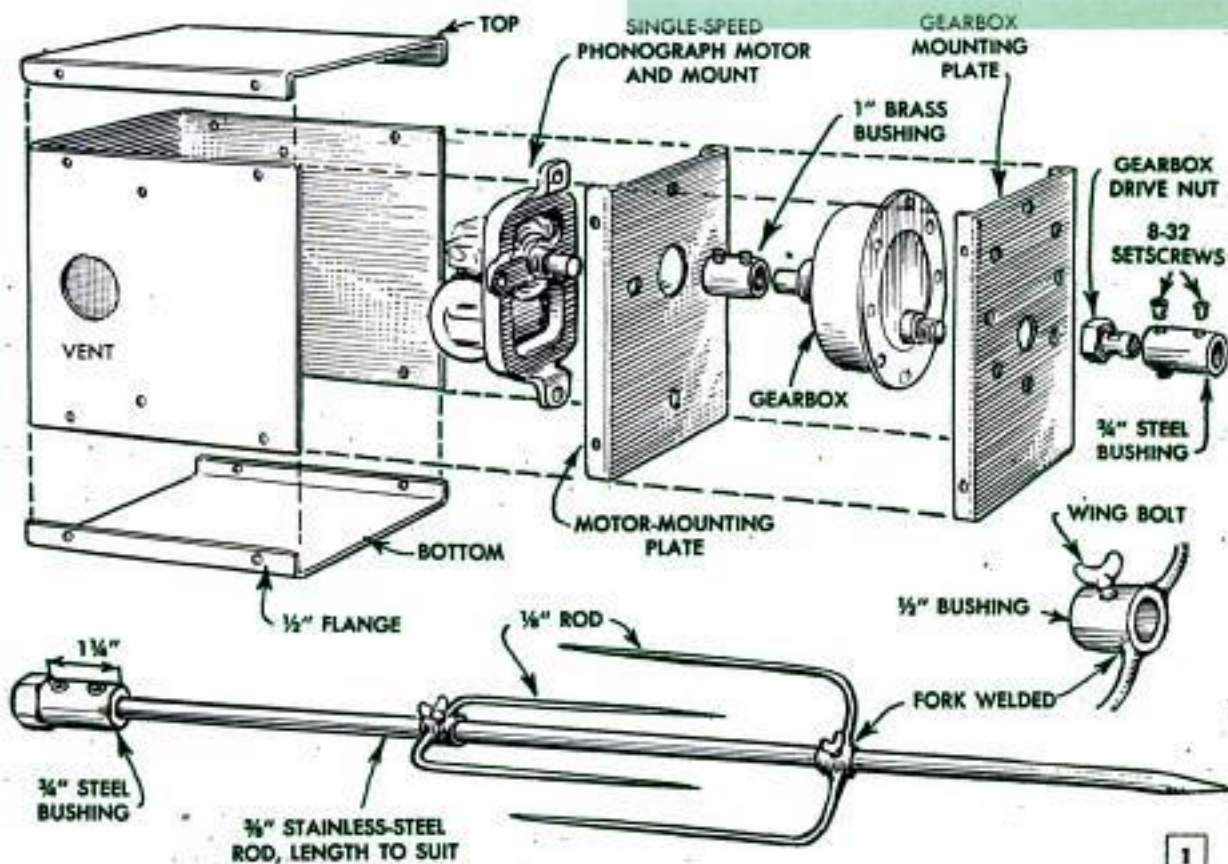
# Motor-Driven Barbecue Spit

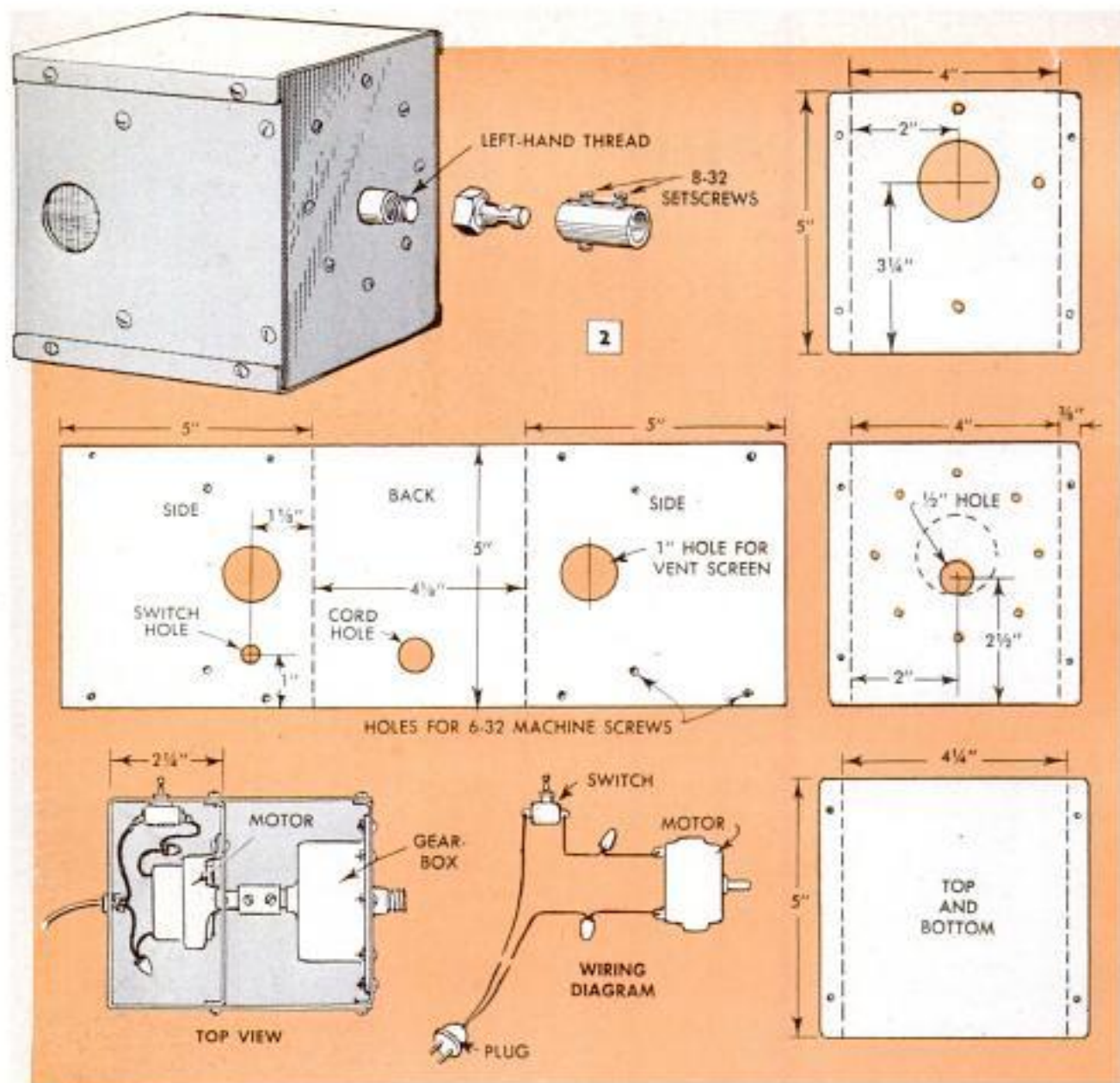
IF YOU ENJOY the delights of food barbecued over an open fire but hesitate at the thought of hand-turning the spit, a motor-driven spit is the answer to your problem.

The spit, detailed in Fig. 1, is powered by a single-speed phonograph motor coupled to a war-surplus gear-reducing unit. The gearbox, in turn, is coupled to the spit rod. Two welded forks slide on the spit and can be locked in any position by means of hand-tightened wing bolts. The spit power assembly is mounted in a sheet-metal box and fitted with a convenient toggle switch.

The sheet-metal box should be made according to the dimensions in Fig. 2. Do not drill holes for mounting the motor until the motor is obtained; different makes of phonograph motors have different sizes and types of mountings. The sheet metal used in making the box does not have to be too heavy, but should be thick enough so the heat of a fire will not cause it to buckle or warp.

The gear-reducing unit for the spit is available at war-surplus stores which handle electronic and radio equipment. The





gear reducer is the type used at the rear end of a dynamotor and has the part number PE 1016. The end of the reducer driving shaft has a left-hand thread and is fitted with a specially shaped connecting nut which comes with the gearbox. Two small ears on the driven shaft of the gearbox are cut off to permit fitting a brass bushing which couples the shaft to the phonograph motor. The bushing is a 1-in. length of brass rod, drilled at one end to receive the gearbox driven shaft, and at the other end to receive the phonograph-motor shaft. The bushing is cross-drilled and tapped for 8-32 setscrews.

The electric motor for the spit power unit can be salvaged from any discarded phonograph. If none is available, a new motor can be purchased at most radio-supply houses. To assure accurate alignment between motor and gearbox, the motor is fitted on its plate and the plate is marked and drilled. After the motor is bolted in place, the gearbox is coupled to

it. The gearbox plate now is marked and drilled and both plates are bolted to the inside of the sheet-metal box.

The spit is a length of  $\frac{3}{8}$ -in. stainless-steel rod. Its length is determined by the width of the fireplace or barbecue pit over which it is to be used. The sliding forks on the spit are bent from  $\frac{1}{8}$ -in. steel rod and each tine is filed or ground to a smooth point. The forks are welded to bushings which are lengths of  $\frac{1}{2}$ -in. rod, drilled to slide freely on the spit. The bushings are cross-drilled and tapped to receive wing bolts which hold the forks in the desired position.

The bushing which couples the spit to the gearbox is a  $1\frac{1}{4}$ -in. length of  $\frac{3}{4}$ -in. steel rod. One end of the bushing is drilled to receive the spit rod. The opposite end is drilled to slip over the connecting nut on the end of the gearbox shaft. The bushing is cross-drilled and tapped to receive 8-32 setscrews. Two setscrews, one on each side of the shaft, seat on the flat surfaces of the

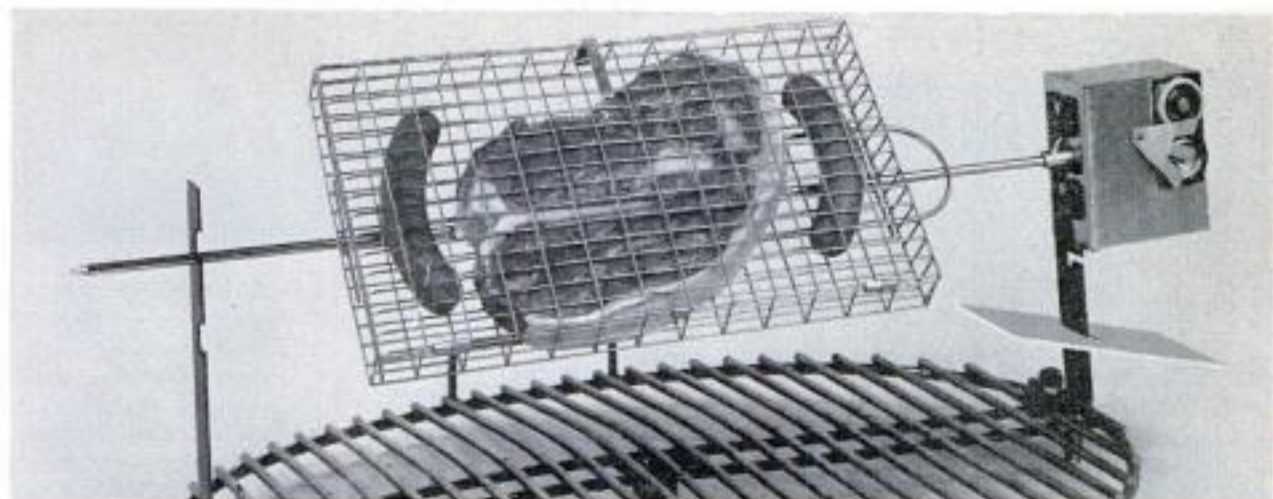


Photo courtesy U. S. Associates, Inc.

connecting nut. The spit now can be removed or replaced simply by turning the nut on or off the gearbox shaft.

A toggle switch is mounted on the side of the sheet-metal box and is wired to the motor and to a lead-in cord. For convenience, a socket or receptacle may be mounted on the box and a removable extension cord used.

A vent, covered with screen wire, is located on the side of the box to provide ventilation for the motor. It may also be necessary to line the box with some sort of insulation if the power unit is used especially close to the heat of a fire.

If you do not care to make a powered spit, there are several manufactured units

available. A spit that is especially ideal is one called "Roto-Wizard," manufactured by U. S. Associates, Inc., of Los Angeles, Calif. It is powered by two D-type flashlight batteries, which will run the spit for about 10 hours of continuous operation, longer when used intermittently. Since the inexpensive power source is self-contained, the spit can be used anywhere: around the home, in the yard or taken on picnics. The photograph at the top of this page shows the unit in action. Power unit, spit and two universal mounting brackets for attaching the unit to the grill of your barbecue are furnished as a package. Steak basket and a wheel that will hold six frankfurters are optional accessories. ★ ★ ★

2170 W. Venice Blvd.  
L. A. 6, Cal.

## Canopy Over Tots' Sand Box Matches House Awnings

Children playing in this tractor-tire sand box are protected from the sun by a canvas canopy. Uprights supporting the canopy are 4-ft. lengths of 2 x 4 bolted to the tire. Braces from tire to uprights are  $\frac{1}{8}$ -in. flat steel. The frame over which the canvas is stretched, also the braces, are 1 x 2-in. stock. Extra canvas at each end of the 48 x 52-in. frame rolls down for added protection. Tire and wood are painted to match house trim. The canopy is made of the same material as awnings used on the house.—Lewis E. Day, Canister, N. Y.



## Glare in Flash Photos Avoided By Using Test Light

The problem of "hot spots" or glares, caused by a flash bulb reflecting from a shiny object or surface, can be overcome by using a flashlight as a test light. Hold a strong flashlight in the approximate position of the flash lamp. Then, using the ground-glass or other type viewer, note where the glares occur. Adjusting the flashlight to eliminate the glares will indicate the position in which to locate the flash lamp.

When the backing on a throw rug becomes soft and the corners curl, the stiffness may be renewed by a coat or two of fresh shellac applied to the underside.



**1. PHONE BILLS** won't be so high if you time toll calls with ordinary three-minute, kitchen egg timer. After purchasing timer, check it against a clock, since many tend to run overtime. Then mount at a convenient spot near the phone. Egg timer is also handy for timing turns when playing parlor games

**2. A DISCARDED NECKTIE** can be converted into a decorative and practical cover for an umbrella. First, reinforce the stitching along inside seam, then slip the umbrella into the tie as shown. After determining how much of the tie will be required for the cover, cut off the remaining material and sew up the bottom opening

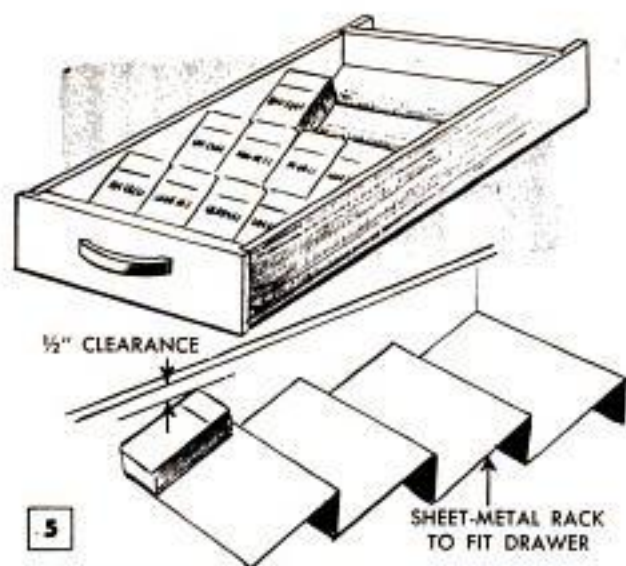


**3. WINDOW SCREENS** can be made waterproof if sprayed with one of the silicone waterproofing mixtures sold for treatment of clothing. After receiving this treatment, the screen will repel water and the mesh will remain open, even during heavy rains. Less water will splash through the screen



**4. ALUMINUM COOKING POTS** can be cleaned and scoured without leaving ugly black marks on which they are rested if an inexpensive sponge-rubber powder puff is used as a pad. This will also keep the pot from slipping during scouring





5

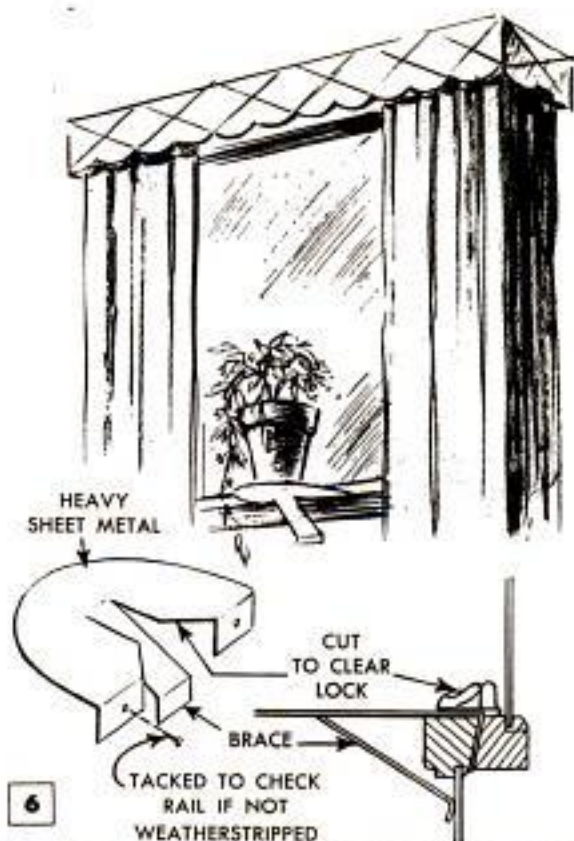
**5. SPICE BOXES** are easily stored and quickly identified when a drawer for them is provided with rack shown above. Bent from sheet metal, the rack is made to fit the individual drawer. The edges of the boxes should come up to  $\frac{1}{2}$  in. below drawer edge

**6. THIS PLANT HOLDER** will permit you to place potted plants in double-hung windows, for the decorative effect and so that the plant will receive more sun. The holder is cut from heavy sheet metal and bent to the shape shown. Weight of pot holds it in place

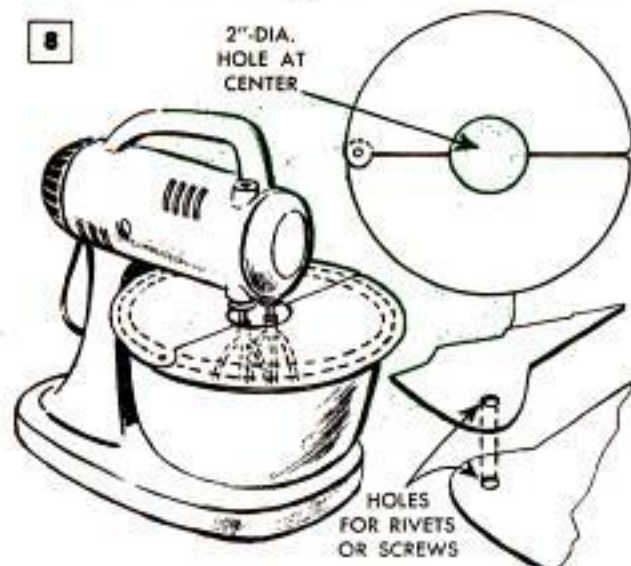
**7. A WOODEN TRIVET**, placed under potted plants used to decorate a porch, will save the porch floor from rotting due to moisture from the pot. The trivet can be of any shape, though the disk is the most attractive. Short lengths of dowel are used for trivet legs

**8. THERE WILL BE NO MORE SPLATTER** and splash from the electric mixer if you use a bowl cover such as is shown. The cover is quickly made from sheet of aluminum or plastic. Two identical pieces are cut out and hinged together with a rivet or small nut and bolt

**9. LOOSE CASTERS** that drop out of furniture when it is moved can be cured if a short slit is sawed in the end of the caster shaft. The shaft is then spread slightly with a screwdriver. Spread only enough to make the caster a tight fit when it is replaced



6



8

9

## Copper Rain Gutter Used as Hood For Smoky Fireplace



Often the only way to correct a smoky fireplace is to attach a hood to it. An inexpensive and yet good-looking hood can be made from a section of copper rain gutter, box-ended as shown in the illustration. This is fastened to the front upper edge of the fireplace opening. The top of the hood serves as a small knickknack shelf.

K. S. Anderson, Chase City, Va.

## Sidewalk Protects Buried Cable



When a buried lead or plastic-covered electric cable is used between the house and the garage, it can be protected against accidental cutting with a spade if it is laid under the edge of a sidewalk, as shown. This removes the cable to a spot where there

is no likelihood of gardening or digging. The usual precautions to avoid cutting cables are to bury them from 18 to 24 in. below grade level and to avoid crossing flower or vegetable beds.

## Defrost Refrigerator Daily

An older-model refrigerator, not equipped with an automatic defroster, can be kept fairly frost-free by shutting it off for one hour each day. To make sure that the refrigerator is not forgotten, set an alarm clock or cooking timer for one hour and shut off the refrigerator. When the

alarm rings at the end of the time, it will be discovered that a small amount of water has collected in the drip pan—the frost that has accumulated in the past 24 hours. Frozen foods and ice cubes will not thaw out during the hour, and the main compartment remains cool.

Mrs. H. Z. Hancox, Nashville, Tenn.

## Cold Draft Through Wall Opening Affects Thermostat Operation

A draft of cold air from a wall opening through which wires run to a wall-mounted furnace thermostat will affect its operation. The air cools the thermostat element, causing it to switch on the furnace, even though the room in which the thermostat is located is at the required temperature.

To eliminate the problem, plug the opening with plaster, calking compound or loose insulation.



## Inexpensive Toy Shelves Built From Apple Boxes

A space-saving combination of toy-storage shelves and child's clothes rack can be made quickly and at almost no cost. Use apple boxes or orange crates for the end shelf units and add shelves of lumber or plywood between them. Cleats nailed to the sides of the boxes support the added shelves. A wardrobe clothes pole can be mounted between the boxes and a wall. As a toddler grows, the height of the shelves and clothes pole may be gradually raised.—Emilie T. Hall, Cornell University, Ithaca, N. Y.





# FISHERMAN'S KNOT BOOK

By Walter Burton

**N**EEED A BRIEF refresher course on how to tie certain fishline knots? Then make this "vest pocket" knot book and keep it in your tackle box. It will come in handy when you are out in the middle of a lake and wonder how to join lines and leaders, tie a hook or plug to a line or make a nonslip loop knot. A glance at the condensed instructions and sequence photos will refresh your memory on the spot.

The book is practically ready-made for you. All you have to do is cut out the green-bordered illustration presented on the following two pages, paste it on a couple of pieces of stiff cardboard and hinge them

together with a strip of adhesive tape. If you wish, an actual sample of each knot may be tied from heavy cord, such as chalk line, and glued on top of the knot illustrations in the right-hand column. Brushing each sample knot, as well as the book itself, with shellac will help keep it clean and water-resistant.

The three photos across the top of the book show successive steps in tying a common fisherman's knot which is widely used to join lines or leaders. First, form a simple overhand knot near the end of one line. Then insert the end of the second line through the center of the overhand knot, loop the end around the first line and tie a second overhand knot. When this is done,



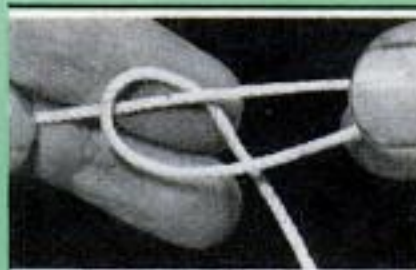
Shellac applied to sample knots, as well as the book pages, will help make them water-resistant

pull the two lines tightly to complete the knot and clip off the ends. If the same procedure is followed but each line is wrapped around three or four times before forming the overhand knots, you can make a splice for joining leaders. This particular knot is shown in the photo directly below the fisherman's knot.

To tie a nonslipping loop, or "fisherman's eye," first form a common slip knot in one end of the line. Continue with the free end of the line and tie a second knot by looping the end of the line around the standing portion of the line. Then adjust the size of the loop and finally pull the two knots together.

To attach a leader to a hook or plug, make a simple slip knot, pass the loop through the hook eye and pull enough leader through so the loop can pass over the entire hook. Note the photos captioned "Knot for Hooks and Plugs." Then draw up the slack to the point shown. Before pulling the loop tight, insert the free end of the leader through it, pull tight and trim off any excess. Many fishermen use this knot to tie nylon leaders.

To loop a leader to a dry or wet fly, proceed as in the next row of photos. Pass the leader through the hook eye



#### Joining Lines or Leaders

Loop end around line near end. Continue loop to form simple overhand knot. Form second overhand knot. Then pull both tightly and clip off ends

## Knots for Lines or Leaders

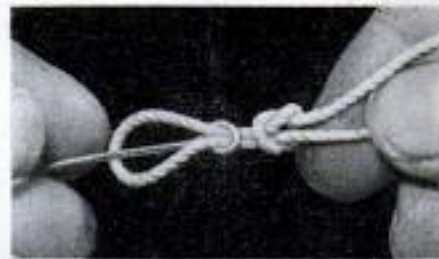
#### Nonslipping Loop Knot

First make slip knot. Then make second slip knot. Adjust first knot to regulate size of loop. Finally, pull the two slip knots together to tighten



#### Knot for Hooks and Plugs

Make slip knot and pass loop through eye of hook. Next, pass loop over entire hook. Then insert free end through loop, tighten and trim off excess leader



#### Knot for Looping Leader to Fly

Proceed as above but pass the leader through eye of hook before making slip knot. Extend loop so it will pass around fly and then draw leader tightly against eye



#### Tying Loops in Line or Leader

Form ring in line or leader and pass free end through it twice. Work center section of ring through twisted portion, adjust loop and pull line to tighten knot



#### Tying Line to Loop in Leader

Run line through loop to form square knot. Insert free end through square knot, pull line and leader to tighten moderately. Then pull free end of line to bring line loop inside leader loop and tighten both







If you wish, a sample of each knot can be tied, using chalk line, and glued over each illustration shown in the right-hand column at the left. Simulated fishhook eyes are formed from wire paper clips

before tying the slip knot. Then extend the loop so it will pass around the fly and draw it tightly against the eye.

Forming loops, sometimes called blood-drop loops, in a line or leader is done by making a ring in the line and passing the free end through it twice. Next, work the center of the untwisted section of the ring through the center of the twisted portion and adjust the resulting loop to the desired size. Then pull the line to tighten the knot. This knot is shown in the second row of photos from the bottom of the page.

To attach a line to a leader or to another line, run the line through a loop to form a square, or reef, knot and bring the end of the line around the remainder as in the bottom row of photos. Insert the end through the square knot, pull line and looped leader to tighten the knot moderately and then pull the free end of the line to bring its loop inside the leader loop. Finally, tighten the knot by pulling again on the line and leader. The resulting knot should look like the accompanying drawing when tied properly. ★ ★ ★

A plastic envelope, or sleeve, will keep your knot book clean while it is carried in the tackle box



## Magnet Holds Eraser and Pencil On Typing Stand or Table

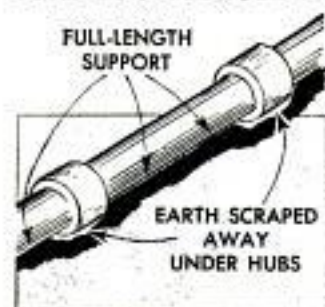


Attached to the underside of a typing table or stand, a magnet of suitable strength will prevent an eraser or pencil which has been placed above it from falling off. Both the eraser and pencil should be fitted with some steel, such as a pocket clip, so that the magnet will hold them. This may be used only under thin wooden and hard-board tables. Before the magnet is attached permanently, it should be tested to determine whether or not it is strong enough to hold the articles in place in spite of the vibration caused when the machine is in use.—E. R. Haan, Evanston, Ill.

## Refinishing a Brass Lamp

When the finish on a brass lamp that has been lacquered becomes dull and marred, remove the remaining lacquer with denatured alcohol. Then wash the lamp with hot, soapy water, rinse and dry thoroughly. Finally, give it a new coat of lacquer, using only a transparent metal lacquer applied with either a high-quality paintbrush or a spray gun. A careful refinishing job will give any brass lamp the appearance of being brand new.

## Properly Installed Clay Tile Will Last Indefinitely



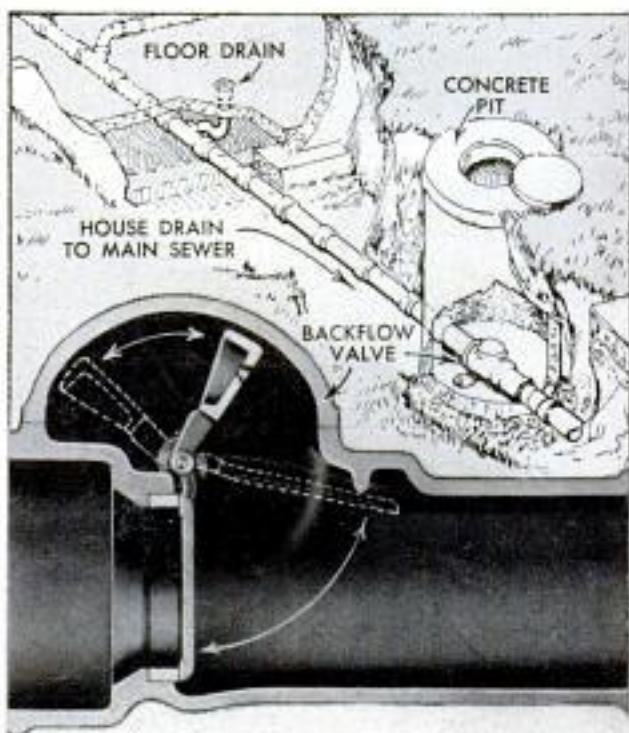
Vitrified-clay pipe, which usually will last indefinitely unless subjected to unusual strains, often breaks because of improper installation. The most common error is to

*Available larger plumbing supply houses*

lay the hubs, or bells, of the tiles on compacted earth, so the rest of the pipe is unsupported and subject to easy cracking. Dig shallow depressions to permit the hubs to be recessed so the full length of the pipe is supported. Also, remove rocks or stones from beneath the tile. A second mistake often made is to omit calking joints before filling them with mortar. The mortar enters the pipe and causes a partial obstruction even before the pipe is used. Calk each joint properly, then seal over the calking with mortar.

## Backflow Valve in Sewer Line Keeps Basement Drains Dry

One method of preventing water from backing up through basement floor drains when a sewer is temporarily overloaded is to install a backflow valve in the sewer between house and street. If the backing-up condition is occasional and mild, the valve can be installed in the line under the basement floor. It should be enclosed in a concrete pit to permit maintenance. The bottom of the pit is poured over several inches of gravel and an opening is provided so seepage from the valve will drain away. When a more severe condition exists, the backflow valve should be installed in a pit away from the house. Insulation must be provided to protect valve and line against freezing. To protect against the possibility of extreme pressure rupturing the sewer behind the backflow valve, a vertical pipe should be installed in the sewer line between the street and the valve. Excess water then will be forced to the surface where provision is made to drain it away.



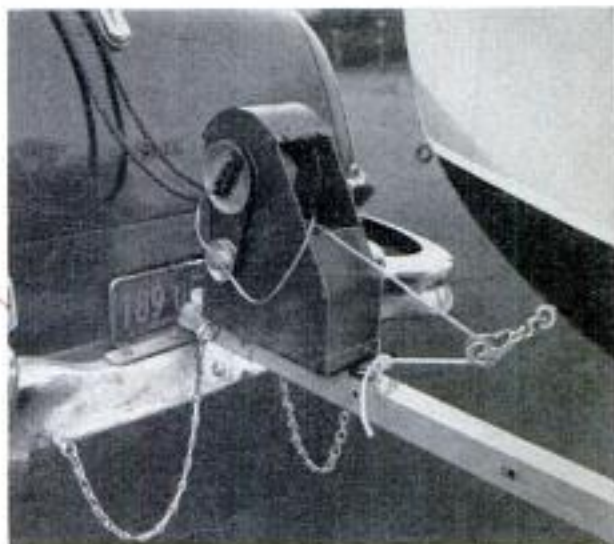


## BOAT TRAILER HAS POWER WINCH

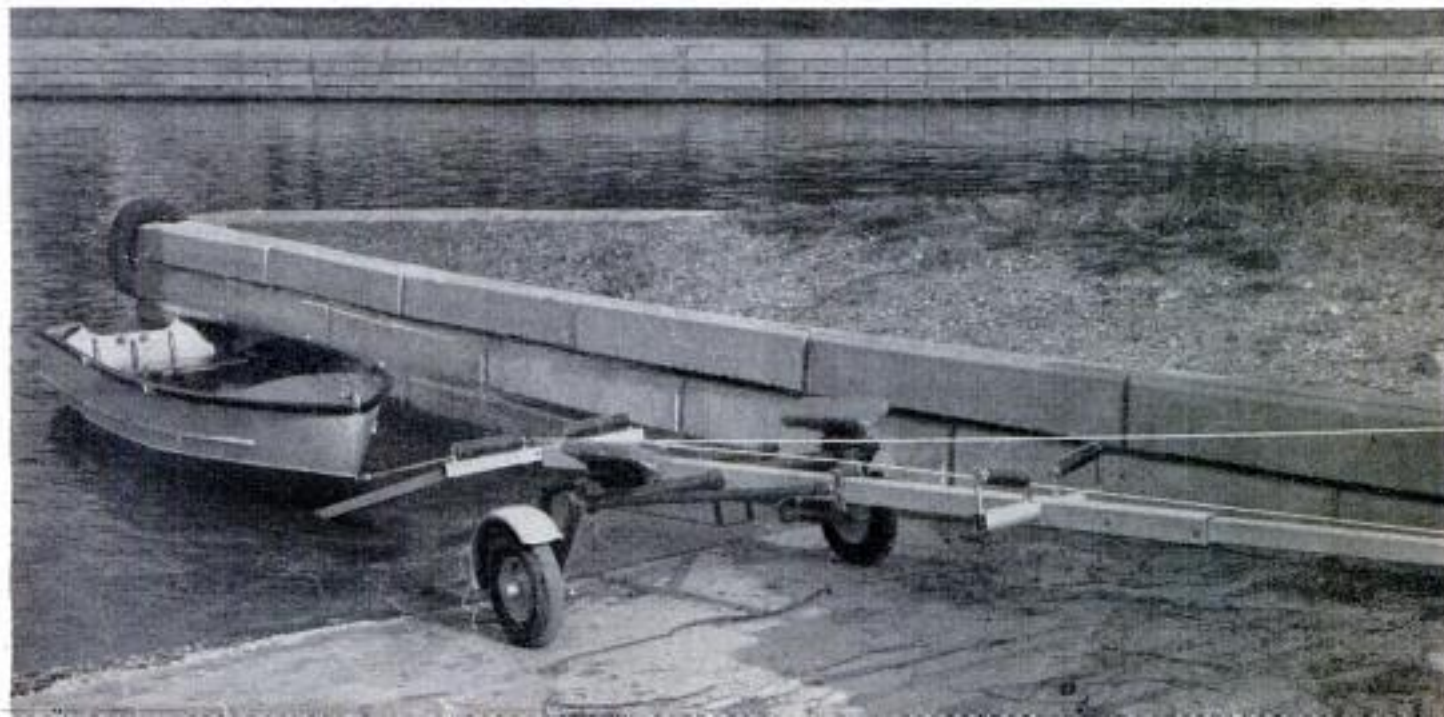
By Joe Ott

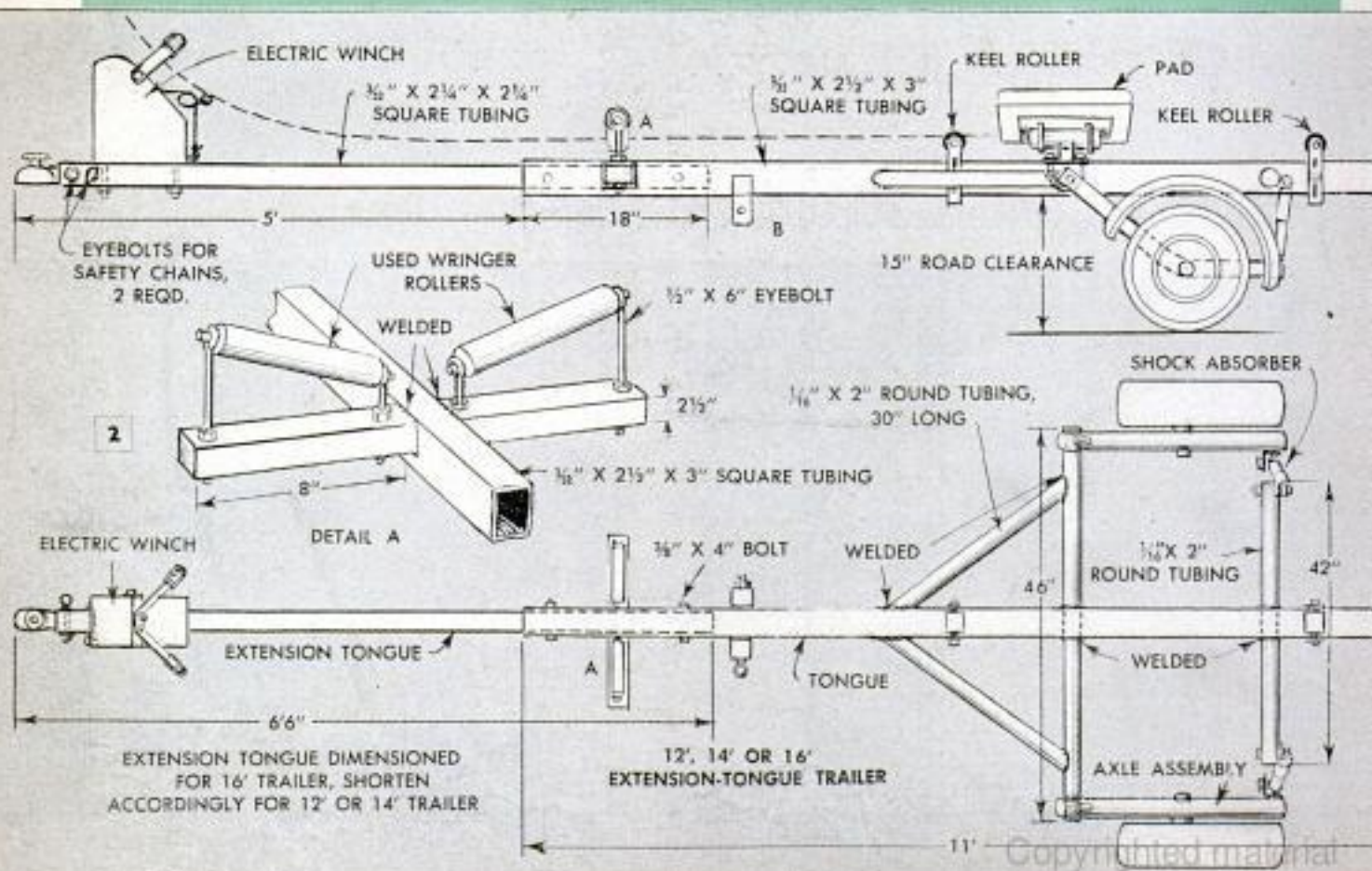
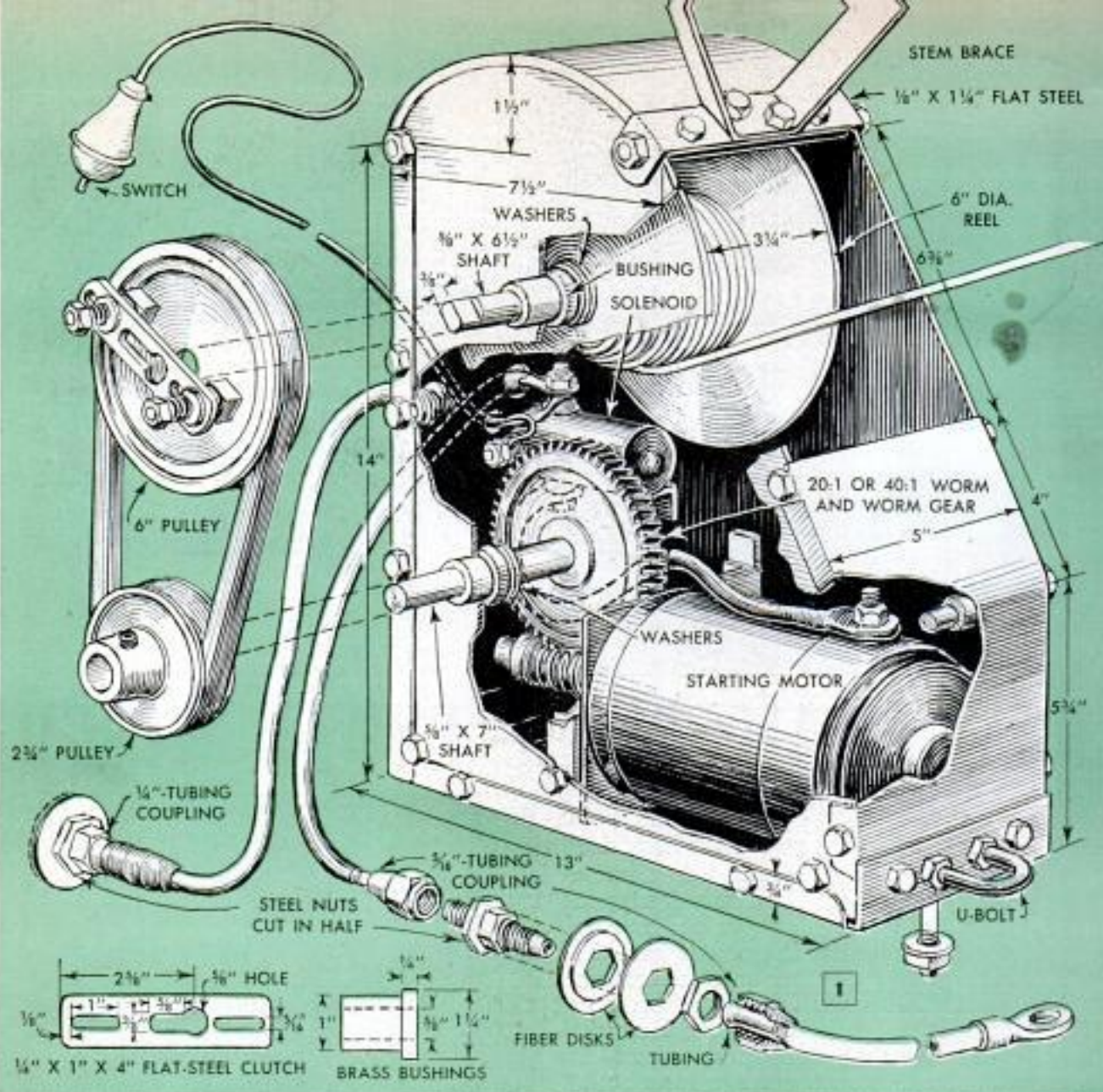
**W**HY WORK when you don't have to? That's the theory behind this electric boat-trailer winch and the ramp-equipped trailer to go with it. You push a button, the car battery supplies the power, and the boat slides out of the water onto the trailer. The electric winch can be used on any standard boat trailer, or on the trailer built from details on the following pages. It features an extension tongue to take boats from 12 to 16 ft., torsion-bar wheel suspension and an 8-ft. ramp which leads from the rear of the trailer down to the water.

The ramp can be added to most trailers with a little modification. Its use means that you no longer have to back the trailer



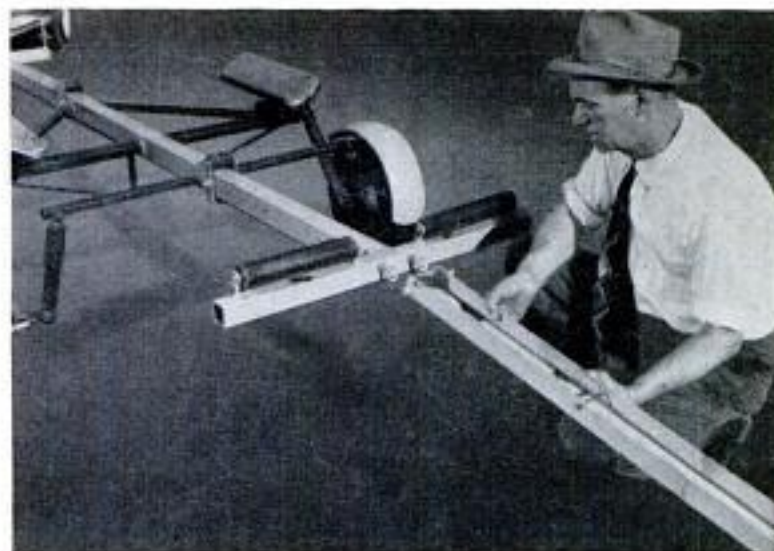
Electric winch, above, and detachable ramp, below, make launching and loading boat almost effortless job





hub-deep water or maneuver the stern of a boat precariously onto rollers that are likely to be several inches above the water. The rear roller of the ramp rests on the beach bottom beneath the water, so it's easy to bring the boat into position. Then you just press the winch button and up she comes.

The winch utilizes a car starter motor to drive a 6-in. reel, as detailed in Fig. 1. The winch housing is made from  $\frac{3}{16}$ -in. sheet steel bolted together as indicated. A starter motor of the type having a long shaft (Ford, for example) is the first unit installed in the housing. A sheet-steel mounting plate is used to anchor it in place. The motor shaft is fitted with a worm, and a worm gear is located after the starter is in position, so the worm and gear can be fitted properly. The worm-gear shaft revolves in bushings set in the sides of the housing. The reel is similarly mounted above the worm gear and is V-belt-driven from a pulley mounted on the worm-gear shaft. To locate the reel-shaft bushings, mount the  $2\frac{3}{4}$ -in. worm-gear pulley on its shaft. Then slip a 22-in. V-belt over this pulley and the 6-in.-reel pulley, wedging a block of wood between the pulleys to draw the belt taut. Use this assembly as a guide for locating the reel-shaft hole in the housing.

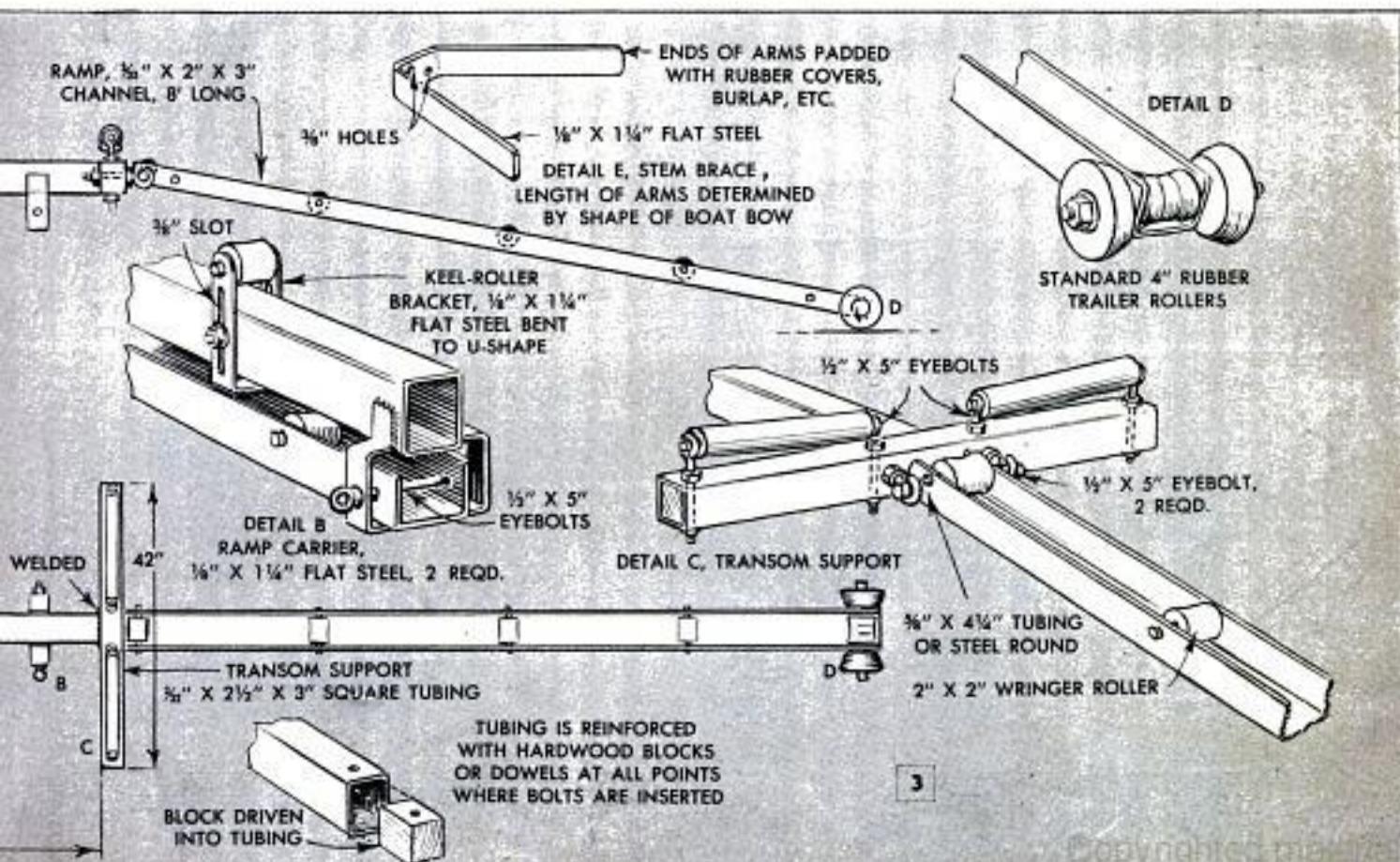


When ramp is to be used, it is slipped over two hooks in transom support. Hooks are 5-in. eyebolts opened to engage tubing in ramp

A  $\frac{1}{4}$ -in.-steel clutch bar is mounted on the reel pulley with two  $\frac{1}{4}$ -in. bolts. The center of the bar is drilled and slotted so it permits the  $\frac{5}{8}$ -in. shaft to revolve freely or engages the tenon filed on the end of the shaft. Each slotted end of the bar is held in place with a washer, spring and nut.

The "hot" lead from the car battery is connected to a solenoid mounted inside the winch housing. Solenoid, starter motor and push-button switch are wired as in Fig. 1. The switch extension cord should allow you to stand alongside the ramp.

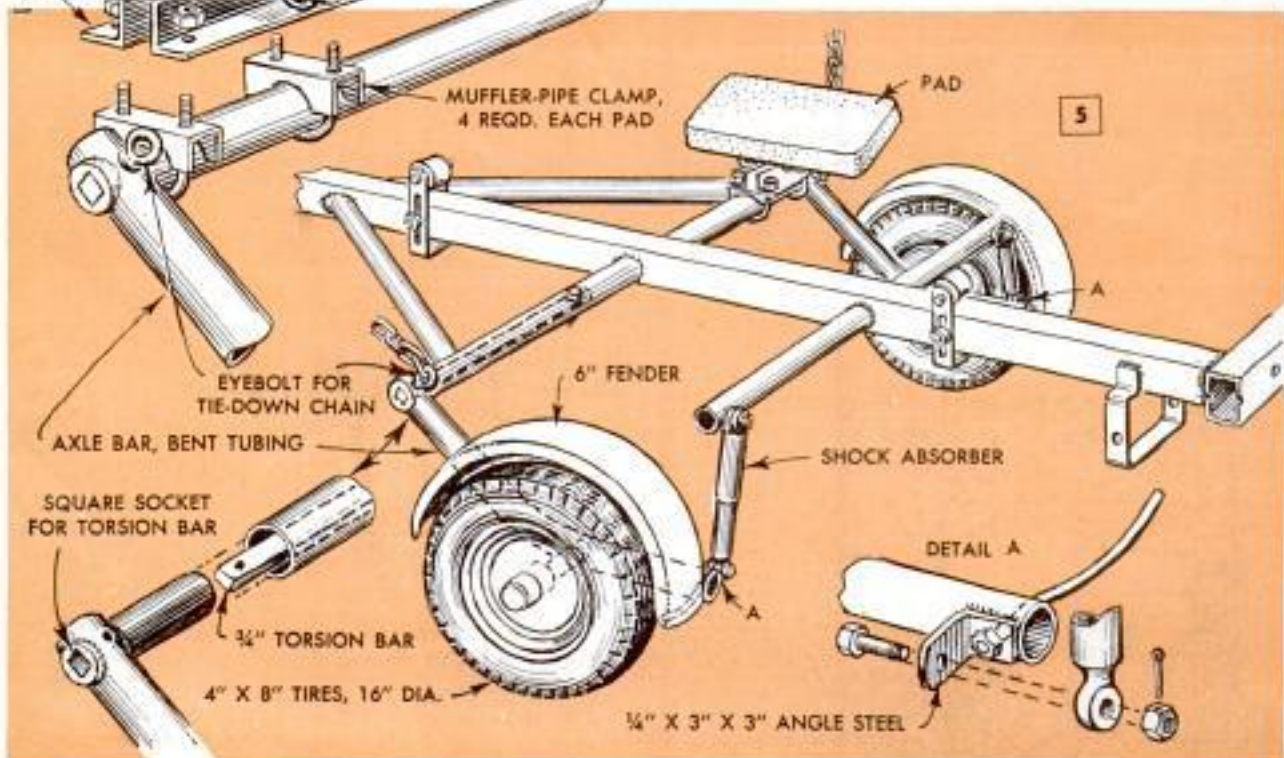
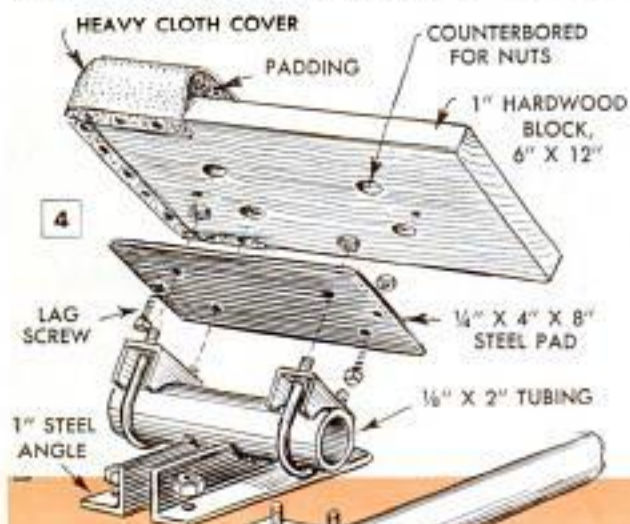
Tubing couplings are used to connect the battery cables leading from the winch to





Boat is tied down on the trailer as in photo above. Note that the transom-support rollers should be raised for this particular hull

Boat is cradled in pads which are mounted on tubing welded to a pair of steel angles, as detailed below



the car. A ground cable which is bolted to the car frame, and a hot cable which is connected to the starter terminal, are brought through the rear of the car body at a convenient location. The hot cable is insulated from the car body with fiber disks. Short lengths of flared tubing are welded to the ends of the cables, as shown in Fig. 1, so the coupling nuts hold the cables tightly on the male fittings. The latter are fastened permanently to the car body with steel half nuts. When the trailer is unhitched, the coupling nuts are unscrewed in a matter of seconds to disconnect the power supply.

Actual construction of the trailer is comparatively simple, as shown in Figs. 1 to 5. The extension tongue is bolted inside the main tongue and the wheel assembly is installed as in Fig. 5. The torsion bar, axle bar, wheels and fenders may be purchased as a unit and merely mounted on the main tongue. Shock absorbers are bolted between the axle bars and a length of round tubing. Both the axle bar and the shock-absorber tubes are passed through the tongue and welded in place.

All rollers are made from washing-machine-wringer rollers which are cut to the desired length. In the case of the bow support, detail A, and the transom support, detail C, the eyebolts permit adjusting the roller angles to match the hull. ★ ★ ★

## Two Ways of Removing Wrinkles When Applying Wallpaper

1st. LOOSEN PAPER FROM DOTTED LINE AND STRETCH UP

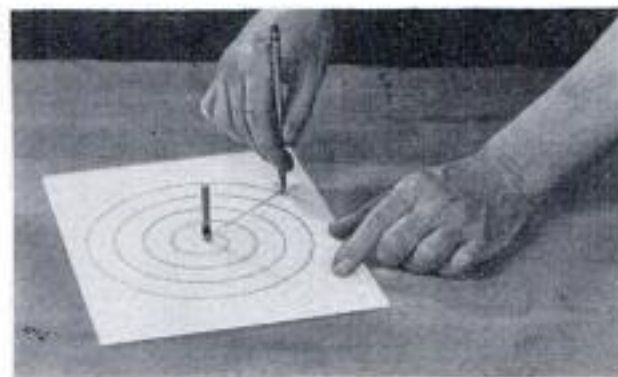


Wrinkles that appear in wallpaper being applied to irregular wall surfaces can be eliminated by one of two methods. First, when the paper pulls tight over a bulge in the wall and wrinkles in an adjacent hollow, pull the moist paper away from the wall and slightly

stretch the portion over the bulge. Smooth the paper back onto the wall. Second, if the wrinkle persists, make a cut with razor blade or pair of scissors near the edge of the wrinkle and overlap the cut edges. To be least noticeable, a horizontal cut made above eye level should have the lower edge lapped over the upper. On cuts below eye level, reverse this lap. On vertical cuts, the overlap should be on the side away from a light source.

## Compass for Drawing Spiral Made From Dowel and Thread

Drawing an accurate spiral is no problem when a dowel-and-thread "compass" is used. Drill a hole in the end of a short length of dowel and drive in a phonograph needle or a nail with head removed and filed to a point. The diameter of the dowel should be approximately one third the distance required between the lines of the spiral. Cross-drill a hole near the bottom of the dowel, run a heavy thread or light cord through and knot it. Tie a small metal eye in the opposite end of the thread to receive a pencil. To make a spiral, drive the dowel needle through the paper into a drawing board. Wind the thread around the dowel without crossing any turns. Hold the thread taut with a pencil held in the eye and circle the dowel until the desired spiral diameter is reached.



JULY 1955



## School Chair in Small Kitchen Provides Snack Counter

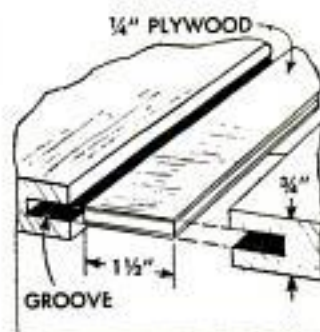
To conserve space in a small kitchen, one mother used a classroom chair as a snack counter for her young son. The chair requires a minimum of floor space and the wide right arm provides enough table area for a sandwich and a glass of milk. After purchasing the chair, she finished it to harmonize with the color scheme of the kitchen.—Olive Henry, Helena, Mont.

## Damaged Hot-Water Bottle Used With Salt as Heating Agent

When a hot-water bottle begins to leak, don't throw it away. Instead, heat ordinary table salt in the oven and pour it into the bottle. The salt will hold heat for a considerable length of time, and will permit continued use of the bag long after it would normally have been thrown away.

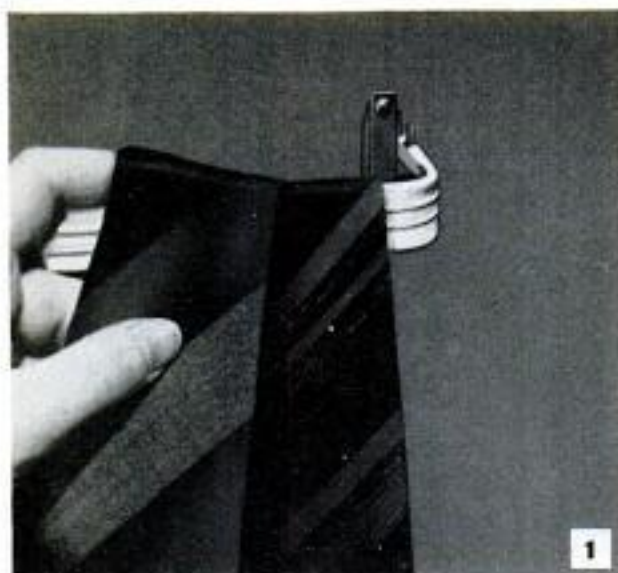
## Splined Joints Strengthen Glued-Up Wooden Panels

A wood panel, such as a table top, that consists of several boards butt-joined and glued together, will be considerably stronger if the joints are splined. Splines of  $\frac{1}{4}$ -in. plywood are used, and should be cut so the top and bottom grain is at right angles to the edges of the boards. The total depth of the two spline grooves at each joint should be at least  $\frac{1}{8}$  in. more than the width of the spline, to allow space for excess glue. Clamp the panels together firmly while the glue is drying.



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## Versatile Curtain Rods Can Be Handy

By R. F. Donovan

1. The curtain rod, either round or flat, can help around the home in many ways. For example, a tie or belt rack that is adjustable to fit the exact width of a closet door can be made by using an ordinary flat-type curtain rod. This same type of rack may be used in the kitchen for dish towels and in the laundry for conveniently hanging small articles to dry

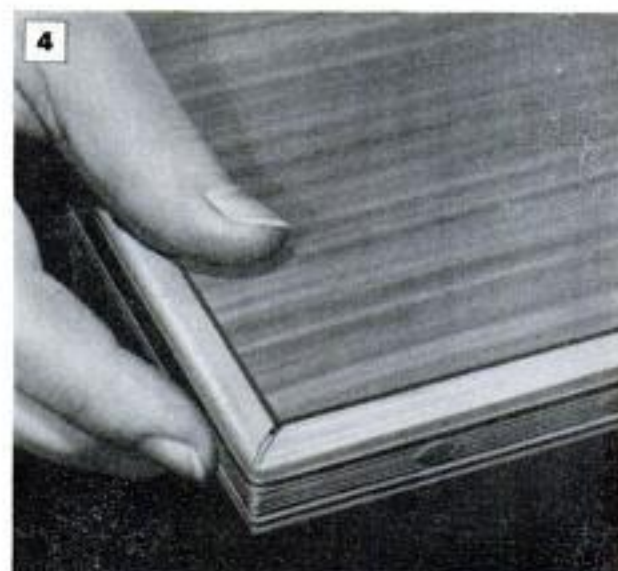
2. If you want to install a hanging-type file in your desk, a flat curtain rod will provide inexpensive tracks. First, a wooden strip is nailed to each side of the drawer, high enough so the hanging files will clear the drawer bottom. Then a flat curtain rod is split lengthwise and half of it is tacked to each wooden strip, as shown in the photograph

3. Flat curtain rods can be used to provide spice shelves that are built quickly and yet are attractive and practical. Just mount a small plywood shelf on the inside of a kitchen-cabinet door, over the range or in some other convenient place. Then install a curtain rod as shown, to act as a fence. This will keep the containers in place, handy and visible

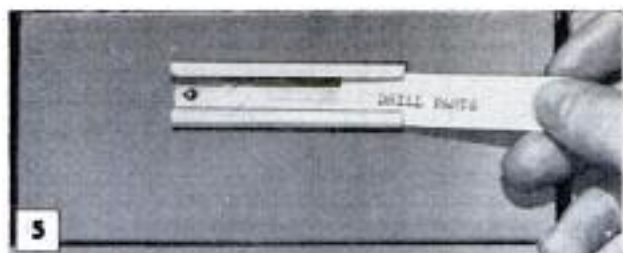
4. Tables, shelves, cabinet tops and other plywood panels can be given an inexpensive metal edging through the use of discarded curtain rods. First, open the folded edges of the rod enough so that it can be clamped over the edge of the plywood. Cut out V-shaped segments, as shown, to go around sharp corners. For rounded corners and longer curves, flatten the edges of the rod slightly. Attach the edging firmly in place with small screws or long escutcheon pins

5. Cabinets, file drawers and storage boxes should be labeled for convenience. Neat holders for such labels are made by cutting a flat curtain rod into short lengths and mounting as shown. Round all corners and sharp edges with a small file and bend them in to hold the label firmly. A strip of sheet plastic inserted over the label will protect it from dirt

6. An extension holder for matches proves useful in many ways: When lighting an oil-burning space heater; when trying to reach an awkwardly placed lighting port in a gas oven, when lighting overhead candles and high-set sconces. You don't have to make such an extension, but simply insert the lighted match in the eye of a standard tubular curtain rod





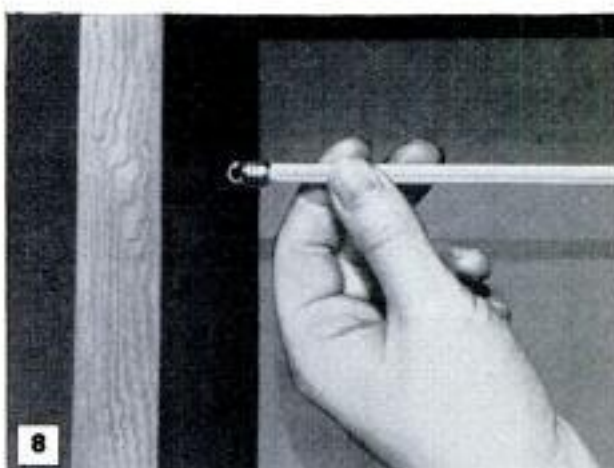
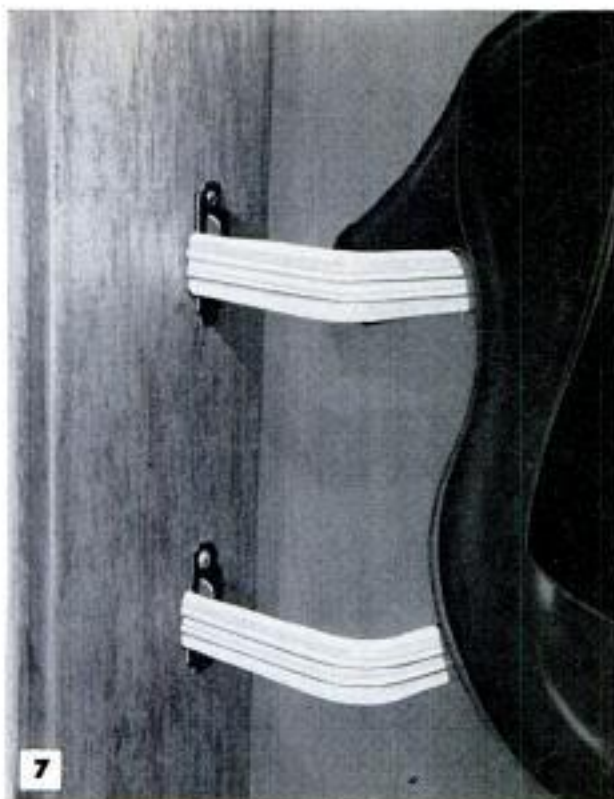


7. Flat curtain rods can provide a space-saving shoe rack on the inside of a closet door. First screw the upper bracket in place and install the rod. To space the lower rod, hang a shoe over the top rod as a guide. Women's shoes will hang nicely in this rack. For men's shoes, use wooden blocks under the bottom brackets to give the proper outward slant

8. Taking inside measurements when putting up shelves is simple if you use a tubular curtain rod as a giant "caliper." Pinch the rod slightly out of round so it does not slide too easily and will hold any set length, and then press the ends against the cabinet sides. For accuracy, make sure it is level

9. Mount the brackets of a flat curtain rod high on the back of a closet door and also on a wall or door at a spot near the ironing board. Then, when hanging space is needed in either of these places, it is a simple matter to place the rod over the brackets

10. Flowerpots on a window sill or shelf are apt to be knocked off and broken, especially if there are children around. To eliminate this danger, fit a flat curtain rod across the sill, and paint to blend with the woodwork. It is removed easily when cleaning



## Weed-Killer Applicator Made From Pipe and Sponge



To avoid damage to nearby grass or plants it is often necessary to apply strong weed killers to individual weeds with great care. If no special applicator is available for this purpose, one can be improvised by forcing a sponge into one end of a length of pipe. Then pour the liquid weed killer into the open end of the pipe and apply to the weed as indicated in the illustration. A slight pressure of the sponge on the weed will usually release enough of the fluid to kill the weed.

## Matches Kept With Blowtorch



Matches will always be at hand for lighting a blowtorch if a book of them is kept on the tank with a rubber band. Locate the matches as far from the torch flame as possible, and keep the book cover closed when not in use.

## Carbon "Tet" Renews Rollers Of Washing-Machine Wringer

When old washing-machine wringer rollers have become softened and unusable, they can be renewed by washing them with carbon tetrachloride. Remove the rollers from the wringer and wipe them with a clean cloth saturated with the tetrachloride. A thin layer of "dead" rubber will be removed, leaving the rollers with a tacky

surface. As soon as the tetrachloride dries, the rubber will become smooth and firm. *Caution:* Use the carbon tetrachloride in a well-ventilated space. The fumes are toxic if inhaled.

Andrew Vena, Philadelphia, Pa.

## Quick-Acting Wooden "Clamps" Hold Picture in Frame

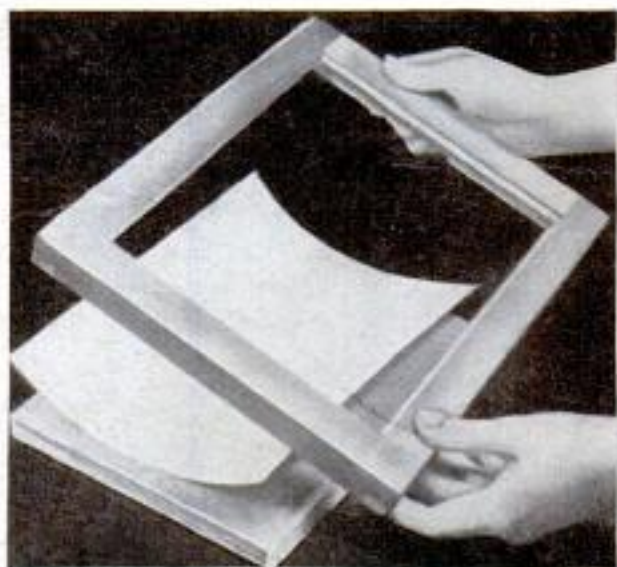
When pictures are frequently changed in a frame, as when used for display purposes, quick-acting "clamps" to hold both picture and glass in place can be made from thin, narrow strips of hardwood. The strips are cut slightly longer than the inside width of the frame so they must be bowed to fit. The clamps hold firmly with the spring of the bow, yet can be removed in an instant. For a small picture frame, one clamp might be sufficient if it is centered.



## Paper Holder for Enlarger

A handy paper holder for making standard-size photographic enlargements can be made from an old printing frame. A piece of  $\frac{3}{4}$ -in. plywood is cut to the exact size of the paper to be used. The paper is placed on this backing, and the frame is then fitted over it. It will hold the paper smoothly in place and will provide even white margins. To keep the frame in exact position while focusing, rubber feet should be attached to each corner of the backing.

Hugh Lineback, Stillwater, Okla.



WTM 157



# PLAYTIME COTTAGE

## PART I

By Edward Mickley

YOUNGSTERS never tire of a playhouse, especially when it is equipped with electric lights and furnished with tables and chairs, bunks for overnight sleeping and even a puppet stage. And because this little house, with its front porch and picture window, looks like a real grown-up house, they'll love it even more. The materials for the basic house cost about \$75. Additional costs for finishing the interior depend on how much you do.

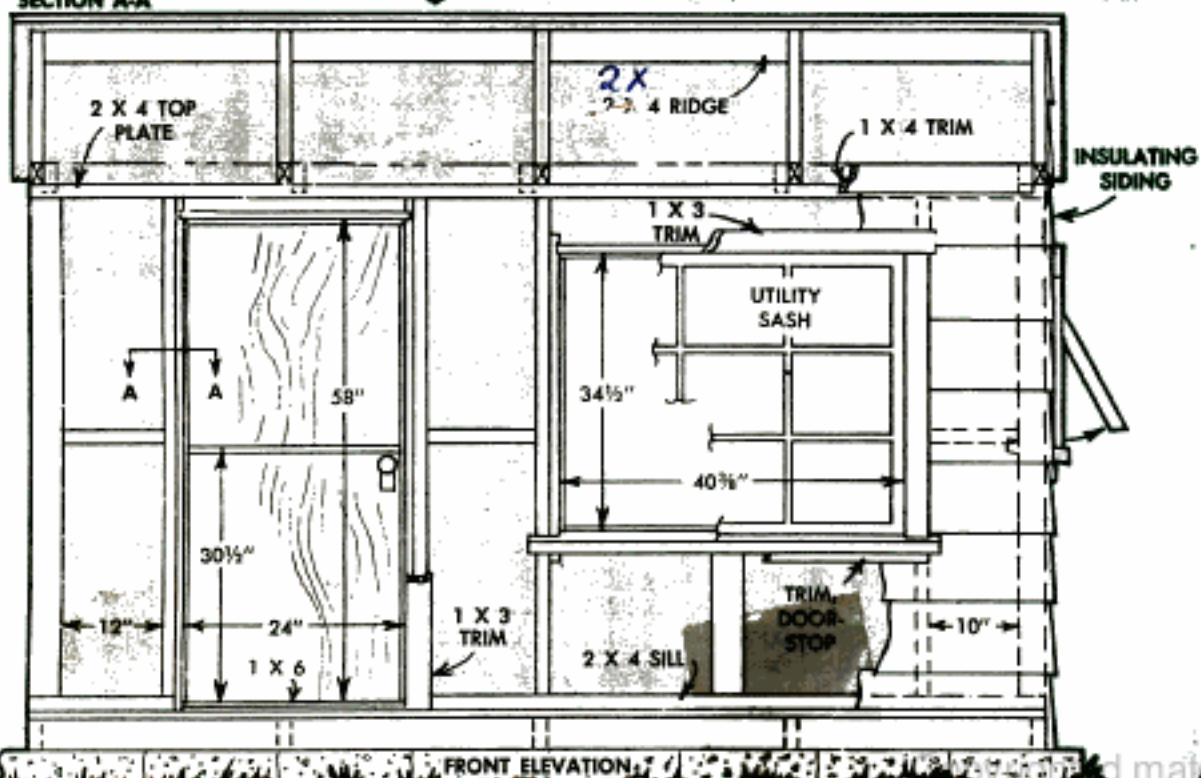
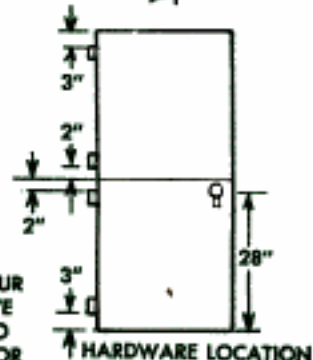
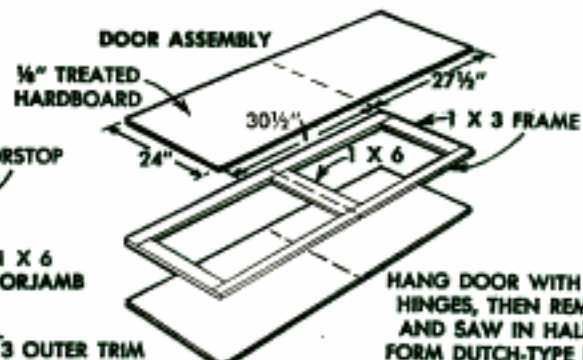
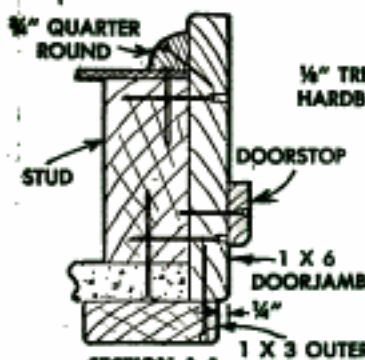
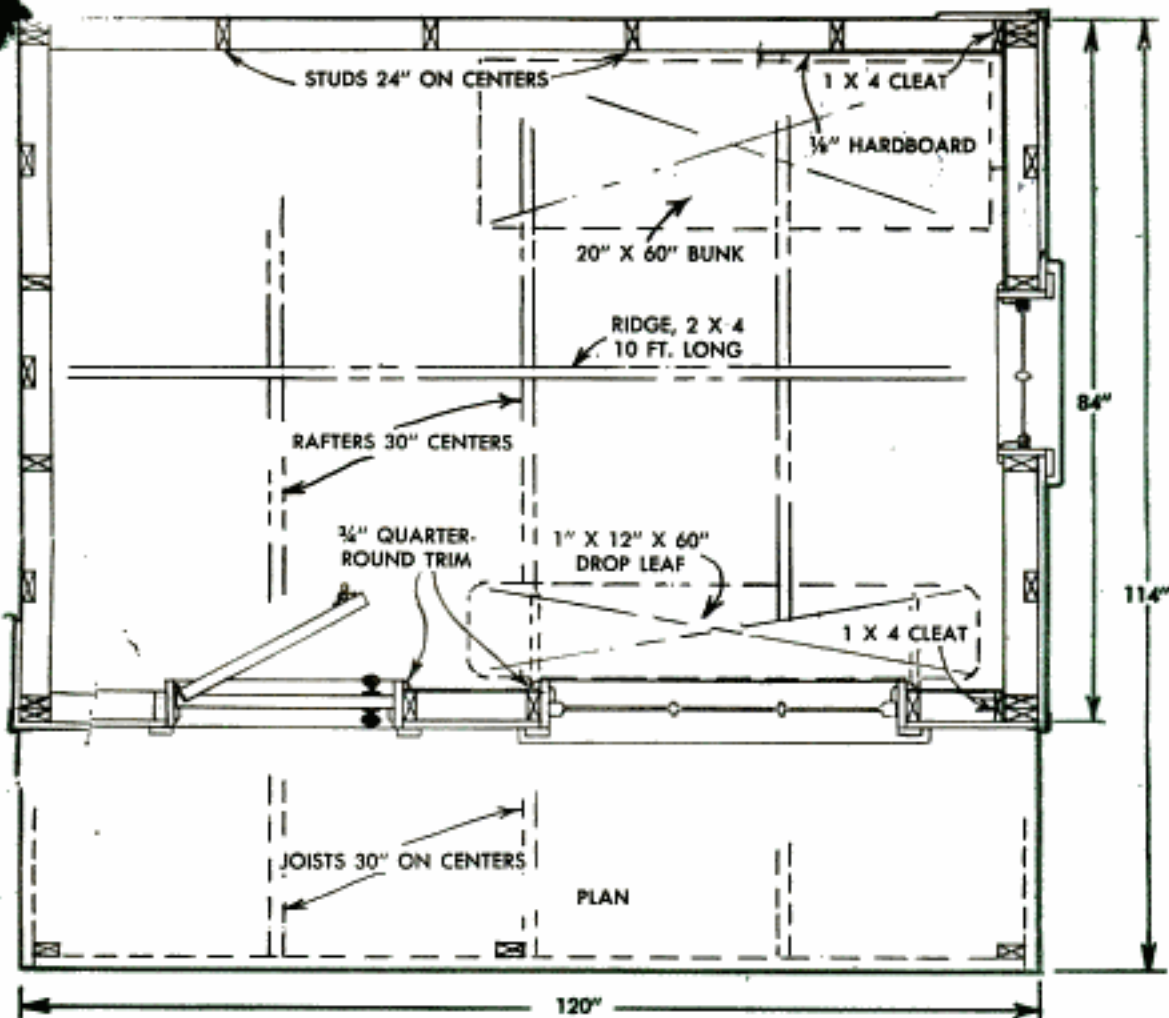
Start the actual construction by framing the floor, using 2 x 4s for joists. The floor is supported on concrete-block piers laid on the ground. Leave the porch unfloored until later, but lay the floor of the house proper, using 1 x 6 tongue-and-groove lumber.

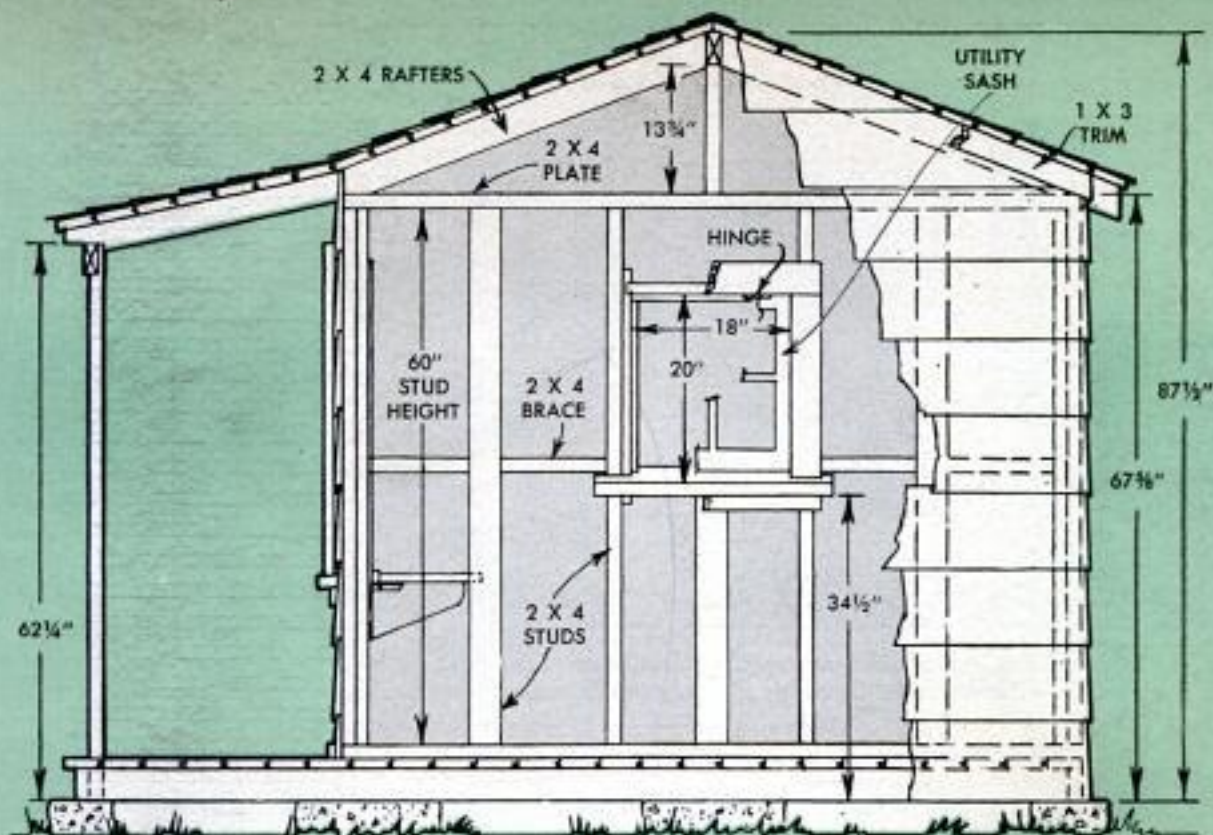
Build each wall framework separately and then tip the sections into place. Brace each section temporarily until all four walls are erected and nailed together at the corners. Next, cut the roof rafters and nail them to the top wall plates. The porch-



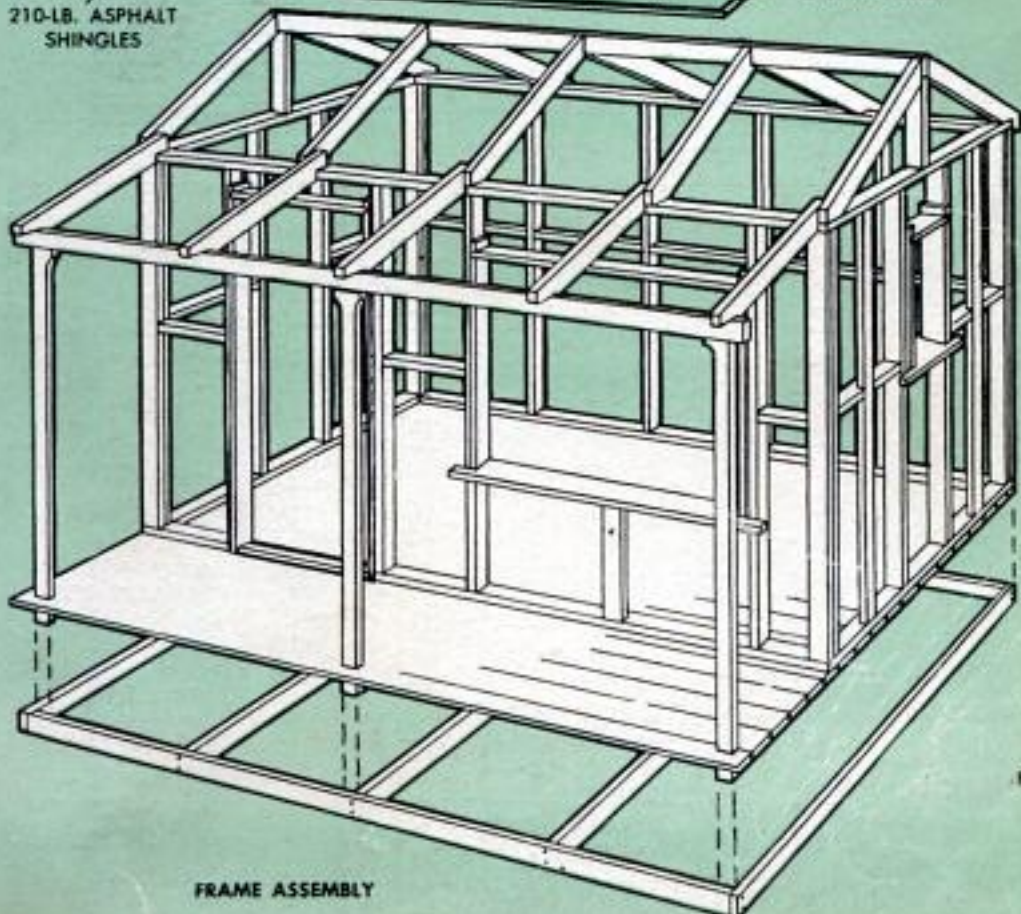
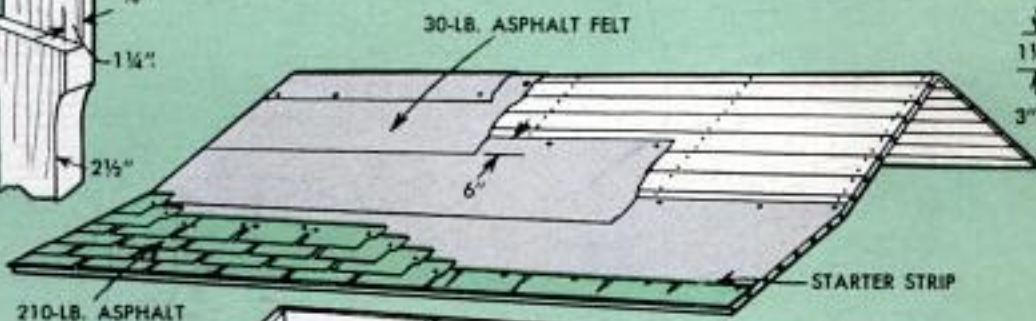
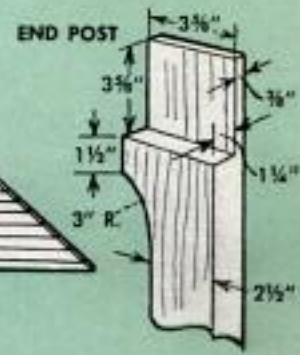
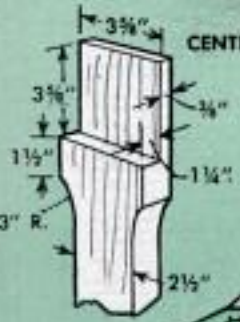
roof framing is supported by three 2 x 4 columns which are notched at the top to lap a 2 x 4 horizontal member to which the porch-roof rafters are nailed. The porch flooring can be laid now, notching it around the supporting columns.

Windows are standard utility sash set into frames made of 1-in. pine. Buy the sash first, then build the frames around them. Fit the sill members at a slant to drain water. The door opening is framed in the same manner as the windows. All windows are hinged at the top to swing outward. The roof sheathing is applied next. Nail either 1 x 6 or 1 x 8 boards to the



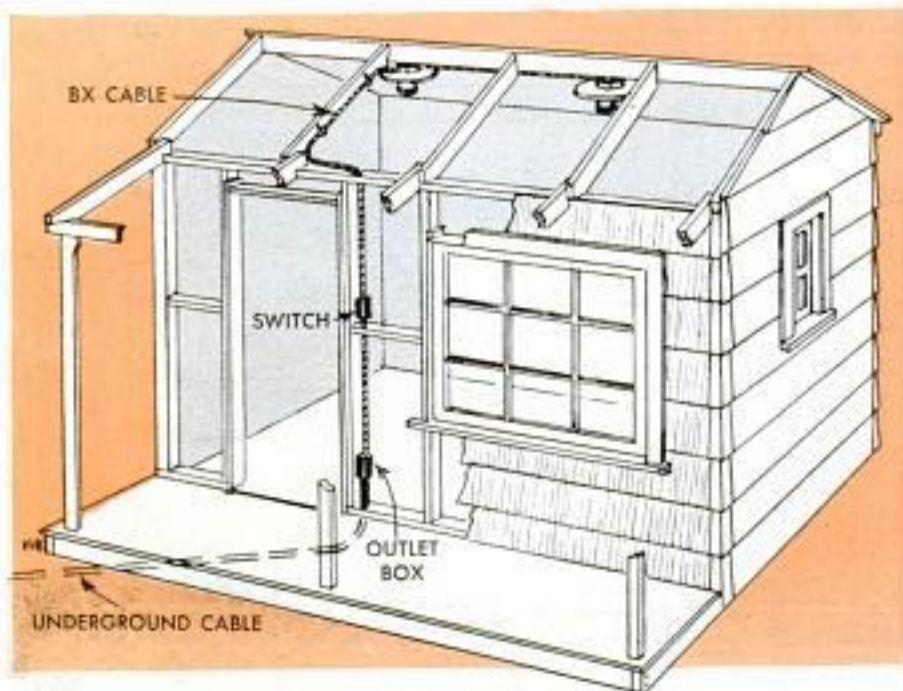


SIDE ELEVATION





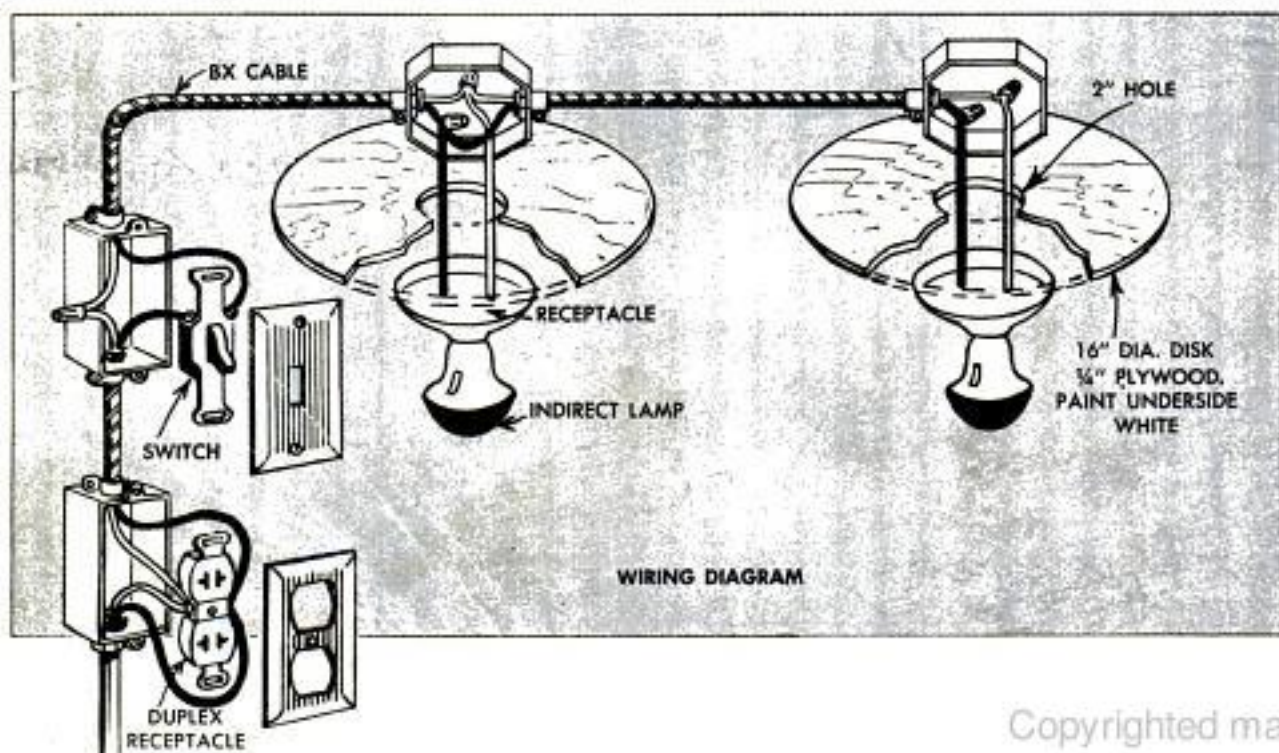
Using insulating siding saves both money and installation time because it forms the outer weather-resistant surface and the exterior wall at one time



roof rafters and trim them off flush with the gable ends. Shingle the roof with regular 210-lb. asphalt shingles applied over a base of 30-lb. roofing felt. The joints of the felt should be lapped about 6 in.

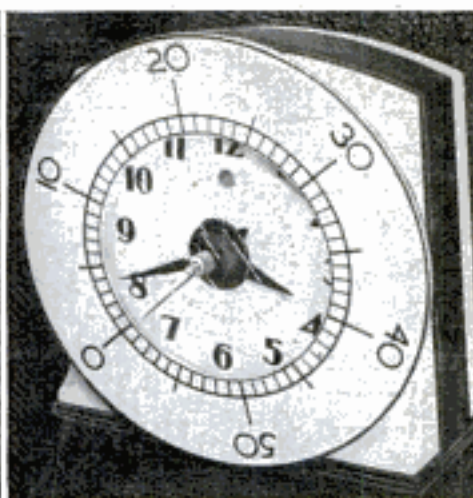
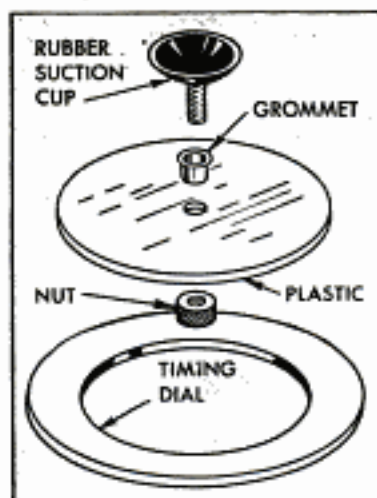
A Dutch door will add endless fun possibilities. The pull-apart drawing on page 178 shows how this door is made. Construction is completed by applying insulating siding to the exterior after which 1 x 3 trim is added around the windows and the door and along the gable ends of the house. The diagram below shows how the house is wired for two lights, a switch and a duplex receptacle. The latter is convenient for plugging in a lamp to light the puppet stage or operating an electric heater on chilly days. The two light fixtures are made from 1/4-in. plywood disks, 16 in. in dia., as shown in the detail. Painted white, these disks act as reflectors, and are held in place by a standard receptacle. Two indirect lamps will provide ample light.

(To be continued)



## Electric Clock With Sweep Second Hand Modified for Timer Use

An electric clock with a sweep second hand can be modified for temporary or permanent use as a darkroom timer by the addition of a timer dial. The dial is a ring cut from heavy cardboard, the inside diameter being slightly smaller than that of the clock face. After the ring is marked into 60 parts, every tenth mark is numbered, as shown in the photo. Next, a disk of clear plastic, with a hole drilled in the center, is cemented to the back of the ring. The assembly is mounted on a screw-fitted suction cup which is attached to the protective glass that covers the clock face. A grommet on the screw prevents the nut from holding the dial too tightly. In use, the

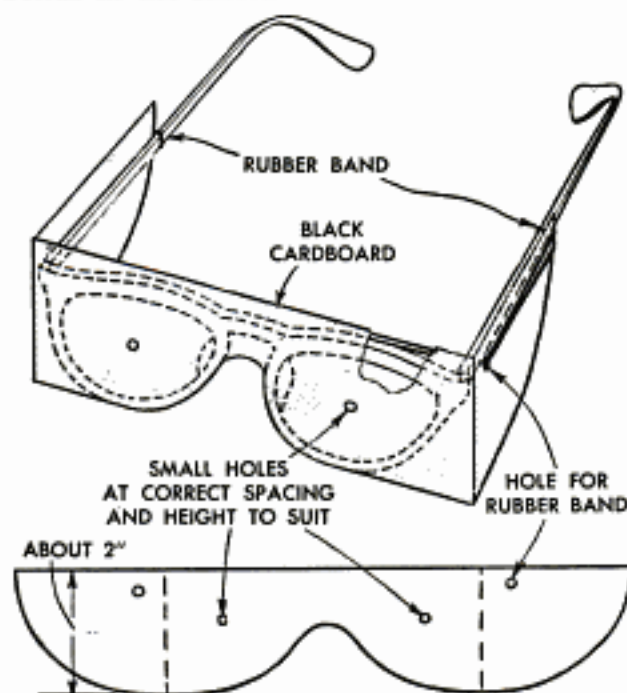


dial is rotated until the zero mark aligns with the sweep second hand, so timing always starts at zero. If the clock is self-starting, it may be plugged into the printer or enlarger so it starts when an exposure is begun.—Richard Hanscom, Elmhurst, Ill.

## Shield Fitted on Eyeglasses Prevents Sun Fatigue and Blindness

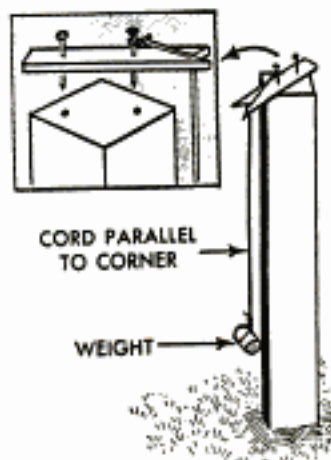
Fitted over sunglasses or regular eyeglasses, a shield that extends back along the temples will protect eyes from fatigue or snow blindness on a sunny winter day or on a bright summer day at the beach. Cut the shield from fairly heavy cardboard to the shape shown in the detail. If black cardboard is not available, paint the inside of the shield with black watercolor paint or cover with dull-finish black paper. The shield is fastened to the glasses by looping a rubber band around each temple and passing it through holes punched near the bends in the shield. The free end of each

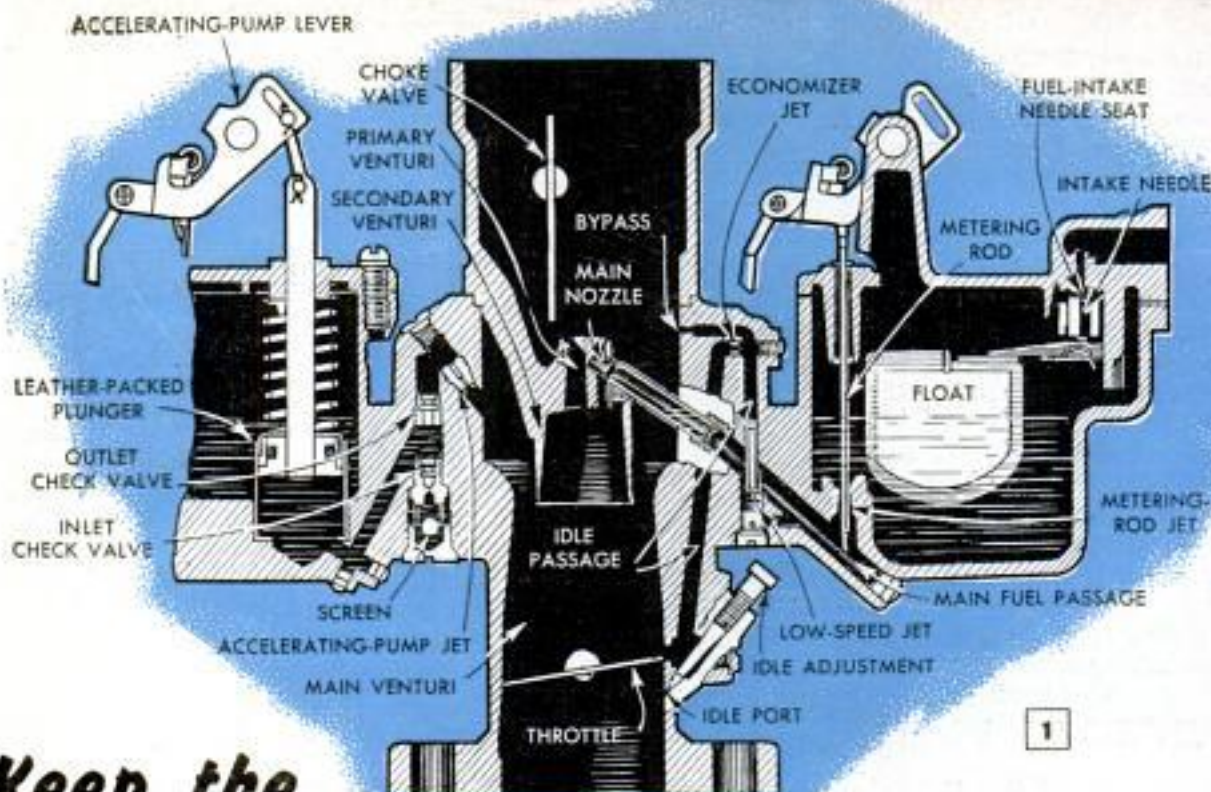
band then is passed along the sides of the shield and looped over the end of the eyeglass temples. Hold a ruler in front of the eyes while looking into a mirror to determine the distance between pupils. Locate the vision holes accordingly. For greater horizontal field of vision, cut narrow horizontal slots instead of the holes.



## Improved Plumb Bob Used To Set Square Fence Posts

If no level is available when setting square fence posts, they can be set plumb by using an improvised plumb bob. A short strip of wood, one end of which is notched, is nailed to the top of each post on a diagonal between corners. A string is tied to one of the nails, passed through the notch and a weight is suspended from it. When the weighted string is perfectly parallel to the corner of the post, the post is plumb. Measure the space between string and post at points near top and bottom to check the plumb in one direction. Sight between string and post corner to determine the plumb in the other direction.





## Keep the CARBURETOR AT PEAK EFFICIENCY

**S**ERVICING a carburetor in good mechanical condition is usually a matter of cleaning with a recommended solvent made especially for the purpose. Solvents can be used in two ways, by feeding directly into the carburetor with the fuel mixture or by pouring a measured quantity of special gum-removing solvent into the fuel tank. Both methods are effective, but the former is much faster

Mechanics use a special gauge for setting the float. Check instructions to be sure of correct setting



By Ed Packer

than the latter. For a fast and thorough job of cleaning, the special solvent container is suspended above the carburetor and a flexible tube is used to conduct the solvent to the carburetor barrel. Then the engine is operated at idling speed on a half-and-half mixture of solvent and gasoline. Accelerating the engine will help to flush all passages thoroughly. Also, it's a good idea to operate it at high speed for a short interval to force solvent through the high-speed jet. Some mechanics use the palm of the hand as a choke to draw the solvent into the carburetor in quantity so that all inner surfaces are thoroughly flushed.

However, if there is any reason to believe that the accelerating pump is faulty or that the float is stuck or the throttle linkage worn, then it will be necessary to dismantle the carburetor in order to repair or re-adjust the parts. Before dismantling the unit, cover a bench with clean paper and then keep all parts in order as they are removed. Parts from carburetors that have been neglected may be badly gummed and will require soaking in a solvent for a half hour or more before blowing clean with compressed air. The parts that should be removed and examined closely for defects are the metering rods, needles and jets and the accelerating-pump plunger, Fig. 1.

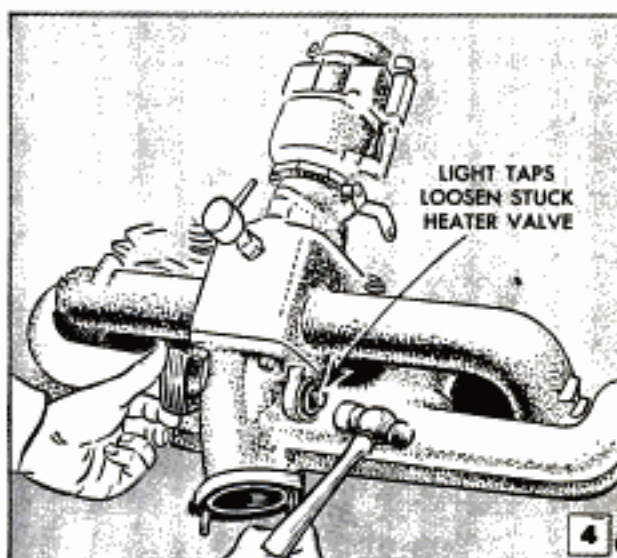
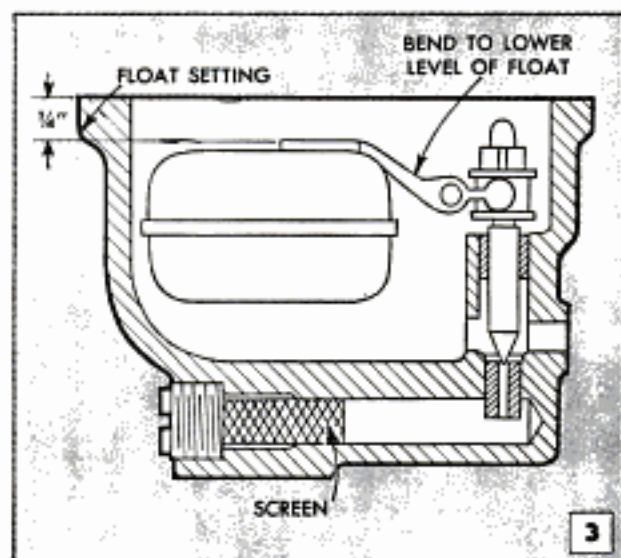


All parts that show signs of wear or corrosion should be replaced. Wearing of the pivots and pins of the carburetor-float assembly causes the float level to rise. This means that the float must move farther before shutting off incoming fuel. A high level of the float can cause the engine to run rough. Hard starting and fuel waste also result. The float level should be checked with a gauge made especially for the purpose, Fig. 2. Although not always recommended as the best practice, it is possible to compensate for wear up to about  $\frac{1}{16}$  in. simply by bending the float arm to lower the level as in Fig. 3. Note that in Fig. 3 the setting is given as  $\frac{1}{4}$  in. but it should be remembered that this may not agree with the recommended setting for all makes of carburetors. Check the manufacturer's instructions before making the final adjustment.

Quick warmup is dependent not only on

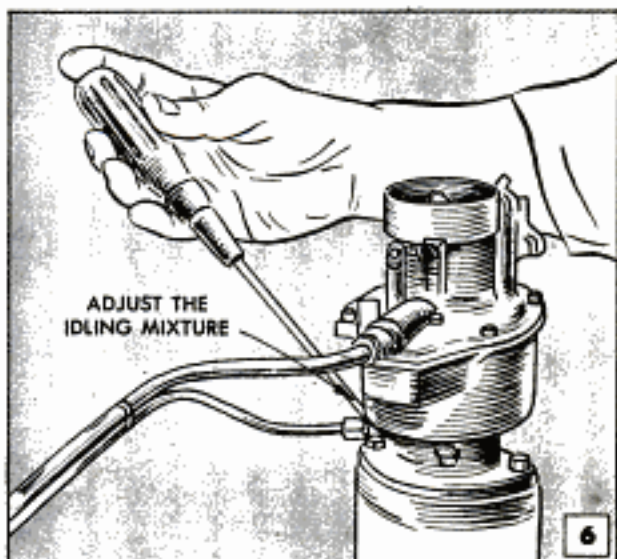
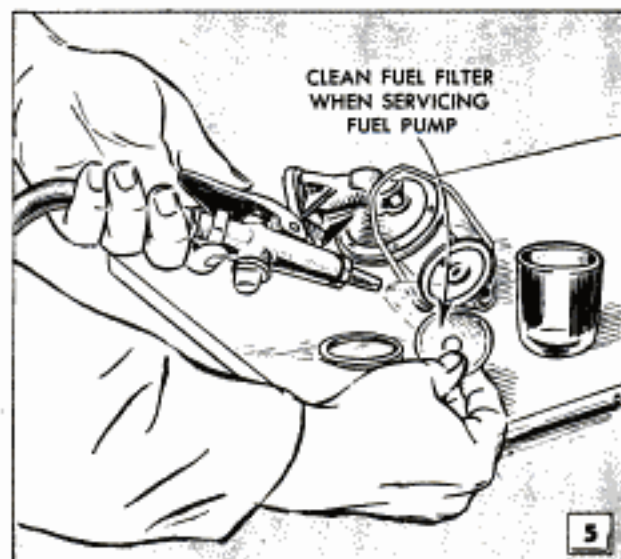
the thermostat in the cooling system but also on the correct operation of the heater valve which directs heat to the intake manifold during the warm-up period. Be sure to check the operation of this valve when servicing the carburetor. Sometimes it sticks and must be loosened with light taps of a hammer as in Fig. 4.

Don't overlook the fuel pump when servicing the carburetor, as the two units are closely interrelated. Clean the fuel filter, Fig. 5, and the fuel-inlet screen, Fig. 3, while the units are disassembled. When the carburetor and pump are replaced on the engine, use all new gaskets and be sure that they are properly positioned. Set the choke controls so that the choke valve is closed with the parts cold. Check later to see that the choke valve is fully open when the engine reaches operating temperature. Adjust the idling-mixture screw, Fig. 6, until the engine idles smoothly. ★ ★ ★



Above, within limits it is permissible to bend the float arm to compensate for wear of parts. Clean the fuel screen while parts are disassembled. Below, always clean the filter when servicing the fuel pump

Above, heater valve sometimes sticks and must be loosened. Replace it if there's any doubt about dependable operation. Below, after servicing the carburetor adjust the idling mixture for smooth operation

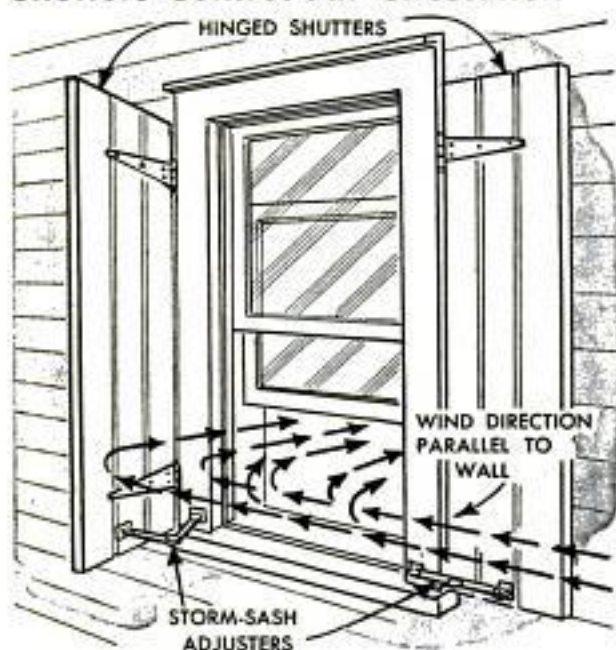


## Garden-Tool Display Rack Made From Nail Keg



Long-handled garden tools are displayed by one hardware-store owner in a portable rack made from an empty nail keg. The top hoop is removed and a piece of chicken wire stretched over the keg. Replacing the hoop and nailing it into place holds the wire tight. Garden-tool handles are slipped into the holes in the wire and held upright. In a windy location, a weight should be placed in the bottom of the keg.

## Shutters Control Air Circulation



Window shutters can be used to control air circulation on hot nights so even a slight breeze moving parallel with a wall will enter a room. Shutters fastened to a house for appearance only should be taken down and hinged to the edges of the window

frame. A friction-type storm-sash adjuster then is installed between the window frame and the lower edge of each shutter. In use, one shutter is swung outward to divert the air into the window, while the other is folded flat against the wall.

## Rings With Reflector "Stones" Locate Pedestrian at Night



Slip-on finger rings with license-plate reflectors as "stones" are worn by the children of one farmer as a safety precaution when walking down a highway at night. The lights of oncoming cars reflect against the rings and locate a pedestrian, even when he is otherwise not visible because of dark clothes.

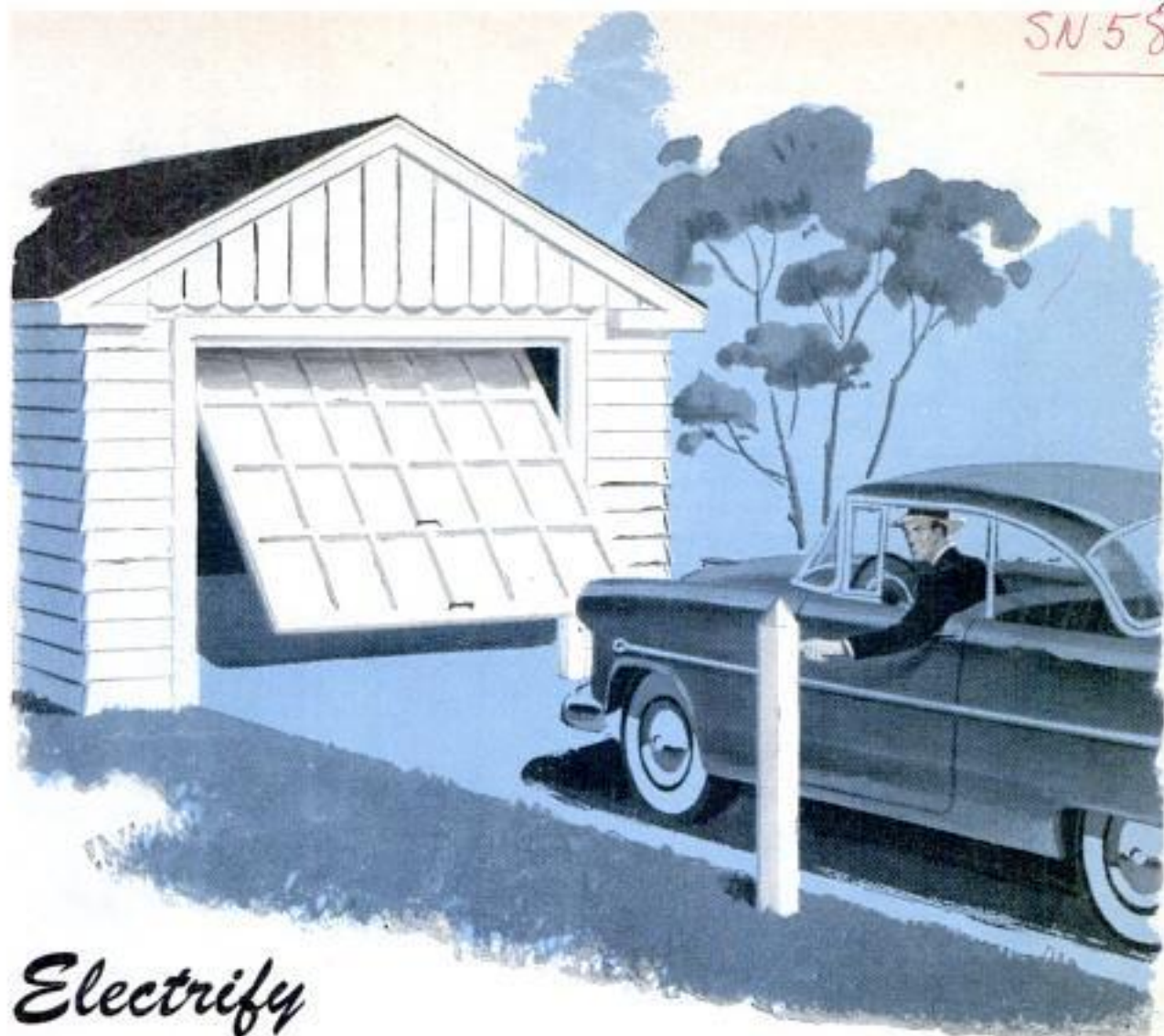
Ken Murray, Colon, Mich.

## Rubber Band Holds Nail to Hammer For Working in Small Space

When working in a small space where you cannot hold a nail for starting, a rubber band can be used to hold the head of the nail on the hammer. As shown in the photo, pass the band around the hammer handle, cross it in front of the face and draw the end of the band through and around the claws. Then slip the head of the nail under the rubber band where it crosses. Not only will this hold the nail for starting, but also will release automatically once the nail takes hold.



POPULAR MECHANICS



## *Electrify* YOUR GARAGE DOOR

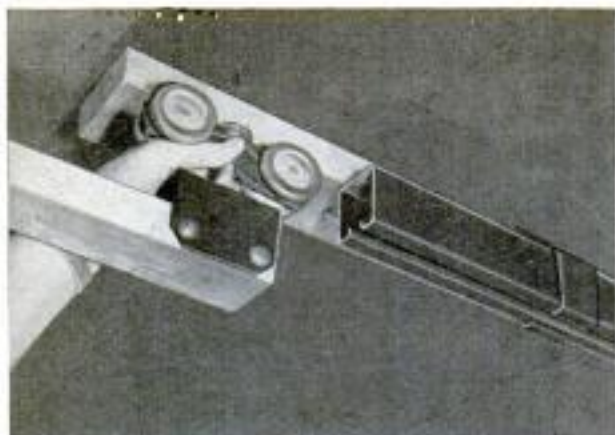
By Tom Griberg

**POWERED BY A** washing-machine motor and gear assembly, this unit opens and closes the garage door by means of remote-control switches. When inside the garage, you press a momentary-contact switch which closes a relay and starts the motor, raising the door to the open position. As the door nears the full-open position, a stop on the lifting bar engages a rod that actuates a d.p.d.t. (double-pole, double-throw) switch, moving the sliding contact points to the opposite terminals, which stops the motor and reverses its polarity. When outside the garage you stop the car at the second momentary-contact switch, which is of the key type and is mounted on a post at a convenient height. Closing this switch starts the reverse cycle and closes the door. As the door reaches the closed position, the d.p.d.t. switch is automatically reset by means of the stop, or tripper, to

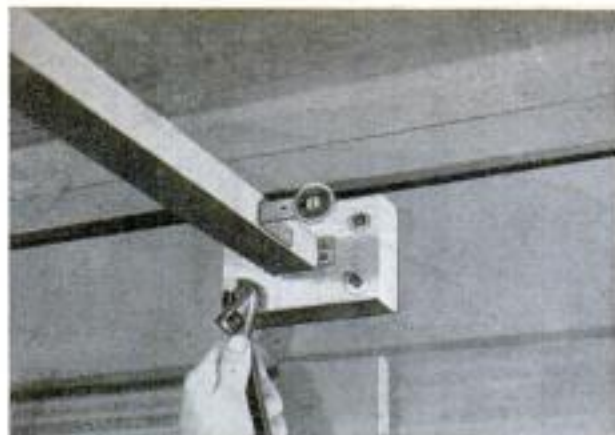
repeat the first cycle for raising the door.

The washing-machine power unit is dismantled and all gear trains removed except the worm and gear which drive the wringer shaft. On some units, the motor is directly connected through a flexible coupling; on others, the gear train is belt-driven from the motor. Either type will operate satisfactorily in the new application provided the belt is not unusually long. Unless you are thoroughly familiar with fractional-horsepower motors, have your electrician dismantle the motor and bring out the necessary reverse leads.

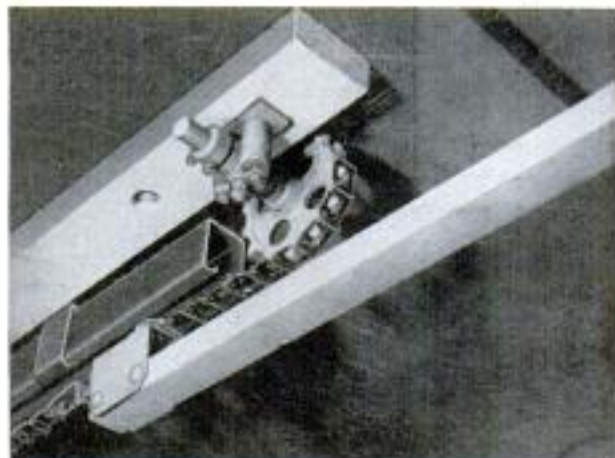
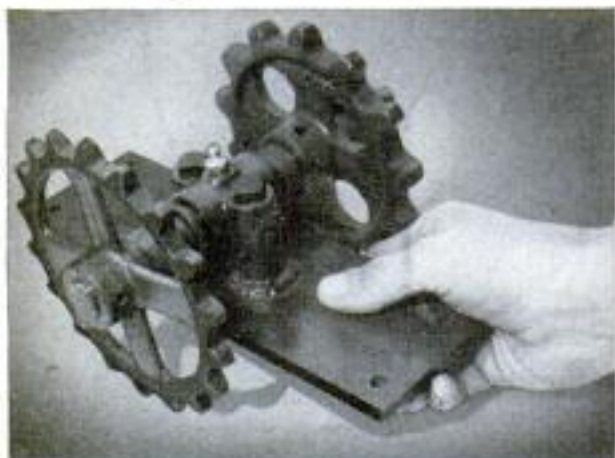
The next step is to assemble and mount the door-lifting mechanism on the ceiling of the garage. This consists of a length of square steel door track, 7 ft. 6 in. long, one roller-bearing hanger, three sprockets 5 in. in dia. and one 2½ in. in dia., also shafting and bearings. You will need about 20 ft.



Above, sliding door hanger into square track. End of lift bar is bolted to hanger yoke. Below, drive and driven sprockets are mounted on steel base



Above, end of lifting bar is hinged to upper rail of door. Below, idler sprocket is mounted at outer end of track. Lifting bar is in the closed position

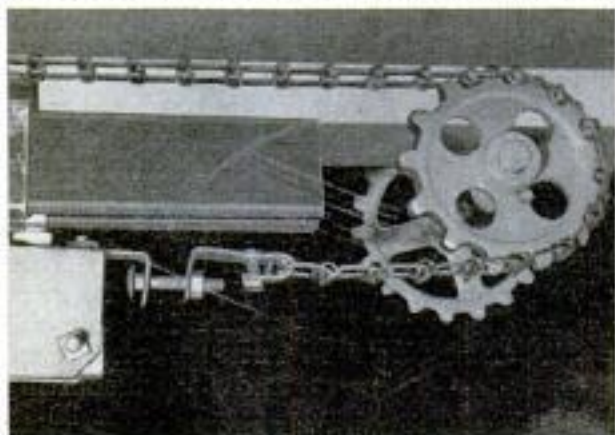


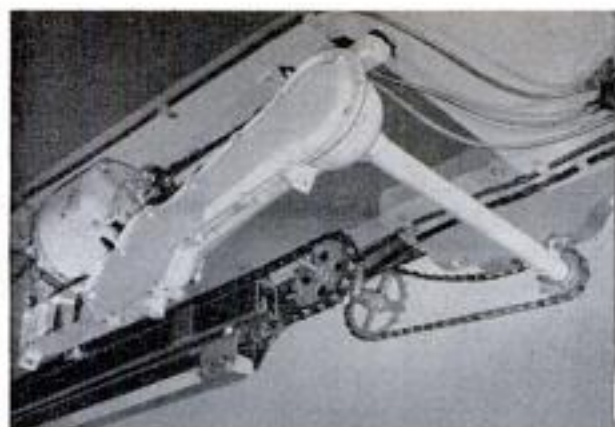
of flat-link steel chain of a size to fit the sprockets. These parts are available from farm-implement dealers. The door track is bolted to a length of 2 x 4 and the whole lag-screwed or bolted to the garage ceiling. The outer end of the track should be about 12 in. from the end of the door when the latter is in the full-open position. The track should be about 6 in. above the edge of the door, and must be located precisely on the center line of the doorframe. With the door closed, measure and cut a length of 1 1/8-in. stock and rip it to a width that will fit in-

side the yoke of the rolling hanger. Bolt one end to the hanger as in the upper left-hand photo above. Attach the other end to the top rail of the doorframe as in the right-hand photo above, using a sturdy hinge and blocking out as shown, to assure that the bar will be parallel with the floor when the door is open. Next, center and mount an idler sprocket on the 2 x 4 supporting the door track as in the lower right-hand photo above, the sprocket precisely on the center line of the track. Then assemble the drive and driven sprockets as in the center left-

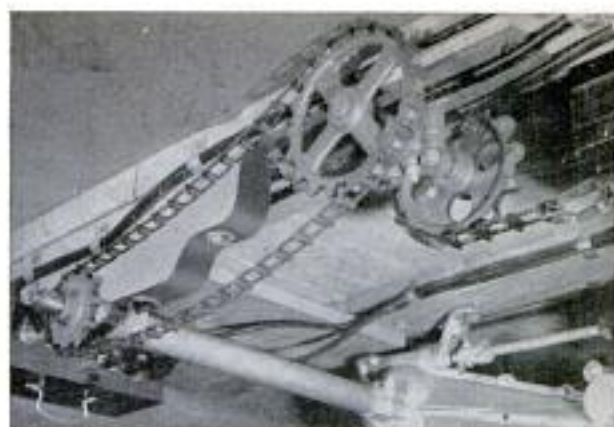
Drive and driven sprockets are mounted at inner end of door track. Note provision for tightening the chain

The completed lifting unit is shown here ready for installation of the power drive. Door is nearly open





Drive unit from wringer-type washing machine provides power lift for raising and lowering the door



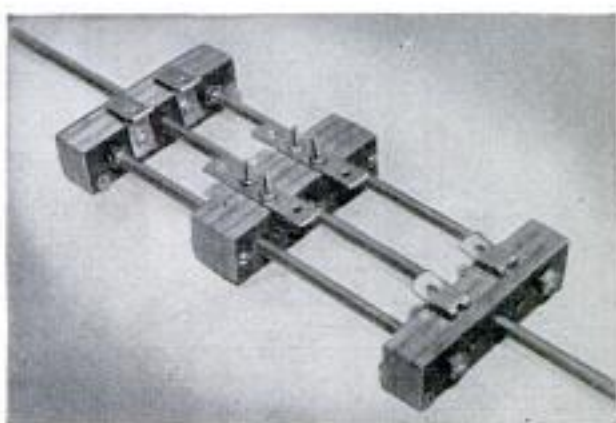
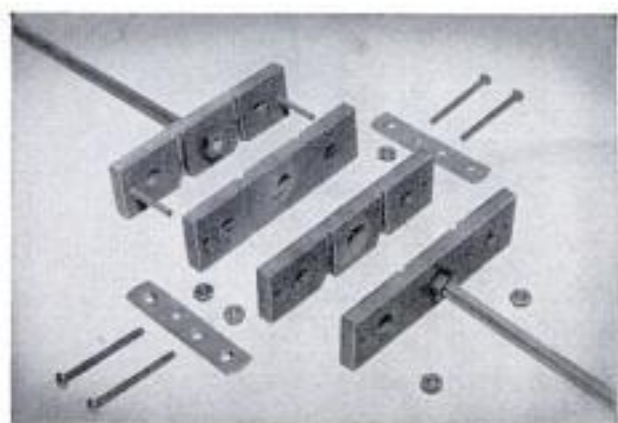
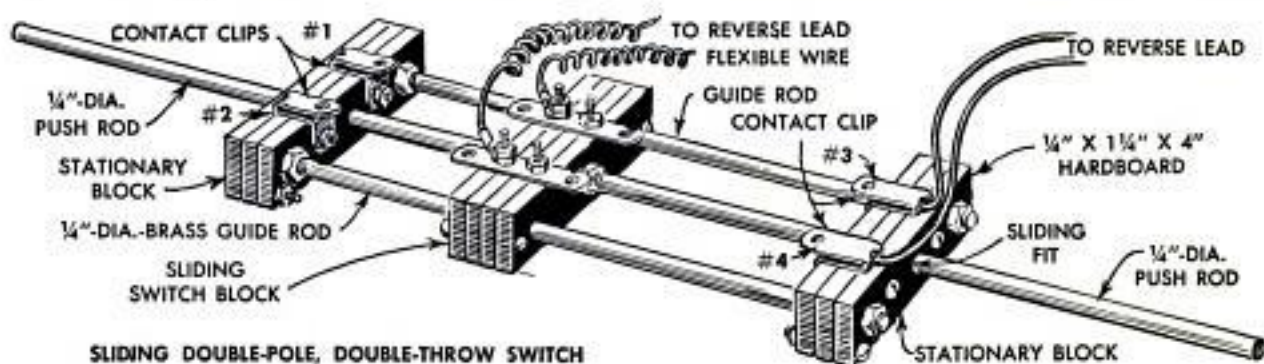
Lift is power-driven by sprocket mounted on end of wringer shaft. Note shape of wooden base blocks

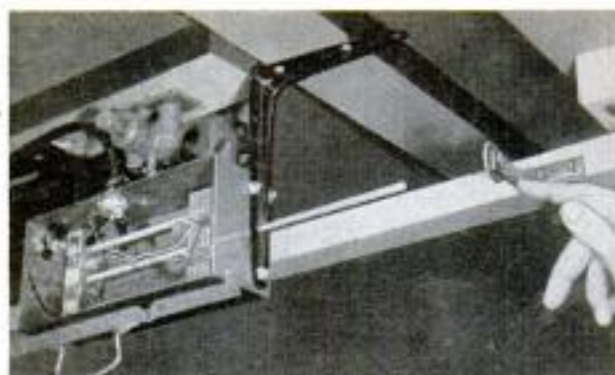
hand photo, page 186, and mount at the opposite end of the door track as in the lower left-hand photo shown on the same page. When the chain has been placed on the sprockets you have the assembly shown in the lower right-hand photo on the preceding page. Note in this illustration the simple device for adjusting the tension of the chain, also in the lower left-hand photo.

Next, mount the 2½-in. sprocket on the top end of the wringer shaft of the power unit, cutting away the housing if necessary in order to mount the sprocket correctly. Then mount the drive unit as in the left-hand photo above. The mounting must, of course, be worked out to suit the power unit used, as these will vary somewhat in construction. Place the chain on the driven sprocket only, so that the door can be raised

and lowered by hand simply by pulling on the chain. Now, make the d.p.d.t. switch as in the detail and photos below, using three pieces of hardboard for each of the stationary blocks and four pieces for the sliding block. Bolt together as shown. Make spring clips and sliding contacts from 1½-in. angle brackets. Mount on rods as in the detail and test the switch for alignment of the contact points. Mount the switch in a metal box as in the upper photo on page 188.

Now the job is ready for wiring, but first some experimenting must be done in order to locate the switch correctly in relation to the lifting bar. To do this, mount the switch temporarily and then clamp stops, or trippers, near the ends of the lifting bar. These are angle-steel brackets which have a washer bolted to one end as shown in the





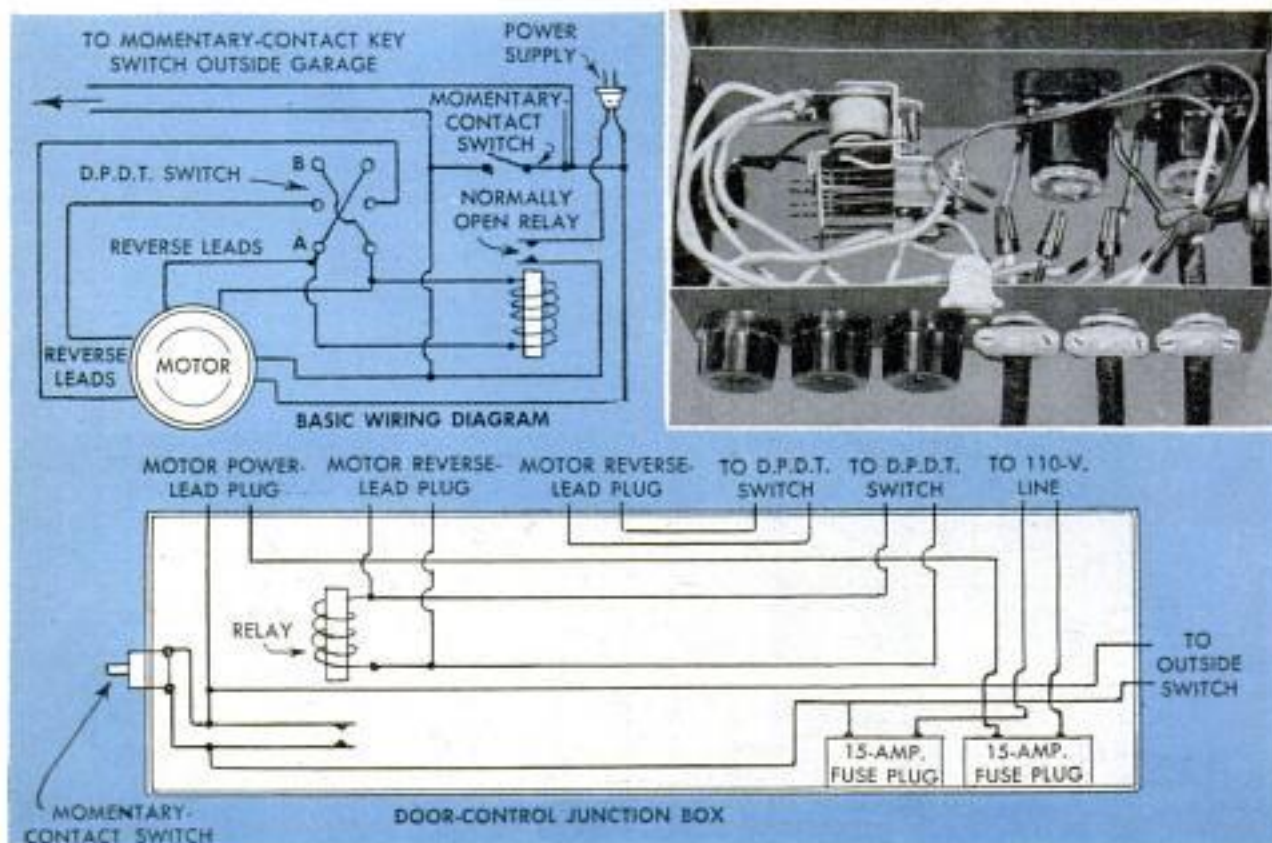
The d.p.d.t. switch is mounted at the outer end of track. Tripper is nearing end of actuating rod

upper photo on this page. Open and close the door manually, repositioning the trippers so that they engage the sliding rod carrying the switch and move it the required distance to close the contacts. Mount the switch box permanently and mark the location of the trippers. It may be necessary to relocate them later.

Complete the wiring, bringing all leads to a junction box which houses the 50-volt 90-ohm relay as in the photo below. Mount momentary-contact switches in convenient locations inside and outside the garage. When wiring the d.p.d.t. switch, connect clip No. 1 to clip No. 4, clip No. 2 to clip No. 3. Then connect wires to clips No. 1 and No. 2, the wires to be attached to one of the reverse leads on the motor. Two lengths of flexible wire lead from the contact strips on the sliding switch block to

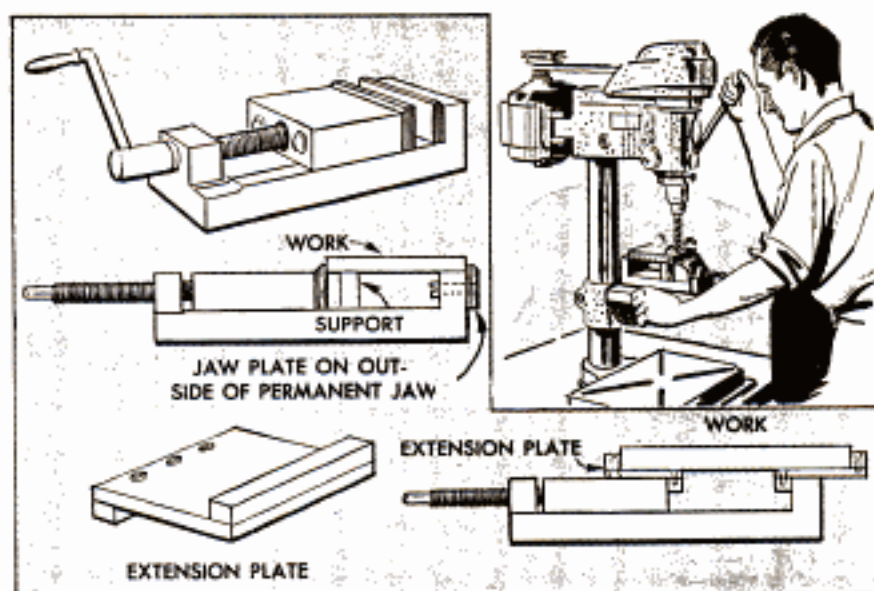
the other pair of reverse leads on the motor. Do not solder these connections as it may be necessary to interchange them. When installing the wiring it's a good idea to wire a double-pole switch in the 115-volt power line so that current can be completely cut off from the installation.

Now test the unit, starting the cycle with the door closed. If the motor runs in the wrong direction, interchange the leads. Test again, changing the location of the trippers, if necessary, to move the sliding block of the d.p.d.t. switch the correct distance at the completion of each cycle. In this it will be necessary to take into account any tendency of the door to coast, or overrun, as it nears the full-open position. Some doors coast more than others. The distance the door moves after the tripper on the lifting bar actuates the switch, cutting off power and stopping the motor, determines the movement, or throw, of the switch. Obviously, the sliding block must move far enough to engage the contact clips at the opposite poles of the switch in order to reset the unit for the reverse cycle. This can be determined only by experimenting with each individual installation. The throw (movement of the sliding block) of the switch can be shortened if necessary by running the threads back farther on the guide rods. When correct location of the switch and trippers has been determined, solder and tape all electrical connections and screw trippers permanently in place. Be sure to oil parts and motor. ★ ★ ★



## Modifications Increase Holding Capacity of a Drill-Press Vise

The capacity of a drill-press vise of the type shown in the detail can be increased by relocating the steel jaw plate of the fixed jaw on the outside surface. When work is held in a vise so modified, a support of the same height as the fixed jaw must be placed beneath the work adjacent to the movable jaw. Further increase in holding capacity of the vise is possible by using two extension plates. The plates are pieces of steel plate with blocks screwed to opposite sides of opposite ends to form a Z-shape. The extension plates can be held solidly on the vise jaws by using blocks deep enough to permit

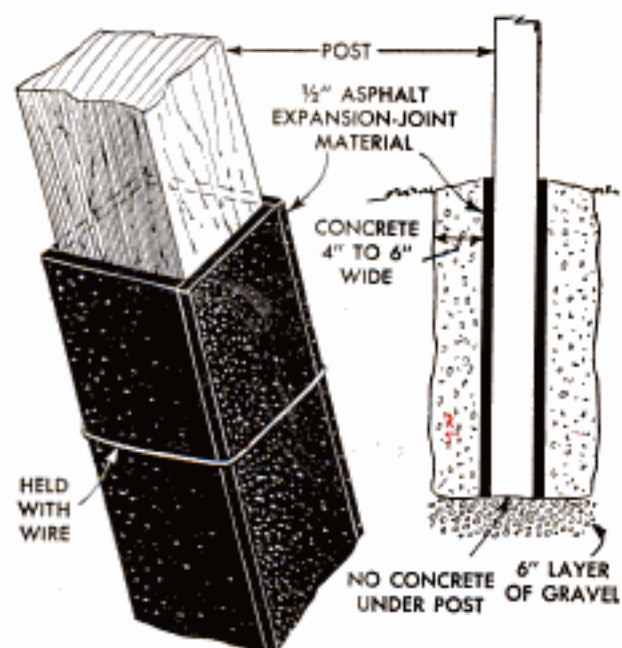


drilling holes to match the jaw-plate holes in the vise jaws. The extension plates then are screwed directly to the vise jaws.

## Expansion Material on Post Prevents Cracking Concrete

Cracking of concrete poured around a wooden post set in the ground, which results when moisture absorbed in the post freezes and expands, can be avoided by wrapping pieces of  $\frac{1}{2}$ -in. asphalt expansion-joint material around the post before pouring the concrete. After treating a post with wood preservative, pieces of the ma-

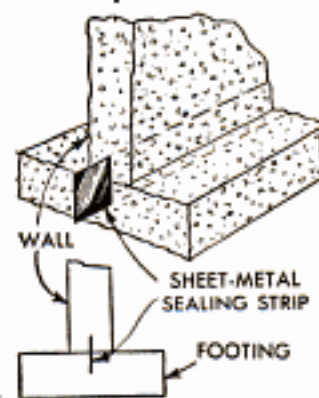
terial are wired around that portion of the post which will be enclosed in concrete, with the edges of the material overlapped. When wrapping a round post, heat the asphalt with a blow torch so it becomes pliable enough to wrap snugly around the post. The asphalt material, which is used in the construction of concrete sidewalks and driveways, is available at most building-supply yards.



When painting the outside of a house, a much more professional-looking job can be had if the underneath edges of the clapboards are painted first. Brush several edges within arm's reach first, then coat the faces of the boards.

## Joint Between Footing and Wall Sealed With Metal Strip

In areas where ground water is likely to enter a basement through the joint between footing and concrete wall, a watertight joint may be provided when footing and wall are poured. One way of doing this is to install an 8-in.-wide strip of heavy sheet metal in the footing. Aluminum, copper or other nonrusting metal should be used. The metal is centered in the footing, with half its width projecting into the wall forms so that the wall can be poured around it. As the wall is poured, the concrete should be tamped carefully to eliminate any voids which might form around the strip.



## Metal Weather Stripping Renewed By Scoring With Screwdriver



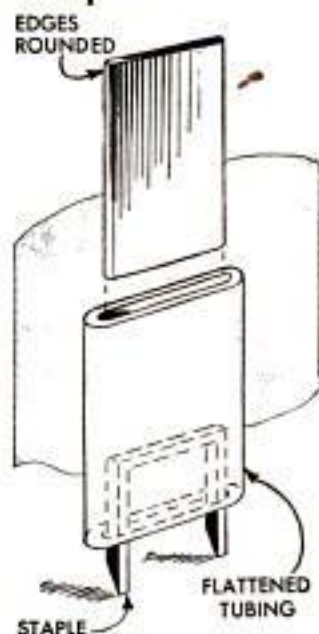
Metal weather stripping which has lost its "spring" can be renewed without being removed from the frame. Simply score the stripping with a medium-sized screwdriver along the first bend, as shown in the detail.

Apply moderate pressure on the screwdriver. At points requiring a greater bend, apply more pressure. To check the fit of the stripping, sight between door and frame at a strong light.

J. B. Mullen, Barrington, Ill.

## Tool Drives Small Staples

A tool made from a short length of flattened tubing will save both material and patience when it is necessary to drive a number of small, easily bent staples. The flattened tubing should be a loose fit over the staples. A piece of flat steel is used as a drive pin or plunger. It is cut to a length slightly longer than the tubing and the edges are rounded to prevent it from binding. In use, a staple is inserted in the end of the tool and the plunger tapped with a hammer.



In use, a staple is inserted in the end of the tool and the plunger tapped with a hammer.

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# Shop Notes

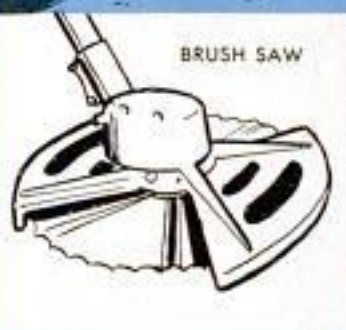


## KNAPSACK POWER UNIT

*Clears land, cuts tall weeds, trims hedge, edges lawn and cultivates your garden throughout the growing season*

**I**NTERCHANGEABLE WORK HEADS fitted to this knapsack power unit give it a versatility especially suited to the needs of estate owners, farmers, highway-maintenance crews, and week-end gardeners with trimming, cultivating and lawn-edging jobs that take a lot of time when done by hand. The power unit consists of a tubular arm which houses a drive shaft, the two members being attached to an air-cooled gasoline engine of 1 to 2 hp. The unit weighs 25 to 35 lb., depending on engine size, and is carried in a handy working position by means of an adjustable shoulder strap. A special centrifugal clutch releases at engine idling speed, engages when the engine is throttled to operating speeds. The air-cooled engine is fitted with a metal shield to protect bare arms and clothing against possible burns and oil stains.

Three heavy-duty heads, or attachments, are shown at the right. The brush saw is



BRUSH SAW



CHAIN SAW

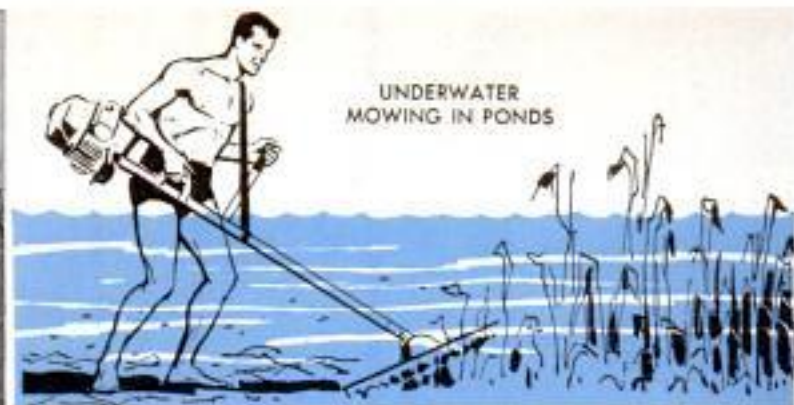


TALL-WEED TRIMMER





Photos courtesy Hoffer, Inc.



UNDERWATER  
MOWING IN PONDS

just the thing for clearing land of growth ranging from 1 to 5 in. in dia. Note especially the V-shaped openings in the blade guard. In use the guard serves a two-fold purpose, covers the blade and serves as a stop when starting the cut, either to the right or left. The chain saw fells trees up to 15 in. or more in diameter, bucks logs into cordwood lengths and trims large trees after felling much faster than the best axman. Both the brush saw and the chain saw can be operated within an inch or so of the ground level when cutting trees and brush. Two-handed control of the units is obtained by means of the handles located on the shaft extension. The tall-weed trimmer, illustrated on the preceding page, utilizes the same guard as is used with the brush saw. The circular blade is removed and replaced by the two-edged weed-cutting blade. Makes short work of mowing tall weeds on vacant lots. Farmers use the unit widely for trimming tall weeds along fence rows. It cuts small bushes and brambles close to ground level in the same manner as the brush and chain saws.

The power scythe works like a sickle-bar mower and is designed to work anywhere you can reach. It cuts saplings, weeds, grass, underwater growth in shallow ponds and along lake shores in resort areas. It's fine for hedge trimming, as the 20-in. cut reduces trimming time to a matter of minutes for a hedge of average length.

Swinging a hoe on a hot day during the vegetable-growing season is something experienced gardeners don't like to think about. But a rotary-hoe attachment for the knapsack power unit eases the labor and reduces the time required. Does a better job as it works close to the plants, pulverizes the soil to a dry-weather mulch, annihilates weeds by shredding the root systems and while all this is going on the operator simply carries the unit by the shoulder strap in a comfortable, upright position. Depth of cut is controlled by the rate of movement over the ground. Lawn edging is done in the same manner. Just change attachments and away you go as in the lower photo at the right. ★ ★ ★



SCYTHE FOR MOWING,  
WEED CUTTING AND  
HEDGE TRIMMING





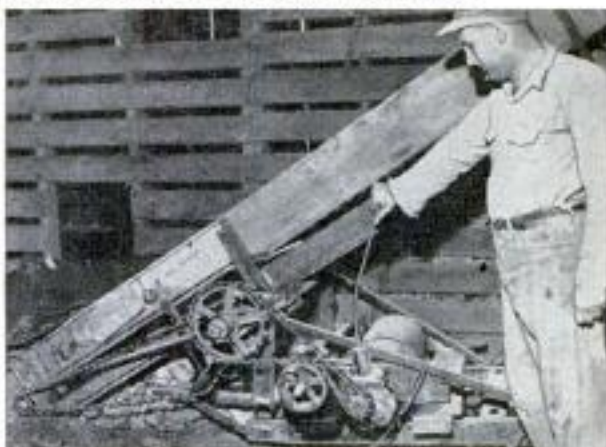
ROTARY HOE



LAWN EDGER



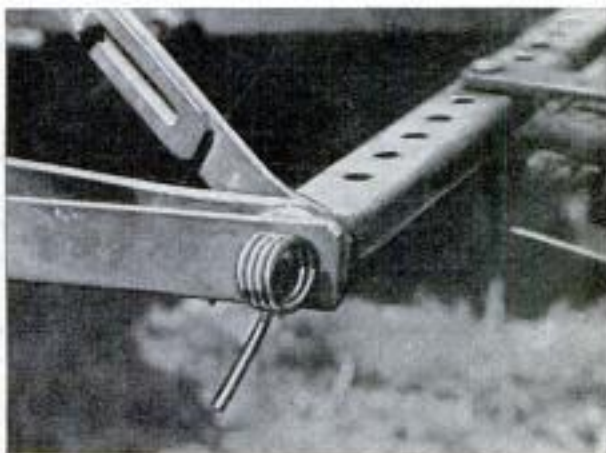
## Variable-Speed Electric Drive For Portable Farm Elevator



To adapt his portable elevator to various uses requiring speed changes, one farmer built a variable-speed drive employing an auto transmission direct-connected to an electric motor. The latter is connected to the input shaft of the transmission by means of a flexible coupling and the output transmission shaft carries a sprocket which drives a jackshaft. The elevator is chain-driven from the jackshaft, which is fitted with a spring-loaded friction clutch to prevent breakage should the elevator become clogged. The motor, transmission and jackshaft are mounted on the elevator trailer frame so that the gearshift lever is in a handy position for changing speeds to meet the load requirements.

## Discarded Rake Tines Utilized As Linchpins On Drawbar

After losing a number of the linchpins used to hold the ends of the drawbar of his Ford tractor in place, one farmer found that the spring ends of broken tines from a side-delivery rake worked better than the original pins. When the tine is forced into the hole, the spring tension grips the end of the bar firmly, yet permits easy removal of the tine when required.





### Several Waterers in Pasture Prevent Hogs Crowding

Crowding of hogs is less likely, and fewer mud holes result, when several sled-mounted stock tanks, to which waterers are attached, are located in a large hog pasture. Sunshades and self feeders located close to each tank further minimize bunching. The stock tanks are filled from a wagon tank.

### Heavy Spring "Stretched" With Hammer and Chisel



A hammer and chisel were used by one mechanic to "stretch" a heavy spring being installed in the counterbalance mechanism of an automobile hood. The chisel is driven between the turns of the spring to force them apart, then a nail is slipped through each turn before the chisel is removed. As soon as the spring is installed,

the hood is raised so the mechanism stretches the spring and allows the nails to drop out.—R. S. Boyle, Akron, Ohio.

### Plastic Template Used to Locate Center of Round Work

To find the center of a round piece of wood or metal, use a plastic template that fits over the end of the work. On a 4-in.-sq. piece of plastic sheet about  $\frac{1}{8}$  in. thick, scribe diagonal lines from corner to corner. Drill a  $\frac{1}{16}$ -in. hole at the point where the lines cross. Place one leg of a compass in the hole and scribe circles on the plastic,

spaced  $\frac{1}{4}$  or  $\frac{1}{2}$  in. apart out from the center. To use this template, clamp the round piece vertically in a vise and hold the template against the end so that the outer edge of a circle corresponds to the circumference of the work. Then make a mark through the center hole. Even on pieces that are out of round, the center can be found by locating as many points as possible of the work on one of the scribed circles.

James I. Greene, Philadelphia, Pa.

### Inverted Funnel and Can Cover Make Safe Ash Tray

A funnel can be inverted and set in a can cover or over any dish to make a safe ash tray for use on a work bench. Such a tray will eliminate any fire risk that might arise from having an exposed ash tray on the bench, since cigarettes and matches are dropped down the spout of the funnel into the pan, where they are kept covered.



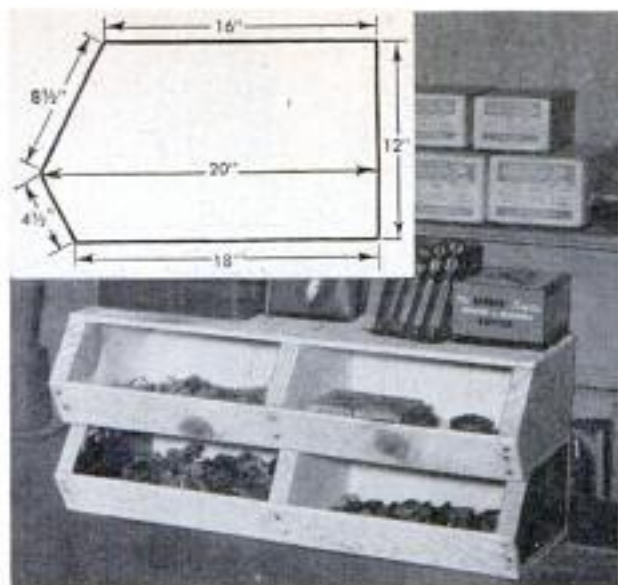
### Tire-Repair Record Kept Inside Hub Caps

To keep a handy record of when tires were repaired, crossed, balanced, etc., take off the hub caps and stick several strips of white adhesive tape to the inside of the cap. Whatever data that must be kept can then be penciled on the tape. To make sure the tape sticks properly, clean the inside of the hub cap before applying the tape.

Ivan Grosvenor, Indian Rocks, Fla.



☞ Grease packed into a blind hole before tapping it will be forced out by the tap and carry the metal chips with it.



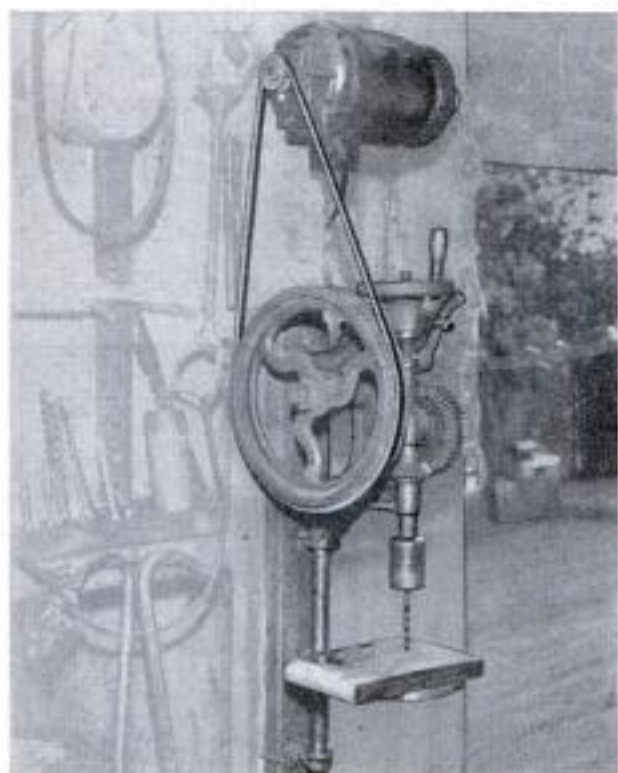
## Stacking Bins Store Parts Within Easy Reach

Open-front storage bins that stack solve the problems of storage and convenience in hardware and farm-implement stores, farm shops, tool cribs and even in the home shop—anywhere that small parts, nails, screws, bolts and washers require storage in easily accessible bins. The detail gives dimensions for the endpieces of fairly large individual bins, but by altering the dimensions in proportion the endpieces can be made larger or smaller as desired. The photo at the right pictures single-compartment bins made in duplicate, some with center dividers. A shallower, two-compartment unit is

pictured in the left-hand photo. When building either type, care must be taken to make duplicate parts precisely the same size. Only the top-row bins in the stack have cover pieces. All others have open tops as pictured in the photo at the right. Bottoms, including the slanting front piece, and the backs can be cut from plywood, hardboard or solid stock as required. Solid stock,  $\frac{3}{4}$  in. in thickness, is necessary if the bins are to hold a heavy weight such as bolts, nuts or washers. Otherwise,  $\frac{1}{4}$ -in. hardboard or  $\frac{3}{8}$ -in. plywood is suitable.

L. H. Houck, Jefferson City, Mo.

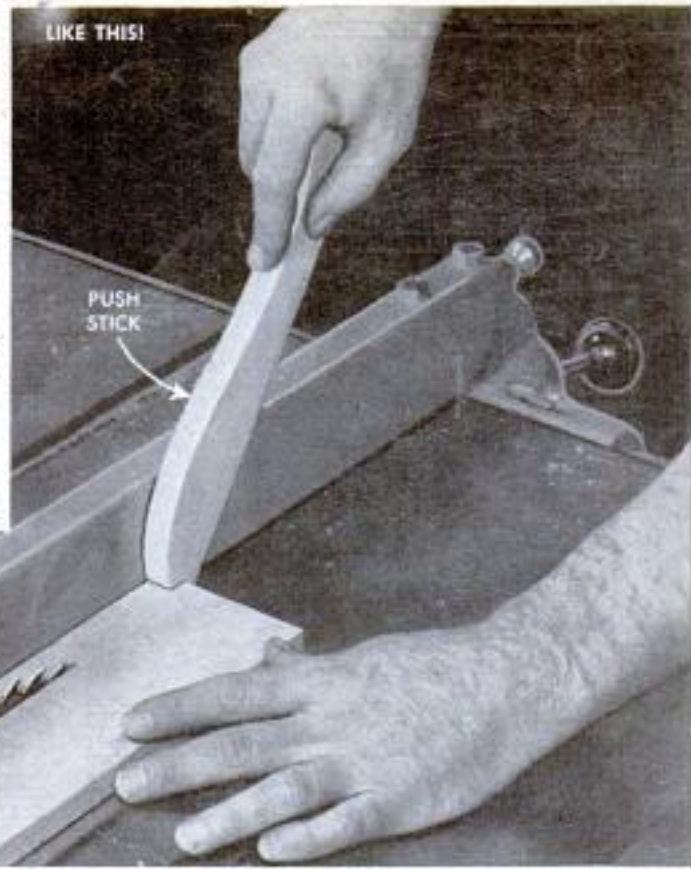
## Electrified Post Drill With Minor Alterations Used as Power Tool



With minor modifications many hand-powered machines, such as the post drill in the photograph, can be converted to use as a power tool. In the case of the drill, an electric motor was bolted to the wall above it and a V-belt of the proper length passed around the flywheel of the drill and a pulley on the motor. The hand-powered tools, of course, are not built to run at speeds as high as regular power tools.

## Swivel Mount for Table Saw Utilizes Barber-Chair Base

One home-workshop owner solved the problem of limited space in his shop by mounting his table saw on an old barber-chair base so that it could be raised, lowered or rotated to clear adjacent tools and benches when working long pieces. The locking mechanism permits the saw to be held securely at any desired position. The base also is handy for positioning the height of the saw when more than one person uses it.—Carl Miller, Oakland, Calif.



Keep all your fingers by making a notched pusher stick and use it when ripping narrow pieces. Make it a must project when you get your new saw

## Do-It-Yourself

By Wayne C. Leekey

Let's face it! Put a million or more power tools in the hands of a million week-end carpenters and you're going to have accidents due to plain carelessness. However, many painful injuries resulting from incorrect usage of power tools can be avoided

Note: Saw photos show blade unguarded only for sake of clarity. Whenever practicable, guard should be used

When less blade is exposed there's less chance of serious injury. Keep the projection  $\frac{1}{4}$  to  $\frac{1}{2}$  in.

With blade exposed this much, chance of serious cut is greater. Without guard, lower position is safer



SN 57

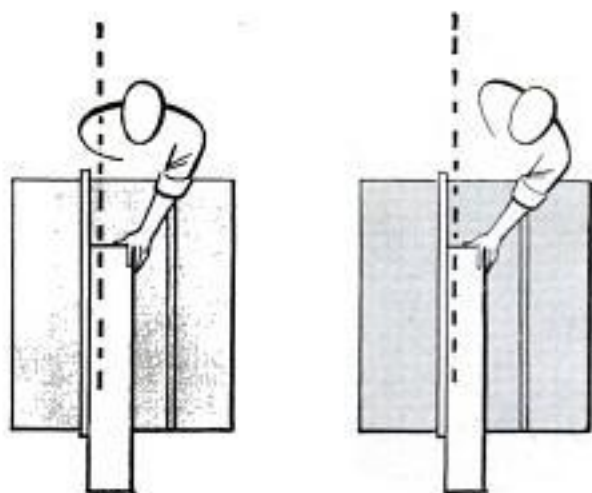
**I**F YOU ARE ONE of the ever increasing number of "do it yourselfers" who are walking out of hardware and lumber stores the proud owners of brand-new power tools, you are in for a lot of fun and relaxation. But don't let carelessness turn these happy hours into painful ones—do it yourself, but do it safely!

Manufacturers have made their tools as safe to operate as is practical. The truth is that many injuries result from a lack of know-how as much as from plain carelessness, whether the homeowner is sawing pickets for a fence, cleaning paintbrushes or performing some other common do-it-yourself task.

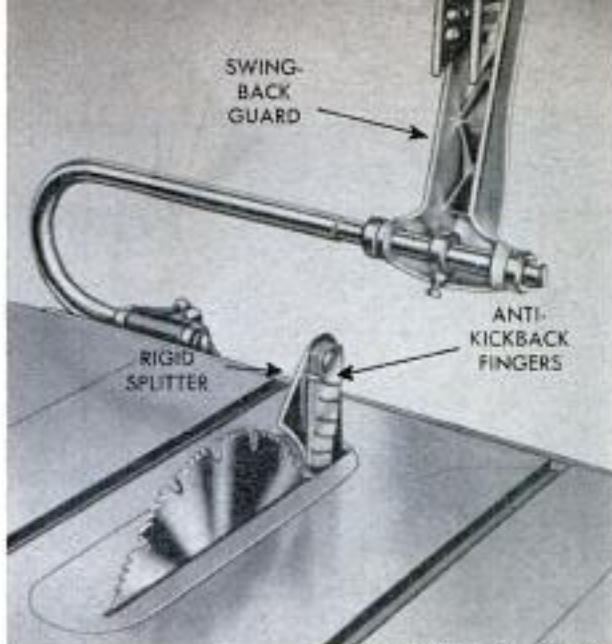
Power tools have made workshop and home repair jobs so simple and quick to do that many become careless in observing ordinary precautions. This is especially true in the case of a circular saw. While most home-workshop machines are provided with protective guards designed to cover the blade completely and include devices to prevent kickback and binding, even the best guards are inadequate for all-around use and become a hindrance. Consequently they are removed and the saw is used with the blade exposed. Best assurance against getting cut when ripping

# Safely!

Kickback, while a saw hazard, need not be feared by the operator. It generally happens when saw fence is out of alignment with blade, which causes the work to pinch and bind at completion of cut and send it flying with force. Even with saw mechanically perfect, adopt safe practice of standing to one side

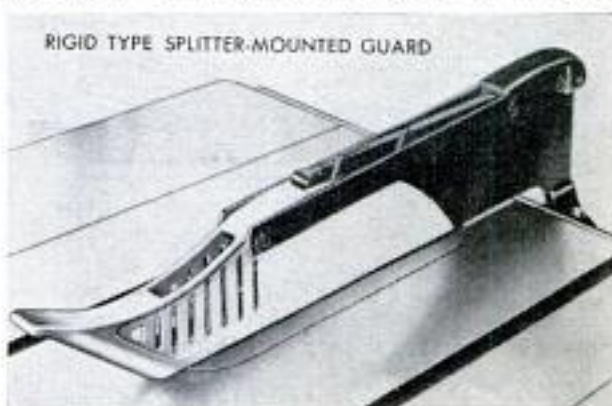


JULY 1955



Rockwell Mfg. Co. photos

Above, typical swing-back guard, incorporating splitter and antikickback features, gives operator most protection. Below, splitter and guard is one piece



Above and below, right and wrong way of using stop rod. Wrong way invites pinching and harmful kickback

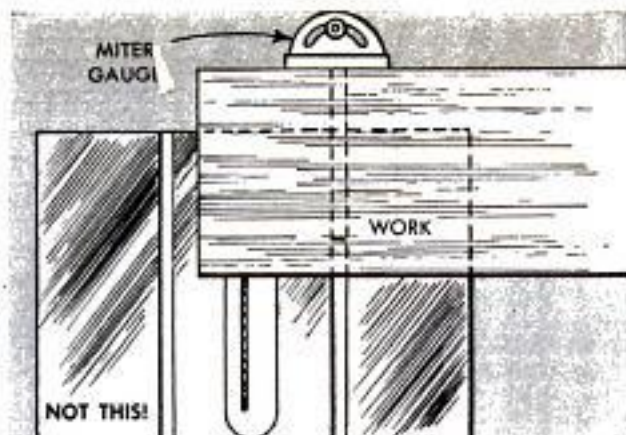


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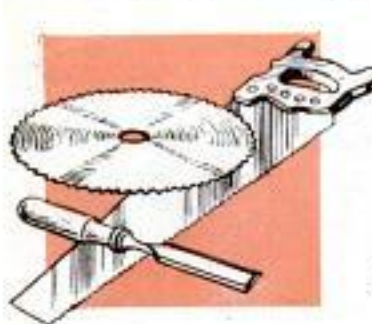
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Here's a safer way to crosscut a wide board compared to usual way at right. Reverse miter gauge in slot, push work against it



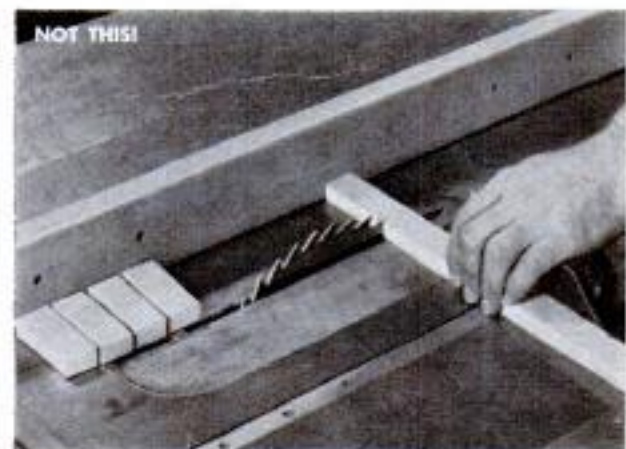
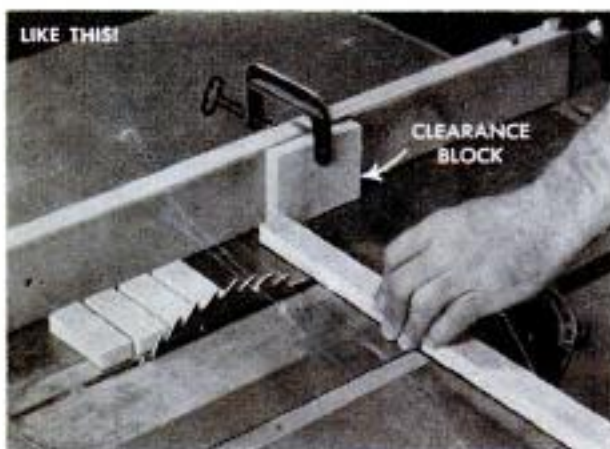
From combustion standpoint, keep oil and paint rags stored in container. Also, avoid burning off house paint with blowtorch



Keep cutting tools sharp—dull tools are a hazard. Smashed thumb is less likely if hammer face is polished with sandpaper



Below and at right, don't use fence as stop without first providing clearance block. Otherwise, work will jam and be thrown



narrow work less than 2 in. wide is to make a push stick and keep it handy. It will keep your hand away from the blade. Another safe practice is to keep the saw blade  $\frac{1}{4}$  to  $\frac{1}{2}$  in. above the surface of the work. While it may require slightly more feeding pressure on some types of work, less blade is exposed and thus less chance of a serious injury should you have a mishap.

Kickback, which occurs when the work binds between the fence and the blade and is thrown with considerable force, is another saw hazard that can be charged to lack of know-how. This can happen during both rip and crosscut operations. Antikickback fingers on a splitter-type guard make ripping of narrow pieces a safe operation, although if the operator checks to see that the fence is in exact alignment with the blade, the chance of kickback is remote. In crosscutting where duplicate pieces are being mass-cut, there's a right and wrong way, the latter resulting in binding and kickback. For example, when using a stop rod on the miter gauge, always place it to the left of the blade. Placing it to the right of the blade will cause





Carelessness in leaving a chuck key in a drill press can cause a bad bruise when the machine is started

the severed piece to bind, get caught in the blade and fly. Of course, there is a more obvious reason why this shouldn't be done—the blade will strike the stop rod. Where the saw fence is used as a stop in cutting duplicate pieces to length, first clamp a clearance block to the fence as shown on opposite page. Otherwise, the work may bind between blade and fence and be thrown violently. When crosscutting a wide board on a small saw table it is safer to reverse the normal position of the miter gauge in the table slot and push the board against it as pictured at the top of the facing page. Struggling to hold a long board that is being ripped is another way of inviting trouble that could result in an accident. Always provide beforehand some means of support for the outboard end of the work. A floor-model drill press will serve as a fine support since its table can be raised or lowered to equal the height of the saw table.

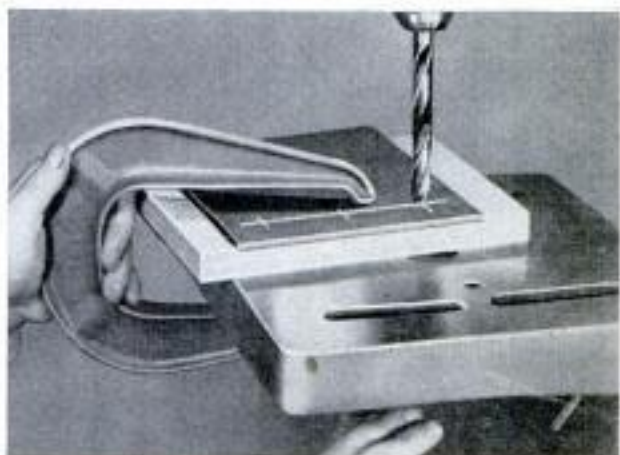
Dress the part when you work in your shop. Avoid dangling shirt sleeves—either roll them all the way up or keep them buttoned. Certainly avoid wearing a tie which could become caught in a lathe or drill press. Perhaps the safest apparel is a snug-fitting sweat shirt. Arrangement of tools in your shop has a lot to do with safety. Many mishaps have been caused by long work striking other machines while being cut.

If you own a portable electric drill or handsaw, it is best to make use of the ground-connection wire that is a part of the plug. This third wire is for your protection in the event a short should develop in the switch or the tool itself. It is designed to replace the center screw that holds the



If your bench grinder is without eyeshields, protect your eyes from flying abrasive particles by always wearing goggles

Rockwell Mfg. Co. photos

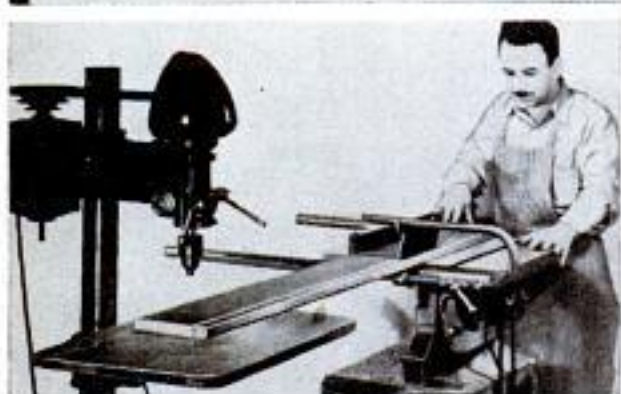
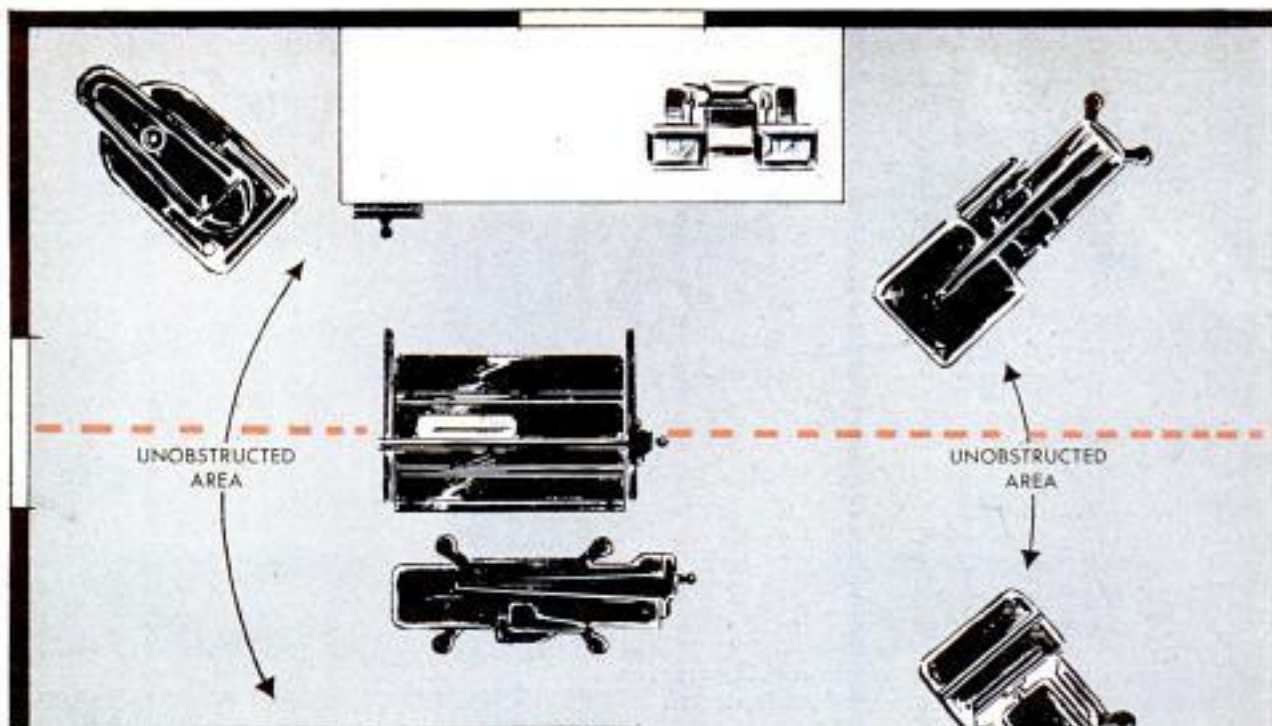


A most painful cut can be inflicted when drilling sheet metal. Always clamp the work when it is too small to hold so it can't spin when bit breaks through



WEAR RUBBER GLOVES WHEN USING PAINT REMOVER





Drill press provides extra support when sawing long boards. Trying to hold such long work invites trouble

Use ground wire on your portable tools. Ground-wire receptacle is grounded to metal conduit or metal box

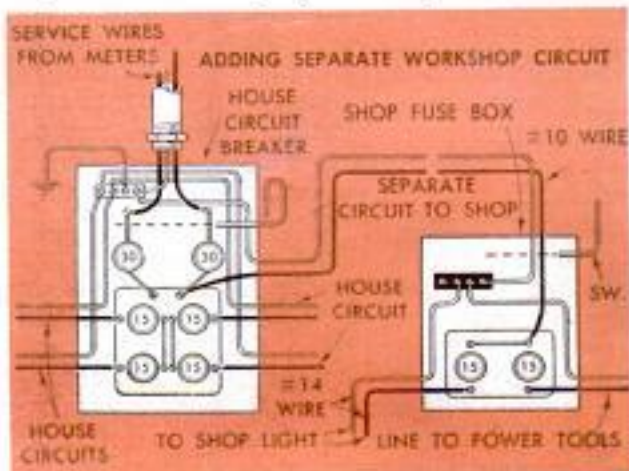


There's safety to be had in proper shop layout. Try to arrange tools to give unobstructed area around saw

receptacle cover. As a precaution against overloading existing circuits, you should take the time to run a separate circuit to your workshop. The diagram below shows how No. 10-ga. wires are run from the main fuse box, or circuit breaker, to a separate fuse box in the shop from which No. 14-ga. wires are run to individual plug-in receptacles.

In working with other shop tools, such as a drill press, be sure to remove the chuck key before turning on the machine, and in drilling thin work like sheet metal make it a practice to clamp the work to the table. Many a bad cut has been inflicted by the work spinning as the bit breaks

Separate circuit for workshop safeguards house wiring from overloading. Typical wiring is shown below



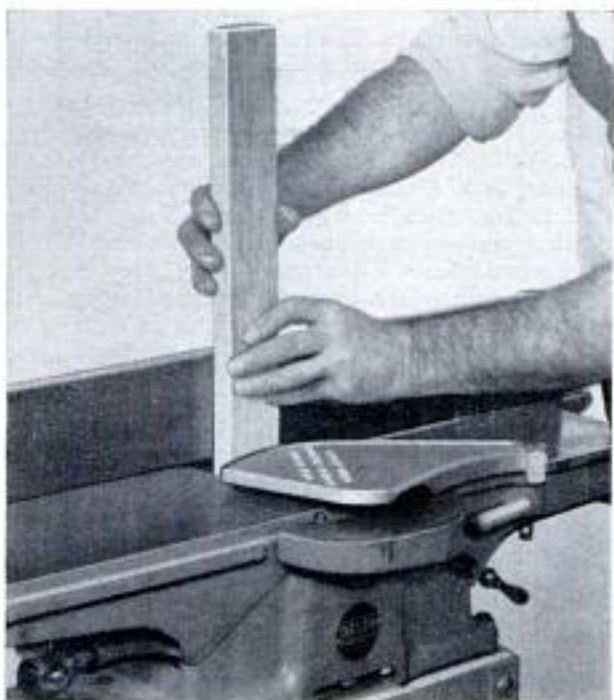


Make a hold-down pusher block and use it whenever you plane thin stock on jointer. It will save your hand

through. If your bench grinder is not fitted with eyeshields, have a pair of goggles handy to protect your eyes from flying particles. In planing thin stock on a jointer, make a hold-down pusher block, as shown, to safeguard your hand and give better support. Also, while it is perfectly safe to joint edge grain in the case of wide plywood panels, never attempt to plane edge grain of work narrower than 8 in.

Other precautions that contribute to safe do-it-yourself include keeping flammable oil or paint-soaked rags in metal containers. Special care must be used in handling quick-drying lacquers. Do spray-painting outdoors whenever possible. Cleaning of paintbrushes in solvents should likewise be done outdoors. Always wear rubber gloves when handling paint removers, thinners and other toxic finishing materials that may irritate the skin. ★ ★ ★

Never plane the end grain of work that is less than 8 in. wide. Narrower stock will catch in jointer knives



JULY 1955

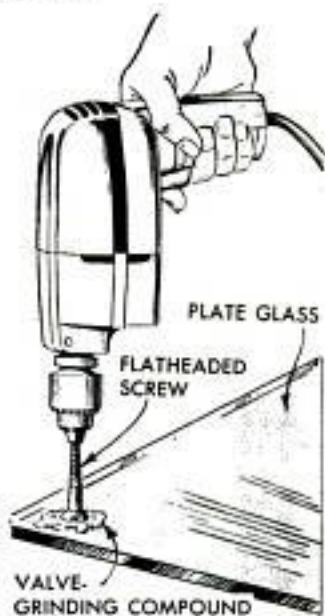
## Shop Dustpan Made From Oil Can Fitted With No-Stoop Handle



No stooping and fewer trips to the trash can are the advantages of a large-capacity shop dustpan made from a 5-gal. square oil can. The top of the can is cut off at an angle and the cut edges bent over to provide stiffness. A no-stoop handle, consisting of a length of scrap wood, is screwed to the bottom of the can.

## Flatheaded Screw Used as Bit To Bore Hole in Glass

Holes can be drilled in mirrors and other plate-glass objects by using a flatheaded screw chucked in an electric drill. The screw is chucked shank first and the head is used as the boring tool by applying valve-grinding compound to the area where the hole is to be bored. A hand electric drill can be used if care is taken to hold it steady. A drill press will do a faster, more accurate job. In either case, do not permit the glass to overheat, as this will cause it to crack. The best method is to practice first on scraps of glass similar to the piece to be bored.



Bill Clough, Rifle, Colo.

201

# SHOPPING FOR TOOLS



**1. DISPOSABLE SAW BLADE** sells at a price that is very little above the cost of having a blade of equal size sharpened in the conventional manner. Lasts two or three times as long as ordinary circular blades. Each disposable blade is dynamically balanced, assuring true, vibrationless operation and cutting power loss to the minimum. Teeth are especially hardened to give the longest possible cutting life. Crosscuts and rips fast and clean

Rocco Products, 2019 Fourth Ave. S., Minneapolis, Minn.

**2. HINGE BUTT MARKER** cuts the three edges of a hinge mortise with several light strokes of a hammer. Waste is then removed with a chisel, using light, paring cuts. In use, edge of door and jamb are marked to locate the top of the hinge leaf. One cutting end of the butt marker is positioned on the line with the stops against the side of the door. Light hammer blows sink the cutting edges to required depth in door and jamb

Stanley Tools, 111 Elm Street, New Britain, Conn.



**3. HOLE CUTTER** works in steel, cast iron, aluminum and other nonferrous metals. Three cutting bits, 120 deg. apart, balance the cutting torque, insuring smooth cutting action and a true hole diameter. Works on flat, cylindrical or crowned shapes and can be chucked in a lathe for cleaning and rough-boring cored holes in castings. Equipped with removable pilot

bit. H. Clark Co., 9330 Santa Monica Blvd., Beverly Hills, Calif.



**4. WIRE STRIPPER** cuts insulation and strips it clean in one quick snap of the handles. Saves time for electricians and assemblers of electrical equipment where exacting workmanship is required. Takes all common wire sizes with a simple adjustment. Specially designed cutting and stripping mechanism does not nick or score wire

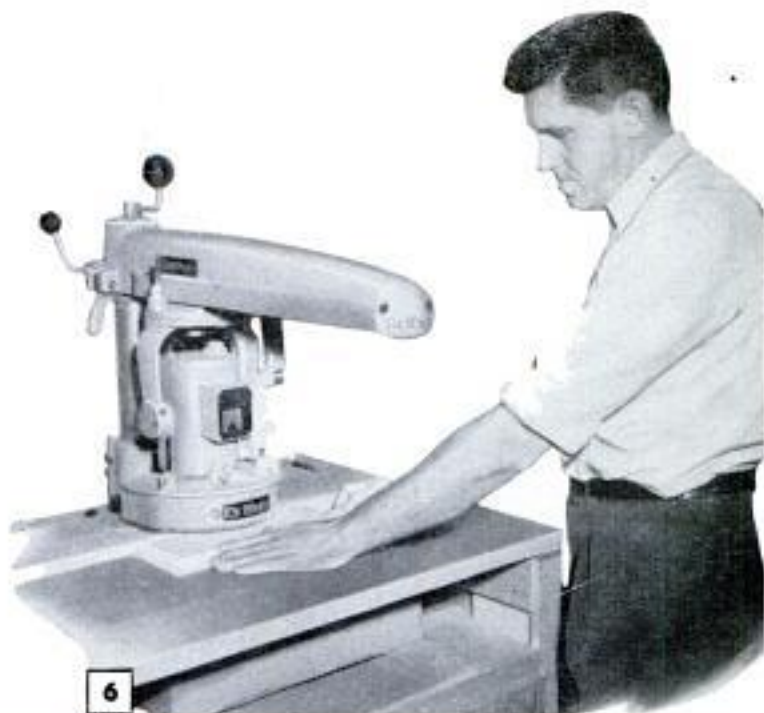
Crown Industrial Products Co.,  
713 Amsterdam St., Woodstock, Ill.

**5. PAINT-SPRAYING ATTACHMENT** is designed to be driven by any 1/4-in. portable electric drill. Has piston-type, twin-cylinder air compressor and pressure regulator. Spray gun is 1-qt. capacity, siphon type and is threaded to take standard Mason jar for easy color changes. Supplied in two separate kits, with or without spray gun

Portable Elec. Tools, Inc.,  
320 W. 83rd St., Chicago 26

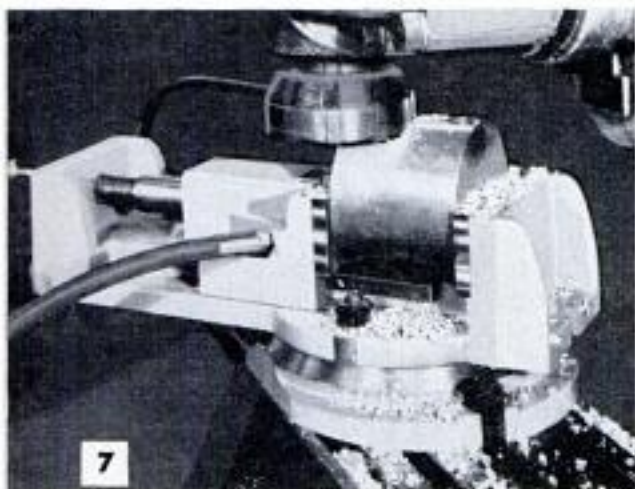
**6. SHAPER GUARD** for radial saw provides complete coverage of motor spindle and cutters, thus protecting operator from any possible hand injury due to momentary inattention. Adjusts to within  $\frac{1}{8}$  in. of the top surface of the material being cut. Is fitted with a deflector which guides dust and chips to the rear of the machine. Unit is used with motor inverted as pictured in photo at right

DeWalt, Inc., Lancaster, Pa.



**7. AIR-POWERED HYDRAULIC VISE** utilizes compressed air and hydraulic fluid for semiautomatic actuation. Combines the speed of an air vise with the locking force of a hydraulically operated unit. Cuts loading and unloading time by as much as 50 percent on many repetitive operations. Hand crank gives fine slow-motion adjustment to the required jaw opening. Has graduated swivel base for mounting on milling machine

Wilton Tool Mfg. Co., Inc.,  
925 Wrightwood Ave., Chicago 14

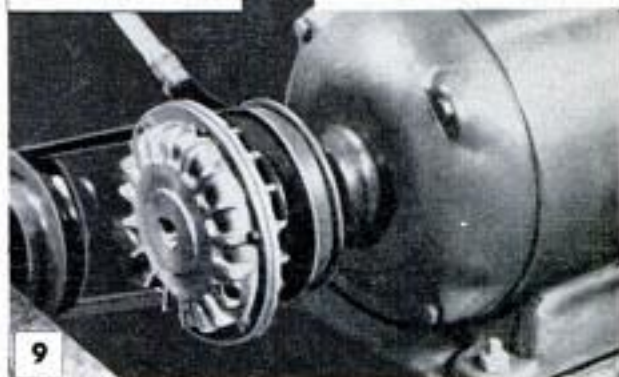
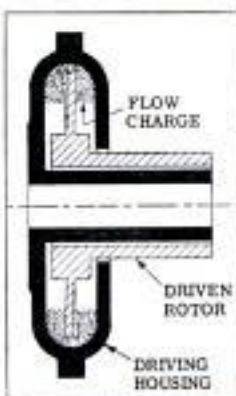


**8. PAINT CAN AND BRUSH HOLDER** provides a comfortable handle for a quart paint can and a holder for the brush as well. Enables both professional and amateur painters and decorators to work with less effort from a stepladder, chair, stool or extension plank. Unit consists of plastic handle shaped for easy gripping with one hand, an integral friction clip for holding the brush and two steel bands which grip the paint can in the manner illustrated in photo

Handi-Grip Bottle Holder Co., Flint, Mich.

**9. FLEXIBLE INDUSTRIAL-TYPE DRIVE UNIT** introduces a new principle in high-speed power transmission involving heavy inertia and shock loads on such equipment as compressors, conveyors, crushers and certain types of machines used in metal-working plants and textile mills. Unit consists of a housing inside of which is a rotor that turns concentrically as in the upper right-hand photo and the inset detail drawing which is a sectional view. The two parts are referred to as the driving housing and the driven rotor. Between these two parts are fine steel balls, or "shot," called the flow charge, which transmits power in a manner similar to a fluid. A typical application is pictured in photo. Starts smoothly and delivers constant torque

Dodge Mfg. Corp., Mishawaka, Ind.

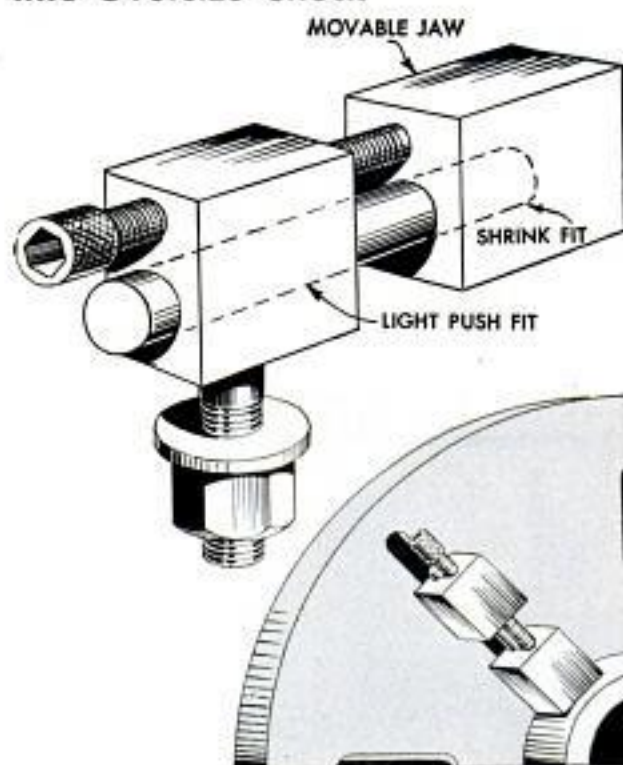




### Tractor-Mounted Spray Outfit Permits One-Man Operation

As the spray nozzle may be operated with one hand, this tractor-mounted spraying outfit makes it possible to spray weed killer while driving the tractor. The nozzle is fitted with a long hose to simplify spraying livestock and the inside of farm buildings. A rotary-type spray pump is driven by the tractor power take-off and liquid insecticide or weed killer is carried in a 50-gal. steel drum. The drum is mounted on a bracket fastened to the tractor.

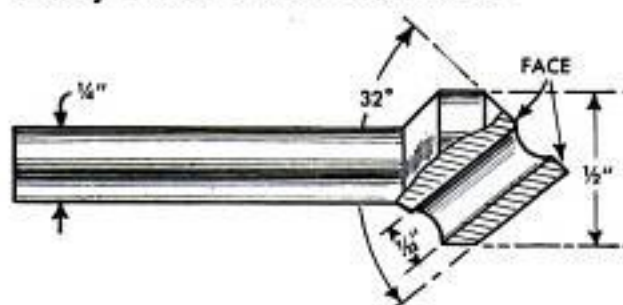
### Clamps Convert Lathe Faceplate Into Oversize Chuck



Three screw-operated clamps bolted to the large faceplate of a lathe convert it to an inexpensive, but serviceable, chuck for holding round or square work. Each clamp consists of two steel blocks. One block, which bolts through the long slot of

the faceplate, is a square shouldered down to form a stud which is threaded and fitted with a nut. A second block which forms the movable jaw, is clamped to the first and both are drilled off center for a guide rod. The hole through the fixed block is reamed to a sliding fit over the rod. The rod is a shrink fit on the movable jaw. A second hole is drilled through the stud block and tapped to receive a socket-head adjusting screw.

### Easily Made Countersink Bit

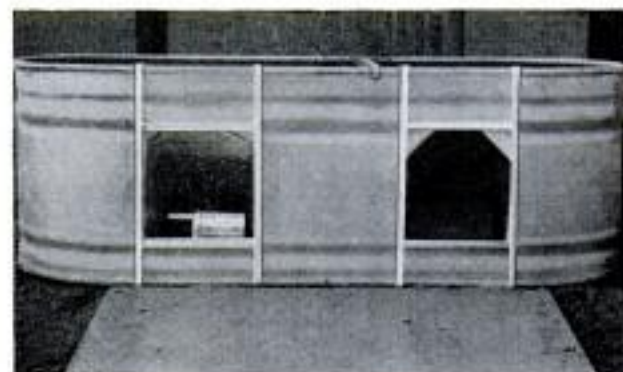


This countersink bit for woodworking requires only turning a simple blank on a metal lathe and drilling one hole. The blank is turned to the dimensions given in the detail, then the pointed face is filed smooth. A  $\frac{7}{32}$ -in. hole now is drilled in the face, being centered  $\frac{7}{16}$  in. from the point and parallel to the angle of the point. Form a cutting edge by grinding or filing away a little metal on the leading edge of the hole. Extend the relief in diminishing degree about halfway around the circumference of the hole. Temper the tool to a yellowish-brown.

Walter E. Burton, Akron, Ohio.

### Steel-Angle Frames on Waterer Protect It Against Hogs

Hogs no longer can cause this watering tank to leak by crowding against the edges of the openings and breaking the seams. Steel angles are welded together to form a frame around all four sides of each opening. Water for this particular tank is supplied from below by pipes buried in the concrete slab.





Here's how  
fresher air  
makes your  
Chevrolet strong

... says Ed Cole, Chevrolet Chief Engineer

**M**AYBE it's an odd way to put it, but it's almost literally true—the design that gave the 1955 Chevrolet its High-Level ventilation system also let us build a better body.

I'd like to explain this because it illustrates the very real benefits you get from engineering that makes one structure do the job of two.

We put the ventilation intake in the cowl, right at the base of the windshield, to pick up fresher air, above the level of road dust and fumes. This air goes into a plenum chamber, which is just an engineer's name for a reservoir or box that smooths out wind gusts to produce an even flow of air to the passenger compartment (and also drains out any stray raindrops).

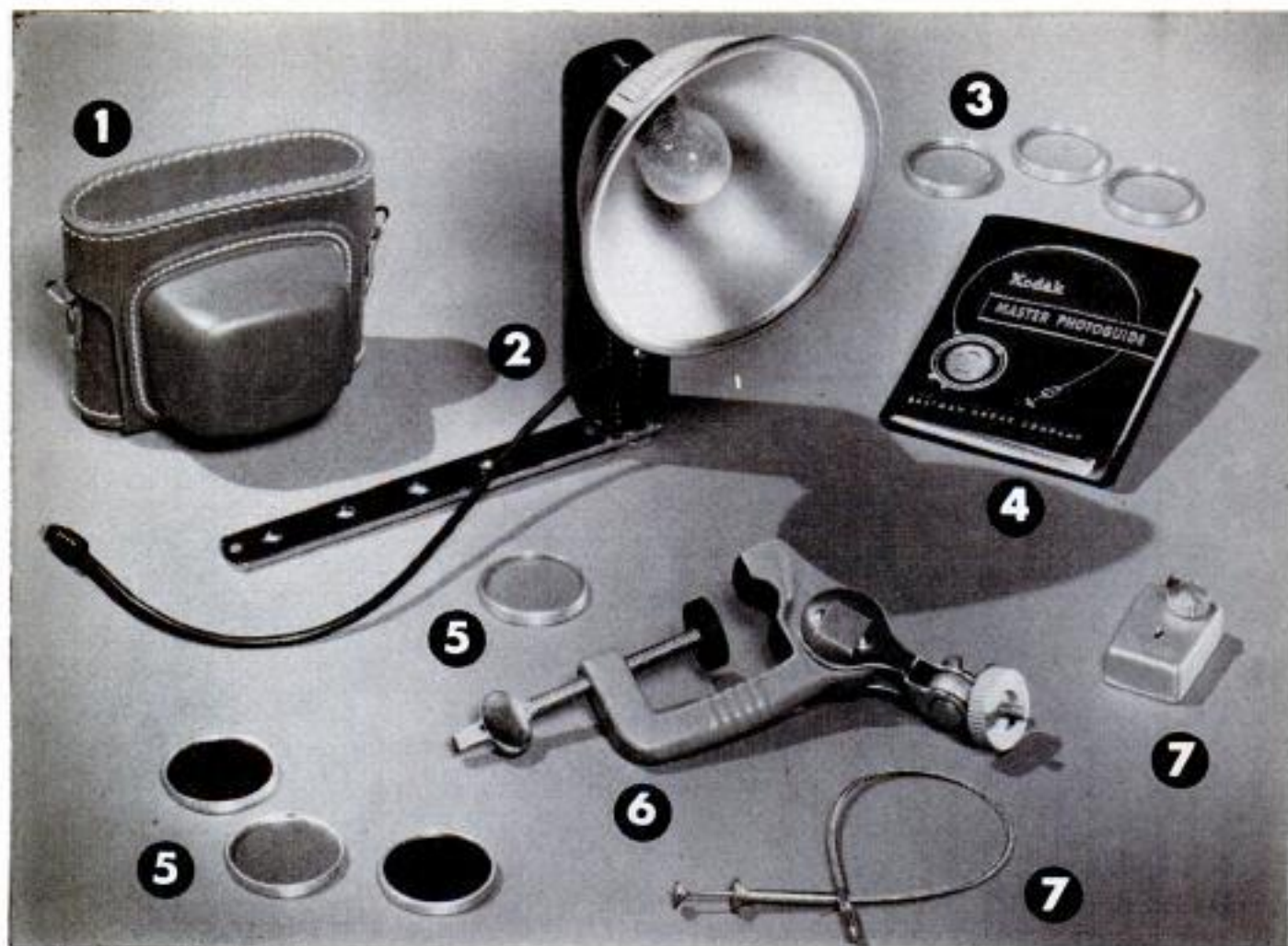
We could have just hung this box inside and let it go at that. Instead, we designed a specially shaped chamber and *welded* it to the cowl and body metal to form a double-walled arch, as you see in the drawing above.

So the plenum chamber does a double job now. It delivers a *smooth* flow of outside air. And it also is a key structural member, a husky reinforcement that adds to the rigidity of the whole car. That's why the 1955 Chevrolet is so rigid and shake-free. Your dealer can show you just what this means in a demonstration drive, so why not make a date with him now? . . . Chevrolet Division of General Motors, Detroit 2, Michigan.



*motoramic*  
Chevrolet





## 7 good ways to get better pictures

Good pictures generally don't "just happen." They're good because someone *planned* them to be good—and took pains to carry out that plan. Here are some suggestions on the use of picture-taking equipment you'll find at your dealer's that can help you make sure all your shots this summer are good ones. Take a few pains—get some great pictures!



### 1 Protect your camera

When you start out with your camera in search of good pictures, the fun goes out of it a little if the camera isn't protected by a carrying case. You have to be extra careful because you have a precision instrument in your hands. And this restricts your movements—particularly if you're hiking or taking off in a car. And when

you put the camera away, you have to look for a specially safe place for it. A good carrying case—at least the way Kodak makes them—is engineered not only to protect vital parts of the camera against shock but for convenience and ease of camera operation. They're of finest materials and give your camera a smart, professional look. Kodak cases, designed for Kodak cameras, begin at \$2.65.




### 2 Flash for punch

As you thumb through the current copy of your favorite illustrated weekly magazine, ask yourself what makes so many of those pictures so "snappy" and professional-looking. Chances are that—in close-ups especially—flash had something to do with the *punch* these pictures always seem to exhibit. So, do some thinking about *flash*—particularly for filling in shadows in direct daylight shooting. You




could scarcely invest less money—and reap more benefit—than in acquiring a flash unit like Kodak's Standard Flashholder, with its brilliant Lumaclad reflector and its universal bracket for attaching to any camera with a tripod socket. And, with simple adapters, it can be made to operate practically any flash shutter. It's only \$7.95 (batteries a few cents additional).

### 3 Get closer!




There are all too many snapshots in the world where the subject—someone's pet dog, or the baby, or a small, inanimate object—is "lost" somewhere in the middle of the picture with acres of space surrounding it. "Fill the picture with the subject" is a good rule to go by. And if you're shooting a relatively small subject—like the baby's face or even the fishing lure you just tied for yourself—then reach for your Kodak Portra Lenses. These are auxiliary lenses you slip over your regular lens and which *magnify* your subject, nicely filling your negative full of *subject matter* rather than *space*. Available in a choice of "magnifying powers," Kodak Portra Lenses range from \$2.65 up, in sizes and with adapters to fit almost any lens.

### 4 Photographic Professor



We'll admit that not even the most experienced and proficient photographer could store in his memory *all* the film and picture-taking data and calculations one might ever need. This is why the Kodak Master Photoguide was devised. It's like having an expert at your elbow to provide you with exactly the right shutter and lens aperture setting to use, regardless of light conditions and for any of the several films you might be using. You will profit greatly by getting one of these vest-pocket guides (only \$1.75) and keeping it with you. There is scarcely a question about a given picture with a given film under a given light condition which it can't answer—right on the spot!

### 5 Filters for realism




When placed over your camera lens, a filter can improve the realism of almost any black-and-white picture you take. Kodak Pictorial Filters, available in yellow, green and red, are easy to use and inexpensive (from \$1.50). A yellow Pictorial Filter emphasizes clouds and

contrasts a light object or figure against the sky. A green Pictorial Filter is used for natural reproduction of blossoms and foliage and for outdoor portraits against the sky. A red Pictorial Filter provides highly dramatic blue sky-white cloud contrast.


There are some useful filters for Kodak color film, too. One is the Skylight Filter (from \$1.75) which reduces bluish haze found on overcast days or in the shade. Others are filters which permit you to use certain outdoor types of Kodak color film indoors and indoor types outdoors—a great convenience when you want to buy one roll of color film and use it both indoors and outdoors. The exact filter to use and the exposure data are found in the instruction sheet packed with your color film.

### 6 Steady, brother!



With today's fast film and fast shutters, the usefulness of the good old tripod is sometimes forgotten. Well, if a tripod is just too much to carry around, give a thought to the Kodak Flexiclamp—which you can slip into a coat pocket! It is basically a tripod screw swivel-mounted on a padded "C" clamp which will open as wide as 2 inches to clamp on anything from the back of a chair to a garden gate! Use it for time exposures of any kind, of course. But use it, too, for *any* picture which takes careful composition—from landscapes to table-top shots. Costs only \$5.95.

### 7 Get into the picture!



It is often pointed out that the least-photographed member of any given family is the one who takes most of the family pictures. Seems logical. Well, if that means *you*, and your camera shutter can be operated by a cable release, you can change all this by utilizing a Kodak Auto-Release (\$3.86). It's merely a delayed action "trigger" which takes your place at the camera while *you* get into the picture. Simply attach the Auto-Release to your camera using an ordinary cable release (a 7-incher costs only \$1.25). You press the button and walk into the scene. The Auto-Release waits about 10 seconds—and then snaps the picture!

*Prices are list, include Federal Tax where applicable, and are subject to change without notice.*

**Kodak**  
TRADE-MARK

Eastman Kodak Company, Rochester, 4, N. Y.

# Care and Feeding of Engines

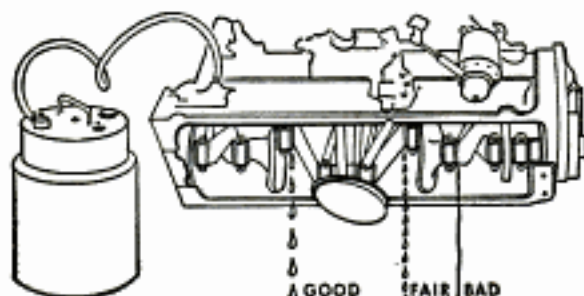


BY  
S. P. CORP

## WORN BEARINGS WASTE OIL

Even a brand new Sealed Power KromeX Ring Set can't keep worn or cracked bearings from wasting oil. A main bearing clearance of .0015" will allow enough oil to discharge through the side of the bearing for lubrication. If clearance wears to .003", five times as much oil is discharged. If clearance wears to .006", discharge is 25 times as much as that of a normal bearing. Pistons and rings can't control such a flood of oil.

Worn connecting rod bearings will discharge a large amount of oil directly onto the cylinder wall, flooding rings designed to take care of a normal oil flow.



## BEARING LEAK TEST

To test for bearing leaks, remove oil pan and attach an oil pressure tank to the oil gallery between oil pump and bearings. Use an SAE 20 oil, under 20 to 25 lbs. pressure, and check oil drip from each bearing. 15 to 20 drops per minute is desirable. 30 to 120 drops per minute is serviceable. 120 to a stream is excessive and corrections must be made to bearings or shaft.

Turning the crankshaft during this test will indicate an out-of-round condition of the shaft if the oil drip varies.

## WRITE FOR FREE MANUAL

Thousands of car owners already have their free copies of Sealed Power's new illustrated handbook, "Care and Feeding of Engines." It's crammed with useful, easy-to-understand, money-saving helps on car care. Send a postal card request for your copy today! And when you re-ring, be sure to use Sealed Power KromeX Ring Sets—for quick seating, fast break-in, immediate oil control, and long, long service. Sealed Power, Dept. G-7, Muskegon, Michigan.



# Sealed Power

## PISTON RINGS

# Clinic for Homemakers



As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—the editors of *Popular Mechanics* invite you to present your problems to The Clinic Editor for help and advice. Address your questions to The Clinic Editor, *Popular Mechanics Magazine*, 200 East Ontario Street, Chicago 11, Ill.



## Sidewalk Repair

**Q**—The sidewalk leading to my back door is laid next to the house wall. It has tipped inward toward the building wall and is broken in several places along the entire length. I have thought of pouring a new walk right over the old, using the latter as a foundation or fill. Can I do this successfully? If not, what do you suggest?

—N.W., Va.

**A**—We do not advise the procedure you suggest. It seems to us that it would only aggravate the condition already existing. Obviously, the original walk has settled and broken up due to a lack of adequate support. Quite likely it was laid over freshly graded earth without allowing sufficient time for settling. We would suggest that you consider breaking up the old walk and removing it entirely. Then excavate for a gravel fill about 5 in. deep. This should be tamped firmly. Pour a new walk in wooden forms, striking off the concrete to a depth of at least 3 in. As soon as the mixture sets, cover with burlap or earth and wet with a hose at intervals for a week or more. This procedure will cure the concrete slowly.

## Leaf Disposal

**Q**—I have always made it a practice to use leaves from my wooded lot as a mulch for shrubs, rather than raking and burning each autumn. Now I'm told that a leaf mulch should not be used for this purpose as prolonged use "sours" the soil and provides a haven for insects. What about it, is this right or wrong? I want to know beforehand so that I can plan the best procedure for this coming fall. I have a deep lot with a number of large trees.

—O.R., Okla.



**A**—Are the shrubs you have been mulching with leaves slowly withering, or are they still growing vigorously after several seasons? Their condition should be the answer to your question. We'll guess

(Continued to page 210)



# The **SPARK** for today's high compression and higher horsepower was **pioneered**



## 1 An Exclusive Fused Copper-Ceramic Seal —What it is and what it does!

Among many important spark plug design features pioneered by AC—the unique Fused Copper-Ceramic Seal stands out as a particularly brilliant technological achievement. The problem was to provide both electrical and thermal conductivity while maintaining the gas-tight seal between the center electrode of the plug and its insulator.

AC engineers came up with a metal-ceramic formula that is the perfect answer. This is a mixture of copper and ceramic material which is fused at high temperatures during plug assembly, and bonds with both the metal of the electrode and the ceramic of the insulator. Naturally, the copper insures high electrical and thermal conductivity.

## 2 AC Exclusive THIN Insulator Tip Difficult to Form—but worth doing!

If you will examine the firing end of an AC Spark Plug closely, you will observe that, unlike any other spark plug, its insulator tip is made thin by recessing it all around the center electrode wire. At the right is a cut-away to show you how this insulator tip is made.

AC, and only AC, does this—a difficult engineering accomplishment, but worthwhile because it enables the plug to work more efficiently. The thin tip heats faster than a thick tip can—and burns away combustion residues which would otherwise deposit. Briefly—that's why AC Spark Plugs stay clean longer, come to top operating efficiency faster. They boost power and insure quick starting.



AC SPARK PLUG DIVISION  
GENERAL MOTORS CORPORATION  
FLINT, MICHIGAN

## TEST YOUR WOOD RASP I.Q.



- Q.** What fine wood rasps are most useful to the home craftsman?
- A.** According to surveys by Nicholson File Co., the most useful rasps are: Flat, Half Round, Cabinet, Last Maker's and 4-in-Hand. (The 4-in-Hand is actually a versatile combination tool: half round and flat, file and rasp.)
- Q.** What brand of rasp does the home craftsman prefer?
- A.** Nicholson by 7 to 1 over the next leading brand, according to sales records and polls of brand preference.
- Q.** Why does the home craftsman prefer this brand?
- A.** Because he is sure of a *perfect rasp every time*. Durable, uniformly excellent Nicholson rasps are the product of 91 years of rasp-making leadership.
- Q.** What other Nicholson wood files or rasps are available?
- A.** Special purpose rasps include Round and Round Cabinet, Round Staggered Tooth. Nicholson also makes Flat and Half Round Wood files and Half Round Cabinet files, with teeth especially cut for smooth filing action on wood.

Send for Free 50-page Book, "File Philosophy," to learn more about the proper choice, care and use of files and rasps.

**NICHOLSON U.S.A.** **NICHOLSON FILE COMPANY** **MADE IN U.S.A.**  
 22 Acorn St., Providence 1, R. I.  
 (In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

**NICHOLSON**  
**FILES** FOR EVERY PURPOSE

(Continued from page 208)

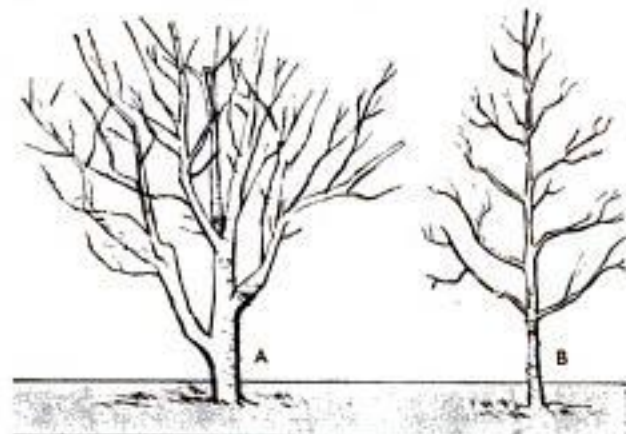
they are doing very well under the mulching procedure you are using. There is little justification for burning leaves or any other organic matter which can be made available as plant food by mulching or composting. Leaves that cover lawns should be raked and composted, or used as a mulch around shrubs and trees. If leaves are left on a lawn the larger ones tend to settle, flatten and overlap and may smother the new growth of grass in the spring. A thin coating of the smaller leaves from trees and shrubs will do no harm. A valid reason for burning leaves is to destroy those from diseased trees or shrubs to prevent spreading of the disease to plants not yet infected. The leaves from certain oaks tend to acidify soils after prolonged use as a mulch. They should be used as a mulch around plants that thrive in soils of high acid content.

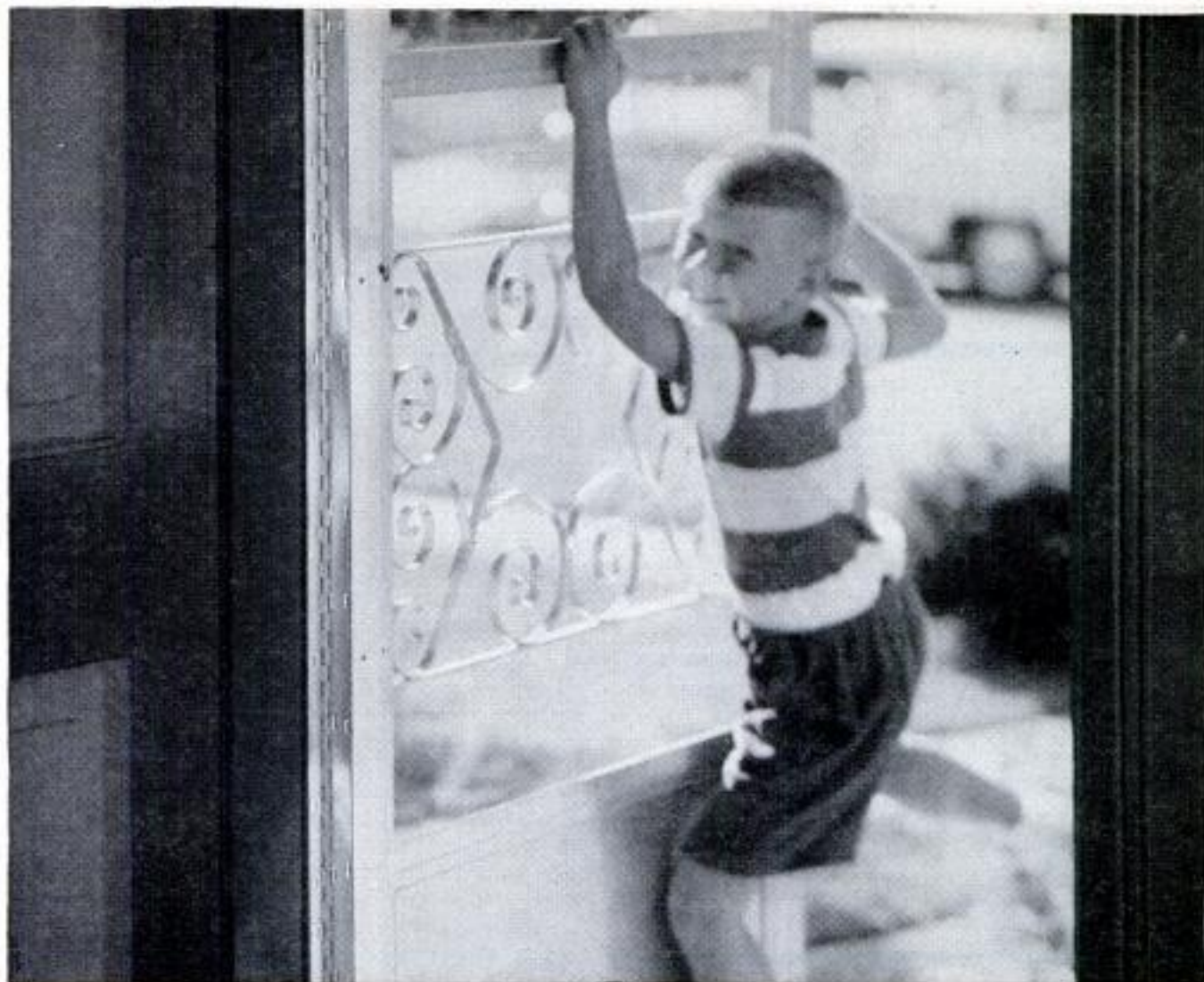
### Pruning Fruit Trees

**Q.**—I want to set out several fruit trees either this fall or the coming spring and I want to know how to prune them correctly to obtain the best shape for fruit bearing. The first question that comes up is whether to plant one-year or two-year trees and then how to prune the trees to form what I have heard is called "a fruit-bearing frame." What does this mean? Does it refer to the shape of the tree, or to the limbs individually?—S.R., Md.

**A.**—You did not say what kind of trees you are referring to—apple, pear, peach or what. For this reason our answer can only be general. Also, we are assuming you refer to nursery stock when you say "one-year or two-year" trees. Although it is not a recommended procedure in all cases, we would suggest that you consider the purchase of one-year whips for spring planting. These whips usually come branchless, which generally permits one to train the tree by controlling to some extent the development of branches where desired by simply pinching off new growth during the first spring and summer. During this period it's a common practice to keep growth to three or five branches. In this procedure it should be kept in mind that the purpose of pruning is not to change the natural growth habits of the tree. Pruning is designed only to correct faults and maintain natural form consistent with good structure. A general aim of experienced orchardists is to obtain what they call a low heading of branches before the tree reaches bearing age. To accomplish this desired tree shape, they begin early, remembering that growth from terminal, or end, buds such as those at the top of a whip, usually grow straight, while those from branch, or lateral, buds, tend to grow at an angle. Thus they take advantage of this natural sequence of growth development to shape the tree so as to obtain the low-headed growth structure in detail A.

Before whips are planted, shorten all roots (if this has not already been done by the nursery) which have developed to the size of a lead pencil. Cut back any injured roots to sound wood, being careful to make clean cuts with a sharp knife. Plant according to approved practices. Then keep a close watch on the first-year shoots that develop along the trunk, permitting only three or four to develop in a full season's growth. Do not cut off the leader, or main stem. Detail B shows two to three-year growth after thinning and heading back for correct structural development.





**STAPLING SAVES 66%, STOPS SAG!** You're looking at a big-selling feature of a well-known storm-and-screen door. It's the strong, continuous hinge secured by *staples* to aluminum frames. Until recently, self-tapping screws held three 8-inch hinges. In time, screws worked loose. Doors sagged.

A Bostitch Economy Man saw a way to improve this method—using metal-piercing, rust-proofed staples and longer, stronger hinges. Now, Bostitch Metal Stitching saves manufacturer *two-thirds* in fastening costs, offsets extra cost of better hinge. The improved doors work better, sell faster, last longer.

## How much can you save by swinging over to Bostitch stapling?

Your Bostitch Economy Man can tell you—objectively and honestly. He's one of 350 trained fastening specialists working out of 123 cities in the U. S. and Canada. There are over 800 kinds of Bostitch staplers in his cost-cutting repertoire. Look up "Bostitch" in your telephone directory or check the coupon.

*Fasten it better and faster with*

**BOSTITCH, Inc., 547 Mechanic St., Westerly, R. I.**

I'd like to know exactly how stapling can cut costs in our fastening operations. I'm particularly interested in the applications checked below:

### HI-SPEED PRODUCTION FASTENING

- stapling vs. riveting
- stapling vs. spot welding
- stapling vs. screws or bolts
- stapling vs. glue or cement
- stapling vs. tape
- stapling vs. tacks or nails
- stapling vs. solder
- stapling vs. wire or string

### PACKAGING and CARDING

- sealing bags (cloth, paper or plastic)
- mounting products on display cards
- fastening items to individual cards

### SHIPPING ROOM ECONOMIES

- preparing cartons for filling
- sealing filled cartons
- lining or padding crates
- applying shipping bills or tags

### BUILDING APPLICATIONS

- applying asphalt roofing
- laying underfelt
- installing ceiling tile
- applying insulation
- installing low-voltage wiring
- applying shake shingle siding

### OFFICE EFFICIENCIES

- filing
- routing
- posting
- binding folders and reports
- preparing advertising dummies

**BOSTITCH®**  
STAPLERS AND STAPLES

Name \_\_\_\_\_ Position \_\_\_\_\_

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# upson panels

for a  
beautiful job  
the easy way



### beautiful walls

Be your own professional decorator. Remodel with stunning, modern Upson Striated Panels. Use Striated as a fourth wall and for cabinet doors. *Upson Striated won't crack or splinter.* Has unbroken embossed surface. Easy to apply. Paint two-tone for glamorous effect. FREE details, mail coupon.



### garage workshop

Made warm and comfortable with Upson All Weather Sheathing used as interior walls. Just nail rugged, super-strong Upson All Weather direct to studs. Easy to paint. Easy to work, saws clean. Every fiber waterproofed. Available many sizes. See lumber dealer. Insist on Upson.



### zoo cut-outs

For the kids' room. Animal cut-outs of Upson  $\frac{1}{8}$  Panels. A cinch to do with coping or jig saw. Fun to paint. Nail or glue up. Upson Strong-Bilt Panels make wonderful walls, too. They are crackproof, add lasting beauty to your home. FREE details yours, mail coupon today!

Every Upson Panel type paints beautifully, is easy to work, saws clean, neat. Upson Panels are available in many sizes and thicknesses. See your lumber dealer. Insist on the name "Upson" for highest quality.

45th

FREE DETAILS, MAIL COUPON



PROVEN QUALITY YOU CAN TRUST UPSON

The Upson Company  
5117 Upson Point, Lockport, New York

Year

Please rush FREE details on \_\_\_\_\_  
(TYPE OF PANEL)

Name \_\_\_\_\_

Address \_\_\_\_\_

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

## Jewels from Wood

(Continued from page 137)

Then he clamps the handle in a vise and, with a strip of abrasive cloth, further smooths the surface and works the piece to final shape. With an Osage-orange stick, he burnishes the surface of the wood until it takes on a glasslike appearance. Other kinds of wood can be used for such friction polishing, but the Osage stick, being very hard and strong, seems to work better than any. Immediately after the burnishing operation, he dips the piece into clear lacquer, drains off the excess and stands the handle in an empty bottle until the lacquer has dried. Next he applies the silicone-wax compound and polishes the surface to its final sheen.

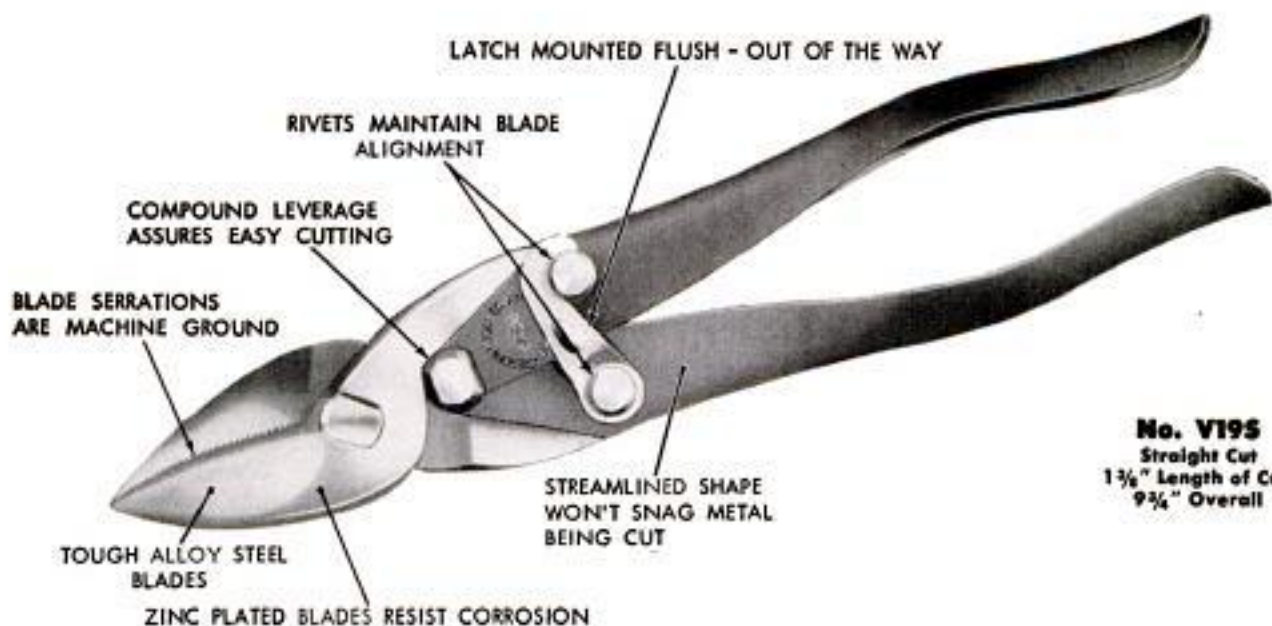
Then he removes the wood jewel from the handle to which it had been glued and smooths the back surface before he glues on the proper jewelry finding—ear wire, cuff-link part, or pin. In the case of a pendant, he inserts the pin of a tip ring in a drilled hole. ★ ★ ★

## Vender Uses Powdered Coffee

Fresh coffee is available 24 hours a day in a small vending machine. The vender has a built-in automatic water heater and uses powdered instant coffee. Despite its small size—only 12 inches in diameter and 22 inches high—it holds enough coffee, cream, sugar and cups for 250 servings.



# CRESCENT AVIATION SNIPS



**No. V19S**  
Straight Cut  
1 3/8" Length of Cut,  
9 3/4" Overall

Distinguished by CRESCENT'S exclusive streamlined design, these new Snips have many outstanding features. Alloy steel blades have extraordinary hardness and toughness and keen edges with machine ground serrations which can be factory reground. Compound leverage produces tremendous blade power with ordinary handle pressure.

Made in three patterns: V19S, straight cut, V19L, left hand which cuts to the right, and V19R, right hand which cuts to the left. All have zinc plated blades and parkerized handles. Neoprene Insulating Sleeves are available separately or installed.

*Sold by Hardware Dealers  
and Industrial Distributors Everywhere.*

## New CRESCENT SCRATCH AWL WITH TENITE HANDLE

Four inch fine steel blade hardened full length — can be easily and repeatedly re-sharpened.

**No. 74**  
Tough, Blue  
Tenite Handle

**CRESCENT TOOLS**  
*Give Wings to Work*

*Sign of the Artisan  
Symbol of Excellence*



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by  
**CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK**



**Guaranteed to fire in oil.** Aldor Spark Plugs have bi-metallic thermostat control that keeps spark plug always at peak efficiency. Adjusts to any heat range requirement automatically. Special non-burning electrodes. In sets (AR1388-2) ..... **95c ea.**



**Add new beauty and style** to your car's interior, and protect your floor mat from wear with these handy rubber Utility Mats. Also has many uses around the house. Choice of 5 colors, 17"x17" (2N1105-9) ..... **Ea. 95c**  
17"x 20" (2N1110-14) ..... **Ea. \$1.25**



**Car Top Carriers** — complete, ready to install. Mount on any car top quickly, easily. Adjustable. Heavy web straps anchor to rain guard — Vacuum cups support and cushion any load. Strong steel 40" (CS332) Pr. **\$8.55**  
Hardwood — 48" (CS229) Pr. **\$6.50**



## New Power... New Beauty...

Over 40 Years... Headquarters



**Guaranteed leakproof Wizard Muffler** protects against deadly carbon monoxide gas fumes. Engineered to conform to original equipment specifications. Heavy, long-lasting steel construction. Gives your old engine "new car" silence! (71144-1386) ..... **\$4.40 up.**



**Don't be stranded** by a worn-out fan belt. Replace now with a Wizard extra-quality Fan Belt. Inner core of endless rubber impregnated rayon cords. Tough rubber cushion reduces heat, assures long life. Can't slip, stretch. Guaranteed fit. (71105-9209) **69c up.**

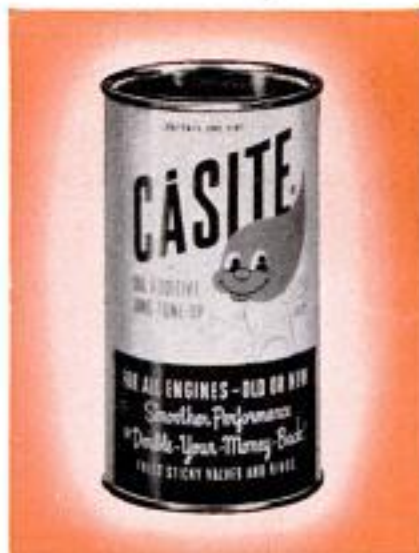


**Get more miles per gallon** with Pyroil "A". Gives heatproof lubrication. Reduces carbon, gum deposits. Lubricates upper part of motor. Pyroil "B" Crankcase Oil gives a cleaner engine—more power. Removes gum, sludge. Pyroil "A" or "B" (AR1336-7) Pt. **98c**

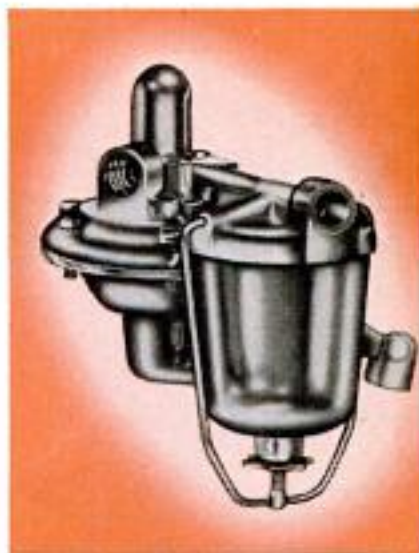




**Wizard De-Sludge-Er** oil filter cartridge has new 100% cellulose filter agent. Out-filters paper or cotton. Removes sludge-forming elements from oil. Won't clog, channel or by-pass. For all cars, trucks, tractors with full-flow or by-pass systems. From..\$1.25 up



**Like a "tune-up"!** For better engine performance the year around, add Casite to your motor oil with every oil change. Keeps engine clean. Gives you easier, faster starting . . . quiet, smooth power. Ideal for breaking in new cars. Pint, only (A122P).....\$1.00



**Wizard Fuel Pumps**, guaranteed for long, dependable service. Original equipment replacement. Diecast body; precision machined surfaces and parts; fully tested. Extra high quality diaphragm for longer life, top performance. All popular cars. From. \$2.45 up

## New Safety For Your Car At **Western Auto**

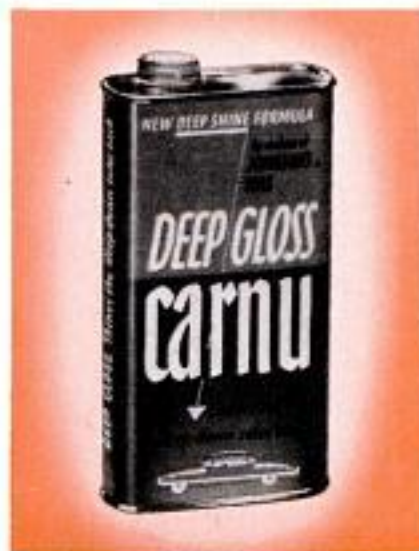
For Top Quality Auto Supplies.

**Western Auto**  
STORES AND ASSOCIATE STORES

NOTE: Western Auto Associate Dealers own their stores and set their own prices, terms and conditions. Prices may vary due to differences in local conditions. (D51-75)



**Chrome Exhaust Deflectors** and Extensions add beauty to your car. Keep exhaust off bumper. Easy to attach . . . fit most cars. Western's Exhaust Deflector; simple, flared design (C8286) **53c** Exhaust Extension (8" x 2 1/2"); straight-tube type. (C8287) **\$1.19**



**It cleans! It polishes!** Johnson's Deep Gloss Carnu cleans as you put it on . . . shines to a hard, long-lasting mirror finish when you wipe it off. No tiresome buffing or rubbing. Restores deep down color. Won't harm finish 20-oz. can (D7719).....\$1.65



**Drednaut Hydraulic Jack** takes work and danger out of tire changing. Easy wrist-action lifts any car. Twist—it's down, safely and smoothly. Precision built for most severe transport service requirements. 7" high, raises to 14 1/4". With handle. (A6188).....\$10.25



## Get Good Performance the Way Big Fleets Do...

### All States Freight, Inc., Akron, Ohio, Uses Federal- Mogul Engine Bearings

With headquarters in Akron, a natural "hub" city, All States Freight provides fast, dependable common carrier service throughout the midwest and east.

All States' rigid schedule of maintenance keeps its hundreds of trucks ready to solve the problems of time and distance. They use Federal-Mogul engine bearings for always-dependable heavy-duty service.

Federal-Mogul oil-control bearings have led in the replacement field for more than 30 years—because of *quality!* Get this quality, next time your car, truck or tractor engine is overhauled. It costs no more to get the best—ask your mechanic!

for New Power . . .

**FEDERAL-MOGUL**  
Oil-Control Bearings



RESEARCH • DESIGN • METALLURGY •  
PRECISION MANUFACTURING • SERVICE

## Keeping Up With the Atom

(Continued from page 139)

in this country as in the known and estimated reserves of coal, petroleum, oil and natural gas combined."

With the energy demand constantly growing in industrial United States, Doctor Hafstad's chart shows uranium beginning to supplement other fuels as a power source in the '60s and, although not displacing other fuels, arriving "just in time to be very helpful in meeting this country's increased energy demands."

"But our fossil fuels will not last forever," Doctor Hafstad says, "and oil and natural gas particularly may be depleted to a very large extent before the end of this century. With such tremendous reserves as those contained in uranium and thorium, the implications are that this new source of energy will become increasingly vital as time progresses."

☆ ☆ ☆

Army engineers have demonstrated that water and sewage can be sterilized by exposure to gamma rays available in waste products of atomic power plants.

☆ ☆ ☆

Although many deaths from lung cancer have been reported among miners working in European uranium mines, five years of study in the Colorado plateau uranium mines produced no proof that radiation in the mines has caused lung cancer.

☆ ☆ ☆

Deep-seated cancer is being treated at Cedars of Lebanon Hospital in Los Angeles by exposure to a radioactive cobalt "bomb." The cobalt is encased in 2000 pounds of lead shielding and housed in a room with armor-plate door and concrete walls three feet thick. For further protection of the operator, a fluoroscope is focused on the patient's "target area" and a TV camera transmits the picture to the remote control room.

☆ ☆ ☆

Yugoslavia is the first Balkan country to announce plans for the production of nuclear energy for nonmilitary purposes.

☆ ☆ ☆

The British have disposed of 1500 tons of radioactive waste by dumping it into a deep spot of the Atlantic Ocean. The dangerous atomic garbage was placed in tanks calculated to remain sealed under water for 30 years or more.

Now is the perfect time to take

# CHRYSLER'S

# "100-MILLION-DOLLAR RIDE!"



**GREATEST V-8 POWER** on the road . . . Performance as you've *never* known it before. Thrilling response. The biggest margin of safety-reserve in any car!

**FULLY-AUTOMATIC** no-clutch driving . . . with famous Chrysler Power-Flite! Incredibly smooth and silent, it multiplies engine power over 400%!

**EASIEST STEERING** is yours with Chrysler Full-time Power Steering. Absorbs road-shock and wheel-fight, gives you safest maneuverability!

**SMOOTHEST GOING** over even the roughest roads . . . with Oriflow shock absorbers' double-strength cushioning power! Plus Antiroll suspension.



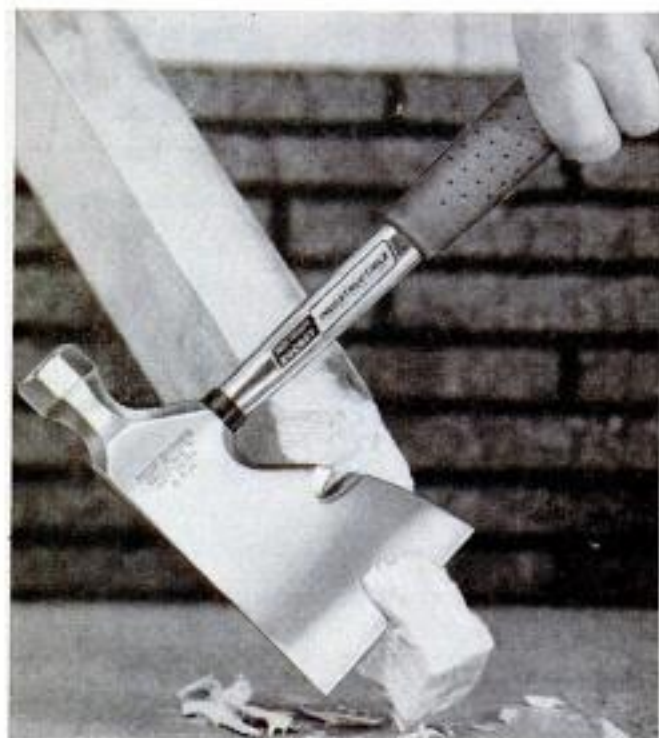
**HERE'S THE SLEEK** new "100-Million-Dollar Look" . . . the trend-setting new automotive fashion that's got motorists swinging to Chrysler in record numbers! And here's today's greatest new car *value!* All of Chrysler's eye-filling new beauty . . . plus Chrysler's traditionally famous size, comfort, and matchless performance . . . *at an easy-to-buy price that's much less*

*than you might think!* We invite you to see Chrysler and learn the **BIG** difference in big cars today . . . by taking the thrilling "100-Million-Dollar Ride!" Your Chrysler Dealer will be happy to see you at any time it suits your convenience (but make it *soon!*) . . . to show you how easily he can fit this great new Chrysler Windsor DeLuxe V-8 to *your* budget!

**COME SEE AND DRIVE AMERICA'S MOST SMARTLY DIFFERENT CAR!**

# TRUE TEMPER®

## Tool News



### NEW: HANDLE WON'T BREAK Cushion grip absorbs shock

Now you can get a True Temper **ROCKET hatchet**. The tubular steel handle won't bend or break. The cushion grip absorbs shock. Thin blade is forged from finest steel, full polished. The **ROCKET hatchet** is built like the **ROCKET hammer**—indestructible in all normal use!

Less than a year old, the **ROCKET hammer** is already the craftsman's favorite. Ask any carpenter! They like the nonslip grip, perfect balance, head that can't loosen. No other tools in the world are like the **ROCKETS**. Made by True Temper Corporation, Cleveland 15, Ohio.

### NOW: A family of **ROCKET** tools at your hardware store



**TRUE TEMPER®**

Finest quality in hammers, hatchets and axes • Lawn, garden and farm tools • Shovels • Shears • Fishing tackle • Golf-club shafts

## High-School Robots Learn the "Three Rs"

(Continued from page 124)

these answers were "pumped" into the Thinker in a briefing session before I started my "interview."

I turned to current events. "Now . . . president after Harry Truman." Slowly it spelled out **E-I-S-E-N-H-O-W-E-R**. I asked for the governor of Minnesota. It paused a few seconds—about 10 seconds are needed between the answers—and wrote in those peculiar "drawn" letters, **F-R-E-E-M-A-N**. Correct.

That's remarkable for current events, I thought, but how would it do on history? I led off with, "Now . . . who won the world's series last year?" That was too easy. It quickly answered, **G-I-A-N-T-S**. I decided to go back a few years and asked the robot, "Now . . . who was president after Monroe?" The machine wrote in distinct letters, **A-D-A-M-S**.

Can the machine reason? A simple test showed that it will not. I asked, "Now . . . will Red China attack Formosa?" There was no answer.

The final question during this first 20-minute "run" surprised me. As a special treat for me the boys had "briefed" it. "Now . . ." they asked proudly, "name the represented magazine." Placing one word over the other, it wrote, **P-O-P-U-L-A-R M-A-C-H-A-N-I-C-S**.

They immediately noticed the error, and looked embarrassed. "Mechanics" was spelled wrong.

So the machine could make a mistake, I thought. But no, it was a mistake in briefing the Thinker, not the Thinker's error. The machine spells phonetically. After they told it to spell "mEchanics" the spelling was correct.

Neither Lease nor the boys will tell exactly how the Thinker functions. The "magic brain" is still under wraps because of possibilities of patents. This much of an explanation is given:

First, the Thinker is a facsimile type of machine. It reproduces answers given to it, but can't think for itself.

An audible word, signal or sentence is spoken into the mike and is carried to the central "nervous system" or "brain." Here the question is acted upon and answered by relaying electrical impulses over wires to a receiving apparatus which changes the impulses back into intelligible answers.

It does not involve anything basically original. Lease, who advised the boys, stressed that "we make absolutely no

(Continued to page 220)

## NOW! Apply Three Finishing Coats a Day!

Wonderful Satinlac® dries so quickly, you're ready for the next coat in 3 or 4 hours. Thus, 3 coats a day is a reality! But time-saving isn't Satinlac's only advantage . . . not by a long shot!



It gives you the most beautiful natural finish you've ever seen. A handsome satiny effect which not only wears well but is easy to maintain. This Wizard with Wood works like magic with hard or soft woods! Never darkens or turns yellow.

## New Adhesive with 1001 Uses Discovered!

It's the most revolutionary adhesive in years! It bonds instantly, permanently, on contact . . . without clamps, presses or nails! It's Weldwood® Contact Cement! Bonds any combination of wood, glass, leather, paper, cloth, rubber and metal (including do-it-yourself aluminum). Makes it easy . . . even for amateurs . . . to apply Micarta or other plastic surfacing materials to table tops, kitchen counters, etc. Enables you to put up plywood paneling without nails! A real Wizard around home, shop or garage.



## Get Weldwood Glues and Finishes at Hardware, Paint and Lumber Dealers!

You can always get Weldwood Glues, as well as Firzite® and Satinlac, at your local hardware, paint or lumber dealers. Weldwood Products come in a variety of convenient sizes, suited

to your individual needs. Weldwood Contact Cement comes in 25¢, 35¢ and 60¢ and larger sizes. Weldwood Presto-Set® Glue comes in 25¢, 45¢ and larger sizes. Weldwood Plastic Resin Glue comes in 15¢, 35¢, 65¢ and larger sizes. Firzite and Satinlac are available in pints, quarts, gallons and 5 gallon cans. Keep a supply of these Wizards with Wood on hand in your shop — you'll use them all the time.

## First Ready-to-Use Glue worthy of the Weldwood Name!

We experimented for years to find a white glue worthy of Weldwood's reputation. Now we have it—Weldwood's new Presto-Set Glue. It's ready to use! Sets fast! Bonds like magic! Bonds wood to wood, wood to cloth, cloth to paper, upholstery fabrics to wood, etc. Saves you time, too, because you can often machine jobs just 30 minutes after using Presto-Set! Now available in handy "squeeze" bottle.



## Best Undercoater for Plywood Stain Jobs . . . Clear Firzite!



Yes, there is a way to tame unsightly wild fir plywood grain! There is a way to make it take on the appearance of costlier woods. Start with a coat of Clear Firzite on stain jobs. This Wizard with Wood soaks into the pores and subdues the wavy grain; practically eliminates grain raise and surface checking. To produce oak, walnut and mahogany stains, simply add colors-in-oil.

## Weldwood Plastic Resin Glue is "Old Reliable" of Professionals!

Professional cabinetmakers, men whose reputations are at stake on every job, call Weldwood Plastic Resin Glue, "Old Reliable" . . . and with good reason. It makes glued joints stronger than the wood itself. The joints actually grow stronger with age. It's highly water-resistant, too! More and more hobbyists have discovered that when the job has to be right . . . it's best to rely on the "Old Reliable" . . . Weldwood Plastic Resin Glue.



## Best Undercoater for Paint Jobs . . . White Firzite!

Hobbyists use White Firzite to solve 2 distinct problems. They use it as an undercoater on fir plywood paint jobs, to seal the pores; help prevent grain raise and checking. And they use it to get a "woody" blond or pickled or wiped effect so popular today. White Firzite can easily be tinted with colors-in-oil to obtain any light pastel tone you want.



\*Trade Mark

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***If your car's dip stick repeatedly shows you need to add oil, your power is fading... and it's time to replace your Piston Rings!***

Having to buy too much oil and gas, and slow pickup reveal POWER FADE! Your rings are badly worn—you're wasting money on lost power.

Top performance is gone. And despite the extra oil used, vital engine parts remain starved for oil. This is not only costly and wasteful, but is a warning of expensive repairs to come later.

See your motor specialist for a ring check-up. If he recommends a ring change, it will pay you to install Hastings replacement rings. They're engineered exclusively for worn engines to quickly stop power fade, oil-pumping and gasoline waste.

All the safety and driving enjoyment of full-powered performance are yours again with Hastings Rings... it's the best money you can spend on your car.

HASTINGS MANUFACTURING CO., HASTINGS, MICHIGAN  
HASTINGS LTD., TORONTO

*Piston Rings, Casite, Oil Filters, Spark Plugs*

**\* TOUGH but oh so gentle**



**HASTINGS**

STEEL-VENT PISTON RINGS

*Regular or Chrome-Faced*

**\* TOUGH on oil-pumping • GENTLE on cylinder Walls**

claims of discovering any new scientific phenomena."

It is unique because it applies old principles in a completely new and different way, according to Lease. He explained it this way:

"A professor once told me the only difference between an engineer and anyone else is that what takes others 100 hours to do, an engineer can do in one hour. About the same thing is the case here."

The machine's parts—mostly scraps—are worth about \$120. The boys estimate their actual labor at 560 hours each. At a dollar an hour the total cost would run a little over \$1000. It's powered by regular household current, and uses about 200 watts.

The Thinker is built largely around the molecular theory of magnetism, the electromagnetic theory and the theory of electromagnetic induction. In other words, it is as simple as the common bar magnet, the electric motor, the electric generator and the transformer. It deals with inductance and inductive reactance, as applied in pulsating direct-current and alternating-current circuits.

The inventors emphasize that it is a completely "closed circuit" device, using no form of radio-type transmitter or receiver. The machine was originally designed to be a communications device rather than a question-and-answer-type machine. Its biggest value would be as a communicator, the boys believe.

As a novelty—leaving the Thinker in the back room for a moment—Castor the Great steals the show. He's a handsome, romantic and "dangerous" robot who roams the halls of Foley High School. Directing Castor on his jaunts is his creator, Kenneth Freude, 17, a junior.

After working for two months assembling various pinball-machine parts and other pieces of "junk," Kenneth was able to make Castor walk, defend himself with a water gun, pick up paper, wink at girls, talk and react with fright by raising his hair! Total value of this project—about \$200.

There is also a little robot. Versal Cross, 17, the senior student who built it calls it a Doodlebug or Snail. The Snail follows a beam of light and, having lost it, searches until it finds the light again. It is not controlled by radio or by other remote controls. Assembled, it looks like a giant bug with feelers guiding it as it searches for the beam of light.

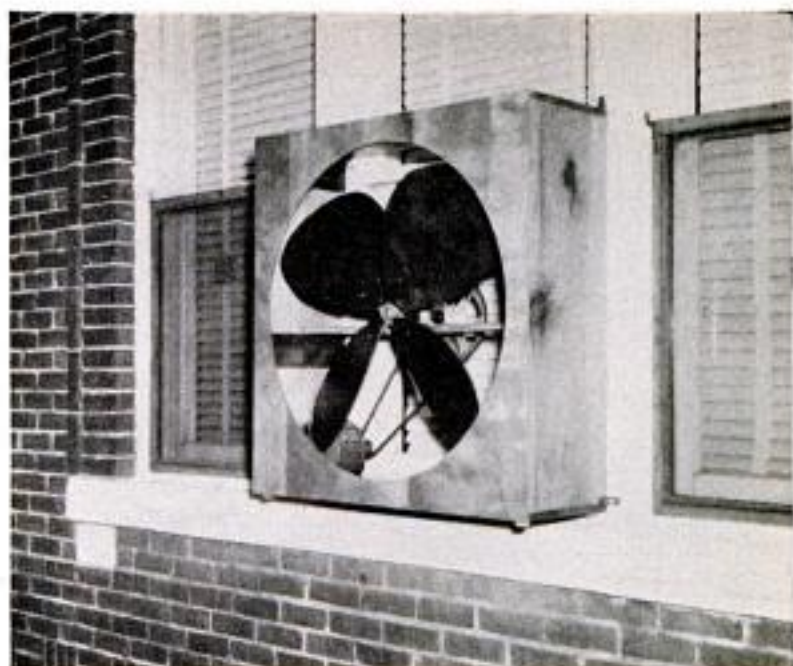
Armies of the future might use cannons like the one Edward Heintze constructed as his science project. Loaded with water and a few drops of sulphuric acid, the

(Continued to page 222)

HOW TO

# Keep Cool

This Summer

## Few Dollars Builds Breeze with Easy-to-Assemble FAN KITS • SAVE UP TO 75%

### NEW IMPROVED FAN KITS CAN BE INSTALLED THREE WAYS!

Cooling, refreshing outside breezes can now bring relief from summer heat at the lowest cost ever in your choice of installations! Window and Standard Attic fans have been assembled by thousands—NOW, with the new All-Purpose Fan Kit you can also make a dependable HORIZONTAL installation in your attic. Efficient operation is guaranteed!

### NO SPECIAL TOOLS OR SKILL REQUIRED FAN READY TO PLUG-IN IN FEW HOURS

Step-by-step instructions, included in every complete kit of parts, shows exactly how to assemble and install your own low-cost cooling system. Even the most inexperienced householder can do it. All Necessary parts are included in the kit. The only additional requirements are a few pieces of lumber for fan housing and a new or used  $\frac{1}{4}$  or  $\frac{1}{2}$  HP 1750 RPM motor, usually available at appliance dealers at small cost.

Sizes for every need are available for immediate shipment. Installations now in use include Homes, Apartments, Farm Buildings, Laundries, Shops, Offices and many more.

30" Fan cools average 5-room home, 6000 CFM.....	\$14.95
36" Fan cools larger homes, 8000 CFM.....	17.95
24" Fan cools smaller homes, 4500 CFM.....	13.95
20" Fan cools apts., offices, etc. 2800 CFM.....	12.95

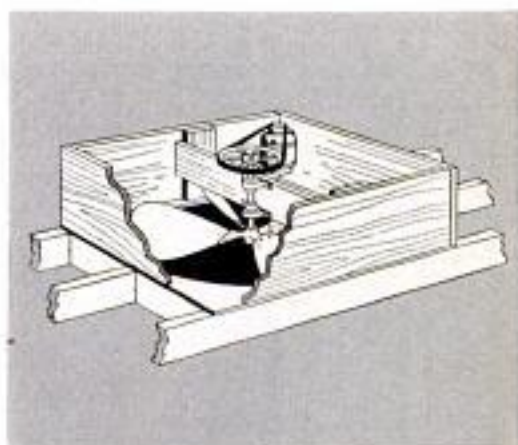
Shipped direct by manufacturer postpaid on orders accompanied by check or money order. Deposit of \$3.00 required on C.O.D. orders.

**Satisfaction Guaranteed — Circular Free.**

## FAN KIT Company

154-P, No. Belvedere

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Typical HORIZONTAL ATTIC INSTALLATION with new All-Purpose Fan Kits. No extra parts needed.



PARTS included in all kits: Aluminum fan spider, Masonite blades, shaft, oilite bronze bearings, collars, pulleys, belt and bolts. Everything you need with complete instructions.

# FAIRCHILD

A Famous Name in Industry

## MAKES THE FIRST AND ONLY TWO MOTION ELECTRIC SANDER

Perfect for every  
**"DO-IT-YOURSELF"**  
Enthusiast !!



DUALINE . . . the only sander with both Orbital and Strate Line motion, using separate, instantly interchangeable plates. Orbital motion provides for very rapid stock removal while Strate Line delivers a whisper smooth finish cut. Designed to reach corners, ceilings and other hard to reach spots, the DUALINE is light, powerful, quiet and smooth . . . ball bearing throughout. \$44<sup>95</sup>  
5500 OPM from the 1/2 HP universal motor . . . Push-button paper removal is fast and easy.

Fairchild makes a complete line of drills, drill kits, bench grinders and other tools . . . plus the new single action Orbital sander. Low priced, fully guaranteed, thousands of uses. Send for Free catalog and prices of these rugged, industrial type Fairchild electric tools.

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### HOW TO GET A NEW GARAGE DOOR AT LESS THAN HALF PRICE!

Yes, you can have a swing-up garage door like the one shown here — complete with Stanley Swing-Up Hardware for less than half what you'd normally pay!

How? Build it yourself from Easi-Bild's\* Pattern No. 86. It's easy! No special tools — no special skill! Just follow the clear, "can't-go-wrong" directions of the pattern. Tells you everything — including what materials to buy,

where and when to use them. Stanley Garage Door Set is simplicity itself to install. You'll be amazed how quickly you can do the job — and mighty proud of your results.

Ask your dealer for Simplified Directions for Installing Stanley Garage Hardware and Easi-Bild Pattern. Or use coupon below. \*Trade Mark Reg. U.S. Pat. Off. — Easi-Bild Pattern Co.

EASI-BILD PATTERN CO., Dept. 627, Pleasantville, N.Y.  
Enclosed is 50¢ in coin, money order, check for  
Garage Door Pattern No. 86

Please send Simplified Directions for installing  
( ) Single ( ) Double Garage Door Hardware.

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cannon breaks the solution into gases. The gases are ignited by an electrical charge. With a loud "crack," the cork is sent sailing across the 40-foot classroom.

For a more recreational project, seniors Thomas Wildman and Gordon Viste, both 17, connected an "electronic brain" to an electric train. A spoken command causes the train to stop, go forward or back up. The brain changes the sound waves of the voice into electrical currents. These are sent to the controls of a regular electric-train set. One "shot" of electricity stops the train, two shots make it back up and three shots cause it to move forward. When a series of syllables is said—either one, two or three—the same number of electrical shots enter the controls and move the train.

The train works just like an old Iron Horse, too. Using "whoa" for the one-syllable command, the train stops. "Get-up" will make it lunge forward. "Back boy" starts the train on a backward run. The more ordinary commands are "stop," "go forward" and "back up."

In every corner of this Foley classroom are student-built machines that perform a variety of tasks. Each student must work on one project a year.

Lease, who taught shop classes for two years before becoming science instructor last year, says, "I will feel lucky if my efforts help produce only a handful of scientists, for even this handful may be responsible in the end for keeping our country in the scientific lead." ★ ★ ★

### Roller Applies Glue to Seal Carton

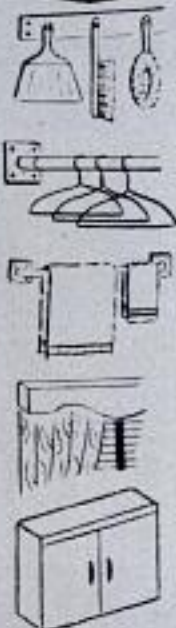
Gummed tape or staples are not needed to seal a paperboard carton when a new roller is used. The hand roller carries a quart of glue. Rolling the machine across the surface applies an even coat of glue and the paperboard flaps then are pressed into place. Ungummed labels also can be applied to the carton with the aid of the roller.





# MOLLY

WHERE NAILS AND SCREWS WON'T HOLD ... MOLLY WILL



**PUTS  
THE FIX IN  
FIXTURES**

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REPLACEMENT OR A REFUND OF MONEY  
Guaranteed by  
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IF NOT AS ADVERTISED THEREON

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MOLLYS  
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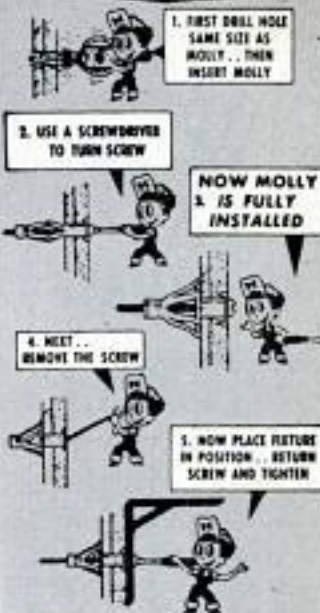
Molly Screw Anchors hold any fixture securely in any hollow wall construction. Molly puts an end to loose fixtures and allows you to install new ones exactly where you want them—not where the studs are. Molly puts an end to broken wall surfaces and crumbled plaster!

Molly will not pull through. It forms its own backing and actually reinforces the area in which it is used. Once installed, anchorage is permanent. Fixtures can be removed for cleaning and be replaced in the same anchor! Mollys are inexpensive and easy to install!

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**EASY TO INSTALL  
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SCREW ANCHORS  
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Prospecting made easy with Goldak's new U-238C triple-action geiger counter! Also famous line of metal locators, from \$49.50. Send 25c for radioactive uranium sample! FREE DETAILS, Dealer Inquiries Welcome.



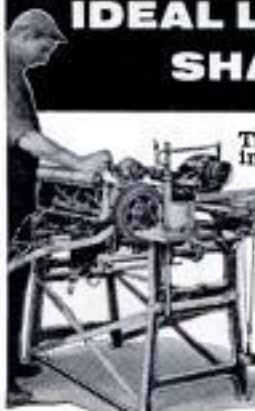
**GOLDAK COMPANY** 1542 W. Glenside Blvd., Glendale, Calif.

## NEW, IMPROVED CALCULATOR FOR WOODWORKERS only 25c

Instantly gives information on lumber, nails, concrete mixes, painting materials, etc. Convenient, simple to read. Just set dial for nail specifications, to convert linear to board feet, find bit sizes for screws, compare characteristics of woods. 6" diameter heavily varnished cardboard. Send 25c, no stamps, please to Greenlee Tool Co., 2107 Columbia Avenue, Rockford, Illinois.



## Need an extra \$1,000, \$2,000, or more? Make it with an IDEAL LAWNMOWER SHARPENER



There are thousands of lawnmowers in your locality: Average \$1,000 profit per 250 mowers with customer satisfaction and repeat business assured. Provide this essential service with an Ideal Lawnmower Sharpener, the only machine that grinds the reel to "fit" the bed knife. Compare by any standard. The Ideal, backed by 53 years of experience, costs no more. Write today for complete, free catalog.

**THE FATE-ROOT-HEATH COMPANY**  
Dept. PM-7 Plymouth, Ohio



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## ELECTRIC FUEL PUMP

Grand Prix Winner  
ECLIPSE MACHINE DIVISION, BENDIX AVIATION CORP.,  
ELMIRA, N. Y.

# New central heating system has a thermostat in every room

Steam turbine operated fan in each room heater circulates filtered warm air. Thermostats are non-electric

*Why didn't someone think of this long ago?* Once in many years a new idea is born; one so simple, so logical, and so practical that it wins immediate and wide acceptance. People constantly tell us that the SelecTemp heating system is just such an idea.

**Home comfort beyond anything you've ever known.** SelecTemp is the ultimate in modern heating—every room a zone, with its own thermostat. Every member of the family has just-right warmth, from 65° or so in mother's busy kitchen to tropical warmth for grandmother. Each room has a separate steam-fed heating unit, which constantly circulates filtered warm air. There is no wiring; fans and thermostats are non-electric. (See diagram at right.)

**Economically installed. Fuel cost low.** SelecTemp heating is very economically installed in new or old homes or buildings, since small flexible copper tubing carries steam to room units. SelecTemp eliminates *overheating* and *unnecessary* heating. Rooms not in use can be kept cool and quickly reheated when wanted. SelecTemp boiler with immersion coils will provide plenty of hot water, winter and summer, at low cost.

**Continuous, modulated heat.** The speed of the fan and the amount of steam supplied are constantly and automatically adjusted to room needs. No more heat than is needed, and no less. No pop-on, pop-off. Just steady heat, accurately metered.

**Learn more about this revolutionary heating system.** Mail the coupon. You will receive a 32-page booklet "12 Plans for Home Heating," describing SelecTemp heating, as well as accurate information on all principal types of modern heating.

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In Canada: 80 Ward Street, Toronto, Ontario.  
Please send me your free booklet "12 Plans for Home Heating."

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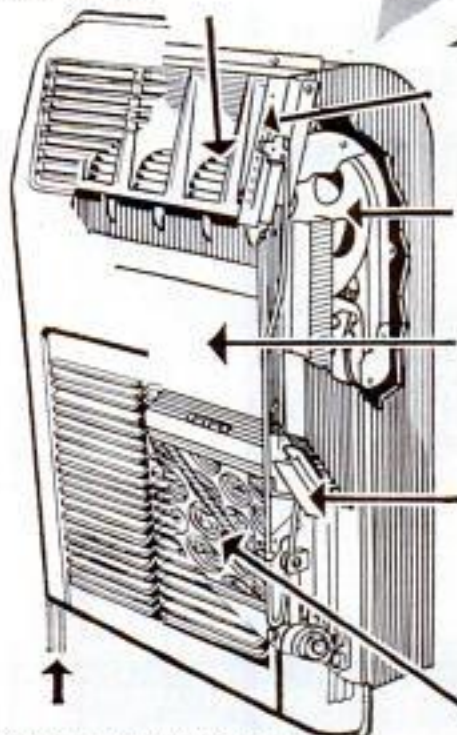
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

224



SelecTemp room units, only 18 inches high, are recessed into wall and can be painted to match color scheme. Three sizes: 6,000, 12,000, and 18,000 Btu output.

Air circulating fan continuously draws room air through SelecTemp unit, quietly filters and re-circulates it.



Thermostat control lets you choose desired room temperature; any warmth level from 40° to 90°.

Small steam turbine operates air circulating fan faster or slower, as thermostat calls for more or less heat.

Heat transfer core. Efficient copper core heat exchanger converts steam heat to warm air heat.

Air sampling chimney constantly samples temperature of room air.

Spun glass filter cleans circulating air; prevents smudged walls and draperies.

Supply and return lines are of flexible copper tubing, only 1/4 and 1/2 inch, I.D.

## IRON FIREMAN®



# SelectTemp

MODULATING ZONE HEATING  
POPULAR MECHANICS

Copyrighted material

# 5 do-it-yourself ideas for week-end carpenters

Save money—have fun with Easi-Bild® patterns and Weldwood Fir Plywood. Here's a happy combination that makes do-it-yourself easy, quick and satisfying!

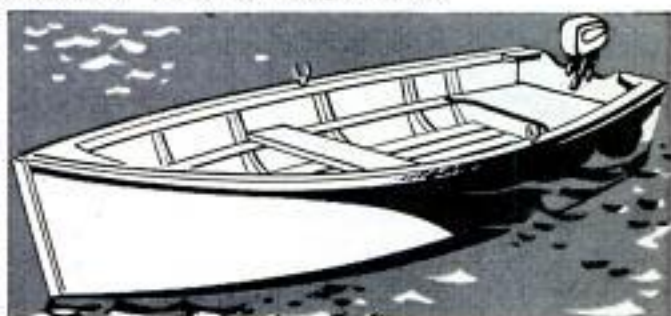
With Weldwood Fir Plywood you can build any of these projects. Make things for the house— even *make* a house!

Most patterns are full size—all contain famous Easi-Bild step-by-step directions and pictures plus detailed list of materials. Your lumber dealer can furnish the exact amount of superior Weldwood Fir Plywood you'll need. And chances are he'll have all the other materials, too.

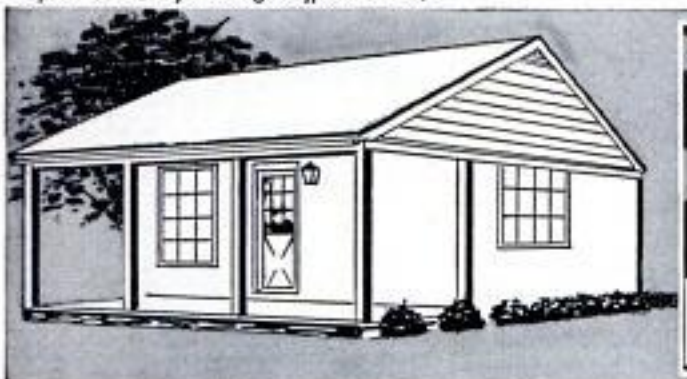
Get started today—send the coupon now!



**Garden chaise on wheels.** Comfortable, relaxing; comes apart for easy storage. #325—35¢



**Utility boat.** 11½-footer handles well with oars, is perfect for 2 to 10 hp. outboard. #85—\$1.00



**Vacation cabin.** Compact yet roomy, contains living room, kitchen, bedroom, bath on entry floor; lower floor has recreation room or second bedroom, laundry and utility rooms. Plus 300 sq. ft. of attic storage! #432—\$3.00



**Storage wall on wheels.** Divides bedroom or sleeping area in den or spare room. #263—50¢



**Swimming float.** Ride with the waves! "Seascope" window can be fitted to view marine life. #247—50¢

\*Trade-Mark Easi-Bild Pattern Company

United States Plywood Corp. Pattern Dept.  
P. O. Box 215, Pleasantville, New York



PM-7-55

I am enclosing \$\_\_\_\_\_ for the following Easi-Bild patterns.

#324—35¢                       #432—\$3.00                       #247—50¢

#85—\$1.00                       #263—50¢

Easi-Bild catalog listing over 200 projects—35¢

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

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



Ask your lumber dealer for

**Weldwood®**

**DOUGLAS FIR PLYWOOD**

Made by UNITED STATES PLYWOOD CORPORATION

World's Largest Plywood Organization

 **NO MORE  
BLOWN OUT FUSES!**

**Here's Mini-Breaker® . . . the lifetime replacement for old-fashioned fuses**



- Fits like a fuse in any standard fuse socket.
- Just press the shockproof Mini-Breaker button to restore service.
- Built-in timelag handles starting loads of major appliances.
- Protects against all overloads and short circuits.
- Lifetime protection against electrical fire hazards.

In 10, 15, 20, 30 amps. AC only, 125 volts max. Listed by Underwriters' Laboratories, Inc.

**MINI-BREAKER®**

Ask for it at your favorite store or write Mechanical Products, Inc., Jackson, Michigan

*Say You Saw It in Popular Mechanics*

CLIP THIS TO GET

**NEW! DELCO  
LOW PRICE  
WATER**

WELLMASTER JUNIOR JET

SHALLOW WELL PUMP



Precision-Engineered and Quality-Built By . . .

**GENERAL MOTORS  
DELCO**

Only **\$89.95** f.a.b. Rochester (Suggested List Price Model 53372 as Illustrated)

- No other pump can match this new Delco Jet for PRICE . . . and QUALITY . . . in 1/2 HP class!
- New simplicity . . . only ONE moving part . . . New compactness . . . Self-adjusting capacity . . . New durability . . . All at new LOW PRICE!

**WRITE! for Full Information or Call Your Delco Water Pump Dealer Today!**

**DELCO APPLIANCE DIVISION**

GENERAL MOTORS CORPORATION  
Dept. PM3, Rochester 1, New York



**Lawn Edger Buries Coaxial Cable**

In some areas television viewers now have the option of connecting directly to a coaxial cable, eliminating the need for a towering antenna. One TV dealer in Florida who operates such a service has found a power-driven lawn edger an ideal tool to dig a trench for the cable. Previously the trench had been dug by hand, which required resodding that part of the lawn. The edge-cutter blade was removed and replaced with a 10-inch carbide-tipped steel blade. After the edger is run across the lawn, a spade is forced into the cut and moved back and forth to widen the trench slightly. The coaxial cable fits easily into this space, dirt is tamped down over it, and the grass shows no sign of disturbance.

**Car-Key Tie Clasp**



Useful as well as ornamental is a tie clasp that serves as an emergency car key. The key, which bears a crest of the owner's automobile, swivels away from the tie bar when it is to be used. It is made to fit the locks of the owner's car as well as does the original key.

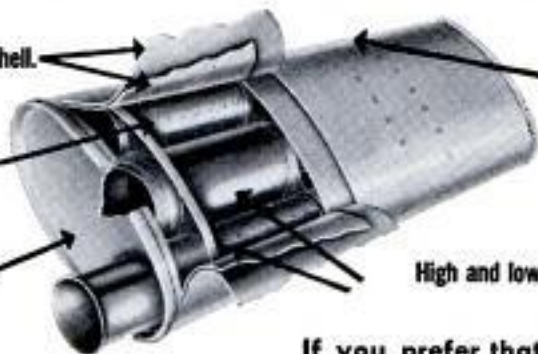
# SAVE UP TO \$8 WHEN YOU BUY **SILENTONE** WORLD'S BEST MUFFLER

26 gauge inner shell—22 gauge outer shell.

Double shell lasts longer.

Non-clogging extruded holes—  
no whistling, no restriction.

16 gauge, spun-locked,  
blowout-proof steel heads.



Crimped seams  
eliminate  
weak points.

High and low frequency tuning chambers.

Ordinary mufflers silence your engine by throttling its power. Remember, every pound of muffler back pressure wastes 2 hp of engine output. Silentones are scientifically designed to keep back pressure at a minimum, give you the performance you want, the mileage you expect. Leaktight 1/3 heavier steel construction makes Silentones safe and last thousands of miles longer. They're individually engineered for your car. Install Silentone® yourself—save up to \$8.

If you prefer that deep mellow tone—hear how Dynatone Mufflers sound on your car. Your store has a recording. Dynatones are engineered, not packed. Cost far less than Hollywood types. Dynatone duals and headers available for use with any type muffler.

Write for your free copy of the interesting booklet "Carbon Monoxide, Your Car and You."

## SILENTONE MUFFLERS

Dept. 2G, Toledo 1, Ohio

Sold only by America's Leading Automotive Chain Stores

**FREE BOAT KIT CATALOG** Write: **LUGER INDUSTRIES**

**8' to 14' Models from \$39.95 incl. freight**

- Assemble your own boat
- No experience necessary
- Save 1/2 "factory prices"

Marine Hardware, Fiberglass, & Trailers

12 ft. Runabout Pictured.

DEPT. B 4452 NICOLLET AVE MINNEAPOLIS 9, MINN.

### STOP WATER WASTE AUTOMATICALLY

Use HECO Flex-tip, the nozzle that shuts off the water FOR YOU. FLEX to use—RELEASE, it's off. No running back and forth to faucet. Stop puddles, save water and mess when washing cars, mixing cement, transplanting flowers and shrubs, etc. Made from solid brass bar stock and grease resistant Neoprene. Nothing to clog or break. Thousands in daily use. Get yours! \$1.75 each, 2 for \$3.00 postpaid. Satisfaction guaranteed. If dealer can't supply, send check or money order to: Customer Service, Dept. M, HECO, Littleton, Colorado. Colorado residents add 2% sales tax.



**SEND FOR FREE CATALOG**



### Money-Making Tools!

It's easy to own the same "pay-off" tools used and endorsed by America's top-earning mechanics! You can start building your own kit with basic Snap-on sets—add others any time. Never sold in stores—direct to users only. Send today for free catalog!

Snap-on Tools Corporation  
8062-G 28th Ave., Kenosha, Wis.



A perfect paint job with half the trouble. Get your money's worth. Paint shaken on a Red Devil Paint Conditioner is ready to use right out of the can. Paint is perfectly mixed factory-fresh—needs no stirring. Ask your dealer to mix your paint on a

## Red Devil PAINT CONDITIONER



**FREE**

How to Prepare Surfaces for Finishing. Illustrated instructions on preparing masonry, wood and metal surfaces for painting.

**Red Devil Tools.** Dept. 146  
130 Colt Street, Irvington, N. J.

Please send FREE copy of "HOW TO PREPARE SURFACES FOR FINISHING."

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

JULY 1955

227

## STOP SAGGING REARS!



with  
LOW-COST

### AIR LIFT PNEUMATIC SPRING BOOSTERS

Car got that "middle age spread" look? Even new cars need help for overloads of luggage, equipment or extra passengers. AIR LIFTS fit between leaf springs and frame — inflate with air to support overloads up to 1000 lbs! Perfect for vacation trips, and so easy to install. See your dealer or write for his name.

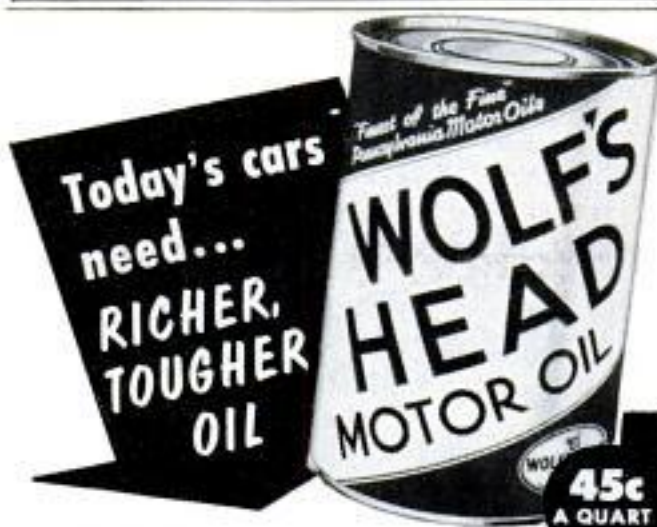
Most  
Models  
\$20



**FREE!** . . . tip-packed literature on Air Lift remedies for sagging rears. Write Dept. 47.

**AIR LIFT**

**AIR LIFT COMPANY,**  
LANSING, MICHIGAN

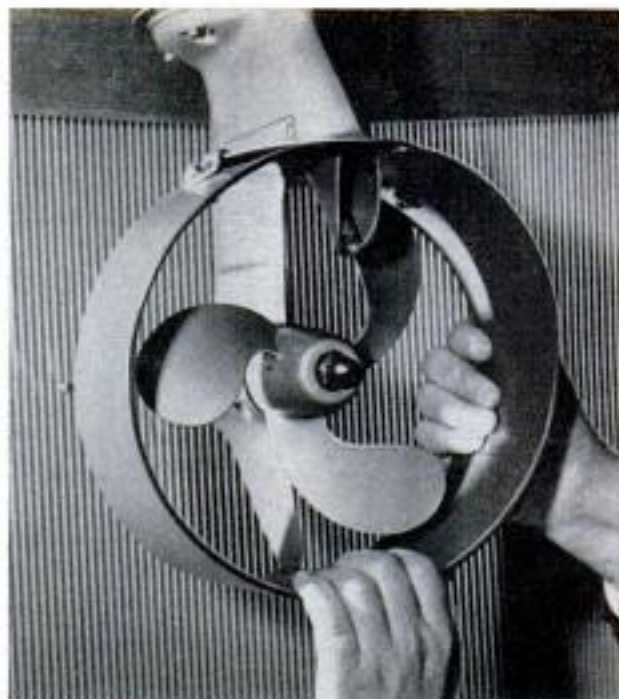


## INSIST ON WOLF'S HEAD!

- 100% Pure Pennsylvania.
- Refined three steps further than ordinary oils.
- Scientifically fortified . . . cleans as it lubricates.

Insist on WOLF'S HEAD for better engine protection, more power, better oil mileage!

**WOLF'S HEAD OIL REFINING CO., INC.**  
OIL CITY, PA.



### Guard for Outboard Motor

Most outboard motors can be fitted with a new aluminum guard which fits around the propeller and prevents swimmers from being injured by the blades. The guard helps to prevent weeds from fouling the propeller and is said to increase the maneuverability of the boat. The manufacturer claims that its use will also increase the speed of a boat up to 25 percent.

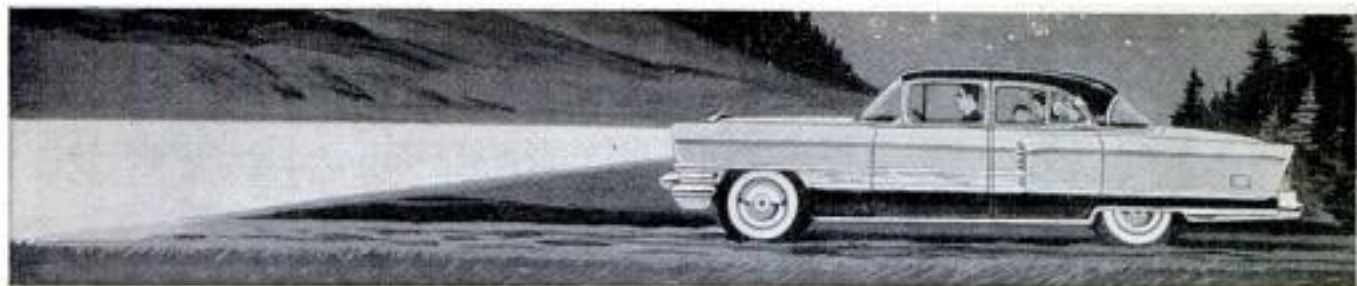
### Clamp-On Valve Tap Drains Sealed Systems



It takes only a moment to tap and drain tubing at any point along the line with a clamp-on valve unit. The valve pierces a hole in the line and serves as a conventional valve for draining the fluid. One size of valve fits three sizes of tubing from 1/4-inch to 3/8-inch. A Neoprene gasket

seals the valve in position so there are no leaks. It can be left in position for future use or, if desired, removed and the tiny hole closed by soldering.

From chick to three-pound broiler in 10 weeks is the rate of growth of a new chicken, a Silver Cornish-New Hampshire cross, developed at the Department of Agriculture's Beltsville, Md., research center.



**Headlight Beams Stay on the Road!**

Packard Torsion-Level Suspension keeps headlights steady and properly aimed for best visibility regardless of passenger or luggage load — an important safety factor in night driving.



**Takes Sweeping Curves, Sharp Corners in Stride!**  
Front and rear wheels are interconnected to give equal load on both outside wheels. You get a secure sensation of positive control on sweeping curves, tight corners with added stability and safety.



**Takes Off at Ideal Ride Level!**  
There's no rear-end "squat" to snap the neck or jar the spine when the new Packard takes off! The car drives forward evenly balanced and seat backs nestle more closely to passengers.

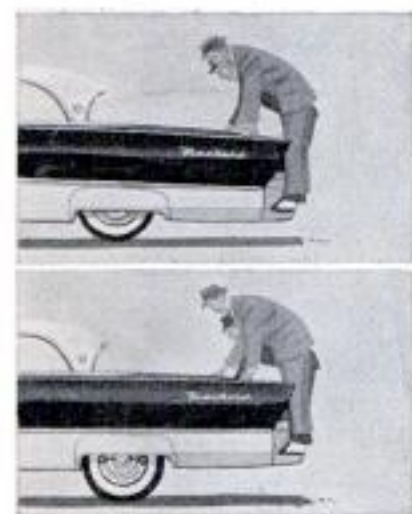
## New PACKARD TORSION-LEVEL Ride

### ELIMINATES CONVENTIONAL COIL AND LEAF SPRINGS

Smooths the Road... Levels the Load — *Automatically*

Long famed for creative engineering leadership, Packard has developed new Torsion-Level Suspension... hailed as the greatest ride development in automotive history... and here's why! In other cars, twisting forces due to vertical wheel movement are transmitted to the frame.

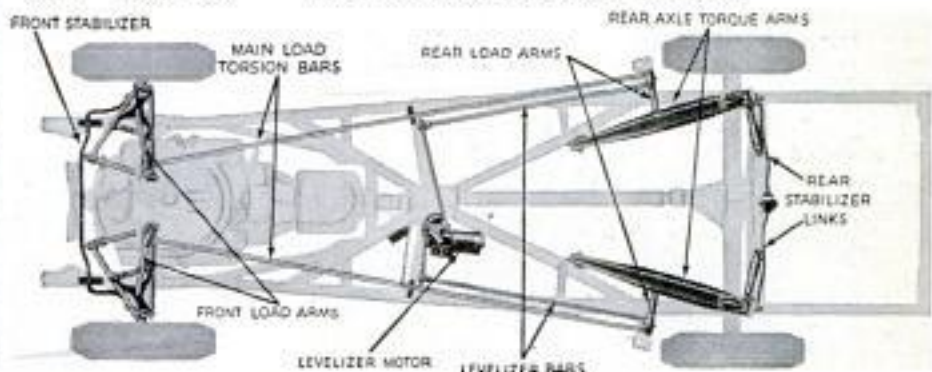
Passengers are pitched and bounced, car body and frame are wracked.



Just 7 seconds after load change, the unique levelizer automatically brings Packard back to ideal ride level.

With the new Packard, these same twisting forces are transmitted along the new Torsion Bar system, and absorbed before they can reach either frame or passengers. A power-controlled levelizer automatically compensates for changes in passenger or luggage load... keeps the new Packard always at ideal ride level.

But to fully appreciate this new kind of ride, see your Packard dealer — Take The Key And See... Let The Ride Decide!



Torsion Suspension is made up of two full-length torsion bars, four pivot arms and links. Driving torque arms connect rear axle housing to frame. The levelizer has two shorter bars connected by links and levers to a two-way motor.

**PACKARD DIVISION • Studebaker-Packard Corporation**

JULY 1955

229



## The Oil Filter that Guards the *Life* of your car engine

Grime doesn't pay in your engine. It robs you of oil life and trouble-free engine service. That's why it's smart to rely on WIX to police your oil and stop costly engine repairs.

**wix**  
ENGINEERED FILTRATION

WIX HEVI-DUTY Oil Filter Cartridges more than meet automotive engineers' specifications for filtering efficiency — and do not disturb additives in today's heavy-duty oils. Ask your Serviceman for a WIX Cartridge the next time he changes your oil. There's one designed especially for your car—to keep your oil *clean* and your engine sweet-running—to protect your engine *and* your pocketbook.

**POROSITE**—the modern, pleated paper WIX Cartridge for Full Flow Filtration Systems.



WIX CARTRIDGES  
are priced \$1.50  
as low as

**WIXITE**—the outstanding depth-type WIX Cartridge for Partial Flow Systems.

**OIL FILTERS wix CARTRIDGES**  
AUTOMOTIVE • INDUSTRIAL • RAILROAD  
WIX CORPORATION • GASTONIA, N. C.  
IN CANADA: WIX ACCESSORIES CORP. LTD., TORONTO

## Owners Praise Ford's Power, Styling

(Continued from page 90)

"I prefer black. My wife wanted two-tone white and buckskin. That's what we got. Hard to keep clean."—Delaware chemical engineer.

"Some of them are too loud."—South Dakota blacksmith.

"They look awful."—New York welder.

"They won't be beautiful too long due to fading."—New Hampshire clerk.

### 1955 FORD V8 SPECIFICATIONS

#### ENGINE

Bore and stroke	3.62 x 3.30 in.
Piston displacement	272 cu. in.
Brake horsepower	162 at 4400 r.p.m.
Compression ratio	7.6 to 1
(Optional high-compression V8 in Fairlane and station wagons equipped with Fordomatic: 182 hp. at 4000 r.p.m.; 8.5:1 compression; 4-barrel carburetor. Dual exhaust standard on Fairlane and station wagons)	
Transmissions	3-speed conventional, Overdrive, Torque converter with planetary gears.

#### GENERAL

Steering ratio (over-all)	25.3:1
Steering wheel turns, (lock to lock)	4.5
Turning diameter (curb to curb)	41.2 ft.
Shipping weight (unladen)	3236 lb.
Wheelbase	115.5 in.
Tread, front	58 in.
Tread, rear	56 in.
Height over-all	61.0 in.
Width over-all	75.9 in.
Length over-all	198.5 in.
Road clearance	6.5 in.

#### CAPACITIES

Oil (less filter)	5 qt.
Water (less heater)	19 qt.
Gasoline	17.5 gal.

#### INTERIOR DIMENSIONS

Front-seat width	60.5 in.
Rear-seat width	60.3 in.
Headroom, front	35.1 in.
Headroom, rear	34.2 in.
Legroom, front	44.3 in.
Legroom, rear	41.9 in.

### Here Are More Complaints

"When parked on an incline in the rain, water will run into the interior when the door is opened."—South Carolina overseer.

"We have lots of rain here. The doors just can't be stopped from leaking. The curve of the windshield causes the water to come around and in the vent window when driving."—Oregon store manager.

"I expected more than I got in a new car. Body is very poorly assembled. Attention to detail terrible. I have three type-written pages of deficiencies."—Delaware engineer.

"Chrome seems to be a very weak point

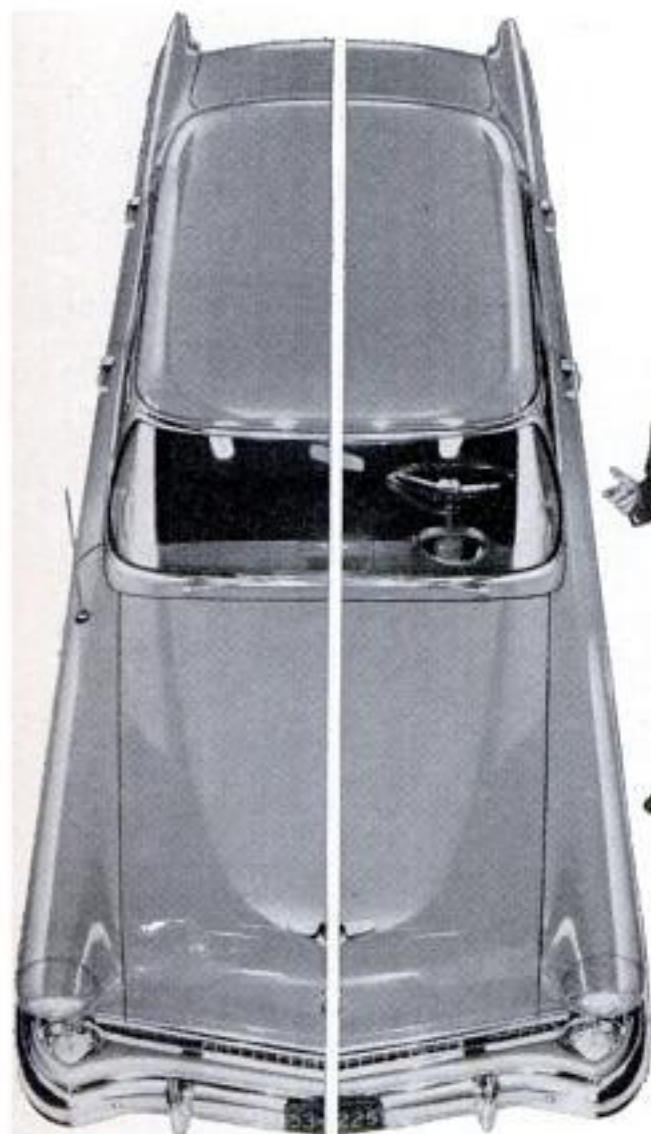
(Continued to page 232)



Here's what



found out about Car-Plate —



# Easiest way to put on the toughest kind of wax

*EVEN AFTER 3 MONTHS—  
CAN YOU PICK THE CAR-PLATE  
WAX SIDE FROM THE HARD-RUB  
AUTO WAX JOB?*

**HERTZ** picked 20 of its rental cars in cities across the U.S. One side of each was waxed with liquid Car-Plate, the other with one of three well-known paste waxes.

**HERTZ FOUND:** *Car-Plate is far faster, easier to apply than any paste auto wax.*

After months on the road, the sides were compared for wear and shine.

**HERTZ FOUND:** *Car-Plate lasts as long as the most durable paste auto wax.*

The reason: all the Car-Plate Wax stays on your car—you don't rub wax off as when polishing paste wax. The Hertz test car shown here was driven 3 months, then simply washed and photographed. If you can't tell the Car-Plate side (right) from the paste side, why waste hours rubbing? Next time wax with Car-Plate!

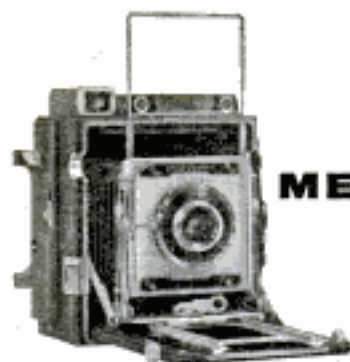


*Before waxing use Car-Plate Cleaner. Wax will bond perfectly in a brilliant, long-lasting finish.*



## JOHNSON'S

# CAR-PLATE WAX



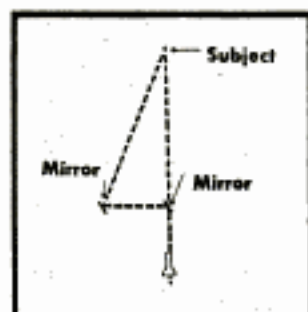
## WHY 3 METHODS OF

# Focusing

WITH

## THE GRAPHIC® 45?

Three focusing methods are featured in the Pacemaker Graphic 45—one of many reasons why it is the most popular, most used all-purpose hand camera on the market. Let's examine these methods one by one.



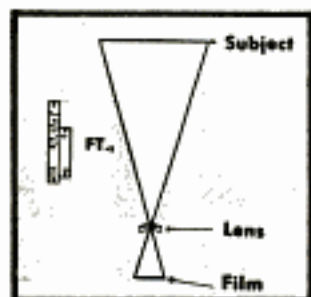
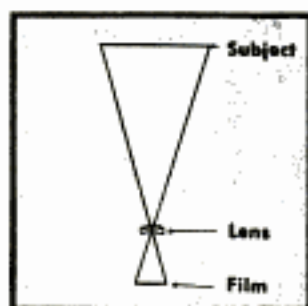
### 1. Coupled Rangefinder

**Focusing** with the new Graphic Rangefinder for normal eye level shooting—fastest method for all-around use. Interchangeable cams couple it to wide angle, normal or telephoto lenses. As you turn the focusing knobs on the camera

bed, the two images seen through the Graphic Rangefinder window gradually merge until at the point of accurate focus of the lens, both images are superimposed, clear and bright. Built-in Rangefinder for night focusing.

### 2. Ground Glass

**Focusing** is the original and basic method of determining sharpest focus and subject matter to be included in the finished picture. It enables you to see: a) your picture exactly as it will appear in the print; b) what parts of your picture are in or out of focus; c) how you can improve framing or composition. Ground glass focusing is a "must" for the serious photographer.



### 3. Scale or "Guess"

**Focusing** for quick "off the cuff" shooting—convenient for sports, action or ordinary snap shooting. You simply focus the lens with the focusing knobs on the front of the camera bed until the focusing scales on the bed indicate the estimated distance from the subject to the camera.

For the full story on Pacemaker Graphic 45's, write Dept. PM-75, Graflex, Inc., Rochester 8, N. Y.

# GRAFLEX®

*Price-Winning Camera*

for the 1955 Ford. The bumpers have not begun to corrode, but screws holding the parking-light lenses and rear lights have corroded. Trim around windows showed corrosion within two months. Inside, the parking-light housing was particularly bad."—Alabama chemist.

"Had to have it repainted due to sand in paint on first job. Side chrome on crooked."—Virginia telephone worker.

"Overhead valves rattle terribly from 40 to 50 miles per hour."—Georgia machine operator.

"Wrap-around windshield protrudes too far into the path of a person entering the front doors. Ash tray is located in an awkward position."—Nevada salesman.

"Bump knees every time I enter it because of wrap-around windshield."—Washington, D.C., hotel supplier.

"Tires should be inspected more carefully. I find that two of mine are about 1/2 inch out of round."—Washington soldier.

"Rear-spring suspension had to be beefed up. I had two leaves added so I could carry three persons, their luggage and a full gas tank."—Indiana sales engineer.

"Wheels are out of alignment at the slightest touch of a curb."—New Jersey merchant seaman.

"Turn-indicator lights on dash are blinding at night. Oil filter in such an out-of-the-way place."—Ohio brakeman.

"Ford policy as regards furnishing a wiring diagram and service manual is intolerable. Other manufacturers make a slight charge for such information. I am still waiting (almost five months) to get mine from Ford. It's impossible to trace a wire and if an emergency arises you're just out of luck."—New York electrical engineer.

"Headlights stick out in front too far to give enough clearance when parking. Or else the bumper does not extend far enough."—Washington, D.C., credit manager.

"Speedometer noisy this year, too."—Minnesota salesman.

"Buttons on the seat upholstery are an awful nuisance."—Arizona student.

### How Is the V8 Engine?

Ford has made more V8 engines than any other manufacturer. Has this experience helped? We asked the owners if they had had any trouble with their engines and 73 percent said they had none at all, 21 percent said they had some trouble, and 3 percent said they had considerable (the other 3 percent did not answer the question). With the 24 percent that said they

(Continued to page 234)

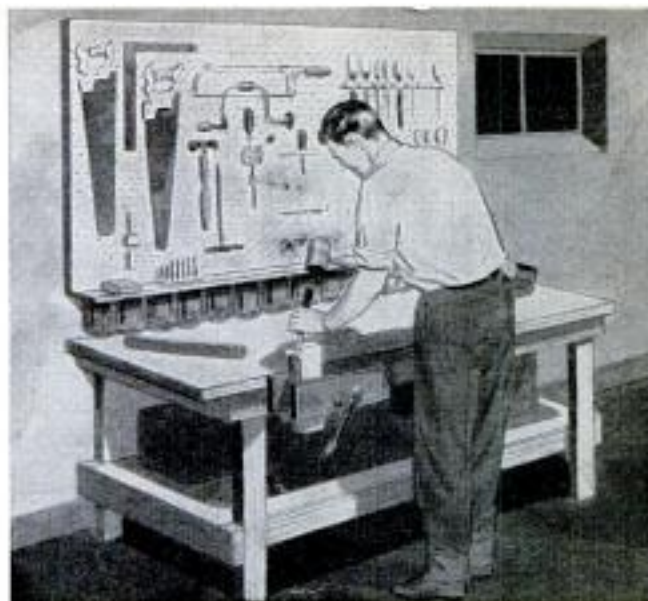
# If you have a hammer



You'll do a more professional job with Plastic Wood. Fills nail holes, covers hammer marks. Handles like putty, hardens into real wood.

You need **"PLASTIC WOOD"**

Stronger—resists weather—sands to a smooth finish.



## SEND FOR FREE PLAN!

### Presdwood work bench and Peg-Board tool rack

New, easy-to-follow plans show how to build this sturdy Masonite Presdwood® work bench...how to hang this handy tool rack made of Masonite Peg-Board\* paneling.

With smooth, sturdy Tempered Presdwood for work surfaces, you don't have to worry about splinters or slivers. This dense, knotless and grainless material will withstand a tremendous amount of bumps, dents, scrapes, yet won't harm work. Lasts for years.

Famous Peg-Board panel is readily fastened to any wall. Wide choice of hangers keeps tools within easy reach.

Send the coupon today. And see your lumber and building materials dealer for the many types and thicknesses of Presdwood.

Choose this Man—He  makes the difference  
**MASONITE PRESWOOD**  
 PANEL PRODUCT OF MASONITE® CORPORATION

MASONITE CORPORATION  
 Dept. PM-7, Box 777, Chicago 90, Ill.

Please send me your free plan, No. AE-312, and Masonite Presdwood "Idea Book."

Name.....

Address.....

Town.....Zone.....

County.....State.....

\*T.M. REG. U.S. PAT. OFF., B. B. BUTLER MFG. CO., INC.

## MAGNETS 225# PULL

GENUINE ALNICO—NEVER WEAKENS

AMAZING, PERMANENT MAGNETS—WILL NOT WEAKEN! NON-ELECTRIC. Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from sweepings. Clear alley of harmful tacks, nails. Many other uses. Pays for itself quickly. GUARANTEED. Try any magnet one week. Money refunded if you are not well pleased.

No. M-725 (Weights 54 oz.) Has pull of 225 lbs. on steel block. \$15.00  
 No. M-825 (Weights 70 oz.) Has pull of 125 lbs. on steel block. \$ 8.50  
 No. M-575 (Weights 18 oz.) Has pull of 75 lbs. on steel block. \$ 6.00  
 No. M-500 (Weights 13 oz.) Has pull of 50 lbs. on steel block. \$ 4.00  
 No. M-101 U-shaped Magnet (Wt. 2 1/4 oz.) Pull of 6 1/2 lbs. 2 for \$ 1.50  
 No. M-291 Pocket Magnet (Wt. 1 1/2 oz.) Pull of 4 lbs. 2 for \$ 1.15  
 No. M-35 Hobbyist assortment of eight small magnets. . . . \$ 1.50  
 No. M-48 Powerful Hot Pad Magnets. 8 for \$1.00. 30 for \$ 3.00

Send Money Order or Check. We pay postage. No C.O.D.'s.  
 MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.

**BUILD FINE GRANDFATHER CLOCK NOW**  
 The simple sensible Red-i-Kut way as thousands have—  
 SAVE HALF. SHOP TESTED PLANS "SPIRIT OF THE CENTURY" Narrow waist 20" tall or stately straight side "SPIRIT OF AMERICA." EASY-TO-FOLLOW step-by-step PLANS tell all—plus BROCHURE of heavy brass weight Westminster, tube chime, movements, gorgeous dials, 2 1/2" solid mahogany case kits. Send \$1.00 today — Both plans \$1.50 NOW.  
 KUEMPEL CHIME CLOCK CO., #7 Kuempel Bldg., Minneapolis 16, Minn.



Mechanics call them "America's finest."

Sockets and attachments  
 Open end and box wrenches  
 Combination wrenches  
 Complete tool sets

BONNEY FORGE & TOOL WORKS • ALLENTOWN, PA.

It's the BOUNCE THAT COUNTS!

**Lumiclad**  
 ROOF COATING

The amazing insulation quality of Lumiclad provides low-cost temperature control. Keeps buildings cooler in summer; Warmer in winter. Apply Lumiclad yourself...goes on quickly, easily.

WRITE FOR FREE TEST KIT!  
 Dept. 75J

Abesto MANUFACTURING CORP.  
 MICHIGAN CITY, INDIANA

had trouble with the engine, the valve system was the most frequently mentioned troublemaker. After this come the carburetor, then the ignition system and oil leaks and finally oil consumption.

"I threw a valve. Factory failed to put two valve keepers on No. 2 intake."—California traffic manager.

"Have changed to smaller jets in carburetor. From No. 59 to No. 51."—Kansas clerk.

"Carburetor leaks."—North Carolina hosiery worker.

"Tappets keep working loose or tight. Had to have new exhaust-heat riser."—Oregon truck driver.

"New rings installed at 1400 miles. Still uses oil."—Kentucky federal officer.

### Changes They Would Like

Here are some miscellaneous quotations by owners describing the one change they would like to have made in their Ford:

"Put starter switch on the right of the steering post."—Maine truck driver.

"Take off the Fairlane streak."—An owner who prefers to remain anonymous.

"Have all dull finish in front of the driver. Too much chrome to reflect in his eyes."—Washington, D.C., retired owner.

"Be able to open trunk without using the key."—Utah civil engineer.

"Put glove compartment in middle of dash."—Colorado clerk.

"Improve front seat. It squeaks every time someone moves on it."—Oregon machine operator.

"Have ventilators in rear door open."—Georgia district manager.

Well, there you have it, the good and the bad of the 1955 Ford V8. For a detailed listing of percentages in these and other categories, turn to the percentage table on page 89. ★ ★ ★

Turn back to page 86 to begin Floyd Clymer's report on his road test of the 1955 Ford V8.

### Clymer Tests the Ford V8

(Continued from page 87)

Ford's spark plugs this year have no gasket. A gas-tight seal is accomplished by a taper just above the threads, which insures better heat dissipation than plugs using gaskets. Servicing is inconvenient as the spark plugs must be removed from the underside of the engine, as must the oil filter. Extra-long dipsticks for checking crankcase or Fordomatic oil levels are easy to reach and read.

The test car's speedometer on long, open stretches would show 112 miles per hour.

(Continued to page 236)

## GIVE YOUR CAR THE SAME MIRACLE POWER TUNE-UP AUTO ENGINEERS DO!

Modern engines need more lubrication than even premium oils can give. Auto engineers themselves tune up their engines with Miracle Power.

Even new cars can develop sticky valves, noisy hydraulic valve lifters, and sluggishness. That's because engines get as hot as 1400°F, oils burn at about 550°F, and oil can't lubricate after it's burned.

But Miracle Power *always* provides lubrication. You pour it in your gas and oil, and the colloidal synthetic graphite it contains is carried to every part of your engine. The graphite forms a breath-like protective lubricating film on all metal surfaces. The film impregnates metal as butter does bread. It won't burn or drain off, and it doesn't build up on itself. It protects even in those vital five minutes after

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Prove Miracle Power for yourself. Add an 85c-can to your oil and gas every 1000 miles; use the 39c-size in gas between treatments. Your valve troubles will disappear, you'll burn less oil, your car will start like a breeze even on cold mornings, and your engine will deliver everything it's got. Follow the lead of auto engineers. Get Miracle Power at car dealers, garages, service stations. Miracle Power is available at Ford, Studebaker,

800 to 1400

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300 to 550

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Oil burns at 550°F, but engine heat rises to 1400°F. You need more than oil to lubricate your engine. You need Miracle Power—which always lubricates and won't burn away!

International Harvester, Kaiser, Willys dealers in their own Miracle Power containers. It treats the engine, not the oil.



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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Even though the speedometer is fast by about 7 percent, this model is definitely a sensational performer that handles and performs like a car in the high-price range. It really "scats" away from traffic signals and up hills.

Roadability and handling are better than any other Ford I have ever driven and compare favorably with any car I have tested, regardless of price.

The ball-joint front suspension, coupled with the tilted front springs, is a revelation. It makes for easier steering and, even over the hardest bumps at high speeds, there was very little bounce. The shock absorbers do an excellent job of controlling the rebound. Suspension design is good. There is very little "roll" on the corners and the stability of the car under almost any road condition is excellent. I ran into some snow with icy roads over LaVeta Pass (altitude 9382 feet) in the Colorado Rockies and even there I had a feeling of safety in driving this new Ford.

The brake drums are 11 inches in diameter this year (as against 10 in 1954) and have 192 square inches of braking surface. I experienced very little fading, even on winding mountain curves or when slowing down from high speeds. The suspended brake pedal operates with little pressure, even without a power assist. The left-hand-

operated parking brake is effective and easily applied or released.

The gasoline economy is average. With the 8.5:1-compression-ratio engine I found premium gasoline to be most desirable.

The Fordomatic transmission is smooth in operation and with careful use of the throttle upshifting is hardly noticeable. With wide-open throttle, high gear engages at about 56 miles per hour. Depressing the throttle causes instant downshift below 56 miles per hour, but above this speed no downshift is possible, except by pulling the shift lever into Low. Low can be engaged at high speeds, which gives the effect of a dual-range transmission. Low gear is excellent for emergency braking.

The hood is wide, long and high, giving the impression of a very large car. Bumpers are large and afford good protection.

The instruments are well located. I can't go for the left-hand-controlled ignition-key starter. Most people are right-handed, but perhaps the styling engineer is a "south-paw" and likes it that way—I don't.

The heating and ventilating system is very efficient, simple to operate and the levers are well located in a compact unit within easy reach of the driver's right hand.

Speedometer location is excellent and its

(Continued to page 238)

**BURGESS**  
*flashlight*  
**BATTERIES**

A QUALITY DRY BATTERY FOR EVERY PURPOSE

SEALING IN STEEL AND PLASTIC

ASK FOR THEM AT YOUR FAVORITE STORE

"BURGESS BATTERIES SHO' RUIN'D DE' SPOOKIN' BIZ'NESS"!!!

The advertisement features a large illustration of a Burgess flashlight battery in the foreground. The battery is cylindrical with a black and white striped pattern and the word 'BURGESS' printed vertically. Above the battery, the text 'BURGESS flashlight BATTERIES' is written in a stylized font. To the left of the battery, a speech bubble contains the text 'A QUALITY DRY BATTERY FOR EVERY PURPOSE'. Below the battery, the text 'SEALING IN STEEL AND PLASTIC' is written. To the right of the battery, a cartoon scene depicts a boy in a hat and boots fishing with a flashlight. A bear is visible in the background, and a signpost reads 'ASK FOR THEM AT YOUR FAVORITE STORE'. At the bottom of the scene, a speech bubble from the bear says 'BURGESS BATTERIES SHO' RUIN'D DE' SPOOKIN' BIZ'NESS'!!!'. The background shows a forest with trees and a crescent moon in the sky.

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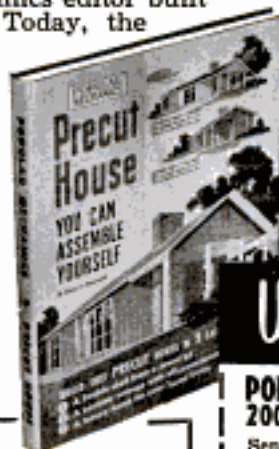
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New Popular Mechanics Book and Plans—New Precut Materials Kit—Packaged Plumbing, Heating, Chimney, Etc.—Make Amateur Carpenter's Job Easy

Here is the newest Popular Mechanics "Build-It-Yourself" house. You can build it in three stages, with or without an available kit of materials pre-cut to actual size and shape, for the amazing low price of only \$1800. The first stage will give you the start of a grand home that you can live in while you progress with building. The second stage will give you a fine summer home, with all wanted conveniences, for a total of only \$2800 for both stages. When you add the third stage you have a real luxury home for year 'round living in any climate for only \$3800 total cost. Richard Dempewolf, author of the "Precut House" book and a Popular Mechanics editor built the test house pictured above for even less. Today, the appraised value, including the land is \$12,000.00.

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You can build the house with the book alone. The plans make it easier. The book gives lists of materials required, all measurements and dimensions, suggestions for financing, and tells in words and shows in pictures every detail of construction. Like thousands of others who have built their homes themselves, you can do it too and save up to 70% of the cost. The dream home that seemed impossible is here. This fabulous, economical house, designed by famous architects, especially for amateur builders, is your answer to the home you always wanted.



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Overall size 24 x 46 feet. Note the two typical floor plans shown. Above: Two bedrooms, bath, kitchen, dining room, living room, car port or porch. Below: Three bedrooms, bath, utility room, kitchen, dining area, living room, porch. The "Precut House" book shows many other variations.

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The unusual features of the Precut House are: adaptability to various interior arrangements; use of materials designed especially for amateur builders; easy construction; unusual amount of closet and storage space; built-in furniture; house that is suitable for city, country and resort; low maintenance cost; complete insulation. All this at a cost so low no other house of similar size can compare with it.

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The test house pictured above was built in eastern Pennsylvania by the author and his wife, neither of whom had any previous building experience. It is a year 'round home, insulated, modern heating and plumbing, fireplace, redwood interior finish, dozens of built-in features and floor-to-ceiling, 9-foot wide picture window. Total man hours required to build—1650. Total cost not including ground and inexpensive foundation—\$3731.23

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transparent hood makes for easier daylight reading. The dial is directly in front of the driver and vision is perfect because there is no upper half of the horn ring to interfere. Fuel and temperature gauges use needle indicators, but red warning lights for oil and generator signals leave me cold. I like to see those indicator needles move. The directional-signal indicating lights are located on each side at the bottom of the speedometer panel. These flashing lights are brilliant, certainly no driver can fail to heed their warning.

The Fordomatic lever operation is simple, easy to shift, plainly marked and illuminated for night driving. The quadrant is now enclosed in a panel mounted on the dash. It is easily visible, but I'd prefer it located near the top of the steering column, which requires less movement of the eyes to determine location.

The body has a solid feeling when the doors are closed and there is but little body rumble at high road speeds. Factory assembly and inspection seem to be better than in past years. During heavy rain a little water seeped in, but there was no evidence of dust coming in during the tests. The arm-rests, door handles and window cranks are well located, but the cranks could turn more easily. Seat springs and upholstery are of top quality. Seating position and leg-room are both excellent.

The interior finish and appointments are certainly the finest ever offered by Ford and are the equal of or better than some medium-priced cars.

The wrap-around windshield affords excellent front vision, and the wide rear window gives plenty of rear vision.

One feature I like about the Ford front doors is that locking positions hold them stationary in half or full-open positions. There is an exceptional amount of trunk space. The lid doesn't open as wide as on some other makes.

I also tested the Fordor Town Sedan. The handling qualities and general characteristics are the same as the more powerful Fairlane model, but I found that top speed is about 6 miles per hour less. However, mileage was approximately 1 1/2 miles per gallon better with the less-powerful unit—which has 162 horsepower, a two-barrel carburetor, single muffler and the standard head. The Ford Fairlane models develop 182 horsepower. ★ ★ ★

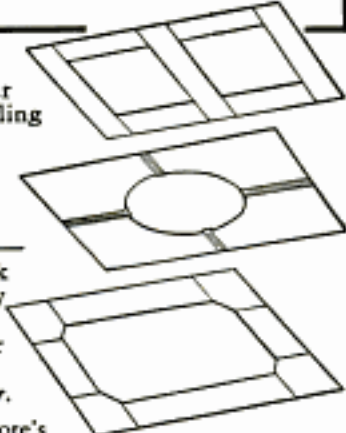
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With parquetry, rugs, tile—the floor is part of your decorative scheme. The ceiling was once decorative, too. Then, the old materials became too expensive.

Today we have new materials—easy to handle—and the ceiling comes back into its own. An attractively paneled ceiling is something you can build for yourself—in a new home or right over the old plaster.

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Write for Bulletin VT-27.  
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Terrific for hunters, ranch, home, farm, civilian defense, boat, camp, trailer, barbecue, etc. Burns any type gasoline. Burner 10 3/4" dia. Unit approx. 23" x 21" x 10". Has 2 tanks (2 1/4" x 5 3/4") with welded seams, 3 brass valves, 3 air filters, air gauge to 80 lbs. Can use as air tank for compressor or fill with liquid for spraying. NEW Korean war surplus. Wt. 95 lbs., boxed. Approx. GOVT cost \$150. Complete with 2 spare energizers and orifice cleaner (compare this price) — \$10.50

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FREE Book



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3707 Field Bldg., 315 Westport Rd., Kansas City 11, Mo.

## A Pool for Your Back Yard

(Continued from page 81)

The new one, however, is 22 feet in diameter, 3 feet deep and will hold the entire family and a few neighbors. It comes in a small cardboard box with all the necessary parts.

Bulkier and heavier by many tons, but designed to last indefinitely, are the precast slabs of concrete that make up Jack Robineau's Amcrete pools in Briarcliff, N. Y. These massive prefab walls are as



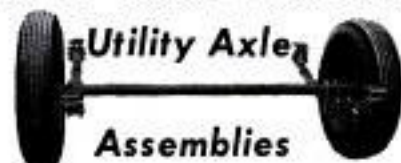
Water pressure of garden hose operates vacuum cleaner for pool. Suction behind nozzle draws refuse

solid and smooth as buffed granite. "We make them to order for any given pool dimensions," explains Robineau. "In giant flat-bed forms at Marietta Company plants, the wet mix is juggled until nearly all the air is out—producing a remarkably dense concrete slab five inches thick. It is then hand-troweled to a high finish that resists chipping, honeycombing and pitting in the roughest climate." Hauled to location on trucks, the 20-foot sections are slid by crane into slots in the previously poured floor of the pool. Sections are joined and bolted firmly to precast concrete buttresses. The result is a pool that is cheaper than concrete poured conventionally, but so solidly constructed that if lifted from the ground it would stand by itself.

If you don't like plastic or concrete, how about metal? The Chester Products Company in Hamilton, Ohio, will be glad to

(Continued to page 242)

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send out a truck loaded with one of their brand-new aluminum pools prefabricated in one piece. A crane on the truck hefts its burden into the prepared hole in your back yard, and in three days the finish-welded pool is ready for water.

So far this manmade pond comes only in rectangular shapes. If you'd prefer a metal pool with curves, there are new steel pools designed to ramble all over your lot. Off the drawing boards of Koven Pools in Jersey City have come a wide assortment of curving steel sections, ready to weld on any pool site. Kidneys, pears, acorns, eggs, ovals, free forms and wiggly curlicues that encompass "satellite" wading pools off the big main pool are all possible. The curved steel sections, in various combinations, will make up a pool in almost any form the human mind can conjure. U. S. Steel's American Bridge division also has announced a family-size prefab steel pool this year.

The new "wonder pools" are a far cry from those of a few years ago, when a private pool was something you saw only in pictures of movie stars' homes. It was right after World War II that two revolutionary methods of applying concrete suddenly put the average American "in the swim." Gunite and hard pack eliminated expensive forms and cut building time from weeks to days. What's more, using either system a man could design his pool in any conceivable shape at no extra cost.

How do they work? In both systems the hole itself is the form against which the concrete is applied. Roughly dug by skip loader or clam bucket, it is then carefully finish-shaped by a shovel crew. Welded steel mesh is then laid in the hole like a basket, held away from the earth by small blocks so it will be thoroughly embedded in the concrete. In the hard-pack method, described at the outset of this article, the concrete arrives in a stiff, quick-setting mix that is quickly thumped and troweled in place by a scrambling crew of 12 to 20 men. In the Gunite system, dry cement and sand in proper proportions are shot through a hose under air pressure and mixed with water at the nozzle. The Gunite man, holding a stance like a fireman at a big blaze, simply sprays the concrete in place. His crewmates do the finish troweling on the final coat of silica plaster by hand. The whole job of digging and "pouring" takes about two days.

Actually, Gunite and hard pack still are far and away the most-popular methods of low-cost permanent pool construction. "They put the swimming-pool business in business," says one builder. Thousands

(Continued to page 244)

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built by such companies as Paddock, Anthony and Baker on the West Coast, and Welding Engineering, Sylvan, East Coast and E. L. Wagner in the East already have made them familiar.

Principal appeal, besides cost, is the versatility they offer in shape and size. People with odd-shaped lots and small yards still can have real pools. Builder Wagner has sprayed a Gunitite installation in a tiny private yard squeezed in among a square block of New York skyscrapers. "We had some fun removing the earth with scoops hung on skyhooks—booms perched on neighboring roof tops and setbacks," he says. "But the pool went in, and it met all the rigid city health codes."

Probably nowhere have these pools taken as many varied and unique forms as in southern California, where half of all the new pools are being built, and where one new home in every 40 boasts its private pond. Free-form pools cling to tiny ledges on precipitous hillsides, kidney shapes slip snugly away in triangular back yards, dog-legs sneak around corners and under the shade of plastic-roofed lanais. One trick, easily effected in Gunitite and hard pack, is to leave an island somewhere in the middle of the pool. One owner uses his for a diving platform, another as a planter for trees and ferns. A smart swimming enthusiast, whose back yard dropped away over an abrupt cliff a short distance from the house, used an island to support one whole corner of the building. The pool swoops in from the edge of the cliff and curls around the island to provide a swimming area under the patio roof.

Some California ideas are even more elaborate. One fellow built a pool that starts outdoors, goes right under the glass wall of his house and into his living room. The built-in steps at the end bring the swimmer up to a nice soft carpet. Many Western pools have rock gardens built along their picturesque edges, and some folks have arranged to pipe the water returning from the filter over a tiny rock cascade so it gurgles back into the pool as pleasantly as a woodland brook. This year one company has introduced a design whereby water is returned by a perforated pipe running along the eave of a lanai that projects over the pool rim. It provides a curtain of water that produces a melodious drizzle, cools the breezes wafting through it, and purifies the water by aeration as it rains down.

Which of the new pools is best? Each has advantages, depending on the use expected of it, terrain features, available space and individual preference.

(Continued to page 246)

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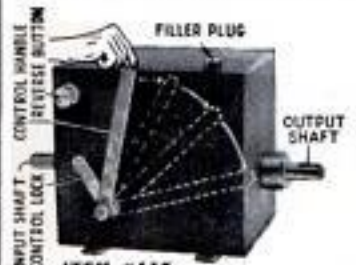
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For the do-it-yourselfer, a plastic pool liner hung over a homemade concrete block or wood frame in a hand-dug hole provides a big tank at remarkably low cost. When these pool liners first appeared, word got around that squirrels found the plastic good eating and spent the winter fattening up on chunks of swimming pool. "Since then we've changed the plasticizer that appealed to them," the fabricators reveal, "and they hate the stuff now."

New do-it-yourself pool ideas already are in the cards. Celanese is working with a prototype in which glass cloth is laid over a homemade wood form, and bonded in place with layers of polyester resin that anyone can apply with paintbrush.

In the more permanent pools, most of the bugs already have been worked out. Steel tanks once had a reputation for floating out of the hole like a boat, if heavy rain or flood raised the water table sufficiently. "We fixed that," explains a Koven engineer, "by using extra-heavy structural girders under the pool bottom."

Sufficient ground pressure can even hoist a concrete pool out of its hole. Recently a 20 by 35-foot kidney-shaped structure weighing 52 tons floated out of its hole when a nearby brook flooded the area. Engineers had to float it back where it belonged. That pool, incidentally, was good old-fashioned poured concrete, made by a new method that brings its cost right in line with other new types. The secret is a system of flexible steel forms invented by Arnold Sheldon of Clinton, N. J. Unlike wood, they can be used over and over indefinitely and can be made to assume any desired shape.

"One of our franchised contractors in Omaha is building a 20 by 30-foot pool with 10-inch-thick walls in any shape, complete with filter system, diving board and ladder, for \$2990," Sheldon says.

What about filter systems and other accessories? Are they necessary? Most reputable pool builders will not make an installation without at least including proper openings for installation of such equipment. Some won't build a pool without them. And if they're not included in the price of the pool, you can expect to add another \$600 to \$1000 to get them. But any experienced pool man will tell you they're well worth the cost in reducing maintenance troubles and in keeping a pool swimmable.

John Kurtz, president of Superior Swimming Pools in Miami, Fla., makes typical comments on the subject. "Some folks," he explains, "are inclined to think of a home pool as an enlarged bathtub. There's no comparison. After each bath you drain

(Continued to page 248)



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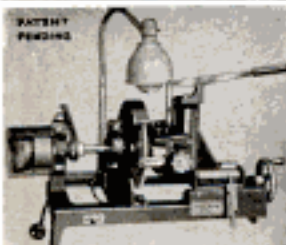
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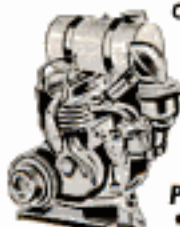
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your tub, but you don't drain a 30,000-gallon pool after each swim. Yet a swimming pool is not fit to bathe in after the first swimming party if the water isn't chemically treated or filtered. Insects, dust and vegetation join the other ingredients. The water clouds. Spores of algae begin to establish their beachhead of green slime in the first day. In a week you are forced to drain, scrub and refill your tank."

Actually, pool owners "never had it so good" as far as worksaving gadgets go. Filters do most of the dirty work. They come in a variety of sizes to suit many pocketbooks and pool sizes—from portable affairs on dollies that can be wheeled up to the pool edge to buried tanks for large pools. Actually the filter is nothing more than a tank filled with diatomaceous earth, or with layers of gravel and sand going from coarse to fine. Water pulled from the pool by a pump swishes through and all dirt is sifted out. After filtering, a valve is turned, the pump reversed, and water backs up through the filter and washes the dirt out to a drain or dry well.

What about silt and stones on the bottom? Water vacuum cleaners, with hoses that float on tiny buoys, pick this off the bottom and wash it out through the filter. Leaves and twigs floating on the surface? Automatic "skimmers," or openings in the pool side at surface level, suck in surface water and anything on it, and pass it out to the dry well or through the filter. All these contraptions, plus a few chemicals (and even water heaters if you can stand the tariff), make the job of maintaining a modern pool an easy one for the harried fellow with a nine-to-five job. And the cost of operation? It is estimated at about \$20 a month the year 'round. ★ ★ ★

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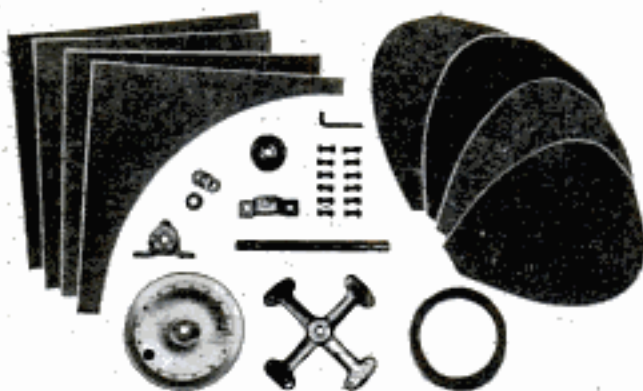
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## What Can We Do About Smog?

(Continued from page 70)

Smog not only is irritating to the eyes and respiratory tract, but there is a hint that the increase in cancer may be associated with the increase in air pollution in large cities. Medical authorities have warned that a material increase in smog in Los Angeles may have a grave effect on public health.

From the standpoint of agriculture, smog does about \$3,000,000 worth of damage to leafy crops in the Los Angeles region every year. Some growers have moved their operations to outlying, smog-free areas. Realizing that smog will continue for some time to come, experts at the Riverside Experiment Station of the University of California are now trying to develop smog-resistant strains of plants and are seeking chemical sprays that might afford some protection to crops. Some fungicides normally used for blight control seem to have value. The experts suggest that irrigation be held to a minimum during smoggy periods.

About 1000 tons of pollutants that formerly were discharged into the air every day in Los Angeles are now being collected at their sources. As reported by the Los Angeles County Air Pollution Control District, these contaminants include 350 tons of sulphur dioxide now being reclaimed at petroleum refineries, 400 tons of gasoline vapor now being trapped at refineries and storage areas, 60 tons of dusts and fumes from metals industries and 65 tons of particles from unimproved industrial furnaces. The exasperating thing is that smog has become worse at the same time that these pollutants were removed; this is ascribed to a boost in population (with more automobiles and incinerators) during the same period.

Smog appeared to be an easy thing to control when Los Angeles first became concerned about it, but now the many agencies that are fighting it find that air pollution and its control are complicated subjects. Millions of dollars have been spent so far and the estimate is that the total bill will run into the hundreds of millions.

Lauren B. Hitchcock, president of the Southern California Air Pollution Foundation, points out that Los Angeles spent \$750,000,000 in bringing water to the city and distributing it. Now it is faced with the problem of providing itself with tolerable air, an even more important basic need. Mr. Hitchcock expects that the diagnosis and remedies being sought for this one city will be of value in other cities.

(Continued to page 252)

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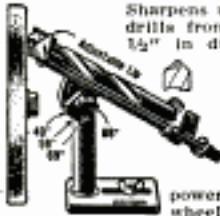


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To find out more about the constituents of smog, radioactive tracer elements are being introduced into fuels, then studied for chemical changes after combustion. To find the areas in which smog appears to generate most rapidly, aerometric sampling stations have been set up in the area. In addition, radar beams that are absorbed by some compounds suspected as constituents of smog are to be directed across the Los Angeles basin. Wind movements in the area are being studied with the use of fluorescent aerosols that serve as tracers.

It may be that ozone and nitrogen dioxide occur in greater-than-normal amounts in the air along parts of the Pacific coast. To find out, improved types of measuring devices are being installed in and away from Los Angeles. If it turns out that there are "ozone clouds" drifting in from the sea, a proposal has been made to detect the clouds by microwave radio or even to disperse them while still offshore.

One of the things that is under study is some way of replacing home incinerators. Municipal incinerators aren't a satisfactory answer, and burying the refuse of a large city is costly. One suggestion is to grind up all rubbish and refuse at home and flush it down the drain, similar to the way garbage grinders dispose of food scraps. Objections to this include the waste of precious water and the fact that sewage systems could hardly handle so large an additional load.

This isn't the first time that Los Angeles has had an air-pollution problem. Up to 15 or 20 years ago the city occasionally was blanketed by black smoke from the thousands of smudge pots set out in the citrus groves to prevent frost. Today all the old-fashioned pots have been replaced by modern "return stack" orchard heaters that produce more heat and no smoke. These, plus wind machines, solved one air-pollution problem.

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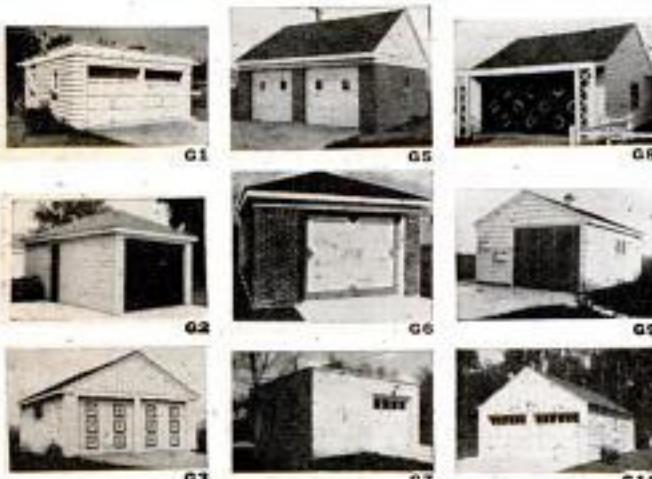
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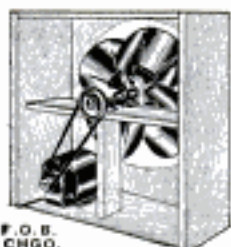
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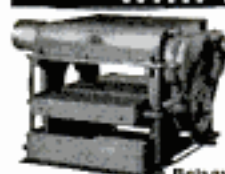
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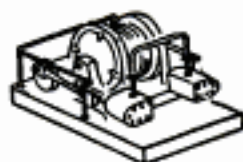
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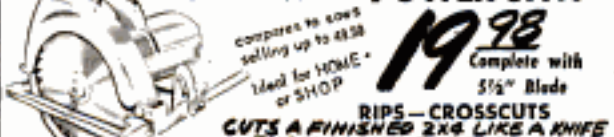
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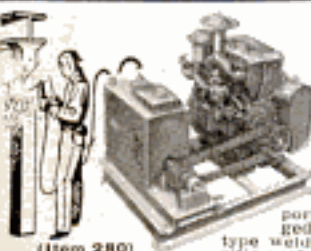
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110-120 v. 60 cyc. AC. absolutely the best made—exclusive dynamically balanced armature; heavy windings develop up to 5000 watt overload for motor starting. Skid mounted—portable. Powered by an easy starting Briggs & Stratton 6 HP engine—complete with all accessories; engine easily disconnected for other uses. Big outlet box, voltmeter, no wiring necessary. Ample current for all purposes. Factory warranty. (Item 31) Wt. 210 lb. Reg. price \$585. Special at... **\$299.50**

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Generator only and control box... **\$169.50**  
**DUAL VOLTAGE** 110-220 available on any of these models for \$28.00 additional.



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Blade Opening CFM	Wt.	Item	Price
16" 1814"	2925 19 lb.	165A	\$27.95
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High powered double transformer soldering gun that converts ordinary 115 v. current to instant heat for big soldering jobs! Installs or removes copper pipe fittings in two seconds! Applies solder joints, heats tools for hardening, provides heat for continuous sheet metal soldering. Saves at least 50% labor time. Includes complete heating unit transformer, heavy cables and grip type soldering pliers. Wt. 38 lbs. (Item 777) Reg. \$79.50. Close-out **\$39.50**

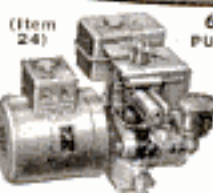
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## 600-700 WATTS PUSH BUTTON START

115 v. 60 cyc. AC Powered by a rugged 2 HP easy starting Briggs engine. No wiring necessary! Just plug in and operate. Plenty of current for any oil burner, freezer, brooder, emergency lights, etc., which require radios. Complete with Voltmeter and built-in winding to charge 6 v. auto batteries. (Item 24.) Wt. 75 lbs. Easily fits in car trunk. Be prepared if storm knocks out power lines. Reg. \$275 Value... **\$143.50**  
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Now, a super efficient portable steam generator that produces live steam at 100 lbs. pressure in 60 seconds from a cold start! Produces large volume of high pressure steam on 2 pints of fuel oil. Instantly cleans sticky grease, dirt, rust, old paint, etc. off implements and road machinery. Says for itself in a few weeks. Sterilizes soil. Sterilizes as it cleans—milk equipment, etc.

Fully automatic—oil fired with new, built-in lifetime bronze water circulating pump. Draws water from faucet or bucket. Simple and safe—no one can use it! Built-in safety valve. Complete with 12 ft. of high-pressure steam hose and new triple efficiency steam gun that automatically mixes in soap solution if desired. Wt. 250 lbs. Item 463. **\$329.50** Special factory price.

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A powerful pump that handles up to 15,000 gal. per hour. Easy to operate. Self-priming (after initial prime), no foot valve needed—resulting in 25% more capacity. Exclusive impeller design provides maximum rate of water per horsepower, yet handles water containing a large percentage of stone, gravel and mud. 2 in. suction and discharge. Powered by an easy starting 6 hp. Wisconsin engine and mounted on big rubber tired wheels. Wt. 280 lbs. (Item 280). Special Factory price... **\$299.50**  
Same pumps mounted on steel skids. Wt. 250 lbs. (Item 503). Factory price... **\$275.00**



## SELF-PROPELLED MASTER GARDENER

It's a power sickle It's a rotary tiller  
It's a lawn mower It's a blower  
New! with Power reverse!  
Improved Master Gardener with new extra power and a full gear transmission—providing forward, neutral and POWER REVERSE! Works for you the year 'round. Does terrific job of cutting weeds, tall grass, etc. or prepares mellowed deep seed beds without labor. So well balanced that any woman can easily handle it. Has two built-in clutches controlling motion and implement drive. New gear tread tires assure nonslip drive. Performs better—does more than tractors costing twice as much. Converts in minutes to Tiller, Power Lawn Mower, Snow Blower, etc. Basic self-propelled tractor with famous 2 1/2 hp Briggs engine, complete with rewired starter. **\$129.50**  
Wt. 110 lbs. Factory Special... **\$129.50**

Tractor shown with Sickle Bar Attachment  
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Easy payment plan available. Freight paid east of Rockies—half paid elsewhere.

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(Item 10) Easily installed in furnace pipes. Forces even heat to all rooms. Over range removes kitchen smoke and odors. Powerful, continuous duty motor. 110-120v. AC. Mount in wall or ceiling to ventilate any area. Quiet, super-efficient fan moves huge volume of air. (400 to 600 CFM).

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12" Pipe, wt. 8 lb.	59.85

**HEAVY DUTY FAN.** Semi-enclosed motor, suitable for spray booths, restaurant exhausts, poultry houses, etc. 10" Fan, wt. 9 lbs. (Item 10E)... **\$11.95**  
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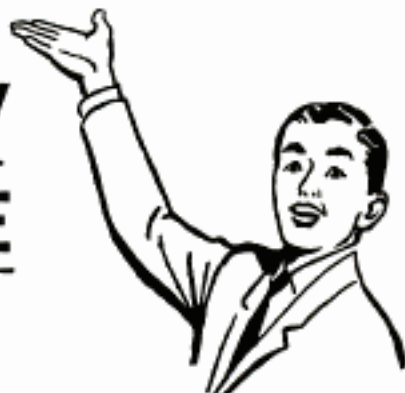
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