

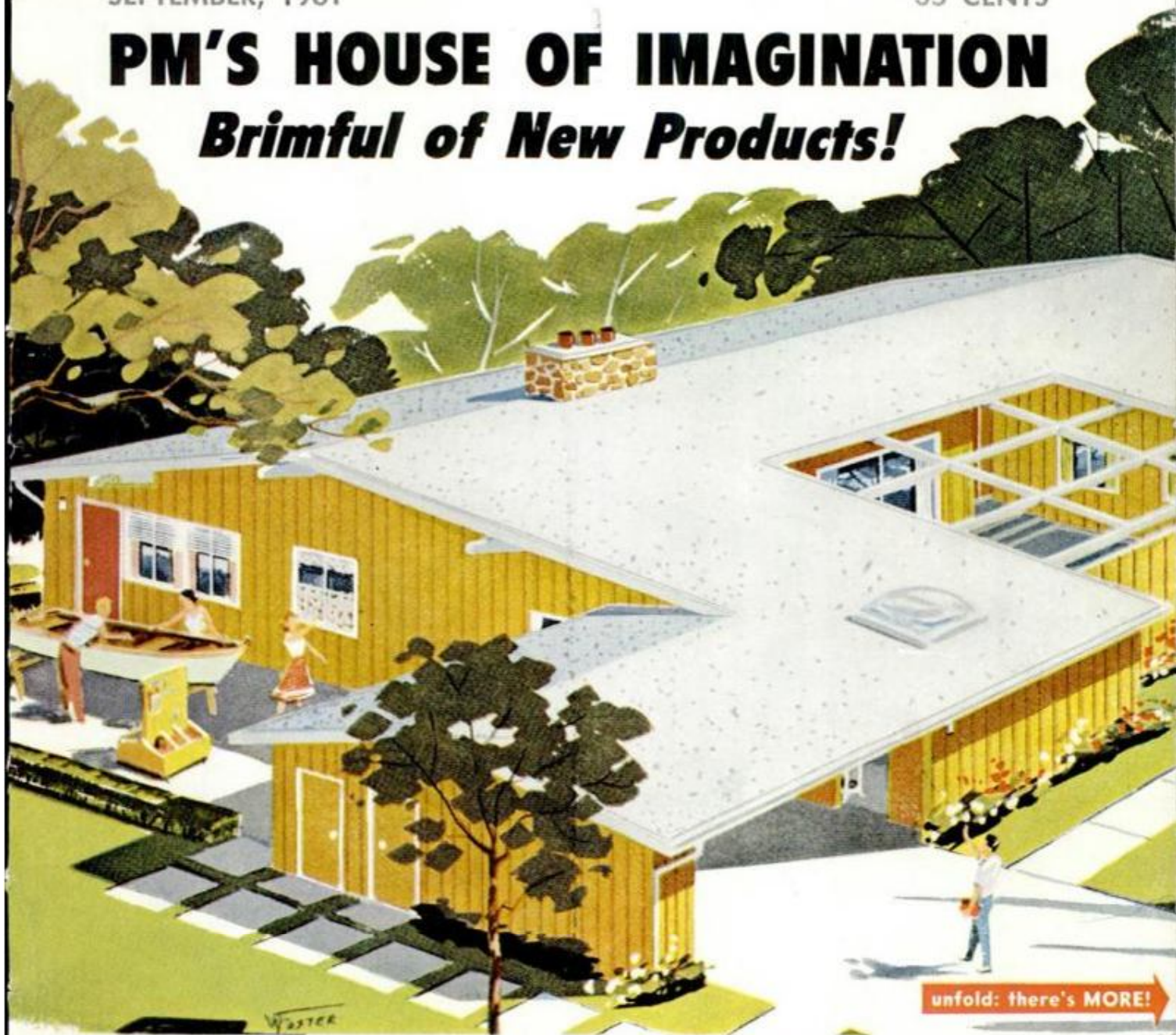
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POPULAR MECHANICS

SEPTEMBER, 1961

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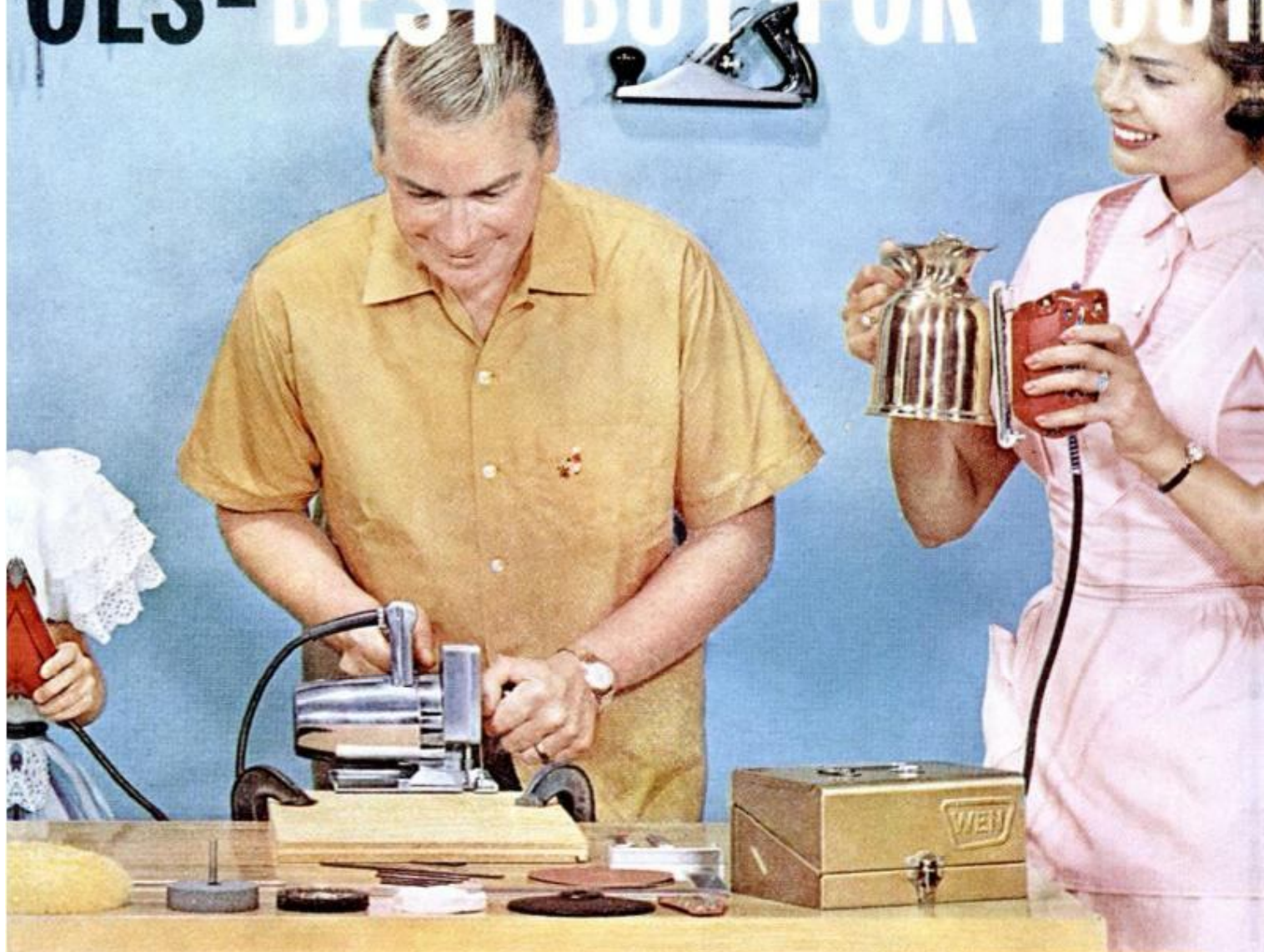


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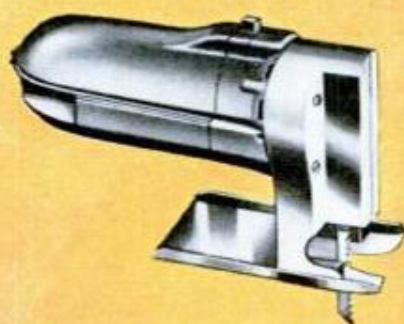
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**2650 5/8" Strokes
Per Minute**

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Per**

**LIGHTWEIGHT ALL-PURPOSE
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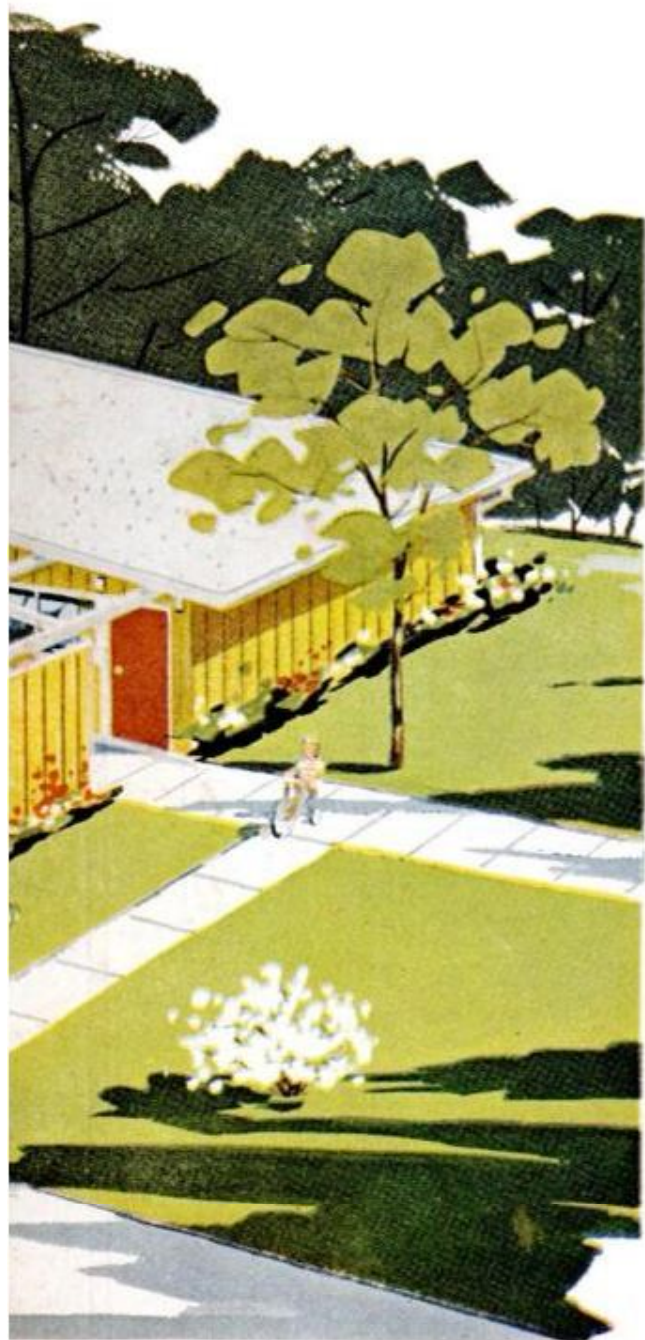
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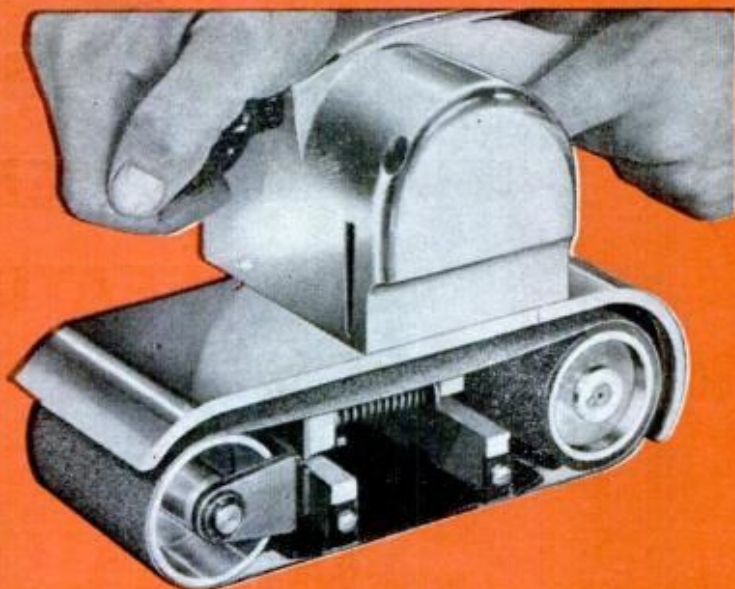


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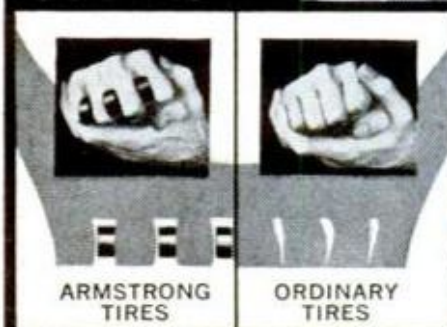


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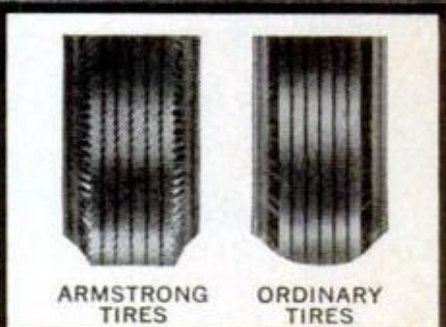
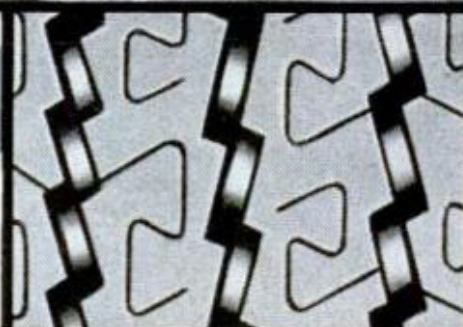
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SEPTEMBER 1961
VOL: 116 NO. 3

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Next Month . . .

Your first colorful views and fact-filled news of the "Surprising '62 Cars." Don't miss the 1000-mile road test on America's first V6. Or the "X-ray" discussion on other all-new 4, 6 and V8 engines, styling and suspension innovations. In the same issue: "Adapting Your Stereo to Twin-Channel FM" and money-saving tips on "Repairing Home Appliances."

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This One



A965-TZS-PKZK



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AN AUTHENTIC 18-INCH WORKING MODEL WITH
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AND FOR THE BIGGEST THRILL OF ALL, you'll fire practice shots from the newest and mightiest nuclear-powered missile-firing submarine! You'll stand breathless as the Skipper gives the command to launch the Polaris missile . . . cheer with the crew as the history-making shot lands on target *1,200 miles away!* These are just a few of the thrills that await you—in the new Science Program presentation of **SUBMARINES**. And it's yours for only 10¢ on this "get-acquainted" offer.

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Each month this new program will take you on a "guided tour" of a different field of science. One month a chemist will show you metal that burns and gas that pours. Another time a biologist will let you look through his microscope at a living cell. On other adventures your guides will be radio engineers . . . medical researchers . . . nuclear physicists.

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Think what these adventures will mean to your family—especially if you have children in school! It will help them participate in science projects, help prepare them for life in the space age—may even lead to a scientific career.

MAIL COUPON NOW with only 10¢ for the Introductory package. With it we will also send the current Activity Kit for which you will be billed only \$1, plus shipping. No further obligation. If you do not wish to continue, simply write us within ten days. Otherwise you pay only \$1 plus shipping for each month's scientific adventure. You may cancel at any time. Mail the coupon with only ten cents to: **SCIENCE PROGRAM, Dept. 1-PM-9, Garden City, N.Y.**

NEW INFORMATION OFFICIALLY RELEASED

Our first model (illustrated) had only 8 tubes. Now Navy has released more information. You get brand-new model with all 16 Polaris tubes.

- POLARIS missiles that FIRE •
- PERISCOPE slides UP and DOWN •
- RUDDER moves • PROPELLER rotates—half of hull snaps off revealing interior • 3 molded colors.

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(Please Print Plainly)

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City Zone State.....

(Same offer in Canada, 105 Bond St., Toronto 2.
Offer good only in U.S.A. and Canada)

27-SC17D



OVER THE EDITOR'S DESK

Kite Champ Reports



I'd be less than a proud father if I didn't think that Jane Yolen's story about my kite-flying adventures (June PM) was great. But she did overlook the smashing new Aero kite which is airborne the minute you blow it up. It can also rise like a rocket when handled by an expert, as witness the action in this photo.
New York, N.Y. WILL YOLEN

Seals and Coyotes

Being a control tower operator, I got a chuckle out of your June issue item on Lt. James Weeks' Antarctic flight problem: ("Will someone please chase that stupid seal off the runway?").

Out here at Rogers Dry Lake during the long, hot summer months, quite often you hear: "Edwards tower, will you please send someone out here to chase those shaggy coyotes off the runway." The job usually falls to our competent Air Policemen.

Sincerely enjoy your worth-its-weight-in-gold magazine.
Edwards AFB S/SGT. CHARLES A. BENT
California

Shaggy, Sarge? In summer?

Change the Family's Mind

Thank you for the May issue vacation articles, especially the one on Mexico.

I have wanted to travel to Mexico for some time now but haven't been able to sell the family on it. Your excellent article will change the family's mind, I'm sure. To be truthful, I've always been dubious in regard to some matters concerning Mexican travel until now.

Hats off to Jim Whipple for his Detroit Listening Post, also.
Wilmore, Kentucky GLEN POWELL

Senor Whipple sends you a buen viaje for those kind words, Glen.

Lost Reader

One little phrase has just lost you a reader. In the article, *The Town That Spends Its Summers Afloat*, you say: "Let a teenager go boat-rodding on the river . . ." I am a teen-ager and I believe that statement is a great injustice to our group.
Portsmouth, Va. DENNIS REGULA

We apologize, Dennis. Boat-rodders come in all ages, shapes and sizes, and are not typical of any group.

600 Nerve-Wracking Parts

Mr. Wadsworth stated that plastic kits should stay in the six to ten year age group. He apparently has never assembled any large plastic kit. They are anything but easy. As an example, the Revell Thermopylae took several weeks of tedious, nerve-wracking labor to assemble its over 600 parts, many of which had to be handled with tweezers.

I spend over two hours merely painting the average 98-cent plastic model, just to make it look like a model and not like a toy. It is not the kit, but how it is assembled. Oh yes, Mr. Wadsworth, I'm fourteen.
Fort Lauderdale, Fla. MICHAEL T. PARKER

. . . I agree with Reon Wadsworth. Plastic models should not be put in competition with homemade models in any age group. They show no ability on a person's part, while homemade models show the skill and time put into the models.
Kimball, Neb. BILL PTACEK, 13

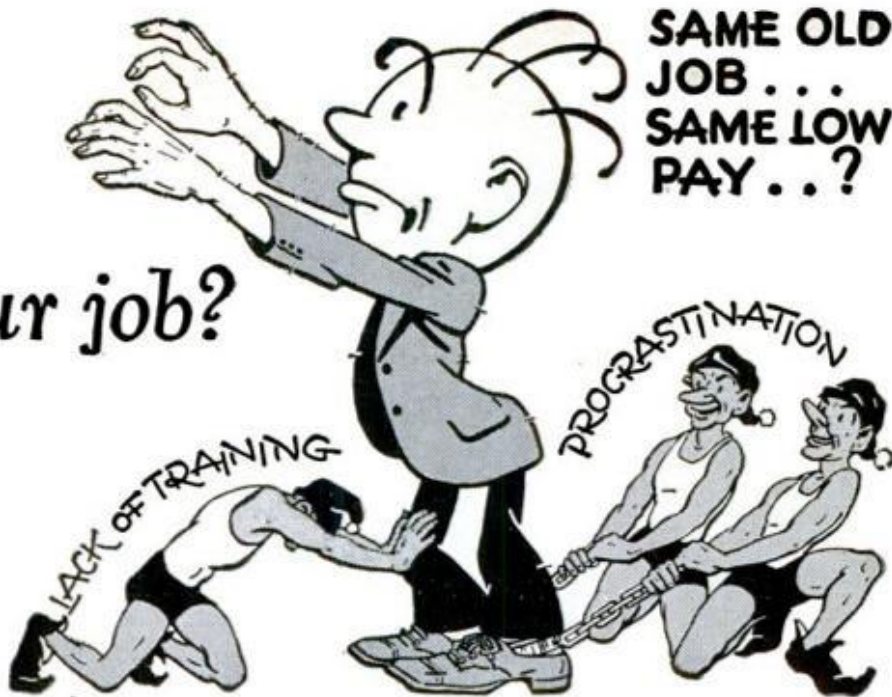
Kit Versus Scratch-Built Again

In connection with the kit-versus-hand-crafted-models discussion (June PM), one group likes to build from scratch, purchasing only the parts they cannot construct themselves. A second believes in the lazy

(Continued to page 12)

Are You "STANDING STILL" on your job?

**SAME OLD
JOB . . .
SAME LOW
PAY . . . ?**



You can justify a real pay raise and a better position—by making one simple move—the move that opens the way to more earnings and promotions—*practical training.*

If YOU are "standing still" on your job—no promotions—only token increases in pay—then you had better do something about it. You know that if you are untrained, your chances of getting ahead are slim. **NOW IS THE TIME TO PREPARE.**

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- Diesel
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- Welding
- Motor Tuneup

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City, Zone, State.....

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I GOT IT, HONEY! I GOT THE PROMOTION! OUR MONEY WORRIES ARE OVER! TODAY'S OUR LUCKY DAY!

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GUMOUT Cleveland 4, Ohio

(Continued from page 8)

way—they build kits and get their enjoyment out of viewing the finished product.

I belong to a third group who believes in scratch-and-kit building. I cut up model kits, such as my 1960 Ford F-100 which has had four scale feet chopped from the bed and eight scale inches from the top. This takes time and perfect matching is often harder than building from scratch.

I agree, though, that scratch-built models and kits should not be in the same classes for competition. Possibly there should be three groups, with scratch-builts and radically altered kits in a class together for final competition.

Richmond, B.C., Canada **MIKE TINDALL**

Lightening Lawn Chores

After reading John Linkletter's article on lawn chores (April PM), I decided he was still wasting time. Here's my little time-



saver, on which I mow and sweep at the same time. Why blow that extra 10 minutes?

I keep telling myself (and my wife) that I'm not lazy, just efficient!

Charlotte, N.C. **JOE DOYLE**

Lawn-shaver Linkletter sends congratulations, Joe. He also asks what job your wife thought up for you to do in that extra 10 minutes you saved.

Brooklyn Mayhem

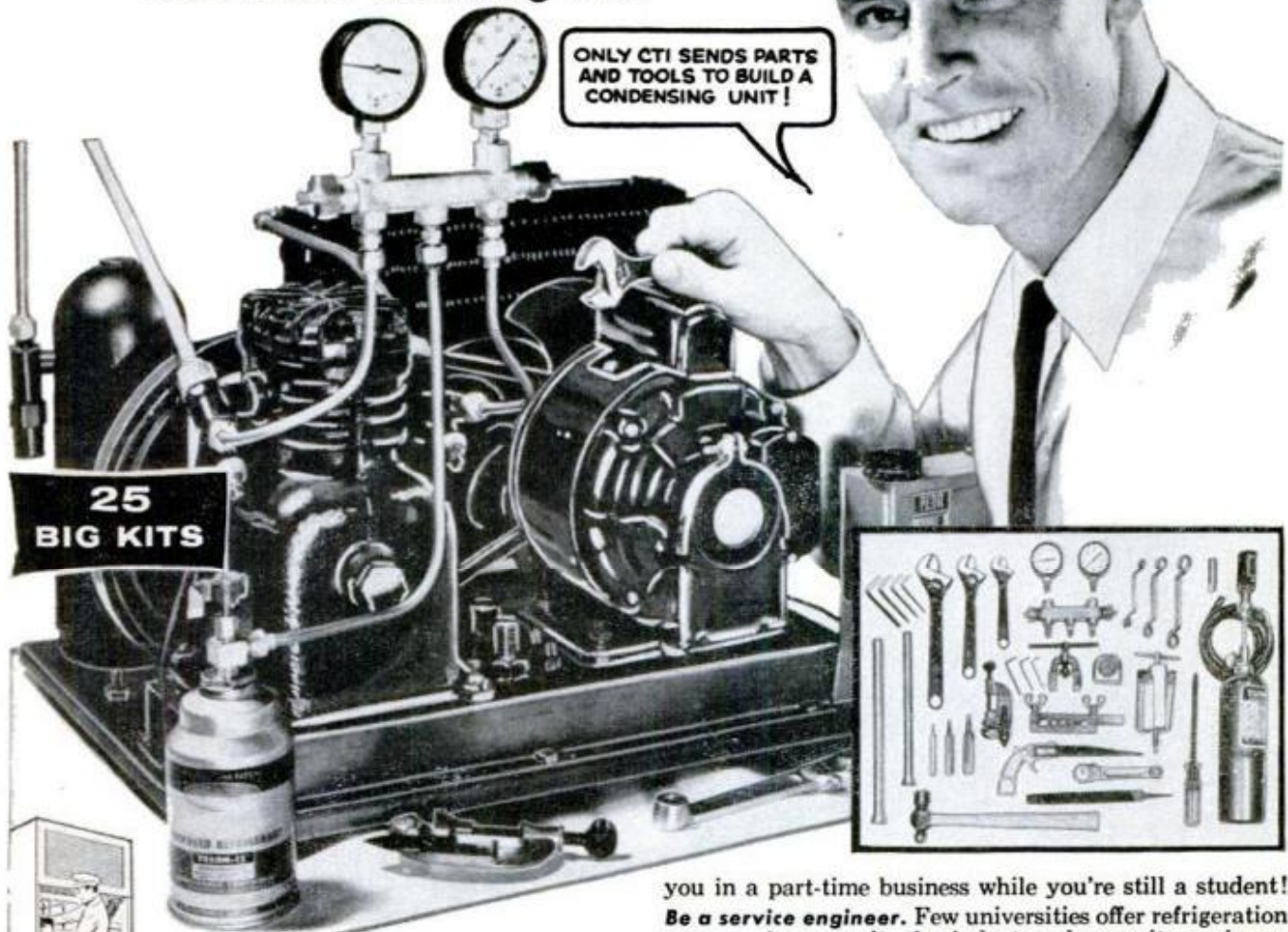
Yes, please publish projects similar to Butch Biven's and George Godfrey's lightweight bicycle powered by a small gasoline engine (July PM, Editor's Desk column). Keep it simple and inexpensive—here in Brooklyn parking is a problem, insurance rates are exorbitant and traffic is mayhem . . .

Brooklyn, N.Y. **WILLIAM FLYNN**

A lot of enthusiastic readers second your motion, Bill, so you can expect to see projects along these lines in future issues of PM. Watch for them.

The Editors

How to build a big-pay future in the Air Conditioning and Refrigeration industry with CTI Home Training Kits



A better job or your own business

The news is spreading fast: America's finest opportunity field is now Air Conditioning and Refrigeration! Today there are over 150 million domestic and industrial units in use. Over 6 million new freezers, refrigerators and air conditioners are manufactured annually. So quickly is the industry expanding that 20,000 service technicians must be trained each year. Yes, air conditioning is a big, uncrowded field where the opportunities are as large as the paychecks!

Learn at home by practicing. It's easy to master this craft. CTI sends you 25 kits of parts and tools to build a heavy-duty, commercial-type, 1/4 h.p. condensing unit (illustrated above). You complete 20 work projects—do 10 trouble-shooting jobs. Then you build an air conditioner, freezer, refrigerator or milk cooler.

Make money as you train. So practical is CTI training that many students earn extra cash fixing and installing. Some make calls on their own; others work for local appliance dealers. CTI training pays its way—actually puts

you in a part-time business while you're still a student!

Be a service engineer. Few universities offer refrigeration courses. As a result, the industry chooses its engineers from technician ranks. If you have above-average ability, you too may get into planning and estimating—the engineering phase of a great business.

Go in business. This is one of the easiest of all fields in which to start small and grow big. You make friends as you make calls, and build a list of potential customers. You also can sign service contracts with food stores, taverns, motels, restaurants, etc. CTI has special information on how to get started.

Write for new catalog. Your opportunities in the air conditioning and refrigeration industry are thoroughly covered in our big new booklet. *Mail coupon for your free copy.* We'll also send a lesson sample so you can see for yourself how easy it is to learn this top-pay, secure craft. Be sure to mail coupon *today.*—Commercial Trades Institute, Chicago 26, Illinois. *A Non-Profit Organization*

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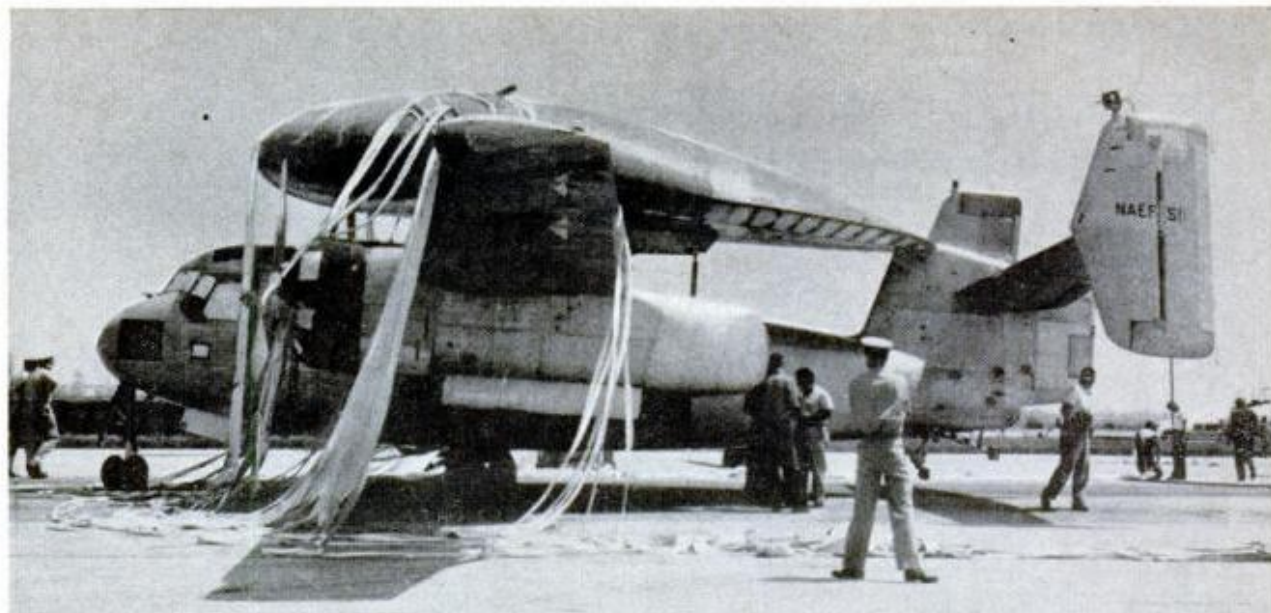
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Accredited by National Home Study Council





NYLON BARRICADE stops Grumman WF-2 Tracer in tests at Naval air-engineering facility. Purpose was to learn whether the plane, personnel or the radar equipment in the dome would be injured by such a barricade if plane were to land aboard ship. The only noticeable damage: slight dents to metal cowling



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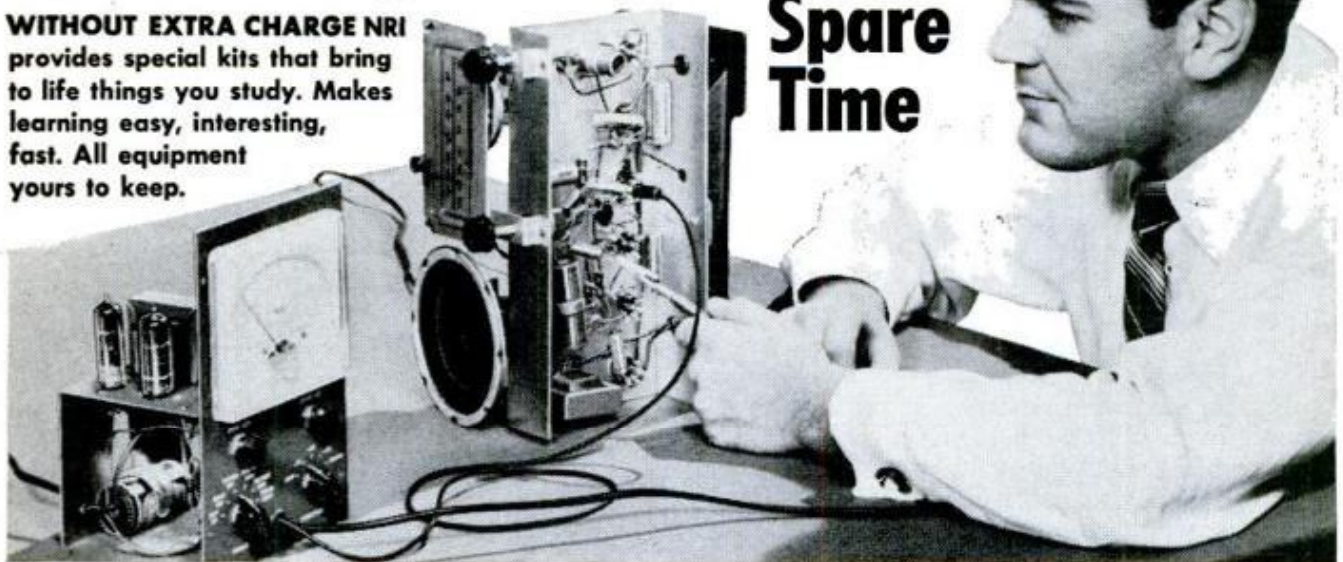
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J. M. SMITH
President

If you check the classified advertisements in your local newspaper, you will undoubtedly see more job opportunities available for men with Electronics training than for any other field. Hardly without exception, these are better than average jobs, with bright futures . . . jobs for which YOU could qualify through NRI training. Thousands of men like yourself—most of them without a high school diploma—have moved up to good pay and enjoy greater prestige in jobs with TV and Radio broadcasting stations, in industrial plants making Electronic equipment or in businesses of their own where they sell, install and service Radio and TV sets.

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NRI Trained These Men



I was working in a textile factory trying to make ends meet. Now I own one of the most modern service shops in this section. **ARGIE C. TAYLOR**, Glasgow, Ky.

After graduating I was a shipboard radio operator. Now I am chief engineer at Station WARA.



NRI was a wonderful foundation. **RAYMOND D. ARNOLD**, Attleboro, Mass.

Thanks to NRI I am in a top position with the Federal Aviation Agency in the Navoids Electronic Section. **JOE DUCKWORTH**, Fort Worth, Texas.

Four months after starting your course I left my job in a hardware store to work at Raytheon Manufacturing. Now I am an engineering assistant in Microwave Power Tube Research and Development Laboratory. **LEONARD BLOOM**, Newton Centre, Mass.



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SIDELIGHTS FROM THE PENTAGON



By William R. Kreh

Ice-resistant paint is being sought by the Navy. Ice is a hazard for Navy ships operating in Polar regions. It builds up on the superstructures, adding dangerous weight. So the Navy is carrying out extensive tests at the New York Shipyard searching for a substance that can be added to paint that will keep ice from sticking to surfaces it's used on.

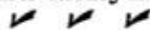


A friendly land mine is being used by the Army during maneuvers. Instead of blowing off a tank's track when it's run over, the mine electronically slips the tank's gear into neutral to indicate gently that the driver has goofed.



Underwater radioactivity can be measured by a supersensitive instrument developed by the Navy. It's called DUNC, appropriately (for deep underwater nuclear counting). It's so sensitive that it will detect one lonesome atom of radium in a billion times a billion molecules of water.

Lowered from a ship, the three-foot-long tube sends electrical impulses back up the cable every time it is hit by a radioactive particle, thus instantly giving data that formerly could only be obtained by taking a water sample and analyzing it in a lab.



Jungle stripping is secretly being tested by the Army to rid dense forest areas of foliage to expose guerilla fighters or enemy installations. A chemical already has been developed that, when sprayed from the air, causes leaves to fall off plants and trees and denude a forest in less than three days. This isn't fast enough and Army experts are working full-speed to develop a quicker-acting chemical.



Like your eggs boiled *precisely* three minutes? Then you'll be glad to hear about the Naval Radio Station at Balboa, Canal Zone, which is now broadcasting time signals accurate to five parts in 100 billion. The accuracy is kept by comparing the signal with an atomic clock in the Naval Observatory in Washington, D.C. Balboa and another very-low-frequency station in Rugby, England, give the superaccurate time signals practically worldwide coverage.



A Rube Goldberg space capsule has been designed by the Navy. The capsule is to be used to recover small payloads from high

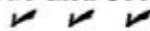
altitude probes and here's what happens when it re-enters the earth's atmosphere:

1) The heat of re-entry on the plastic skin closes a circuit and this blows off the back of the missile. 2) A projectile falls out into the ocean where it explodes to give sound-detection devices an idea of where the capsule is about to land. 3) A parachute pops out from the spot vacated by the projectile. 4) Tiny bits of foil are released with the chute to reflect radar beams. 5) An antenna is pulled out by the main chute and begins broadcasting signals good for as far as 150 miles. 6) When the capsule splashes, the water completes another circuit which causes cutters to close on the parachute lines and free the capsule. 7) The water also dissolves plastic material holding sea dye which spreads along the ocean surface so the capsule can be spotted from the air.

After all that, there's not much excuse for the Navy losing any capsules.



It takes 686 tons of sand to clean a Navy submarine. That's how much is needed to blast clean a typical hull before it can be repainted—and that's enough for a private beach 46 feet wide and 300 feet long.



A flying missile launcher is under "serious study" by the Defense Department. The launcher could cruise the skies for two days or more without refueling.

The Pentagon calls the project "Dromedary" because the proposed aircraft could go a long time without a drink of fuel. One official described the concept as one "in which you have an aircraft that takes off, stays up a long time on patrol, on station, and is armed with missiles of the Skybolt or a more advanced type."

Such a plane would undoubtedly use the principle of "boundary layer control," a method of stabilizing air as it passed over the wing and tail surfaces of an aircraft. By controlling this boundary layer, drag would be reduced substantially, thus cutting fuel requirements.



Image intensification, a system for seeing in the dark, has been unveiled by the Army Corps of Engineers. In a night exercise recently at Fort Eustis, Va., observers were completely in the dark as hundreds of troops and scores of assault craft stormed the beaches right in front of them. With the flick of a switch, however, night was turned into day. Three special television cameras brought the entire scene into sharp focus.

The new TV cameras use ultrasensitive pickup tubes which amplify dim star light about 100,000 times. No infrared or other artificial light source is needed and because of this, the system cannot be detected.

PM REPORTS



DEATH ON BUGS

TIRED OF sharing your barbecue, patio, or outdoor play area with mosquitos, flies and sundry other bothersome insects? Then you will be happy that someone finally has gotten around to invent and market an inexpensive insecticide dispenser that is really effective. Called "Insect Fogger," the product shown is a compact electrically-driven unit that converts ordinary insecticide into thick clouds of fog which quickly envelope everything in a large area, killing most insects on contact. With the barrel removed, it can be used for applying water-base mothproofers, garden sprays, weed killers and similar liquids.

A self-priming motor-driven pump forces insecticide through an atomizing nozzle located in a heated, insulated chamber. Upon entering the latter, the atomized liquid vaporizes into a thick fog which shoots from the barrel as pictured above. Fogging is started and stopped by a trigger switch on the handle. A knob on the housing adjusts insecticide rate of flow. The unit becomes operational 6 min. after it is plugged into a 110-v. outlet. While sprayed areas may be occupied immediately, insect repelling effects remain for hours. The unit retails for about \$40 from Burgess Vibrocrafters, Inc., Grayslake, Ill.

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BULLETINS FROM THE WORLD OF SCIENCE

Disasterproof messages can be sent across the U.S. by a new underground communications system in the event of a war or the destruction of communication towers—as recently occurred in Nevada.

Under development, it calls for low-frequency radio signals to be shot through a dense rock mass underlying the nation. Signals would be picked up by mile-long antennas dropped into holes 50 miles apart. The overlying rocks prevent the messages from being intercepted or jammed.

Ocean levels have dropped 1500 feet in the last 20,000,000 years, and they are still dropping. The reason? According to Dr. John Weaver, of the University of Puerto Rico's Institute of Caribbean Studies, the Earth is continually expanding and rifts are opening in the ocean floors. Billions of gallons of water simply fall into these trenches.

While Weaver noted that a rift zone near Iceland is now widening about 20 feet a mile every 1000 years, he makes no prediction as to when it might be possible to hike—rather than to sail or fly—from New York to London.

Pink toothbrush is the coming thing for kids. Dr. Quinton Williams, U. of Texas, has started children to swishing a red dye (erythrosin) in their mouths before they brush their teeth. The dye turns red on spots where bacteria has collected. Using a mirror, the child sees where to brush, and just how effective are his up-and-down and side-to-side strokes.

You may soon be eating wood. The American Viscose Corp. has developed a filling food product from wood fibers. A purified form of cellulose, the product has no calories. It can be used to give body bulk, opacity, texture and palatability (so says the corporation) to many foods, particularly those for people who are dieting.

An official of the firm says they'll probably be using more wood for food than for rayon within the next few years. The U.S. Food and Drug Administration has already said it is safe for human consumption.

James Biery

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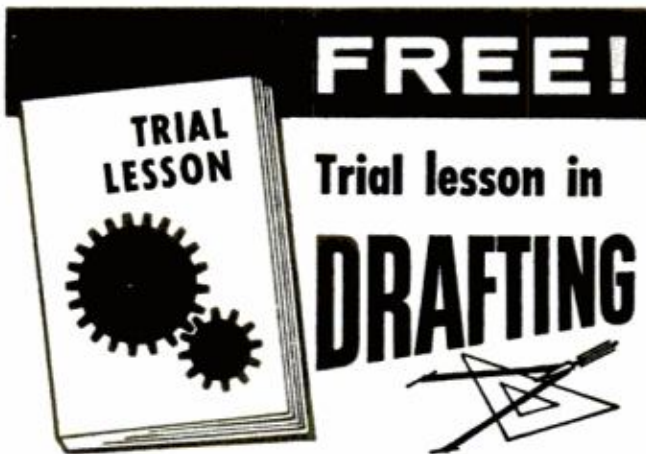
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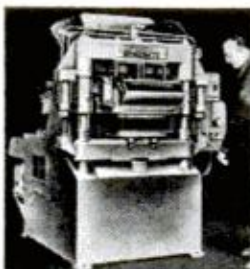
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SIDELIGHTS ON AVIATION



Gooney Birds never die, and apparently they aren't about to fade away either.

The old DC-3, originally designed and built in 1935, is not only still flying but still outnumbers any other aircraft in the air. The International Civil Aviation Organization, an agency of the United Nations, announced there were 1926 Gooney Birds in service around the world, more than the total number of all the new turbojets and turboprops, plus a few piston-engines.

The figures justify the DC-3's selection as one of the 12 most significant aircraft of all time (PM, June, 1961).

All-time best sellers among aviation publications include three government booklets first put out about 15 years ago.

They are "Facts of Flight," on the fundamentals of aircraft operation (286,298 copies sold); "Path of Flight," on navigation (485,599 copies); and "Realm of Flight," on flying weather (455,096 copies).

Facts, which sells at 50 cents, Path, 65 cents, and Realm, 75 cents, are available from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Coast-to-coast flights in five hours are now routine. It was just 50 years ago this month that the first one began—and it was not completed until three months later.

Calbraith Perry Rodgers, flying a Wright Brother's pusher nicknamed the "Vin Fiz" (after a soft drink marketed by the sponsor of the flight), followed railroad tracks through most of his 4300-mile trail-blazer. In 1911 there were no air markers, no beacons, no radio beams, no weather forecasts, no airway maps, few highways and no airports. His only instrument was a piece of string fastened to a brace which told him whether the plane was climbing, diving or drifting. He landed where he could.

Rodgers made 69 landings, 15 of them severe crackups. The plane was repaired so often en route, the only original parts to survive were the rudder and one strut.

An engine cylinder exploded once embedding splinters of steel in his arm. In a crackup at Compton, Calif., his ankle was broken. When the plane was repaired, he hobbled to it on crutches and flew on to Long Beach on Dec. 10, taxiing into the surf to complete history's first coast-to-coast flight, an epic of perseverance.

Kevin V. Brown

POPULAR MECHANICS



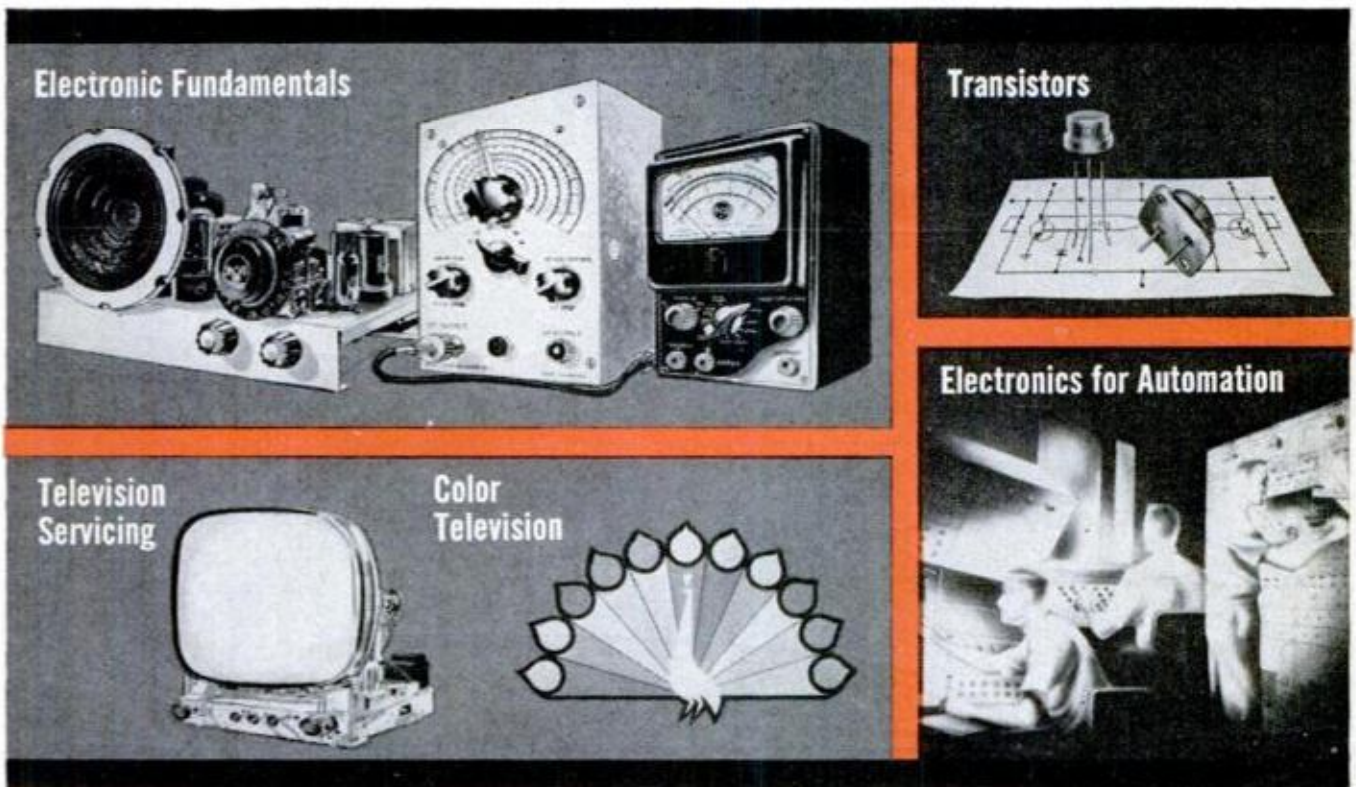
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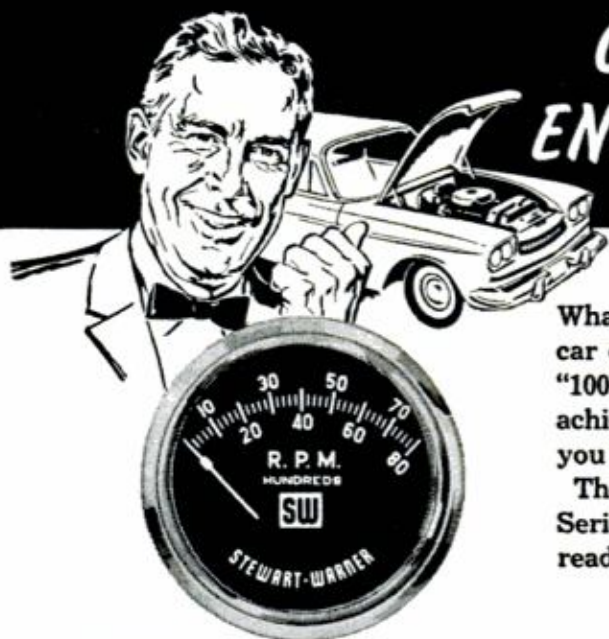
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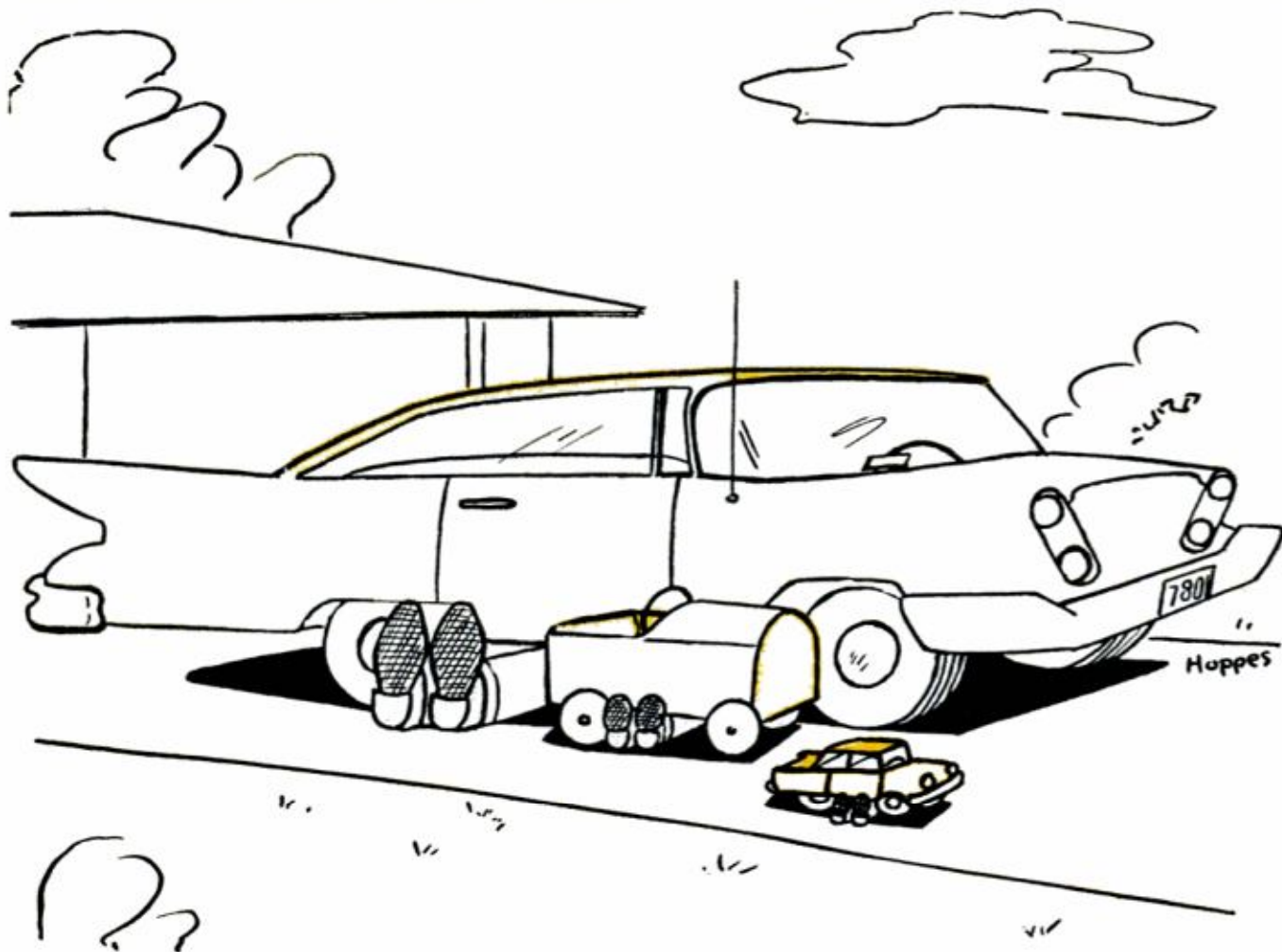


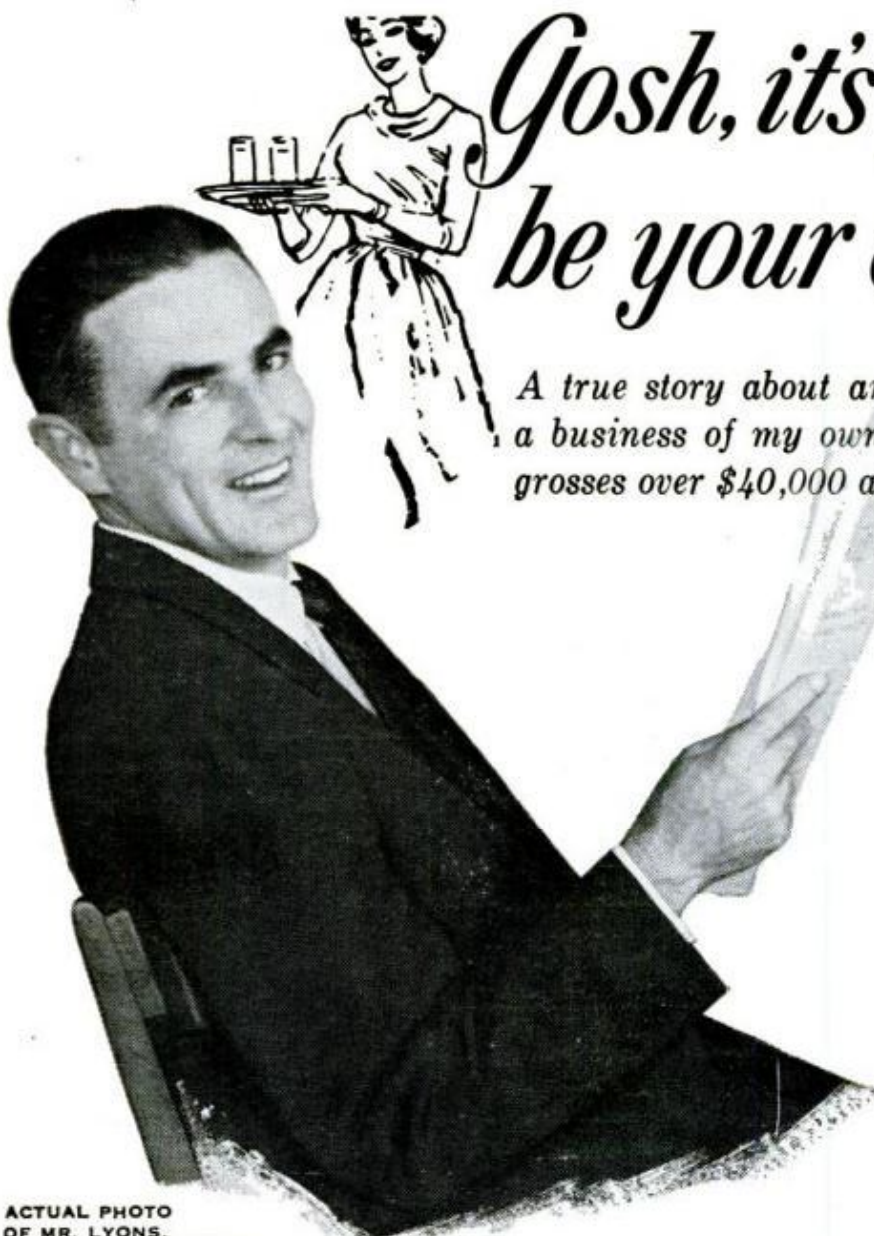
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Gosh, it's good to be your own boss!

A true story about an ad that got me started in a business of my own three years ago—that now grosses over \$40,000 annually!

ACTUAL PHOTO OF MR. LYONS. ADDRESS ON REQUEST.

by Michael J. Lyons

It sure is a wonderful feeling to be your own boss and know the sky's the limit if you're willing to get in and pitch. I know, for I've been on both sides of the fence.

I'd been watching for just the right thing when I spotted an ad offering a Duraclean rug and upholstery cleaning dealership.

Now, just three years since I saw that ad, I have my own \$40,000-a-year business.

I investigated the company and found it to be a top level firm respected in the field since 1930.

Unlimited Market Potential

I found that the money-making pos-

sibilities in this field are endless. The Duraclean process itself—its safety and efficiency—told me that here was the right combination to make it BIG.

Easy to Start—Training Free

It's easy to get started with Duraclean. Everything is provided—and a complete training course helps you build your new business.

You don't need a shop since cleaning is done in the customer's home or place of business. And with wall-to-wall carpet so popular, "on location" cleaning is really a *must!*

Easy to Get and Keep Customers

Your success in this field is charted with a tested sales program set up by the company. First, it teaches you how to *get* customers. And when we get customers, we *keep* them because of Duraclean's fine advantages. Folks rave most over our no-scrubbing, no-soaking features which mean rapid drying and no-shrinking or texture distortion.

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**TUNE IN ON
THE INVENTORS**



SEPTEMBER is housing month at PM, and here are a few recent patents awarded in that field:

A paint bucket for rollers which eliminates the roller pan won patent No. 2,988,767 for Arthur Tretwold and Willis Marshall, of Bellingham, Wash. Like so many good inventions, it's a simple improvement—an ordinary-looking paint bucket except that one side is flat and ribbed to make a rolling surface. You dip the roller in the paint in the bottom of the bucket, roll it out on the flat side, and you're ready to paint.

A home dry cleaning machine won patent No. 2,987,902 for Jack Mack, of Scottsbluff, Neb. The unit, which is an attachment for an electrically-controlled, automatic-cycling home washer, uses the washer's tub and control mechanism to supply dry cleaning fluid instead of water. It cleans, rinses and dries fabrics just like the big commercial automatic machines.

Combining an air supply and exhaust system with a fluorescent lighting fixture won patent No. 2,985,090 for Murray L. Quin, of Overland, Mo., for Day-Brite Lighting of St. Louis. Mr. Quin's system puts V-shaped, perforated ducts between the lights to circulate air through the home—or office. An air duct and exhaust system is connected to the fixtures; some feed fresh air while others exhaust stale air. As a bonus, the system maintains a constant temperature around the fluorescent lights for maximum lighting efficiency at all times.

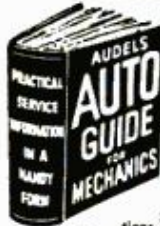
The "scrubbing bar," a bar of soap with bristles embedded, won patent No. 2,979,748 for Guy Beatty, of Bakersfield, Calif. His soap bar contains bristles that are scored at short intervals. As the soap wears down, the bristles break off at the scored spots, maintaining a scrub-brush surface as long as the soap lasts.



It has nothing to do with housing, but the most interesting patent this month is No. 2,986,812, awarded to William Arter and Robert Clothier. They've designed a combination fishing lure and beverage can opener. It may be the ultimate in fishermen's conveniences.

Copies of the original patents may be ordered for 25 cents each from the Commissioner of Patents, Dept. of Commerce, Washington 25, D. C.

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Treated Twine Edges Lawn

By stretching a specially treated twine along the border of the lawn, then sprinkling, a gardner can keep grass from spreading into shrubbery, over sidewalks or under fences. The twine can also be tacked in place for curves.

The E-Z-Edge twine is manufactured by Farmer & Krueger, 1112 S. 10th St., Sunnyside, Wash. About two cents a foot.



Plastic Fibers Guard Fishhook

Eliminating an old fisherman's bogey—the wire weed guard that keeps a lure from being snagged but also keeps fish from being hooked—a new series of lead-headed lures uses a bunch of medium-soft plastic fibers in place of the wire. Hook protection is as good as before, but the plastic bends away when a fish strikes. Made as marabou-feather jigs or jig-and-worm combos by Bass-Buster Lures, Amsterdam, Mo.

Earn Extra Money Soon

... while training at home for high-pay career or business of your own!

AMAZING PLAN FOR YOUR SUCCESS IN RADIO-TV-APPLIANCES and ELECTRONICS

Central will show you how to start making money soon . . . servicing AM-FM radios and television sets . . . repairing electrical appliances . . . building and installing electronic equipment in homes, factories, and business offices. Step-by-step, you'll learn how to get started in spare time at minimum cost; how to prepare for a bright future in servicing, audio, communications, broadcasting, or the gigantic electronic industry. Complete FCC license preparation included. High income, prestige, security, prosperity . . . all can be yours!

NO EXPERIENCE NEEDED!

You don't need high school diploma or previous knowledge of electronics to get started. Quick, low-cost home training for young and old. New illustrated lessons make learning easy. We supply equipment and *know how* you need to start making money soon. You learn by *doing*. You assemble useful, practical electronic projects—no incomplete "student" radios and testers—our kits meet commercial standards. Also recommended for citizen band and amateur radio operators, hi-fi and stereo enthusiasts, hobbyists, etc. Your personal pleasure and the savings you can make on home installations and repairs alone, make this course a profitable adventure. Keep your present job—set your own pace—add to your income—and find out how much fun Electronics can be!

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Cash in on growing demand for technicians in hundreds of exciting space-age fields: guided missiles, rocketry, outer space research and development, automation, nuclear power, computers, microwaves, radar, communications, oil field exploration, air traffic control, civil service, armed forces, etc. *Start now*. Get facts—mail coupon today for two FREE books!

NEW KITS!



You will build and keep this handy "transistorized" electronic and appliance tester that you'll use soon to start earning spare-time money. Many other practical and profitable electronic projects to choose from: 4 transistor portable radio—code oscillator—solar cell switch—RF signal generator—CB converter—oscilloscope—others! Fully described in our FREE 64-page catalog.



Central grad GLEN LEIRER, shown here, earned an attractive income from part-time Radio-TV Servicing. Now he's employed as a Computer Technician for RCA Service Co., Camden, N. J.

Over 50,000 Successful Graduates Since 1931!



"I averaged between \$60 and \$70 a month servicing radios and TV's part-time while taking your home study course. Plan to open my own shop soon." Student THEODOR SCHMIDT, Peshastin, Wash.



Central grads HOWARD EDMONDS & FLOYD CONKRIGHT are joint owners of EDCO FACTORY TV SERVICE CO., K. C., Mo., and RANCH MART TV & STEREO, Leawood, Kansas, have three service trucks, seven full-time employees.

Grad FRANK LEENKNECHT works in missile field for Convair Astronautics, San Diego, Calif., and as Transmitter Engineer for Station KDEO as a sideline.



RESIDENT TRAINING—Central also offers a full-time ECPD-Accredited Technical Institute program at its resident school in Kansas City, Mo., for qualified high school graduates. Details in FREE catalog.

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What the "oil-burning" engine is telling you



No mechanical part will last forever. By the time you have driven your car 50,000 miles, the crankshaft in your engine will have made 150,000,000 revolutions. Piston rings will show signs of wear. Engine bearings will wear, too, and your engine may begin to burn increasing amounts of oil.

Worn bearings — sluggish performance

Main, connecting rod, and camshaft bearings control the oil flow inside your engine. As bearings wear, they leak excessive amounts of oil, and this oil—up to 25 times the normal amount—is thrown violently against the cylinder walls. It slips past piston rings into the combustion chamber where it burns to heavy carbon and varnish. Rings become clogged and deposits build up on valves. Your car burns oil, gas mileage drops, and performance becomes sluggish.

Fm bearings — 1st choice for cars

Your mechanic knows what to do. He'll probably recommend an overhaul . . . and new Federal-Mogul engine bearings. Fm bearings are used as original equipment by most American car and truck manufacturers.



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ITEMS FROM ALL OUTDOORS



We're talking survival again this issue, with the second half of Russ Tinsley's test report on page 156. So it's fitting to pass the word on a new first-aid and survival kit designed for easy carrying by outdoor people—just in case. The kit is small enough to fit in a jacket pocket, tackle box or glove compartment, but contains a knife, compass, fishhooks, nylon leader, signal mirror, water-purification tablets, signal flag, pencil, candle, matches, burn ointment, ammonia inhalant, gauze bandage, adhesive tape, gauze pad, paper clip and an instruction booklet. It comes in a leather case for \$4.98 from Davenport and Walden, Box 692, Inglewood, Calif.

Outdoor activities far from power lines and modern conveniences have brought back many "old-time" appliances for campers, boaters and others. Now you can buy a wood or coal-burning cast-iron stove, just like Grandma used to use, only better. The compact little stove stands only 10 inches high, is 18 by 13 inches square and weighs 40 pounds. It'll burn any kind of fuel, from logs and coal to patent chemical fuels, and an optional attachment will rig it for oil. For boaters, it has a top railing to keep pots and pans from sliding off in rough seas. It's made by Washington Stove Works, Box 919, Everett, Wash.

Another convenience for outdoor living in a new compact form is the little 6 or 12-volt electrical water-pressure system being made by Grover Products Co., of 1233 South Hope St., Los Angeles 15, Calif. The motor and pump don't take up any more space than half a loaf of bread, but they'll put running water in a car or boat with instant, automatic pressure without a pressure tank, and will supply up to six faucets. The gadget will work as a bilge pump or bait-tank circulation system, too.

Fishermen and bird-watchers can learn to spot their quarry by sound with a new 12-inch long-playing record of fish and bird noises that comes with the book *Animal Sounds and Communication*, published by the American Institute of Biological Sciences, 2000 P. St. N.W., Washington 6, D.C.

Dick Kichpatnik

POPULAR MECHANICS

CHOOSE YOUR JOB TRAINING—THEN LEARN BY DOING!

Challenging work—if you can get it. To land a job as a Helicopter Mechanic, you need training. The kind of training you get through the Army Choose-it-Yourself System.

If you qualify (by passing aptitude and physical exams), this system lets you choose your job training before you enlist.

On-the-job or in school, Army training is practical. You learn by doing. The skills you absorb can pay off for the rest of your life.

You can choose from many different kinds of job training. Aircraft Maintenance is one possibility. There's also Data Processing, Missile Operations, Finance, Automotive Maintenance, Communications Center Operations—to name a few. Ask your Army recruiter to show you a complete list.

Can you qualify for the job training you want? It's easy enough to find out. Before enlistment. Without obligation.

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Imported briar bowl lined with *real honey*. Starts caking the instant you light up. Hence, no break-in.



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Metal grate condenses moisture, tars, nicotine. No wet heel.



3. Smokes cooler!

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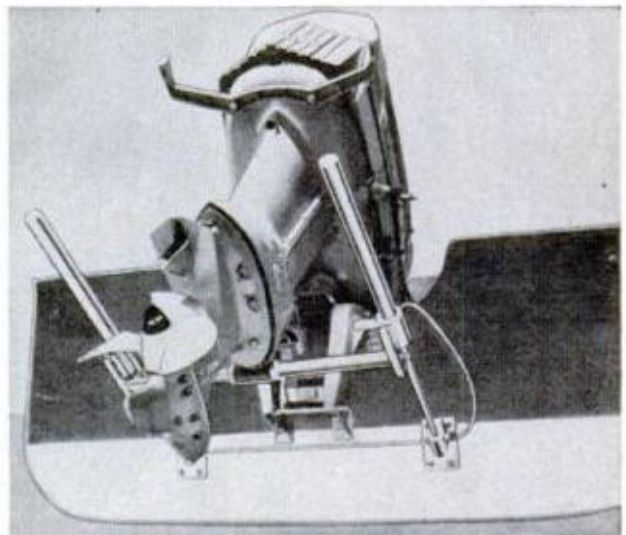
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Automatic Portable Pump

Convenient for boat owners and householders alike is an automatic, self-contained portable pump recently placed on the market. Powered by two two-volt rechargeable batteries, it can raise water over 35 feet and will run continuously for seven hours on one charge. The pump is manufactured by the Russell Harrington Co., Southbridge, Mass., and sells for \$69.50.



Push a Button, Up It Goes!

Tilting an outboard motor up on the transom has become a one-finger operation for the boater with the aid of a new boating accessory.

Powered by a cylinder of compressed carbon-dioxide gas, the lifting device is controlled by a push button mounted near the steering wheel. It will tilt the motor to any desired angle. Tilt-O-Matic is manufactured by the National Marine Corp., South Bend, Ind.

Just a Few Months NEW and Already One of the **HOTTEST** Money-Makers for Men Everywhere—even Spare Time!

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ONCE YOU BUY MERLITE LIGHT BULBS—YOU NEVER HAVE TO BUY BULBS AGAIN—NEVER!

Averages \$12 an Hour

"Merlite Bulbs are the answer to a salesman's prayers. They're fantastically easy to sell. Working only part time, I have averaged \$12.00 per hour."

Philip Smith, Maine

Sold 178 Bulbs First Afternoon

"The first afternoon I sold 178 bulbs. Am very pleased with reception we get from customers. Please ship my next order at once."



W. E. Foust, Arkansas

Makes \$8.20 an Hour in Just Spare Time

"These guaranteed Merlite Bulbs surely sell. I've averaged \$8.20 per hour for the time I've spent with them. That makes a nice income and wish I could give full time to the job."

L. C. Benedict, Virginia

Daring NO-TIME LIMIT FREE REPLACEMENT GUARANTEE Does the selling FOR YOU—MAKE up to \$1,000.00 in a MONTH!

It's fantastic—14 magic words (ONCE YOU BUY MERLITE LIGHT BULBS—YOU NEVER HAVE TO BUY BULBS AGAIN—NEVER!) are making it easy for men everywhere to make a "small fortune"—as much as \$1,000.00 and more in a month, spare time or full time! No demonstrations, no fast-talking sales pitch needed. Almost everyone jumps at the chance to buy Merlite Bulbs with the iron-

clad Guarantee (packed with each bulb) that unconditionally offers to replace FREE any burned-out Merlite Bulbs, no matter when they burn out—in 5 years, 10 years—NO TIME LIMIT! And the Guarantee applies to all Merlite Bulbs purchased or replaced! Every home needs 12 to 24 Merlite Bulbs to replace old-fashioned short-life non-guaranteed bulbs. Make up to 120% profit, easily make \$50 in few spare hours. Merlite men are doing this now!

FREE Money-Making Details Amazing No-Risk Offer

Find out for yourself how much money you can make with the sensational Guaranteed Merlite Long-Life Light Bulb. We'll send you—FREE and without obligation—complete money-making Illustrated Sales Outfit and an astounding offer which helps you get started making money without risking a penny. Mail coupon TODAY!

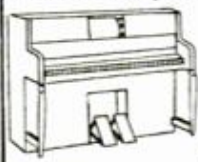
Merlite Industries, Inc., Dept. C-15J (Bulb Div.) 114 East 32nd Street, New York 16, N.Y.

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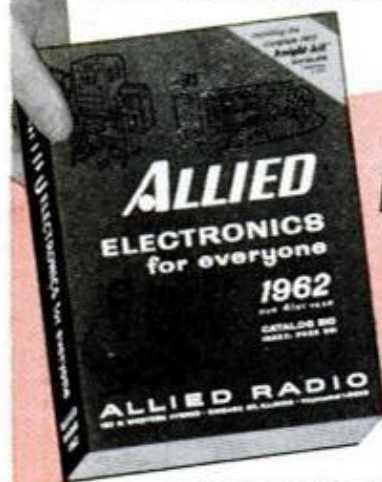
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**Juice of Desert Snail
Makes Emergency Drink**

Flyers or other travelers who may get stranded in the Negev desert in southern Israel or in the scrub desert along the North African coast, need not fear they will die of thirst. They can drink the juice of a large white snail called *Ehrenbergi Roth* which abounds in those areas. Its shell contains as much as a half teaspoonful of body fluids. Flight Lt. John Billingham of the Royal Air Force Institute of Aviation Medicine at Farnborough, England, in a test lived for four days on the juice. Simulating conditions of a desert crash, he was shut in a chamber where the temperature sometimes soared to 118 degrees F.

"I was a bit weak at the end of the four days," he says. "But I was mentally alert and quite happy. It's pretty awful stuff, rather fishlike." He drank four pints a day. Two rats, fed the fluid, put on weight.

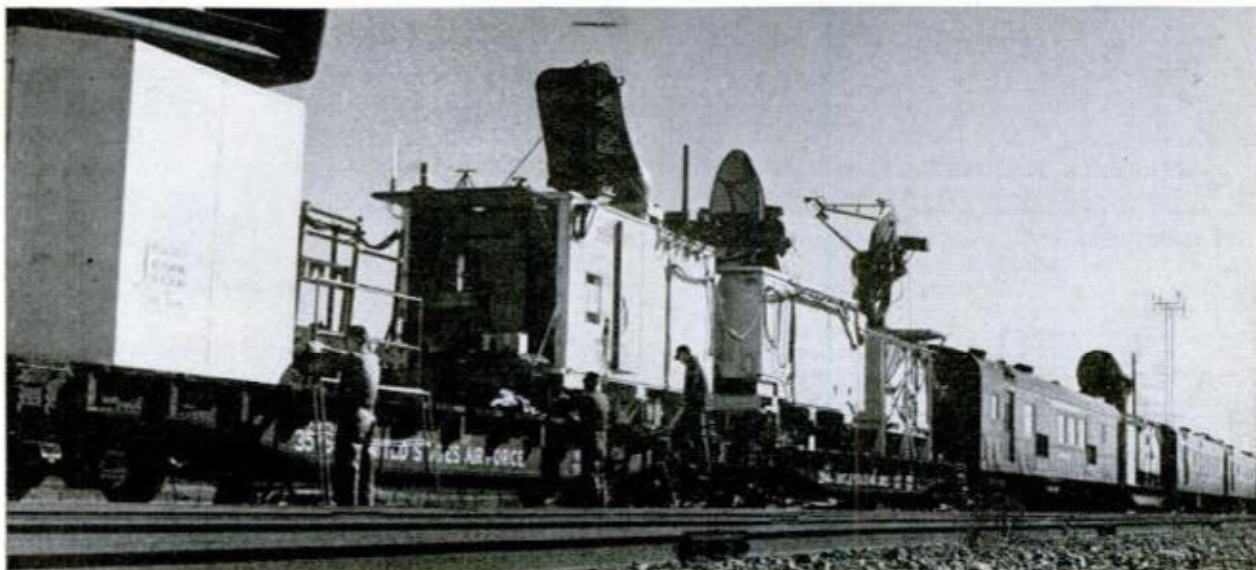
**Do-It-Yourself Spending
Was \$3 Billion in 1960**

American handymen spent \$3 billion to do it themselves in 1960, according to the Census Bureau's first survey of do-it-yourself spending. Of the total national outlay of \$9.5 billion for home upkeep and improvement, \$3 billion went for materials and equipment for home repair, alterations, or additions.

In one category, outdoor alterations, the amount spent for do-it-yourself operations exceeded the amount paid for hired work.

**How Much Acceleration
Can a Skeleton Stand?**

Most acceleration studies to date have concentrated on effects of G-forces on blood circulation, the nervous system and general human behavior. Anatomists and engineers at the University of Michigan and Wayne State University are now studying what these strenuous forces do to the human skeleton to find "the threshold for fractures"—the point at which bones begin to crack under intense acceleration. The test apparatus, built into an eight-story elevator shaft at Wayne's medical school, will create forces up to 50 times the weight of gravity (50 Gs). Specimens have been exposed in it to accelerations up to 14 Gs without causing fractures. Some of the findings concern the tensile and compressive strains measured along the spinal column during vertical acceleration, the effect of restraint by seat belt and shoulder harness and the inadequacy of seat cushions to absorb the shock of acceleration.



Radar on Rails Counts "Hits" by Air Force Bombers

In the early days, Air Force bombing crews practiced by dropping bags of flour at circles marked on the ground. Today they use radar that can pinpoint the accuracy of simulated raids from altitudes up to 45,000 feet. The "raids," incidentally, are on widely scattered towns and cities in the U.S. and are made almost daily.

The RBS units (for radar-bomb scoring) are set up in railroad cars—former hospital cars used by the Army in Korea—and moved about to give the bomber crews new targets to locate, unfamiliar routes to follow and a variety of terrain to fly over on each raid.

Here is how the system works:

The bomber, usually a B-52 of the Strategic Air Command, makes its practice bomb run on an assigned target city, keeping in constant contact with the RBS unit. The RBS radars "lock on" the oncoming bomber, tracking it automatically on a plotting board. Just before the simulated release of the bomb, the aircraft transmits a tone to the RBS site by radio. The moment of the simulated bomb release is indicated

by stopping the tone. Then the radar goes to work.

The target site and the radar site have already been precisely plotted. By using figures on distance and direction of the bomber from its target, the aircraft's ground speed, heading and altitude, wind conditions, bomb-fall characteristics and other data, RBS technicians can compute the accuracy of each mission. The computation allows them to tell exactly if the target was hit or, if not, by how far and in what direction it was missed.

The RBS train has enough power to serve a city of 2500, and its tanks carry 10,000 gallons of fuel—enough for 30 days' operation. Additional tanks carry more than 10,000 gallons of water. More than four miles of cable provide interconnecting communications and power outlets.

The whole train consists of the six converted hospital cars used for command, administration, maintenance, supply and power; three flatbed cars with vans housing the radar and electronic equipment; and one boxcar for storage.

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Campers can now enjoy hot or cold showers no matter how far they stray from modern plumbing, thanks to an ingenious Austrian inventor who has come up with a completely portable shower.

Water is pumped from a bucket to the shower head by the bather who stands on the pumping apparatus and shifts his weight back and forth from right to left. The rustproof pump has no moving parts.



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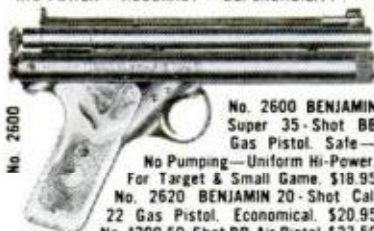
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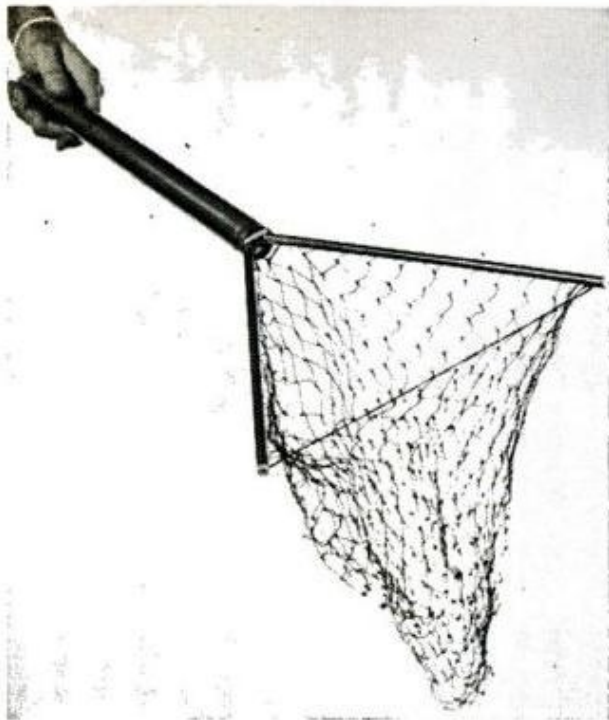
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THE SURPRISING '62s

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October Popular Mechanics



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SEPTEMBER 1961

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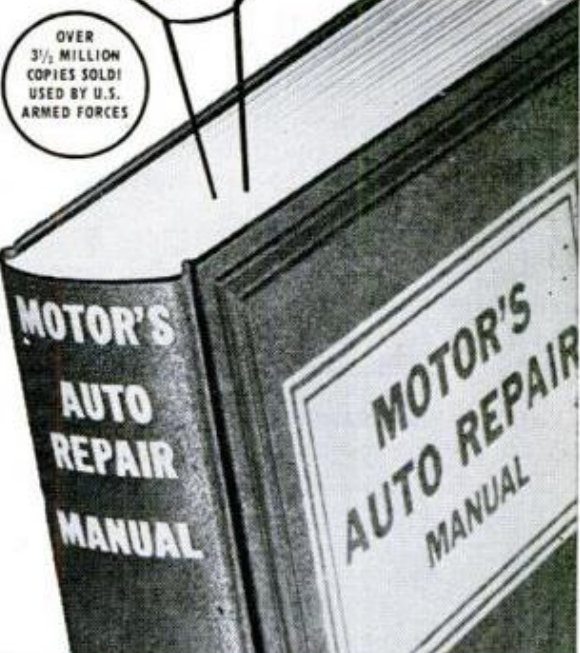
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








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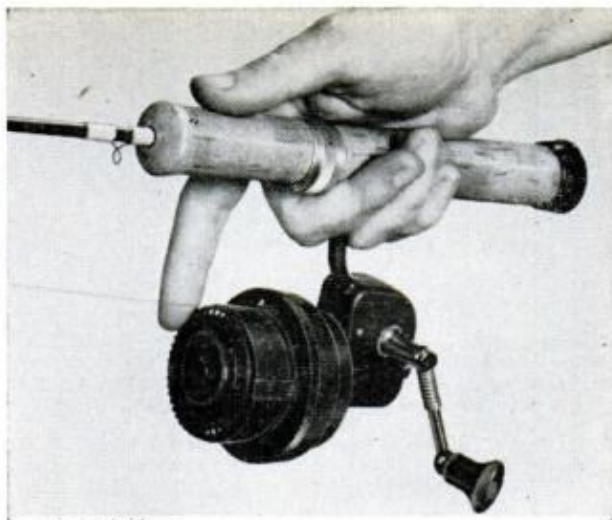
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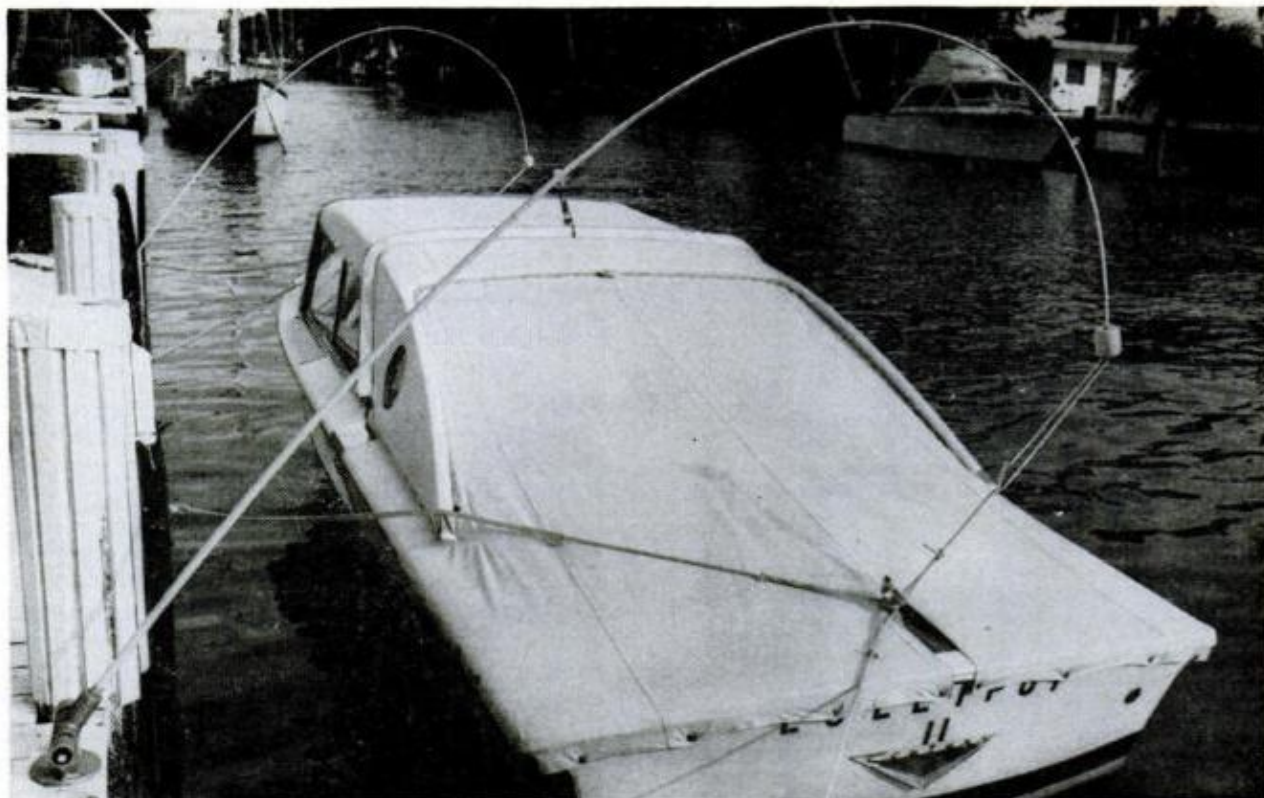
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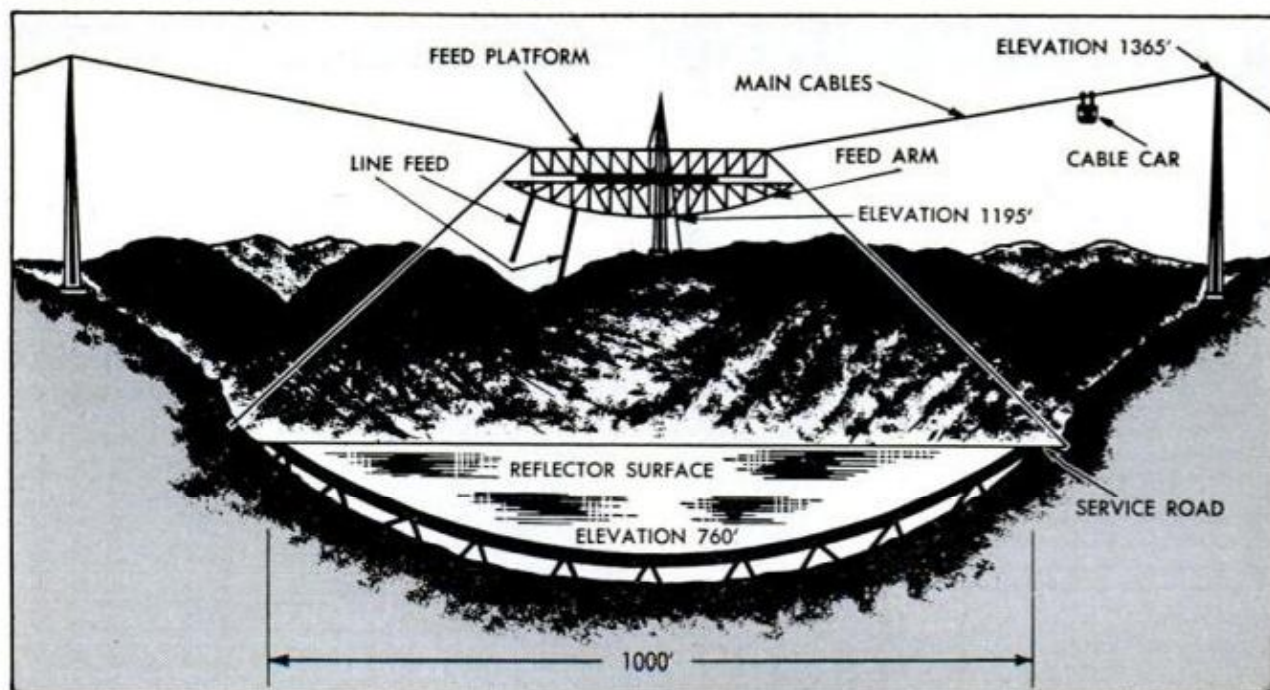
sion bar mounts, the whips' lines slip easily over one cleat forward and one aft. Spring action holds it out, Y-lines hold it in. It's made by Marina Products, Inc., Fort Lauderdale, Fla.

Radio-Radar Telescope Will Listen to Stars and Map Moon

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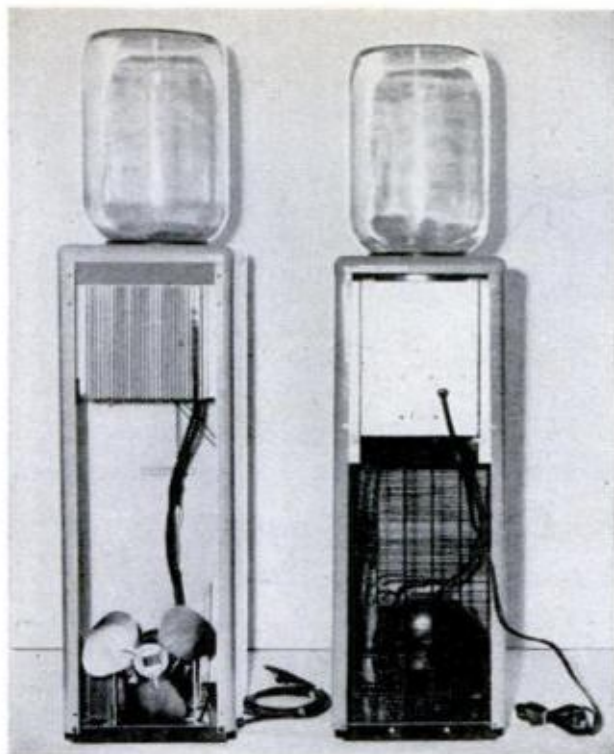
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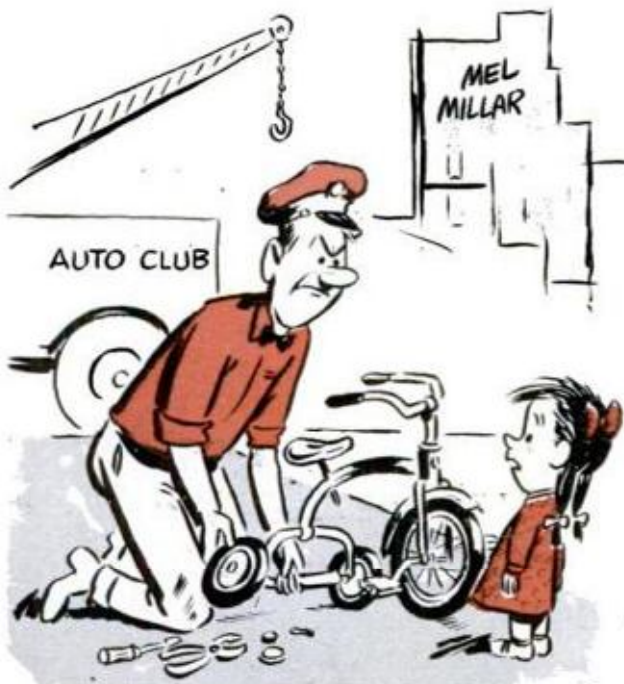
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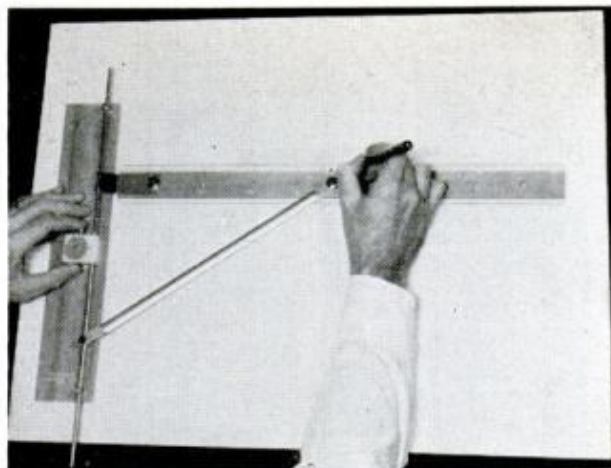
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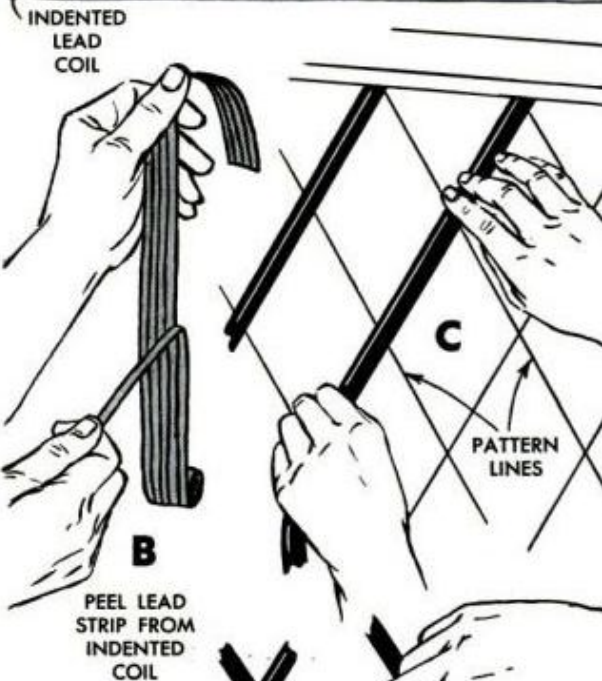
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The list of uses of diesel power in American industry is a long one.

Trucks, buses, ships, locomotives, farm machinery, construction equipment, and stationary power equipment such as electric generators and drilling equipment all make use of diesel power.

The list of applications of diesel power has grown steadily in recent years and growth is expected to continue in years to come. This has brought about increasing job opportunities for trained diesel mechanics, and industries that depend on diesel engines as a primary power source are expected to expand considerably during the 1960's.

The number of diesel-powered trucks and buses in this country almost doubled between the years 1953 and 1957, and diesels are by far the most-used power source in today's railroads. In fact, the advantages of diesel power are so well known that one of the world's leading car manufacturers offers a diesel-powered passenger car.

An important consideration in the increased use of diesels in industry and in the increase in job opportunities for diesel mechanics is the fact that most industries using diesels in large numbers are expected to expand their activities considerably in the coming decade.

Great numbers of diesel-powered bulldozers, cranes and other earth-moving equipment will be manufactured and sold because of the government's multibillion dollar highway expansion program. Farm mechanization has been steadily increasing for a long time and this trend will continue at an accelerated pace in years to come. This has opened up a gigantic market for diesel-powered harvesters, tractors and other farm equipment.

The expanding petroleum industry will be ordering great numbers of diesel engines to run generators which supply power for drilling and pumping equipment.

Diesel equipment is used in ventilating, drilling, pumping and hauling in modern

mining operations. It is expected that the use of diesel equipment in mining will be expanded to an even greater extent in coming years.

An advantage of the diesel engine is that it operates relatively inexpensively. Not only is diesel fuel cheaper than gasoline, but the engine itself burns fuel more efficiently, uses less fuel for a given amount of work and delivers more miles per gallon for moving equipment.

American industry will be putting diesels to ever greater use wherever dependable and economical power is needed and wherever it is possible to apply diesel engines to the job.

Because of this increased use of diesel power, many mechanics with years of experience on standard gasoline engines are taking educational courses in diesel mechanics so they can capitalize on these new opportunities. The similarity of the basic parts of diesel and gasoline engines (although fuel feeding and firing systems differ) makes gasoline engine experience a valuable asset for a diesel mechanic.

Many young men have found it helpful to take correspondence or resident-training courses in the theory and practice of diesel mechanics while they are working full-time on standard gas engines. In this way it is possible to broaden employment potentials and build a good base for the increased income opportunities available to qualified diesel specialists.

Some correspondence schools offer by mail detailed courses in diesel engine repair and maintenance. These courses are often tailored so that they are of value not only to beginning mechanics with limited job experience, but also to experienced gas-engine mechanics who want to broaden their knowledge to include diesels.

Excellent resident-training courses are also available to beginners and experienced mechanics. These courses have the advantage of offering actual classroom instruction and practical training with valves,

cooling systems, starting systems, bearings, injection systems and other important diesel-engine parts.

Correspondence training lets students undertake their courses of instruction without interrupting their present jobs. Students can set their own "classroom" hours for minimum interruption with other demands on their time.

Although it is necessary for students to be present for classes in resident-training schools, evening courses are often offered, and many such schools help their students find part-time work to assist in defraying expenses. This lets students hold jobs at the same time they are learning new techniques.

Throughout the country there are opportunities for qualified diesel mechanics because diesel power is used in so many different industries. Among the important sources of employment are bus lines, trucking companies, shipping lines, railroads, electric power plants, logging camps, marine-engine repair shops and firms that service diesel farm tractors and construction equipment.

The earning power of a diesel mechanic depends on his experience, training and knowledge. Obviously, the more a man applies himself to increasing his knowledge of the theory and practice of diesel mechanics, the greater his opportunity to take over a well-paid supervisory position with a bus or truck line or in a repair shop.

Figures show that in 1958 most qualified and experienced diesel mechanics earned upwards of \$2.50 an hour and this wage has risen since that time. Although no national data are available on the incomes of diesel mechanics, it is reported that many earn over \$120 a week, and salaries offered in supervisory positions are considerably more substantial.

If you are now an auto mechanic and want to broaden your employment outlook with diesel training, you will want to check into correspondence and resident-training schools for the detailed instruction they make available.

If you are considering making diesel mechanics a career or are a beginning gas-engine mechanic, you will find educational courses in diesel mechanics can be your stepping stone to a higher-paying job in this expanding field.

For information on diesel mechanics and other career opportunities, write for Popular Mechanics career-guidance book, "SKILLS for AMERICA." Write to Popular Mechanics, Dept. SFA 80, 200 East Ontario St., Chicago 11, Illinois.

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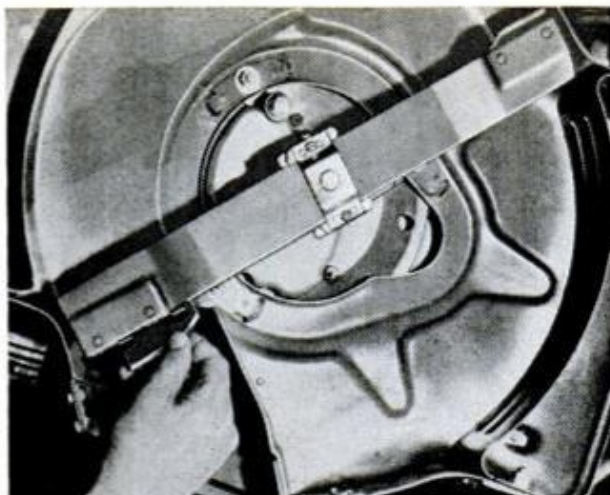


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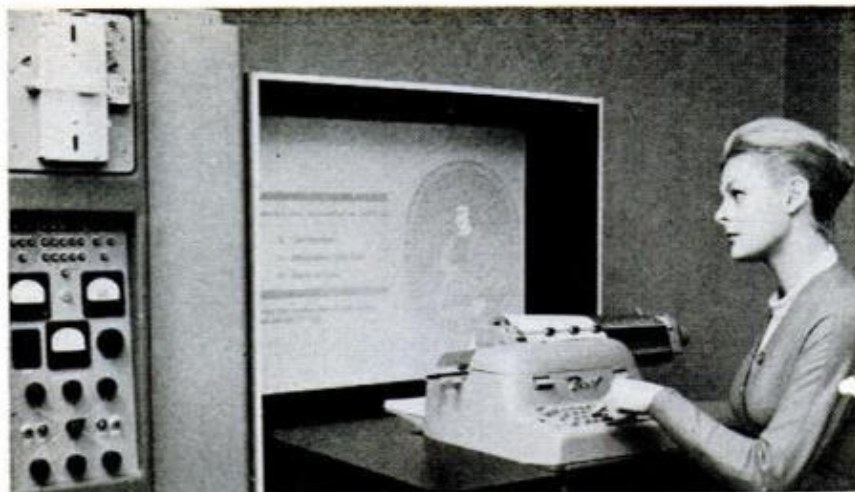


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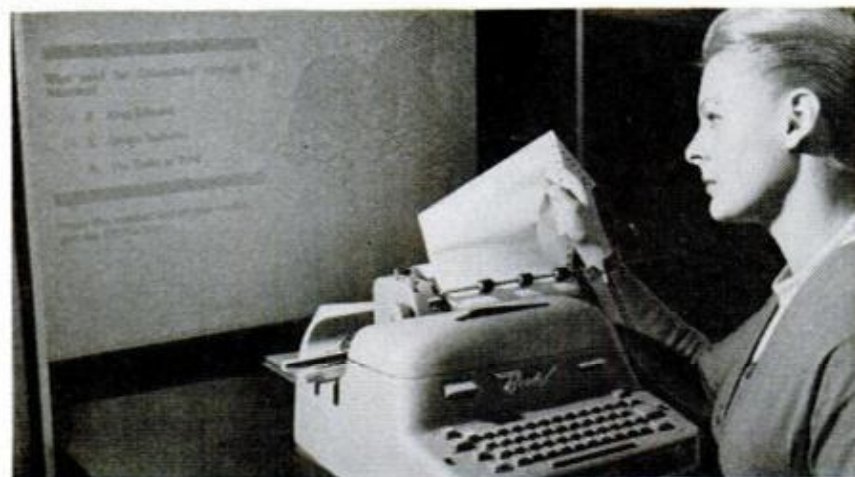
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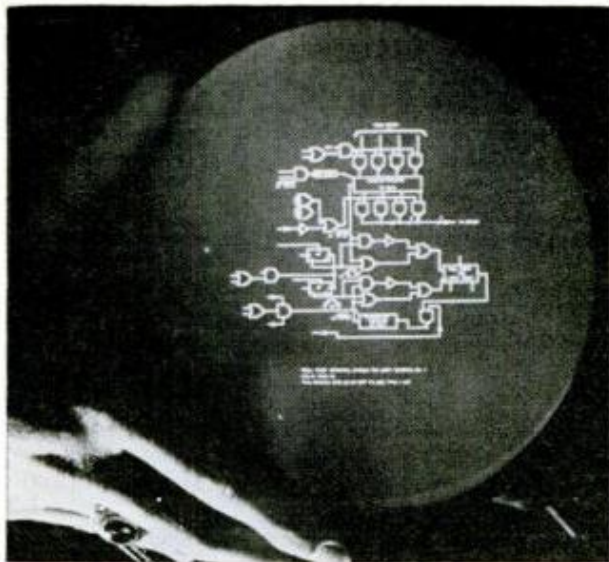


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CHRISTMAS Cards—the easy way to that extra income you need. Personal and business designs, with customer's name imprinted, all in one album. These deluxe cards pay deluxe commissions. Earn \$300 to \$500 (plus bonuses) easily this season, even in spare time. Sales experience unnecessary. Free sales kit includes our outstanding 40th Anniversary sample album and easy-to-follow selling instructions. Send for kit now; pocket profits next week! Write Process Corp., Dept. D-3, 3450 S. 54th Ave., Chicago 50, Ill.

IF You sell Christmas cards, make most extra cash with lines of all leading companies from one firm. World's biggest line. Over 150 Christmas, everyday box assortments, 600 big money-makers. Make up to 50% profit plus big cash bonus. Free giant color catalog of all lines; samples on approval. Arrow Greetings, 513 Fourth Ave., S. Dept. 83-E, Minneapolis, Minn.

AMAZING Christmas card profits! Make 75¢, not 50¢, on fast-selling \$1.25 assortment! \$75.00 on 100. Gift bonuses. 250 best sellers—assortments, candy, novelties. 52 personalized samples free; assortments on approval. Free gift offer. Creative, 4401 Cermak, Dept. 507-A, Chicago 23.

WANTED Part-time fire extinguisher salesman. Out-O-Matic, 1737C East 31st, Denver 5, Colorado.

BIG Money making opportunity. Exclusive line uniforms, jackets, pants, shirts, coveralls, sportswear. Advertising embroidered. Every business prospect. Get selling outfit free! Topps, Dept. 106-J, Rochester, Indiana.

\$480 MONTHLY Commission on 4 easy orders a day, selling nationally advertised line comfort shoes, warm jackets. 230 styles. No investment—postcard brings free outfit. Mason, Chippewa Falls K-377, Wis.

MAKE \$50 - \$75 - \$100 extra money. Run Greeting Card, Gift Shop at home, visit friends. Show thrilling Evans Christmas card assortments, gifts, exclusive 25 for \$1.50 personals. Experience unnecessary. Write for sample boxes on approval, free imprint albums, surprise gift offers. New England Art Publishers, North Abington 90, Mass.

SELL Greeting cards. Make extra money. Christmas, all occasion assortments, stationery, jewelry, gifts, name imprinted Christmas cards. Experience unnecessary. Write for salable samples on approval, details. Hedenkamp, 361 Broadway, Dept. PM-69, New York.

AUTOMATIC Bed warming sheet, you sleep on, not under. Outsells electric blankets 10 ways, costs less. Generous profits. Patented Products Corp., Dept. PM-91, Danville, Ohio.

WANT To make \$25.00 or more in a day for part or full time route work? Man or woman. Write McNess Co., Freeport 24W, Ill.

NEW Bathroom deodorizer. Hangs on wall. Banishes odors bathroom, kitchen. Lightning seller. Samples sent on trial. Kristee 84, Akron, Ohio.

BEAUTIFUL Feather pictures! Free details, sample 20¢ stamps. Apartado 9036, Mexico 1, D.F.

FREE Sample. Beautiful curios! Sell on sight! Apartado 9036, Mexico City.

START Your own business, selling the "World's Most Usable Bible." Sales quick, easy, and profitable. Extra bonuses; free insurance; other benefits. Write International Book Company, Department M, Box 118, Wichita 1, Kansas.

EARN Good weekly profits. Clip news items for plastic laminating. Details free. Plastiperm, Dept. 2, 156 Elm St., No. Cambridge 40, Mass.

FABULOUS Profits in transistor radios. Write Flor'enz, 439 Race St., Cincinnati 2, Ohio.

WORLDWIDE Opportunity. High continuous earnings. William Cole, Mahwah, New Jersey, U.S.A.

AMERICA'S Newest fragrance combination spillproof Flacon Cologne for purse plus 1/2 oz. bottle attractively packaged. Retail \$1. Nelson, 153 E. Tremont Ave., New York 53.

MAKE Terrific money during spare time! Take orders with colorfully illustrated catalog of toys, jewelry, all-occasion cards, collector's items and household gadgets. Work your own hours. No experience necessary. Excellent for direct selling or parties. For free money-making catalog, write: North Star, Dept. 1-722, 251 East Fifth Street, St. Paul 1, Minn.

NEW, Exclusive, toilet repair. Fifty million prospects. Repeat, top profit. F. C. Johnson Inc., 2827 Lawndale, Rockford, Illinois.

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

YOUR Own business—Used suits \$1.50; overcoats 65¢; mackinaws 35¢; shoes 12 1/2¢; ladies' coats 30¢; dresses 15¢. Enormous profits. Catalog free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago 8, Ill.

MAKE Up to \$50.00 a day soliciting delinquent accounts. Terrific commissions. Write today. National Credit, 304Y Pickwick Bldg., Kansas City 6, Mo.

FREE Offers of \$1.25 Christmas card assortment, \$5 in gifts introduce sensational, new spare-time money-makers. Over 300 fast-sellers at \$1 up. Many exclusives. Free personal album. Request samples on approval and free offers. Cardinal, 1400 State, Dept. 31-K, Cincinnati 14.

RUN A spare-time greeting card and gift shop at home. Show friends samples of our new 1961 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. 5, Ferndale, Mich.

BIG Profits. Stamp social security plates, key protectors. Sample 50¢. Catalog free. General Products, 11 No. Pearl St., Albany 7, N. Y.

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.

MAKE Profitable men's-women's wear. Sample free. Sunmade, Brockton 64, Mass.

OUR First man made \$250 weekly selling lumber, hardware, garage, filling station and tire dealers. Exclusive territory. Commissions on repeats. Hiram Barber Co., Crete, Nebraska.

BUY IT WHOLESALE

100 FREE Wholesale catalogs! Complete directory, \$1.00. (Refundable). Parmelee's Supply, Marshfield, Wisconsin.

JUST Out! 356-page catalog—save to 50% on auto parts, accessories. All makes, models. Send 25¢—refundable on first order. Whitney, 1919 PA-9, Archer, Chicago 16.

LARGEST Wholesale supply source in U.S.! Furniture, clothing, appliances, housewares, automobiles and accessories, tools, sporting goods, hobby supplies, farm equipment, imports, new products, bargain merchandise. Free details. Associated Wholesalers, Box 108-DD, Lincoln, Nebr.

FREE! Name brands catalog! Your own high profit business. Sell name brands, full or part time. No inventory, no investment. More than 2,000 name brand items; lowest wholesale prices. Watches, jewelry, cameras, hi-fi, stereo radios-phonos, appliances, housewares, hardware, power tools, luggage, musical instruments, garden equipment, sporting goods, toys, many others. 8 floors of name brands. Million dollar inventory. Orders shipped complete in 24 hours! Send for free, beautifully illustrated catalog now! Separate wholesale price list. H. B. Davis Corp., Dept. PM, 145 W. 15 St., New York 11, N. Y.

2,000 PAGES Wholesale catalogs! Write: Mosaser, Box 47-B, Newark, Ohio.

BUY Below wholesale! Thousands of nationally advertised products. Drugs, clothing, housewares, cameras, jewelry, hardware, sporting goods, etc. Postcard brings price list showing actual factory cost. Buy-Rite, 310 Main, Bennington 2, Vermont.

SAVE! Name brands at special discounts—free catalog. Unlimited Sales Co., Box 9250, Chicago 90, Illinois.

97 PAGE Wholesale import catalog. Order by dozen. Sell to neighbors. \$1.00, refunded first order. Ben-Jean Importers, 2631 Raymell, San Diego 11, California.

NEW Deluxe multicolor below wholesale catalog, automobile catalog, and others. Housewares, appliances, refrigerators, freezers, washers, dryers, television, radios, furniture, clothing, luggage, binoculars, phonographs, recorders, cameras, projectors, tools, typewriters, watches, jewelry. Name brands. Huge discounts to 70%. Postcard: Selbyco, Decatur 15, Ill.

WORLD'S Largest wholesale supply. Buy from 679 American, European, Japanese wholesalers. Tailormade suits from Hongkong. 123 dropship catalogs. Rockbottom prices. Free details. International Buyers, 216-M Jackson, Chicago 6, Illinois.

WHOLESALE: 850,000 Items. Supply source directory 25¢. Idealer, Park Ridge, Illinois.

USED And new watches \$2 up. Free list. Southern Watches, 5-PM So. Wabash, Chicago 3.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin PMW, Covina, Calif.

BIG Discount family catalog! \$1.00, refundable: Feathers, 1790 Third Street, Atwater, California.

100,000 PRODUCTS Wholesale! Terrific bargains available! United Wholesalers, 1265-M Broadway, New York 1, N. Y.

NAME Brands from Benrus through Webcor. Wholesale catalog \$1.00 refundable. Zietz Enterprise, White Temple Rd., Vandavia, Mich.

WHOLESALE Catalogue! Housewares, appliances, watches, tools, \$1.00, refundable. Andrews Distributors, Box 631, Graham, N. C.

USED And new watches \$2 up. Free catalogue. Southern Watches, 5-PM So. Wabash, Chicago 3.

SOURCE List. Over 200 manufacturers and wholesalers \$2.00. Buyers Source, Dept. 3PW, 3702 Aurora, Indianapolis 27, Indiana.

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GET New shirt outfit free! Make \$90 weekly on 5 average orders a day. Famous quality made-to-measure dress and sport shirts, \$4.50 up, sell fast to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 425, Terre Haute, Ind.

SENSATIONAL New zipout shrimp tool—the hottest item in years. Sells on sight, big volume, terrific profits through super markets and houseware stores. Fully patented, a must for every home and restaurant. Write today. Send \$1.00 for demonstration sample. Zipout, Inc., Dept. PM, 4905 North Second, Rockford, Illinois.

STEP Up to effortless merchandising! Selling is old-fashioned! Revealing booklet shows how you can parlay modest sum into profitable lifetime business without pounding pavements. Rush name for free book. Indiana Laboratories, 315 W. Franklin, Dept. J-68, Elkhart, Ind.

AMAZING Opportunity. New low priced fire alarm protects homes, farms, offices, factories, etc. No wiring—hangs like picture. Pays up to \$1,100 a month. Free kit. Merlite (Alarm Div.), 114 E. 32nd St., Dept. F-66J, New York 16, N. Y.

SELL Bowling shirts with players' names, team emblems colorfully embroidered. For men, women. Entire teams, leagues buy at low prices. Make \$500 monthly extra. Sales kit free. Topps, Dept. B106-J, Rochester, Indiana.

WILL You wear new suits, sports coats without one penny cost and agree to show them to friends? You can make up to \$40.00 in a day even in spare time, without canvassing. J. C. Field & Son, Inc., Dept. C-1826, Harrison & Throop Sts., Chicago 7, Ill.

ANYONE Can sell famous Hoover uniforms for beauty shops, waitresses, nurses, doctors, others. Miracle fabrics—nylon, dacron, wash 'n wear cottons. Exclusive styles, top quality. Big income, real future. Equipment free. Hoover, Dept. L-100, New York 11, N. Y.

CALENDARS, Novelties. Full or part time. Liberal commissions. Fleming, 6535-A Cottage Grove, Chicago 37.

MAKE Big money taking orders for Stark dwarf fruit trees. Everybody can now grow giant size apples, peaches, pears in their yards. Also shade trees, shrubs, vines, roses, etc. Outfit free. Stark Bros., Desk 30192, Louisiana, Mo.

MAKE Extra money—Big cash commissions plus premium for you and your customers. Sell advertising book matches. Sensational new tenor glamour girls, hillbillies; dozens others. All sizes. Quick daily sales; big repeat business. Free master kit makes selling easy. No experience necessary. Superior Match, Dept. M-961, 7530 Greenwood, Chicago 19.

SHINE Shoes without polish. New invention. Lightning seller. Shoes gleam like mirror. Samples sent on trial. Kristee 48, Akron, Ohio.

MAKE Extra money selling advertising matchbooks. Free catalog and sales outfit. Matchcorp, Dept. PM-91, Chicago 32.

EARN Big commission full or part time. Build profitable business of your own selling America's largest line low priced business printing. 360 page catalog samples hundreds of items used daily by business people. Imprinted ball pens low as \$8.95 for 100. Big full color catalog low priced advertising specialties included. Free sales kit. National Press, Dept. 8, North Chicago, Illinois.

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\$1,000.00 A Month for making dramatic 3-second demonstration of amazing lightweight Presto fire extinguisher. New chemical used by airforce snuffs out fires instantly. Only \$4.95. Terrific commissions. Millions want it. Free kit. Merlite, 114 E. 32nd, Dept. P-66J, New York 16.

MAKE Big money selling industrial brush line to gas stations, stores, factories. 6 orders daily pay you \$100 weekly. Protected territory, full commissions on repeat orders. No experience needed. Sample offer. Sales guaranteed. Write Harper Brush, 3109 State, Fairfield, Iowa.

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MOST Restaurants buy our action sign. Swiveletter Co., Hammond, Indiana.

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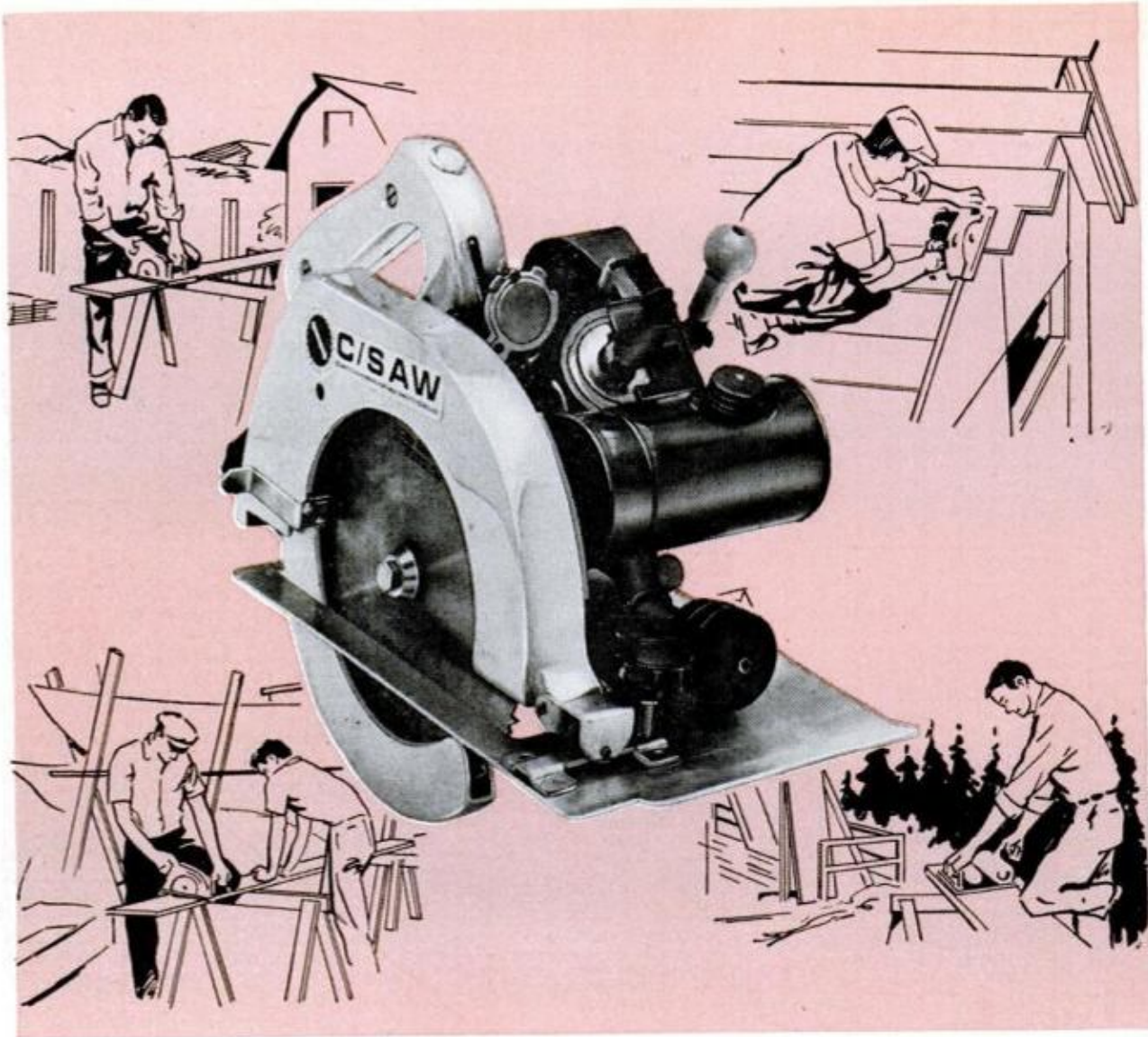
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COMES TO YOU NOW a portable saw that runs without the power cord dragging along the length of the stock, entangled in your legs or draped over your shoulder and always catching on something behind you. This unit is just about the size and heft of the electric portable saw you've been used to, but it's driven by a tiny, $\frac{3}{4}$ -hp. gasoline-powered engine that gives the same spitfire performance as a model airplane engine, only it's much, much more powerful.

What can you do with it? According to the manufacturers, Comet Manufacturing Div., of the Siegler Corp., P. O. Box 2098-D, Pasadena, Calif., it will handle any job that can be done with the old standbys, the portable electric saws. To a builder this means no waiting for a power line to be brought in to the building site. He takes his C/saw out of the case, pulls the starting cord and in seconds he's cutting lumber to dimensions. He can make 90-degree cuts to $2\frac{5}{8}$ in.; 45-degree cuts to $1\frac{7}{8}$ -in. depth with the

8-in. blade which is regular equipment.

To a farmer C/Saw is portable power sawing anywhere on the farm, miles from a high line, if the job to be done is that far from electricity. No need to bring the job to the saw; he takes the saw to the job, no matter where. C/Saw takes only a pint of fuel per hour.

C/Saw means much the same thing to a boat builder. He has no need to select the building site with a power source always in mind. Building boards, frames, planking and decking can be cut to size anywhere.

And then there's the fellow set on building his own cabin on some remote lake. With C/Saw in his pack he can be cutting joists, studs and rafters in minutes after the lumber is delivered to his clearing. C/Saw weighs only 11 lb.

What's the price of C/Saw? It sells for \$119.95 and for that money it's a lot of machinery in a very small package — no electric cord included, of course.

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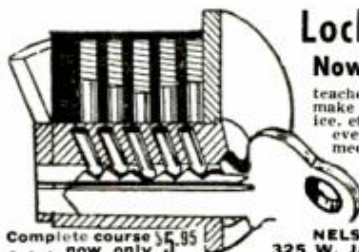


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Ferris Wheel—for Eggs

Poultry farmers have modernized everything but the hen in recent years, and this one, Clayton Hirniesen of Denver, Pa., has put his egg-gathering baskets in a six-basket ferris-wheel frame to speed egg pickups in his laying shed. Built of scrap metal and mounted on three industrial casters, the cart can be pushed with a waist-high yoke to leave his hands free. It rotates to keep an empty basket at hand.

Self-Cleaning Rake

Self-cleaning tines on this garden rake eliminate the need for periodic removal of debris by hand. The operator simply presses down and forward. This action "folds" and cleans the tines. Jerco Machine & Steel Co., 2020 N. Washington Ave., Minneapolis, Minn., it costs \$3.65.



No Discords Here

With an aluminum strip, plywood, a plastic cylinder and a broom handle, William Strong of New South Wales, Australia, devised the Strongo, an instrument for folks who have lost the use of their fingers. The strings are plucked with a special plectrum while a metal bar is drawn over the instrument's neck. Strong says it sounds like a guitar and that it is almost impossible to produce a discord on it.

Bicycle Power Attachment

With a 2½-horsepower do-it-yourself attachment, any bicycle can be motorized. The unit has one moving part—its clutch-pulley combination. Its friction drive eliminates the need for chains and sprockets. Manufactured by Go-Byk Industries of Rothsay, Minn., it costs \$69.95.



Thousand-Mile Road Test on America's First V6 Engine



How did it hold up? What kind of performance did it deliver? What was the fuel mileage? Read this exclusive report in the October
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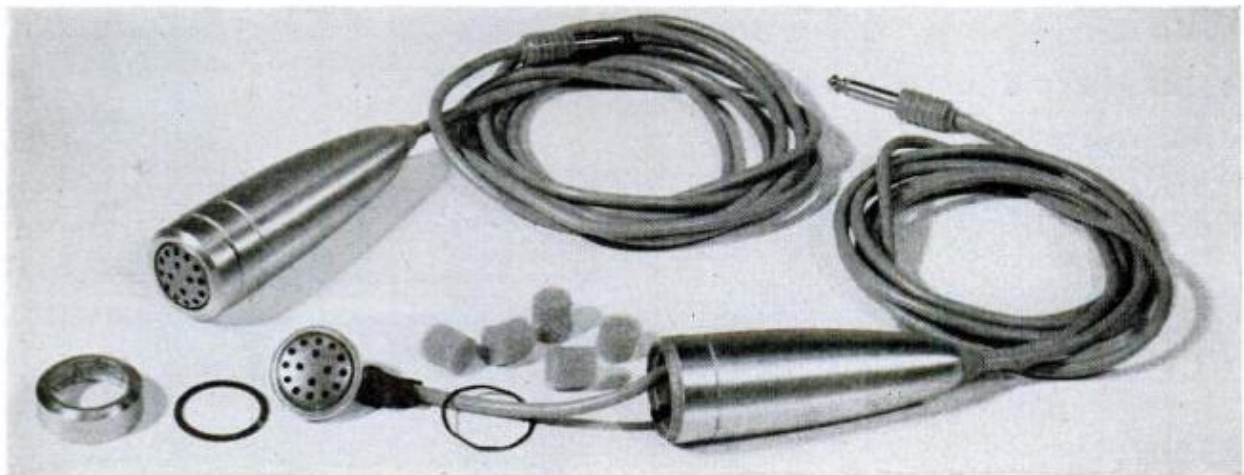


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Italian-Styled TR-3 Rated at 118 M.P.H.

Combining a rugged TR-3 chassis and engine with plush body work by Italy's Michelotti, the Italia 2000 is designed for dependability plus smooth, good looks. The TR-3A mill puts out a maximum of 100 horsepower at 5000 r.p.m. and makers claim it has a top speed of 118 miles per hour. Among optional items are overdrive, leather upholstery, wire wheels and whitewalls

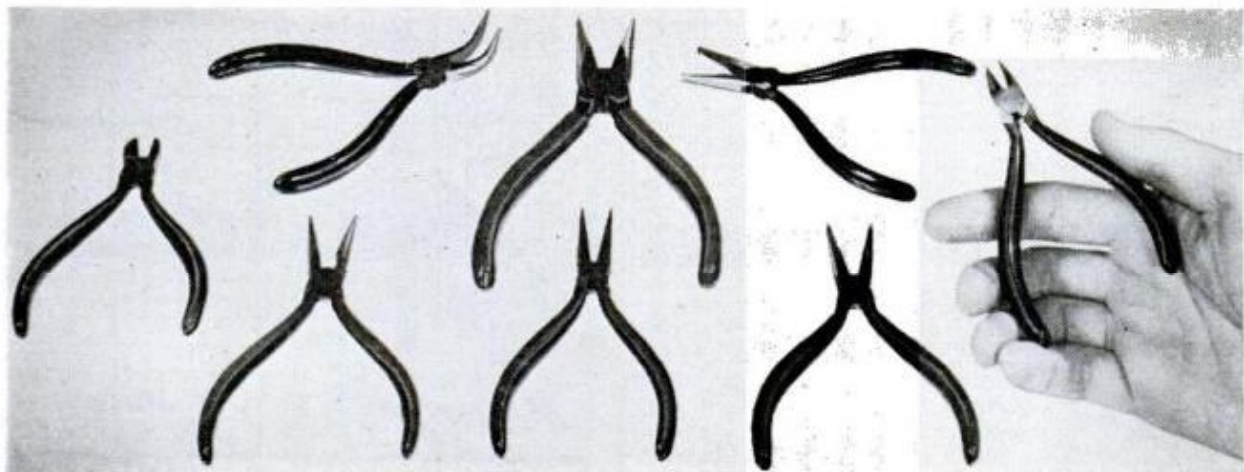


New Mike for Electronic Customizers

New microphone in kit form permits the builder to choose his own variables in frequency response. To increase bass response, eliminate the polyfoam bits and drill a small hole in the case. Small screw in hole will restore high response. \$7.50, CBS Electronics, Danvers, Mass.

Spring-Loaded Tools Have Safety Grips

Tools in a wide assortment of types feature plastic hand grips which not only provide added safety factor, but make working easier on the hands. Most types feature small spring between grips under the joint, to permit ease of opening. Diamond Tool Co., Duluth, Minn.



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Morgantown
 Stockton Co., Inc.
 Building Supplies

Richmond
 Richmond Lumber
 Co., Inc.
 Northwest Second & E St.

St. John
 Standard Lumber Co. of
 St. John, Inc.
 Route 41

Salem
 Curtis Miller
 West Market St.
 at Bridge

Seymour
 Central Lumber & Supply
 Co., Inc.
 Eighth & Pershing St.

Valparaiso
 Smith-Nuppau
 Company
 360 Indiana Ave.

Whiteland
 Home Fair, Inc.

IOWA

Algona
 Kelley Lumber Co.
 821 North Main

Davenport
 White Lumber Store
 909 East River Drive

Hawarden
 Schoeneman Bros. Co.
 901 Ave. E

KANSAS

Arkansas City
 Woods Lumber Co.

Bern
 Bern Lumber Co.

Kansas City
 Logan Moore Lumber Co.
 47th & Mission Rd.
 Midwest Floors
 4660 Parallel Lane
 Roddis Lumber &
 Veneer Co.
 1016 Southwest Blvd.

La Harpe
 Diebolt Lumber
 and Supply

Newton
 Houston-Doughty
 Lumber Co.
 200 East Sixth

Waterville
 Waterville Lumber &
 Coal Co.

Wichita
 Houston Doughty Lumber
 Co. Big Six Yard
 6601 East Kellogg
 Rock Island
 Lumber Company
 302 South Emporia Ave.

KENTUCKY

Louisville
 Roy B. Thompson
 Lumber Co.
 3200 Preston
 T. W. Yunt Lumber Co.
 2915 Preston

LOUISIANA

New Orleans
 Simon Streiffer Co.
 Home Supply Center
 2026 Metairie Road

MASSACHUSETTS

Chicopee
 J. G. Roy Lumber Co.
 861 Meadow St.

Fall River
 Schwartz Lumber
 664 Broadway

MICHIGAN

Auburn Heights
 Grace Harbor Lumber Co.
 70 South Squirrel Road

Charlevoix
 Kit Carson Lumber Co.

Detroit
 Eastern Cabinet Works
 6615 E. Jefferson

Escanaba
 Stegaths
 1812-20 Ludington St.

Galesburg
 Taylor Lumber Co., Inc.
 89 East Battle Creek St.

Gladstone
 Sterling Building
 Supplies
 1122 Delta Ave.

Iron River
 Proksch Lumber Co.
 132 Third St.

L'Anse
 Lake View Lumber &
 Hardware Co.

Owosso
 Sturtevant & Blood
 Lumber Co.
 301 South
 Washington St.

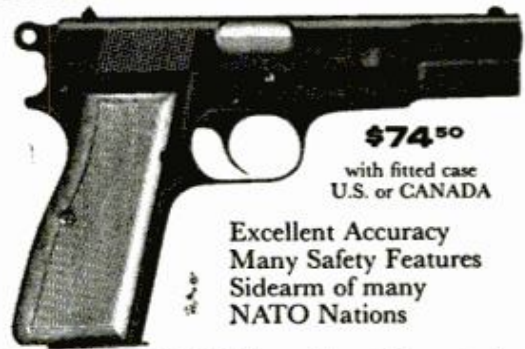
Wyandotte
 Williamson Lumber Co.
 657 Vinewood

MINNESOTA

Maple Plain
 Lundsten Lumber Co.

Montrose
 Lundsten Lumber Co.
 (Continued to page 84)

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\$74.50
 with fitted case
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Excellent Accuracy
 Many Safety Features
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 NATO Nations

GREATER FIRE POWER — 14 cartridge capacity against 6 in center-fire revolvers and the usual 7 to 9 in other semi-automatics. Rugged, dependable, compact and richly hand-polished and finished. So safely designed the severest blow on the hammer cannot cause accidental discharge. Weight — 2 lbs., over-all length — 7¾", ammunition — 9mm Parabellum or Luger.

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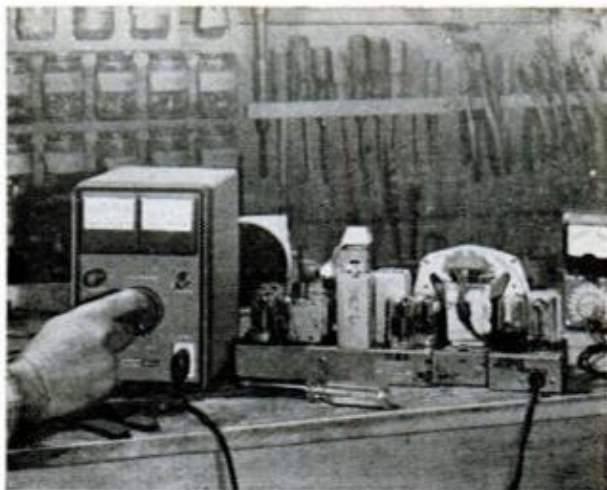
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This compact piece of test equipment provides continuously variable a.c. at the test bench. Two meters provide monitoring of current to three amperes, voltage from zero to 140 volts. Both sides of line are fused for added safety. Balky radios frequently respond to cure-or-kill treatment. Plug radio into variable supply, run primary voltage up to 140. Leaky or marginal components will burn open, are then easy to identify. EICO, Long Island City, N. Y.

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PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. The big 4-lb. can is obtainable from your lumber, paint or hardware dealer at \$1.40; or will be shipped direct postpaid (in U. S.) for \$1.75. Complete satisfaction guaranteed or your money refunded.

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Jackson Trenton Lumber Co. 321 East Pearl St.
Yazoo City Gilbert Lumber & Supply Co. North Main and Canal Sts.
- MISSOURI**
Burlington Junction B. J. Lumber Co.
Kansas City Marzoff Hardwood Floors, Inc. 1617 West 39th
St. Genevieve Ste. Genevieve Lumber & Realty Co.
St. Louis Sloan-Seidel 2239 South Vandeventer
Slater Sailor Lumber Co. 164 West Front St.
- MONTANA**
Lewistown Montana Lumber & Hardware Co. 403 First Ave. South
Missoula Wright Lumber Co.
- NEBRASKA**
Brady Farmers Lumber & Coal Co.
Elwood Elwood Lumber Co.
Grand Island Johnson Cashway Lumber Co. 716 South Elm
Lincoln Johnson Cashway Lumber Co. 1820 R St.
Pauley Lumber Co. 945 South 27th St.
Millard Millard Lumber & Grain Co. 305 South Fifth
North Platte Field-Birge Co. 101 West Front St.
Oakland Holmquist Grain & Lumber Company
Ogallala S. E. Martin Lumber Co. East Highway 30
Plainview Great Plains Supply Co.
- NEW JERSEY**
Belford Bay City Lumber Co. 230 Main St.
Denville Metalcraft Center Route 46
Fanwood Fanwood Lumber & Supply Co. 246 South Ave.
Flemington L. Tereshko Lumber Co., Inc.
Lake Hopatcong Jefferson Lumber
Madison Unkel Plywood & Lumber Co., Inc. 313 Main St.
Neptune Channel Lumber Co. Standard Supply Co., Inc. Rt. 33 at Garden State Parkway
Neshanic Station J. S. Amerman & Co.
Newark Channel Lumber Co.
Parlin Channel Lumber Co.
Secaucus U. S. Timber Lumbermart 143 County Ave.
Springfield Channel Lumber Co.
Wayne Circle Building
- NEW MEXICO**
Albuquerque Seymour Lumber Co. 3101 Fourth St., N.W.
- Artesia City Builders Supply, Inc. 1801 West Main
Hobbs Hobbs Lumber & Supply Co., Inc. 706 West Marland
Moriarity Moriarity Trading Co.
- NEW YORK**
Baldwinsville Tappan Lumber Corp. East Genesee St.
Batavia Genesee Lumber & Coal Co. 76 Franklin St.
Brooklyn Fox Lumber Co. Windsor Lumber Co.
Buffalo Frontier Lumber Co. 1941 Elmwood Ave. Frontier Lumber Co. 1670 Genesee St.
Coldwater Coldwater Lumber Co. 149 Cherry Road at NYC
Depew 6161 Transit Road
Fairport Dudley Lumber Co., Inc. 23 South Main St.
Flushing Sugar Lumber Co.
Hamburg Draudt Bros. Lumber-teria, Inc.
Haverstraw Allison & VerValen Co., Inc. 9 W & Westside Ave.
Jamaica Sutphin Builders
Leroy Joseph Lapp Lumber Co. 43 Mill St.
Long Island Macrose Lumber Co.
Mottydale Sposata Linoleum Co. Brewerston Road
North Syracuse Beauty Craft Floors, Inc. 456 South Main St.
North Tanawanda Esco Lumber Co. Main & Thompson Sts.
Rochester Atlantic Millwork, Inc. 2715 West Henrietta Road
Genesee Reserve Supply Co.
Giordano Lumber Co., Inc. 200 Clifford Ave.
Fred R. Large Lumber Co. 36 Harrison St.
Mathews & Fields Lumber Co. 120 Stonewood Ave.
Spencerport Spencerport Lumber Co. 36 Slayton Ave.
Syracuse E. W. Edwards Co. South Salina St. Minfelt Wholesale Co. 1850 Lemoyne Ave.
Watertown Minfelt Wholesale, Inc. 434 Eastern Blvd.
Webster Webster Lumber Co. 799 Holt Road
Williamson Williamson Lumber Co. 9 Railroad Ave.
- NORTH CAROLINA**
Canton Powell Lumber Co. 30 Clyde St.
Carrboro Fitch Lumber Co., Inc. Chapel Hill
Fitch Lumber Co., Inc.
Charlotte Cathey Lumber Co. 4115 Monroe Road
Dunn Nu-Home Wholesale Builders Supply 1212 North Ellis Ave.
Gastonia Seth Lumber Co.
Greensboro New Home Building Supply Co. 625 South Mendenhall St.
(Continued to page 86)



Hand-Powered Dry Shaver

Taking its power from a spring-loaded key which is depressed with the thumb, a dry shaver from West Germany features gyroscope drive. Power is transmitted through a lever and clutch to accelerate a flywheel. The shaver operates at a speed of 10,000 revolutions per minute and will run for one minute after the key is depressed a few times. It is available for \$14.95 from Hertvy Co., Box 57, Rego Park 74, N. Y.

Magnetic Wave Guides in Space May Aid Radio Communication

It may be possible to beam high-frequency radio waves from Northern to Southern Hemispheres through naturally existing magnetic channels that carry the radio waves at almost full strength. Prof. Henry Booker, director of the school of electrical engineering at Cornell University, Ithaca, N. Y., has been investigating the possibility of such a system under a grant from the National Science Foundation. He concludes that it is feasible. Basis for such a system lies in the fact that earth's magnetic field controls the motions of the outer atmosphere so as to filament the plasma into millions of magneto-ionic ducts. These wave guides extend from the ionosphere in the Northern Hemisphere to the ionosphere of the Southern Hemisphere via the part of space known as the magnetosphere. The ducts may well be more than 10,000 miles in length, says Professor Booker, who suggests these channels will permit scientific investigations of outer space with a detail hitherto unavailable to scientists.

SEPTEMBER 1961



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842 ELM PLACE, RICHMOND, IND.

85



Foldaway Automobile Desk

Salesmen can fill out call reports immediately after making each call, using a traveling desk which folds out of the way when not in use.

The pressed-wood unit includes a clip to hold papers in place and pockets in the vinyl back to carry cigarettes, sunglasses, maps and other small items.

The accessory is made by the Car-Jot Co., Box 144, Deerfield, Ill., and sells for \$6.95.

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- Lincolnton**
Cronland Warp Roll Co., Inc.
Building Material Department
Seth Lumber Co., Inc.
- Mt. Holly**
Seth Builders Supply Co., Inc.
- Rose Hill**
Herring Supply Co.
304 South Sycamore St.
- Thomasville**
Reed Supply Co.
100 National Highway
- OHIO**
- Akron**
Brown-Graves Lumber Co.
191 East Miller Ave.
- Canton**
The DeVille Lumber Co.
1225 Gross Ave., N. E.
- Cleveland**
Rock Island Lumber Co.
14550 Lorain Ave.
Weiler-Wilhelm Lumber Co.
1087 West 11th St.
- Coshocton**
Muskingum Valley Lumber Co.
1247 East Main St.
- Maumee**
Maumee Lumber & Supply Co.
707-717 Conant St.
- North Olmsted**
North Olmsted Lumber Co.
27375 Lorraine Road
- Warren**
McAllister & Morgan, Inc.
5400 Oakhill Drive, N.W.
- OKLAHOMA**
- Anadarko**
Antrim Lumber Co.
207 East Main
- Boise City**
The Star Lumber Co.
South Cimarron Ave.
- Chickasha**
Stone Lumber Co.
320 South Third St.
- Oklahoma City**
Caston Lumber Co.
4416 North Western
Temple-Johnson Floor Co.
1211 North Pennsylvania
- Ponca City**
Rock Island Lumber Co.
208 South First Street
- Stillwater**
Grimsley Flooring Co.
200 North Main
Roy T. Hoke Lumber Co.
218 West Ninth St.
Kermit W. Ingham Lumber Co.
7 West Eighth
- Tulsa**
Dale Carter's Building Center
4459 South Sheridan Road
Hanna Lumber Co.
Plywood Tulsa, Inc.
4205 Southwest Blvd.
- Watonga**
Davidson & Case Lumber Co.
- OREGON**
- Albany**
Brad's Floor Covering
Edwards Albany Planing Mill
- Astoria**
Brookfield Co.
- Baker**
Builders Supply Co.
- Gresham**
Gresham Linoleum Co.
- Medford**
Big Pines Lumber Co.
32 West Sixth
- Milwaukie**
Casey's Linoleum
- Portland**
Acme Hardwood Floors
1708 S.E. 122nd Ave.
J.W. Copeland Yards
Don Town, U.S.A.
8950 S.E. McLoughlin Blvd.
House of Linoleum
3739 S.E. Hawthorne
- Linoleum Looe**
2815 S.W. Barbur Blvd.
Mt. Hood Supply Co.
8300 S.E. Division
Spear Floor Covering
1201 S.W. Jefferson
Stewart Griffith Co.
Strom Floors
10320 N.E. Halsey
Sunset Floors
6913 S.E. Foster
Westside Floor Covering
2432 N.E. 26th Ave.
- Prineville**
Healy's Prineville Furniture Co.
- Rhododendrum**
Mt. Hood Linoleum
- The Dalles**
The Dalles Linoleum Co.
- PENNSYLVANIA**
- Bellafonte**
M. L. Claster & Son, Inc.
- Blairsville**
Andre Lumber & Supply Co.
164 Davis Way
- Cochran**
Crum Brothers Lumber Co.
152 South Franklin St.
- Greensburg**
Cook Lumber Co.
249 West Otterman St.
- Saint Clair**
Integrity Building Supply, Inc.
59 North Second St.
- St. Marys**
Elk Building Materials, Inc.
Trout Run Road
- Sharon**
Johnson-Sizer Co.
369 South Dock St.
- Union City**
Mullens' Coal & Supply
5 Market St.
- SOUTH CAROLINA**
- Gaffney**
Gaffney Lumber Co.
North Johnson St.
- Lake City**
F. H. Sullivan & Co.
- SOUTH DAKOTA**
- Sioux Falls**
Schoenemans Home Improvement Center
305 East Eighth St.
- TENNESSEE**
- Memphis**
Hill Flooring Co.
110 Neil St.
- TEXAS**
- Amarillo**
Lumber & Supply Co.
2601 East Third
Witt Builders Supply
2306 West Seventh
- Borger**
Knight Lumber Co.
306 North Weatherly
- Bridge City**
Fields Lumber Company
355 West Round Bunch Road
- Clarksville**
Allen Lumber Co.
Temple Lumber Co.
201 South Walnut
- Dallas**
Don Cameron Lumber Co., Inc.
711 South Ewing
Trinity Floor Co.
127 Oregon
- El Paso**
Peterson Lumber Company
1630 Texas Ave.
- Freeport**
Haynes Lumber Company
304 North Gulf Blvd.
Simmons Building Supply Co.
Fourth Street at Park Ave.
- Houston**
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6801 Telephone Road
Maynor Lumber Co.
6316 Mykawa Road
Roddis Lumber & Veneer Co.
2403 Sabine St.

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Mercedes
Farris Lumber & Supply Co.
202 Second Street

Orange
Temple Lumber Co.
1111 Park Ave.
West End Lumber Co.
Mac Arthur Drive

Port Arthur
Wyde Lumber Corp.
1205 Ft. Worth Ave.
Wyde Lumber Corp.
3333 25th St.

Richmond
Wessendorff Lumber Co.
109 North 8th St.

San Antonio
Billbrey Lumber Co.
2030 Pleasanton Rd.
Roddis Lumber & Veneer Co.
727 North Cherry St.

San Marcos
Tuttle Lumber Co.

Texarkana
Alamo Supply & Lumber Co.
727 West Third Street

UTAH

Orem
Central Builders Supply Inc.
673 North State

VIRGINIA

Ashland
Ashland Lumber Co., Inc.
Ashcake Road

Virginia Beach
Bill Macdonald's Virginia Beach Lumber and Supply Co.
Birdneck Road

WASHINGTON

Kennewick
Diamond National
P. O. Box 457

Newport
Diamond National

Spokane
Diamond National

Vancouver
Art Pugsley Floor Covering

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Wright-Bachman Lumber Co.
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WISCONSIN

Athens
Braun Brothers & Co.

Beaver Dam
Luken Lumber Company
Roedl-Jacobs Lumber Co.
114 East Third Street

Boulder Junction
Ashtons

Eden
Community Lumber & Supply, Inc.

Gillett
Gillett Building Supply Co.

Green Bay
Green Bay Planing Mill
Willow and Elizabeth

Hudson
Consolidated Lumber Co.
701 Second Street

Kenosha
Andrews Lumber Co., Inc.
4800 75th Street

Madison
Findorff Lumber & Supply
601 West Wilson Street

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Menzner Lumber & Supply Co.

Niagara
J. H. Zawada Supply & Lumber Co.
1009 Main Street

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Berns Brothers Lumber Co.

South Milwaukee
Bliffert Lumber & Fuel Co.
6826 South 13th Street

Sturgeon Bay
Berns Brothers Lumber Co.

Wabeno
Twin City Lumber & Fuel Co.

Wales
Allen Lumber & Fuel
124 South Main

Wausau
City Lumber & Supply Co.
710 South Tenth Ave.
Mortenson & Stone Lumber Co.
First Avenue North at Bridge Street

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Wilbur Lumber Co.
7919 West National Ave.

West De Pere
Rupiper Lumber Co.
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Wisconsin Rapids
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Casper
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Rawlins
H. Larsen Inc.
218 West Cedar

Sheridan
Vickere Lumber Company
135 North Gould

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Valley Lumber Yards Limited

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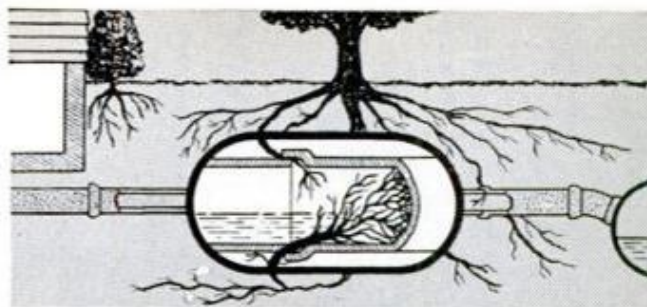
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311 — 2nd Street

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Santa Clara
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750 Walsh Avenue
(Continued to page 88)



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Roots are just naturally thirsty. They force their way through joints in your sewer line, eventually clog it. Toilets and sinks "back up", soon overflow. Now you can avoid costly digging or mechanical cleaning this easy, permanent way.



Pour one box of revolutionary Hercules R-D into toilet bowl. R-D kills and decomposes roots permanently, often overnight. To keep sewer lines root free, apply R-D twice a year. Safe to handle. Safe in septic tanks. Don't wait for trouble. Get R-D now from your plumbing or hardware dealer. It works, or your money back. Only \$3.95 for 2 lb. box. Send for literature.

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Get new home "handy-pack" at leading hardware stores or write Friesland Plastics Co., Friesland, Wisconsin.



Only
39¢
full 32"
(When writing add 6¢ for handling.)

F-12



CUT HEAT BILLS UP TO 37%

If your attic insulation is less than 4" thick, up to 37% of your fuel dollars are being wasted every year. The easiest, most inexpensive way to bring your attic insulation up to the 4" level is with Zonolite Attic Insulation.



Pour Zonolite right over your present insulation. It's fire-proof. Verminproof. Permanent. Won't rot or pack. At your lumber and building supply dealer.

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- COLORADO**
Denver
Barter Machinery & Supply Co.
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- FLORIDA**
Jacksonville
Carolina Lumber Co.
575 Phelps St.
- Tampa**
Eagle Roofing & Art Metals Works
Florida Steel Buildings
- GEORGIA**
Atlanta
Carolina Lumber & Supply Co.
2135 Plaster Bridge Road
- ILLINOIS**
Elgin
George W. Hitzeman & Son
42 Kimball Street
- Peoria**
Lumber Yard Supply Co., Inc.
105 Hancock St.
- Springfield**
Springfield Builders Supply Corp.
1900 E. Mason St.
- INDIANA**
Evansville
Lensing Wholesale, Inc.
600 North Sixth Ave.
- IOWA**
Early
Iowa Lumber & Supply Company
- Dubuque**
Service Wholesale Company
540 East 9th Street
- Waterloo**
The Wood Products Company
127 Utica Street
- West Des Moines**
Wheeler Lumber Bridge & Supply Company
110 Hoak Drive
- KENTUCKY**
Russellville
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Metal Distributors of
Alexandria, Inc.
Calvert Avenue
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Metal Distributors of
Norfolk, Inc.
2602 Hampton Boulevard

Richmond

Southern States Co-Oper-
ative
627 E. Main Street

WASHINGTON

Seattle
Berkheimer's, Inc.
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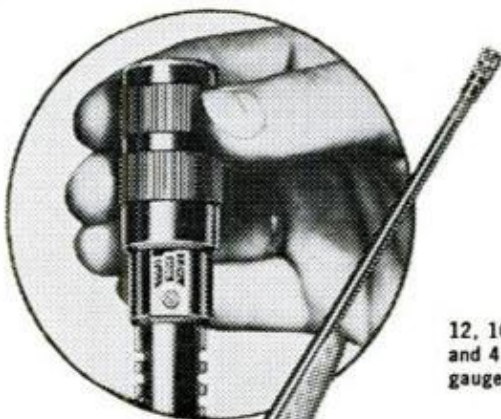
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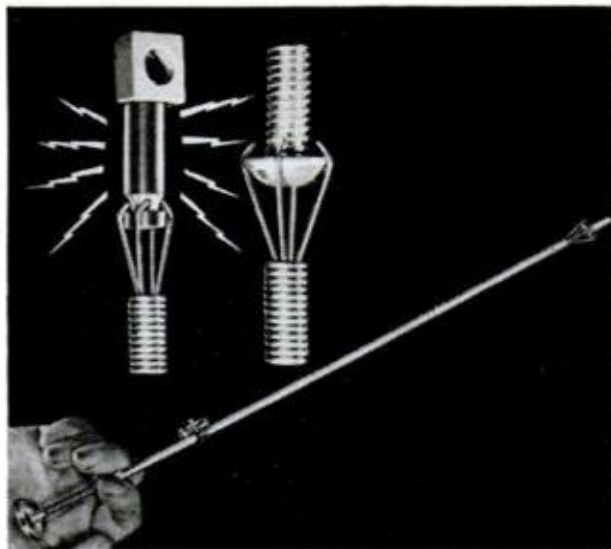
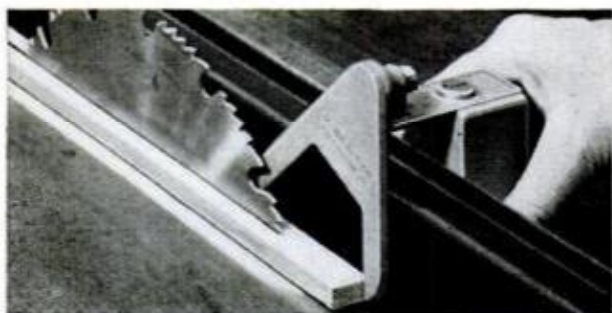
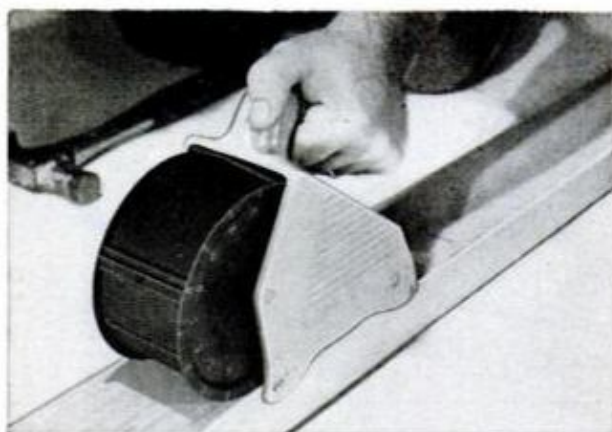
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SHOPPING FOR TOOLS



PAD SANDER, above left, with housing and plate of plastic, sands with the grain in a straight-line action. The reciprocating motor operates at 14,400 short strokes per minute. A removable knob adapts sander for right or left-hand operation and gives free access to corners. The rubber bearings reduce lubrication problems. It's priced at \$19.95 by the Weller Electric Corp., 601 Stone's Crossing, Easton, Pa.

RETRIEVER, above, is used to pick up articles such as small tools, screws and nails dropped in hard-to-get-at places. A retracting plunger closes four steel claws around object to be retrieved. A permanent magnet is included with kit. It may be seized in mechanical fingers and used to pick up metal objects. Retail at \$2.95. Available from Borroughs Tool & Equipment Corp., 2429 Burdick St., Kalamazoo, Mich.

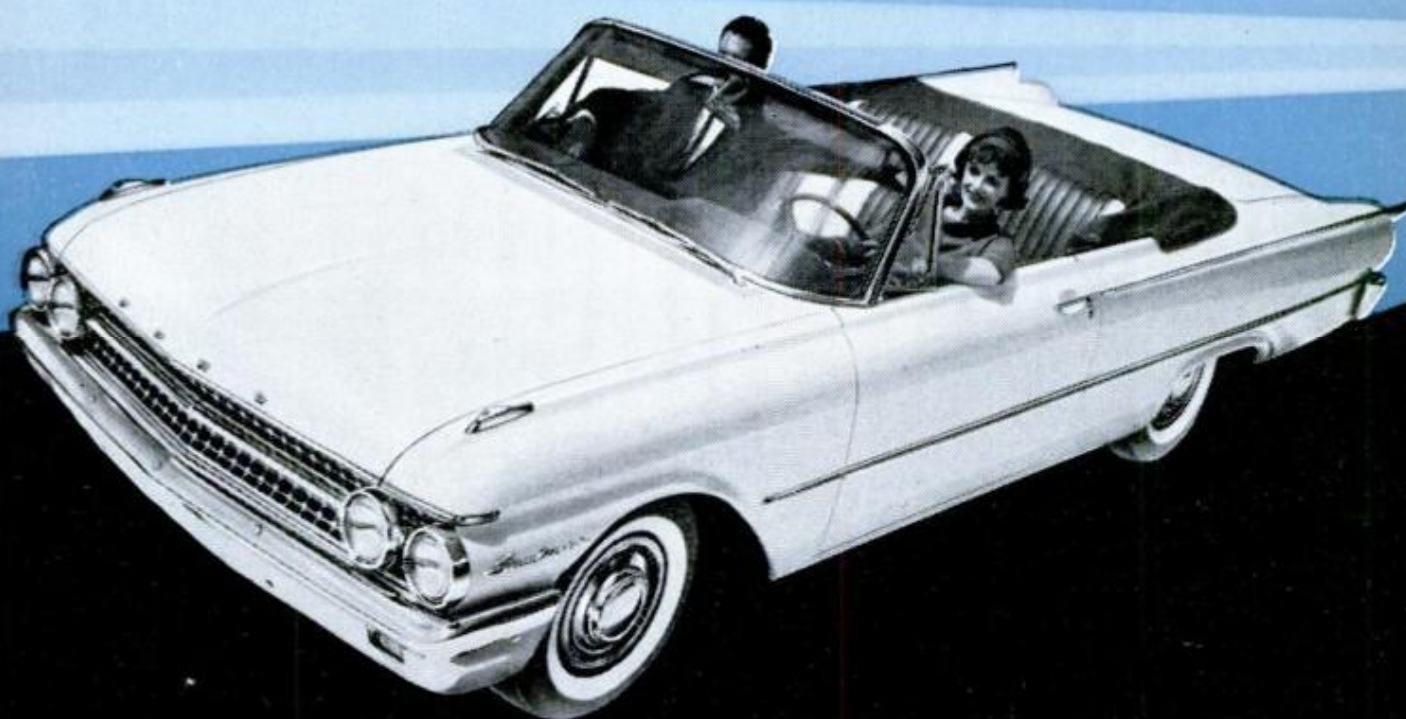
HOLE SAW, above left, is adjustable for cutting holes from 1½ to 2½ in. Saw is designed for use in a portable drill with a ¼-in. chuck. Hole size may be adjusted rapidly by simply rotating the plate until blades are at desired diameter and then tightening lock nut. An extra set of blades for cutting metal are included with the drill. Made by Zoron, Inc., 612 W. Monroe St., Chicago, Ill.

LAYOUT MARKING TOOL automatically prints 8, 12, 16 and 24-in. spacings for studs or other modular building materials. The tool eliminates the time-consuming job of laying out stud positions by hand. Markings show equally well on steel or concrete. Tool will print cross marks as fast as it is rolled along work surface. Body is aluminum. Price \$19.95. Pearson Products, 127 Kipling St., Elyria, Ohio

SAFETY PUSHER makes it possible for an operator to keep his hands at a safe distance from the blade of the table saw while ripping narrow strips. Made of aluminum, the pusher adjusts to most thicknesses of lumber, doing the work of both push stick and hold-down. Besides being safer, pusher helps to assure cutting accuracy. Guide retails at \$3.98. Alson Mfg. Co., 937 N. Evans St., Pottstown, Pa.

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■ For literature or nearest dealer, write: Superscope, Inc., Dept. 9, Sun Valley, Calif.

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Always within easy reach for emergency use, a new first-aid kit mounts on the visor of any car or truck. Contained in the plastic package are an assortment of bandages, antiseptic and burn compounds. The kit is a product of Medical Supply Co., 1027 West State St., Rockford, Ill.

Chemical Prevents Tooth Decay

Tooth decay can be prevented and early decay healed by a chemical that rehardens tooth enamel, according to test-tube experiments conducted by biochemists at the University of Alabama Medical Center.

Researchers softened some 300 teeth in an acetate buffer solution, then exposed them to rehardening chemicals such as secondary calcium phosphate dihydrate and synthetic hydroxyapatite. The former returned teeth to original hardness in eight days; the latter took four hours.

Once rehardened, the teeth resisted softening solutions more vigorously than they had previously, said Drs. Theodore Koulourides, Heriberto Cueto and Ward Pigman.

Why a good tune-up includes Spark Plugs

Some people do engine "tune-ups" and never look at the spark plugs; others service or replace spark plugs, and that's all. Either of these operations can give a temporary lift to engine performance—but it's only temporary, you can be sure. A good tune-up *starts* with spark plugs, then checks all the things that affect their operation—compression, battery, coil,

distributor, timing and carburetor. In a good tune-up, the prime concern is the proper functioning of the spark plugs, for only when spark plugs are right and everything that works with them is right, is your engine conditioned for long-lasting top performance. So, for the very best results, make sure your spark plugs are checked when your engine is tuned.

Why the best tune-up includes AC Fire-Ring Spark Plugs

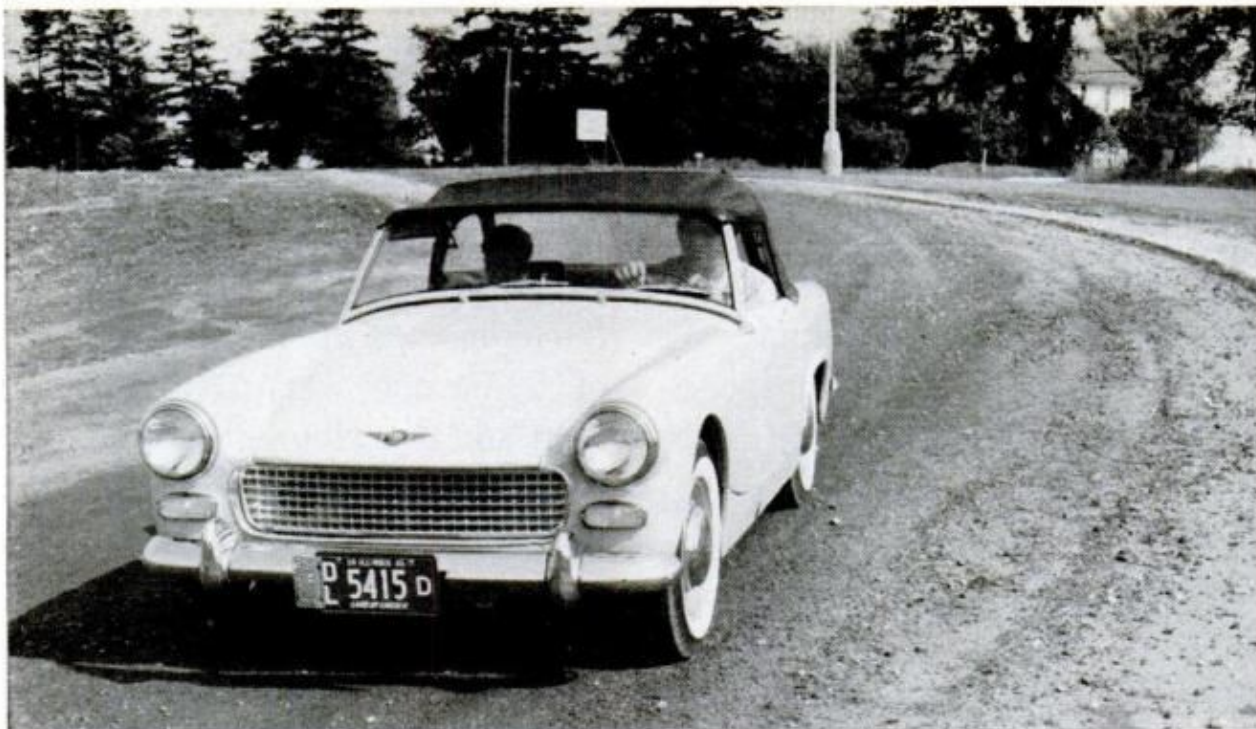
Your engine will perform better—longer—if the tune-up it gets includes new AC Fire-Ring Spark Plugs. AC Fire-Rings have a host of superior performance and reliability features. ACs give you the exclusive Hot Tip that provides self-cleaning action as you drive. ACs are built with heat-bonded internal seals and pressure-

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BUILT BEST FOR EVERYTHING YOU OWN THAT RUNS ON GASOLINE



RESTYLED FRONT END (no more frog eyes) and added horses under the hood make new Sprite a prize to own



Spotlight on the New Mark II **SPRITE**

By *Jim Whipple*

WHEN British Motors Corporation first launched their Sprite three years ago, nobody believed that a bona fide sports car could be manufactured, shipped to the U.S. and sold for under \$1800. At that time (1958), Triumphs and MG's delivered for around \$2500 and all the other true sports cars commanded lots more money.

But, after five minutes at the wheel the skeptics became enthusiasts and the Sprite established itself as Junior-Grade version of the big Austin Healey six-cylinder "3000" Sports car.

In its original version the Sprite handled beautifully, but its 45 horsepower made it something less than a real competitor in stock form.

However, its potential was a real challenge to the sports-car racing crowd, especially the limited-budget boys. They reasoned that if it handled that well at 70 it might do just as well at 95. They felt if they could lay on more power for go and more brakes for stop, they might well have a promising class H winner. (That's 750 to 1000 cubic centimeters displacement, or 45 to 60 cubic inches.)

Before too long highly-modified Sprites

were turning up class victories just about everywhere this side of the Iron Curtain, and the Sprite won at such big international events as the Sebring (Florida) Grand Prix and THE big race at Le Mans, France.

Of course the racers had such things as beefed-up brakes and clutches, racing wheels and tires, stiffer shocks, and engines modified with higher compression ratios, bigger carbs and manifolds, "hot" valve timing, tuned exhausts and high-speed ignition systems.

Yet, basically, these racing Sprites were the same cars that were buzzing around suburban streets in the U.S.

However, even as they drove their new Sprites happily out of showrooms, thousands of owners had ideas for improvements. Most owners wished for: more power, better luggage space, a more usable interior and, perhaps most fervently, improved styling.

Owners could struggle with the murky, lidless, unlined luggage "compartment" that, in effect, was the entire rear end of the car aft of the folding bucket seats. They

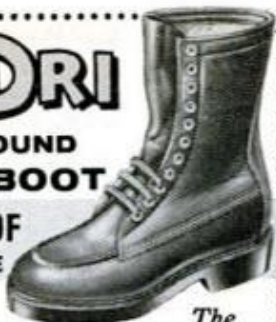
(Continued to page 96)

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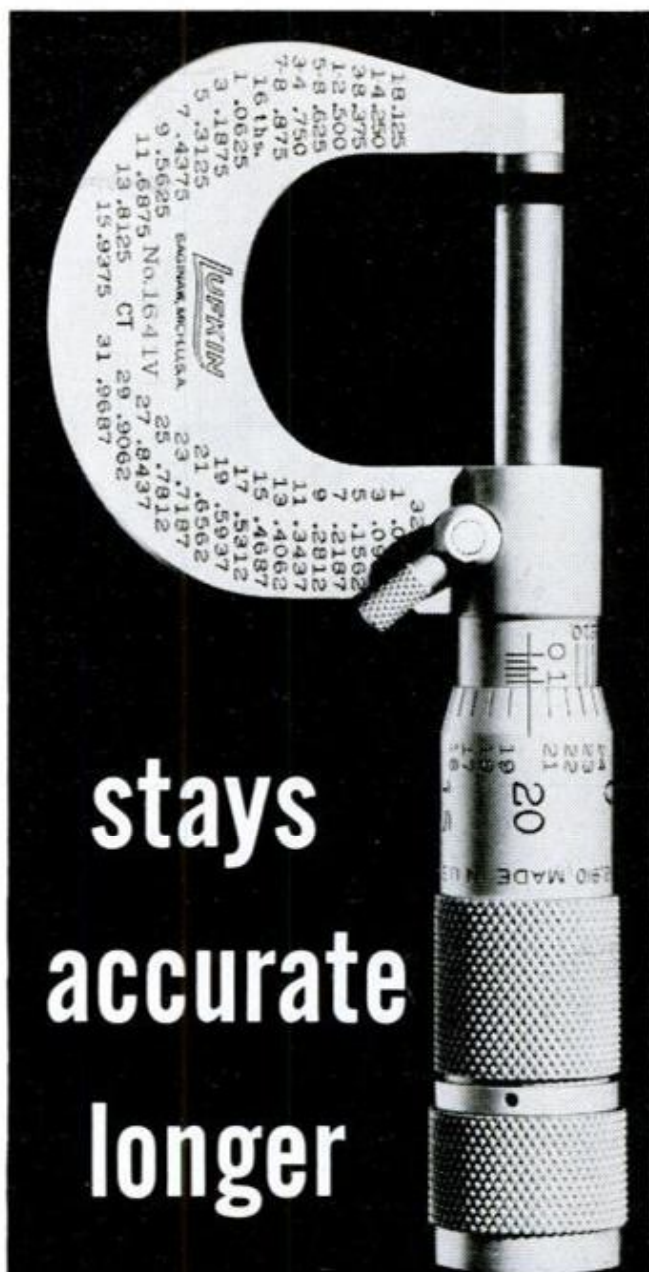
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TOP'S A SNAP to snap once you've fitted tubular frame in place. Small boy sits snug behind seats



LUGGAGE COMPARTMENT has 11½ cubic feet, is moderately capacious by two-seater sports car standards

didn't mind losing stop-light drag races to elderly Nashes. But that buglike front end had to go.

The factory was not unaware of these opinions. They took significant steps.

The fruits of their labors, the "new" or Mark II Sprite recently appeared and PM hastened to borrow one for a test.

Pepper Pot Altered?

Those familiar with the old, "first" Sprite, will be happy to know that their little pepper pot has lost none of its terrific roadability. No one has messed around with that suspension. The rack and pinion steering gear is still as light and quick as ever. The taut feel of the coil-spring independent front suspension and the solid tracking of the rear axle, located by its quarter elliptic springs and torque rods is the usual delight.

The action of the hydraulically operated clutch is smooth and the four-speed transmission works crisply and quickly.

But we hadn't driven the Sprite 20 feet before the area of change in performance made itself felt. An increase of five horsepower would seem pretty small to a Detroit engineer and invisible to an advertising agency. But, in the 1525-pound (dry weight) Sprite, the extra 10 percent puts added snap in each gear. You can reach 60 miles per hour in 20.6 seconds — slowish compared to a U.S. V8 but enough to give some compacts a real tussle at traffic lights. Of course, on a winding country lane you can keep ahead of most passenger cars, thanks to the low center of gravity.

Top speed is well over 80 and the little car cruises happily in the lower 70s, although the wind scream around the vinyl top and detachable side screens could be

annoying on those long high-speed trips.

The side screens—British for side curtains—really keep water out. Sliding plexiglass panels make it easy to ventilate the car in bad weather, as you can get fresh air through the heater for cooling your feet or defogging the windshield, once the hot water tap under the hood is turned off for the season.

Sprite devotees will love the new rear which has been squared off for a crisper appearance. While some space is lost to the spare, jack, tools and, when it's down, the top and its braces, the Sprite's new, lockable luggage compartment compares favorably with those of two-seater sports cars costing three times as much.

Just aft of the bucket seat backs there's a carpet-lined room for coats, extra luggage or two quite-small boys.

Frog Eyes Gone

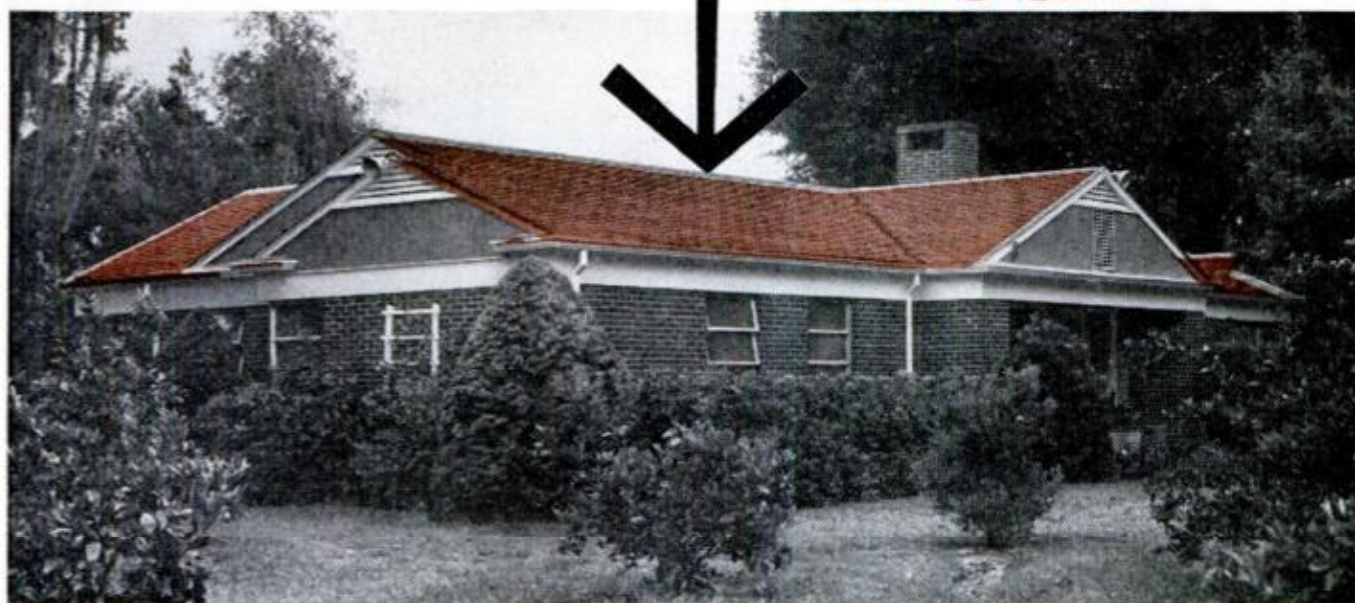
The new front end is probably one of the greatest changes ever made for the better. The old Sprite's frog eyes have gone the way of all tortured sheet metal and the tilt-up hood assembly has been replaced with a sleek pair of fixed fenders and a conventionally hinged hood panel.

Summing up the Sprite is fairly easy. Here we have the lowest-priced genuine sports car available in the U.S. at the price of the lowest of the compact coupes. For long trips the car needs only a better soundproofing and a bit more power to insure a slower-running quieter engine. For short around-town hops or cruising on pretzel-like mountain roads, it's well nigh perfect.

And beneath it all is the intriguing possibility of converting it to a class H race car!

★ ★ ★

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Sheriff Hall restores defective roof with Masticote

Sheriff J. P. Hall, Green Cove Springs, Fla., says he added many years to the life of his roof—with a paintbrush. Sheriff Hall applied Masticote, a fibrated colored aluminum coating made with Alcoa® Pigments by Madison Paint Co., Cleveland, Ohio. Mrs. Hall (who wanted a new roof) was completely sold after seeing the finished job.

The Hall roof was seven years old. Hard years of exposure to Florida's semitropical climate had caused wear and deterioration. The granules had washed and worn off; the shingles had faded and were beginning to curl. Sheriff Hall reports that Masticote sealed down the shingles and waterproofed the entire surface.

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2. HUNDREDS OF SIZES of precision compression and extension springs are now available as stock items. These new springs are made with music wire for standard use and stainless steel for high-temperature use. Stock springs are economical for small-quantity users. Made by Associated Spring Corp., Bristol, Conn.

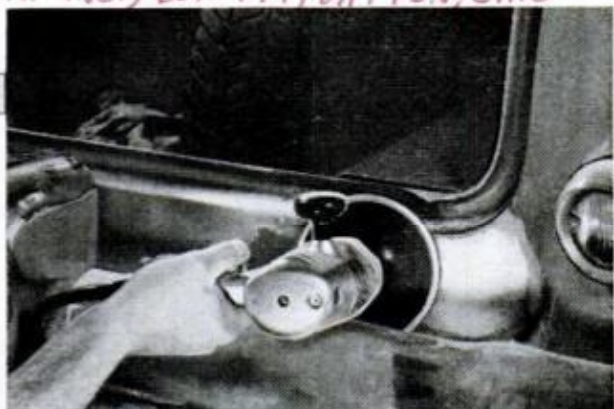


3. A COMPLETE LINE of cut nails is now available. Their sharp edges are said to have up to 75 percent more holding power than ordinary nails, and they penetrate hard woods without splitting, enter concrete readily where round, smooth nails do not. Hillwood Mfg. Co., 21700 St. Clair, Cleveland 17, Ohio

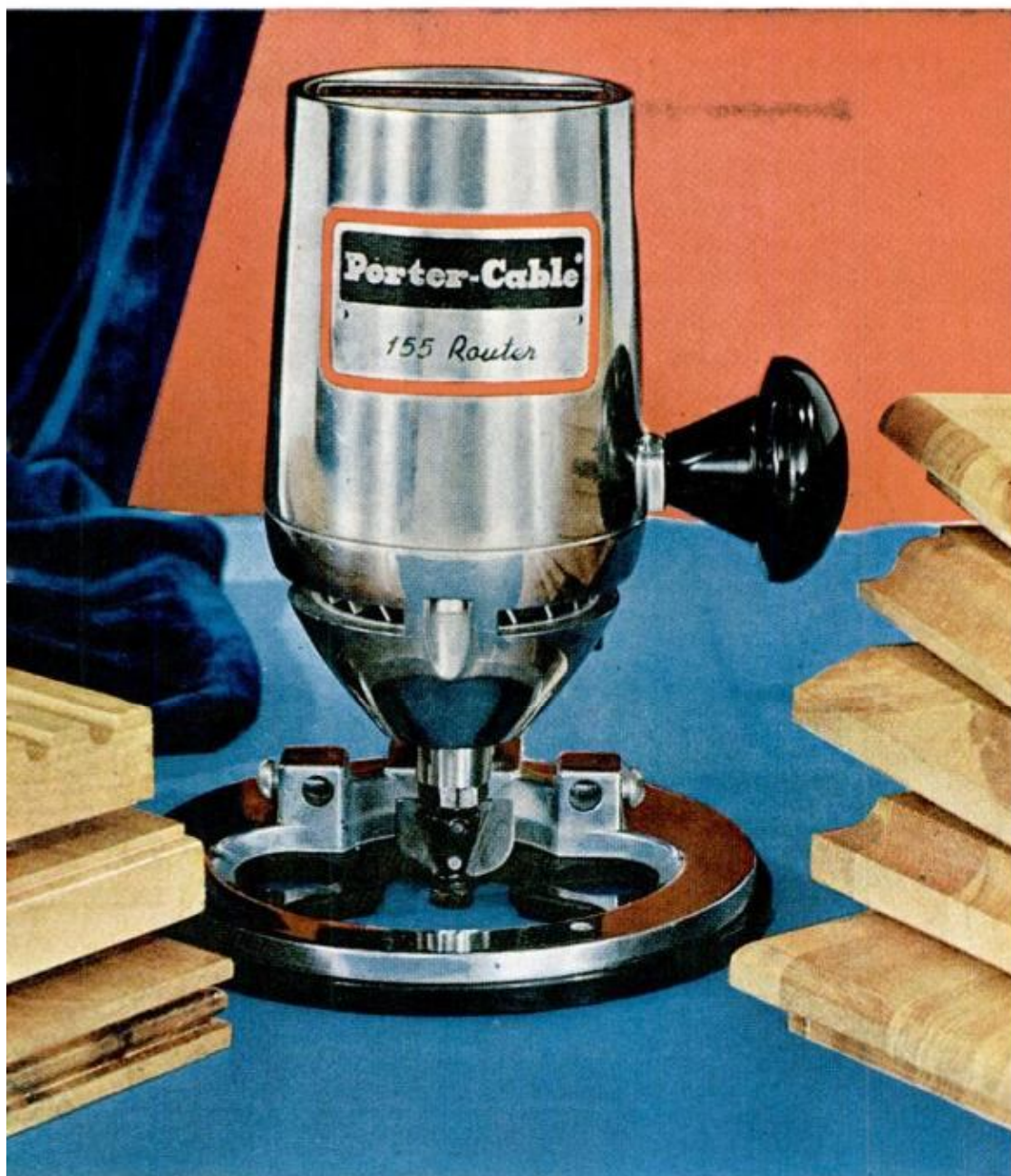


4. PLASTIC FILLER now available makes it easy to repair unsightly holes and dents in the family car. Also, you save dollars and increase the car's trade-in value. After sanding the patch, prime and paint area to make an invisible repair. Made by Webb Products Co., G & Columbia, San Bernardino, Calif.

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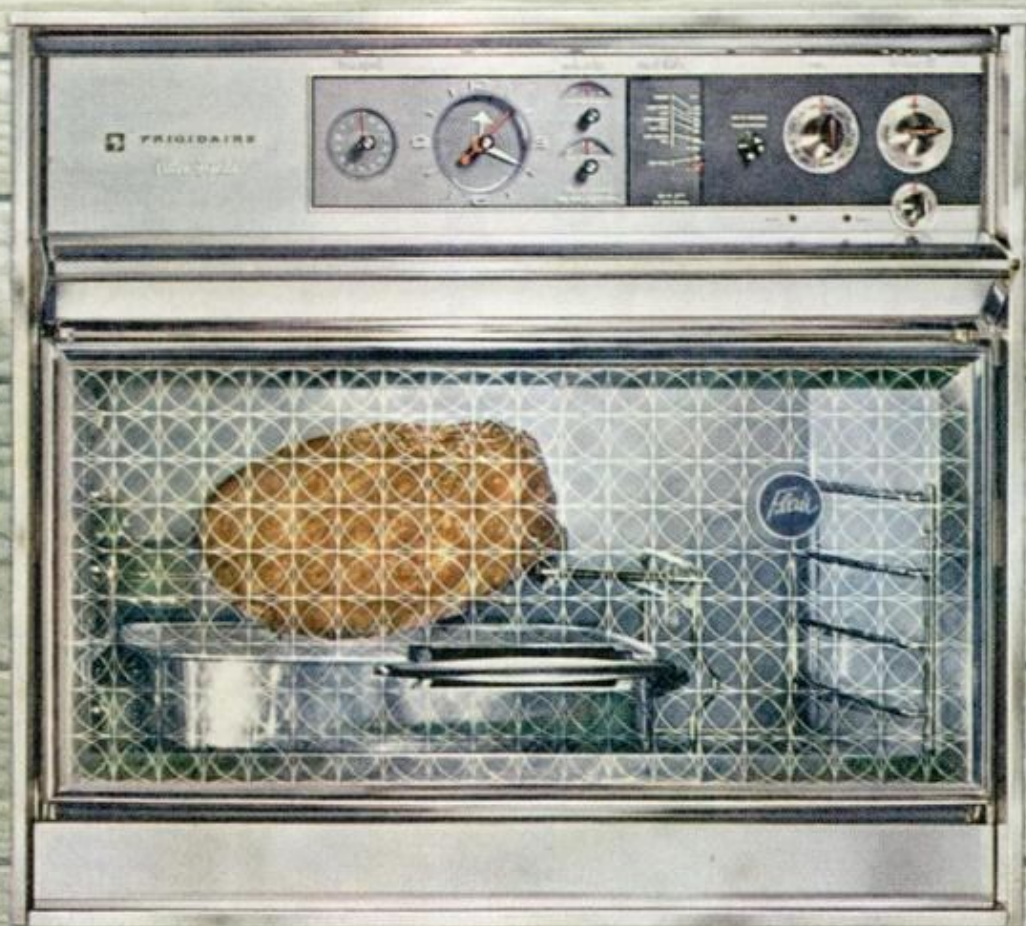
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POPULAR MECHANICS

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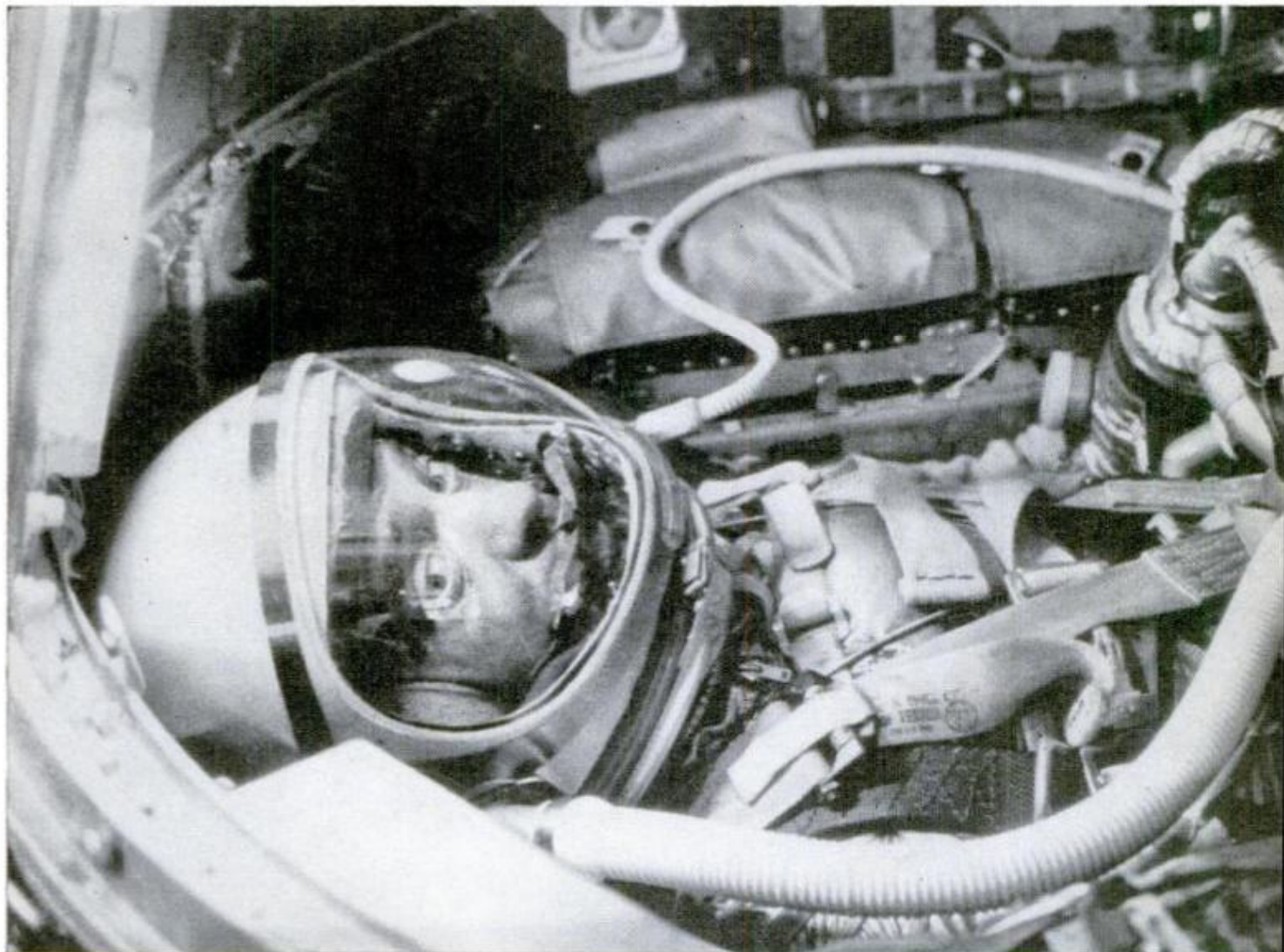
What We'll Learn From the Astronauts

**POPULAR
MECHANICS**

SEPTEMBER

1961

By
Edwin Diamond

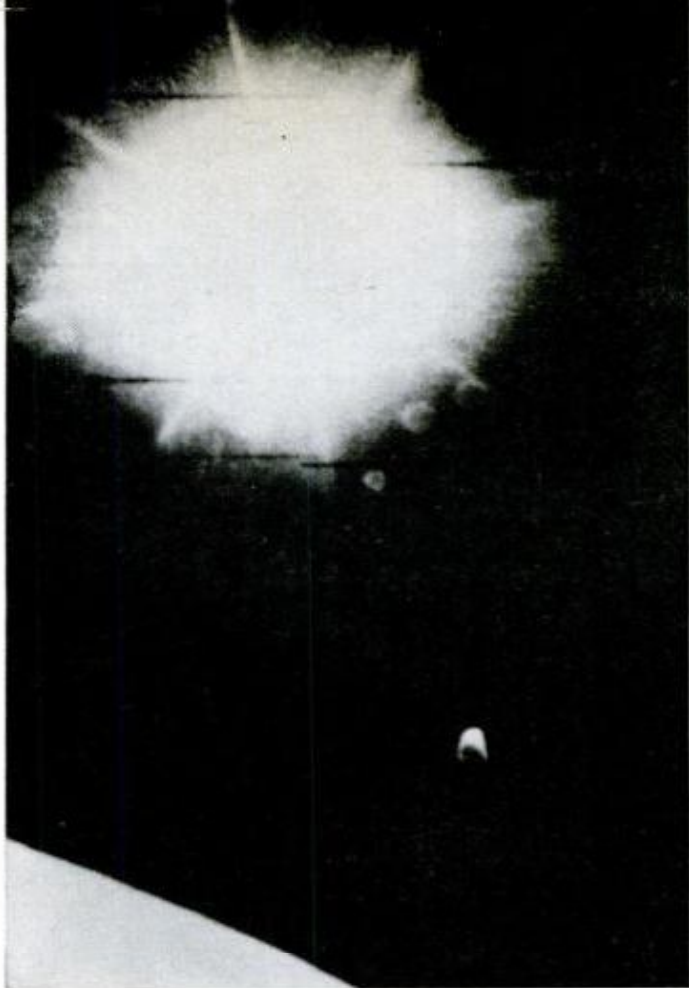


FIRST VOYAGER into space from the U.S., Alan Shepard, suggested important changes in space flight procedure

ONE MORNING LATE THIS FALL, shortly after dawn, millions of Americans will watch a seemingly familiar drama on their television screens. One of the seven astronauts, clad in a silvery space suit with white plastic helmet attached at the neck ring, will ease himself into the Mercury space capsule. The hatch will be closed. The gantry tower will rumble back, and a huge white rocket will stand solitary on the concrete launching pad.

At this point, however, the drama will deviate from other space spectacles, the first of which Americans watched on May 5, 1961.





SUN and Earth are seen together in this photograph: it will be a sight, too, for the eyes of astronaut



EARTH drops away in this picture from Thor nosecone. Cape Canaveral is below; U.S. East Coast curves north

This rocket will be broader, taller and more powerful than the Redstones that lifted Alan B. Shepard, Jr. and "Gus" Grissom into space for their brief, pioneering rides.

This booster is the Atlas ICBM, most powerful carrier available to the American space effort. At the command "lift off," three Rocketdyne engines, capable of generating 360,000 pounds thrust, will flame to life. In four furious minutes of flight, the Atlas will carry the first American into orbit. He will circle Earth at 17,500 m.p.h.

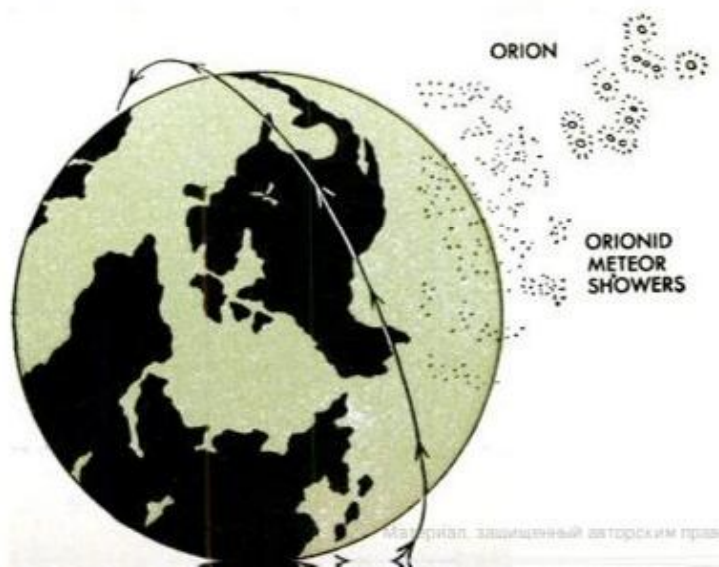
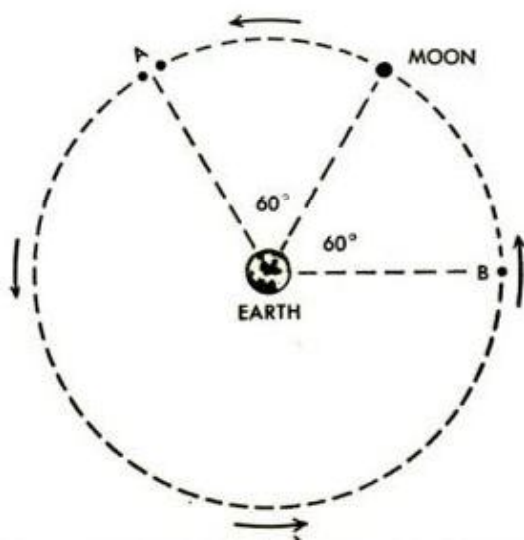
in "true" space flight. From a vantage point 120 miles high, he will survey an exhilarating domain. His periscope eye—a precise optical system that provides a 175-degree view of Earth through a "picture window" porthole twice the size of the one in the first capsule—will take in 1600-mile-long vistas.

Three times around Earth the astronaut will circle. On the first orbit, the Canary Islands, the Sahara, Lake Victoria in Tanganyika, the Indian Ocean, southern Australia, and Mexico will all flash by under-

← **RECOVERY** techniques, and recovery areas for orbital shots have been worked out from experiences gained during suborbital flights. After Shepard's 302-mile flight, for instance, explosive bolts installed to quickly open capsule hatch worked too well on Grissom's flight when his capsule flooded and sank

MOON may have smaller moons 60° before and behind itself. Orbiting astronaut may verify report

SKY holds possible danger of meteorite collision. Capsule will pass shower from Orion constellation





SHEPARD FLIGHT experience caused gauge on spacesuit arm to be moved, a new microphone in the helmet, and a raft trackable by radar for capsule

neath in less than 90 minutes. To a network of stations below (see map), the astronaut will call out the shape and distribution of cloud formations, demonstrating the potential weather-watching capabilities of manned satellites. Near the end of the second orbit, the capsule will pass over the United States for the first time at a point near San Diego. On the third orbit, it will pass over the Hawaiian Islands before beginning the critical descent from orbit.

If all goes as planned, this epochal flight will last four hours and 30 minutes. Its relatively Earth-hugging path (120 miles altitude) will keep the astronaut well under the Van Allen radiation belts, which begin to reach lethal intensities at approximately 200 miles altitude above the equator.

But the flight path will be lofty enough to give the space rider a view of the starry universe free of the atmospheric veil that distorts celestial objects for Earthbound observers. On his agenda are several astronomical observations. Recent color movies, recovered from a 500-mile-high nose cone, showed the stars as distant orbs in a rainbow assortment of their true radiation spec-

trum colors—brilliant red, yellow, white and blue. Will human eyes pick up the same radiation spectrum differences? They should. If the orbiting astronaut can see the colors, the night sky will look as though someone had spangled a black velvet carpet with thousands of glowing colored sequins. Earth itself, will be a greenish-orange ball suffused with the bluish glow of its atmospheric blanket—fading into deep blue where day meets night. The sun will be a glaring white disc, observable only through special tinted glass, in the black infinity of space.

Recently, a Polish astronomer, Dr. K. Kordylewski of Cracow Observatory, reported the existence of two faint, cloudlike objects circling Earth on the moon's orbit—60° ahead of it. Astronomers believe these cosmic "clouds" may be natural satellites of meteoric material, trapped between Earth's and the big moon's gravitational fields. There is another such point 60° behind the moon. From his vantage point in space, the Mercury astronaut, trained in astronomy, may well be able to see and identify other mysterious celestial



ORBITING FLYER will see daylight fade into night as shown in first photograph ever taken of Earth partly in daylight, partly in night. Hazy band along rim is thin layer of atmosphere. Will astronaut see color?

bodies, which have appeared in some nose-cone movies but don't show on sky maps. The astronaut is also certain to test out some important changes incorporated in his space vehicle as a result of Shepard's and Grissom's experiences. Though it isn't generally known, at 9:35.10 eastern standard time of the morning of May 5, 1961, Comdr. Shepard made a momentous decision.

His brief flight was only one minute and ten seconds old. From his Mercury capsule "Freedom Seven," he had just radioed back to Cape Canaveral: "Fuel is go. 2.5g. Cabin 5.5 Oxygen is go . . ." Then, nine miles high, his slim Redstone rocket passed from subsonic to supersonic speed. The capsule was subjected to maximum aerodynamic pressure—the forces of air density and speed combined at their peaks. The entire ship vibrated; there was heavy buffeting. For several seconds, Shepard had difficulty reading the cabin pressure dials.

Shepard *had* to make a decision. If he reported the buffeting, he might be ordered to terminate or abort the mission. He had made up his mind, he later recalled, "to handle things alone if I could and call for

help only if I couldn't." After 15 seconds, the vibration stopped. Shepard and the capsule were through in one piece. "Okay. It is a lot smoother now," he radioed back, "a lot smoother . . ."

And suddenly, the way was also a lot smoother for the entire U.S. space effort. Only a few weeks before Shepard's flight, President Kennedy had seriously considered proposals to postpone the mission. Our-toe-hold in space had been truly precarious. If Shepard had aborted, the U.S. manned space flight program would have slipped months behind while technicians worked over the autopilot records, replayed the mission, and subjected wind-tunnel models to stress tests. NASA officials would have spent weeks before Congressional investigating committees. The Mercury-Atlas manned orbital flights set for late this fall would have been endlessly postponed. And, finally, the U.S. might never be committed today to the next logical step—the Apollo program for the conquest of the moon by Americans in 1967.

(Continued to page 282)



You Take the High Road

Not a circus act, but a military exercise — a British Army Land-Rover crosses a defile on twin tightropes that eliminate the need for a bridge for wheeled vehicles.

A set of specially-designed outer wheels, flanged to fit a pair of cables, support the 3600-pound vehicle over a 110-foot span. Once on the cables, the crossing is under power with the driver controlling the operation. The technique was developed by the Australian Army Engineers.



Study Liquids in Space

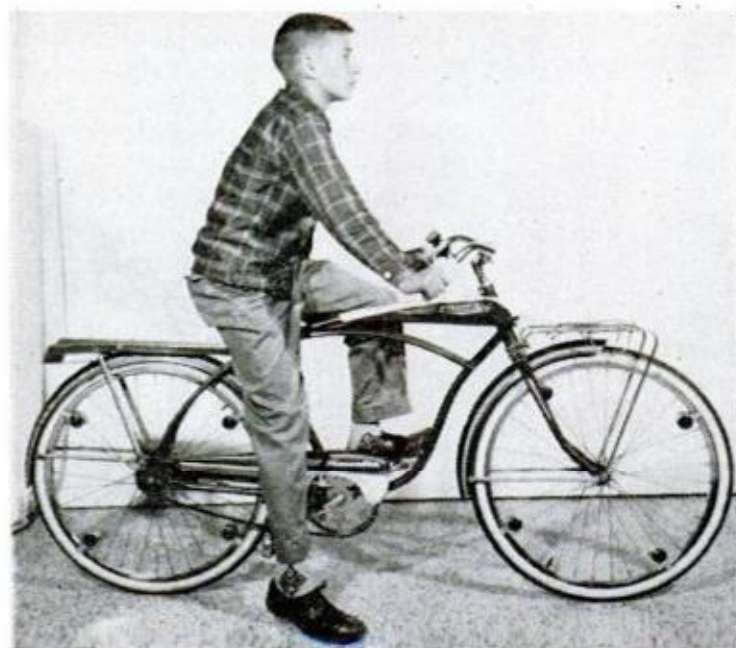
How do liquids which will be used to fuel spaceships behave in a condition of weightlessness—part of the environment of space?

To find out, engineers at Northrop Corp. have devised a zero-gravity capsule, a mockup of which is shown at the left.

Air is evacuated from it to form a vacuum. The capsule is then dropped inside an 87-foot tower. As the capsule falls, a hinged shelf (5) releases the test container which then falls within the falling capsule.

An automatic camera (1) records the behavior of liquid in the specimen cup (2) which is lighted from beneath by miniature lamps (3) powered by batteries (4).

Dr. Elliot T. Benedikt, who heads Norair's zero-gravity research, is shown with the mockup capsule.

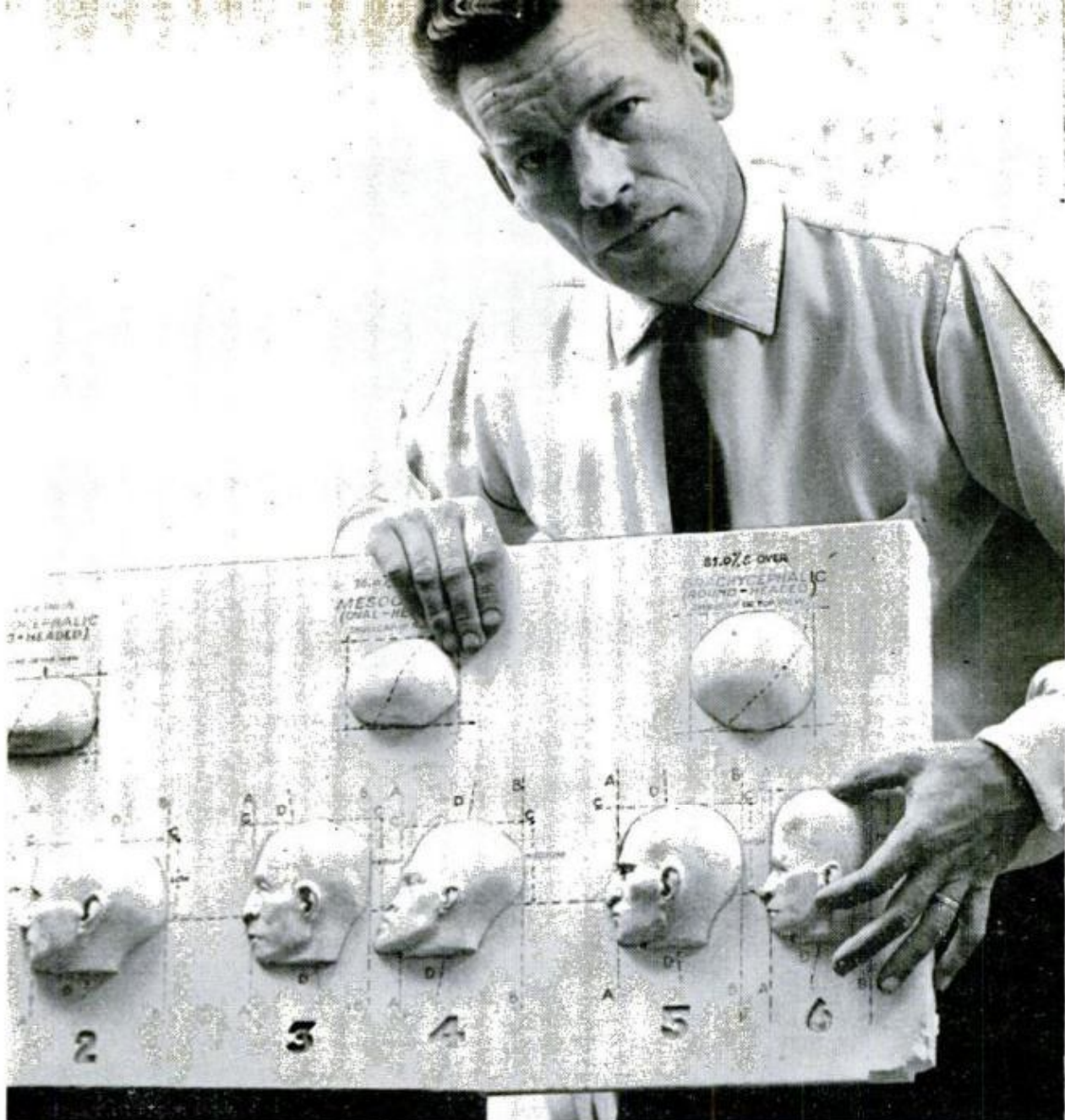


Spokes-man for Safety

Bicycles can be decorated with safety reflectors that are mounted on the front and rear wheel rims between the spokes.

Called Rim Gems, the reflectors are attached by hooking one side of a clamp under the rim and pushing until the other side snaps on. Made of lightweight aluminum, the lights get their brilliance from two red plastic reflectors which shine when automobile lights hit them. They are intended primarily for safety when crossing intersections.

Rim Gems are sold four for \$1.50 or eight for \$2.95 by Deans, Dept. PM, 504 8th St., Rockwell City, Iowa.



SYSTEM OF IDENTIFICATION, using basic head and facial types, has taken John Abbott years to develop

Plaster Masks Give Police 3-D Views of Wanted Criminals

Carved by a retired 20-year veteran of the Royal Canadian Mounted Police, life-like plaster masks of wanted criminals are giving California police a third dimension in identification. From eyewitness accounts of crimes, recorded on a 115-item questionnaire, John Abbott is able to produce

masks which police claim are superior to the composite, two dimensional drawings in common use.

Abbott uses a set of masks representing basic facial types when questioning witnesses, gradually working up the wanted man's final appearance.

QUESTIONING WITNESSES is important part of system. Detailed answers give clues to exact measurements



POPULAR MECHANICS



A NATIONWIDE SURVEY

PM photos by Don Honick

BASED ON 1,895,100 OWNER-DRIVEN MILES

Marginal and boldface comments by Jim Whipple, PM's Auto Editor

Owners Find Nimble, Sporty Corvair

Sales for the first six months of 1961 were 171,459 compared to 114,207 for similar period in 1960 →

Lowness, the very quality that makes Corvair coupes so appealing to sporty types, is a major objection of family users →

IN MARCH 1960, PM published an Owners Report on the 1960 Corvair. At that time, the car was brand-new. In fact, it was something of a nine-day wonder. You couldn't pull into a filling station in one without attracting the attention of curious onlookers who wanted to see "that engine in the trunk."

Now, seventeen months later, Corvair is an accepted part of the automotive scene, and we've polled another group of brand-new owners of a growing family of Corvairs.

Mind you, this Corvair they are rating is basically the same vehicle as the subject of the March 1960 report. Changes have been relatively few. Free hot air has replaced gasoline as a heating agent. The basic sedan of early 1960 production has been supplemented with coupe, station-wagon and camper-wagon models. A Super Deluxe Monza series, in coupe and sedan models, has been added, and there's now an optional 98-horsepower engine and four-speed synchronized manual transmission. And the spare tire has moved to the engine compartment.

When Corvair first appeared, many in the industry assumed that it would take its place alongside the Rambler, Lark, Falcon and Valiant and appeal to buyers interested

WHEN YOU SAY CORVAIR today, you may be talking about a roomy, nine-passenger camper-type wagon (right), a sporty sedan (center) or a compact six-passenger wagon, (at far right)





HANDLING EASE, the number one item on Corvair owners' list of best-liked features, is demonstrated as PM's test Monza swings over a rail crossing with perfect control, thanks to unique suspension

a "Fun Car" With a Few Rough Edges

in an economy compact for a one-car family. But America and Chevy's General Manager, Ed Cole, had other ideas.

After a slow start in '60, due to public hesitancy in accepting Corvair's radical innovations, the car caught on, but not so much as a bread-and-butter family sedan. The largest single group of owners, 40 percent of all reporting on the '61 model, own sporty Monzas, and most of these are probably bucket-seat coupes.

Fewer than 10 percent chose the austere (rubber windshield molding) "500" series. Some 35 percent chose the middle-of-the line "700" series which includes the Lakewood station wagon. And about 12 percent were owners of the Greenbrier camper wagon.

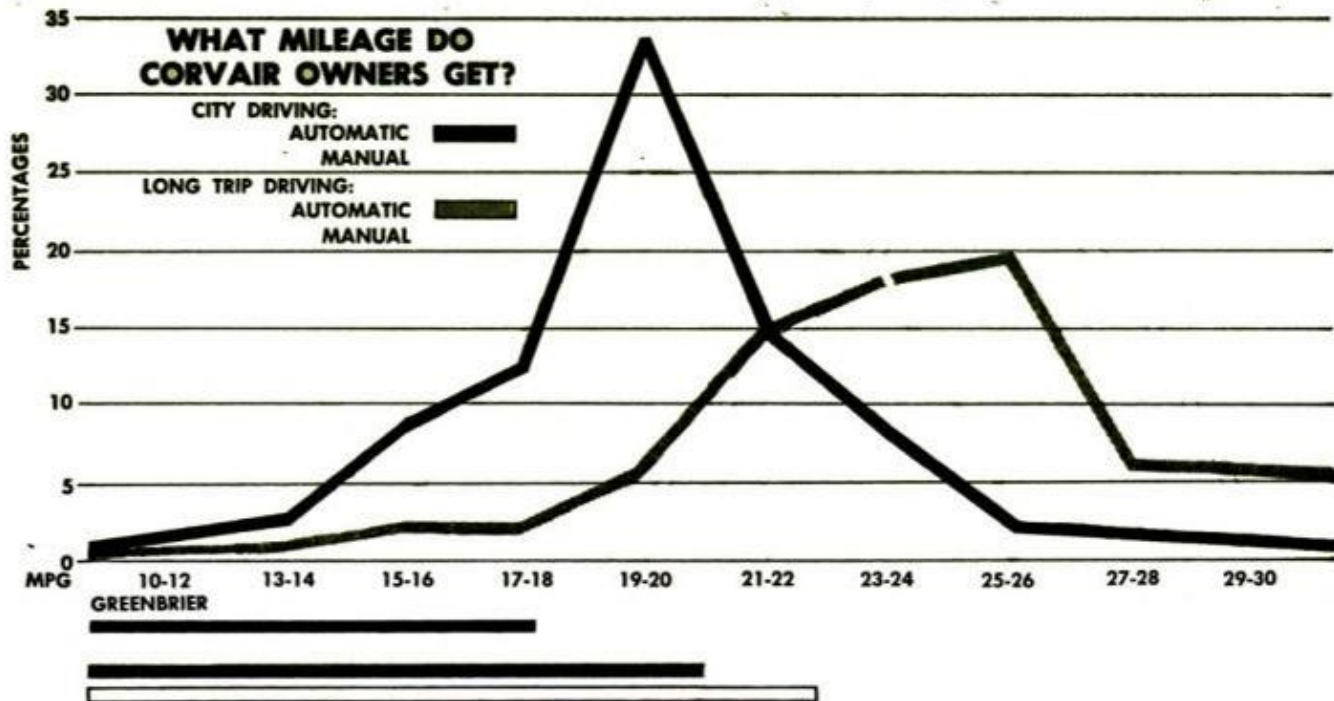
Culling through the reports revealed a strong "personal car" pattern, with many owners using Monza coupes for business as well as pleasure transportation.

The most striking contrast between this and the March '60 report deals with the business of fuel economy. Lack of this attribute was the number-one complaint last year, with 25.6 percent of all reports listing it. Some 45.4 percent of the owners of automatic transmission models said they were not satisfied with mileage.

The Monza was the first really new sports coupe since Studebaker's Loewy-designed job of 1953. ← No wonder it became the car with the built-in waiting list

Air-cooled rear-engined cars have a reputation as great gas savers, ← thanks to a well-known German import; thus the great expectations for Corvair economy





GRAPH OF CORVAIR FUEL CONSUMPTION shows that the difference between city and long trip driving is greater than the difference between manual and automatic transmission in determining gas mileage

There was no black magic here, Chevy engineers merely needed more time to perfect Corvair's dual carburetion →

In about a year and a half, matters have changed. Poor fuel economy has dropped right out of the top complaint hit parade and only 30 percent of automatic transmission owners were dissatisfied with their '61 Corvair's gas appetite.

Among the "best-liked" features, handling ease, riding comfort remain first, second and third respectively, but good fuel economy has moved into fourth place edging out traction in ice and snow.

PM's own constant-speed fuel meter tests and over-all mileage pointed up the fact that Corvair economy is up for '61. The test car was a Monza four-door sedan with 80 horsepower engine and automatic transmission. Here are the results:

Lower-than-average air resistance of small Corvair is one reason for good mileage at high speeds; light weight is another →

- 34.8 miles per gallon at 30 m.p.h.
- 31.32 miles per gallon at 40 m.p.h.
- 30.5 miles per gallon at 50 m.p.h.
- 27.5 miles per gallon at 60 m.p.h.
- 22.1 miles per gallon at 70 m.p.h.

Over-all mileage for city, expressway and country driving was 22.2 miles per gallon.

In what may be a measure of changing public opinion, the matter of insufficient head and legroom showed up in

THREE SMALLISH SUITCASES and a camera bag fill trunk of Corvair, below, with little space left

THE SAME ITEMS stow easily in Lakewood wagon, below, with leftover space plus unfilled front trunk





A BIG PROBLEM for many owners is that of low headroom and entry or exit through Corvair's low doors



ONE JACK RAISES A FULL HOUSE, or at least a full Greenbrier wagon; so that both wheels are off ground

second place on the list of specific complaints in 1961. In the 1960 Corvair report it did not appear among the first half-dozen complaints listed most frequently. Yet no change has been made in size of door openings, seat heights or interior dimensions.

When it came to making an over-all judgment of the '61 Corvair, the balloting came out strangely close to the division of opinion recorded by the '60 owner group.

In 1960 71.2 percent of all owners rated their Corvairs "Excellent." For the '61 owner group the "Excellent" ratings dropped a hair to 70.0 percent. Of the 1960 owners 23.4 percent rated their Corvairs "Average" compared to 25.4 percent for the owners currently reporting. Those who placed their Corvair in the "Poor" category have decreased in number from 5.4 percent in 1960 to 4.6 percent today.

Now, let's lend an ear to the owners' opinions of their new Corvairs. Here, in the order of frequency of mention, are the first six best-liked features.

"I like its handling ease, especially on corners. It rides well."—California airline employee.

"My Corvair is small and easy to manage in traffic, perfect for town driving. Besides, it's a mighty cute little car."—Mississippi school teacher.

"This car is fun to drive."—California draftsman.

"This car is easy handling under all conditions, very responsive in all gears and in the steering. Balances well on all road conditions, including up and down on hills and

(Continued to page 274)

People have had a chance to take some long second looks at all compacts—the novelty and "gee-whiz" attitude has been replaced by more realistic evaluation



This lack of an increase in the "Excellent" rating by owners of a second-year car is disappointing.



It seems there are still puzzling lapses in quality control

This Dixie pedagogue is so right—Corvair gets an A-plus as the nimblest car in town—it steers quicker than a kid's tricycle

THE ACID TEST of a wagon for do-it-yourselfers is passed as Lakewood swallows 4 x 8 plywood sheet



WHERE'S THE SPARE? Answer—in engine compartment of sedan, left, or in front trunk of wagon, right





By Jim Whipple



True quality control rears its lovely head. Who will win 1962's guessing game?

Before we get too deep in the details of the new model year there's something that happened in '61 which merits mention — **Buick's** achievement of a remarkably trouble-free new car, the **Special**. This new design, assembled from thousands of completely new parts, gave a large portion of its owners no reason to go back to the dealer other than for the routine warranty checkups. In PM's Owners Report, (March 1961, p. 81) the **Special** received the unusually high Excellent rating of 85.4 percent from a wide sampling of owners. Everybody in Flint from General Manager Ed Rollert down to power wrench operators on the line deserves a hearty "well done!"

They have done much to restore quality control to the status of a strong promise, rather than a weak joke.

1962 may go down in history as the year Detroit outguessed the public. Compact, subcompact "family-sized car" or full-sized car, there's going to be a size, if not a price, to suit everyone. Just look at the list.

There will be the subcompact four-passenger **Cardinal** by **Ford**; there will be a new Falcon-sized compact, the **Chevy II** which will have interior dimensions similar to **Rambler**, **Lark**, **Valiant-Lancer** and **Comet**. It will be larger than **Corvair** which would seem to put that sporty job into a separate category all by itself.

Then there are the **Buick**, **Olds**, **Pontiac** compacts with their 112-inch wheelbases. Somewhere slightly above the BOP's in size but not in price, will be the new "family-sized" **Ford Fairlane** and **Mercury Meteor** with 115½ and 116½-inch wheelbases and over-all lengths of around 200 inches. A little larger, heavier and lots more powerful, in their V8 versions, are the new **Plymouth** and **Dodge Dart** which have wheelbases similar to the slightly lighter **Fairlane** and **Meteor**. Then finally we have the "full-sized" **Ford** and **Chevrolet** of 119-inch wheelbases and around 210 inches in over-all length.

This could also be the year in which Detroit outguessed itself. It's just possible that a thoroughly bewildered public will stick to established buying patterns, choosing either **Rambler-Falcon-Lark-Valiant**-sized cars or the traditionally larger **Ford** or

Chevy. This would leave several of the newcomers to slip between the chairs.

Hard to guess which way the trends will swing, isn't it? But save a little sympathy for the dealer. He's going to have to stock three different varieties of **Fords**, **Chevies** and **Mercurys**. (**Comets** will be registered under the **Mercury** nameplate in '62.)

And if model choices aren't enough just consider the engine and transmission combinations not to mention the optional axle ratios. (**Buick Special** and **Olds F-85** will have limited-slip differentials too!)

What's behind it all? The industry's desire to make sure there's a car for every potential buyer, that no contracts will go unsigned for lack of suitable merchandise.

There's one bright spot, however. There will be few if any leftover '61 models around to complicate matters. If you were thinking of picking up an end-of-the-year bargain in your favorite color and optional equipment combination, forget it. Your neighbor has beaten you to it. This fact will put the industry hip deep in the new model shakeout — i.e. which models will sell and which won't by Thanksgiving.

Amidst all the new-size car hoopla, one fact should be noted. The compacts — **Falcon**, **Valiant**, **Rambler American**, **Lark** and **Corvair** — have received very minor face-lift changes for '62 and wear the same basic sheet metal that they did back in 1959.

This can only be good news for the buyer as model stability decreases mechanical "bugs," reduces depreciation rates and helps the manufacturer hold the price line in the face of increased labor and material costs. This is good anti-inflation insurance.

How long will this state of affairs last? Which of the five manufacturers will be the first to "chicken" out and spend the big money for the big styling changes? The answer is, whichever one thinks that the styling of his current compact is hurting sales. Then, if he has the money to spend, comes the major body change. And, like dominoes, most of his competitors will follow. One thing's sure, the decision has already been made, thanks to the industry's long lead time. The '63s are already basically locked up and major decisions on '64 models have probably been made. ★ ★ ★



All the Earmarks of a Cyclist

English motorcyclist John Gillson at first glance appears to have an uncommonly large pair of ears. But they're really indicators that make it safer to turn.

"When I want to turn left or right," he says, "I merely flick a switch on the handle bar, the signal on my helmet lights. My hands are then free to grip when a sure grip is most needed—that is, when turning a corner."



Thermoelectric Refrigerator

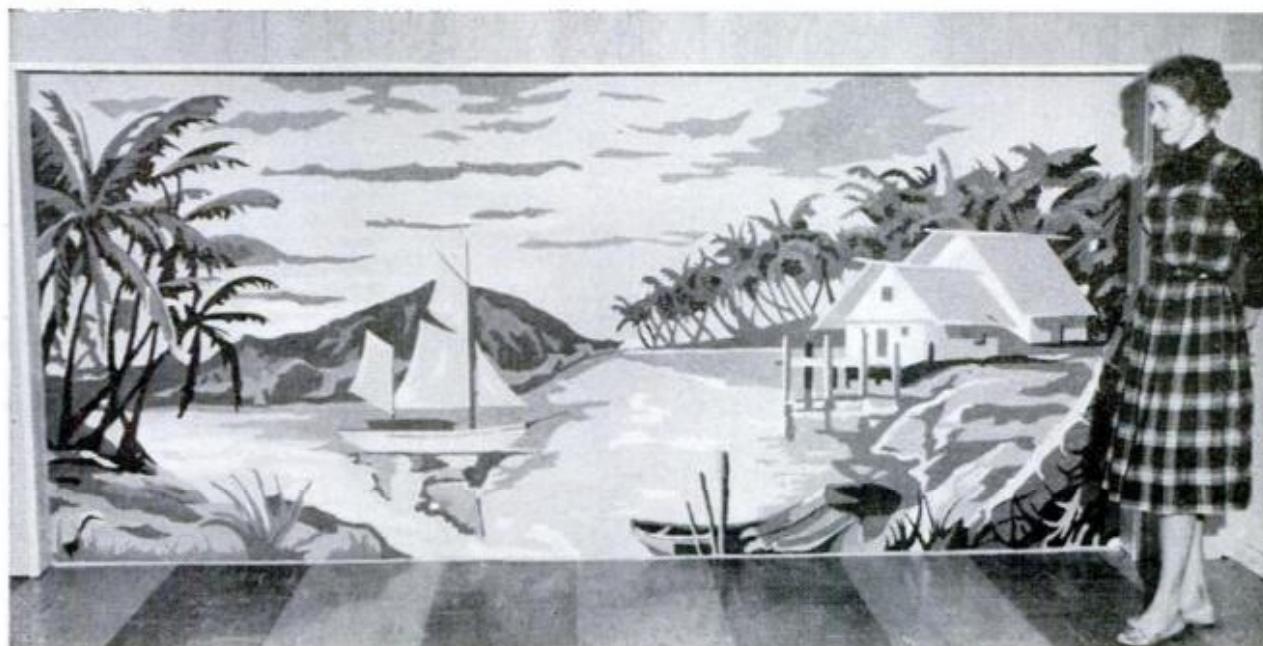
Previously used primarily in research and armed-forces applications, the principle of thermoelectric refrigeration has now been adapted by Norge for commercial units.

Five hundred thermoelectric refrigerators, which need no compressor or refrigerant fluid, have been purchased by the Sheraton hotel chain. Home refrigerators of this type are expected within five years.

Big-Scale Number Painting Produces Mural

Painting "by the numbers" works as well on walls as it does on the coded canvas that comes with kids' paint sets. The C. J. Nast family of Cornwallis, Nova Scotia, transferred a kit painting to a basement wall by ruling the original, small, numbered canvas into half-inch squares, then transferring the

design onto six-inch squares on the wall. They matched the original oil-paint colors with latex wall paint—over a neutral base of concrete wall paint—and came out after a week of evening work with a 5-by-11-foot mural. The original is a 5-by-11-inch child's painting kit.





SCIENCE OVERSEAS

By William Kreh

It's a pity, but nurses no longer make the rounds to take temperatures at the Royal Infirmary, Edinburgh, Scotland. A new electronic machine takes and records temperatures of all patients at the same time.

An electrode, taped to the patient's shoulder, is wired to a central recording machine. By turning the dial to a patient's name, the nurse reads his temperature.

With a little luck, scientists will have a photographic record of the next eruption of New Zealand's Ngauruhoe volcano. They've embedded a remote-control camera, along with a seismometer, in concrete on the rim of the active volcano. Operated from a laboratory five miles away, it will take about 300 pictures before a scientist need venture out to reload it.

Regardez the white square! With these words, or words more definitely French, parents send their kids skedaddling from the TV sets in France. The square, put on the screen by an engineer's pushbutton, signals that something not for children is going to appear. Presumably little Jacques runs the risk of a paddling should papa walk into the room and find him watching the set after the square warning.

The British Naval Air Force trains helicopter pilots to land on the bouncing deck of a ship without ever going to sea.

They've built a rolling platform upon which helicopters can land while it simulates the motion of a frigate's deck. A system of cams and gears make the platform pitch and yaw at varying angles and degrees.

Nerves of iron are being given dogs by Soviet scientists. Pieces of a dog's nerve as long as two inches were removed and replaced by metal electrodes.

"Scalpel! Sutures! Barometer!" This bit of operating-room dialogue is not too far-fetched. German surgeons now get special weather forecasts before scheduling operations.

The theory is that extreme pressure changes, abrupt temperature changes, humidity and rainfall all play a role in human health. This role becomes especially important for people about to undergo critical

operations, for the body under surgery is more vulnerable to atmospheric change.

Skiing on air is the latest fad for winter sportsmen in France. Air cushion skis, conceived by Swiss engineer Gaston Halde-man produced in France, are popular at French ski resorts.

They are made of glass fiber, impregnated with synthetic resin, and wrapped around a hollow plastic tube that's filled with compressed air. By varying the air pressure, skis can be made to vary in hardness, making them suitable for different snow conditions.

A new life raft, made of nonporous, self-sealing foam rubber, is being manufactured in Norway. The floating igloo looks like a big cheese topped by a dome-shaped tent.

Transported halfway across the world in the body of a rabbit, a flock of sheep has arrived in South Africa.

Lionel Rowson of the animal research station, Cambridge University, reports that purebred English lambs whose parents never left their native pastures have been born to a foster mother of a different breed 6000 miles away in South Africa.

In the experiment, fertilized ova were removed from a ewe of the English Border Leicester breed. The eight ova were planted in the body of a rabbit for incubation on the flight. They were then transferred to ewes of an African native breed, which subsequently gave them birth.

"Using this method a small flock of breeding animals can be sent thousands of miles in a rabbit at the cost of only a few pounds," Rawson says. "To send the same number of grown animals by air over the same distance would cost thousands."

Object of the experiment is to develop a method of transplanting ova from beef cattle to dairy cows. Farmers would then be able to get high-class beef animals from lightly-built dairy cows acting as foster mothers.

The complete skeleton of an anchilosaur—a giant lizard 30 feet long—has been uncovered by Chinese and Russian scientists in the heart of the Gobi desert. It is about three times the length of the previous largest skeleton of this species. ★ ★ ★

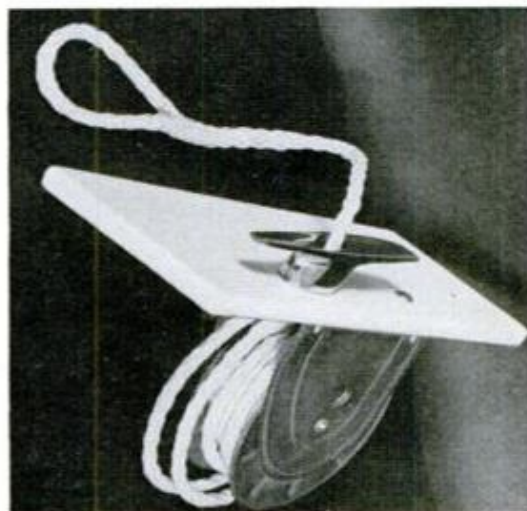


Disappearing Act for Mooring Line

Bow lines on boats with foredecks are automatically stored out of sight under the deck on the spring-rewind reel built into a new piece of boat hardware.

The line runs through a drilled cleat onto the rewind reel beneath. Up to 14 feet of line can be pulled out, tied to the dock and then secured to the cleat with a half hitch. When untied, the line slides automatically back through the cleat and onto the reel.

Manufactured by Puritan Cordage, the reel is being built into boats by Cruisers, Inc., Oconto, Wis., and is also being distributed by Cruisers dealers.



Regular Meals at the Aquarium

Solving the problem of how to insure regular feeding for a tankful of fish when nobody's home, a new self-timing automatic feeder mounts on the edge of the tank and drops 14 feedings in the water at preset intervals.

It will handle any type of food in almost any desired amount, and can be set for 14 single feedings—twice-a-day feeding for seven days, or three-times-a-day feeding for five days. It mounts with rubber-footed screws and runs on a clock-type electric motor. Two rubber "legs" hold a feeding ring. It's made by Double A Brand, 1703 West Wellington, Chicago 13, Ill.



Are You Taking Counterfeit Drugs?

Scientific detectives of the Food and Drug Administration have launched a nationwide drive against traffic in bogus medicine

By James Nevin Miller

ONE JULY AFTERNOON in 1960 an inspector for the Food and Drug Administration performed a routine chore in a Washington, D.C., drugstore. He handed the druggist a doctor's prescription for 24 tablets of Diuril, a high-potency drug for treating high blood pressure, and paid for his purchase.

The inspector drove to his office and gave the tablets to an FDA micro-analyst for the customary examination for authenticity in accordance with the Food and Drug Act.

Next day the micro-analyst telephoned the inspector and announced, "We've spotted a phony. The analysis shows the drug tablets weren't made by the legitimate manufacturer and the chemist has verified the findings. Our microscopic tests show the tablets are just a bit different along the edges from ground bevel marks made by the genuine manufacturer's die on the authentic tablets. Also, the chemical analysis proves there is an obvious difference in the identity of the fillers used to carry the drug ingredients in the tablets."

Two days later another inspector visited the same drugstore and this time had a prescription filled for another drug called Hydrodiuril. This purchase also turned up

a phony drug, instead of the genuine product called for by the prescription.

These findings touched off a nationwide drive against traffic in counterfeit drugs, the first really big campaign in history. Today, after more than a year of undercover investigations, the FDA has moved to bring criminal charges against several alleged makers and sellers of bogus products.

As of July 1, 1961, almost a dozen criminal informations had been filed in the East, Midwest, South and Southwest. Many other prosecutions are expected after sufficient evidence is gathered.

- Two companies and eight individuals in New York and New Jersey were among the first to be charged with counterfeiting and distributing a variety of drugs, including two well-known tranquilizers.

- Another case was filed in Boston against an individual in Roxbury, Mass.

- Another criminal action involving counterfeit Hydrodiuril was filed in Chicago against a wholesale distributor and one of his salesmen for delivering counterfeit drugs to two retail drug stores in Chicago.

- Also, the FDA announced the seizure of more than 6000 tablets described as counterfeits of well-known drugs from



GEORGE P. LARRICK

Commissioner of the U.S. Food and Drug Administration

"Since the purpose of counterfeiting is to conceal the identity of the true manufacturer, there can be no assurance that counterfeit drugs actually contain the kind or amount of the drug supposed to be present.

"Manufacturing, sanitation and laboratory controls are likely to be absent, and the drugs, most of which are potent new drugs, do not pass through the safety clearance required under the federal Food, Drug, and Cosmetics Act.

"Thus, even though the particular batch of a counterfeit drug may have the same strength and purity of the drug it counterfeits, the counterfeiting of drugs is contrary to the public interest and is in violation of federal laws.

"This reprehensible practice poses a serious threat to the public health since it could undermine the fundamental control over the safety and efficacy of drugs."

PRESCRIPTION



FDA INSPECTORS, in the first step of a local drive, spot-check drugstores for possible counterfeit drugs

firms in Chicago, Georgia and California.

Meanwhile, the Senate antitrust monopoly committee, headed by Senator Estes Kefauver of Tennessee, is expected to start an investigation of this and other troublesome problems in the drug trade.

FDA Commissioner George P. Larrick has said, "This is a bootleg operation easily detected by the retail pharmacist. The racket could not exist without the cooperation of unethical druggists."

In view of this, what has the drug industry itself been doing to combat the blot on its good name and on that of legitimate druggists?

Officially, the pharmaceutical companies have hired detectives to track down those suspected of being active in the illicit drug traffic. Besides the public, who unknowingly purchase the counterfeit drugs, the legitimate drug manufacturers stand to lose the most. One major drug manufacturer has estimated its own loss in sales to the bootleg trade at about \$1,000,000 in one year. Throughout the trade, the estimate runs to \$50,000,000.

Semi-officially, the industry's trade journals have been publishing editorials pinpointing the gravity and nationwide spread of the menace, and urging the pharmaceu-

FDA laboratories test suspect and genuine drugs,



MICROSCOPIC TESTS of drug tablets help identify filler material used to bind actual drug ingredients



COUNTERFEIT DRUGS (left row) duplicate originals, even to brand marks, but blowups show differences

SIX MOST COMMON counterfeited drugs. All are provided in tablet form and require prescription

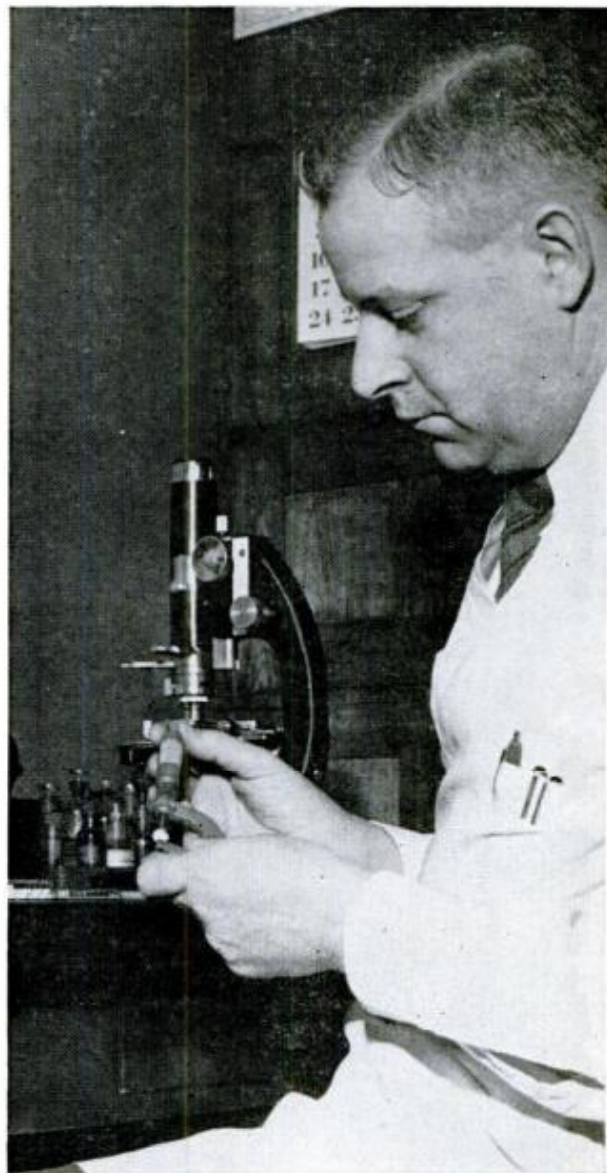


find telltale differences . . .



CHEMICAL TESTS reveal amount of drug used in tablets. Ground up and dissolved in solution, tablets are placed in machine which records contents. Results are then compared to samples of genuine drugs

➔
MICROMETER TESTS measure thickness of suspect drug. Ballistic method is similar to that used by police to study bullet characteristics. Size and shape of tablets, plus other telltale marks, are checked



tical firms and pharmacies to combine forces to defeat the cheap criminals responsible for the situation.

One trade journal commented: "As far as the pharmacist is concerned, he can protect himself by being sure of his source of supply. In fact, we suggest that he take extraordinary precautions to guarantee that those who provide him with his prescription-department stock have outstanding reputations."

Counterfeit drugs are made in precise simulation of well-known trademarked, and usually patented prescription items currently in great demand. The simulation extends even to the use of the same monograms appearing on the genuine item and is so close that differences are discernible only by microscopic, chemical and other highly technical examinations. Counterfeits are generally sold unlabeled, often in paper or pliofilm bags or in partially filled

bottles. The distribution is always surreptitious.

Counterfeiters produce these phonies in their own shops, which often are in basements or garages, free of any control of purity or potency of the ingredients used. They use forged dies bearing the trademarks or other distinctive symbols of reputable manufacturers to stamp the drugs, which usually are in tablet form.

Wholesalers and jobbers in the racket usually buy these goods in bulk lots from shady manufacturers, and in turn will sell them in smaller quantities to retail druggists. So far, according to FDA sources, there is little evidence that box and bottle labels also have been counterfeited, the spurious tablets being dispensed to the customer in the druggist's own containers.

As suggested earlier, the racket is nationwide with especially heavy concentrations along the Eastern Seaboard, Midwest,



SORDID SANITARY conditions of storage room for raw ingredients in plant of company named in federal charges for counterfeiting and distributing drugs. Manufacturers of counterfeit drugs bypass federal inspection

Midsouth and Texas. The states in which counterfeit drugs have been found include New York, Massachusetts, New Jersey, District of Columbia, Virginia, North Carolina, Georgia, Florida Alabama, Mississippi, Louisiana, Kentucky, Texas, Indiana, Illinois, Kansas, Oklahoma, Nebraska, Colorado and California. Some industry sources have estimated that as many as five percent of all prescriptions contain some counterfeit material.

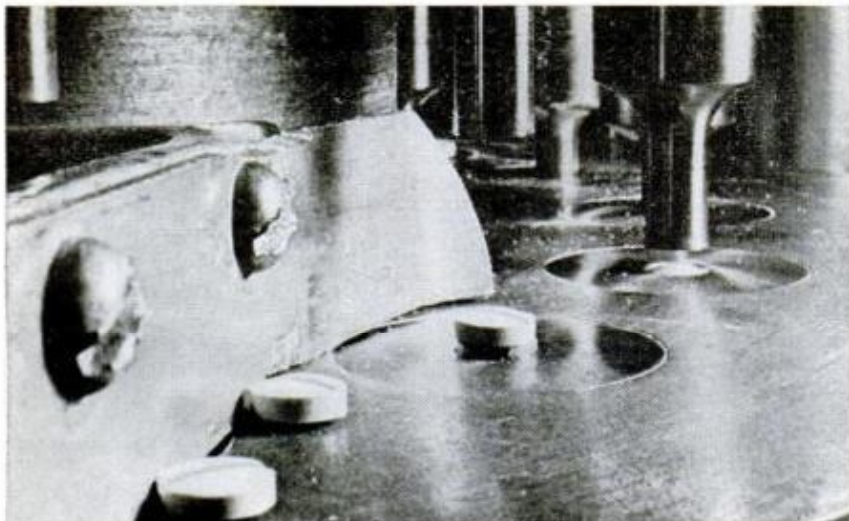
In the FDA's nationwide investigation, samples of eight different drugs were collected from 900 drugstores selected at random between January 1 and March 30, 1961. The drugs surveyed by FDA, known from previous experience to have been counterfeited, were: Merck's Diuril and Hydrodiuril, both sold to relieve high blood pressure and hypertension; Wyeth's Equanil and Wallace's Miltown, both tranquilizers; Schering's Meticorten, for rheuma-

tism and arthritis sufferers; Ciba's Serpasil and Esidrex for hypertension; and Chilcott's Tedral, for bronchitis, asthma and hay fever.

All these drugs have a lot in common. They're much in demand, are usually put up in tablet form and require a prescription for purchase. The most widely counterfeited tablet of Diuril is the 500-milligram strength which retails for about \$5.80 a bottle of 50 tablets. Hydrodiuril of 50-milligram strength is also widely counterfeited and retails for about \$5.75 a bottle.

Equanil and Miltown come in a 400-milligram strength, which retails for about \$5.85 a bottle of 50 tablets. Meticorten retails for about \$15.50 for 50 tablets of 5-milligram strength. These tablets are widely simulated. The Serpasil strength that has been found to be counterfeited is the .25-milligram which sells for about \$8 for 50 tablets.

(Continued to page 270)



DRUG-MAKING MACHINE, in closeup view, shows punches which form each tablet. Counterfeiters duplicate punches which bear trademarks of legitimate manufacturers and turn out tablets in unsupervised conditions

Dr. Paul Siple first went to Antarctica as the Boy Scout's representative on the 1928 Byrd expedition. He has returned five times since, spending, all told, more than four years in South Polar exploration. He is scientific advisor to the Chief of Research and Development, the U.S. Army general staff.



My Most Exciting Moment

I HAVE FOUND ALL OF LIFE so exciting that to single out a moment of greatest exuberance is almost like selecting the most perfect blade of grass in a meadow. For an explorer or scientist each new discovery is exciting. Yet one moment about 27 years ago remains indelibly engraved in my memory.

While being the leader and navigator (as well as cook) of the Marie Byrd Land sledging party, three companions and I had sledged with 27 dogs some 300 miles eastward from Little America. We were, at this point, further into unexplored territory than anyone had ever been. A few days earlier I had lugged a small surveyor's transit to the summit of Mt. Grace McKinley where our supporting party had left our last depot of provisions. From a narrow footing above a sheer drop of about 2000 feet I had run a set of angles on the new mountain peaks that lay ahead. Gusts of bitterly cold wind at about -30 degrees F. jarred my instrument and made my eyes water. Still I could glimpse more peaks ahead of us than my companions could possibly see from our camp position lower down the mountain slope.

The urge to reach these new nunataks was a strong enough motivation to endure the next two weeks of travel. There was a heartsick day when after an exhausting 12 hours we had only advanced a mile. By lightening our loads and relays we made as much as 15 miles on good days. There were pauses for surveys and geological studies among the red, brown, gray, and black outcrops of granite and ancient metamorphosed sedimentary rocks. At last we reached the foot of a giant mountain which barred our view. A glacier saddle formed a pass between portions of the lofty wall. From this saddle we might see a promised land beyond.

Steve Corey and I could not wait another day. While Al Wade and Olin Stancliff made observations on the rocks at hand. Steve and I started our climb in beautiful calm weather, lit by a low midnight sun. As the ascent became steeper we abandoned skis and walked. This was dangerous on the glacier. Our way was barred by great sagging 50 to 100-foot-wide crevasse bridges, but we ran across them. They held or else they would have been our icy tombs for eternity. We reached the crest of the saddle. There, seeming close at hand on the other side of the mountain, were 50 or so bare rugged peaks, black and bold against the white continental glacier. Our excited expressions of awe were absorbed by a stillness that had never before been broken by the sound of a human voice.

We knew that ours were the first eyes to see the looming central peaks of the Edsel Ford Range—a major discovery that suddenly made the years of preparation, work, hardships and discomfort fully worthwhile.

Paul A. Siple

You CAN Detect a Good

-a dealer's 19 secrets

By Charles McMurdo

As told to Watson Fenimore

THERE WAS LITTLE DOUBT in my mind as to the outcome. The young lady couldn't take her eyes off the shiny, green and white hardtop on the used-car lot which I manage.

Traded in on a new car weeks before, the hardtop had come to us in bad condition, but it had been given the standard "cosmetic" treatment from bumper to bumper—a complete repaint, new floor mats, foot pedals, upholstery. It looked as good as new.

Standing next to it was another car of identical year, make and model—in good operating condition but with its original paint and equipment attesting to its years. The second car looked drab in comparison with the refurbished hardtop.

From years of experience, though, I knew that the second car was a better buy. And, since both had been tagged with the same price, I tried to steer the young lady to the second car. But the hardtop's glamour was too much. Against my advice, she bought it.

In a week she was back. The car was hard to start, had little pickup and its exhaust emitted blue smoke. It needed a complete engine overhaul.

My customer was lucky. We did the job free for her, but it cost us \$150. In some other dealerships she might not have been so lucky.

This incident illustrates why many used-car buyers do not get a good buy. They let



the car's looks catch their fancy, a weakness that makes them easy victims for unscrupulous used-car peddlers whose jaloopies ought to be headed for the junk yard.

Knowing the car-buyer's weakness for appearance, the first thing a dealer does on taking a car in trade is to give it a quick, superficial "beauty" treatment. This costs the dealer about \$20, and nets him at least an added \$50 in profit.

Weathered paint is rubbed down with an abrasive and the remaining finish buffed to a high shine. Rusted chrome is sanded

VETERAN USED-CAR APPRAISER Charles McMurdo turns steering wheel in check action for roughness

Used Car Bargain



SHE LOOKS GOOD FROM THE OUTSIDE, but what's under the paint and chrome? Springs and shocks may be in fine shape and a bit of jumping on bumpers will tell. If car returns to original level when you've jumped off, shocks are fine. Continued bouncing after you've quit is sure sign the shocks are ailing

and given a chrome refinish base coat, then dusted with powdered-metal chrome finish and buffed until it, too, shines. The car's interior is washed and sometimes dye-sprayed, and worn floor mats and pedal covers are replaced.

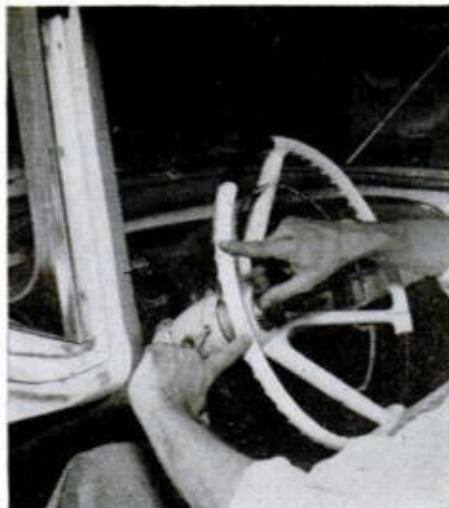
Worn tires may be replaced with recaps, cheap third line or so-called "high-tread" tires, or tires from wrecks. Or tires may simply be repainted or (in a practice which should be outlawed) regrooved and then painted.

Dirty motors are steam-cleaned and then may be painted to cover up water and oil leak marks. And all of these chores the dealer may either do himself or have done on his lot by professional car cleaners who may charge him as little as \$8 labor per car.

The shining result is, of course, what traps the unwary. Yet there's no need to be stuck on the purchase of any used car, if the buyer will only follow a few simple rules—such as those I have learned from years of appraising trade-ins.



1 OIL PRESSURE DIVES as water temperature hits normal, look for bad oil pump or rings



2 MORE THAN TWO INCHES of free play in steering wheel is sign steering gear is worn



3 REPAINTING BATTERED BODY may leave paint flecks on sills, seats and weather stripping



7 VIBRATIONS IN SHIFT LEVER may only mean loose linkage—or transmission's death rattle



8 RUST ON ROCKER PANEL may not be serious; on doors and main panels, it spells repairs



9 POCK-MARKED CHROME is normal. Slightly duller clean finish may be "reconditioned"

My job, in fact, has depended on my ability to tell the true condition of a car without actually taking it apart. Usually I have to do this in a hurry while the customer and the dealer await my verdict. In this sense, I am in the same position as the man who is trying to decide whether to buy a car he sees on the used-car lot. But there is an important difference. I have a boss who expects me to be right!

To make sure I am, I use a number of quick check points which any buyer can follow. Add to these a few he can pursue at more leisure than I usually have, and there's no reason why he shouldn't come up with a good buy.

First of all, inspect the paint job. If its texture differs noticeably from that on other cars in the lot, or you find paint flecks on weather stripping, upholstery or door hardware, or see body-repair ripples under the finish, the car has probably had to be re-

painted because of hard usage, bad care or an accident. Don't buy it. Also make sure the doors, hood and trunk lid fit correctly. They may not if the car has been in a wreck.

Recently, a trade-in customer insisted that the 40,000 miles on the odometer was correct, but the repainted steering wheel told me the car had at least 70,000 miles on it. He finally admitted I was right. Painted instrument panels, new floor mats, new pedal covers, arm rests, seat covers, upholstery—all are signs of hard wear.

A close look at the tires may reveal adhesion ridges along the tread rims, a sign of recapping. While recapping may be safe for normal driving, recaps are not the new tires they appear to be. Watch for freshly-cut treads on tires that are scuffed and worn on the sidewalls. Such regrooving may leave the core nearly bare between the treads and this spells danger.

Check the tire pressures. Low-pressure



4 SCREWDRIER TEST gives idea of tread depth. Close look may reveal regrooving job



5 TELLTALE OIL DRIP? It may be just a bad pan gasket or a main bearing may be gone



6 WHAT'S UP THE PIPE? If carbon deposits are oily, it may mean engine is an oil pumper



10 WHEELS OUT OF BALANCE or out of line show up in uneven tread wear, bald spots



11 GLEAMING HUB CAPS may hide grease or fluid from leaking seal or wheel cylinder



12 TIRE PRESSURE MAY BE right or pumped higher for a snappy demonstration ride

jobs requiring 25 pounds or so can be pumped to 30 pounds or more. The hard tires can make a sluggish engine seem to have more pep since there is less tire drag on the road. Your demonstration ride on the smooth macadam, minus bumps and ruts, won't be likely to show up such "high pressure" tactics.

Uneven tire wear confined to one side of the tire points to bad wheel alignment. A bald spot indicates an out-of-balance wheel. Worn ball joints or worn king pins and bushings may show up in a road test as wobbles and vibrations transmitted through the steering wheel, or sloppy, uneven cornering characteristics.

If the steering wheel binds on the turns during your test run, chances are that steering mechanism has been over-tightened to conceal wear. Also check it with the car at rest for any roughness in turning and excessive free play (over two inches) before

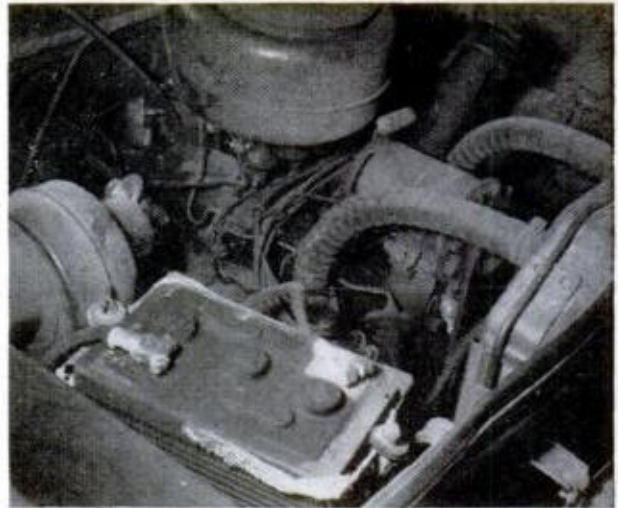
the car's front wheels begin to turn.

With the car in motion and "pulling a load," listen for rattles or heavy thuds from the engine. They may mean anything from bad valves to loose rods or piston slap. A complaining drive-line will sound off with whines, hums and grinding sounds from a bad differential or transmission, or thumps during the shifting of gears from worn universal joints. Of course, the car should have a reasonable amount of pep and pulling power.

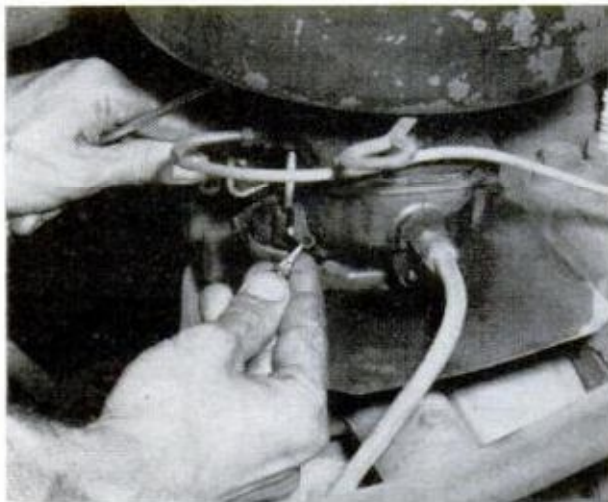
What about brakes? Do they hold and does the pedal resist firmly when not more than halfway to the floor? If not, the car may need nothing more than a simple brake adjustment—or it may need new linings or repairs in a leaky hydraulic system. When you get back to the lot, remember to check by turning the wheels as far in one direction as they will go, and then inspecting the back sides of the wheel drums for signs of



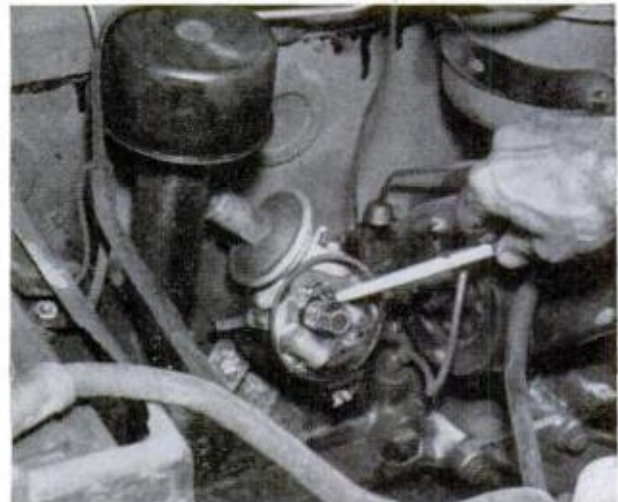
13 LEAKY CARBURETOR GASKETS allow fuel to wash down and leave "varnish" deposits on float bowl—bespeak lack of basic maintenance



14 OWNER CARELESSNESS shows up in "boiled-over" battery covered with white acid deposits—probable result of faulty voltage regulator



16 PROPERLY TAKEN CARE OF, oil-bath air cleaner does important job. Neglected, it lets dirt into carb, makes for worn, dirty idler valve



17 WHAT'S THE DISTRIBUTOR LIKE? Good care will have left grease in cup and wick, no burning of contact points or cracks in tower terminals

a leak. (This may also reveal frayed or leaking wheel lines.)

Also try driving the car at slow speed and applying the brakes while holding the wheel lightly. A pull to the right or left indicates the need for adjustment or repairs.

On standard-shift models, pressure on the clutch should meet with resistance in an inch or so of travel. If it doesn't, the clutch needs either adjustment or replacement. The odds favor replacement on older models. On cars with automatic transmissions, shifting should be relatively quiet and smooth through all speeds.

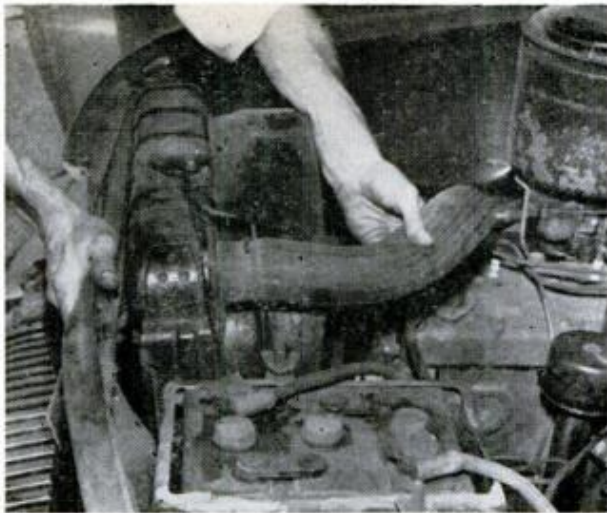
With the engine warmed up after a test run, if the oil pressure drops when the water temperature reaches normal, the oil pump is ailing and the bearings may have been running dry to the point where an expensive repair job is due. If, in addition, blue smoke is coming from the exhaust, you know the engine is burning oil and

needs an overhaul. (Unfortunately, on cars with warning indicator lights, the oil pressure light doesn't come on until pressure is down to about seven pounds. If normal pressure is 15 pounds the car may have been running at eight pounds or close-to-critical low pressure for some time.)

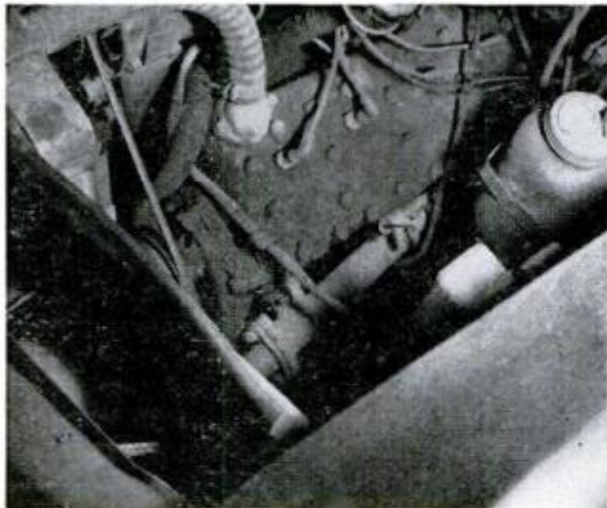
If gray-black (not blue) smoke keeps coming from the exhaust, an engine flush and tuneup are probably needed. Spitting or sputtering sounds from the exhaust can mean burned valves in need of repair.

If you're used-car shopping in old clothes (and you should be), a quick crawl underneath the car may reveal broken spring leaves or shackles, or a loose or rusted-through muffler or exhaust pipe.

Having tested and discounted several cars as potential trouble, let's assume you have found one that stands up fairly well to inspection. Try looking at things under the hood. You might begin with the distrib-



15 SPONGY HOSES NEED REPLACING. Wetness on supporting crossmember, white lime or signs of sealing compound on core mean bad radiator



18 WIND-SPRAYED OIL LEAK mixed with dirt coats engine, holds moisture, shorts out wiring and makes for engine which runs as bad as it looks

utor. If possible, pull the coil lead out from both its coil and distributor ends (it's easily reinserted) and check the brass tips for blue-green corrosion. Do the same with the spark-plug wire ends. Such corrosion bespeaks a lack of simple maintenance and, though it may not have a serious effect in dry weather, unless remedied, it will make starting difficult when things turn wet. Burned, cracked terminal towers are a sign of a bad coil and/or condenser.

By this time you have pretty well added up the score for better or worse. Even if the car exhibits only a few of these more minor weaknesses, your discoveries will supply you with a bargaining point with which to secure needed repairs or pull down the quoted price of the car.

From experience, I would advise you to expect to encounter the following problems. On cars up to three years old, a tune-

(Continued to page 288)



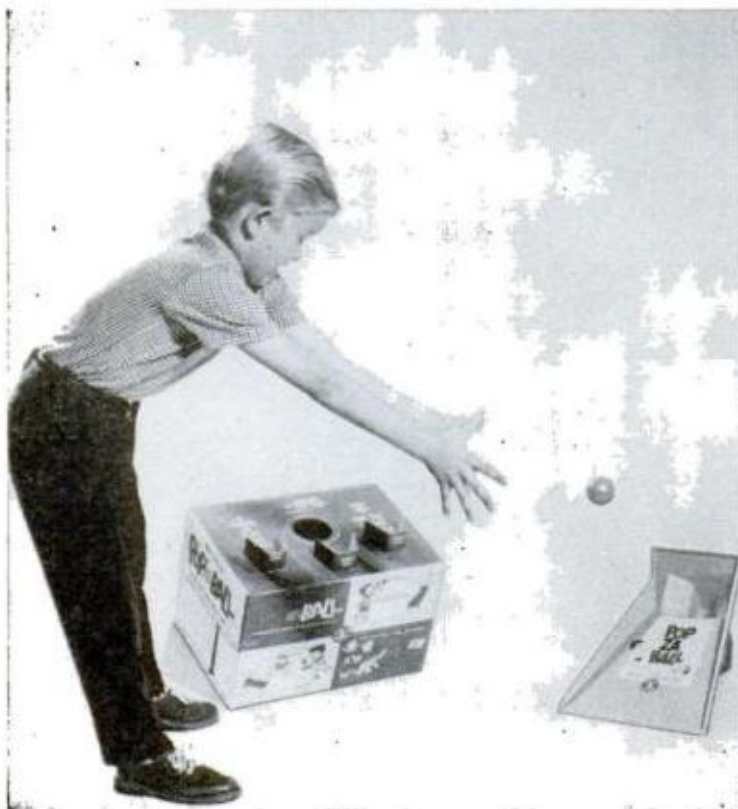
19 DON'T BE AFRAID TO YANK PLUGS. They are as good a barometer of engine's running condition as anything you'll find. Top plug covered with reddish-brown deposits points to good rings, combustion. Bottom plug, from an oil burner, is covered with black, greasy carbon and oil



Police Get Evidence by "Shooting" Speeders

Yielding "the best possible evidence," a squad-car camera system automatically takes pictures of speeders and other traffic violators. It produces negatives that show the time, date, license plate, speed and situation, without the driver taking his eyes

from the road. Two 35-mm. rapid-sequence cameras, one with a normal lens and the other a telephoto, are operated by a button on the dash. A powerful 500-watt-second electronic flash, mounted on the roof, is synchronized for night photography.



Dad-Saving Spring Toy Plays Catch With Junior

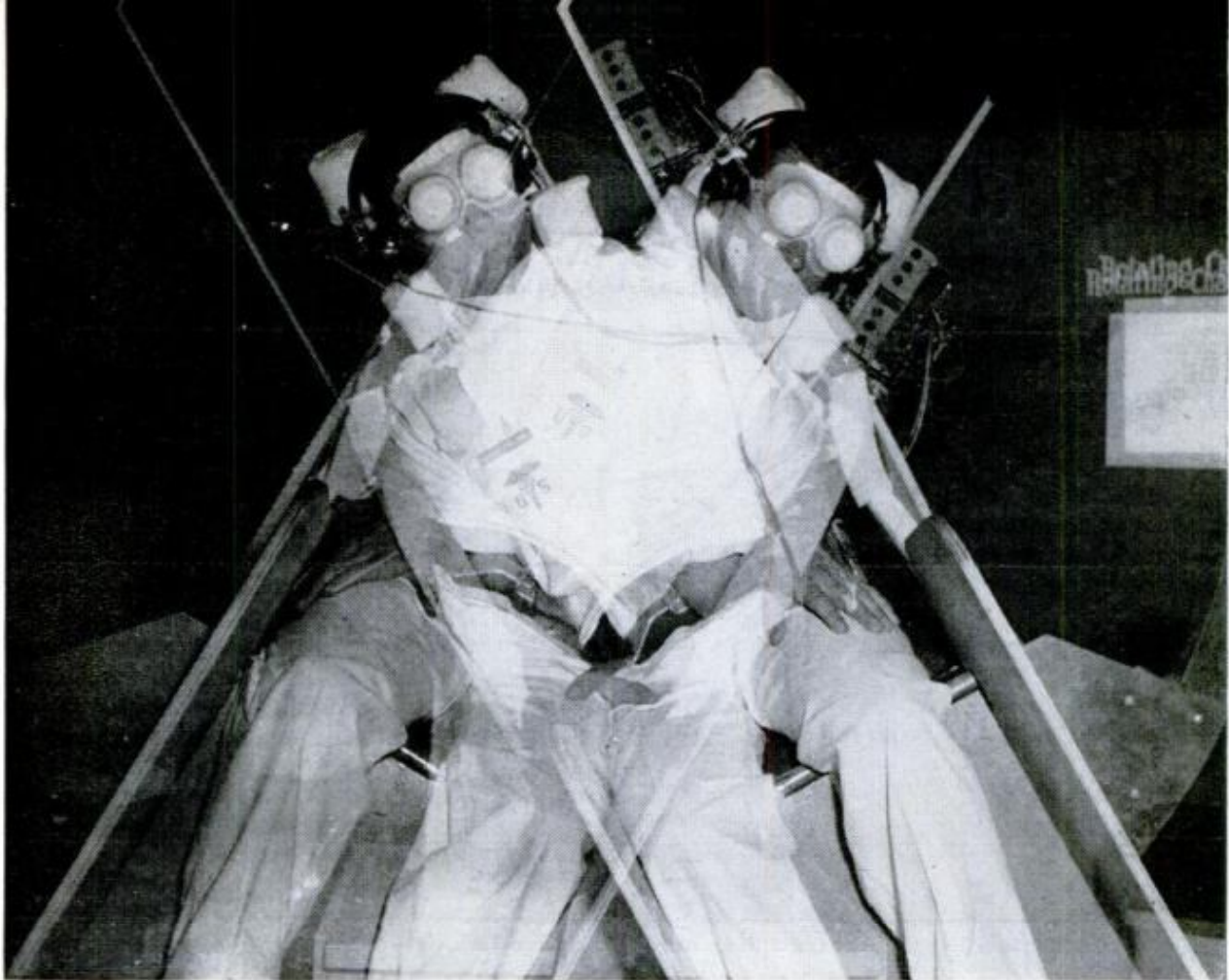
When a plastic ball (furnished) is rolled into a new toy, it is thrown right back by a spring mechanism which has settings for both long and short throws.

The Popzaball (manufactured by Mattel, Inc., 5150 Rosecrans, Hawthorne, Calif.) is expected to be as popular with sore-armed fathers as with their tireless youngsters.

The kit includes a target (shown) which can be used to play a variety of games. List is \$7.

☐ The smallest atoms that have been measured are less than four billionths of an inch across.

☐ Though a porcupine moves slowly by nature, it can run as fast as a man for short distances.



Here's the Air Force Version of Rock 'n' Roll

This double-exposure picture shows a blindfolded Air Force test subject being tilted in two directions while revolving in a special chair at the School of Aviation Medicine at Brooks Air Force Base, Tex.

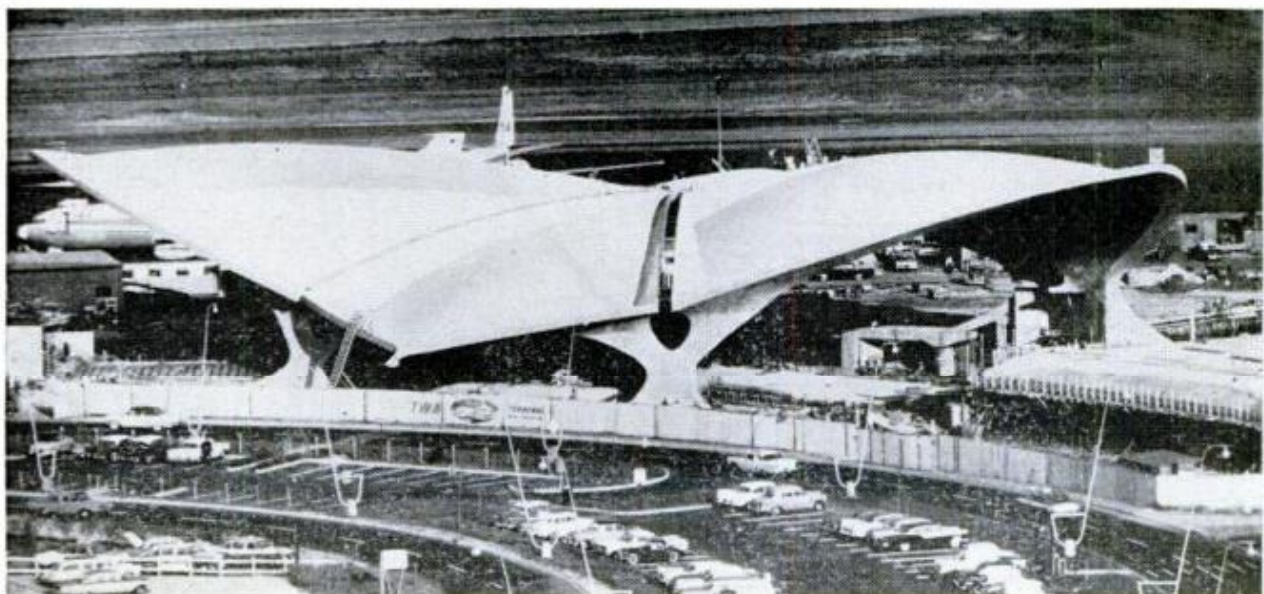
The apparatus is used to study man's reactions to spatial disorientation. The chair rotates at 18 revolutions per minute and can be tilted electrically to 30 degrees from the vertical at the same time.

Concrete Sculpture Forms Roof of Air Terminal

While an observer from the air might mistake the new TWA terminal at Idlewild Airport for a gigantic airplane ready to take off, the knowledgeable visitor will see a flowing design that makes spectacular use

of new techniques in concrete construction.

The New York terminal has a concrete roof ranging in thickness from eight inches at the edges to 44 inches at centerplate. The shell is supported by four buttresses.



PM Tests Volkswagen's



WHEELING THE VW 1500 through this tight curve at 30 miles per hour produced moderate body lean and considerable tire scrub, but car had absolutely no inclination to break loose in dangerous oversteer

NOW THERE ARE TWO. After 23 years of development, production and refinement of one basic model, Volkswagen has brought out a second series, (PM, July '61, p. 81) to be known as the VW 1500.

This new car will go on sale in Germany this autumn, initially in two-door sedan and two-door wagon models. A convertible is set to follow.

Let's hasten to add that there is no thought on Volkswagen's part of abandoning the world-renowned "beetle" (No. 113) which the company likes to call "The Volkswagen" to set it apart from the new "VW 1500." As a matter of fact, there are no announced plans for bringing the VW 1500 into the North American market.

The new model is intended primarily to provide a "step-up" car for motorists in newly prosperous European nations who can afford a bit more car than the current model.

Up 'til now Volkswagen owners who wanted more performance, more elbow room or more luxury, have had to turn to

OPTIONAL SUN-ROOF on VW 1500 glides back into its hiding place smoothly and easily at turn of crank

an Opal, a Taunus or another competitor.

The VW 1500 should suit these people perfectly. In many ways it's a good deal more car than the current classic (dare we say it?) model. But it is not a better car in the sense that it provides any more-efficient transportation than the beloved "beetle."

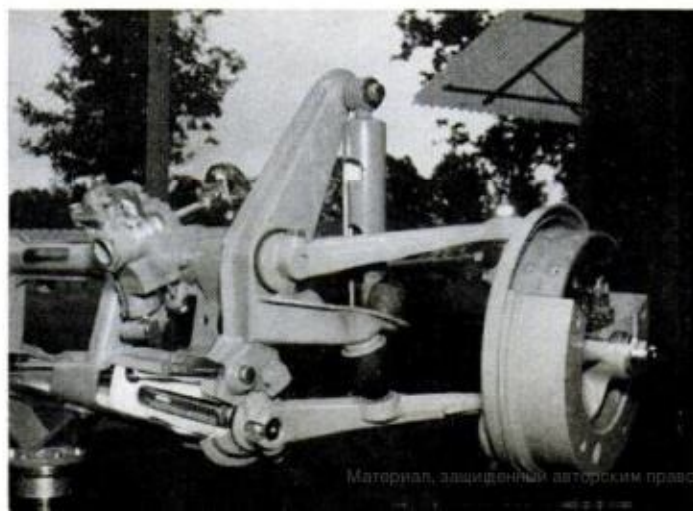
In appearance, of course, there is a startling difference. Those who expected the new car's styling to mirror the present VW's Gothic slopes were disappointed.

Except for the familiar interlocking VW letter insignia on hood and hub caps, there's little clue as to the family relationship. The 1500 might very well have been styled in Stockholm, Turin, Coventry or even Detroit.

The 1500 is neither sleek nor exciting—these qualities have been saved for a new Karmann Ghia. There's nothing of Jaguar or Lancia in the VW 1500, but it grows on you.

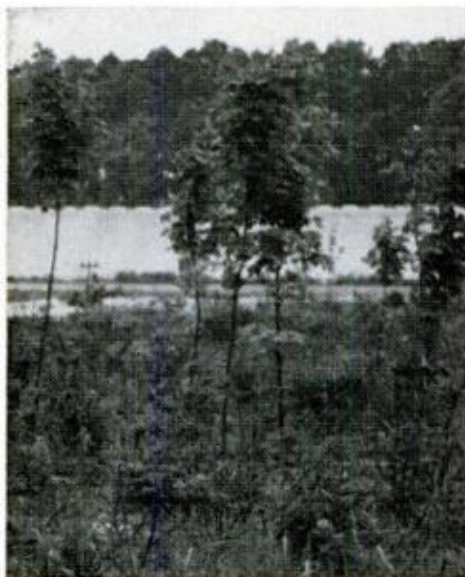
The more we looked at it the more we liked it. The VW 1500 has the simple elegance of Danish modern furniture.

CROSSED TORSION BARS act through lower trailing arms of front suspension. Antiroll bar is on upper arms



New 1500

By Jim Whipple



THERE'VE BEEN SOME CHANGES MADE in the world's most famous automotive shape. The "beetle," left, poses with its new running mate the VW 1500

Or course, the car could have been made to look sleeker at the cost of comfortable seat height and headroom, or more imposing by adding extra sheet metal fore and aft. But this sort of nonfunctional "stylishness" is as foreign to VW thinking as a hula hoop in church.

The most obvious change, of course, is the full-width body which provides 50-inch shoulderroom front and rear and 53 inches of hiproom in the rear seat.

The rear seat incidentally, is contoured to position two passengers on either side of the folding center armrest. With the armrest up, three 180-lb. men can sit back there and still have plenty of room for their legs—making this a snug but workable five-passenger car.

Up front there are two individual chair (not true bucket) seats, also contoured to position driver and passenger. Both front seats are adjustable on a four-inch fore-and-aft travel and both have backrests that have knob-controlled variable tilt.

Front seats are a comfortable 12½ inches

off the floor with a generous 44 inches of legroom. Front headroom is 35½ inches which is ample for over six footers. Rear headroom is two inches less—a hats-off situation for tall men.

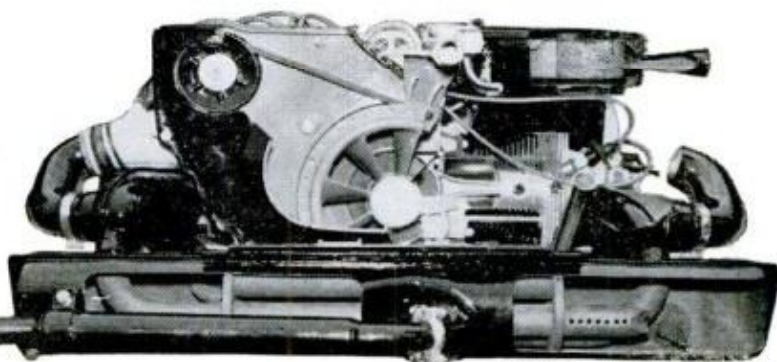
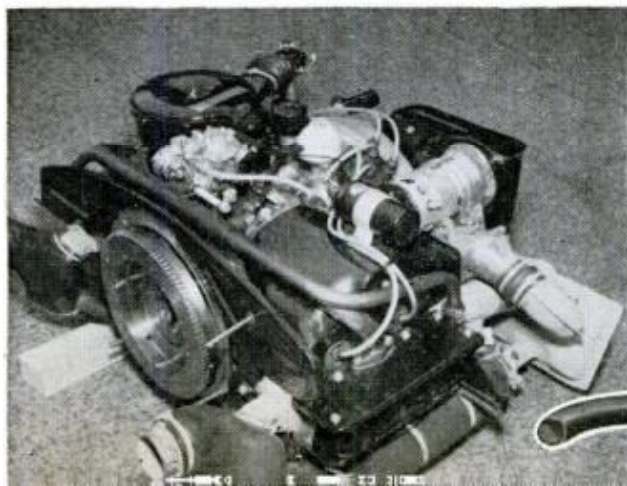
The plastic upholstery is pleasantly firm, and the critical front-to-rear cushion measure equals that of the BOP compacts.

This generously-sized passenger compartment goes on the same 94.5-inch wheelbase of the current model. However, the VW 1500 is 6 inches longer and 2½ inches wider than the No. 113. At 1896 lb. it weighs 265 pounds more. The weight is distributed 43 percent on the front wheels and 57 percent on the rear.

One problem that has always plagued VW owners has been the lack of enough luggage space. Many people have made their living producing roof-top racks for the current car.

With the VW 1500, however, the luggage problem may be solved for many by the two luggage compartments. The one in front, larger than on the No. 113, is over the gas

SUITCASE ENGINE of the VW 1500 is a marvel of space-saving engineering. Top view, left, shows how air cleaner sits beside the horizontal carburetor. Cutaway, right, shows crankshaft-driven blower, generator drive





FRONT TRUNK of VW 1500 measures 27 inches long by 41 inches wide at the rear, is 11 inches deep at rear. Cowl air intake can be seen at upper edge of trunk



REAR TRUNK is 9½ inches deep, runs back 41½ inches under rear deck and window, is 36 inches wide. Oil dipstick and filler is located on trunk's rear rim



DOOR TRIPS LATCH (when closed) which works through cable to lock front seat-back upright for safety. Handwheel, at left, adjusts seat-back rake

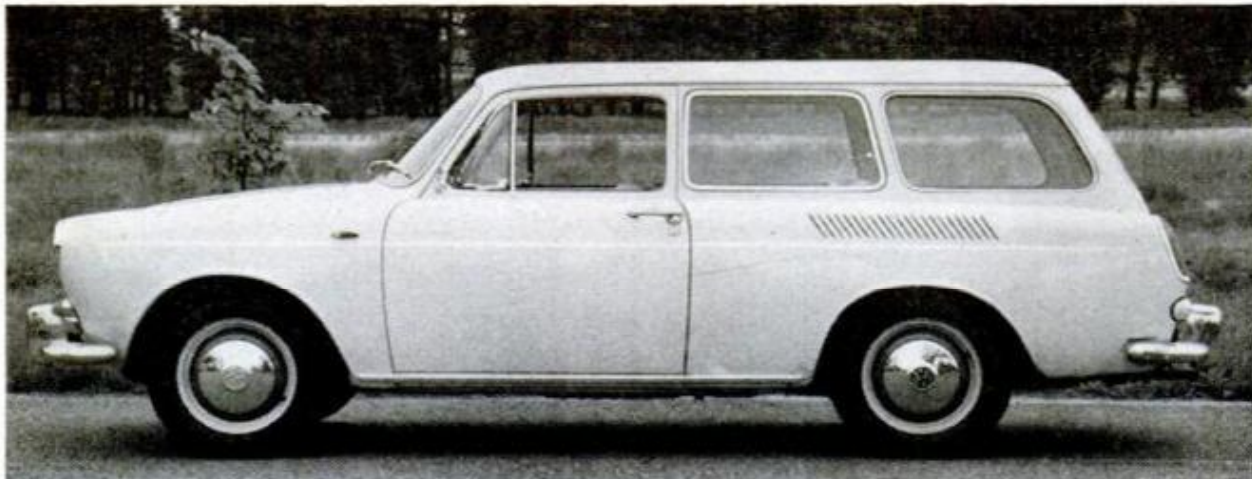
tank, and there's another in the rear, above the "suitcase" engine (see photos). Both trunks are neatly lined to make luggage scratchproof.

The engine compartment is covered with a latched, insulated hatchway that's gasket-sealed. Engine cooling air comes around from slots at the base of the back window past the sides of the metal luggage bin down through an air duct below sill of trunk door, and through a rubber "boot" into the fan housing and hence through the blower into the ductwork and over the top of the engine. A new blower mounts on the end of the crankshaft. It forces air around the oil cooler, which is flat-mounted, and down over the engine and out through ducts beneath.

There is no thermostat to shut down the flow of air. VW engineers say that the ther-

(Continued to page 286)

AT LAST a wagon for folks who like Volkswagens. It's an alternate body style to VW 1500 sedan. It has one-piece, top-hinged tailgate, and side windows that swing out like the sedan's for rear-seat ventilation



Engine With Built-In Wings

*It can thrust itself, and heavy loads,
in any direction — including straight up!*

By Richard F. Dempewolff

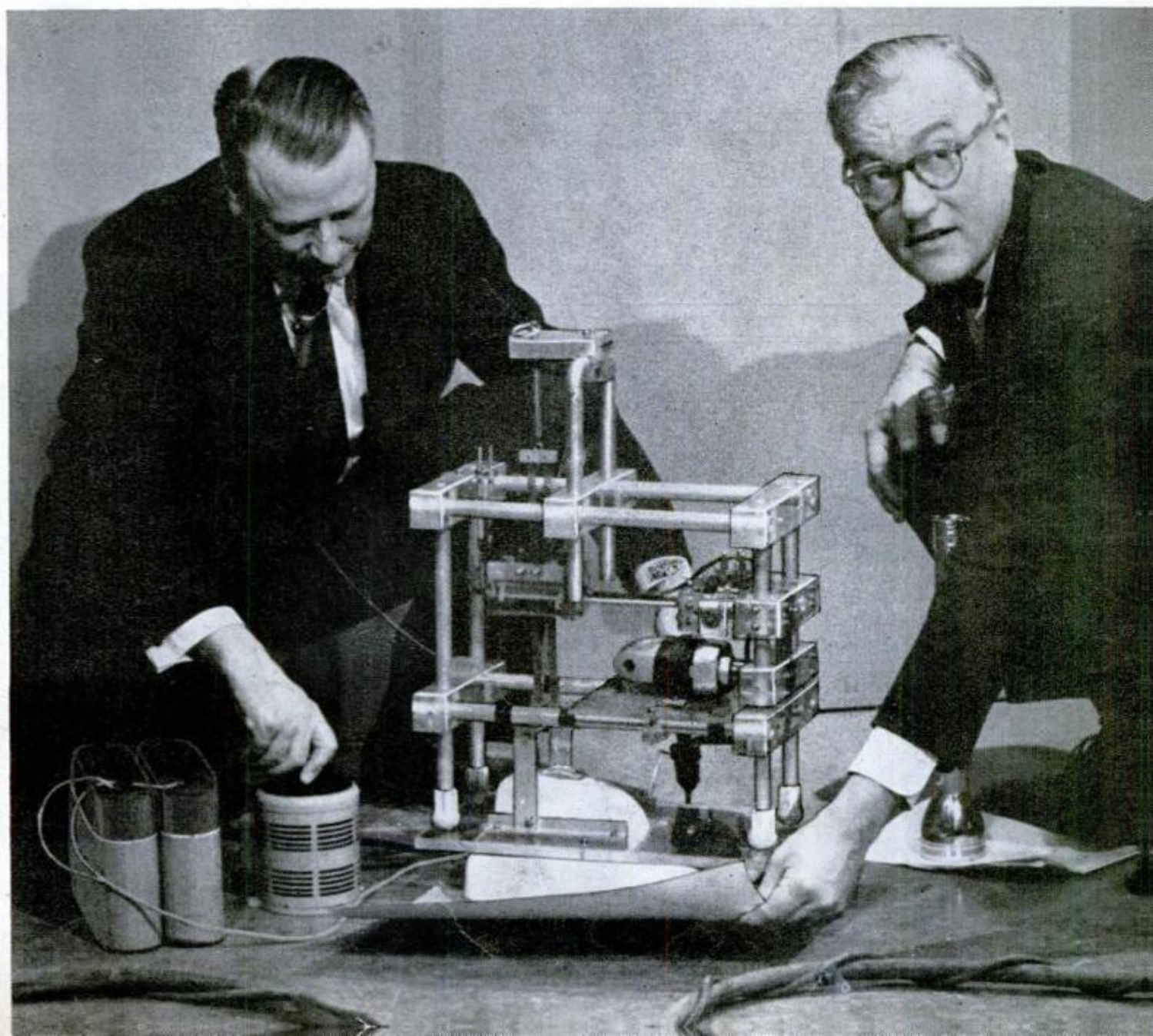


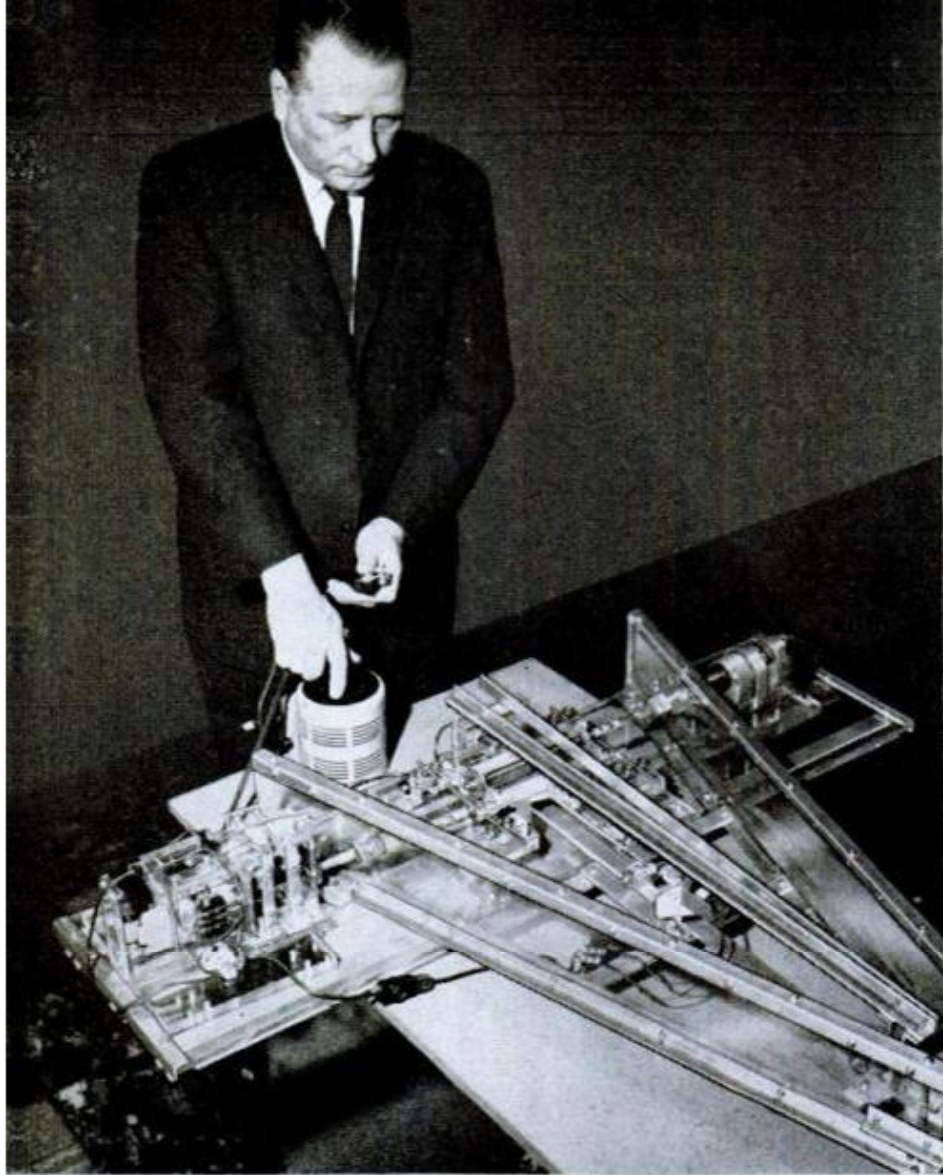
NORMAN L. DEAN unlocked a heavy door in his Victorian house, in Washington, D. C., and led the way into a barren room. A workbench stretched along one wall.

"This is my laboratory," he explained, "and there is the newest prototype of the Space Drive System."

Three brass chains, hanging from the ceiling in the center of the room, held a V-shaped structure of clear Plexiglas a few inches above the floor. It was framed in polished aluminum; the broad end contained motors,

PROPELLED by Norman Dean's "rotating mass" engine, a truck could deliver goods to any floor of a building. Inventor, left, demonstrates a model engine that has lifted itself so paper can be slid under it



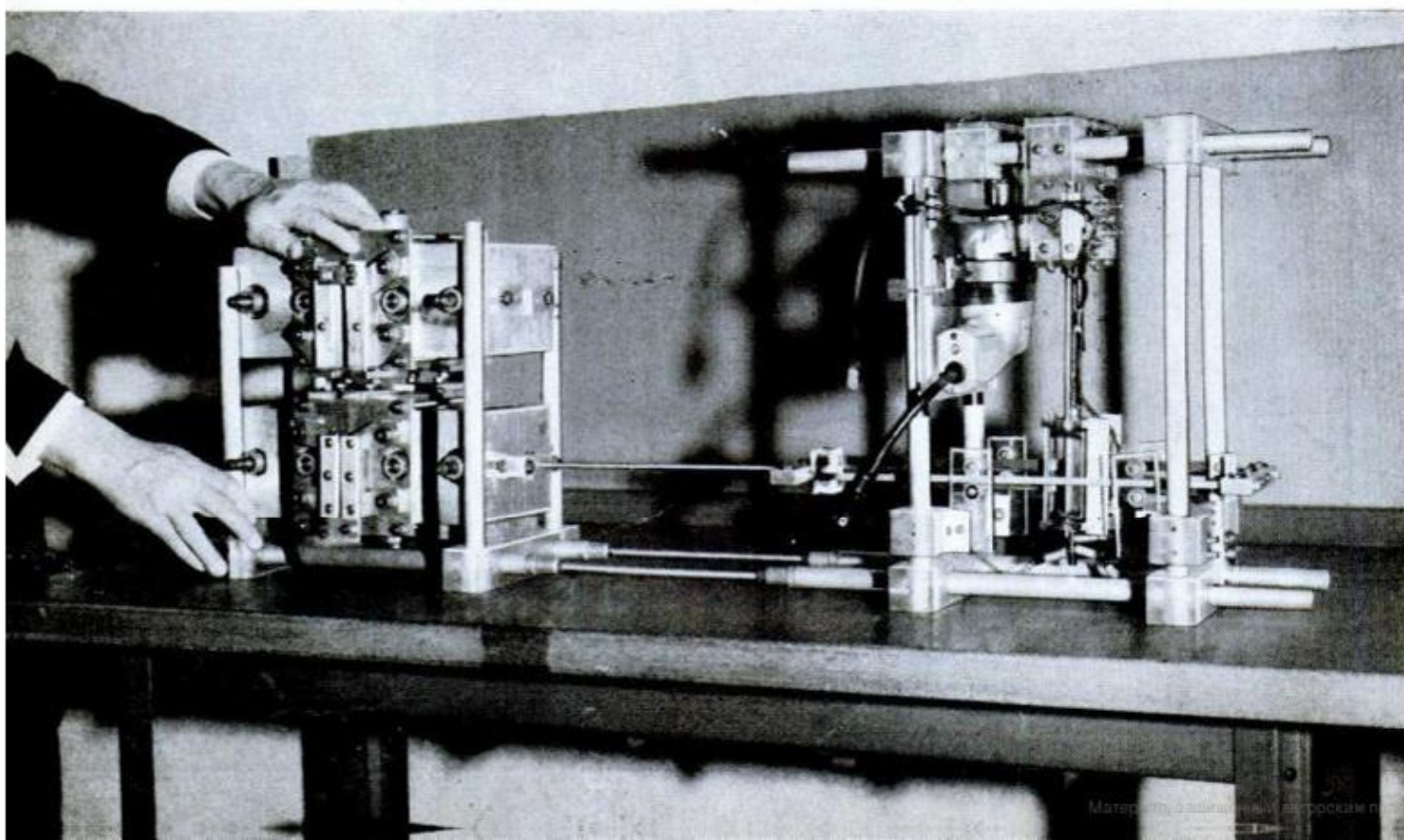


ANCHORLESS WINCH will not only move in any direction in which it is pointed, it also will remain still while pulling loads to it.

ONE PAIR of counter-rotating weights suspended in the framework at right provides enough thrust to move the entire engine along the top of a table—and to pull a weighted 25-pound load, left, along with it.



FUTURE APPLICATIONS: The propulsion system would let a truck move over a swamp; its force could be used to push down walls quickly, easily.



machined brass, steel and aluminum, and a maze of wiring.

I was gazing at what may be the most revolutionary concept in propulsion systems ever devised. The principle employed in the V-shaped framework would enable it to move itself and formidable loads forward, backward, sideways, straight up, or you name it and that's where it will go.

"This model is a version of a commercial anchorless winch," Dean said. "It was built spread out behind windows so engineers can see what goes on inside, and why. It demonstrates the basic principle of the system: *Rotating masses, which are the heart of the mechanism, can be made to exert a force in one direction only.* It also demonstrates a number of things that can be done with this force, as do the other versions of the system you see on the workbench."

Dean's models not only show a net output of one-directional force on instruments—much to the consternation of some engineers who have refused to believe the mathematics of his system—but they also work in actuality. Not long ago, one multiple unit lifted its own weight right off the floor and stayed relatively weightless while the masses inside rotated. Others, not designed to do anything but exert a suggestion of one-directional thrust for measurement by instruments, have brought their weight to zero. Any one of them could, and some did, creep across the lab floor pushing or dragging loads.

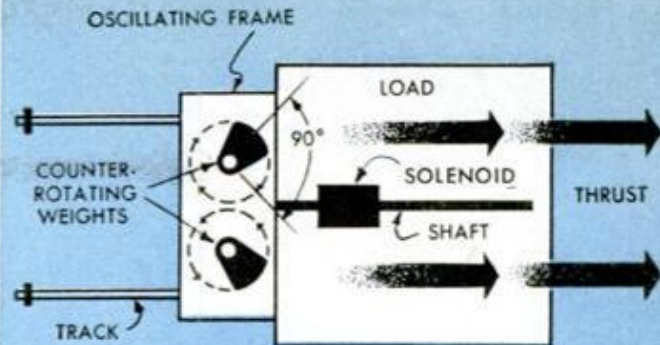
While I watched, Dean attached an 18-pound load of boards to a set of skids on the floor. He fastened the skids to the V-shaped machine with a rod. Another rod, on the load of wood, held an index pointer that was lined up with a plumb bob hanging from the top of the framework. A second plumb bob was lined up with the two back chains.

"We'll run it slowly so you can see what happens," Dean said. He closed two switches, turned up a rheostat, and everything came alive inside the unit. Eccentric rotors began to spin and oscillate. Solenoids snapped. The load of boards began to move across the floor.

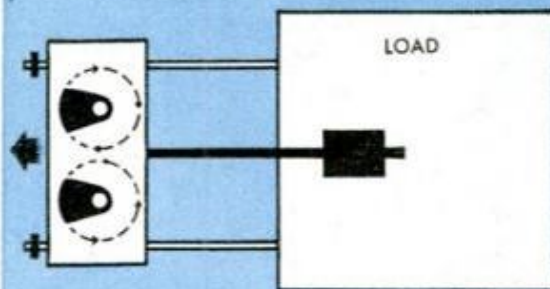
Incredibly, though it still hung suspended like a pendulum from those three chains, the V-shaped unit remained still. The chains stayed in alignment with the plumb bob.

"The forces generated in the machine are exerted on the load in one direction," explained Dean, "but you can see there is no reaction on the machine. The reaction is being taken up by the system itself.

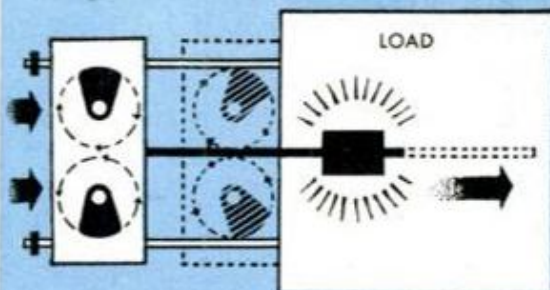
THIS DIAGRAM shows, in plan view, how the system functions during four basic steps in a single cycle



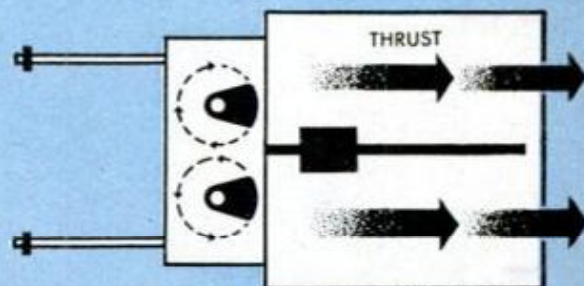
THROUGH 90° OF FORWARD SWING ROTORS THRUST AGAINST LOAD AND MOVE IT FORWARD



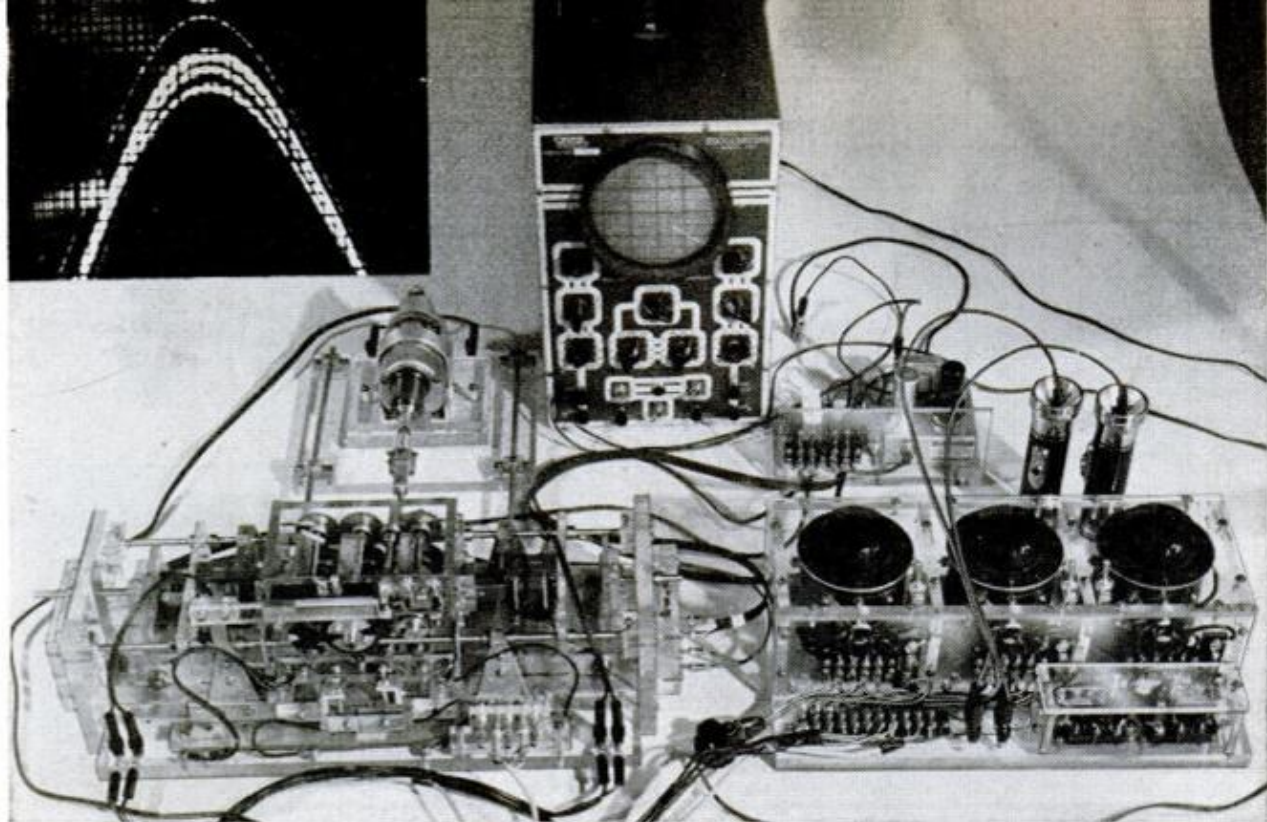
ON BACK SWING ROTORS THRUST OSCILLATING FRAME BACK ON TRACKS



AT START OF NEXT REVOLUTION, ACTIVATED SOLENOID PULLS FRAME AGAINST LOAD SO THAT CENTRIFUGAL FORCE CAN AGAIN THRUST LOAD FORWARD



FOR 90° OF FORWARD SWING, ENTIRE ASSEMBLY MOVES FORWARD AGAIN



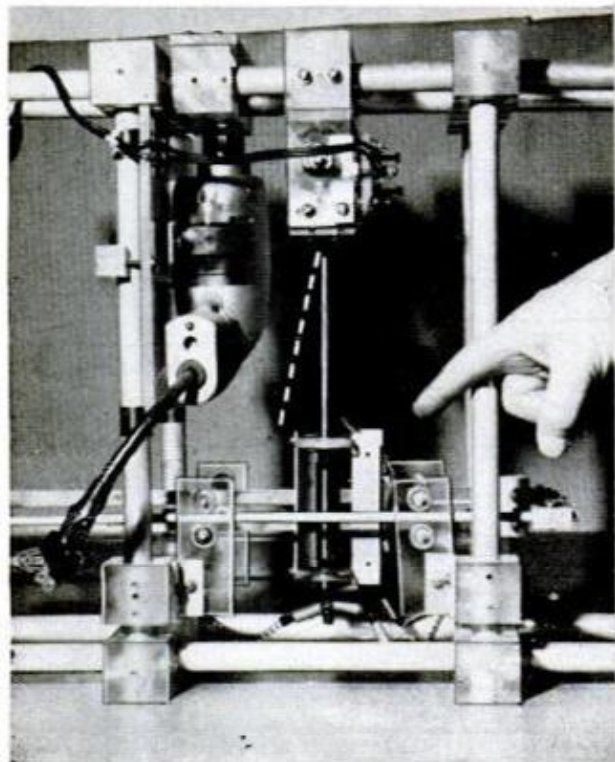
DEAN'S PROTOTYPES have been built for testing with instruments. The oscillograph, top left, which shows a net output of directional force, was obtained by this complex setup. Engine is left, control equipment right

If it weren't, the machine and load would have to move toward each other. Instead, the load moves toward the free-hanging machine."

An anchorless winch, using this system, could pull down a tree without exerting force on the man who held it, Dean pointed out.

"Now watch," he said, fastening two

COUNTER-ROTATING masses are enclosed within frame at the bottom of the vertical driveshaft. Wedge-shaped eccentrics rotate in a vertical plane



metal rods to the load so that their ends just touched the machine—like a pair of prods. "This time, when the load moves forward, the machine will have to move, too."

He flipped the control switches and turned up the rheostat. The load moved forward, its chain supports describing an angle against the plumb bob. "The machine itself, while operating, has become part of the load," Dean explained. "It will work the same way whether it is at the bottom of the ocean, on the face of the moon, or in interstellar space. All it needs is an energy source.

"Imagine a truck using this kind of drive," he said. "No power transmission to the wheels would be needed. You could drive anywhere on any surface. Turn the force direction upward, and you'd lift the vehicle as high as you wanted, then let it down fast or gently. Your foot on the accelerator would control speed in any direction."

Dean is a precisely groomed gentleman who looks like anything but an inventor. In fact, in his workaday capacity, he is a real estate mortgage expert, and Assistant Chief Appraiser for the Federal Housing Administration. For some time though he has spent his spare hours in testing ideas resulting from his interest in the relationships of physical laws. The concept for the space drive was born some 13 years ago as he grew curious about the dynamics of rotating masses. The result of his curiosity is a set of patents on "A System for Con-

(Continued to page 264)

Trailer Totes Chambermaid

For those whose idea of "roughing it" includes the addition of an upstairs maid, the French have designed a trailer with an upstairs room. Called the Digue, it is furnished in the latest deluxe fashion and affords complete separation of living and servant's quarters. For those without a maid, it might do very well as a place in which to sleep an overflow of youngsters.



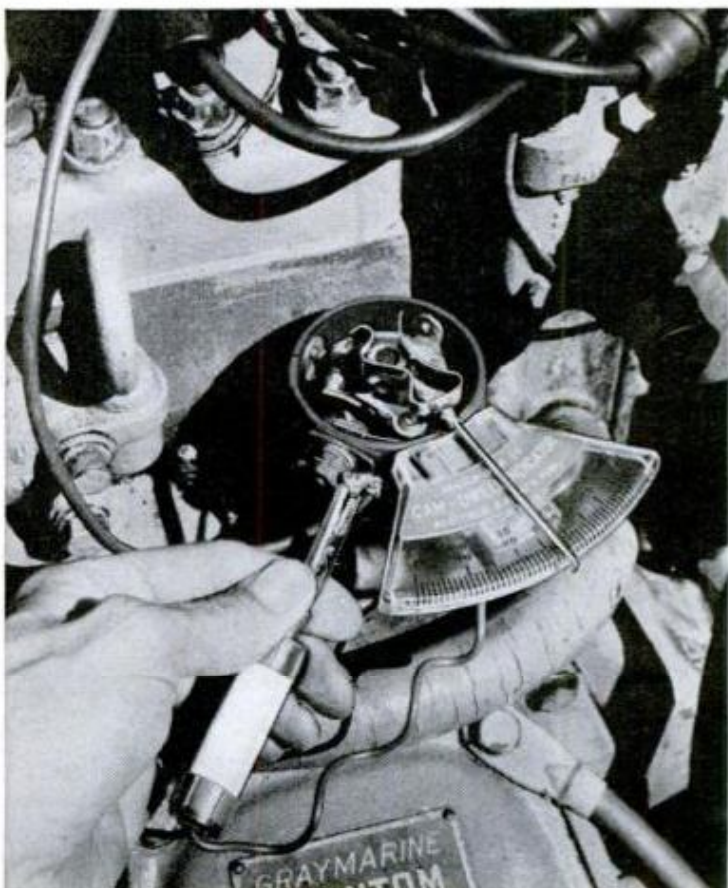
Lunar-Landing Cushion

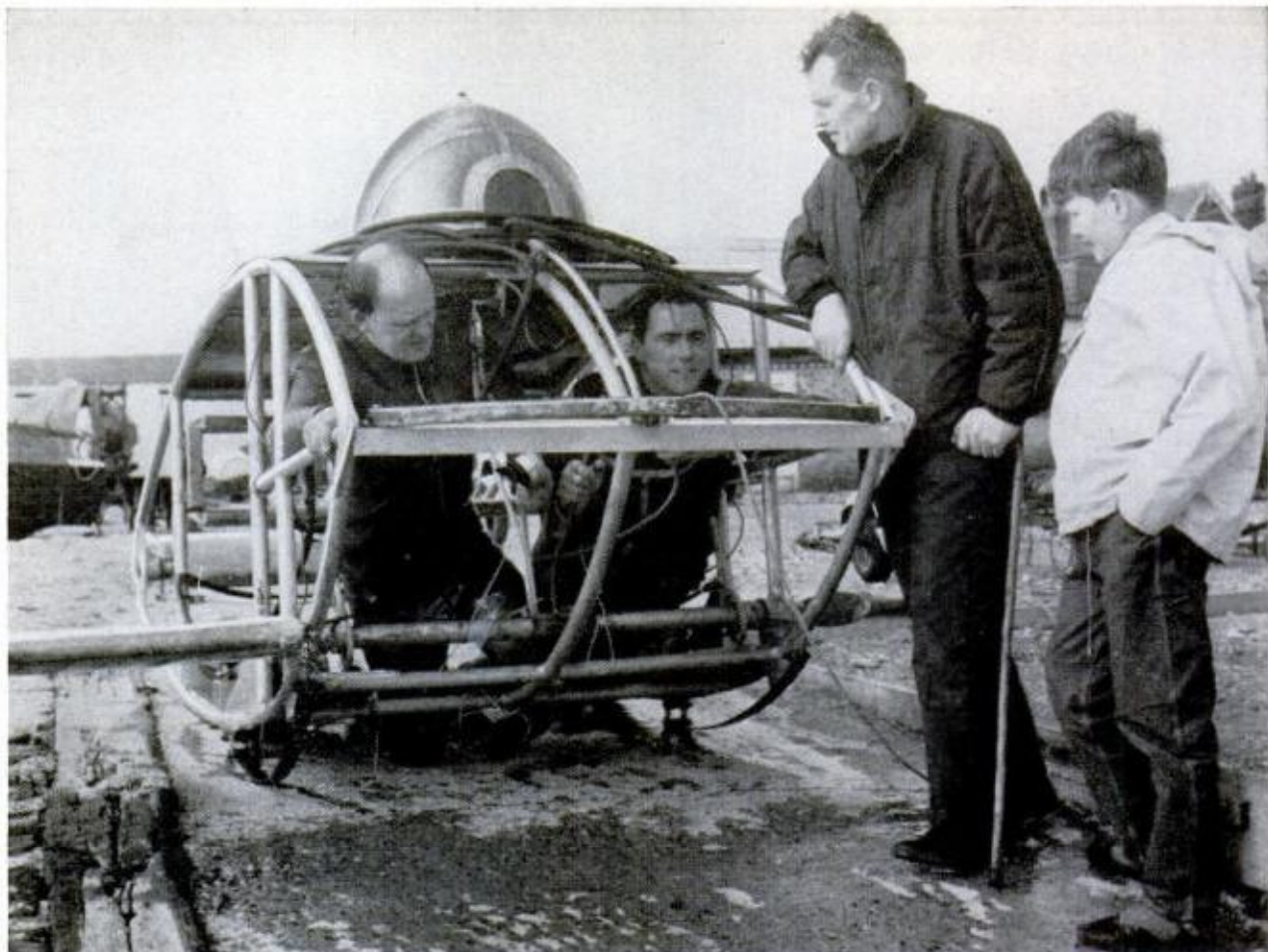
To provide spaceships with a soft landing on the moon and other spatial ports of call, the Goodyear Aircraft Corporation proposes that a special shock-absorbing cushion be used—presumably on the ship's tail end. Already subjected to extensive torture tests, the inflatable doughnut-shaped fabric decelerator consists of a series of separate compartments, each inflatable independently of the others. Sections absorbing the main weight of the vehicle and the greatest percentage of shock, would "give" by partial deflation, minimizing bounce and chances of upset.



Cam-Dwell Indicator

Service mechanics and Saturday tune-up experts may be interested in a pocket-sized cam-dwell indicator which allows dwell adjustments to be made without removal of the distributor from its mounting. With an indicator arm fitted onto the shaft and a protractor set on the housing, the housing is loosened and rotated until the distributor breaker points are closed and the unit's bulb lights up. Continued rotation will move the rubbing block flush with a lobe, forcing the points open again. By moving the pointer to one of the zero markings on the protractor and continuing rotation through one complete cam dwell, the degrees of dwell will be indicated by the sweep of the arm across the protractor. Point adjustments can then be made to compensate for worn lobes. Manufacturer—Arnold Manufacturing Co., 610 E. North Ave., Westfield, New Jersey.



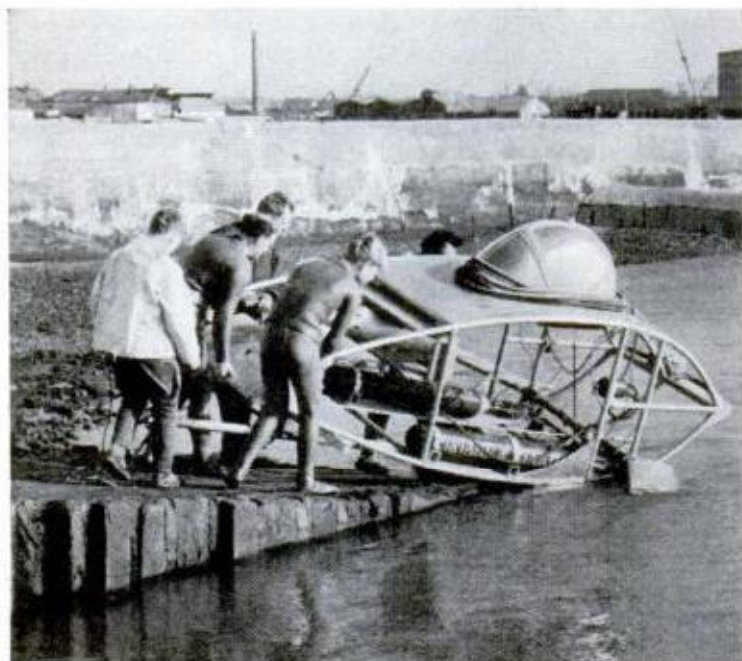


COMMANDER BROOKS (with cane, above) supervises sea trials of his "mobell." The crippled British Navy veteran, who was a submarine crew member in World War II, hopes to have his craft manufactured in the U.S.

Mobile Diving Bell Carries Two Skindivers

Designed by British naval veteran Joe Brooks as a vehicle for underwater salvage and sea-bed farming operations, a new mobile diving bell tours the undersea world with the flexibility of a helicopter. Driven by an electric motor and trimmed and

steered by hydroplanes, the craft's buoyancy is controlled by the amount of air released from tanks into the flotation dome at the top. It carries two men in scuba diving gear. Production models will have a metal skin.





ICBM Container-Erector

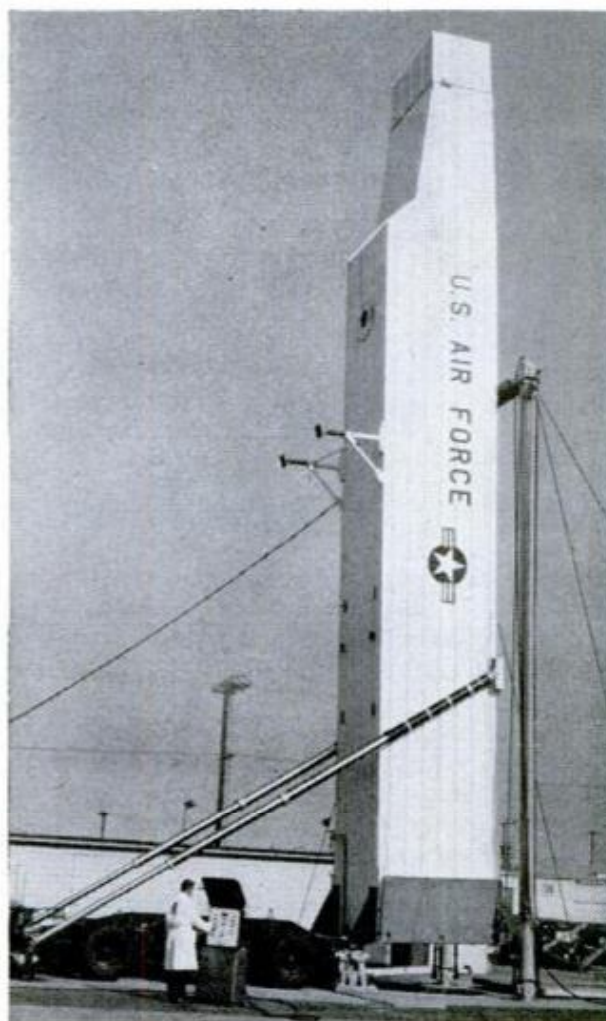
Minuteman ICBMs can be transported to their underground silo sites, erected to an upright position and lowered into the silo with a 63-foot long container.

At the site, the container is raised by two erector-actuators operated from a control panel (top, foreground). When upright, a hydraulically powered hoist, capable of handling 50 tons, lowers the missile into its underground launch site.

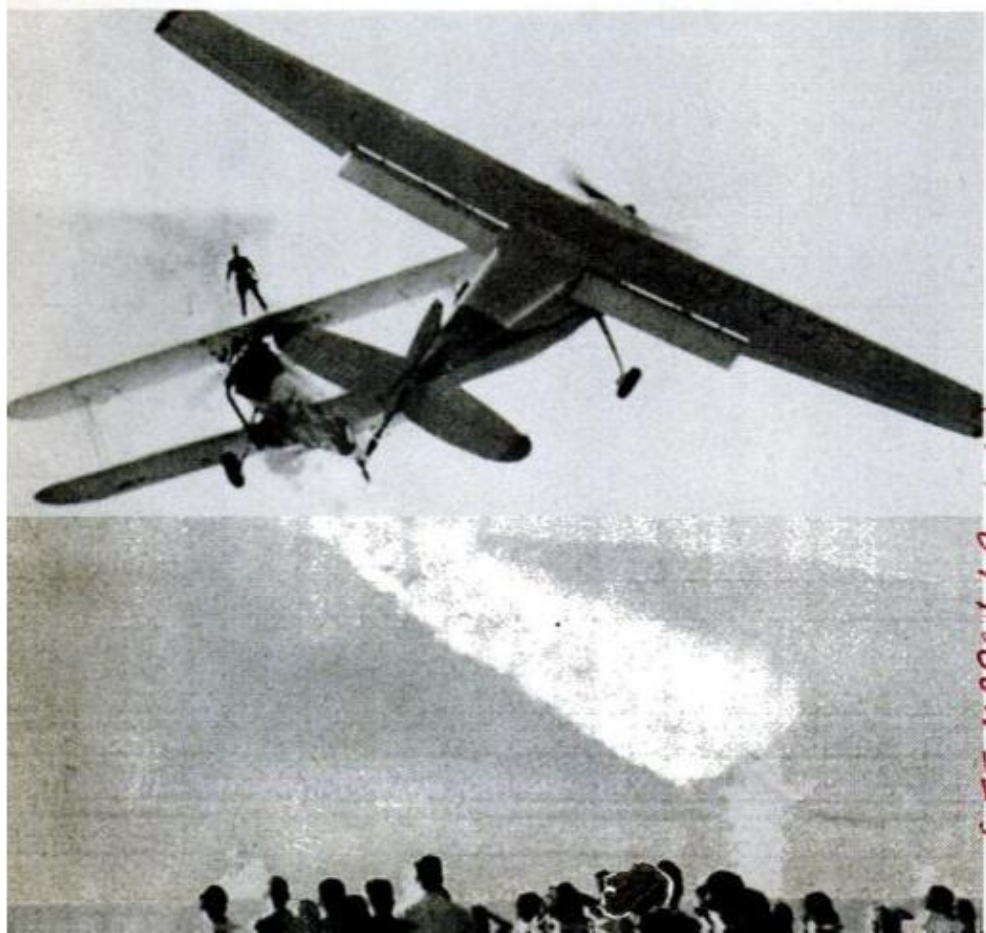
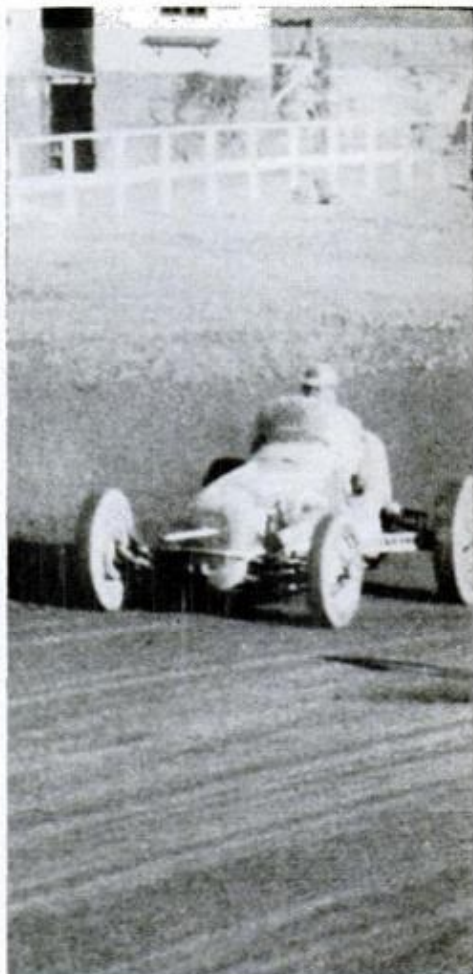


Pen Gun Fires Distress Flares

Based on the familiar pen-sized tear-gas gun, a new flare launcher uses rifle flares to fire a 5000-candlepower distress signal 150 feet in the air. It'll shoot gas cartridges, too. Costs \$8.95 with two rounds, from Penguin Associates, Devon A1, Penn.



Plan for Peak-

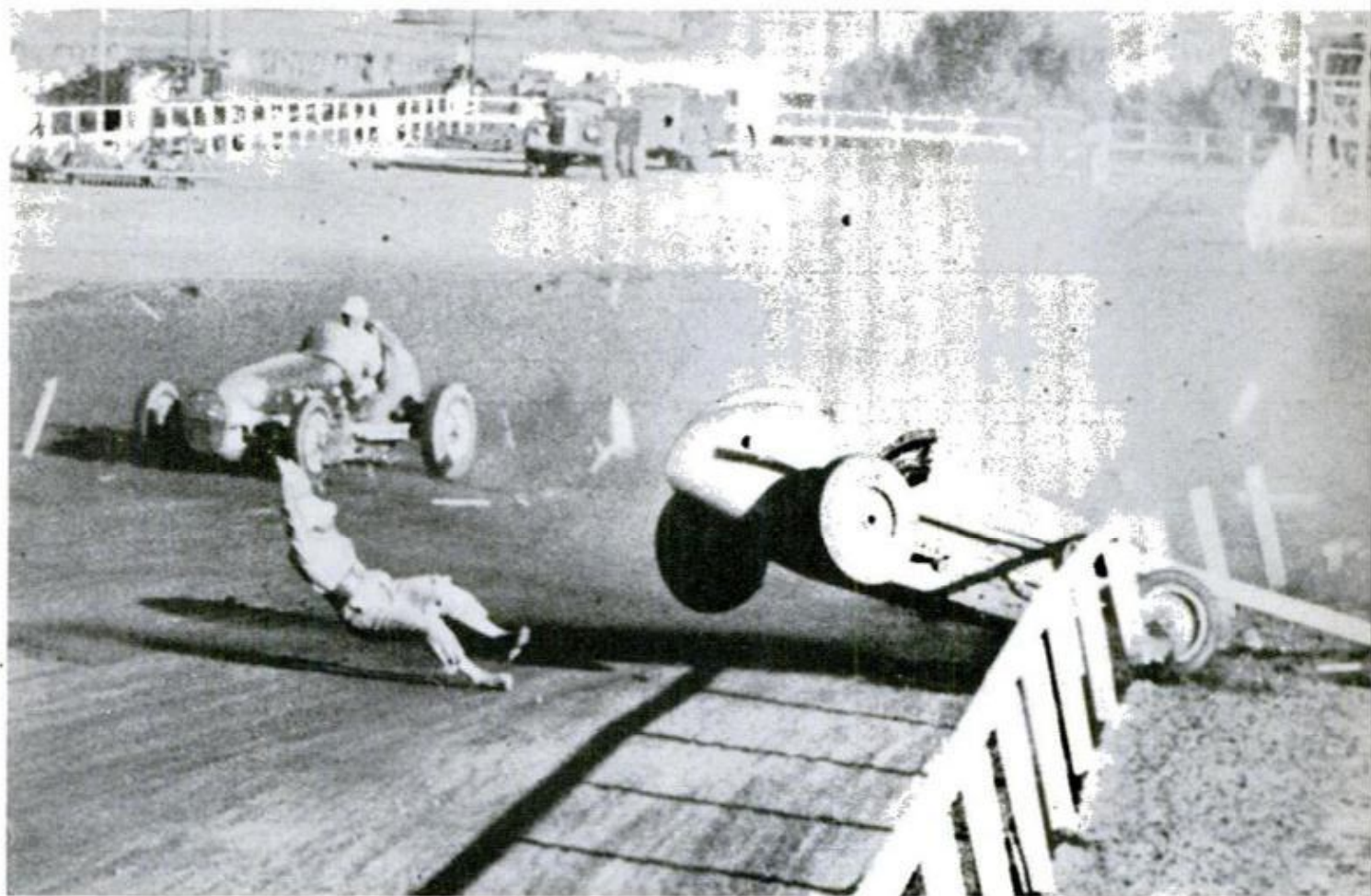


PULITZER PRIZE was awarded Japanese photographer who took dramatic picture of assassination of Socialist leader, Inejiro Asanuma, by fanatic student. If photographer had shot fraction of section before or after, he'd have missed peak action

PUBLIC EVENTS are fair game for amateur photographers who have as good a chance as pros at action. This one, however, was snapped by newspaper photographer who picked peak moment as two planes, one with woman doing wing stand, nearly collided

(SEE MARCH 6 & 7, p. 10)

Action Pictures



SPECTACULAR CRASHES go to photographer who is in right position and ready to shoot. News photographer recorded death of racer Rex Mays by being prefocused on start of backstretch where cars begin straightening out after turn. Amateurs have good chance to get crash pictures at county fairs and stock-car races

ONCE-IN-A-LIFETIME pictures can be taken by anyone with a camera. Some of the all-time classics were shot by amateurs.

Remember the sinking of the SS *Vestris* and the picture of the struggling crew on the tilted deck, the look of fear on one man's face and, in the background, another man with his arms folded in prayer? It was taken by a seaman with an \$8.50 folding Kodak.

Most of the great ones, however, were shot by professionals. The only reason they didn't get all of them is that they weren't there when all of them happened. An amateur was. Luck is the great leveler among photographers. But if luck shines equally on the amateur and the pro, the pro will probably get the better picture.

Why? Because the professional plans his luck.

So can you. You can study your equipment and develop your technique to handle all of the important pictures that luck is likely to bring you—with, perhaps, one exception. Some pictures take courage, and no man can give it to you. What photographer would stand still and take a picture of a man who was trying to kill him? Howard

By
Tom Shafer

30-YEAR veteran of United Press-International, who has photographed some of the world's greats like Gen. Douglas MacArthur, author Tom Shafer offers tips to amateurs



It Sometimes Takes Guts to



OIL-TANK EXPLOSION sent some photographers scurrying for safety, but *Chicago Tribune's* John Austad stood his ground and shot with this spectacular result. Debris in foreground is from earlier explosion in costly refinery fire at Whiting, Ind.



CHIMNEY COLLAPSE caught workman unaware. As he raced for his life, photographer captured scene. Note in this picture and one at left, if photographers had missed the figures they would have killed the impact. Cover figures up, and see the difference

DALLAS TORNADO (right) became one of best photographed in history because, when it whirled into city and residents fled to cellars, photographers raced to roof tops to record it on film. In this shot, tornado is less than a mile away. Nature's rampages are available to all photographers who have guts to face them

Jones of the *Knoxville Journal* did—and got the picture (see page 142).

But courage aside, three elements will prepare you for capturing the peak moment of most situations—studying your equipment, practicing technique, and planning.

There is no excuse for not knowing your equipment, and the only explanation is laziness. Equipment varies too much to go into detail here, but I can offer you this tip: Use only one film and learn basic settings.

Ideally, each picture should be focused

and exposed individually, but often the action happens too fast. Using one “bread and butter” film, you’ll get to know instinctively what exposure it requires under all lighting conditions. All that’s left is focus.

In action photography most pros will pre-focus their cameras by the footage scale at 10, 15, 25, 35 or 50 feet, then wait until the action moves into range or move where the action is. With practice you’ll find that a few *basic* settings will cover all situations.

Stand There and Shoot...



When that happens you're ready for technique, and technique really needs practice.

Let's face it, the pros get more practice than you do, but it's the *kind* of practice you get that will teach you how to take pictures at the very peak of the action.

Try a simple picture of a friend talking. Real nothing, isn't it? Ah, but wait until he points his finger or raises an eyebrow. This is what will lift it out of the ordinary, and this is what the pros aim at.

Catch on? Routine actions will only make

routine pictures unless you catch them at a peak moment. Try a baseball game, even a Little League game. Don't just shoot haphazardly and, like most amateurs, "hope they turn out." Shoot at something definite, like the moment the ball leaves the pitcher's hand or the exact instant it hits the bat. See how close you come. If you're way off, keep practicing until you get it.

This is the essence of peak-action photography—knowing what you want and getting it on film.



Copyright by Knoxville Journal

PEAK-ACTION PHOTOGRAPHY reached its peak in this shocker (left) of an attempted murder. Staring down barrel of gun, newspaper photographer Howard Jones fired back with his camera. His assailant, en route to court to answer charges of drunken driving, objected to being photographed and fired four times. Jones (above) poses alongside marks indicating where two of the shots hit—and, fortunately, missed

To do this consistently, you've got to plan your luck. You've got to anticipate the action. You've got to think!

In predictable situations, it's relatively easy. In a scoring situation in baseball, focus on home plate. In a passing situation in football, get off the scrimmage line and move downfield. If a child drops her ice-cream cone, wait for the tears.

In unpredictable situations, it's much harder but much more rewarding. These situations produce most of the great pictures, and they happen only once.

Japanese photographer Yasushi Nagao had just one sheet of film left when a stu-

dent dashed on stage and stabbed the speaker at a political rally. With just seconds to make up his mind, Nagao waited until the assassin withdrew the sword and prepared to plunge it in again. It was a perfect picture.

Freddie Tschantre saw racer Rex Mays' car skidding, but waited until Mays was thrown from the car before shooting.

These guys were pros, but they applied the same principles that are available to you. If Lady Luck offers you that one big picture, you won't be ready for it unless you've studied your equipment and done some practicing on smaller things. ★ ★ ★

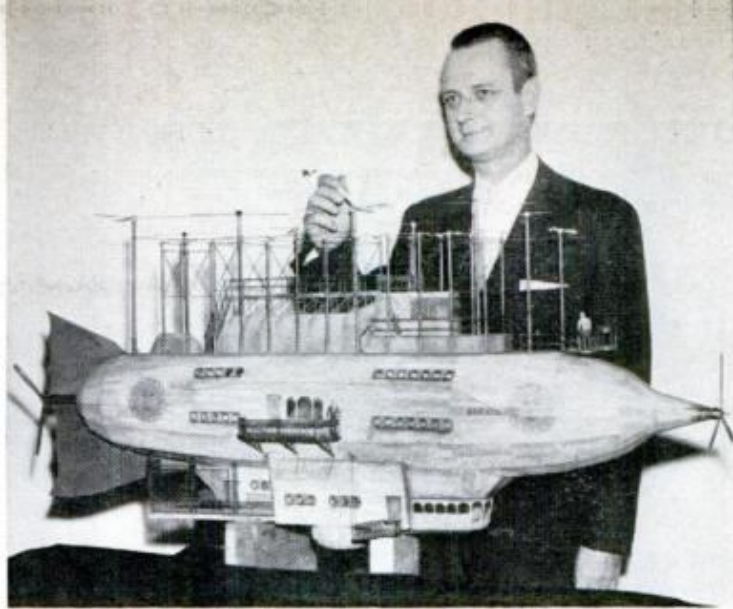


AUTHOR SHAFER, along with other photographers, was blocked by police from covering nursing-home fire. Shafer kept his eye on fellow photographer Steve Lasker, an aggressive type. Moments later, in "discussion" with police, Lasker got the old "heave-ho" and Shafer got his picture — by planning his luck

Jules Verne Airship Model

Described by Jules Verne more than 100 years ago in his novel, "Master of the World," the airship *Albatross* has been produced in a detailed working model for a movie film.

The model is lighted and has tiny electric motors to drive each of its 39 propellers, 37 of which are mounted vertically (for lift according to Verne), and one fore and another aft for propulsion "up to 200 miles per hour."



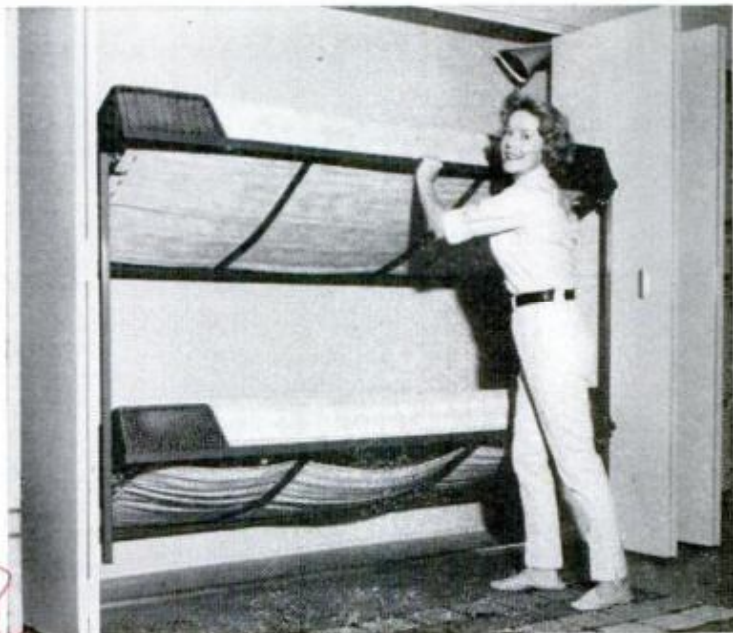
Twin Bunks Fold Into Wall

Hinged to the wall, twin bunk beds can be folded up during the day and hidden behind sliding doors in an alcove.

The beds can also be taken off their hinges and used side by side on the bedroom floor as conventional twin beds.

Available with or without the sliding-door compartment, the beds feature twin-size springs, square metal-tubing frames and plastic head and foot boards. A metal ladder (not shown) is used to reach the top bunk.

The beds are manufactured by Furniture Dynamics, Inc., P. O. 54114, Los Angeles 54, Calif.



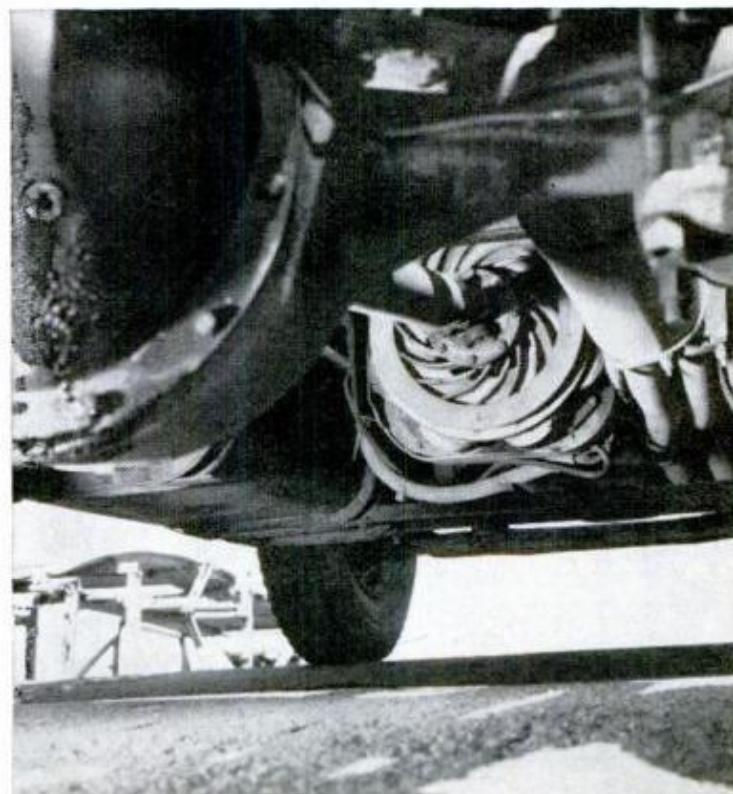
out of business

Electromagnetic Brake

With a new electromagnetic retarder, extra braking action for trucks and buses is supplied independently of the vehicle's air or hydraulic system.

The retarder consists of a coupling of two finned rotors run by the drive shaft, and an electromagnetic stator. For added or emergency braking power, battery current is switched in by the driver and eddy currents are created between the stator and rotors. With the stator locked to the vehicle frame, the eddy currents' retarding action is directed back to the drive shaft and thence to the wheels. This retards forward motion and, incidentally, contributes to reduced brake lining wear.

The unit is manufactured by Lear Industrial Products of Grand Rapids, Mich., under license to Compagnie Telma of Paris, France.



THE ATOM TAPS THE FOREST'S SECRETS

By James Nevin Miller

ATOMIC ENERGY, with its terrible implications of death and destruction, offers no nightmarish headaches to John Rediske, young scientist working at a forest research center in Centralia, Wash.

This is true despite the fact that he spends eight hours every day conducting important experiments with the aid of nuclear radiation. The "Caution! Radiation!" signs, prominently displayed on trees and laboratory walls throughout the timber-thick center, don't bother Rediske. The killing aspects of radioactive isotopes are taking a back seat to peaceful uses in his daily work, which aims to improve the lumber-producing qualities of trees.

Just the same, as an entirely new breed of scientist, a combination of atomic researcher and tree physiologist, John Rediske has a tough job. He must ferret out the innermost secrets of a growing tree. And in this connection he must answer four major questions. How may certain chemical compounds be used most effectively to stimulate tree growth? How may other chemicals be used to kill weed species without damaging the valuable timber? Can chemicals be introduced in growing lumber crops to prevent damage by insect, disease and animal pests? Can they improve germination and genetic makeup?

To help him find the answers, young Rediske has many tiny "atomic assistants" to send inside the test trees for a scientific look. They're called "identifiable radioactive tracers," and they're placed into the complex system of a tree to enable the scientist to follow their paths and evaluate their behavior.

In many cases this novel searching system provides the only practical approach to the solution of vital problems of tree nutri-



Fighting insect enemies

ATOMIC ENERGY is giving scientists new insight into trees, helping them develop chemical sprays that may kill harmful insects without damaging the forest

Mapping root systems

CUTAWAY SKETCH illustrates new technique of mapping tree's root system with atomic radiation. Picture at right shows technique in actual operation



POPULAR MECHANICS



with radioactive materials . . .

PILL BOXES, filled with bark beetles and dosed with radioactive strontium, are attached to tree barks. Beetles' activities can then be carefully traced

FOREST SCIENTISTS' work is divided between outdoor and indoor laboratories. Research center is in heart of timberland rich in pine and fir trees

with the aid of a Geiger counter . . .

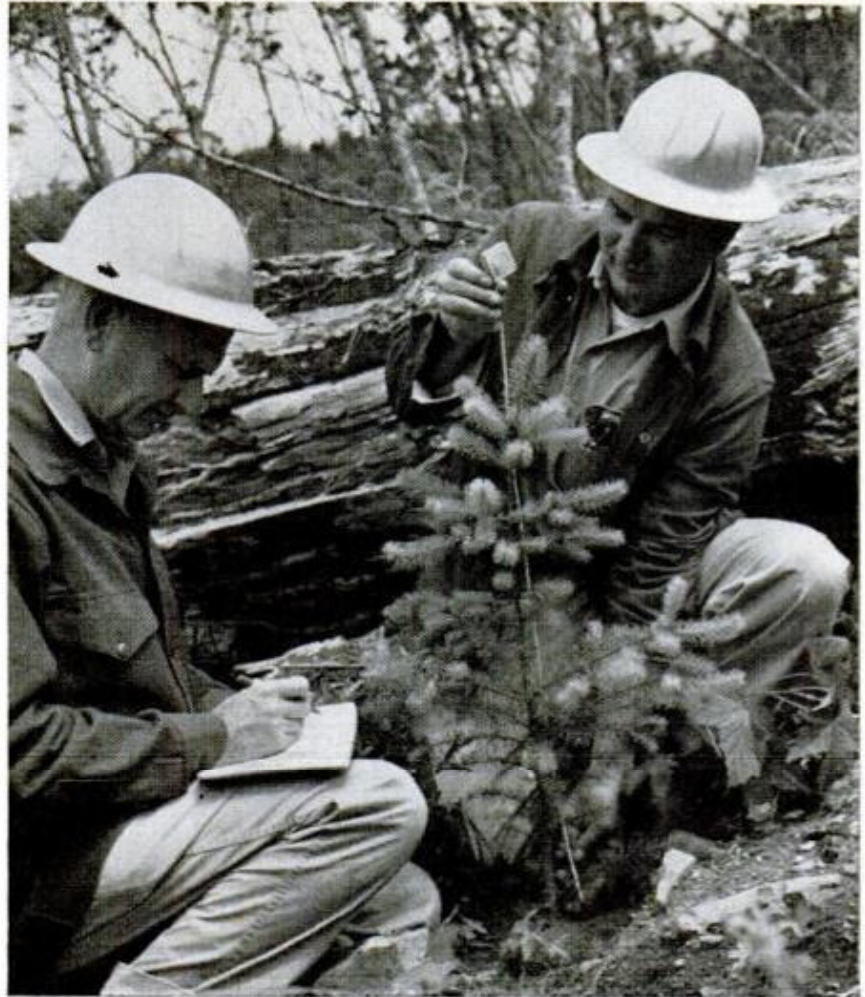
GRID SYSTEM is set up around irradiated tree. As radioactive material—injected into sap stream—circulates through root system, its course is charted with special Geiger counter called a scintillator. Pattern of roots is important to planning the spacing of trees on commercial farms and to developing fertilization systems



Producing better seeds . . .

NUTRIENT TESTS supplement work of studying trees' enemies by studying ways of first producing healthier seeds. Scientists here examine young tree grown from seed produced on soil-nutrient test plot. Experiments have increased diameter of some trees as much as 50 percent

GROWING SEEDLINGS in radioactive solutions in laboratory (far right), scientists are able to learn structural facts about trees—with help of radiation counter—that will enable them to find better ways to treat diseases, combat tree enemies and produce better trees



tion, pest and disease relationships, and genetic influences.

Science's use of atomic tracers in forestry research, which promises to be virtually a science in itself, provides a novel tool for gaining clear insight into the basic biological processes. This technique provides such information rapidly and effectively. In some instances, it is nearly impossible to obtain such information in any other way.

Rediske, one of a half-dozen scientists using the technique at the center, operated by the Weyerhaeuser Company, finds that radioisotopes offer a means of understanding more completely the growing processes and photosynthesis, Nature's means by which green plants use carbon dioxide in the air, water, soil nutrients, and the sun's radiant energy to form the compounds essential to life. With this improved understanding, methods are being investigated to increase the efficiency of timber growth, and thereby, the amount of top quality wood harvested.

Sometimes Rediske wishes he had the ability of the author of Aesop's Fables. Aesop endowed animals with the sense and reasoning of human beings. Foresters often

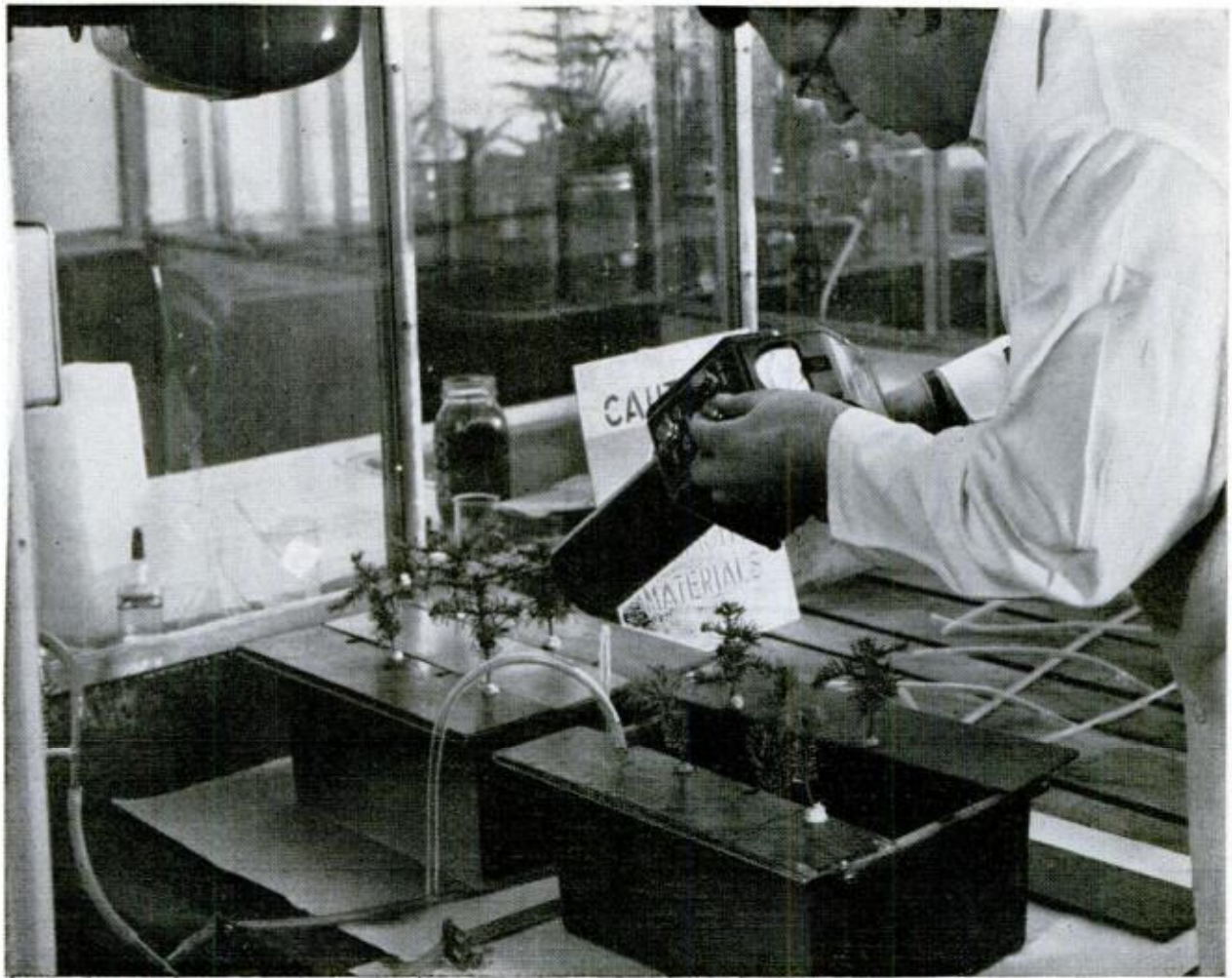
wish they could reason with deer and elk to keep them from eating valuable tree seedlings as fast as they grow.

Since this is asking for the impossible, Rediske and his associate researchers are using radioactive materials to aid in the development of deer and elk repellents for Douglas fir seedlings. For example, selenium, a nonmetallic, sulfurlike element, when present in small amounts in plants, seems to make them distasteful to animals. If present experiments at the center reach their expected promise, then chemically treated seedlings will be left untouched to grow into trees for timber and pulp.

In this general connection a current problem of the researchers is to develop more effective repellents to keep timber bears from destroying immature trees. Surveys show that 200,000 acres of valuable timberland suffered serious bear damage in the state of Washington during the past two years.

Already the scientists have made marked progress on this assignment. A number of their new bear-repellents are now being tested on company tree farms and seem to be serving their purpose very well indeed.

Growing trees in the laboratory . . .



In no instance do the chemical compounds injure the animals. However, their unsavory smell and taste have persuaded the hungry bears to seek their food among other kinds of growing plants.

Another present project is aimed at reducing damage to tree seedlings by rabbits, mice and other rodents. It uses isotopes in the development of repellents to divert the rodents to native vegetation. The experiments made thus far indicate that rodents' eating habits can be changed so that the 15,000 to 20,000 pounds of tree seed planted each year by the company will survive the hungry rodents, and will be allowed to germinate and produce top-grade lumber trees.

Norman Johnson, a young entomologist, has the job of "packing pill boxes." This is involved in a new method he has devised for making tree-killing insects radioactive so he can detect their day-to-day movements as they burrow through bark and into log sections brought into his laboratory.

First Johnson fastens tiny pill boxes to the log sections of Douglas fir trees and fills the boxes with live bark beetles. Next he places radioactive strontium in each box

with the beetles. The radioactive material clings to the insects as they dig through the bark and into the log sections.

Johnson then uses a scintillator (a form of Geiger counter) that is sensitive to gamma rays emitted by the radioactive strontium to track the beetles as they chew their way, out of sight of normal vision, in the test log sections. Every movement of the tiny tree destroyers is visible to the scientist with the scintillator, regardless of where their hungry journey takes them through the wood.

Facts of life habits of these destructive insects, learned in this new type of forest research, enable the scientist to devise methods of combatting them effectively in the forests where they wreak havoc with valuable commercial trees.

George Staebler, a silviculturist, is working on a new and fascinating chore. His problem is to pinpoint or "map" the complicated contours of a Douglas fir's root system. This type of original research is extremely important. The new knowledge it reveals of the extent, depth and density of the root system will enable forest scientists

(Continued to page 260)



Bull's-Eye by Missile

Demonstrating its accuracy, the Air Force's Falcon air-to-air missile was fired at 36-inch targets from F-106 jets more than a mile away. The targets were heated to simulate a jet's exhaust to give the heat-seeking missile something to home in on. A pilot shows a hole it made.



Warm Buddies

In laboratory tests, the British are attempting to find whether soldiers can be acclimatized by artificial means to tropical climates before being assigned there. Volunteers are dressed in inflatable plastic suits to undergo periods of duty while temperatures are raised as high as 101 degrees F.



Boaters' "Personal Windshield"

High-speed sports, from boating through motorcycling, present wind-in-your-eye problems, and it's no fun to con your cruiser through a tricky channel while squinting through tears.

One answer is a new "personal windshield"—a lightweight, ventilated plastic goggle which keeps out the wind and dust without restricting vision. It's called Aye-Eye, and is available in clear or tinted models for \$3.50 from the Alfson Co., 143 East State St., Trenton, N. J.



Converts Heat to Power

Using radioactive isotopes as a heat source, a 40-pound nuclear generator undergoing tests for the Air Force produces 150 watts of electrical power for one year of continuous operation.

It was developed to provide a reliable, long-life power source for unmanned radio beacons and weather stations.

The decaying isotopes heat 144 small semiconductive elements to about 1000 degrees F. Heat exchangers keep ends farthest from the heat at 300 degrees. Heat difference produces electrical current.



They Play Hockey the Hard Way — No Ice

Proving that you don't really need ice for a game of hockey, a group of scuba divers play their version of the game at the bottom

of a swimming pool in Miami Beach, Fla. They report that it's a slower version, but just as rough as it is on ice.

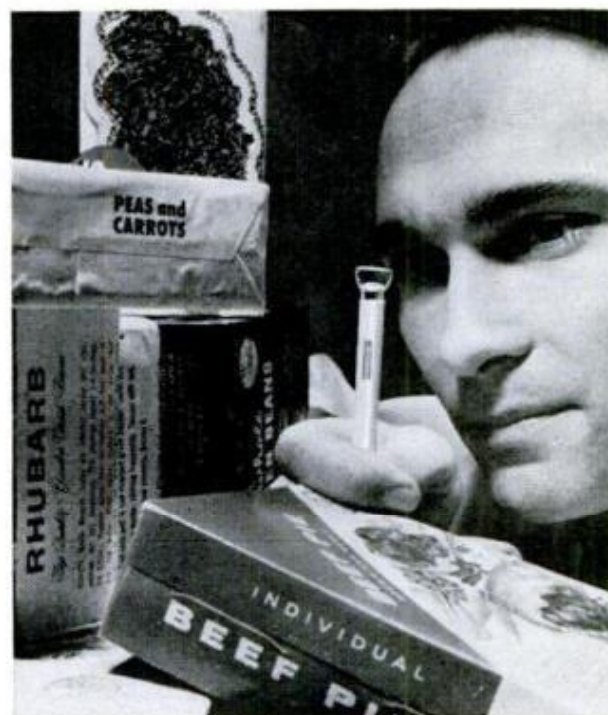
Do-It-Yourself World

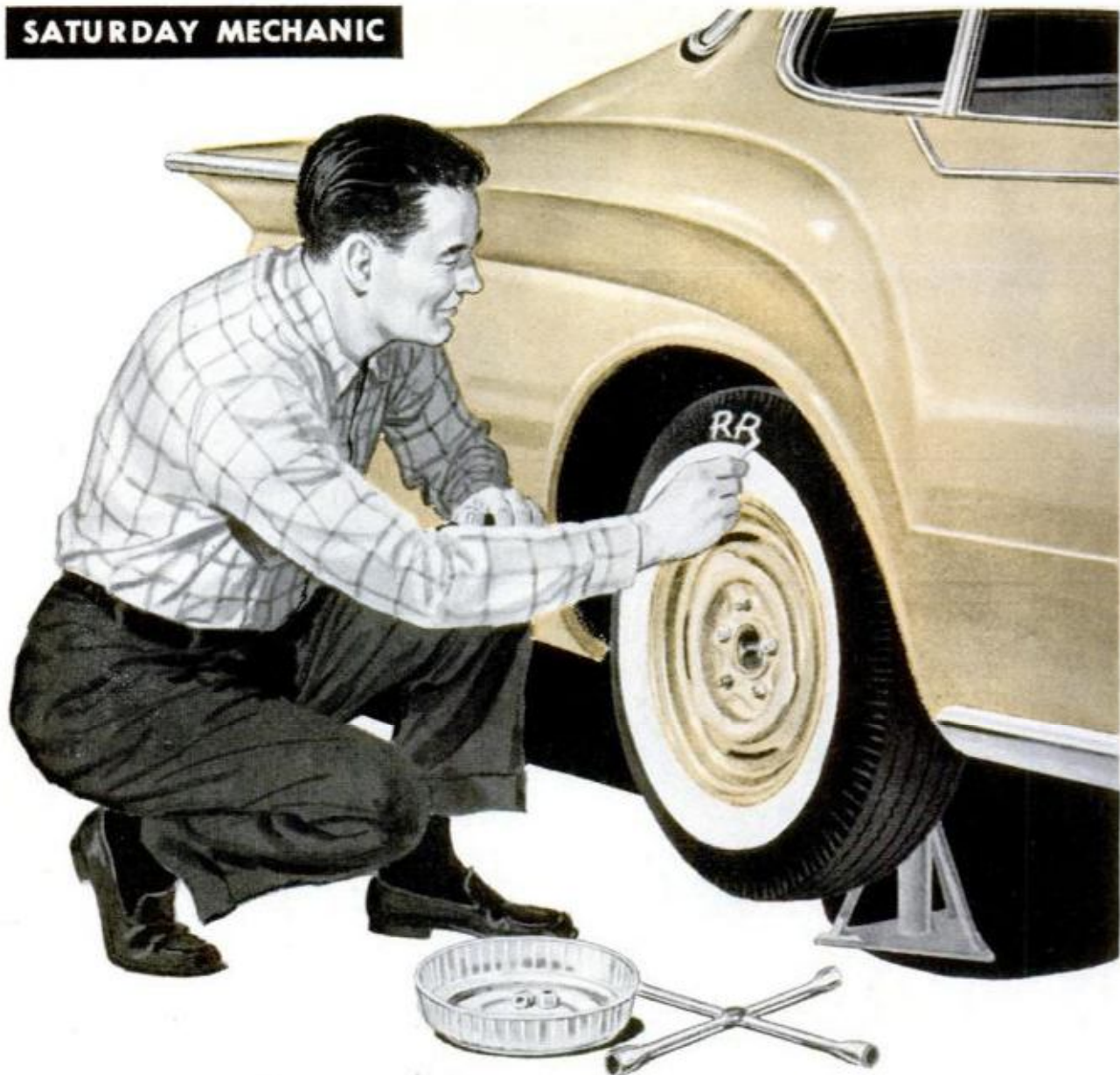
Do-it-yourself world-makers can have a field day with a 42-piece plastic construction kit that makes a 12-inch globe with 24 snap-on land masses in bas relief. Countries — and changes — can be painted on as needed, or as the changes occur. Comes with a geological and geographical booklet for \$11.95 from Eldon Industries, Inc., Hawthorne, Calif.



Indicator Guards Frozen Foods

Temperature history of a shipment of frozen foods can be kept without complicated instruments by a cigarette-sized "yardstick" developed by Minneapolis-Honeywell. The device works on a predictable electromechanical reaction, and records temperature changes for as long as a year to guard against accidental, often undetectable, cold losses.





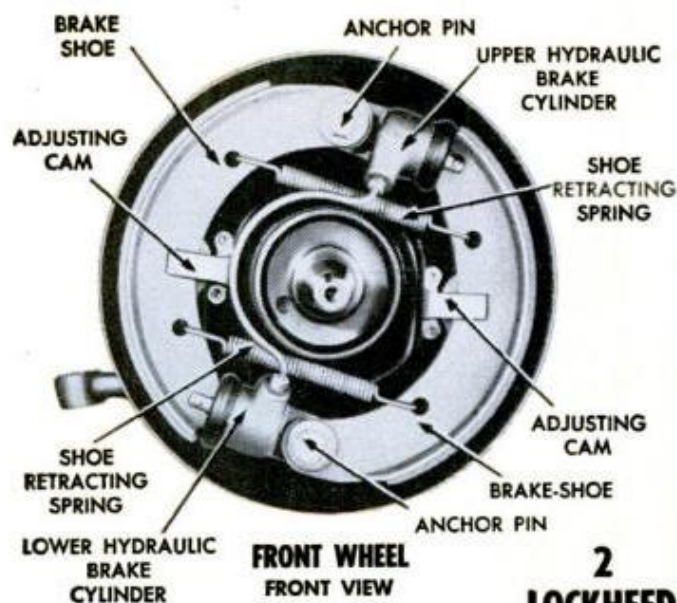
ADJUSTING CHRYSLER BRAKES

By William Hector



BRAKES ON Chrysler cars have certain mechanical features that differ from Bendix brakes and it is well to be acquainted with these variations before you try adjusting the brakes on your Chrysler, De Soto, Dodge or Plymouth car. As an example, you'll find the brakes on 1956 and earlier Chrysler cars fitted with separate adjustable anchor pins and also there will be a hydraulic cylinder for each brake shoe on the front wheels. Rear wheels will have only one brake cylinder but you'll find separate anchor pins. After 1956 Chrysler brake units were fitted with floating anchors which do not require adjustment.

1. CAR STAND is a good investment if you do your own work. Don't rely on jack if you must "get under"

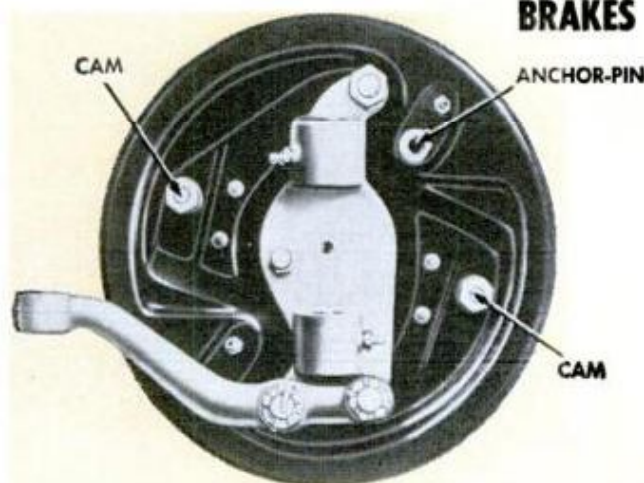


**FRONT WHEEL
FRONT VIEW**

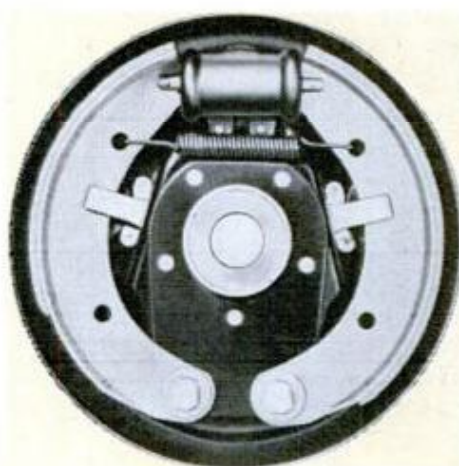


**REAR WHEEL
REAR VIEW**

**2
LOCKHEED
HYDRAULIC
BRAKES**



**FRONT WHEEL
REAR VIEW**



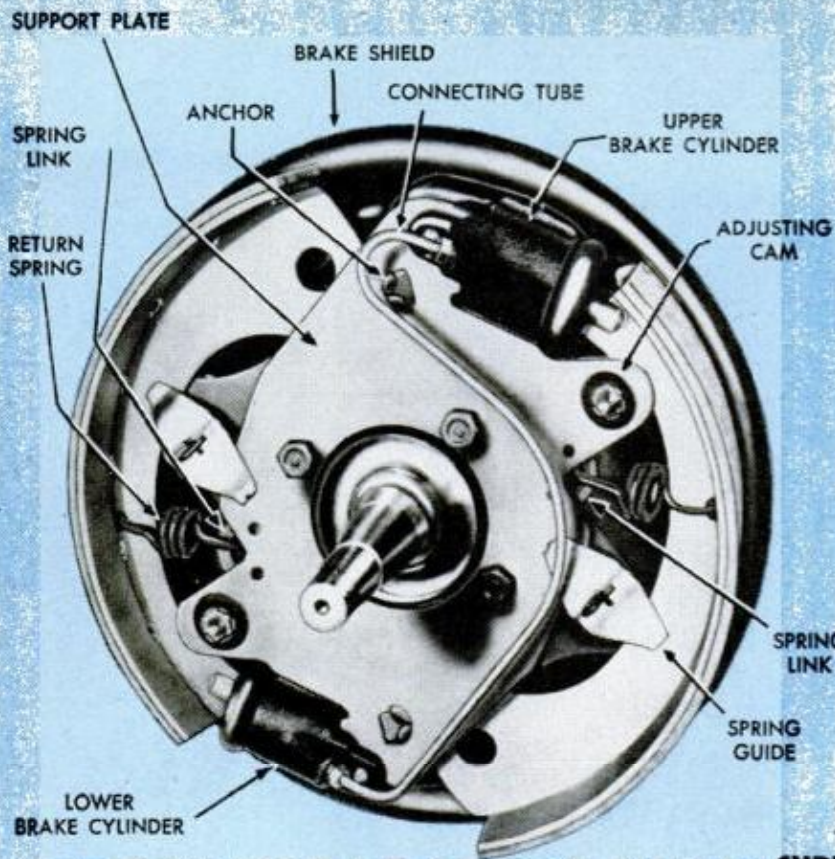
**REAR WHEEL
FRONT VIEW**

If you plan to do the job over a weekend, you'll save a lot of time and possible grief by having everything in order before you pull off wheels and drums and disassemble bearings. See that your car jack is in working order and it's a good idea to have a car-stand handy, Fig. 1, even if you have to borrow one. Never fully trust a bumper jack, especially when some unlooked-for condition or defect makes it necessary to disassemble brakes and possibly get part of yourself under the car. If you're working in a carport or on the garage ramp, clean up the area around the car. Any wisp of gritty dust stirred up by the wind is sure to land on the bearing assemblies you may have removed. Have cloth wipers at hand.

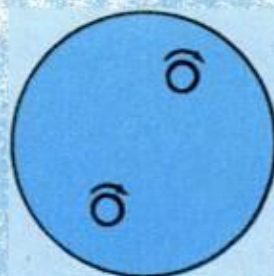
If you've already made the Saturday-morning run to the shopping center, with a lot of stop-and-go, let the brakes cool down

to normal nonoperating temperature before you begin work. And remember that in warm weather this takes time. Before you pull off a wheel chalk the tire so you're sure to get the wheel back in the right axle. Then turn to Fig. 3. You're looking at what you'll see when the wheel and drum come off if your car is 1956 or later. Compare with Fig. 2.

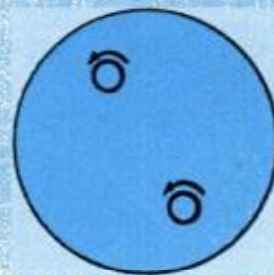
To carry out an inspection it usually is permissible to examine the brakes on only one wheel, the condition of this brake being indicative of the general condition of the other three, assuming, of course, that there is no pulling to one side and no apparent drag or other brake defect. So, you jack up the wheel, drop the axle on a stand, remove the hub cap or wheel disk and then the wheel. Clean the hub cap and use it as a container for the bearings. Wipe off any



FRONT WHEEL



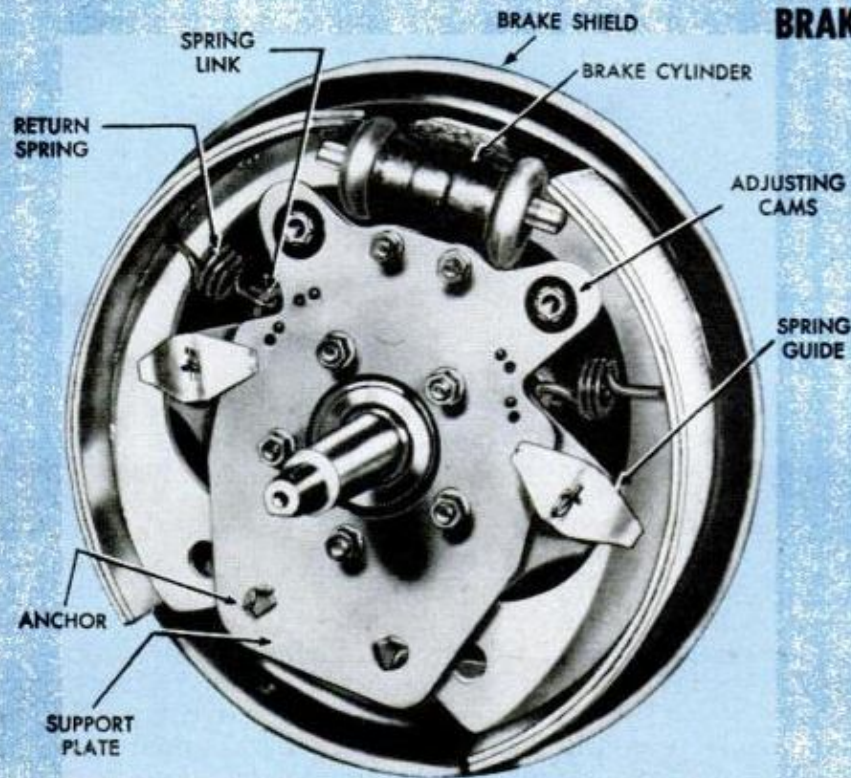
LEFT FRONT



RIGHT FRONT

3

**CHRYSLER
CENTER-PLANE
BRAKES**



REAR WHEEL



LEFT REAR



RIGHT REAR

**ADJUSTING CAMS
(NO ANCHOR-PIN
ADJUSTMENTS)**

LATE MODEL Chrysler brakes, after 1956, have floating anchors that do not require adjustment. Only cams are adjusted. In details at right arrows show direction in which cams should be turned

grease smears which may be on the brake plate or spindle. Dust the drum or clean with sponge and solvent, Fig. 5. Remove and replace oil seals as in Fig. 4.

Now give both linings and drums a critical inch-by-inch inspection to discover any possible defects that may be developing, such as uneven wear on the linings, also loose linings, or threadlike scores on the shoe track inside the drum. If no defects show up, then lubricate the brake-shoe ledges, or platforms, using only the approved lubricant and that sparingly. Remove the bearings in the hub portion nearest the brake plate, or dust plate. Clean and lubricate all bearings and replace in the order in which they were removed. Then, before you replace the drum and wheel, dust the parts thoroughly and re-examine all parts for stray traces of lubricant. Often it is helpful to sand the faces of the linings, Fig. 6, to remove any imbedded dirt. Edges of the linings can be rounded slightly. Finally, replace the drum and wheel, remembering the chalk mark on the tire, and make sure that all nuts are tightened.

To make a minor brake adjustment, rotate the wheel slowly and turn the adjusting cam until the wheel drags, then release the cam until the wheel turns freely. Do this twice on each wheel.

A major adjustment must be made when the shoes are relined, or replaced. With the brakes completely assembled apply pedal pressure to center the shoes. Then adjust each shoe separately. On 1956 and earlier cars, back off adjusting cams and anchor pins until the wheel turns. Then, with the wheel rotating slowly, turn the adjusting cam until the lining contacts the drum. Now, back off slowly on the anchor pin until the wheel turns. Repeat these two steps until anchor-pin adjustment will not free the wheel. Finally, back off on the ad-



4. MAILING TUBE makes a good driver for removing and replacing oil seals in brake drums. Tap lightly

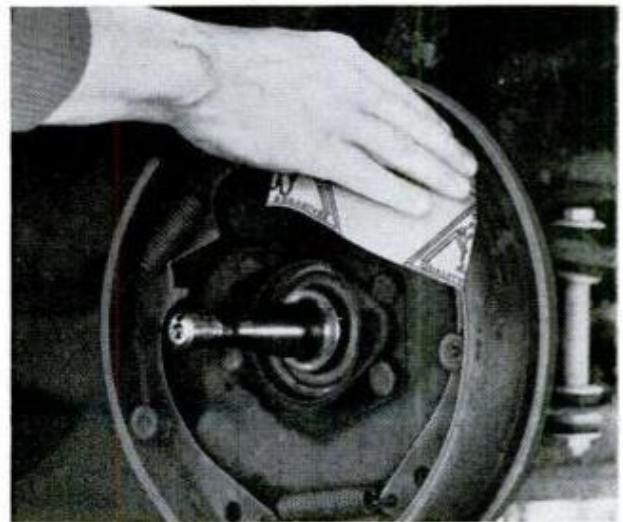
justing cam until the wheel turns freely.

On later Chryslers the brakes have the floating anchors and only the cams are adjusted. Note especially in Fig. 3, the right-hand details, the direction of the arrows on the cams on the front and rear brakes. When adjusting these later brakes it is the general practice to turn the adjusting cam in the direction of forward wheel rotation until the shoe lining is solid against the drum and the wheel is locked. Then turn the cam in the opposite direction until no drag is felt. Repeat the operation on the other cam. ★ ★ ★

5. CLEAN BRAKE DRUM with detergent and hot water or with a solvent. Make sure it is thoroughly cleaned



6. IT'S PERMISSIBLE to clean linings with medium sandpaper. The latter will remove any embedded dirt

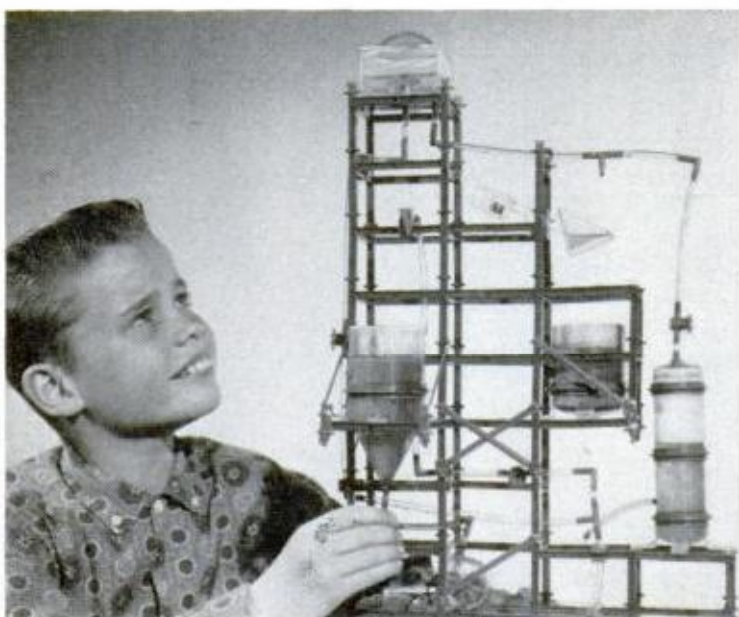




Amphibious Army Carryall

Capable of floating without preparation, the Army Muskrat will cross waterways under full load at about three miles per hour.

On land, its 127-horsepower engine will power it over any kind of terrain, including grades up to 60 percent, and in excess of 60 m.p.h. on the highway. It will carry 1500-pound cargoes or seven passengers with field equipment.



Hydraulic Toy Kit

Youngsters can build and operate model oil refineries, distillation plants and other industrial installations, and learn principles of hydraulics, with a new kit.

Each set, priced from \$12.95 to \$19.95, includes plastic girders, panels and braces, plus a battery-operated centrifugal pump, siphons, level gauges, float valves, elbows, reservoirs, tanks and clear plastic piping.

Colored water is forced through the systems, giving a visual picture of the device in operation.

The kits are manufactured by Kenner Products Co., 912 Sycamore, Cincinnati, Ohio.



World Full of Gas

A 60-foot storage tank for natural gas near Savannah, Ga., has become something of a tourist attraction due to the colorful scale map of the world painted on its surface.

Specially designed for the Savannah Gas Co., the globe contains a reserve supply of natural gas for Georgia's largest port city.

Some idea of the scale used on this gigantic map can be obtained by noting the group of Girl Scouts standing at the base of the ladder, lower left.

☐ The so-called "rare earths" are not particularly rare. Most of these chemical elements are more common than gold or silver. Some, like lanthanum, cerium and neodymium, are more abundant than lead.

☐ The Great Wall of China is thought to be the only work of man that would be visible to the human eye from the moon. The wall stretches 2000 miles.



Long to Be a Gypsy?

TOURISTS are leading the gypsy life in Ireland these days. Seated on caravans, reins loose in their hands, they roam the green countryside, moseying along at their horse's clippity-clop pace.

This gypsy freedom, however, is not free from costs. Con Murphy, a Cork businessman, rents out the four-berth caravans complete with ware, bedding, propane-gas stove, and horse for \$37 a week. Food and fodder for the horse is extra. Grazing a horse overnight may cost nothing or up to \$1.50.

Mr. Murphy's fleet of caravans has grown from one (in 1946) to 14. Sometimes half a dozen are booked as a tour party—with a cook and guide furnished. Usually, though, each caravan is hired individually for trips that may take a traveler—at far from hectic speeds—over byways that pass men cutting turf, blacksmiths at work, or down to the coast where a lighthouse keeper may find time for a mid-day chat.

It seems, by the way, that the romantic open road appeals not so much to adventurous young men but to English nurses.





"We were tired, dirty, sore and hungry. . . ashes and dirt found their way into our food . . . tables and seats built of stone and logs helped immeasurably. . ."

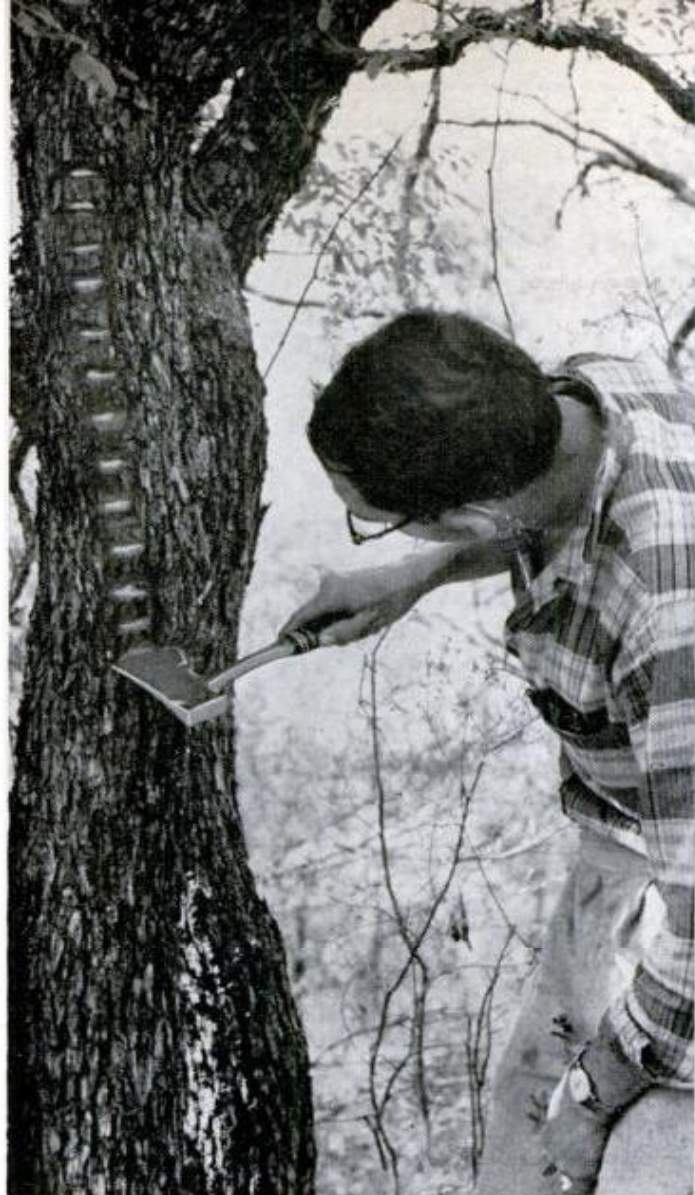
10 Minutes to Survival

PART II
By
Russell Tinsley

Photos by Author

*P.O. Box 3013
Austin 13, Texas*

Could your family leave home on 10 minutes' notice, move into the wilderness and start a new life without outside help? The Tinsleys did, on a surprise assignment from PM. Here's the second half of their report . . .



“An important daily ritual . . . marking off the day with a blaze on a tree.”



“Sanitation was a worry . . . we were constantly searching for ticks.”

SPRING SUNSHINE filtered through budding oaks into our campsite, promising shirt-sleeve weather. The only sounds were the gurgling of our spring-fed creek mixed with spring bird songs. It was a setting suitable for a fine family camping jaunt, and should have been a happy one for our outdoors-loving family. But it wasn't.

Settling into the routine of our survival camp, we were tired, dirty, sore, hungry, and still a little scared. The woods around us were more than a setting—they were our home, neighborhood, shopping center and worst enemy as we tried to scratch a living out of them.

Imagine yourself in our position—living in the wilds with only what food and equipment we had been able to gather in a frantic 10-minute rush to evacuate our home and city to escape a “disaster.” The test assignment from *Popular Mechanics* was dropped in our laps without warning. We went out under the most realistic survival conditions possible with the job of setting up a new home for an indefinite period, then reporting our success—and failures.

Perhaps most important (and something overlooked in so-called survival tests) we had the car. It proved to be a lot more than simple transportation, for the uses of an automobile are endless; it's a

“March 19: We feel like the last family left in Texas—or on Earth . . .”



“What little was left from one meal was carefully hung in storage for the next. Wild water cress, a treat to some people, became a standard vegetable at every meal.”



wonderful tool for survival. Once out of gas it is worthless as a vehicle, but it has a myriad of other uses. The ignition wires can bind things, firewood and belongings can be stored in the trunk, the tire tools are good for digging, floor mats make table cloths, tires can be cut into containers, metal can be hacked from the sides, and the body is always a reliable shelter, from bad weather.

“March 20: Tonight, a treat—soft-shelled turtle on a spit. The white meat tasted like pork; our best meal so far. . . .”

One of the handiest uses of the automobile is for making a fire if no matches are available. Although the time-honored flint-and-steel method is good (knocked together to place a spark in a roll of tinder, in our case, dried cedar bark), a

still better method is to remove the two battery cables where they are attached to the auto engine and rub them together to throw bold sparks. Even when the battery is too weak to serve any other purpose it still will provide a spark for setting a fire. A bit of gasoline captured from the carburetor and dripped on the tinder quickly draws a flame from the spark.

“March 21: Coffee from re-boiled grounds isn’t something I’d serve my friends, but at least it’s hot and satisfying. . . .”

The car seats can be removed to use around camp. The fabric of the seatcovers always is a reliable standby. A pair of pliers, a stock item in our glove compartment, did many jobs around camp; the most important was handling hot pots to and from the fire. The radio, until the battery is exhausted, provides some contact with the outside world, important in the time of disaster. Even an old hunting cap in the trunk proved useful—Marjorie wore it to keep the sun from her face.

A lot of unlikely items proved useful. While gathering her belongings Marjorie, in a rare stroke of luck, came up with three sealed jars. They just happened to be in a cardboard carton she grabbed to



“Eventually we’d have to think about tanning our own furs for clothing . . . Big carp promised a feast, but we prepared it wrong; it made us sick. . . .”



pack the other things in but they were welcome additions. One made a minnow trap, baited and sunk in the creek with a small hole in the lid. Another stored goods from one meal to the next, and the third made a dry container for the two pounds of sugar we had along. A spoonful of sugar is a wonderful energy booster.

Every can, once emptied, was religiously saved. They were used for everything from eating utensils to cups. We had only one eating utensil, a large service spoon, so we had to improvise others by bending tops of tin cans into makeshift spoons. Our one serving pan was drafted into service as a heating container for canned goods, for making coffee and for boiling bath water.

Tools, in any form or fashion, are vital for self-reliant existence. I had an ordinary camping hatchet. It wasn't adequate. A lightweight double-blade ax would have been more practical. A small shovel like the entrenching tools used by our armed forces earns its way

“March 23: What we wouldn't give for a big-big container . . . a toothbrush . . . some soap . . . a tall, cold drink and a cigarette . . . and a mattress.”

The author's "survival kit" of things you might forget:

Heavy knife and small file	Waterproof matches	Roll of stout nylon cord
Fishhooks and fishing line	Coil of wire (for snares)	Garden vegetable seeds

Adding these items would make it a real survival kit:

.22 rifle, 'scope sight	First-aid kit	Pliers
500 rounds .22 ammunition	Aspirin and dysentery medicine	Flashlight with extra batteries
Light double-bitted ax	Several bars of soap	12-foot square of waterproof canvas
Small shovel	Canteen and cooking kit	
Heavy-duty waterproof boots		

NOTE: These items are only basics which can be kept in the car or house to supplement food, clothing and equipment in the event of an emergency evacuation.



“A windfall of pecans was the first fatty food in days—Reed stuffed.”



“Cleanliness became essential . . . ‘dishes’ were scrubbed and scalded.”

in any camp, survival or otherwise. We didn't have one. For digging we loosened dirt with a tire tool and removed it with a tin can.

Fishhooks can be fashioned from almost anything which will sharpen and hold its shape under pressure. One of the best substitutes I've discovered is the strong tin overlap where a can is sealed. This can be cut loose from the can with a knife, bent into the proper shape and honed sharp, either with a file or on a rock. Wire, even fence wire, also makes good hooks. Or they can be made from bone, complete with barb, if a person has the patience to file a bone into the proper shape, or carve it with a knife.

If we should ever face a showdown where survival becomes necessary I believe the sportsman stands the best chance of staying alive. He knows how to fish and hunt. Of the two, I'd pick fishing as more important. A gun with ammunition is a soul-satisfying tool of

(Turn to page 234)

“Abby has been great for Reed . . . He doesn't seem to mind discomforts. . . .”

“Tools are vital to self-reliance . . . but a handy man could improvise. . . .”



Rings Don't Mean a Thing

There are coffee tables, and then there are coffee tables made from a chunk of solid black granite.

One such table, weighing 2400 pounds and costing \$600 was cut from the stone by the DoAll Co., a manufacturer of tools in Des Plaines, Ill., and installed in the firm's lobby.

Because of its hardness and fine grain, the table defies scratches, cigaret burns, ring marks from glasses and never needs polishing.



Any Truck a Swamp Buggy

Swamps, bogs and generally inaccessible terrain which once presented formidable barriers to oil exploration, are no longer serious obstacles. A new, extra-wide, low-pressure tire developed by Goodyear Tire and Rubber Co., allows conventional vehicles to carry crews and equipment into the worst marshland without bogging down.

Operating on four to ten pounds pressure, the tires are quickly replaced with conventional tires for road use, thus eliminating the need for separate road and field-vehicle fleets.



First All-Cargo Jet

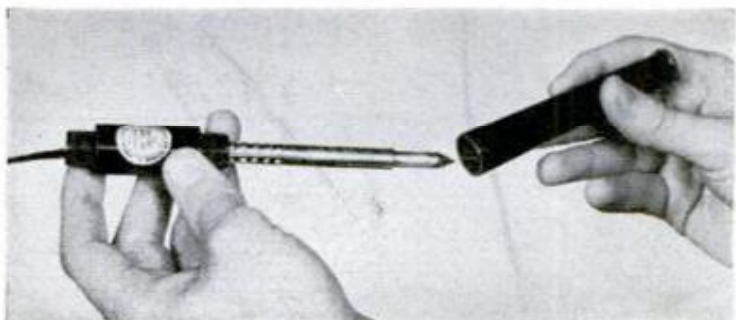
In a joint program, the Federal Aviation Agency and the U.S. Air Force are developing the first jet transport to be used exclusively for cargo by commercial airlines and for cargo and paratroopers by the Air Force.

Specifications include a cargo capacity of 70,000 pounds and a capability of taking off fully loaded from a 6000-foot runway. It will be powered by turbofan engines and features truck-bed-height loading.



Hot Storage Iron

When finished with this new soldering iron, simply unscrew the handle and screw it over the business end. The iron can then be safely placed in your tool kit without waiting for a cooling-off period. Open end allows heat to escape safely. L.I. Electro-Labs Inc., Hewlett, N.Y.



PM's House of Imagination



*Build it from our
plans . . . page 169*

*Add the rolling
toolbox to your
own shop . . . page 178*

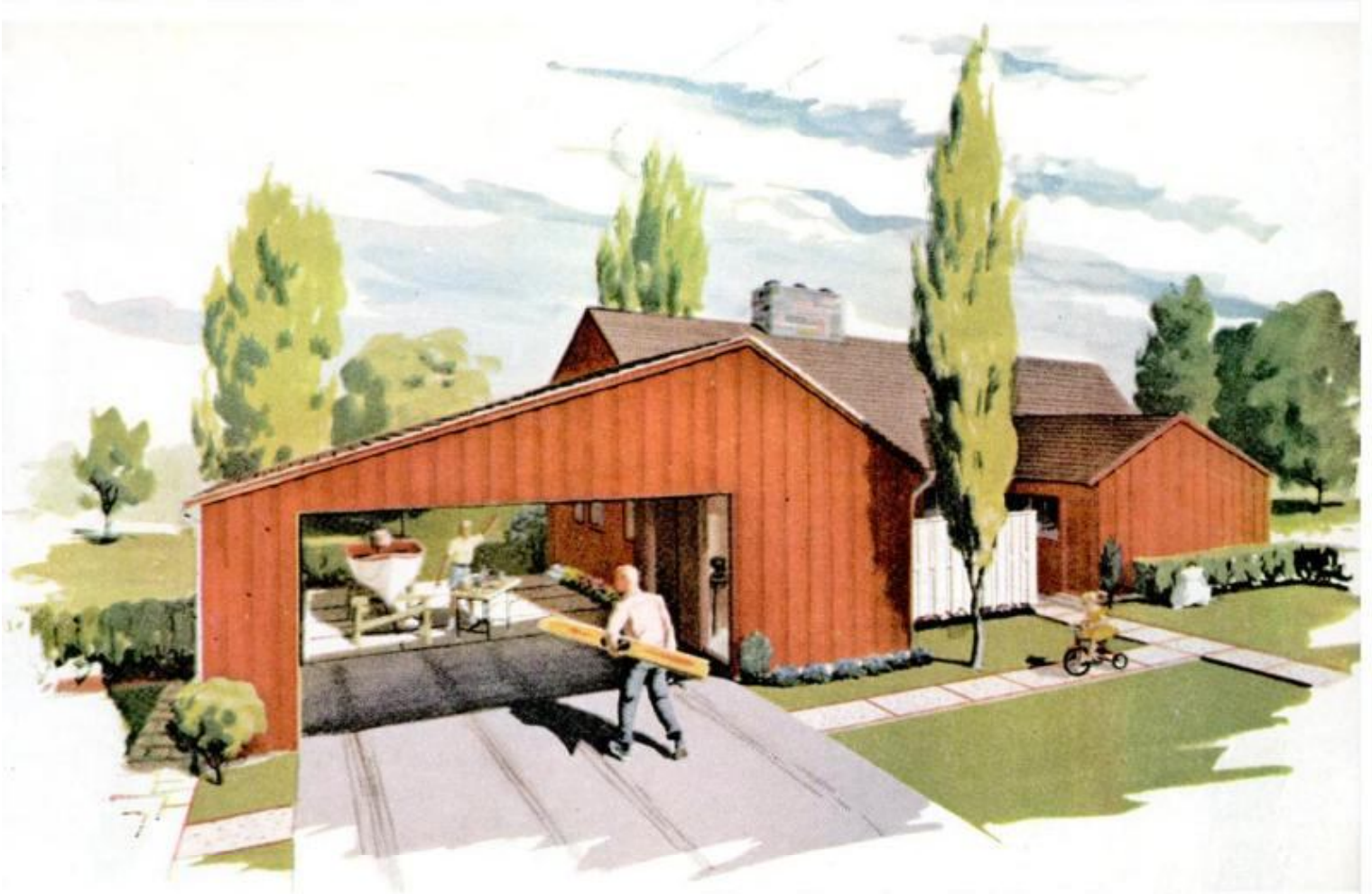
*Preview tomorrow's
TV intercom in the
PM house . . . page 182*

*H*ERE'S A HOME that gives you lots of choices—chances to use your imagination—before and after it's built.

- Do you prefer the low sloped roof (above) or the more conservative New England country style (facing page)? The same plan builds both.
- Do you like a sloped suburban lot? This two-level house is designed just for that lot—but it can also be built on one level from the same plan.
- Are your workshop projects indoor or outdoor type? You can have both—in the shop next to the garage or the project area behind the garage.
- What about noisy vs. quiet family pursuits? This house is zoned so that both can be carried on without disturbance.

PM's House of Imagination is a home for *you*. You'll be inspired to add your own ideas as you imagine yourself living in this home of exciting architectural features.

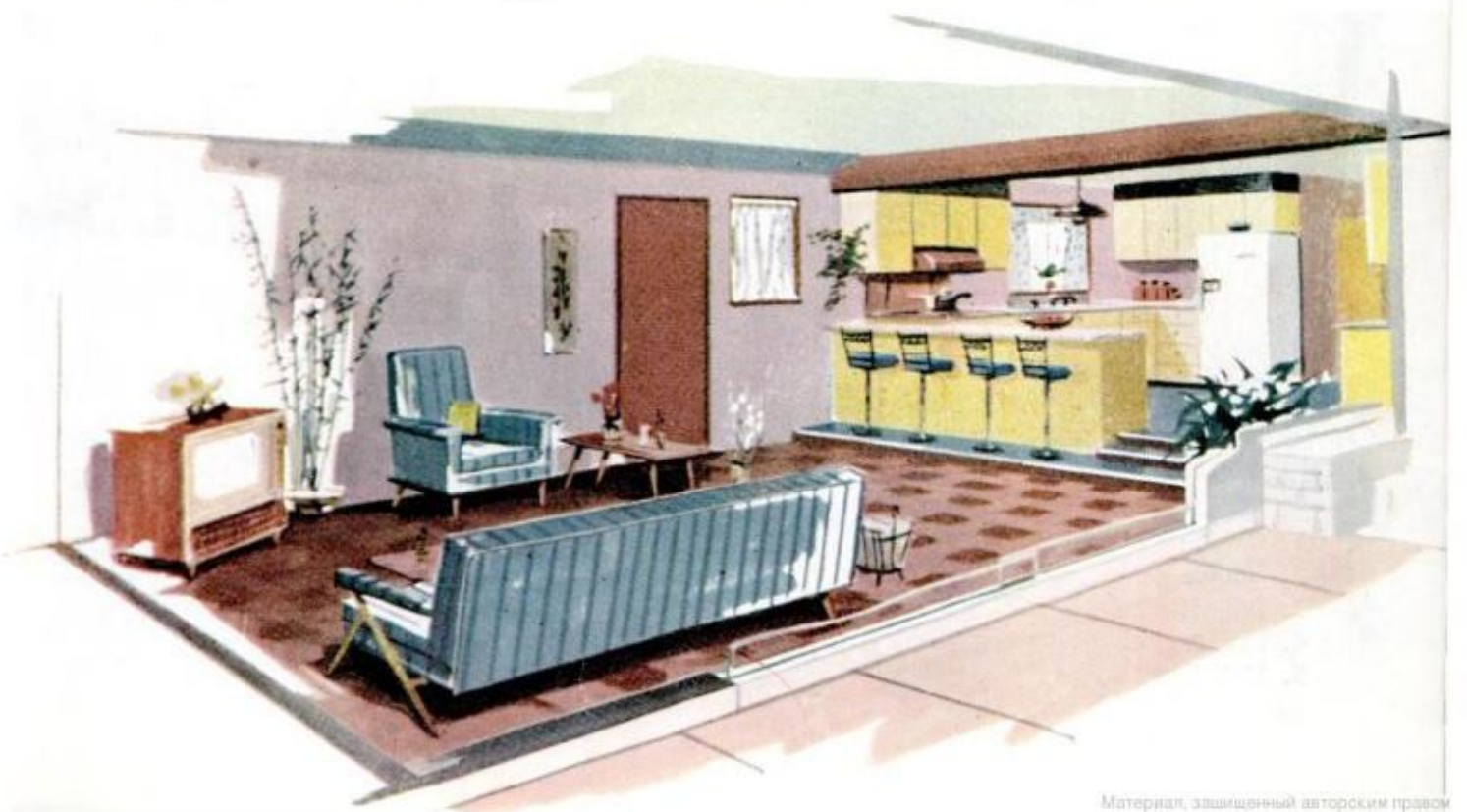
(Continued to page 268)



New England Country Style

ROOF STYLE, with gabled faces of wings toward the street, and vertical siding give this version a traditional appearance. Floor plan is same as that of house shown on the cover. Overhead doors at front and rear of garage open up project area to street and to shop (inside the garage)

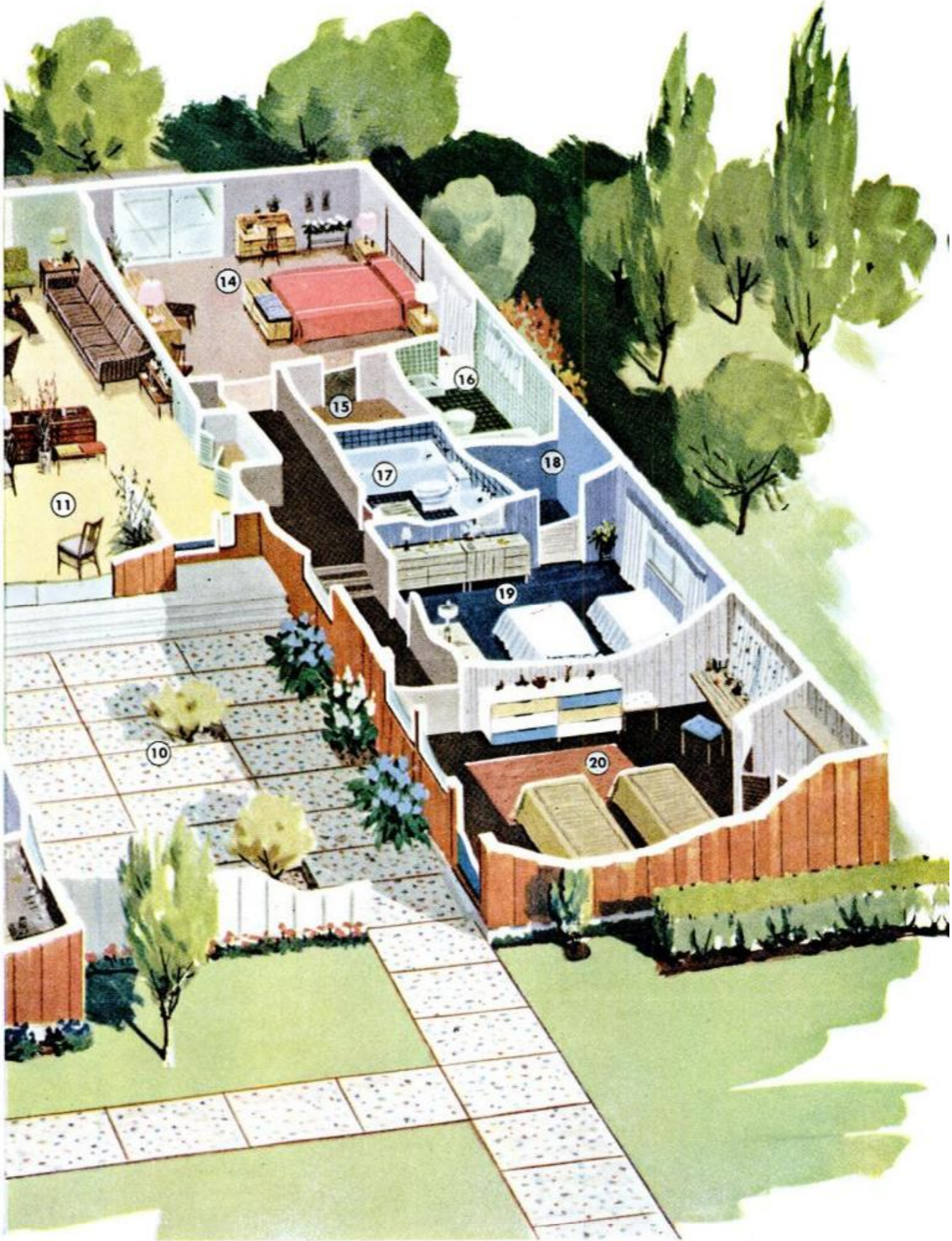
STEPS from family room to kitchen also form a base for permanently mounted stools. The family room (like the two front bedrooms in the opposite wing) is 16 inches lower than main portion of house. Sliding glass doors allow this "farm kitchen" to open onto the court





1. Garden and tool storage, 2 x 20
2. Double garage, 20 x 20
3. Project area, 16½ x 26
4. Laundry-sewing-ironing room, 8 x 12
5. Half bath, 3½ x 5½

6. Heating plant and water heater
7. Kitchen, 12 x 12
8. Family room, 12 x 15½
9. Workshop, 8 x 12
10. Family entry court, 20 x 20



- 11. Dining room and entry, 12 x 20
- 12. Living room, 12 x 20
- 13. Patio, 9 x 22
- 14. Master bedroom, 12 x 16
- 15. Walk-in closet, 4 x 6

- 16. Bath, 4½ x 7
- 17. Bath, 5½ x 7
- 18. Walk-in closet, 4 x 5
- 19. Bedroom, 10 x 12½
- 20. Bedroom, 10 x 16

SEPTEMBER 1961



LIVING ROOM is divided from dining room by a striking fireplace that reaches to the highest point of the ceiling. Front door of home can be seen beyond the low cabinets that house high-fidelity equipment



PASS-THROUGH frames the dining table in this view from the kitchen. Beyond the table can be seen the doorway that leads to the bedroom hallway and the main bath



SHOP has door that opens into the garage, making it handy for materials to be brought in and easy for tools to be carried in or out. On the far shelf is an ultrasonic cleaner that keeps hand tools as shiny as new



SUNNY COURT at the entry of the house is a pleasant "greeting" for visitors. It's also an ideal family gathering place, since a privacy fence hides the area from the street. The sliding glass doors at left open into the "farm kitchen" and those at the right lead into the dining room. Trellis overhead, casting shadow into court, is a feature of low-roofed version of house

FAMILY ROOM is a spot for activities. View from kitchen shows entertainment wall at far end. Door at right leads to shop; curtains at left cover sliding doors to the entry court. Besides the two sliding doors to the front court (the second is in the dining room), there are two others—in the living room and master bedroom—opening onto patio at rear of house





BUILT-IN OVEN and rotisserie are a housewife's delight in the kitchen of the PM House of Imagination. They and other new products appear throughout the house in a display of exciting modern conveniences. Ultrasonic cleaner in shop (page 175) also cleans pots and pans

TV INTERCOM carries voice and picture. Camera is incorporated in cabinet of new Motorola system. More on page 182

FRESH COFFEE in 12 seconds is a quick boost in the morning. The built-in, by Havajava, Glendale, Calif., draws water, brews coffee



All were built except The Chicago one

Where to find the PM house

Watch for local announcement of opening dates

You can visit the PM House of Imagination in your area. Here's a list of the local sites and the names of the builders.

ATLANTA, GEORGIA

3643 Winview Court
Winding Woods Subdivision, Decatur
Built by F. Coin Campbell, Jr.

BATON ROUGE, LOUISIANA

11525 Parkwood Drive
Sherwood Forest Subdivision
Built by Maher and Sharkey, Inc.
Furnished by Kornmeyer's Furniture Co.

CHICAGO, ILLINOIS

12240 Surrey Hill Road
Country Squire Estates (122 St. South and
76th Ave. West)
Built by Country Gentlemen Homes

DENVER, COLORADO

66 South Clarkson Street
Built by Cosman Construction Co.
(see local announcement for opening date)

FORT WORTH, TEXAS

4100 and 4101 Big Bend Trail (twin models)
Built by Art Endres

HOUSTON, TEXAS

107 St. Marks
Venetian Estates
Built by Leo E. O'Neal

LOS ANGELES, CALIFORNIA

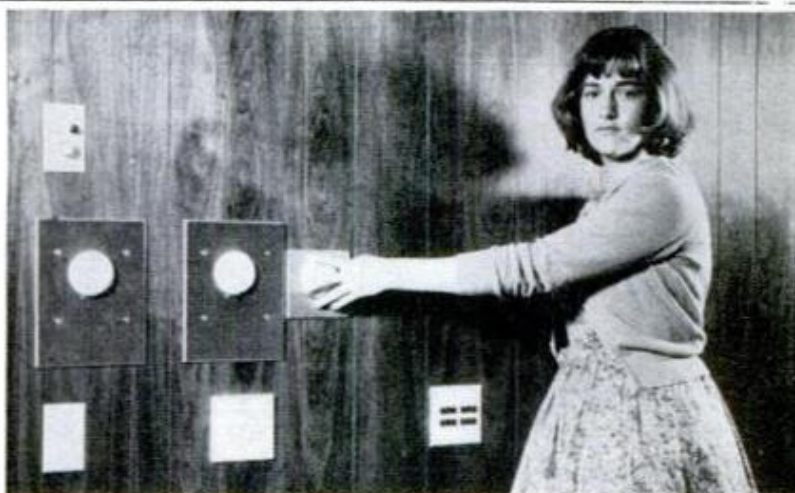
4030 Crenshaw Boulevard
Built by Construction Management, Inc.
Decorated by Jeanette Coppes, NSID, and
Associates
Furnished by Angelus Furniture Mfg. Co.

MILWAUKEE, WISCONSIN

7460 North Longview Avenue, Glendale
Built by MGM Builders, Inc.

SEATTLE, WASHINGTON

2011 123rd Street, S.E.
Woodridge Addition, Bellevue
Built by Modern Home Builders, Inc.
Decorated by Swigart's of Seattle and
Bellevue



WEATHER STATION-THERMOSTAT, a product of Minneapolis-Honeywell, and radio-phono intercom by Step-Saver, Culver City, Calif., are built-in conveniences at left. At right, lights are dimmed with a Luxtrol control

**PM's
House
of
Imagination**

Architect: Grosvenor Chapman, 1640 Wisconsin Avenue, N.W.,
Washington 7, D.C.

Builder of Pilot Model (shown in this section): Construction Management,
Inc., 343 Screenland Drive, Burbank, California

Decorator: Jeanette Coppes, NSID, and Associates

Furnishings: Angelus Furniture Manufacturing Company

Photography: Ralph Morris and Associates

**FOR
PLANS**

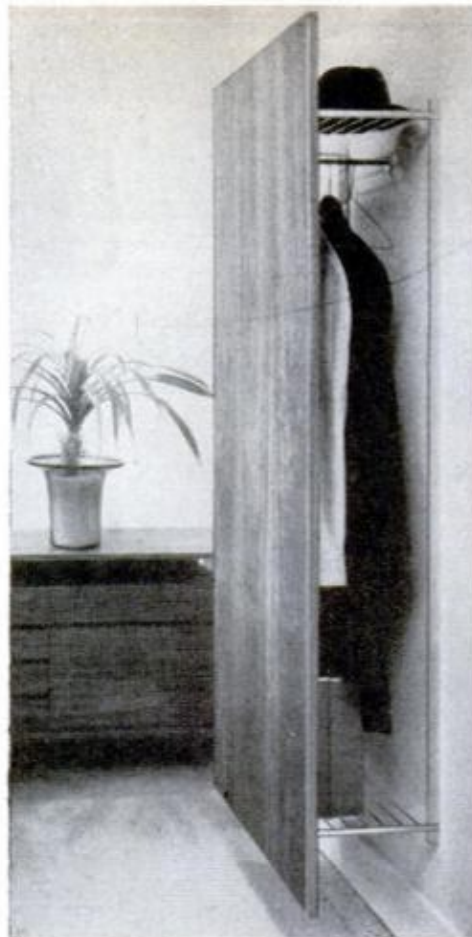
Complete plans including specifications for the PM House of Imagination are available. Each set of plans contains all variations of the house: Contemporary with low-pitched roof; Conservative New England country style with gabled roof; two-level; single-level, and the expanded version. The cost of each set of plans is \$35.00 in the U.S.; elsewhere in the Western Hemisphere, \$40.00; all other areas of the world, \$45.00. Order from Plans Department, Popular Mechanics, ~~200 East Ontario Street, Chicago 11, Illinois.~~

SEPTEMBER 1961

575 Lexington Ave. 169
New York, N.Y. 10022



HEATING AND COOLING an entire house with a unit small enough to be hidden away in a closet is possible with Delco's 365 series furnace and air-conditioning systems. The cooling section includes a weatherproof condensing unit mounted outside house



WALL-MOUNTED WARDROBE which includes a chrome-finished luggage shelf below and a hat rack above is by Hugh Acton, 588 Brockside, Birmingham, Mich.

Home Products--New and Appealing

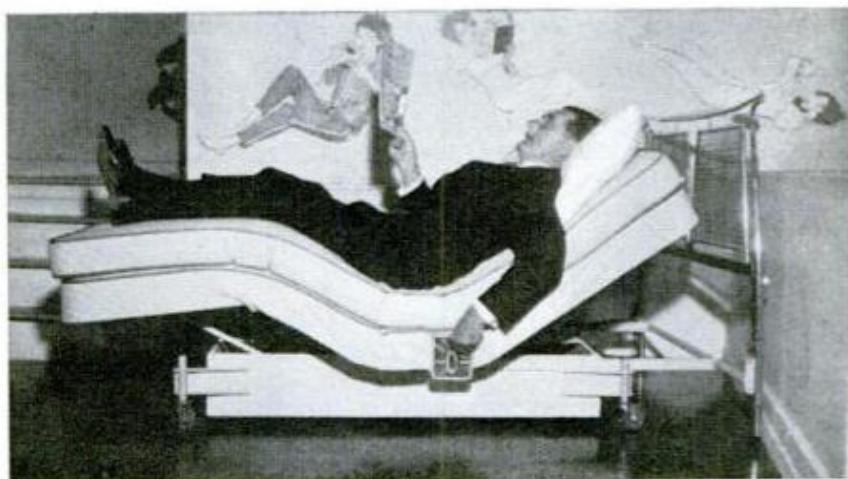
ELECTRONIC AIR CLEANER which can be installed easily in any type of forced-air heating system is produced by Minneapolis-Honeywell. The small control panel, below left, can be mounted anywhere in the home. Safety switches automatically shut off power when the access door is removed to service the three-inch cleaning cell, below right. The cost of the unit, including installation, is about \$350 in a new home, \$400 in an existing home



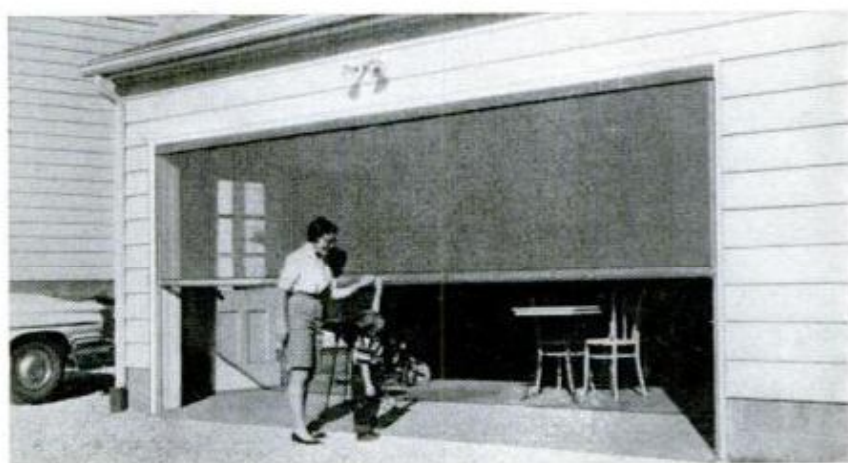


HOME INTERCOM which works through extension telephones is being offered on a rental basis by Bell. Each station consists of a phone and a speaker, while a combination speaker-microphone is used at the door

ADJUSTABLE BED with two motors which elevate the head or foot section at the touch of a switch is being manufactured by the Sleeper Lounge Co., 3279 Wilshire Blvd., Los Angeles 5, Calif. With mattress, \$349.50



PULL-DOWN SCREEN which covers garage door opening operates like a window shade. Made of fibreglas, it zips up the sides for full protection. A screen to fit the opening of a single-car garage sells for under \$50



More New Products

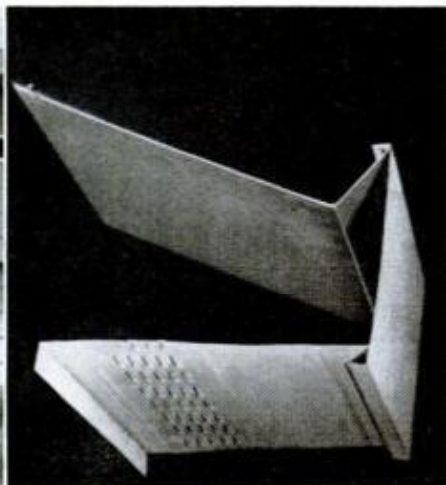
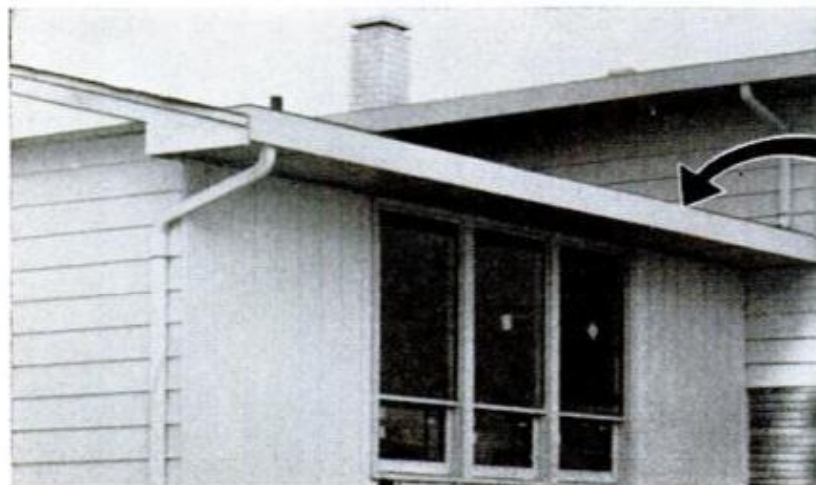


PHONOGRAPH RECORD ALBUMS stored on a new pole-type unit are held in hangers which pivot 90 degrees so that the record can be removed without taking down the jacket. It's made by Record Tree, Inc., 214 S. 12th St., Philadelphia, Pa., and sells for \$24.95



MODERN FIREPLACE HOOD is available in copper, brass, "Skonsmetal" (a pewter-type metal) or iron with a wide choice of light or dark colors and dull or bright finishes. It's manufactured by Scandinavian Art Metal, 1599 E. Walnut St., Pasadena, Calif.

SOFFIT, FASCIA AND GUTTER SYSTEM combined into one easy-to-install unit uses interlocking components made of .032-inch aluminum finished in baked white enamel. Soffit sections are made with fluted ribs and have a continuous breather vent panel extending the length of each section. Fascia plates are available in heights from 6 to 10 inches, and the V-shaped gutter, which extends 14 inches back from the fascia, meets all FHA requirements for rain-carrying equipment. It's made by Gary Steel Products Corp., Gary, Ind.



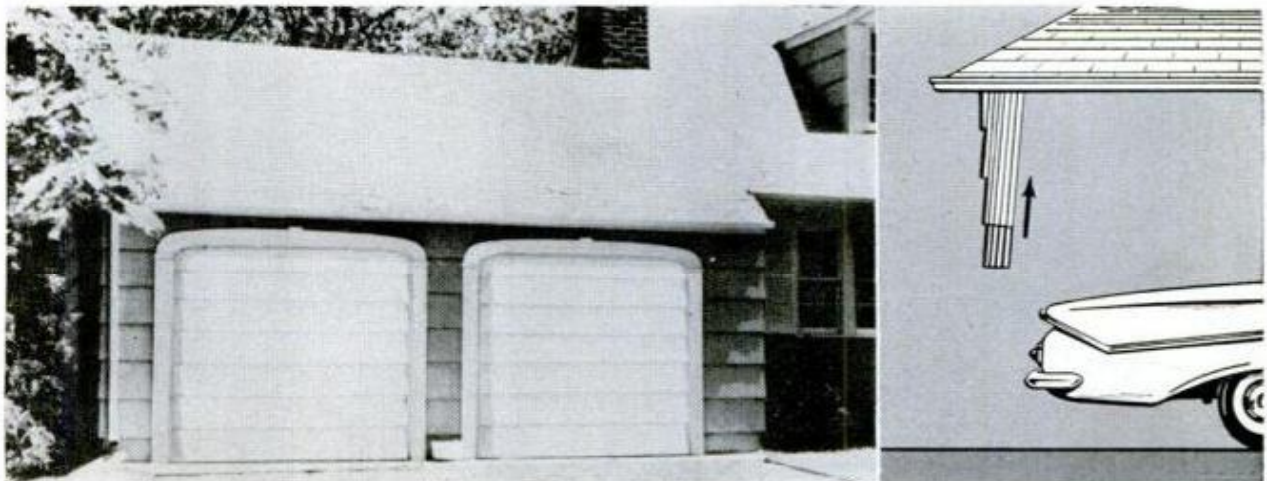


DECORATIVE DOOR MOLDINGS for use with flush doors come in many styles and periods and are available in stock door sizes. They are manufactured by Decorator Door Co., 425 Austin Place, Bronx, N.Y.



BUILT-IN CLOTHES HAMPER of heavy-gauge metal has baked enamel interior. Exterior is primed, ready for finish coat. Retailing for \$14.95, it's made by Quality Line, 5973 Venice Blvd., Los Angeles, Calif.

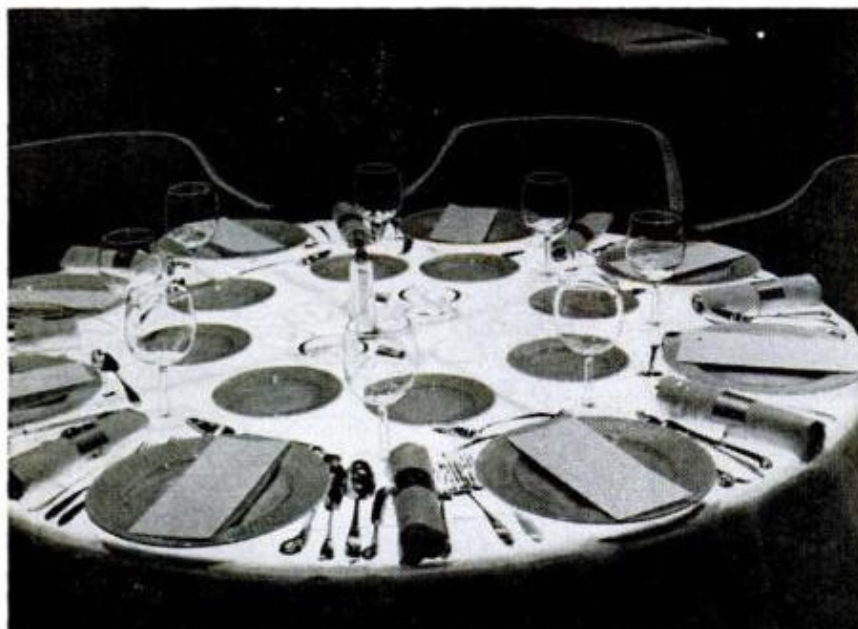
ELECTRICALLY OPERATED GARAGE DOOR raises like a Venetian blind without the use of any counterweights or overhead tracks. The steel panels stack into a compact unit only 10 inches deep. All surfaces are primed and ready for a finish coat with any exterior paint. An 8 by 7-foot door retails for \$159.50, and installation costs about \$15. It's made by Panel-Lift Door Corp., 1724 Chestnut St., Philadelphia, Pa.



More New Products



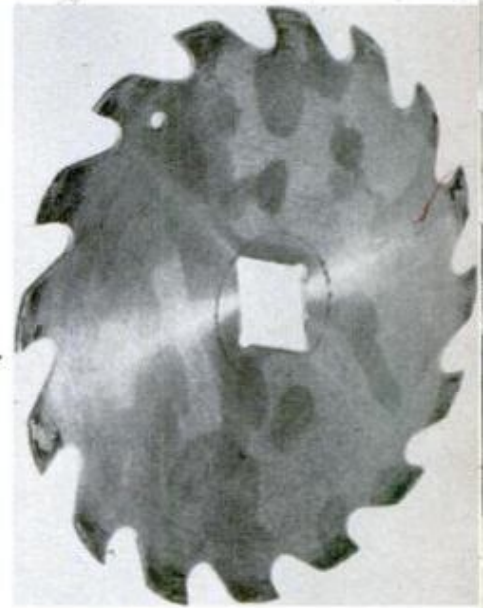
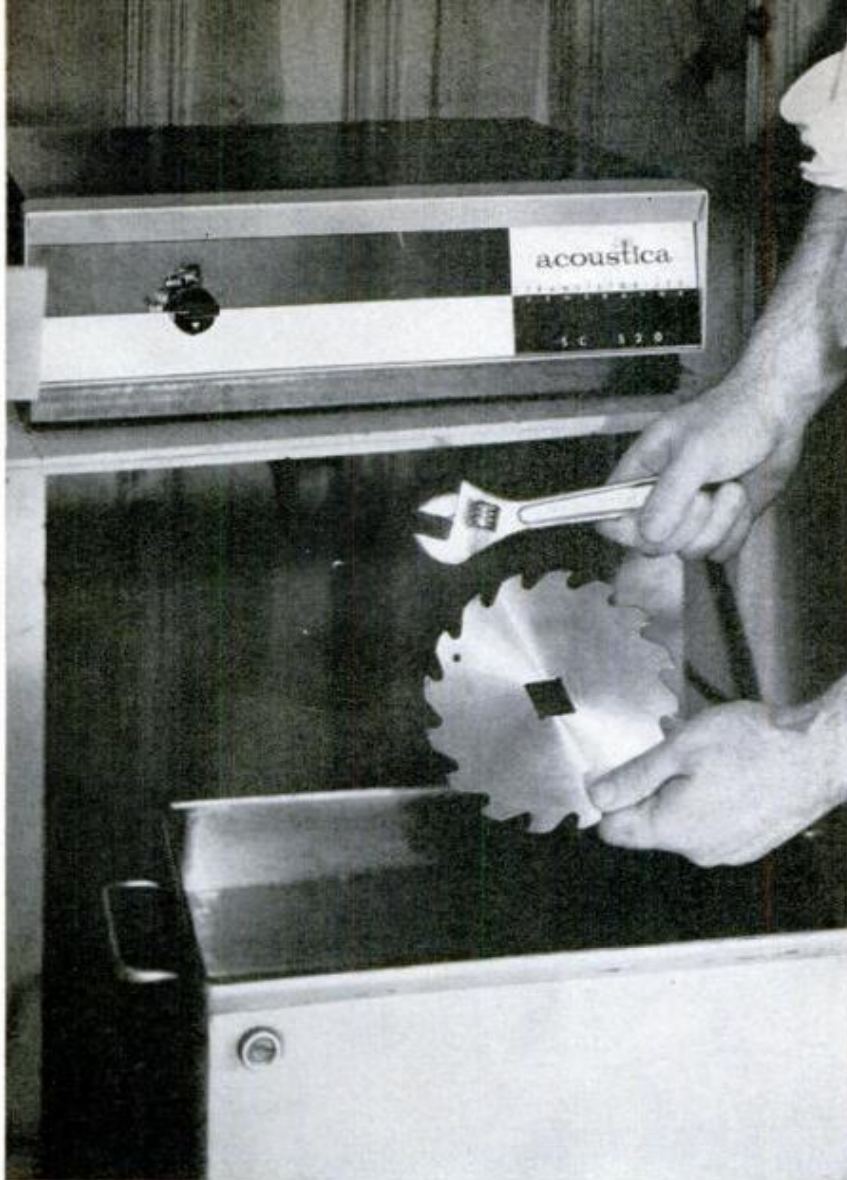
TRaversing SCREEN of polystyrene plastic which blocks out 86 percent of the sun's infrared rays while remaining cool to the touch can be ordered from Jaylis Sales Corp., 514 W. Olympic Blvd., Los Angeles, Calif.



ELECTROLUMINESCENT PANELS in a number of colors and sizes are now being sold by Westinghouse. They are glass panels coated with a conductive film, can even be used as table tops



COMPACT DISHWASHER suitable for built-in or countertop installation washes and steams dishes in 25 minutes. Priced from \$199.95 to \$279.95, it's made by Ling-Temco Electronics, Dallas



UNRETOUCHED PHOTOS of wrench and saw blade shown before and after a less-than-five-minute cleaning in the ultrasonic washer. Wrench was covered with grease and penetrating oil stain; saw teeth with dirt and gum

Workshop Ultrasonic Cleaner

MR. CLEAN will have nothing on the Dad who sports one of these ultrasonic washers in his workshop. Dirt, surface rust, grease, slime — just about anything that can be scrubbed with a wire brush — will come out of this ultrasonic bath clean in a few minutes.

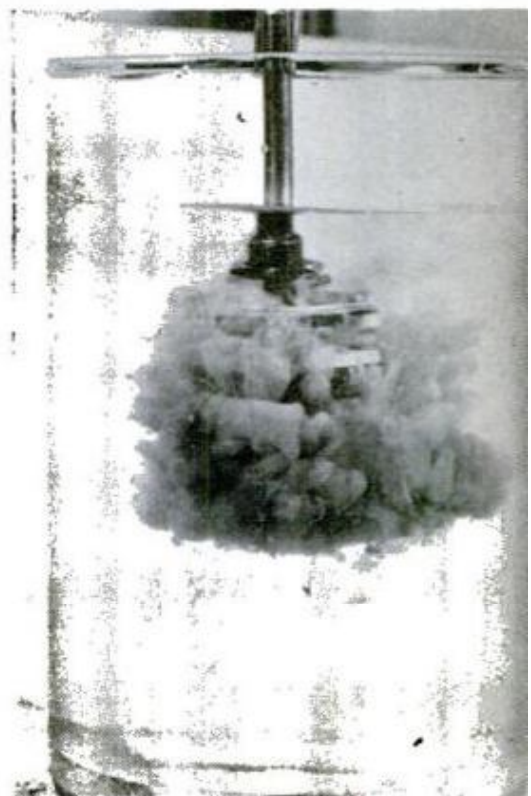
In fact, if Dad doesn't watch it, Mom will be slipping a skillet with burned-on grease into his washer for a cleaning.

Custom-designed installations of the Acoustica ultrasonic cleaners were made both at *PM's* new product-filled House of Imagination in Los Angeles, and *PM's* workshop laboratory in Chicago. These installations consisted of a tank fitted with a transducer and connected to the generating unit by coaxial cable. The generator operates on standard house current. Water is added to the tank with detergent, and high frequency sound then does the dirty work.

At this writing, such ultrasonic cleaners are relatively expensive installations. As they become more popular, though, the cost will come down.

One manufacturer, in fact, is working on a commercially-feasible ultrasonic dishwasher. *PM* hopes to bring you a report on its operation and effectiveness in the near future.

CLOUDS OF GRIME billow from machine part. Clear tank is demonstrator



Listen-Nook for Radio-TV Record Players...



... and Other Noisemakers

TAKE UP TO FOUR KIDS, give each his choice of turning on TV, the record player, the radio or a tape recorder—all at the same time. The noise should start you reaching for some super tranquilizers.

With this appliance sorter-pacifier, however, all is *silence!* There'll be few squabbles over what to listen to, for each child can select his favorite, be it a record, TV program, or radio. Or all four can listen to the same entertainment, while you enjoy peace and quiet in the same room.

Each appliance is slightly modified with a closed-circuit jack. The jack is wired by breaking one of the two loudspeaker wires and connecting each end to a lug of the jack. Then mount the jack to any convenient place on the appliance cabinet. When nothing is plugged into the jack, the appliance operates just as it did before.

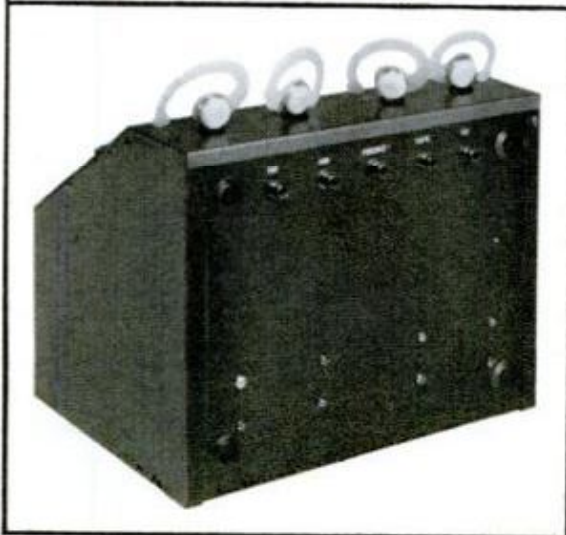
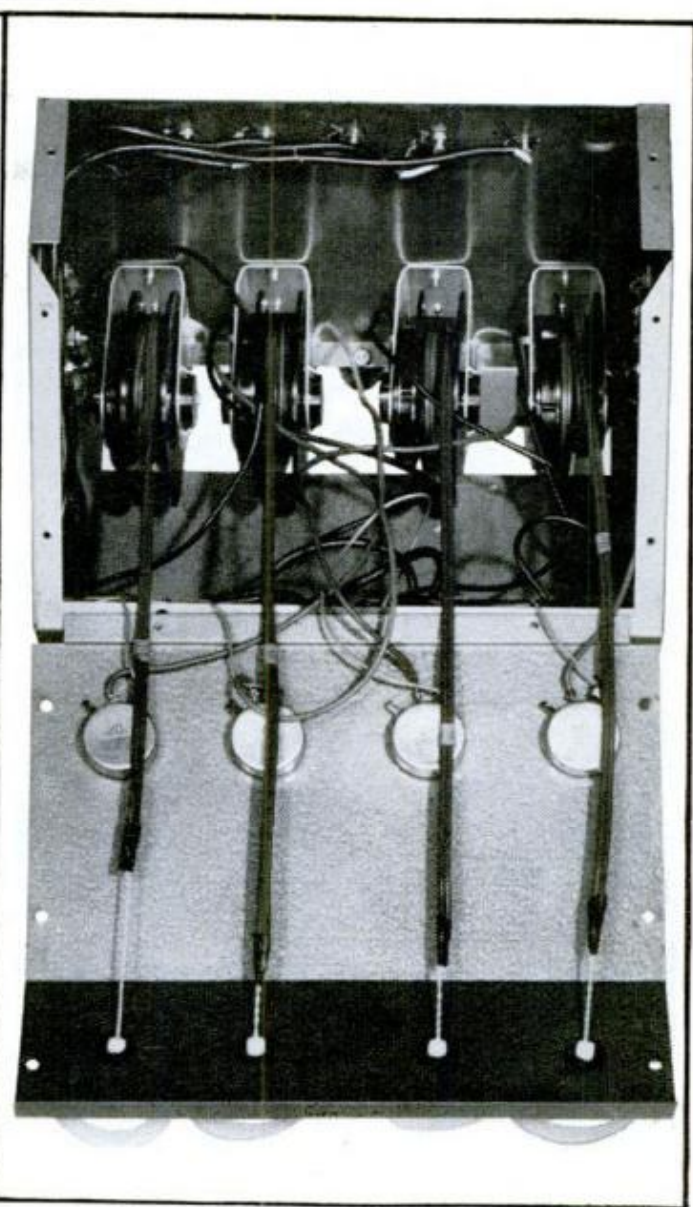
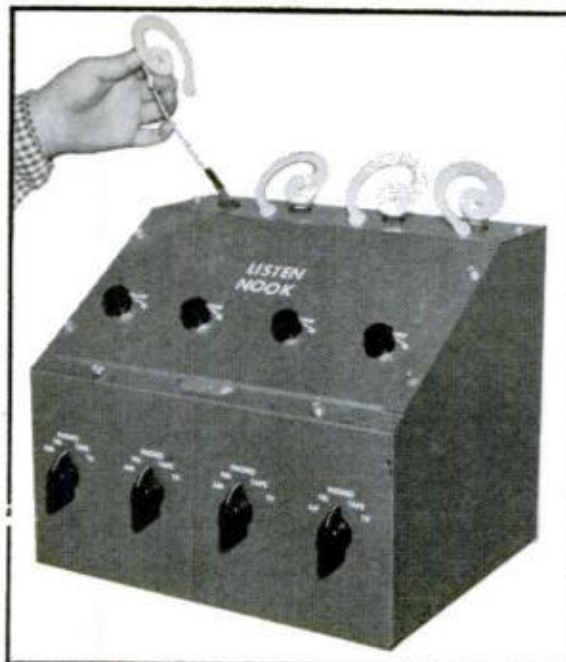
The Listen-Nook is a simple, nonelec-

tronic switching circuit. The reels (Wm. H. Ransome, 400 W. Madison, Chicago) insure that earphones will be properly put away, as they are retracted when not in use. Each child selects his program source and sets his own volume level. As six-ohm earphones are used, mismatch is of no consequence.

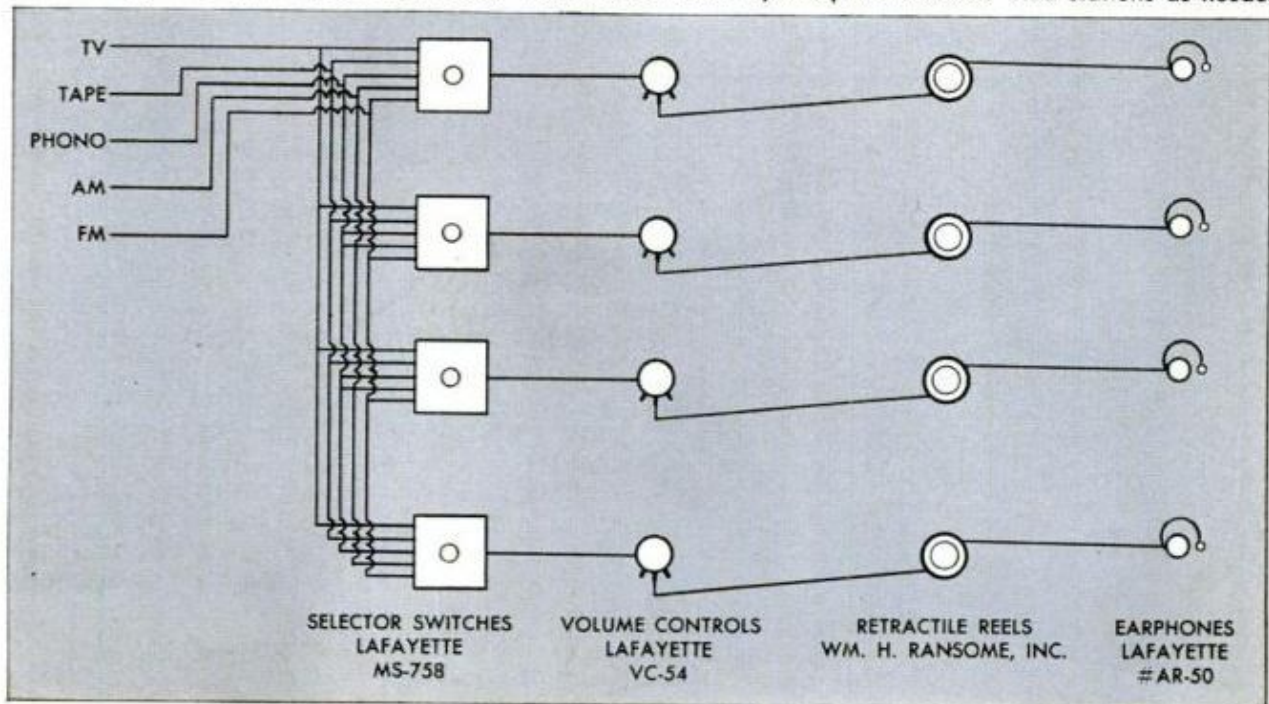
After punching the required cabinet holes, mount the parts and follow the wiring diagram. Use shielded audio cable for internal wiring to reduce the possibility of cross-talk. No shielding is needed on the reels for the earphones.

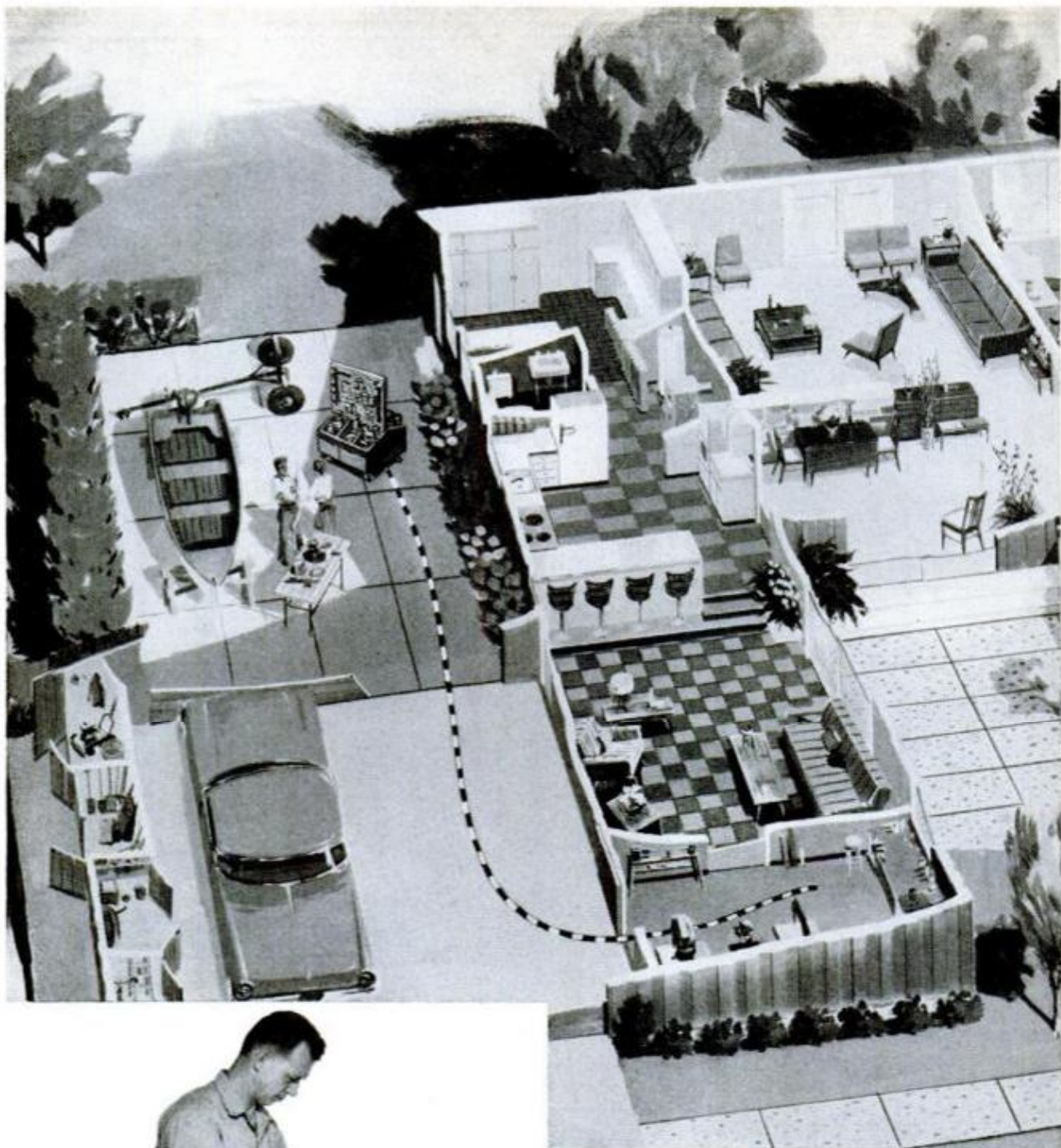
The total cost for the entire system built of all-new parts is about \$30. If you use fewer stations or junk-box parts, the total cost will be reduced.

(Why do you look so surprised, Yogi? After all, our readers are smarter than the av-er-age bear!)—Byron G. Wels



STANDARD HI-FI PHONO JACKS are used to bring the signal into the Listen Nook. Each station selects the desired signal using five-position switches. Volume level is set by the potentiometer. Add stations as needed



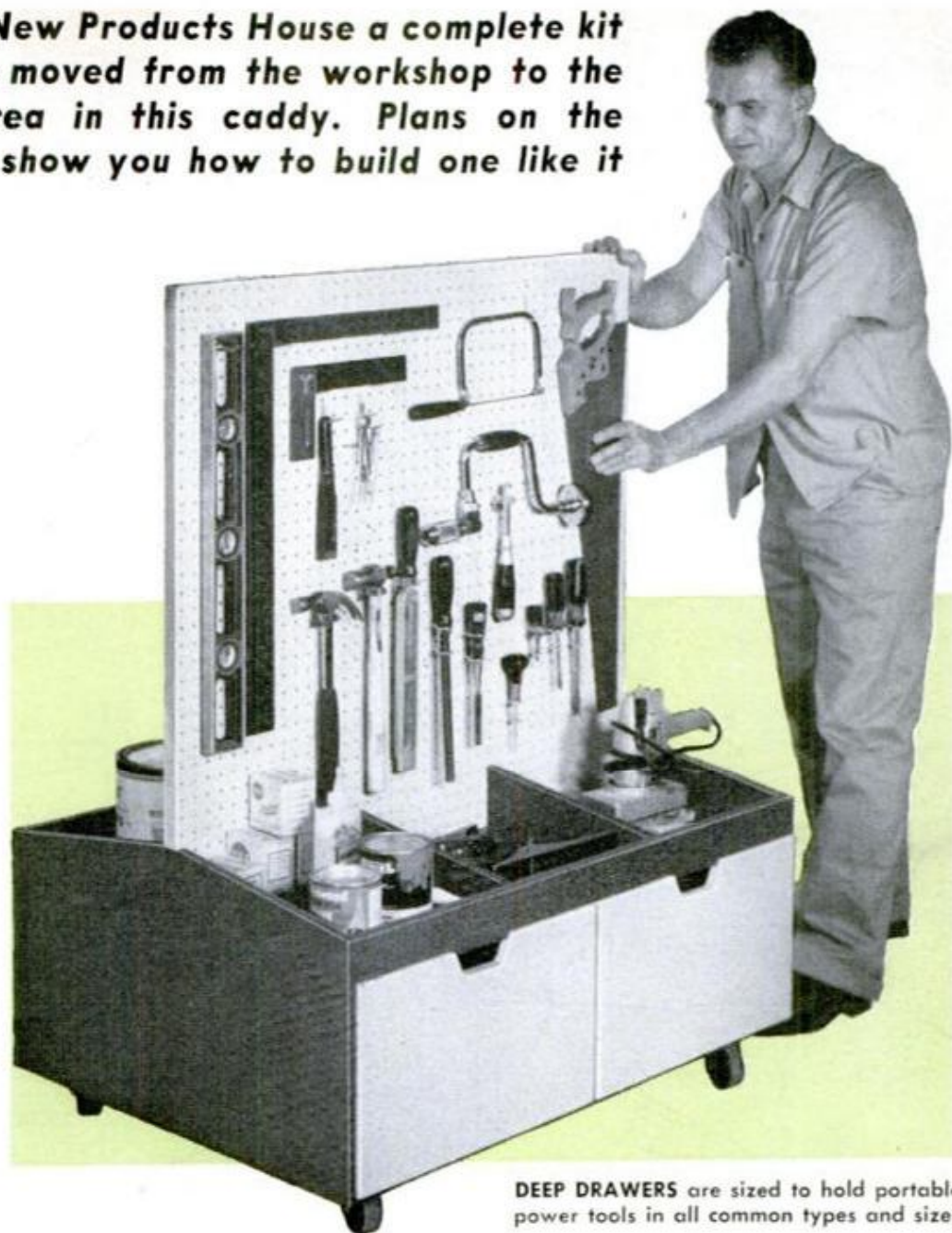


ROLLING

THAT DOTTED LINE you see on the birds-eye plan of the PM New Products House above shows how this rolling toolbox, or caddy, moves from the workshop right out to the project area, carrying a full kit of tools in one trip. And after one look at the original caddy pictured on the opposite page you won't be long figuring out how you, too, can use it.

Study the details and see what you get—six handy open bins, four deep storage drawers for portable power tools and a two-sided tool panel of perforated hardboard, the whole thing requiring a floor space of only 30 x 40 in. That 30-in. width means that the caddy will go through a standard

In the PM New Products House a complete kit of tools is moved from the workshop to the project area in this caddy. Plans on the next page show you how to build one like it



DEEP DRAWERS are sized to hold portable power tools in all common types and sizes

TOOLBOX

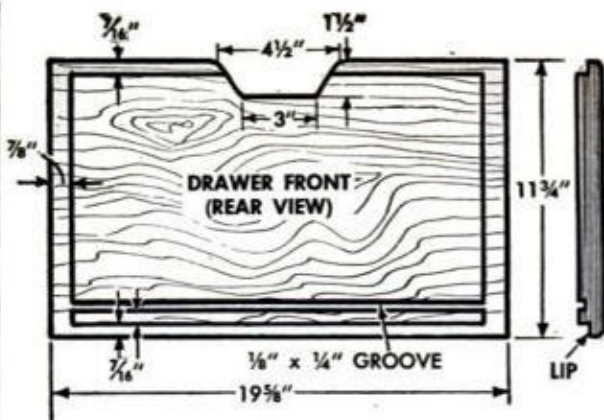
door, into or out of the garage or from the utility room onto a patio or porch, carrying its full complement of tools. This means that any open space you have available, inside or out, becomes a project area when you have this tool caddy to keep tools in order and out of the way until they are needed.

From the construction details you will see that the tool panel consists of two 40 x 48-in. pieces of $\frac{1}{8}$ -in. hardboard attached to the two sides of a frame of 1 x 2s of the same over-all size. The 1 x 2s are joined with corrugated fasteners and the hardboard panels are attached with short flat-headed screws and glue. Note that two



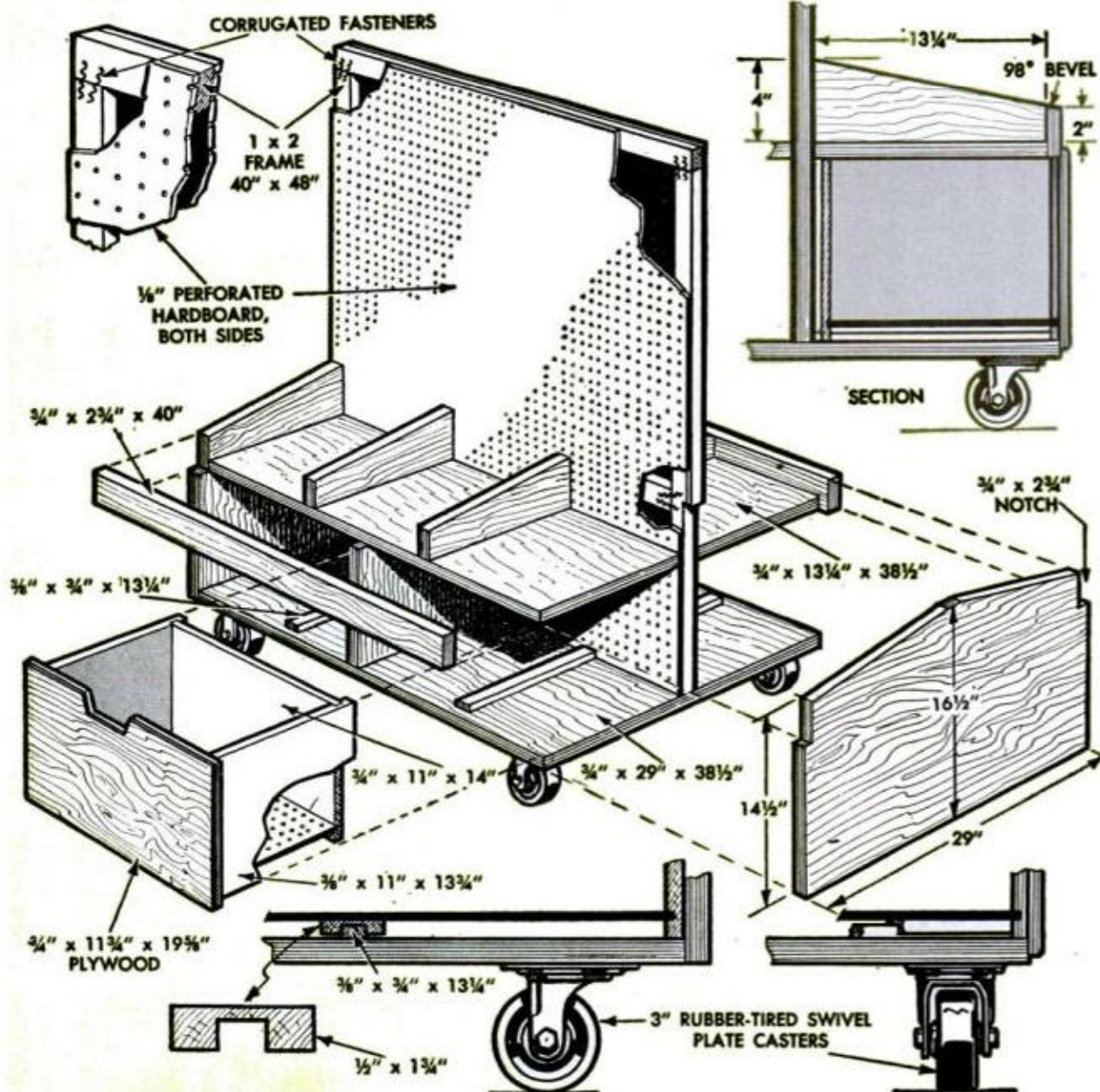


DRAWER BACK is notched to permit grooved slide to engage guide strip. Notch is same size as groove



edges of this assembly are notched 15 3/4 in. up from the lower corners and 3/4 in. deep to take the end panels in a flush fit. The assembly is attached to the base by driving screws up from the underside. End panels are glued and screwed in the notches.

Next, you install the drawer dividers and drawer guide strips. Then follow with the



bottoms of the bins, each with the two dividers attached before assembly. Screws driven through the end pieces hold the bottoms in place, glue being used in the joints for added strength. Finish the bins by attaching the closure strips which, it will be noted, lap the end pieces flush in notches and are attached with screws and glue.

One detail shows a drawer front from the back, or rear, side and indicates the locations of rabbets, hand openings and the groove taking the bottom panel. In the original caddy the drawer bottoms were of 1/8-in. perforated hardboard but you can use 1/8-in. solid tempered hardboard if you prefer. The four drawers are duplicates and each is fitted with a grooved guide which slides on the strip attached to the bottom of each drawer compartment. Attaching the casters finishes the construction.

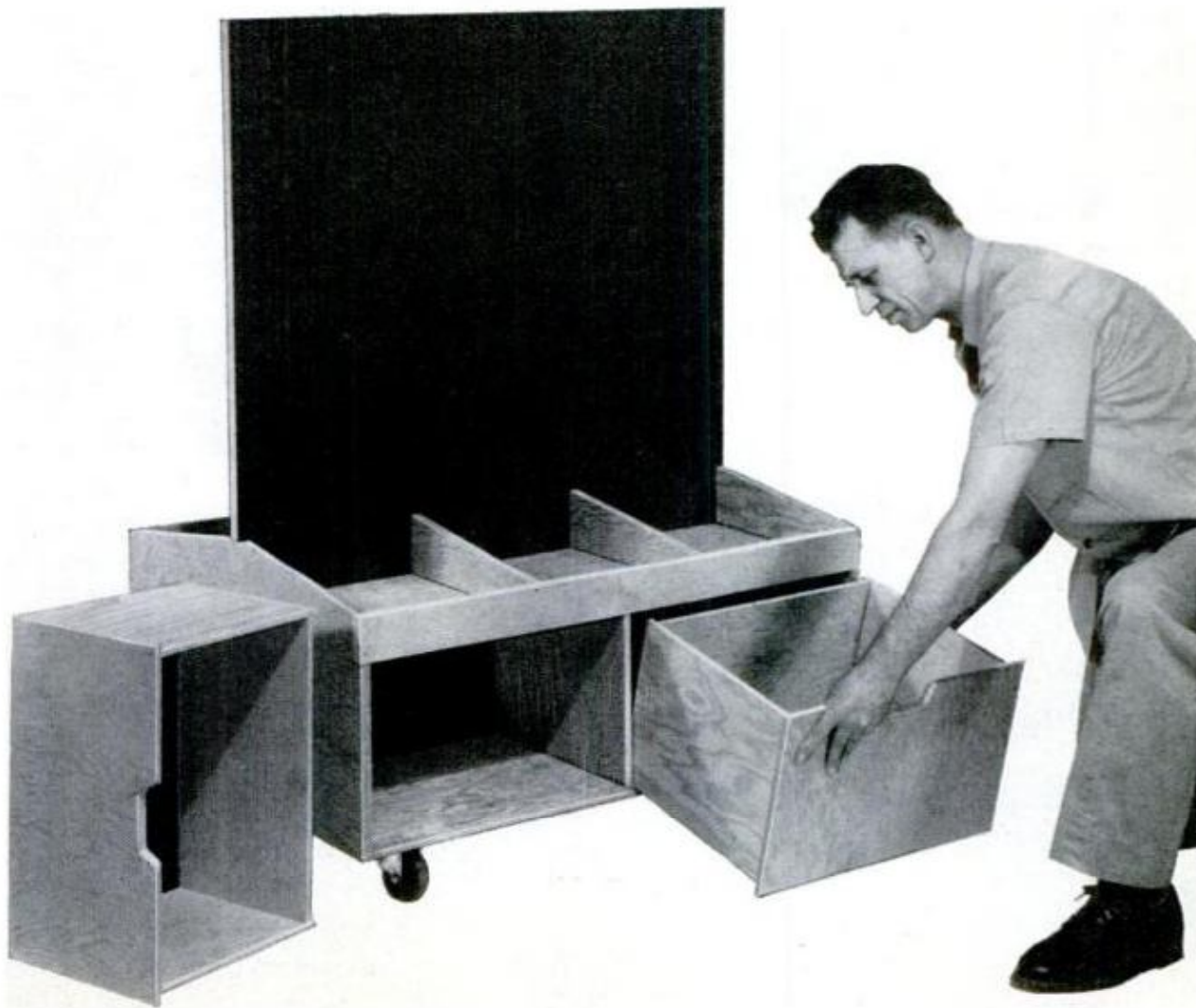
As all exposed parts are of plywood you'll need to do sanding only with fine sandpaper to get a good surface for finishing. First, apply a sealer and then follow with one or two coats of multicolor spatter finish in the color, or colors, of your choice. These new finishes are very durable, perfect for covering plywood and especially attractive.

★ ★ ★



TOOLBOX rolls easily on rubber-tired swiveling casters. Caster plates are attached to bottom with screws

HAND OPENING in each drawer front eliminates pulls, allows caddy to pass through standard door



Television Interwatcher

"WHAT ARE you kids doing in there?"

"Nothing Mom."

"Well, I can see you, so stop it!"

With this TV intercom, not only can Mom see the kids, but the kids can see Mom, and you can bet that the horseplay will come to a halt.

This is one of the unique new home products installed in the *Popular Mechanics* House of Imagination shown elsewhere in this issue.

Each 7 x 8 x 12-inch unit of the system weighs 18 pounds and consists of an eight-inch TV receiver, a TV camera tube, the necessary audio circuits, a 3½-inch speaker, and brightness and contrast controls. Power consumption is 30 watts per unit.

The system is fully transistorized for rugged compactness and is capable of sending the combined audio-visual signal a distance of up to 300 feet along an easily installed ¼ x 1-inch flat line cable. The cable can provide outlets in each room, permitting the user to carry the set from room to room, plug into a wall convenience outlet and the circuit outlet, and be ready to use.

Until recently, TV intercoms were somewhat impractical because of the need for excessively-high light levels. Now however, ambient light is sufficient to provide a clear, sharp picture on the TV screen.

While the system is flexible and can find numerous applications in the home, imagine the convenience when Junior holds a book up and asks, "Is this the one you wanted Mom?"

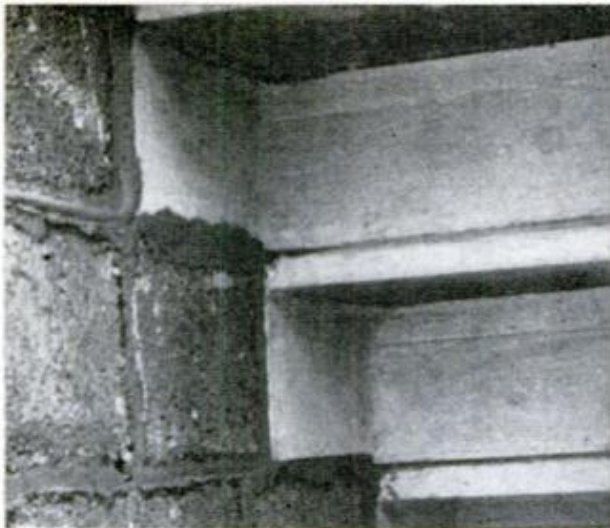
While plans for commercial distribution of this new Motorola TV intercom have not been completed, such installations of them as the one in the *PM* House of Imagination displayed at the Los Angeles home show will sample public response to such products. If enough interest is shown, you may find TV Interwatchers available for your home soon.



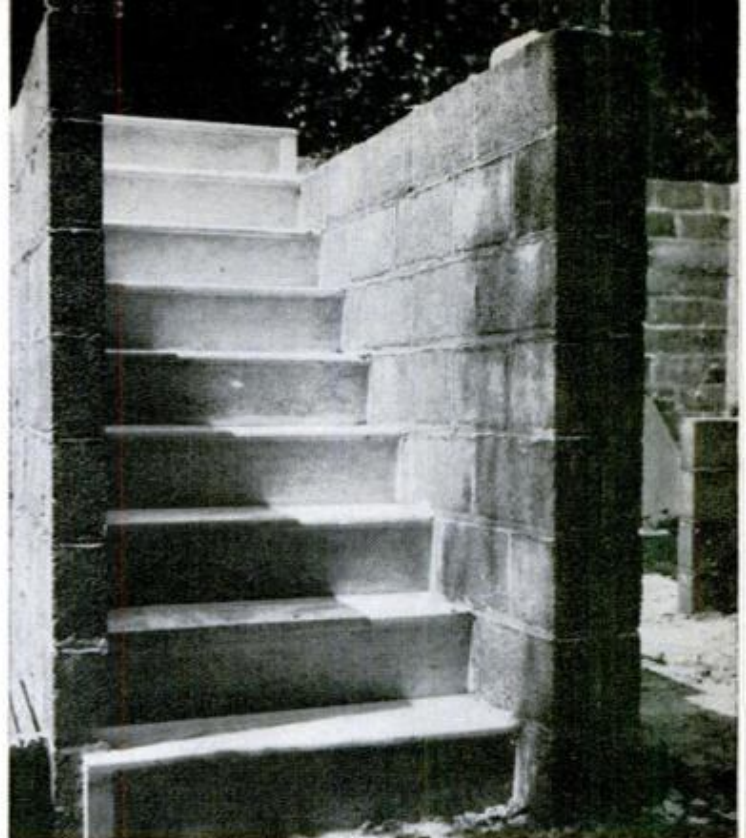
"WE AREN'T FIGHTING MOMMY!" Anybody who has children knows this refrain. Mommy can stop the fray before harm is done

"MOMMY CAN SEE YOU!" The psychological effect of observation seems to add a quiet note to children's noisy play periods





PRECAST STEPS are available with end members that permit them to be mortared into concrete-block walls



GOING-UP VIEW, right, of basement stairway made with precast steps. Not a single form board is required

STEP UP—TO PRECAST CONCRETE STEPS

PACKAGED concrete steps can save you hours of time building forms, mixing, pouring, troweling and curing with the usual cement-sand-gravel-water procedure of regular concrete work. Not only precast, reinforced steps and risers are available, but a stoop complete with iron railing can be yours for the ordering and setting up.

Just be sure to order the size you need including the steel-reinforced landing slab, reinforced steps with precast risers and the flanged abutments with cast-in stringers as in the detail below.

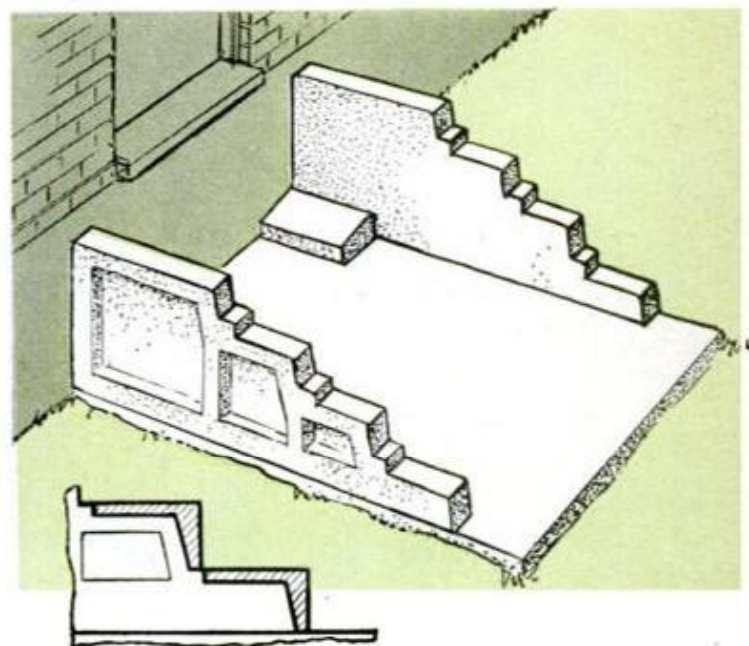
Pour a base slab on a gravel fill, set the abutments in mortar, then mortar the

stringer, set the steps and landing slab in place and there you are. If you ordered the iron railing to fit, just bolt it in place; the necessary bolts are cast in place.

Or, if you're building an inside or outside basement stairway there are steps precast for mortaring right into the concrete-block walls as you see in the photos above. The steps come with nonslip or smooth treads. They are set in place without use of forms.—James A. Lockhart - *Box 128, Bryan, Ohio*

FLANGED, PRECAST ABUTMENTS are mortared to slab poured over gravel fill. Note flanges and cast-in stringers which take steps in made-to-measure fit

PRECAST STEPS consisting of step-and-riser units designed to fit cast-in stringers on precast abutments





THIS OLDER HOUSE, which needed painting, was sold by owner directly to buyer for \$21,000—or \$900 less than the “dickering price” first quoted. By selling direct, though, the owner pocketed over \$1200 he would have had to pay to a real estate agent. The ad which sold this house is the one labeled B on page 186

How to Make Money Selling Your House Direct

With the right improvements and a good sales campaign, you can sell it yourself — and “earn” the commission

By Paul L. Theurer

HOW MUCH YOU SAVE IF YOU SELL YOUR HOUSE YOURSELF





DO put out a FOR SALE sign to attract potential buyers cruising the neighborhood. **DON'T** use a crudely lettered homemade sign such as the one shown here. A professionally made sign will inspire more buyer confidence

"I MADE \$900 yesterday," my neighbor told me smugly.

With visions of fantastic stock deals, poker games, or horse racing, I swallowed the bait and asked how.

His answer, "Selling my house."

No, the house didn't sell for \$900. It sold for \$15,000. The \$900 was extra income, realized because smug neighbor handled the sale himself and saved the six-percent commission he would have had to pay to a realtor.

An extra \$900 on a \$15,000 house could mean a plush vacation, a new hi-fi and TV, or just getting a couple of bill collectors off your neck. Some cities still have only a five-percent commission on real-estate sales (like Birmingham, Bridgeport, Tampa and Indianapolis). But most have adopted the six-percent rate which realtors expect to be the national standard by 1962. And if you happen to be in one of the holdout cities where the five-percent figure is still in effect, the saving on selling a \$15,000 home yourself would still be a very acceptable \$750.

The average American family owns at least three homes in a lifetime, so the opportunity to act as your own salesman and realize that five-percent or six-percent saving may arrive sooner than you think.

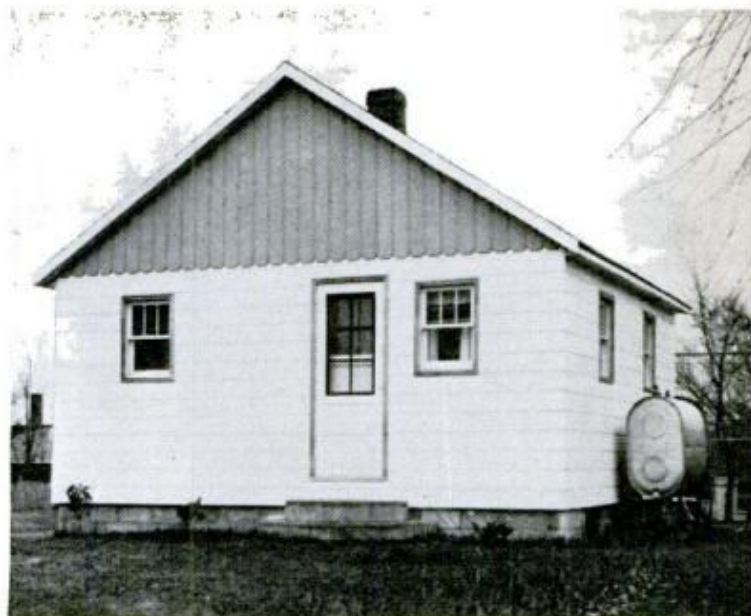
Don't expect to just tack up a FOR SALE

sign, and then choose from among the eager buyers, all waving sheafs of greenbacks. Selling your home requires preparation.

Before you place your home on the market, check the want ads for homes similar to yours in size and in a comparable neighborhood. See what their asking price is. Balance the going market value with the price you paid, adding the value of any improvements and subtracting the value of some of the living you got out of the house. The result should be a reasonable price. Remember, when comparing your house with others on the market that most asking prices are set high to leave room for dickering.

In my neighborhood one family advertised its house for sale in a newspaper want ad, sold it to the third couple that called. Inspired by this example, another family brushed off the real estate agents and tried handling their own house sale, too. After two months of open houses, ads and frustration, they gave up and turned the house over to a realtor. His luck was no better. In desperation, they sought the counsel of their banker. His advice was concise. "Lower your price \$1000."

With the price \$1000 lower, the home sold in less than three weeks. The couple handled it themselves, and still realized almost as much from its sale at the lower figure as



DRAMATIC EXAMPLE of how the same type of house—no matter how simple and plain it is in appearance—can be made more salable with some fixing up, and without major remodeling or altering of the structure

they would from the higher figure working through a realtor.

The moral is clear: An over-priced house will not sell.

After you have decided the price, put the home on the market, if possible in the spring or fall, the best periods for selling real estate. Usual practice is to place a want ad in the local paper and put a sign on the lawn.

Before you prepare your ad, make a list of all the attractions your house might have to a buyer. Select those you feel would most appeal to some family looking for a home in your neighborhood, and then write up the advertisement using some "friendly" words and a little originality. Instead of "Stucco 4 br, 20x14 lr, hot water ht, 2 baths," a Kansas City man ran this ad: "Comfortable older home, sprinting distance Hale school, lots of room for kids and dogs." The phone started ringing at six in the morning, and didn't stop until it was taken off the hook. The house was sold by noon.

Don't stop your promoting with a want ad. There are plenty of opportunities for free listings. Big corporations are constantly shifting personnel, and to make the moves more painless, actually solicit listings for the convenience of the employees. Supermarkets and drugstores often have free bulletin boards where you can post a notice. Your church secretary will probably be glad to put an announcement in the church bulletin.

And for heaven's sake don't take a pencil stub and scrawl "For Sale by Owner" on an old piece of cardboard, and expect it to attract passersby. Many prospective home-

owners cruise the neighborhood where they would like to live, keeping on the lookout for likely looking homes for sale. A sloppy sign would be no inducement to stop. It only costs a few dollars for a neat-looking professional sign.

Desperate to make a big impression, some people will actually redecorate their whole house before putting it up for sale. This is a waste of time and money. Experts recommend keeping the interior decoration to a minimum since most homeowners prefer to do their own refurbishing, selecting the colors and styles they prefer. However, you should definitely repair cracks and clean or repaint marred or dirty walls, using a neutral color like beige, white or gray.

Unless you absolutely have to move, stay put until you have made the sale. A furnished house sells 10 times easier than an unfurnished one, a bank mortgage officer tells me, and he has scores of examples to prove his point. Rooms look more appealing with furniture in them. But clean out the attic and basement so they don't look cluttered. Convenient storage space, which looks bigger when neatly arranged, is a major selling point.

Greeting Your Maiden Aunt

If the exterior looks unkempt and the lawn scrubby, you may not even entice some prospects in the door. Clean up the yard as if your rich maiden aunt, who's also president of her garden club, were coming for a visit.

Should you paint the exterior? Sometimes it pays. "One coat of paint can in-

(Continued to page 246)

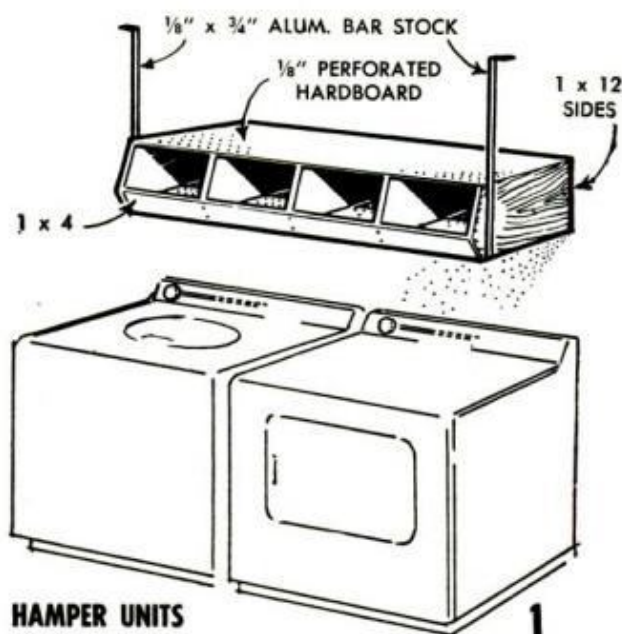
Built-in Convenience

By David M. Swartwout

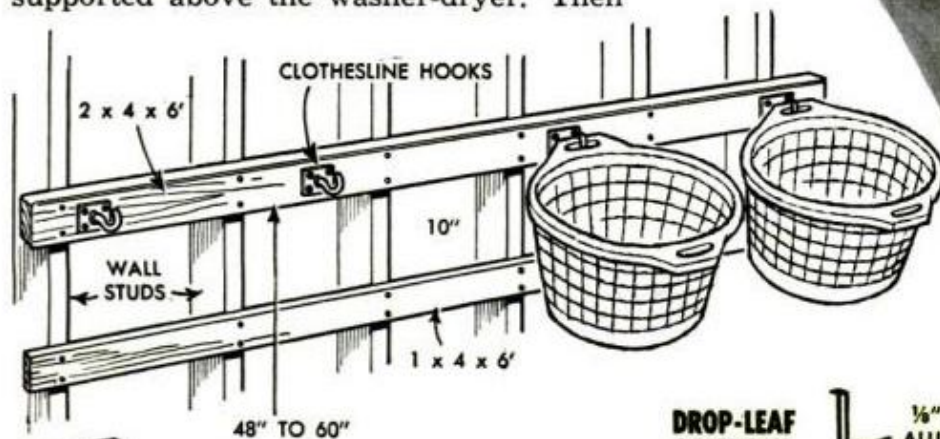
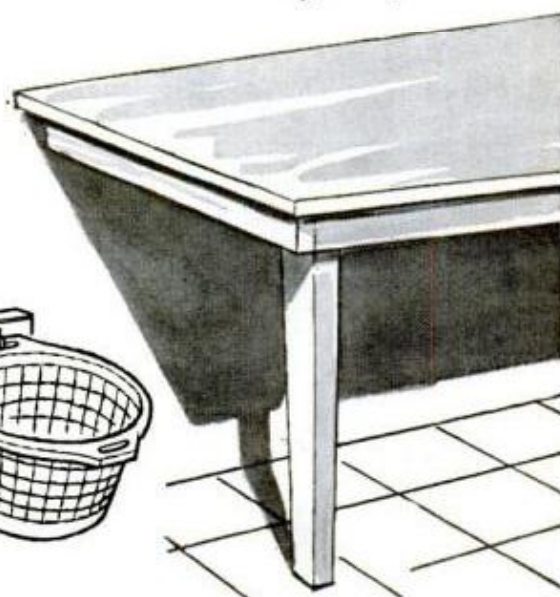
JUST THINK OF the time and steps that would be saved by presorting a whole week's laundry before washday. Think, too, of the convenience of table space in the laundry where the ironing can be organized and carried out without a wasted minute or extra step. If wishes were facts . . . you say. But why not?

It's simple. You do the sorting as you gather the soiled laundry by dropping the items into compartmented, built-in hamper and you end washday with stacks of ironing neatly arranged on an in-the-corner or around-the-corner table having—of all things!—a built-in, sorting Susan. Begin with Fig. 1 and go right on through Fig. 10 and you'll see how it can be done in your own home.

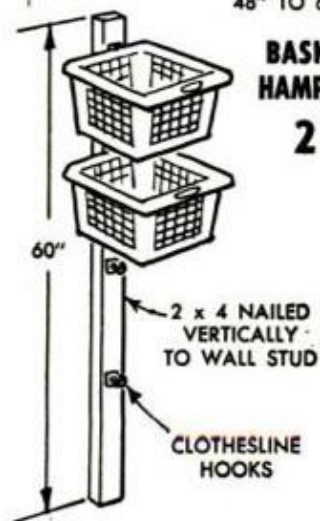
Look first at Figs. 1, 2, and 3 and also Figs. 9 and 10. These are just different versions of much the same type of hamper installation, especially those detailed in Figs. 1, 3 and 10. Fig. 1 shows you a simple four-compartment unit, ceiling and wall supported above the washer-dryer. Then



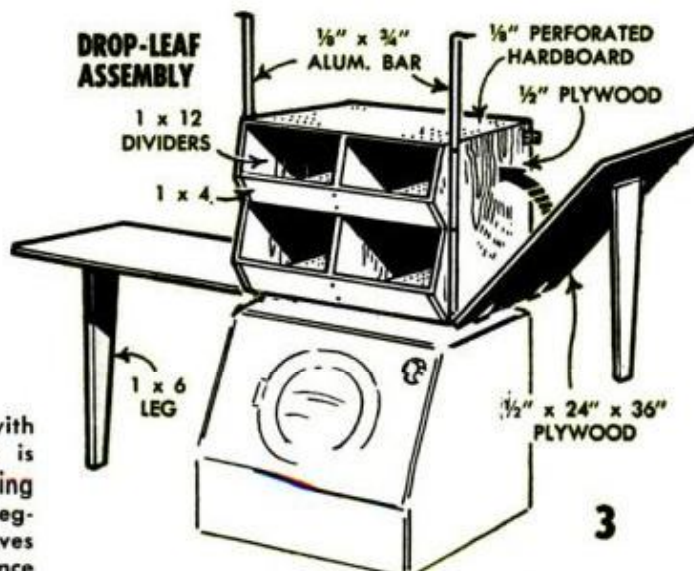
HAMPER UNITS



BASKET
HAMPER
2

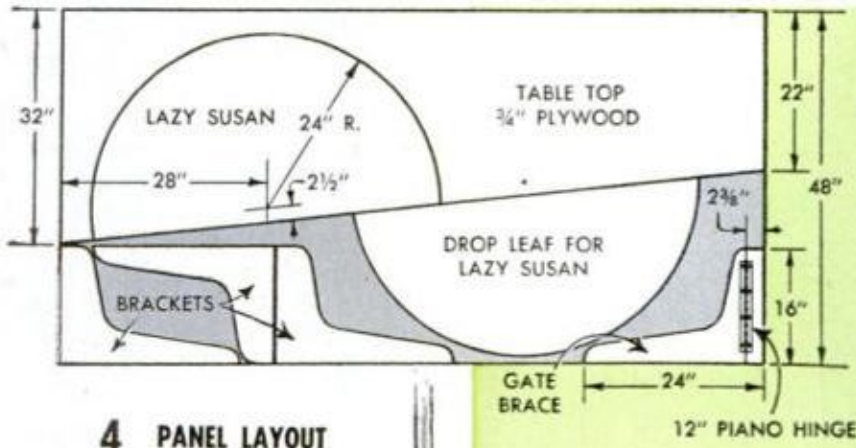


STACKED HAMPER with four compartments is convenient for sorting before washing. Leg-supported drop leaves are added convenience



POPULAR MECHANICS

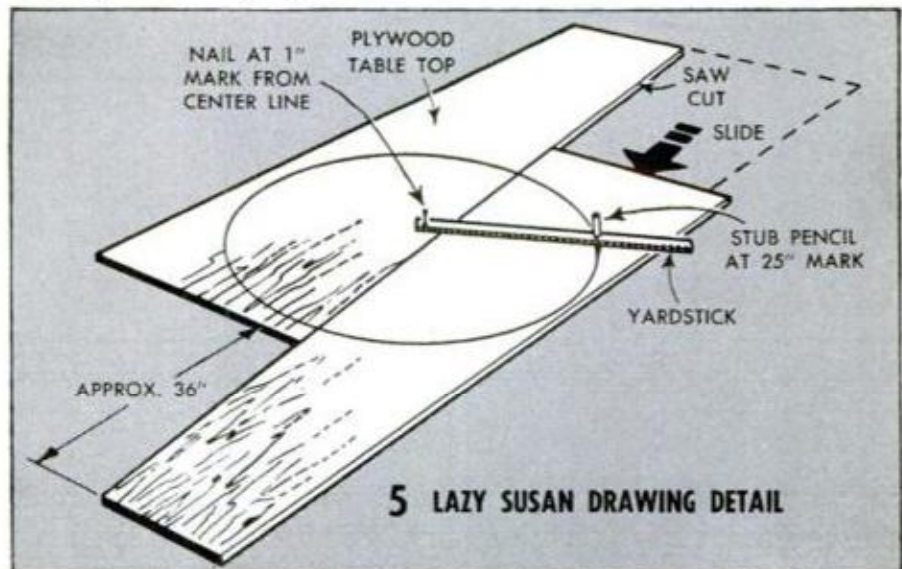
for *Sorting Laundry*



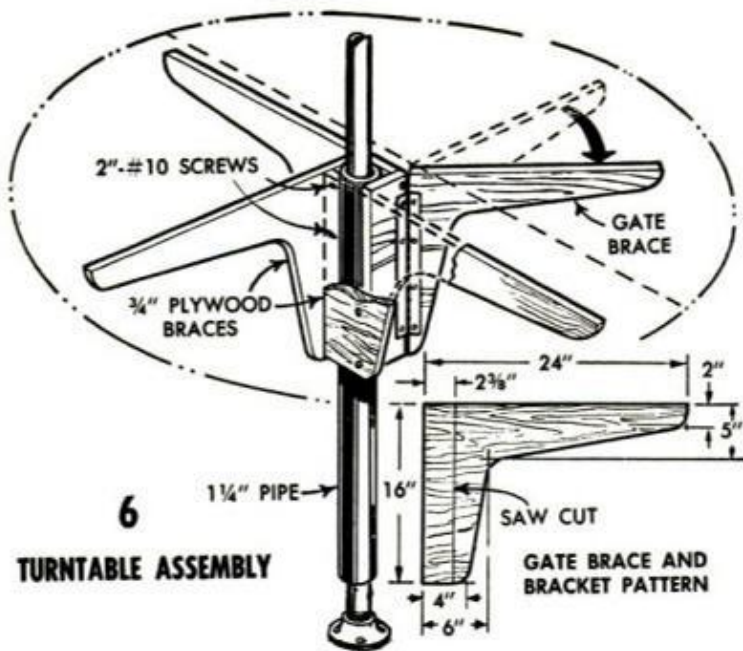
4 PANEL LAYOUT



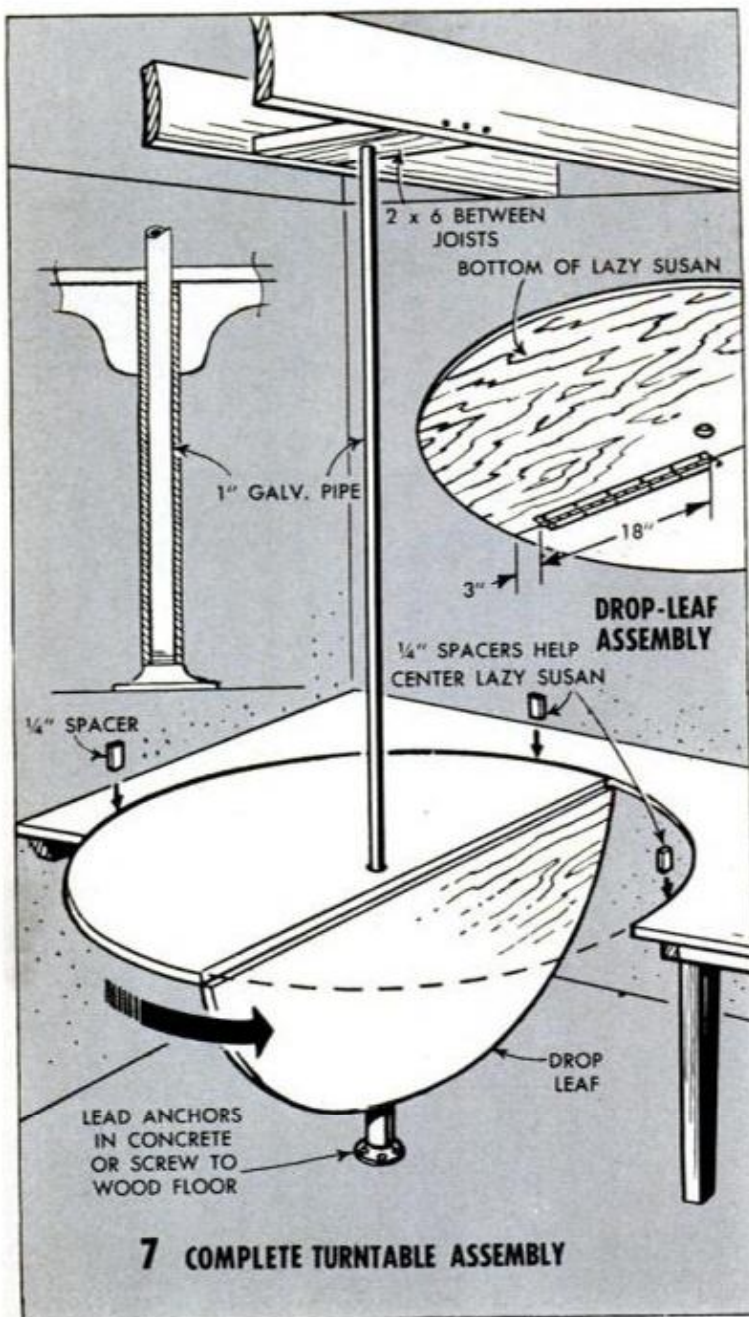
PLYWOOD PANEL is first cut diagonally as indicated in detail. Then pieces are moved past each other and Lazy-Susan top is laid out with yardstick trammel. Parts are then edge-glued



5 LAZY SUSAN DRAWING DETAIL



6
TURNTABLE ASSEMBLY

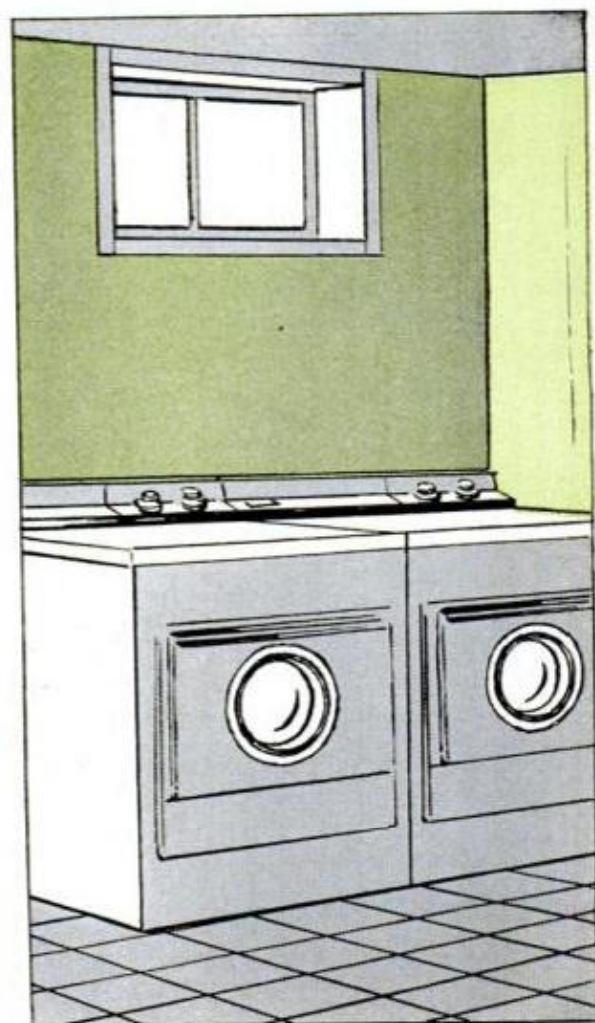


7 **COMPLETE TURNTABLE ASSEMBLY**

there's the four-compartment hamper detailed in Fig. 3, having the added convenience of leg-supported drop leaves on both sides of the combination washer-dryer. Over-all dimensions given for the in-line and stacked types of hamper are only suggestions. You can make four-compartment units like those shown or any number of compartments up to a dozen, using the same materials and methods.

The tilting hampers, made as in Fig. 9 and mounted along the basement stairway as in Fig. 10, are a step-saving convenience. The hampers pivot on lengths of 3/8-in. pipe assembled with elbows, nipples and flanges as in Fig. 10. Each hamper is held in a vertical position by screen-door hooks and tilts down to a horizontal position.

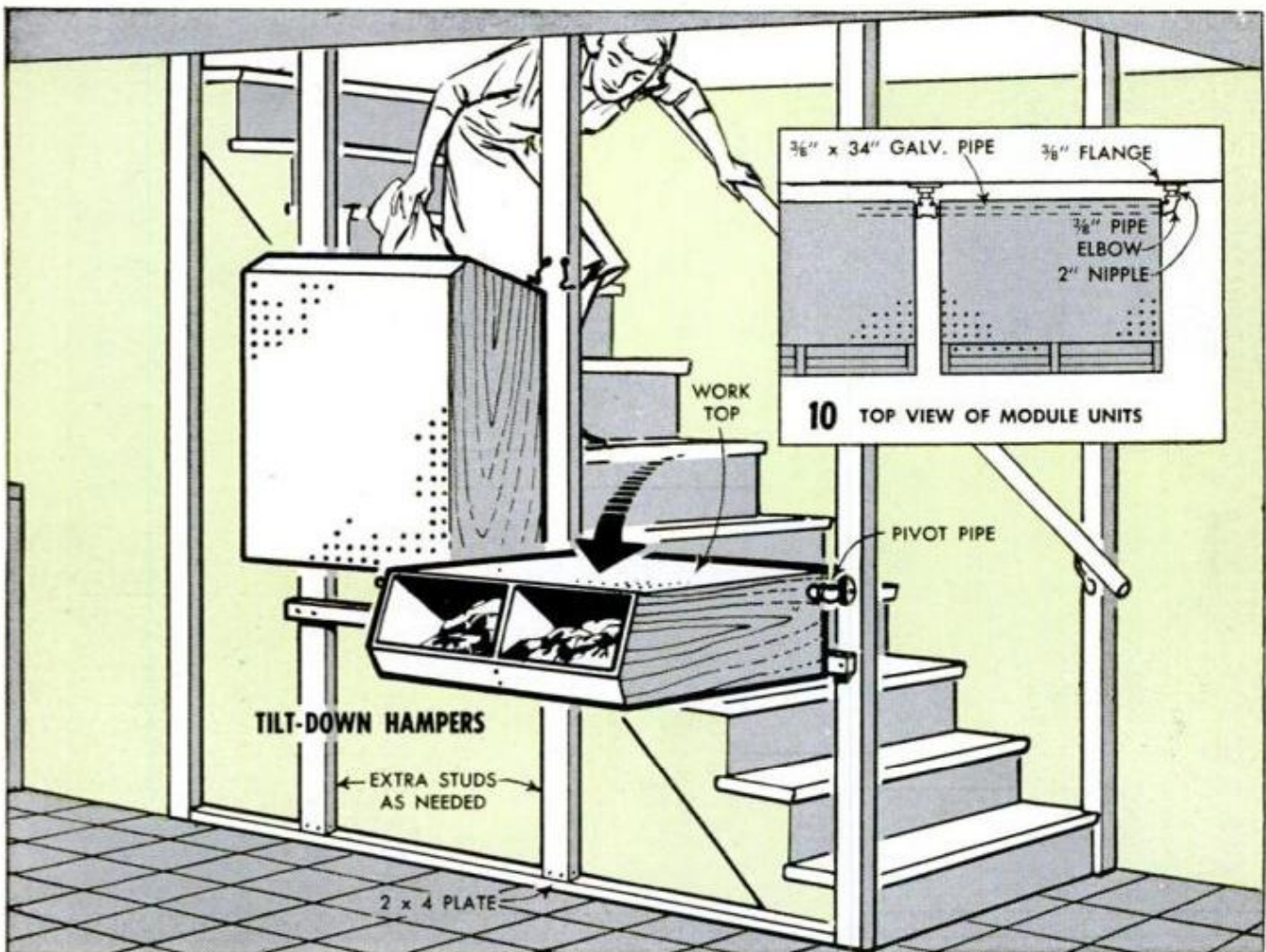
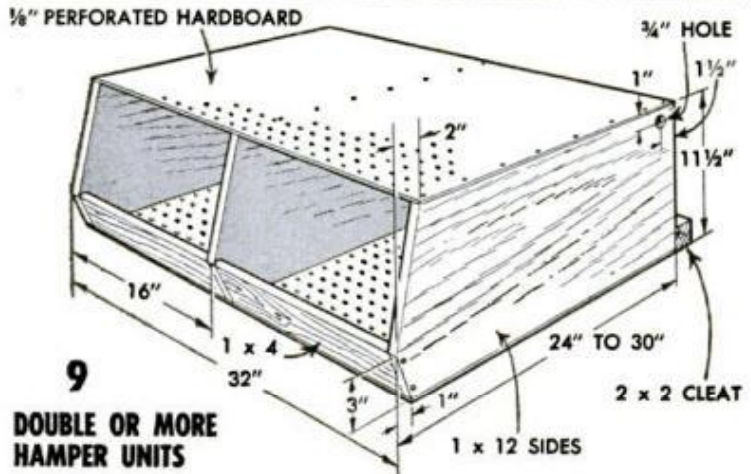
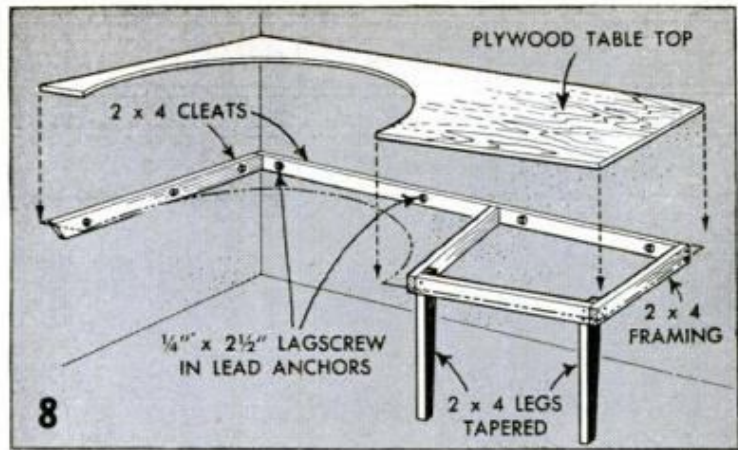
A simple convenience is the basket-hamper arrangement in Fig. 2, common plastic baskets being placed side by side or one above the other as detailed. A 10-lb. load of white goods, colored fabrics and other sortings can be placed in each basket ready for the washer.

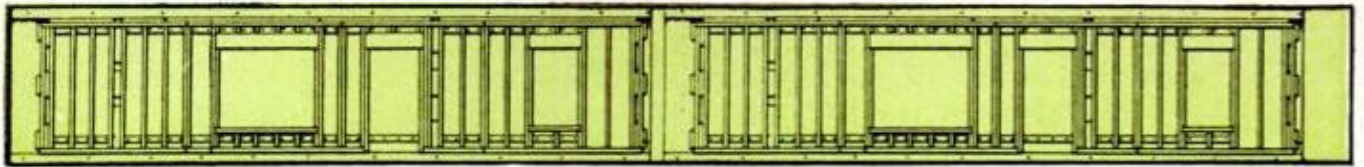


POPULAR MECHANICS

Saving the best for the last, study the details of the sorting Susans in Figs. 4 through 8. Note especially that one Susan has a drop leaf and is designed for the in-a-corner table, Figs. 7 and 8. Otherwise the assemblies are the same with the single exception that one arm of the turntable assembly, or spider, Fig. 6, is hinged to permit the hinged leaf to drop as in Fig. 7. The regular Susan is designed for the around-a-corner table illustrated in Fig. 4. The purpose of the drop leaf, of course, is to gain additional space by dropping the leaf when the Susan is not in use. This is done by swinging the Susan so that the drop-leaf joint lines up with the edge of the table, then swinging the gate brace, Fig. 6, inward to permit the hinged leaf to drop to the down position.

Finish? Plywood table tops and perforated hardboard can be finished by using a priming coat of shellac enamel and two finishing coats in whatever color suits your fancy or the decor of the room. ★★★

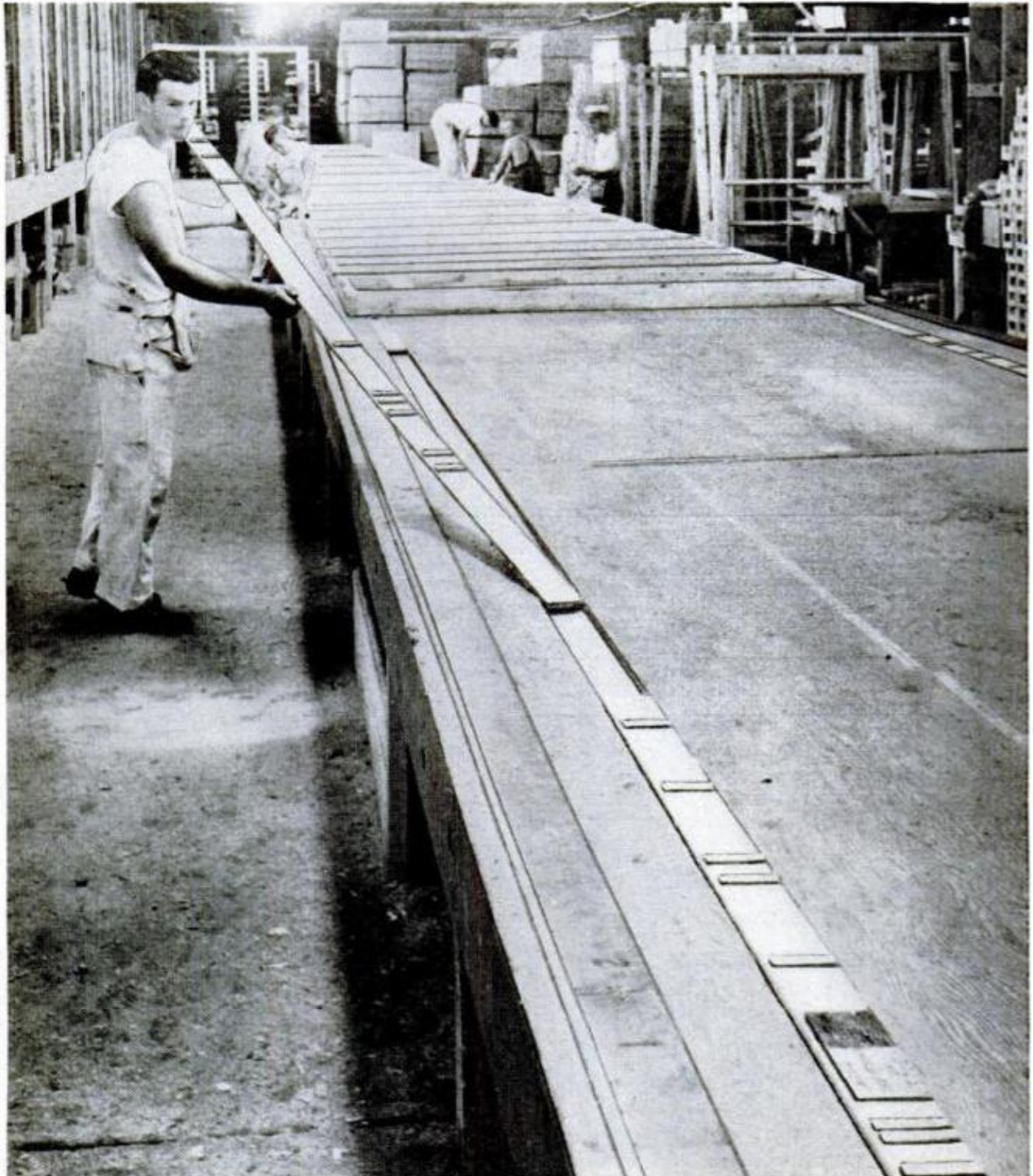


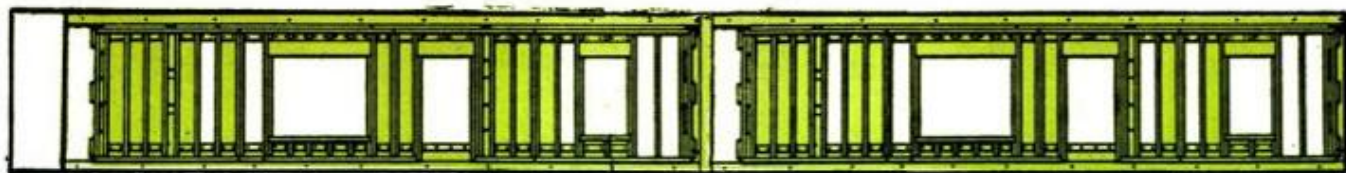


"Snip-Off" House

Assembled as a unit on a table, this wall structure is cut in sections to go to the site

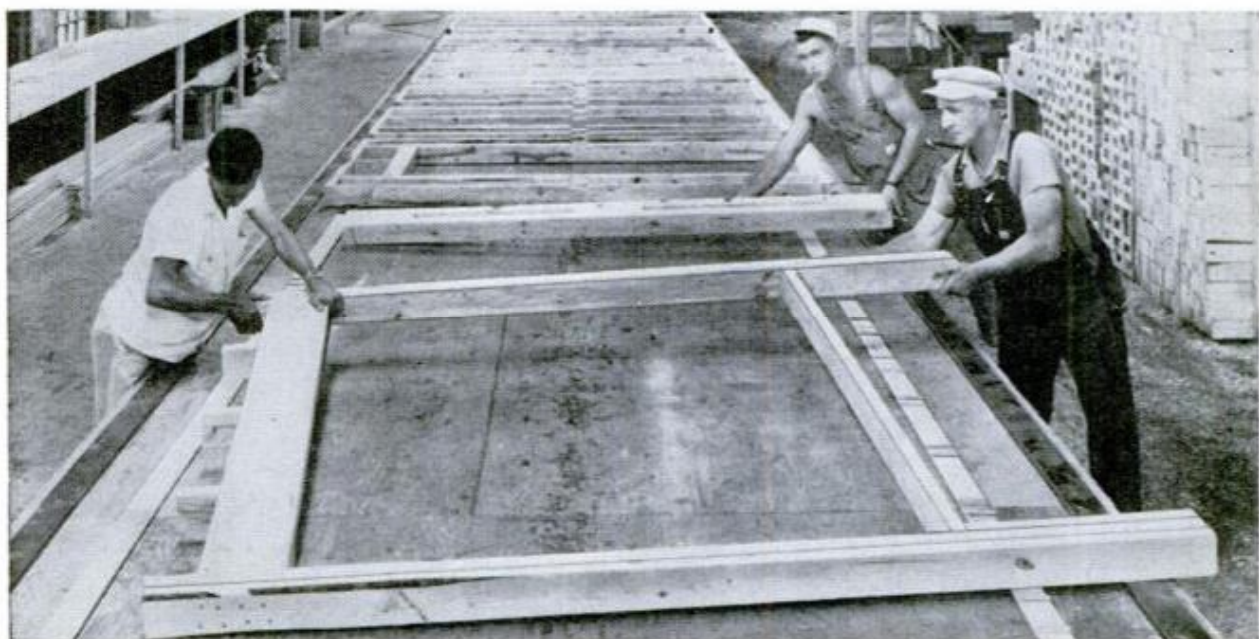
PLYWOOD PATTERN STRIPS are placed in narrow grooves on either side of the 175-foot assembly table





Slotted plywood pattern strips in grooves on a 175-foot table are guides for assembling wall sections from precut pieces in an unusual method of prefabricating houses. All interior and exterior walls are made as a unit, then cut into convenient sections for transportation to the home site.

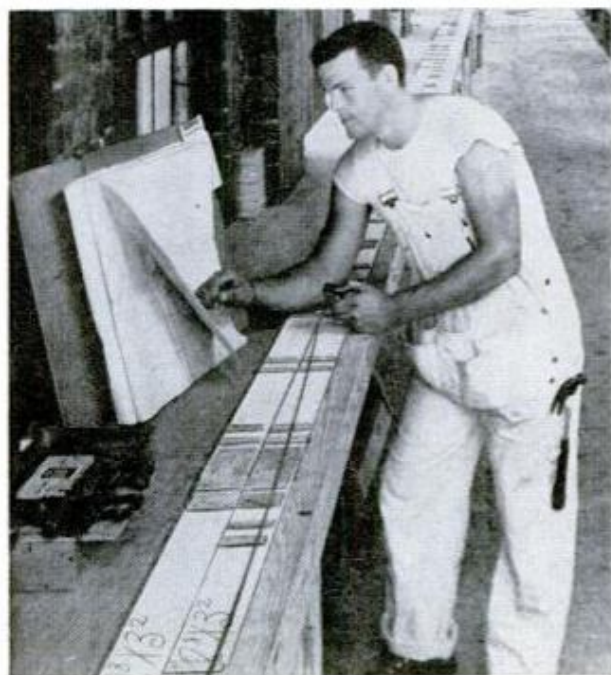
Builder John M. Kemp, Jr., Chattanooga, Tenn., who developed the method, says that pattern strips can be made from blueprints of any style house. Inside and outside walls for a 1500-square-foot house can be erected by four men in two hours on the site, he adds. He is licensing lumber dealers to use the system.



PRECUT LUMBER is positioned in the slots, and the whole assembly is nailed to form one long wall section

PATTERN MAKER converting blueprint into slotted plywood pattern strips is first step in prefabing

WALL SECTIONS are fitted together again at the building site after being cut apart at the plant



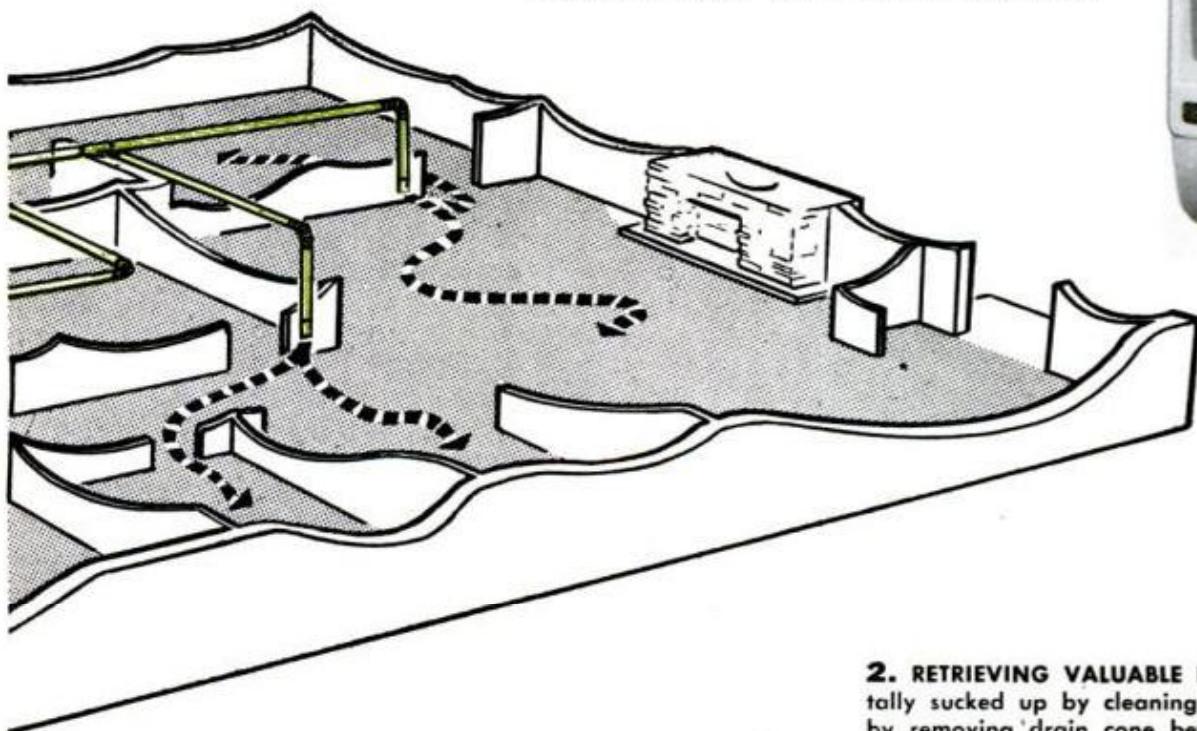
DOWN THE DRAIN WITH

Built-in disposal system sucks up both dust and scrub water and flushes it down the drain automatically. Offers many advantages over portable cleaners

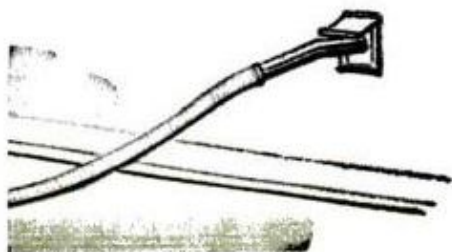


HOUSEHOLD DIRT

1. THIS IS THE TIMER which when set from 1 to 30 min., automatically starts the motor and the flow of water in the tank of power unit



2. RETRIEVING VALUABLE ITEM accidentally sucked up by cleaning tool is done by removing drain cone before motor is turned off and holding it as shown below to divert the flow of drain water into a pail



LUGGING AND TUGGING a noisy, cumbersome vacuum cleaner around your home is the old-fashioned way of cleaning. The modern housewife has only to plug the cleaning tool into handy wall inlets and the dust and dirt are whisked away through a built-in cleaning system which disposes of it down the drain and out of the house for good.

With the system being vented outdoors, there is no recirculation of germladen air or need to redust as with conventional portable units. With the dirt flushed away, there are no bags or filters to clean or empty. The power



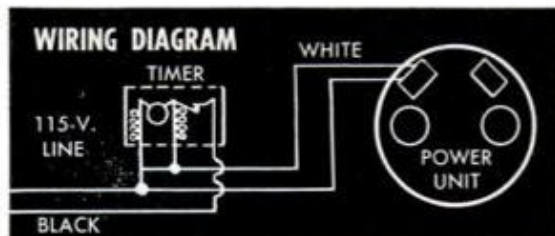
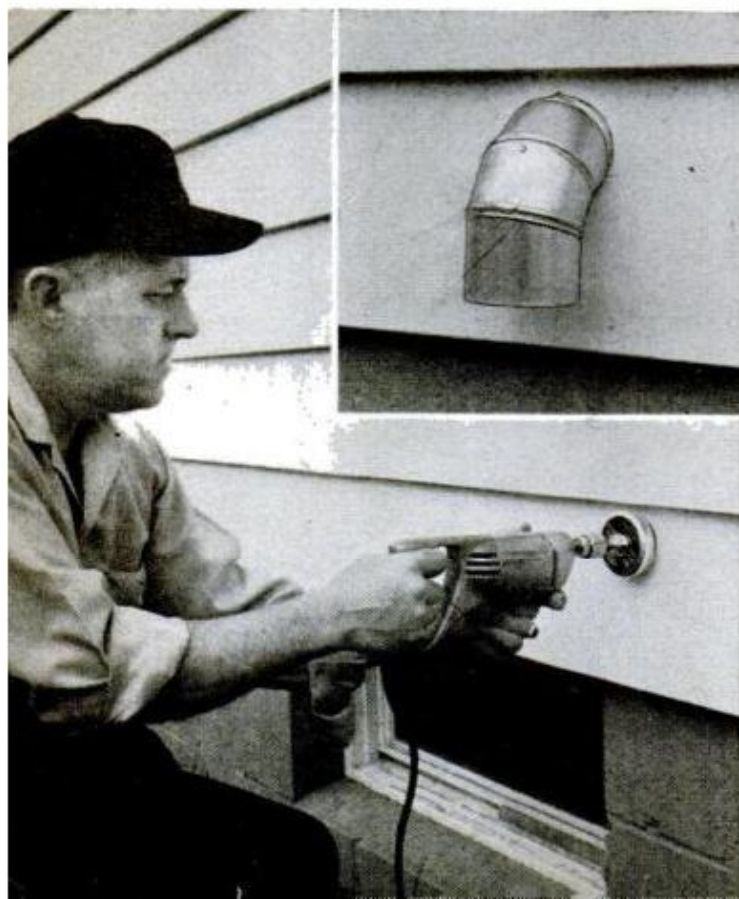


WALL MOUNTING BRACKET



3. POWER UNIT hangs on wall by this steel mounting bracket which is positioned from the floor the exact distance indicated in detail above

4. HOLE SAW is used to bore hole through house to vent exhaust line outdoors. Vent should be protected with hood of some kind such as vent-pipe elbow



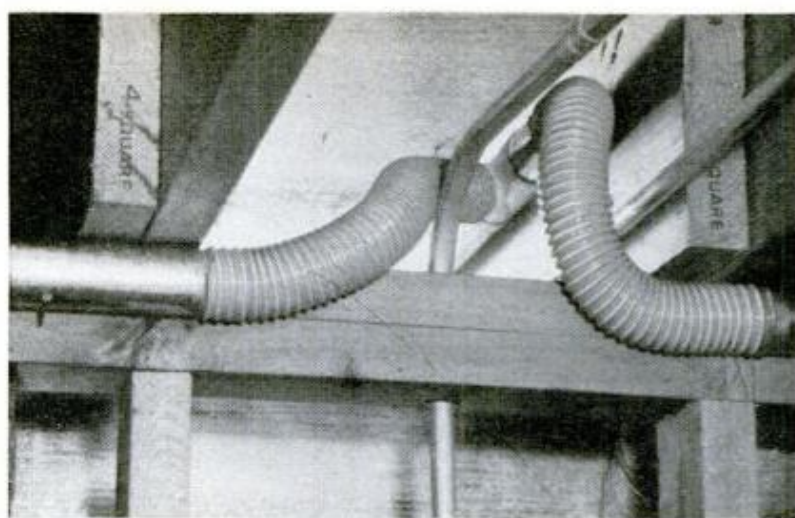
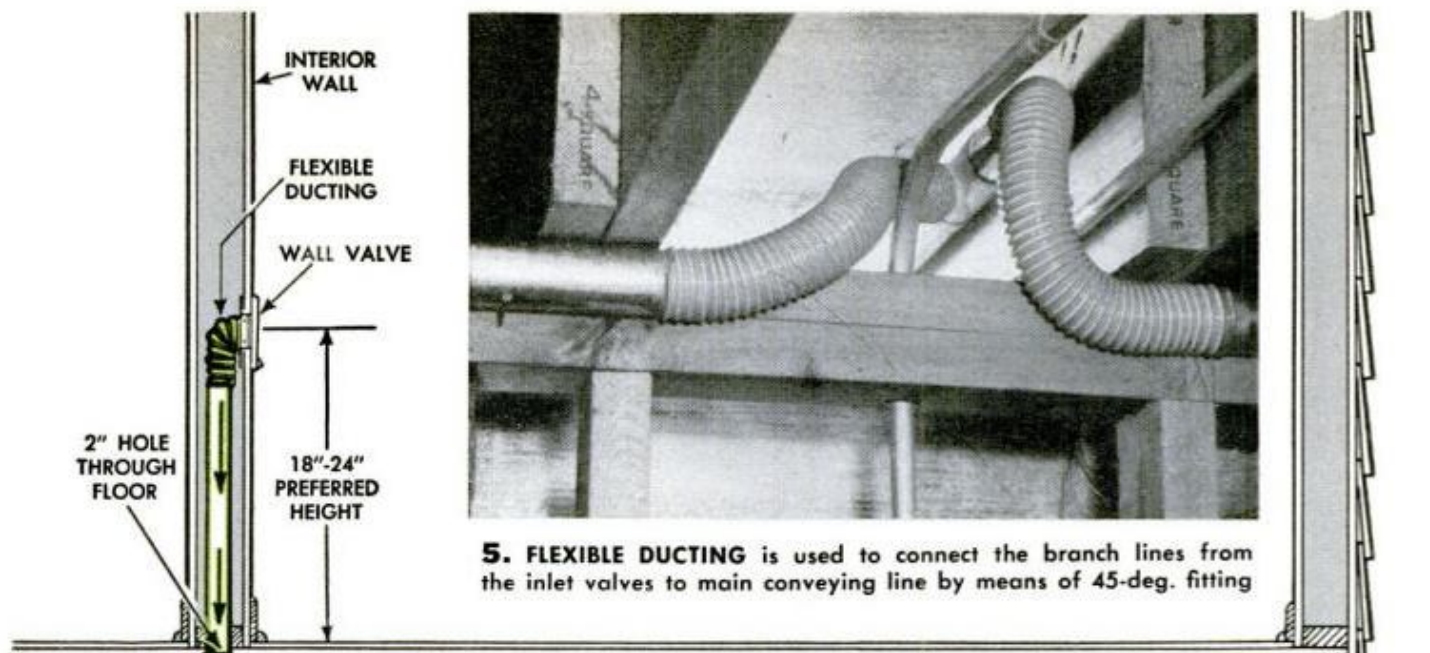
THREE-WIRE CONDUCTOR from junction box to timer is required, two-wire from 115-v. line to power unit

unit is located in an out-of-the-way spot away from the living area, so there is no noise to interrupt phone calls, radio or TV programs, or disturb sleeping or sick rooms. With nothing but a cleaning tool in hand, there is no machine to topple down stairs or tangled cord to trip over. And with a squeegee accessory which wipes dry as it sucks up scrub water, cleaning the kitchen floor is no longer a messy mop-wringing job.

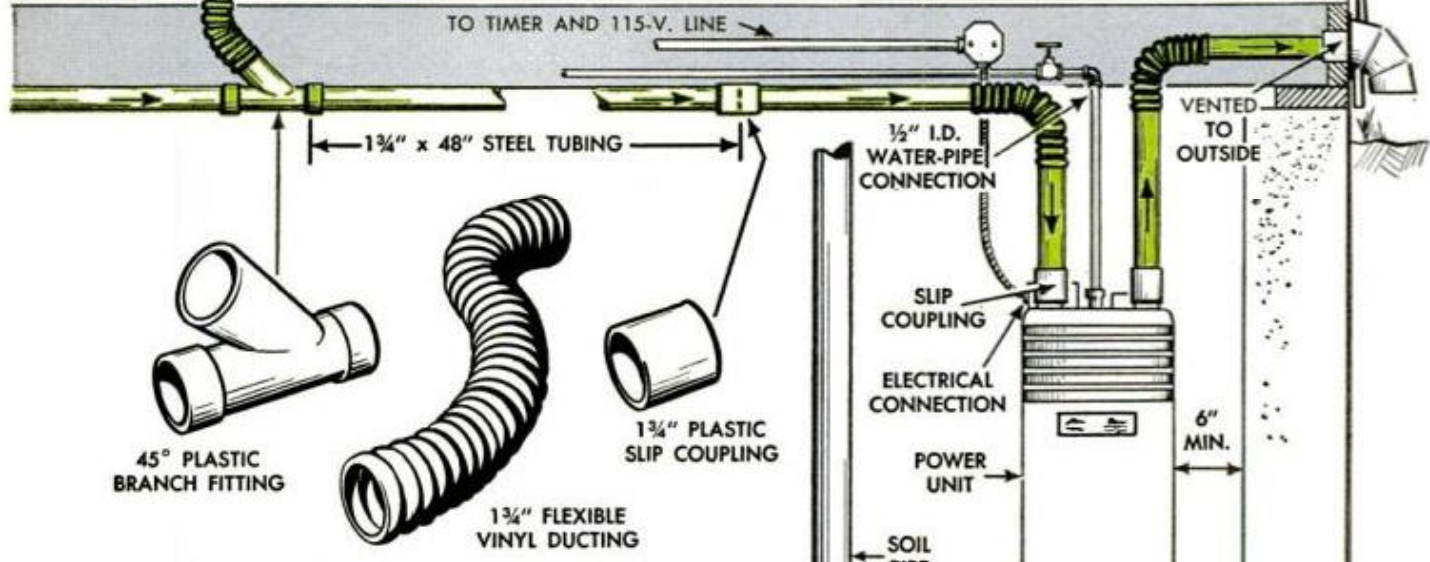
Basically, the built-in system consists of a powerful centrally located suction unit (usually located in the basement or utility room) from which airtight ducts in the form of tubing run to wall inlet valves strategically located throughout the house. The various branch valves join to create one central suction system that will serve the entire house.

Called the Aquamatic, here's how this unique "down-the-drain" system works: The motor is turned on by a wall-mounted cycling timer, Fig. 1, which is conveniently located where the cleaning tools and hose are stored. The timer is set manually for any preselected cleaning period up to 30 min. As soon as the motor is turned on a measured amount of water (about 2 1/4 gal.) enters the tank of the power unit during a 45 sec. interval. A 25-ft. length of flexible cleaning hose is plugged into an inlet valve and dirt sucked through the ducts accumulates in the water in the tank. When the preselected cleaning period has elapsed, the timer turns off the motor automatically, opens a drain valve in the bottom of the tank and the dirt flushes down the drain along with the water. During the cleaning operation the hose can be transferred from one valve to another without turning off the power unit, and the timer can be reset while in operation to extend the cleaning period. When finished, the cleaning hose is merely unplugged from the wall inlet and put away. The cycling timer will even turn the system off automatically if the housewife doesn't want to bother doing it manually. This eliminates any chance of the system being left in operation for a long period if she is suddenly called away from her cleaning.

(Continued to page 252)



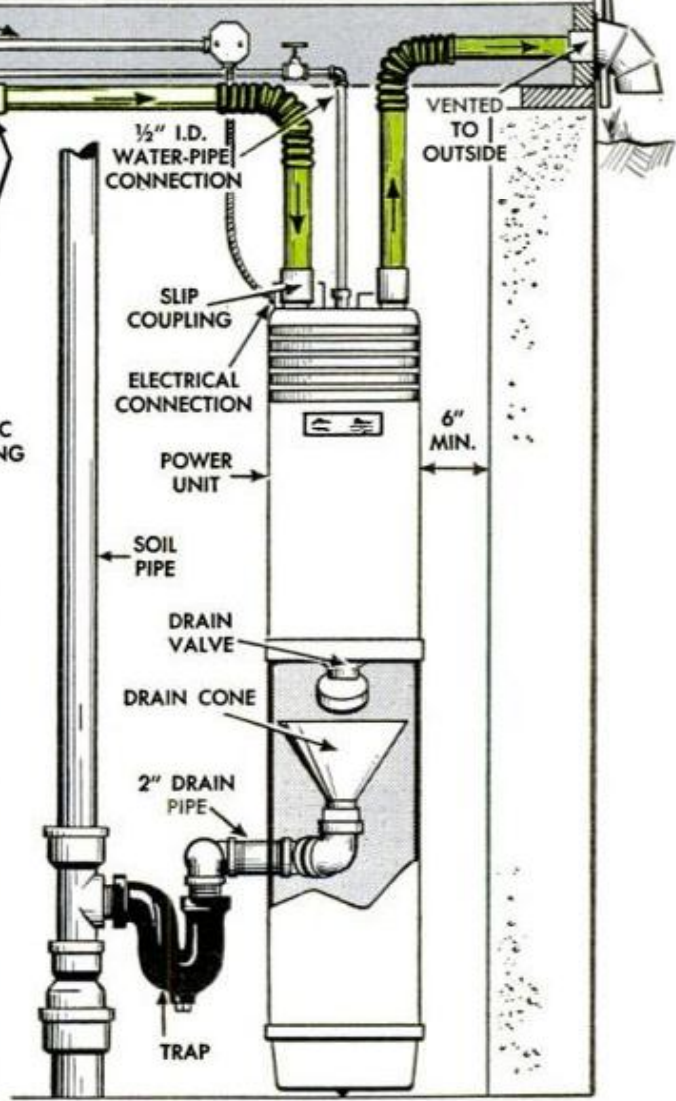
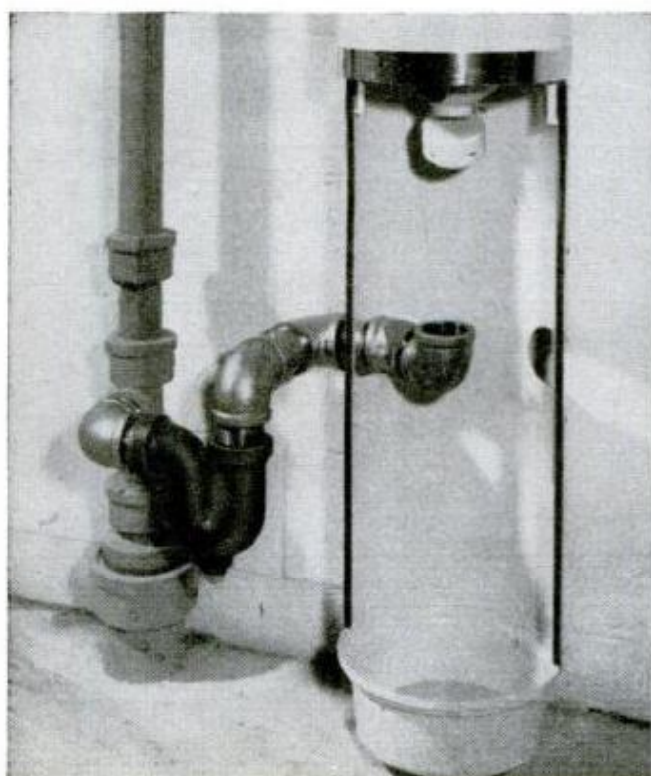
5. FLEXIBLE DUCTING is used to connect the branch lines from the inlet valves to main conveying line by means of 45-deg. fitting



45° PLASTIC BRANCH FITTING

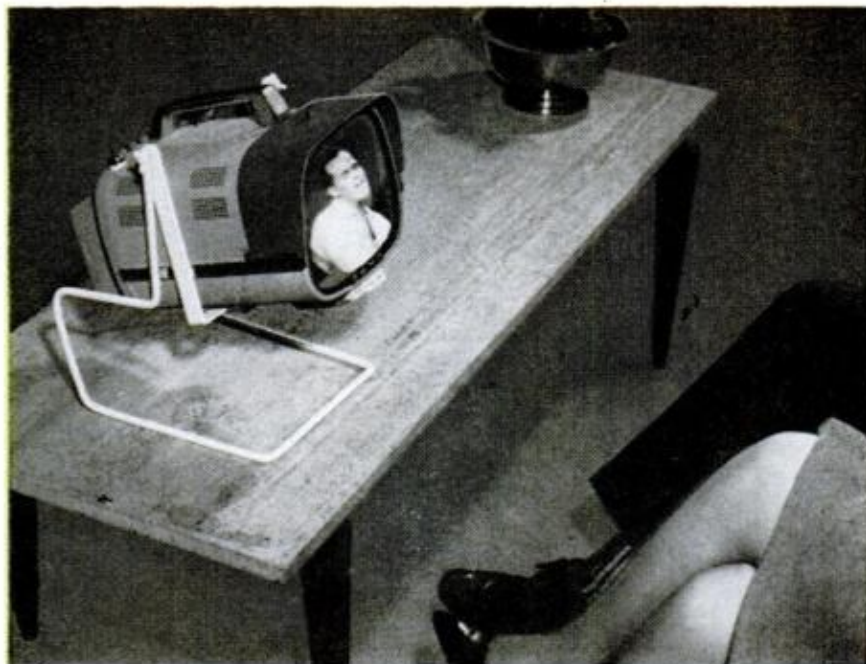
1 3/4" FLEXIBLE VINYL DUCTING

1 3/4" PLASTIC SLIP COUPLING



TYPICAL BASEMENT INSTALLATION

6. PIPING ARRANGEMENT of drain connection will vary with each installation. Photo at left shows how original installation was made. In every case, trap must be installed in drainage line. Special nipple screws in 90-deg. elbow for supporting removable drain cone directly below drain valve in bottom of tank



THIS SWIVEL-MOUNTED BASE was designed by the PM staff for the new eight-and-one-half-inch screen portable television set. Affording easy viewing in any position, it makes television a part of many activities

COMPANION TV

**Hang it in the car. Tote it anywhere you want it.
This small TV is made for your convenience**

THE DAYS OF the stationary one-eyed monster staring at you from across the room may be numbered.

Lightweight, portable sets such as this 13-pound Sony with its four-pound attach-on power pack, are proving to be more adaptable companions for modern-day living.

They have another advantage too. When TV first came in, a scan rate of 520 lines was developed. With an average tube size of only seven inches, these 520 lines gave a picture that was sharp, crisp and clear.

Then the bigger-is-always-better design kick set in. Plastic lenses filled with mineral oil were suspended in front of the TV screen to magnify the image. Bigger and bigger tubes were built until the 27 inch rectangular tube was reached. But the 520-line scan rate, now a standard, could not change, so that as the screen sizes grew, the pictures became fuzzier.

Smaller screens with their sharper picture give excellent viewing if you select the right distance. For example, try holding a ruler at arm's length, and sight alongside the ruler on the wall across the room. Using a door jamb as a reference point, find the place on the wall where the eight-inch mark on the ruler would fall. If your room has any depth, you can see that an eight-

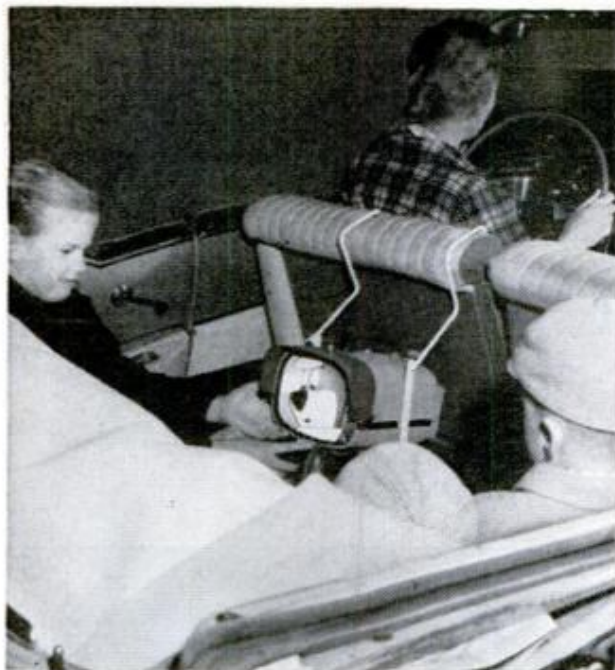
inch TV screen at arm's length is far bigger than a 27 inch screen across the room.

The Sony Corp. set shown is a transistorized unit (tougher than a tube-type) which can operate on standard house current. Or, with an accessory power pack, you can use it at the beach, on picnics or even at ball games. If the unit is used in the home, the power pack recharges. In a car, the set can plug into the cigarette lighter receptacle, using a special cord and plug, or be used on its own power pack.

A hood, mounted on a locking slide, can be moved forward to shield the eight-and-one-half-inch screen. All tuning and volume controls are mounted at the top of the set, including those for the fully transistorized 12-channel tuner. The antenna is a collapsible telescoping unipole, which disappears into the set when not in use.

While the set is easily carried from living room to bedroom, the stand that came with it did not lend itself well to "all-angle" viewing. So *PM's* editors designed the all-purpose support shown in the drawing, which you can also adapt to other small TV sets. *PM's* stand uses the same mounting holes the original stand did, and can easily be swiveled to any position.

The stand also conveniently clamps to



TV IN THE CAR with the PM base does not distract the driver. It distracts the kids, though, pleasantly

the back of the front seat of a car. While you may get some flutter from the motion of the car, reception should be adequate as long as the car remains within fringe limits.

To make the bracket, impress heavy-gauge wire or several strands of wire solder around the bottom of the set to obtain the proper contour. Transfer this shape to a piece of paper and bend a piece of 1x $\frac{1}{8}$ -inch



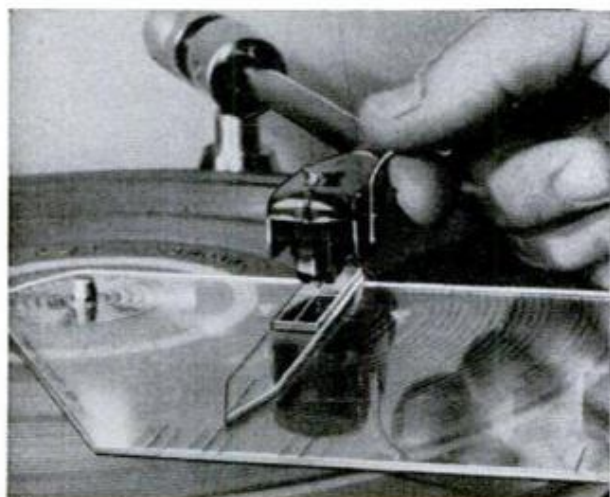
REAR-MOUNTED POWER PACK permits viewing anywhere. It goes to picnics, the beach or the family car

aluminum ($\frac{1}{4}$ inch for a heavier set) to match the contours.

Construct the base platform as shown in the drawing. We used $\frac{1}{4}$ -inch steel rod for our model; a larger set will require heavier diameter rod.

To help the wing nuts hold the set in any position, use a pair of toothed washers supplemented with split lockwashers.

Stylus Aligner



Place the hole of this new aligner over your spindle, set the pointer with its mirrored reference in the proper point, and lower your cartridge over the cross lines. By observing the alignment of the stylus-cartridge-arm in the mirror, you can exactly line up these components for maximum tracking efficiency and less one-side groove wear. \$5.25, Prestige Products, 13647 Burbank Blvd., Van Nuys, Cal.

SEPTEMBER 1961

Radio Pen Set



Transistor radio in a desk set uses six transistors in a full superheterodyne circuit. Operates with four penlight cells, features Alnico permanent magnetic speaker, ferrite antenna, slide-rule dial and fingertip tuning. Earphone jack on side provides quiet listening when desired. The Shaeffer Skripriter ball point pen is set in an all-angle swivel socket. \$54.95, Gulf Coast Distributors, 1907 West Bell, Houston, Tex.

199

X773



Face-Lift Your Home with LUXURY WALLS

By E. R. Haan



1. AN ARM'S LENGTH away Royalcote looks like natural wood. Panels are attached with special clips

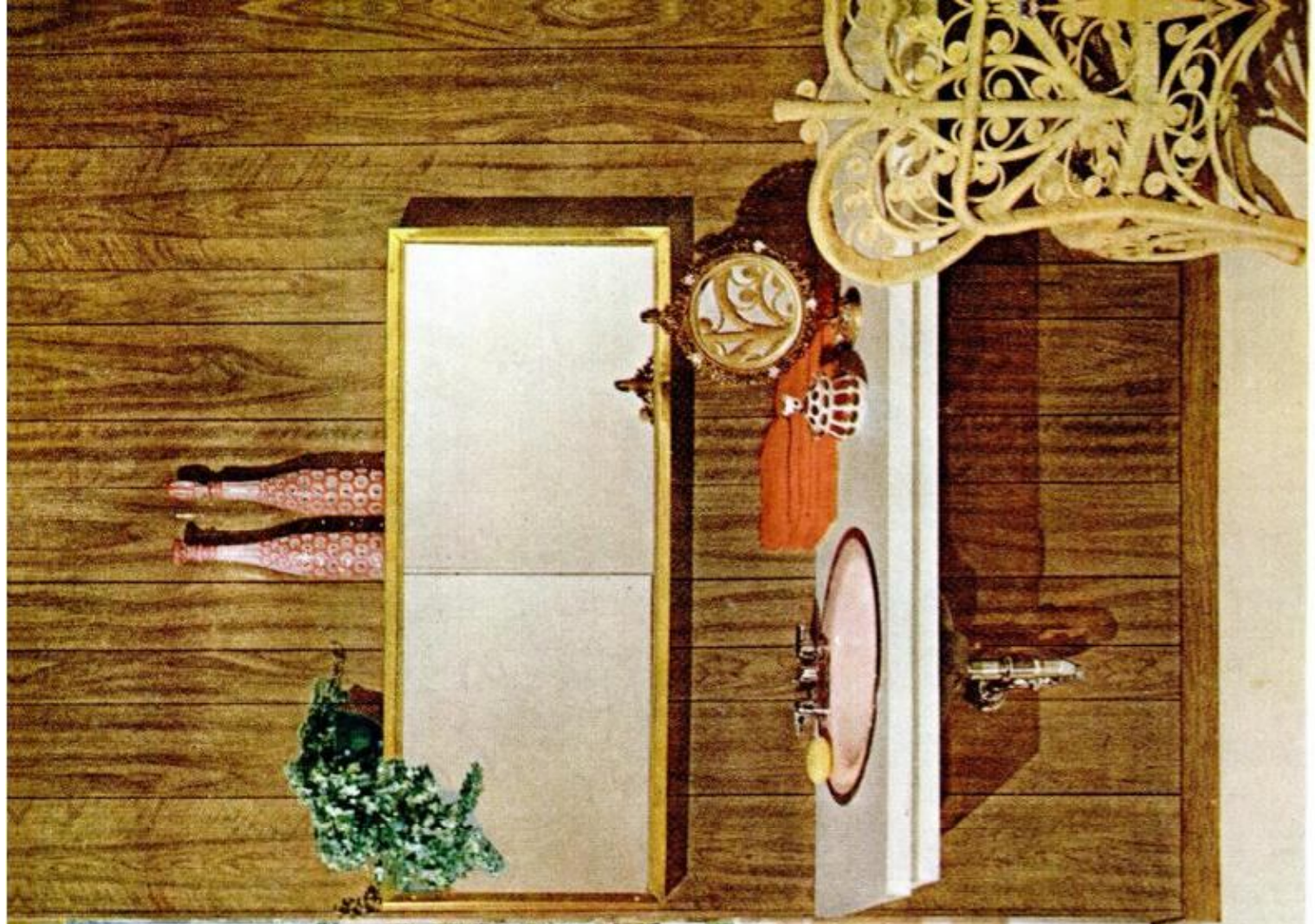
NOWADAYS you can be your own interior decorator, using wall coverings that come prefinished, unfinished, primed and also in a variety of textures, colors and wood graining to fit any decorative scheme in old and new homes. Along with the wall coverings you buy fast, easy application and you get durability equaling that of the house itself. And you do the work with common household tools.

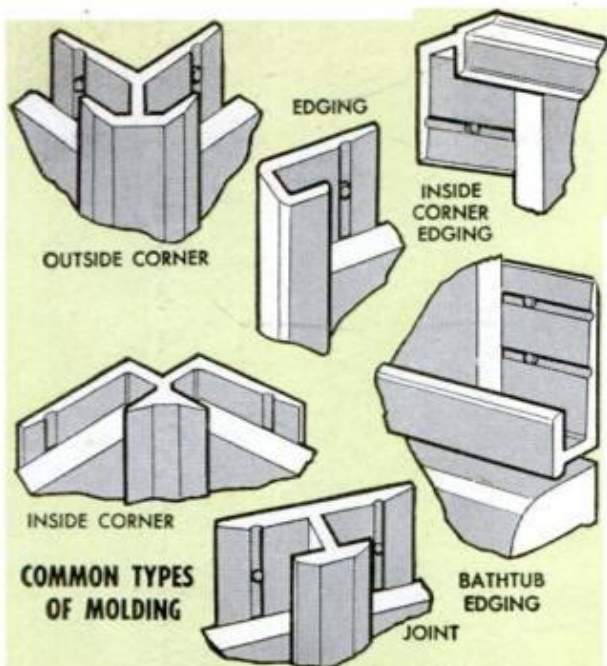
Special hard coatings of many of the wall coverings defy ordinary

2. SEADRIFT TEXTURED AND PRIMED hardboard panels take a tone-on-tone finish, using the priming coat as the predominant color. Just apply latex or acrylic-base paint to a small area and wipe the surface with grain using a damp sponge as below. Depth of tone easily controlled









FURNISHED PLAIN OR WITH EXPOSED PARTS VENEERED TO MATCH PANELING

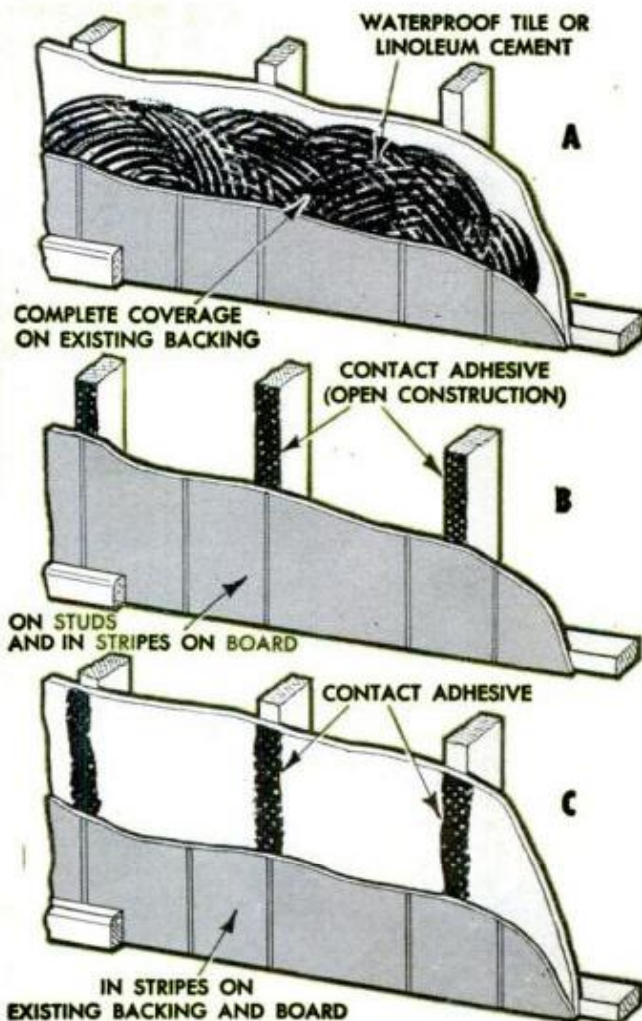
3. EXTRUDED METAL moldings make it easy to fit hardboard wall coverings around bathtubs, around inside and outside corners, conceal exposed edges

wear, resist dents and scratches. Smudges, fingermarks and food stains wipe off without a trace. Dust won't stick to the smooth surfaces; panels don't shrink or check and the colors don't fade. Rigid wall coverings come as 4 x 8-ft. sheets and in planking 6 to 16 in. wide and 8 ft. or more in length. Other types of coverings, some flexible, come as panels in various sizes. These are coverings such as those shown in Figs. 4, 8, 10, 11, 12 and the nonceramic bricks pictured in Fig. 14.

Fastenings. Many of the rigid wall panels can be applied directly to studding in new work, to horizontal wood furring strips, or to plastered walls in old work after wall-paper and loose paint have been removed. Old plastered walls that are uneven or rather badly cracked often require that furring strips be shimmed to give a level nailing or cementing surface. Corners and exposed edges of panels usually are finished with special metal moldings, Fig. 3. Nails, staples, clips, Fig. 1 and locking strips, Fig. 8, and several types of adhesives are common fasteners now recommended by manufacturers of panels. Adhesives are coming into widespread use. Tile and linoleum cements sometimes are used as in Fig. 4, detail A, on plastered walls. Contact adhesives can be applied directly to studs as



4. EXTERNAWALL is a vinyl-surfaced gypsum board that resists scuffs and stains. Details A, B, C, below show how adhesives are used as fasteners for panels



5. A PLASTIC-SURFACED HARDBOARD, Trendwood lends beauty of real wood to walls. Note grain direction in accent panel



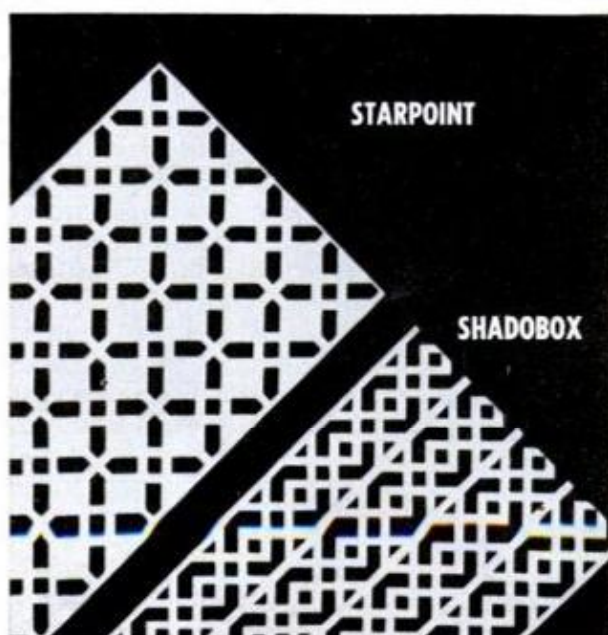
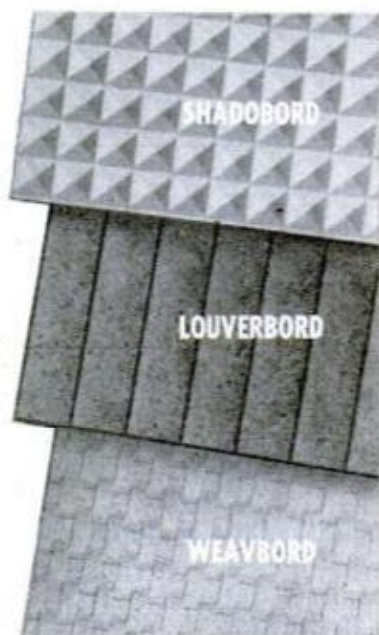
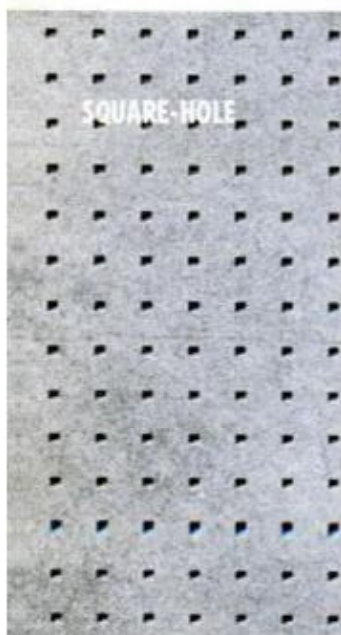
6. PREFINISHED PERFORATED hardboard is not only attractive; it's a place to hang almost anything decorative

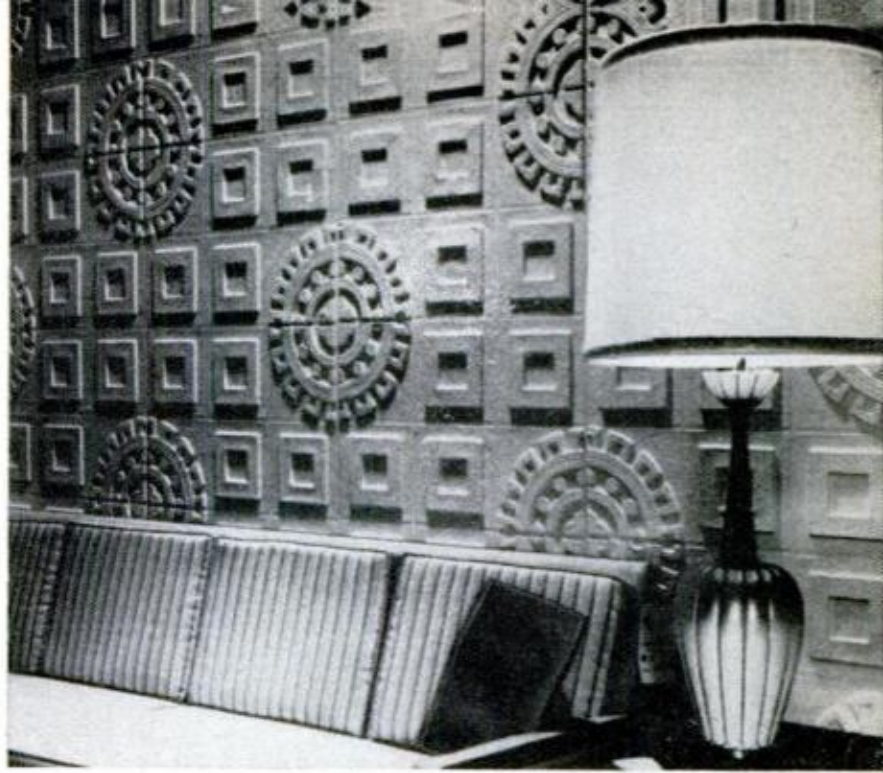
in Fig. 4, detail B, or in spaced stripes over the studding on old or new plastered walls as in Fig. 4, detail C. When applying panels with any type of fastener, follow manufacturer's instructions in all details.

Hardboard and plywood. Available in

thicknesses from $\frac{1}{8}$ to $\frac{3}{4}$ in., hardboards and plywoods have face surfaces which may be smooth, striated, wood-faced, wood-grained or otherwise textured. These come prefinished, unfinished and primed. The white primed, textured hardboard shown

7. PERFORATED HARDBOARD with square holes, also others known as Shadobord, Weavbord, Louverbord, Starpoint and Shadobox are available. Boards find application as room-divider panels, cabinet fronts, etc.





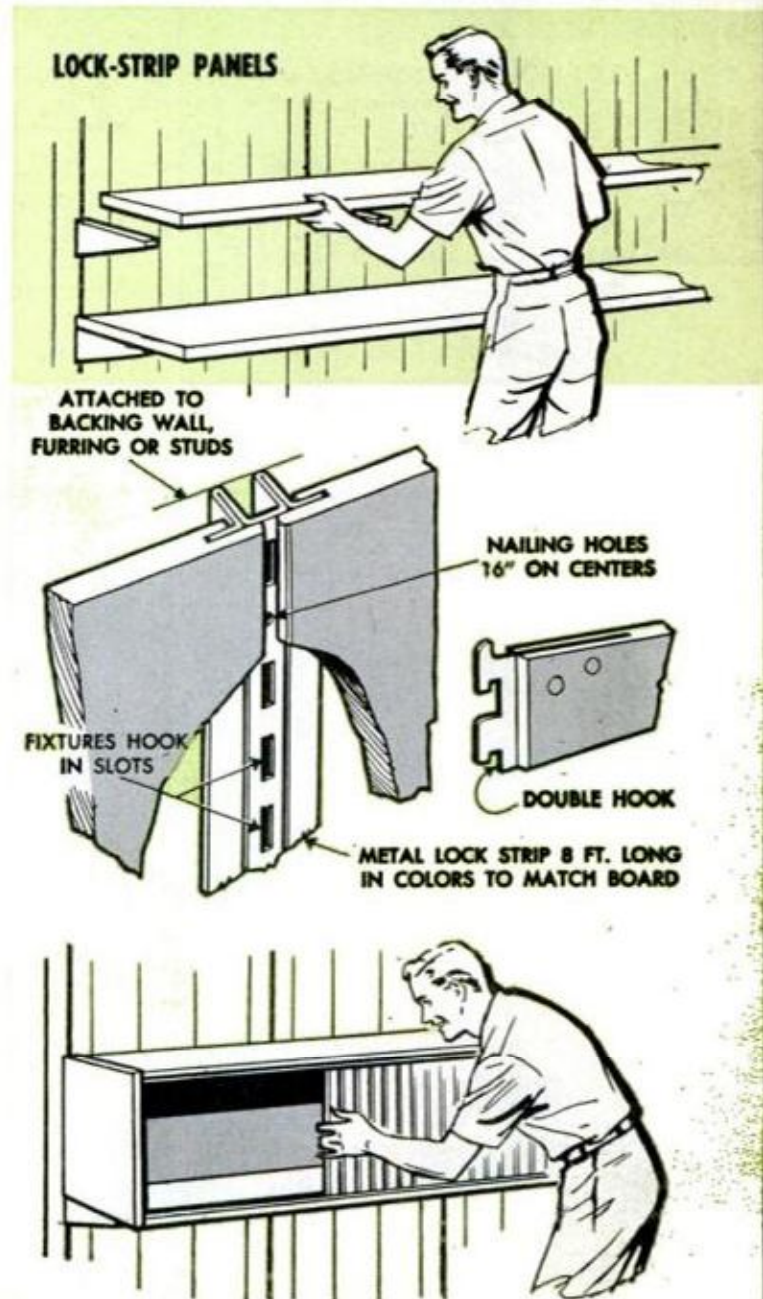
8. WALL EXPANSES are no problem when you use this decorator pattern in Peruvian stone. Easily and quickly applied to the wall with a special cement the keyed panels assemble into realistic pattern pictured at right

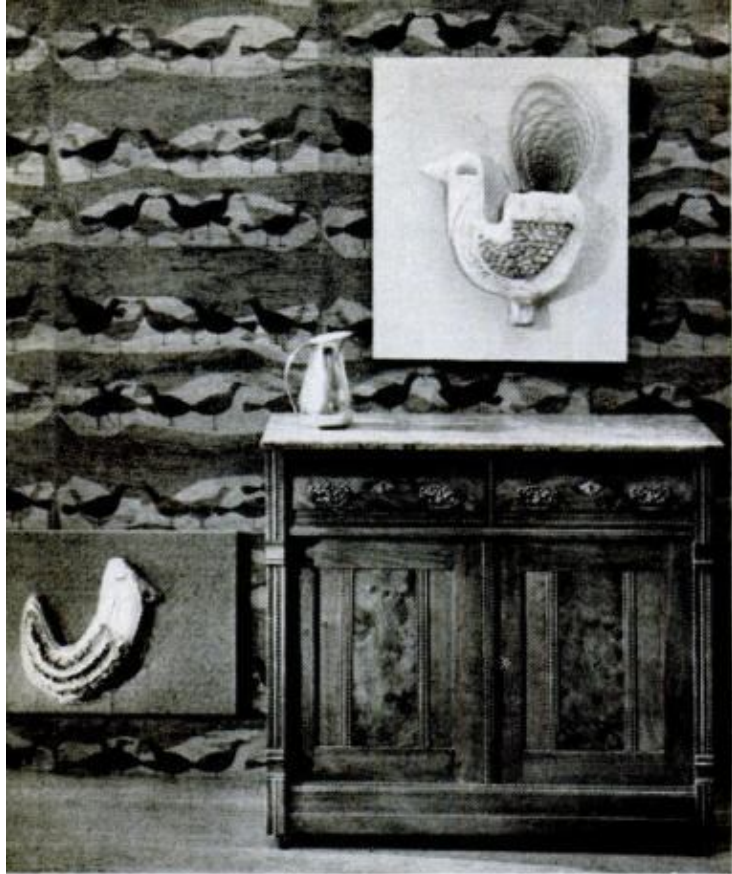
in Fig. 2 and pictured in color on the opposite page is an example. This you can finish in your own choice of color simply by applying a coat of latex or acrylic-base paint and wiping with a damp sponge to give the tone-on-tone desired. Some pre-finished surfaces are coated with a solid-color, baked enamel, others are plastic finished. Some wood-grained surfaces are produced by bonding a plastic laminae to a hardboard backing, the room finished with wood-grained planking, Fig. 5, being an example of this type of material.

Then there are the perforated and textured hardboards, examples and applications being pictured in Figs. 6 and 7. The perforated boards permit any arrangement of wall hangings without use of nails. Perforated hardboard panels can be attached to plastered walls by backing with 1 x 2 wood strips so that there is space between the board and the wall for inserting the various wire hangers through the holes. Also, hardboard panels in wood-grained or textured types can be attached to walls with lock-strip fasteners of the type shown in Fig. 9. The strips serve as joint fasteners for the panels and also as supports for adjustable metal shelf brackets. The exposed portions of the metal strips are colored to match the panels.

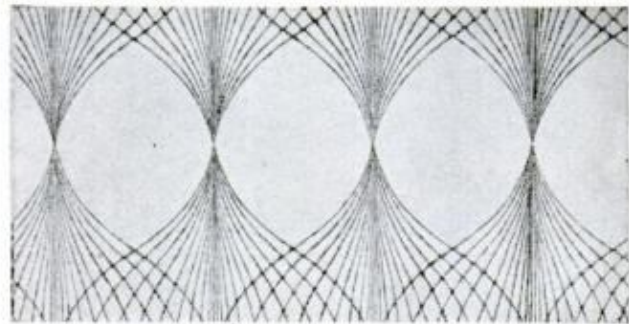
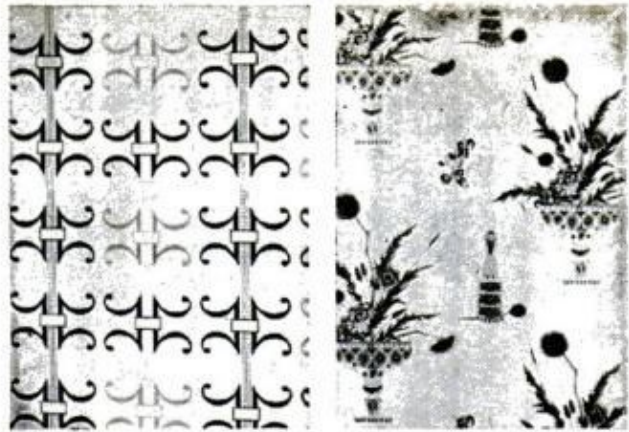
Textured wall decorators. Fig. 8 is an example of the several textured wall decorators now available. The material comes in keyed panels which are cemented to the wall to give the interesting Peruvian-stone pattern pictured. The plastic material is light, easily handled and remarkably real-

9. PANELOK WALL SYSTEM consists of a U-shaped metal locking strip which joins panels and provides slotted bar for attachment of adjustable shelf brackets





10. SILK-SCREENED designs on paper, canvas, Shiki silk and vinyl emphasize a movement away from conventional wall coverings. Above are types of applied decorations in color for use in both new and old rooms



istic in final appearance. For accent walls and entire walls in some rooms you may prefer real wood panels grooved to form squares of uniform size, Fig. 12. Such a material is especially effective as an accent in a large room.

Printed wall coverings. Real luxury coverings having colored designs printed on paper, Shiki silk, canvas, and vinyl, are available to fill just about any need in modern wall decor. Several examples of these

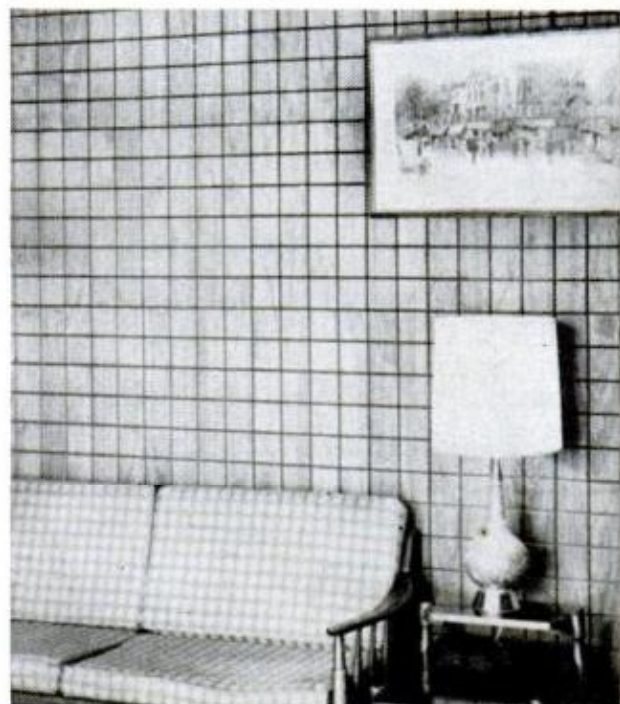
11. IMBEDDED DESIGNS in fibreglas panels make up into attractive room dividers, partitions, screens



ultra wall coverings are pictured in Fig. 10. A wide choice in design and color combinations is available to home decorators.

Fibreglas panels. Room dividers, partitions, folding screens can be made with fibreglas panels in which are imbedded colored designs such as you see in Fig. 11. The material comes in panels 36 x 72 and 36 x 96 in. in light (nonstructural) and heavy (structural) weight, the latter about $\frac{3}{32}$ in. in thickness and suitable for wall paneling.

12. ACCENT WALLS, or entire walls in Gruvwood are tasteful selection in decoration for new and old homes



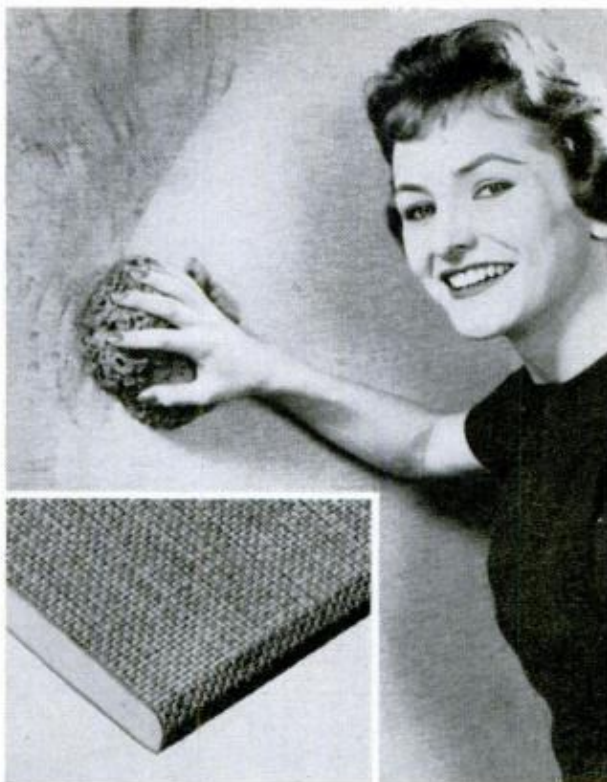
13. DURASAN WALL PANELS are of gypsum with a hard, "cloth"-texture surface. Smudges, fingerprints sponge off. Panels are attached with colored nails

In addition to the three designs illustrated in Fig. 11 the materials come in imbedded colored woven cane, random assorted leaves and butterflies, stained glass, gold thread and street scenes of old buildings.

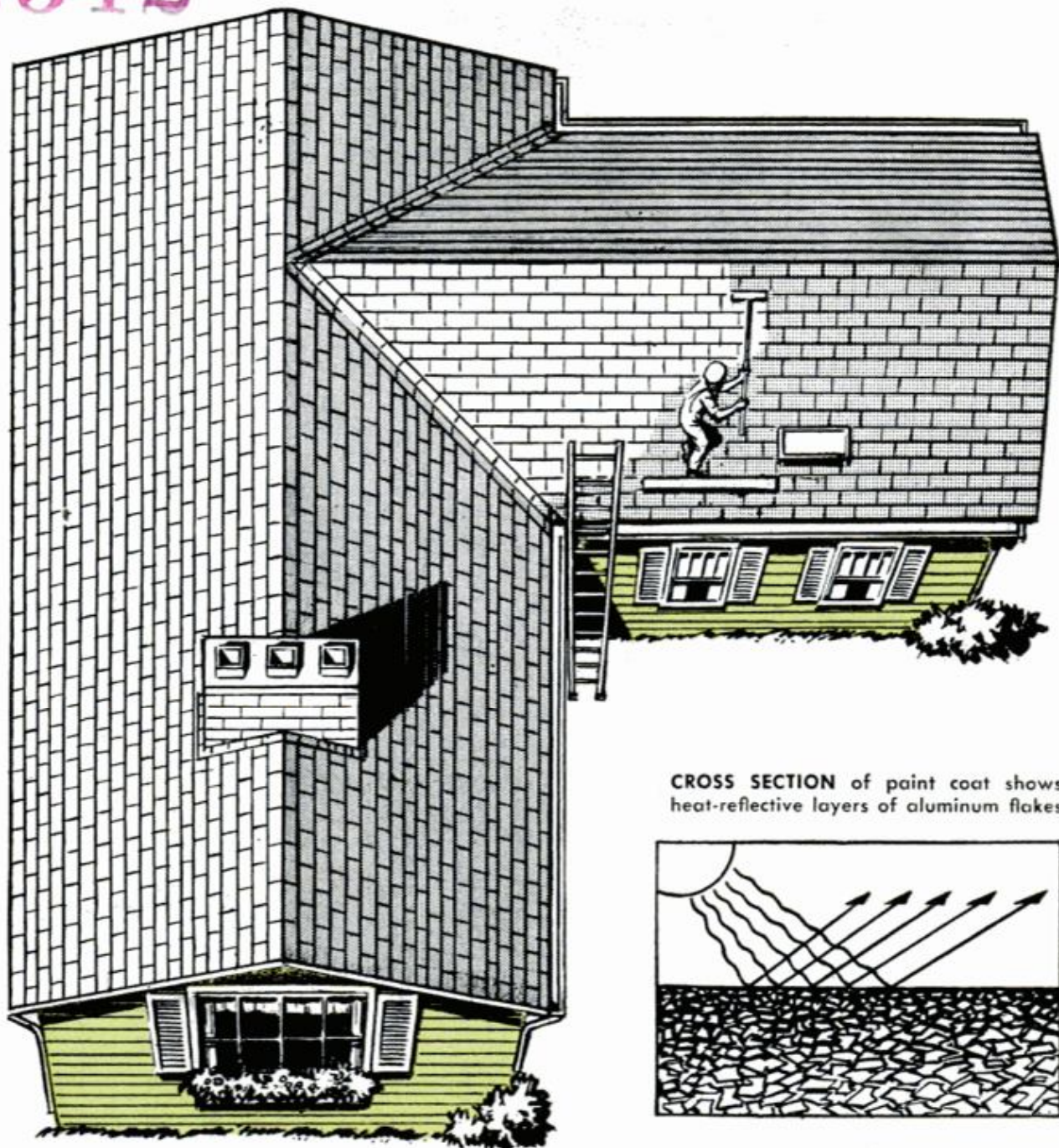
Vinyl-faced gypsum panels. Representative examples of vinyl-faced gypsum paneling are pictured in Figs. 4 and 13. These materials usually come as 4 x 8-ft. sheets with a durable facing in both cloth and wood-grain texture that cleans with a damp cloth or sponge as in Fig. 13. Large panels go up fast with special colored nails.

Nonceramic brick. A typical interior application of nonceramic brick (vermiculite) is pictured in Fig. 14. Bricks come in four decorator colors and are applied directly to the wall with a special adhesive. ★ ★ ★

14. NONCERAMIC Z-BRICK find a place in wall decoration in homes of any age. Especially effective as accents in kitchens. Bricks are available in 4 colors



X542



CROSS SECTION of paint coat shows heat-reflective layers of aluminum flakes

Roll on a New Roof

Long-oil aluminum paints rolled, brushed or sprayed on can add years of useful life to aging wood-shingle roofs

IS YOUR cedar shingled roof showing its age? While the appearance of many and persistent leaks indicates an urgent need for replacement, less advanced stages of deterioration can be arrested by application of an oil-base aluminum paint made especially for this purpose. Such paints are available in colors and in natural aluminum. Composed of a high percentage of linseed or

alkyd oil (40% or more), minute aluminum particles in flake form and a color pigment (if colored), the paint may be applied with a roller, sprayer or brush as pictured.

Normal life of a cedar shingle roof is 20 to 25 years, depending upon the quality of shingles used and the exposure. Application of aluminum roof paint can add another 5 to 10 years of useful life to such a

roof if it is done before deterioration becomes too advanced. Applied in one heavy coat or two light ones, the paint will last about 10 years before recoating becomes necessary. Cost per gallon is somewhat higher than shingle stain. In addition to extending the life of a roof, the aluminum paint improves its appearance and reflects the sun's heat. This means a cooler house and lower air conditioning costs in summer.

When selecting a paint for this purpose be sure to get one with a high linseed oil or alkyd content, referred to sometimes as "long-in-oil." About 1½ lb. of aluminum flake per gallon of paint is considered a good formulation. The oil serves as a bonding agent and preservative for the shingles, requiring from 2 to 5 days to dry. Do not use a varnish or asphalt-base aluminum paint, as neither is recommended for exterior application on wood surfaces.

Shingles Must Be Dry

Preparation of the roof prior to painting is simple. It should be clean and dry. If you paint after a rain, allow ample time for the shingles to dry, about a week in hot weather, a little longer when it is cool.

Application with a roller is easiest. Spraying should be done only on a calm day. Brushing is tedious and time-consuming but produces a good job. For brush applications, use a 4 to 6-in. nylon-bristle wall brush. Start painting at the top of the roof, and with a full brush apply the paint across the shingles. This will allow it to run into the gaps between shingles. Runs on unpainted shingles are covered later.

Roof Tray From Cake Tin

Rolling equipment needed includes a 9 or 12-in. roller, lambskin cover, tray and a holder for the latter to keep it level while on the roof. The roller shown is a commercial model adjustable to take roller covers up to 14 in. A long handle saves stooping and kneeling. The tray is an inexpensive 14-in.-square cake tin which is placed on a wooden holder to suit the pitch of the roof. The drainboard is a piece of ¼-in. plywood to which retaining strips are nailed at the sides and one end. It is slightly lower at the open end, which overhangs the tray. A strip of sponge rubber tacked to the bottom of each leg prevents the holder from sliding when placed on a fairly steep roof.

For roofs that are too steep to stand on safely, it will be necessary to use a ladder secured to the roof, or perhaps roof scaffolding. When painting with a roller, first roll across the shingles, then up and down. Avoid rolling over edges of painted areas. This will prevent unsightly laps.

—F. C. Stebbins

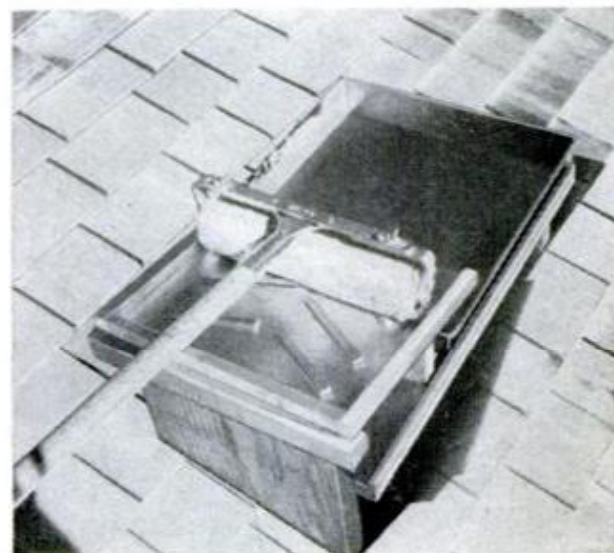


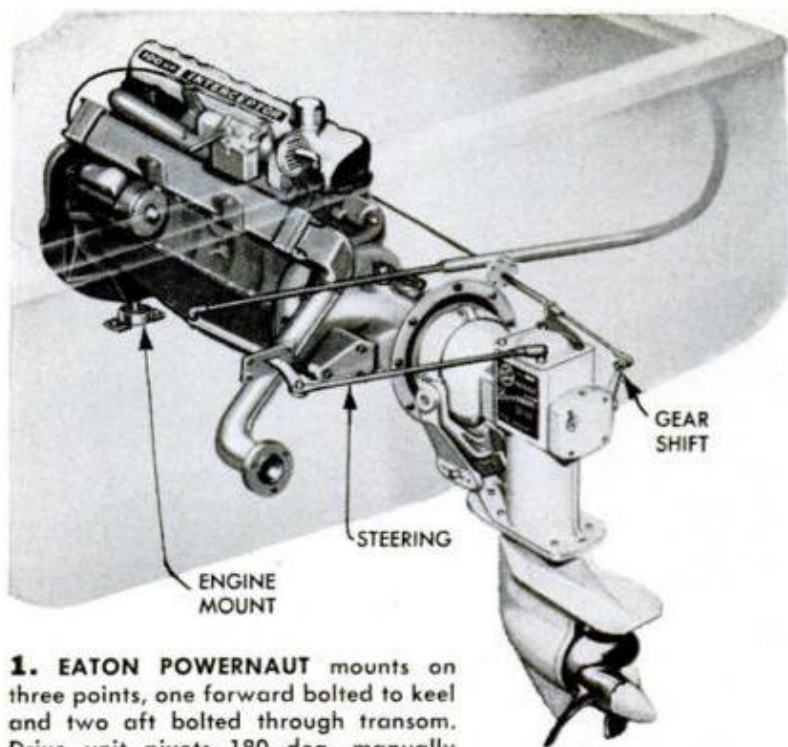
SECTION ROOF with chalk lines. Then stop spray pattern at lines and you won't end up with laps that show when paint dries. Adjust nozzle to round spray

PAINT must be stirred frequently to keep aluminum pigment well distributed in vehicle. For brush application, 4 to 6-in.-wide nylon brush is used



TRAY FOR 12-in. roller is cake tin mounted on holder having wooden drain board and sponge-rubber covered legs cut at an angle equal to pitch of roof





1. EATON POWERNAUT mounts on three points, one forward bolted to keel and two aft bolted through transom. Drive unit pivots 180 deg. manually



2. SEA POWER drive unit is secured to transom by means of hinge pin and locking lever. Entire lower gear case rotates, permitting 360-deg. steering

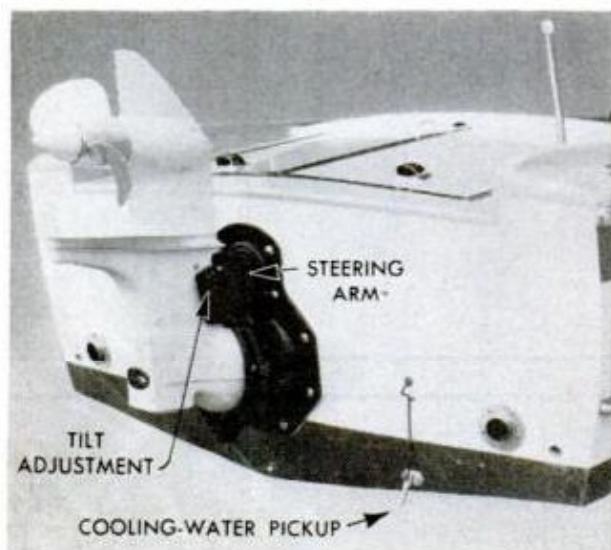
INBOARD-OUTBOARD DRIVES

A roundup of models available, comparison with inboard and outboard motors, and step-by-step installation photos

By Earl Wobeck

BEFORE RINGING THE "engine room" for full speed ahead on inboard-outboard drives, it is appropriate to review the good and bad features of other principal forms of marine propulsion and compare them with in-outs (inboard-outboard drive). Only then can you choose wisely between outboard motor, in-

3. MERCUISER has flexible, rubber-cushioned drive line from engine to stern unit, eliminating alignment problems. Control linkages on production models are neatly concealed in through-transom drive housing



4. DRIVE UNIT of Mercruiser can be hand cranked 180-deg. into raised position for easy prop changing. OMC (Outboard Marine Corp.) unit may be tilted up like outboard, except that it is power operated





board-outboard drive and inboard for a new boat, or when repowering your present craft.

Most in-out units now on the market are pictured in this story, with important design features labeled. The smallest is rated at 35 hp., while the largest is designed for a power range of 125 to 200 hp. While all models are basically similar, there are some important differences. The models shown in Figs. 3 and 6 have a trim tab that counteracts propeller torque, making steering easier. A hand crank is used for elevating the drive unit from within the boat in Fig. 4. The lower half of the drive unit shown in Fig. 2 in color can be rotated 360 deg., giving it a high degree of maneuverability. Most units tilt up outboard fashion, al-

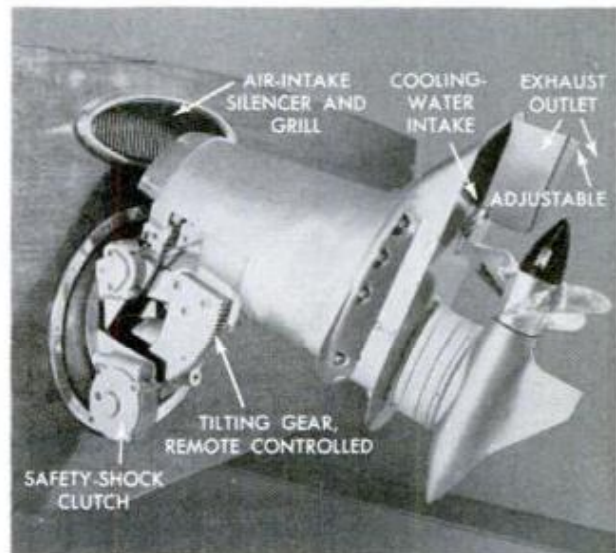
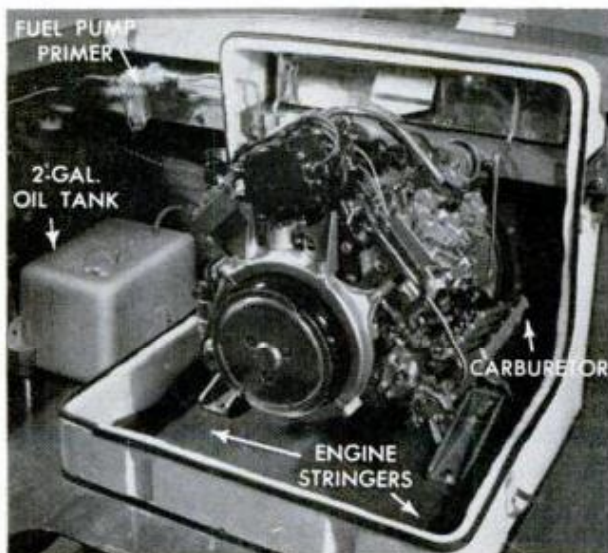
though some can be raised much higher, Figs. 3, 12 and 13. Most units have the steering arm attached to the head of the drive unit as in Fig. 14.

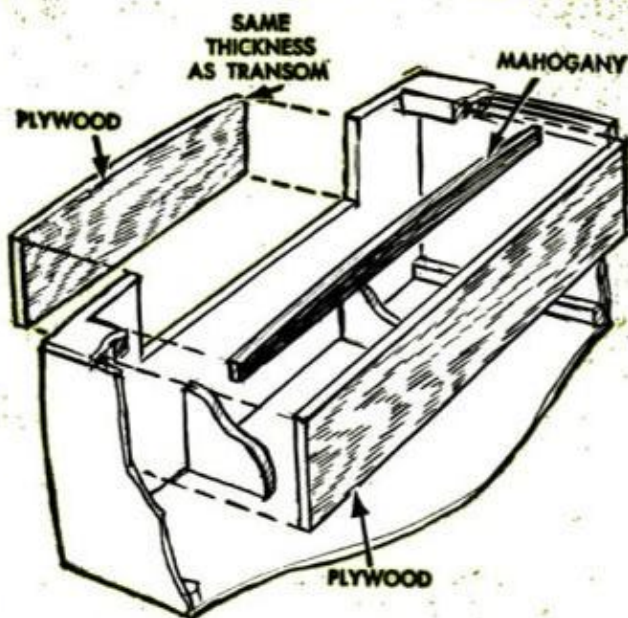
While some models of inboard-outboard drives are sold as a complete power package installed, a few are sold separately for owner installation. Of the latter group, which includes Volvo - Aquamatic, Sea Power, Brennan Imp, Sea Hawk and Muncie Flexidrive, several are available only as a combination power-and-drive package, although only the drive unit may be purchased in one or two cases.

Inboard-Outboard Drives

In an inboard-outboard installation the engine, which may be a converted car en-

5. OMC's INBOARD-OUTBOARD power package weighing 285 lb., is lightest of all such power combinations available, has basic 75-hp. outboard motor powerhead that mounts snugly in stern of boat. Although 2 cycle, engine has special lubricating oil injection system which is supplied from 2-gal. tank located in cockpit





6. CONVERSION OF OUTBOARD BOAT for in-out (inboard-outboard) installation starts with removal of motor well. Cutout then is closed with plywood laminated to same thickness as transom and a trim piece of solid mahogany glued and screwed flush with the upper edge as in the drawing. Some hulls also require engine stringers

or a marine engine without a gear train (bobtailed), is mounted next to the transom as in Fig. 1. The drive shaft passes through a hole in the transom and is connected to an outboard-type gear case and drive unit which is bolted to the transom in line with the drive shaft. On most models the engine is mounted on stringers at the forward end and attached to the transom at the after end, while on one model it is supported entirely by the transom.

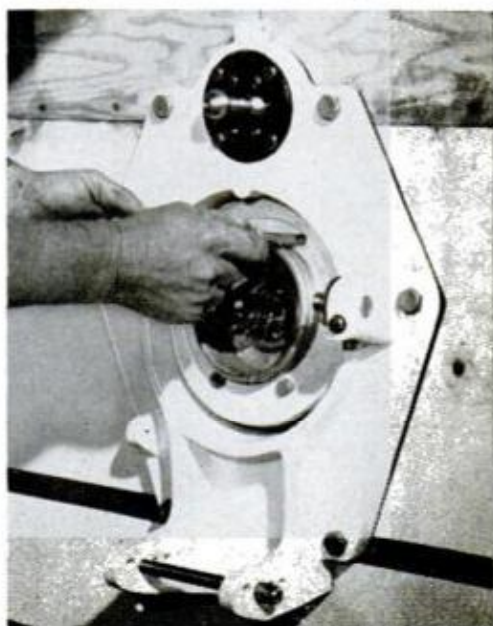
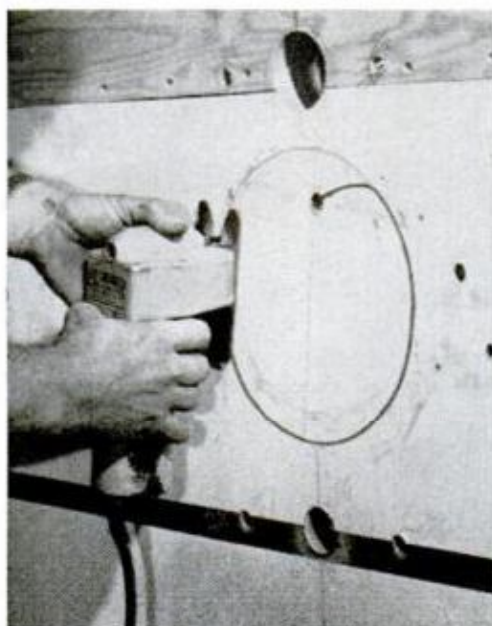
Uses recommended for this type of propulsion include pleasure and commercial craft 17 to 30 ft. in length, or craft requiring more than 80 hp. in a single engine, less than 400 hp. in twins. The largest in-out

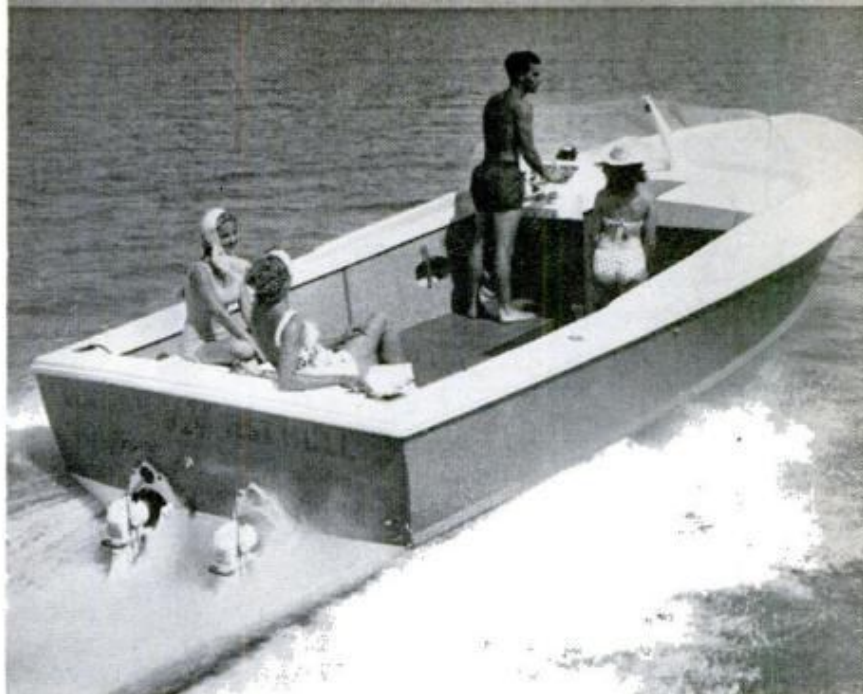
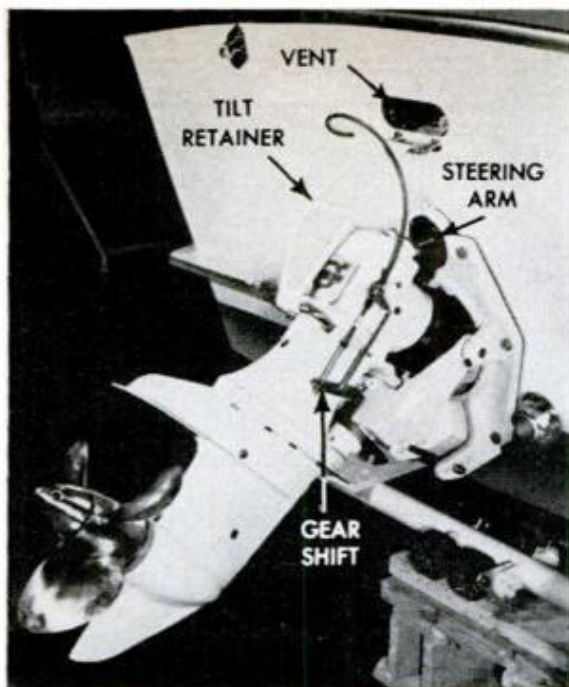
drive unit available is engineered for a 125 to 200 hp. power range.

Advantages over outboards: Lubricating oil is not mixed with the fuel, eliminating a nuisance and additional operating cost common to outboard-motor fueling. In-outs give single engine power options beyond that offered by outboards. Better protection from swamping is provided by a higher, full transom and fully enclosed engine installation.

Advantages over inboards: Installation is much easier, with no long shaft hole to be drilled through the boat bottom for the propeller shaft. Also, no stuffing boxes, separate skeg, shafting or rudder are re-

7. SERIES OF PHOTOS at bottom of this page and next show installation of Volvo "Aquatic" engine and drive combination. First, transom template is centered vertically over keel, after which holes for mounting bolts, exhaust port and tiller arm are marked for drilling. Outside mounting plate then is bolted in place





8. CONTROL LINKAGES on Aquamatic drive unit, left, are mounted externally, as is the case with all other models except Mercruiser. Latter's control linkages are concealed in drive-shaft housing. Right, 24-ft. inboard which placed first in 1961 Miami-Nassau race, demonstrates capabilities of twin in-out installation

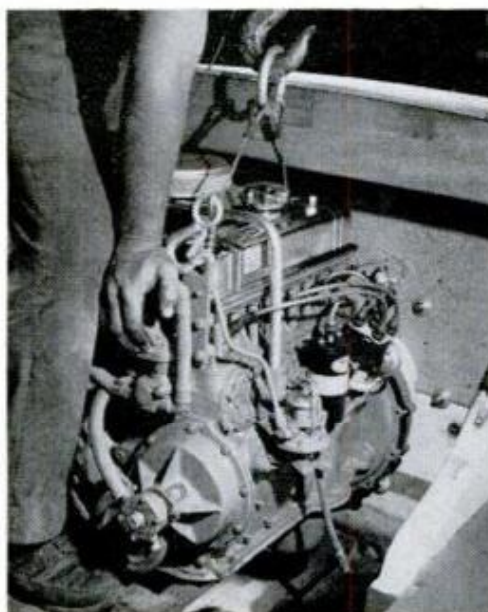
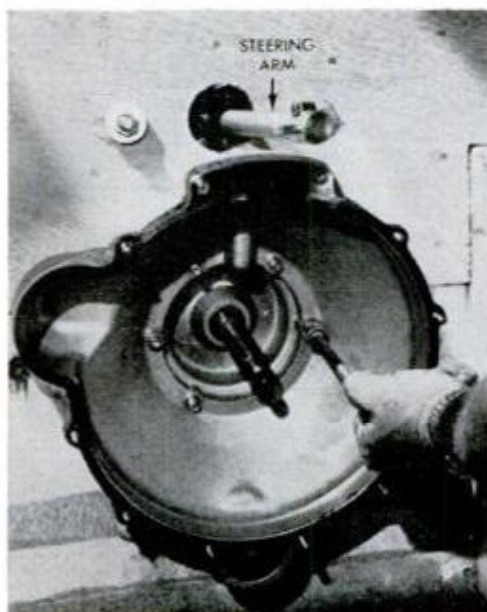
quired. In-out drive units kick up automatically when an obstruction is hit in a similar manner to outboard motors, avoiding damage to underwater drive parts. Steering is much more efficient, being accomplished by rotation of part or all of the outboard-drive unit, similar to outboards. This gives a single-prop boat almost pivot-type turning capabilities which is far better than even twin-screw (prop) inboards.

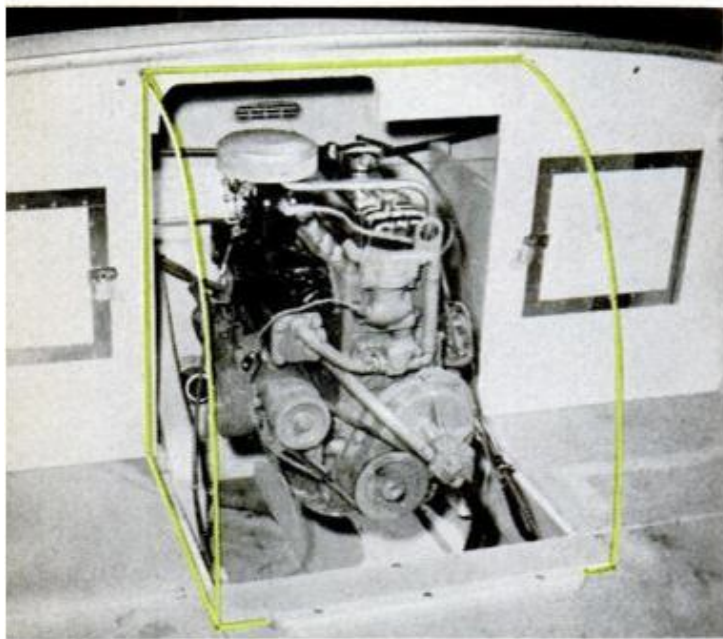
The drive unit includes reduction and reverse gearing at little more cost than conventional marine reduction gears. Also, the tilt-up feature permits trailer launching and retrieving, and the boat can be beached with impunity. With the lower

unit raised out of the water when moored, electrolysis is less of a problem and fouling of the prop and associated underwater parts by marine growth is eliminated. Further, the entire drive unit may be uncoupled easily for servicing or any other reason, a much-appreciated convenience.

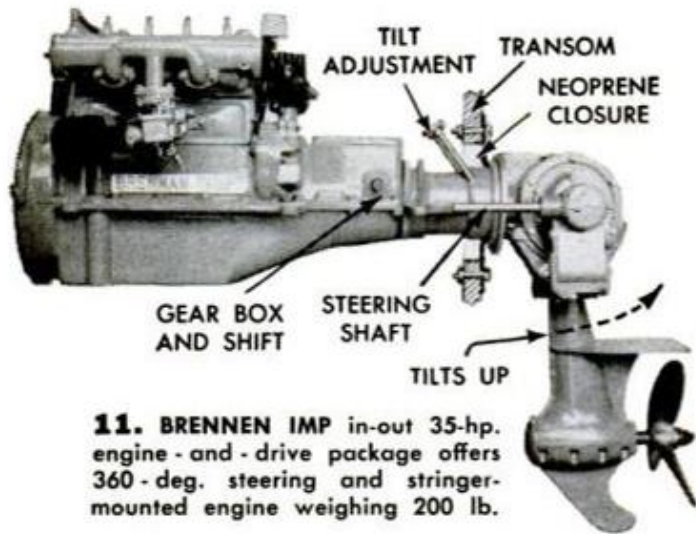
Hydrodynamically, an in-out drive unit is more efficient than an inboard since it has less underwater surface area. This means faster speeds and better fuel economy for the same power input. A further gain in efficiency is achieved through positioning of the prop shaft on a horizontal plane, making maximum use of prop thrust. The angled prop shaft of an inboard oper-

9. BELL HOUSING, left, is bolted to inside of transom, after which engine is lowered into cockpit and bolted to bell housing, center. Right, drive unit is fitted to shaft and locked in place with pins, completing installation except for connecting remote controls, fuel lines, electrical and cooling systems



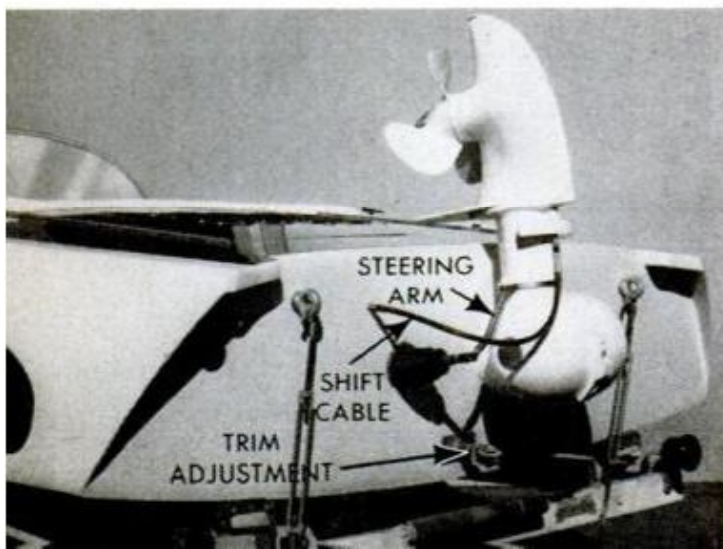


10. ENGINE COVER indicated above may be made of plywood lined with nonflammable sound-deadening material. Note storage compartments port and starb'd and external breather grille at top of transom



11. BRENNEN IMP in-out 35-hp. engine - and - drive package offers 360 - deg. steering and stringer-mounted engine weighing 200 lb.

12. SEA HAWK outboard drive can be used with engines of 50 to 300 hp., weighs only 60 lb. and can be rotated upward 180 deg. to clear water or road hazards. Tilt angle can be adjusted from seat



ates at a disadvantage proportional to the amount of angle from the horizontal at which the shaft is installed.

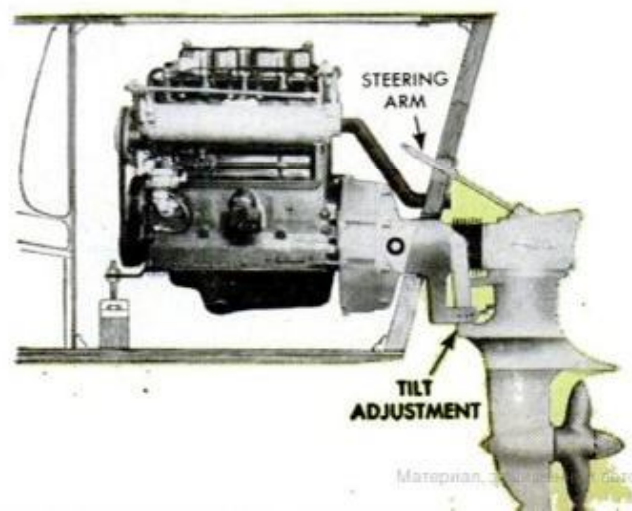
Outboard Motors

The best uses for outboard motors are, pleasure and commercial craft up to 20 ft. in length, or boats requiring a maximum of 80 hp., the largest outboard motor available. When a twin outboard installation is necessary to meet power requirements, most of the weight advantage over inboards is lost and cost becomes equal or greater. However, a twin motor installation offers a hedge against power failure and should not be overlooked as a safety factor, especially if offshore boating or cruising remote areas are frequent fare.

Advantages of outboards; Light weight per cu. in. cylinder displacement (in-outs and inboards weigh about twice that of an outboard of the same size). This makes outboard-powered craft easier to trail, launch and store. Outboard motors are the easiest to install or remove of all propulsion systems, requiring no through-hull fittings for water cooling and exhaust as is the case with in-outs and inboards. The compact powerhead and over-all design takes the least amount of hull space of any propulsion system. Motors are easily removed from one boat and installed in another, giving this type of power greater versatility than others. Outboards are lower in total cost installed, the amount depending upon the size of engine. The same type of remote steering, throttle and shift controls can be used for in-outs as for outboards. The big outboard companies offer a well established, proven product and have a well developed network of repair facilities in the United States and some foreign countries, as a final point in its favor.

(Continued to page 232)

13. MUNCIE FLEXIDRIVE is available as complete power package, or drive unit only for attaching to any marine or converted car engine within its horsepower range of 15 to 160 hp. Unit weighs 86 lb.



QUICK AND EASY

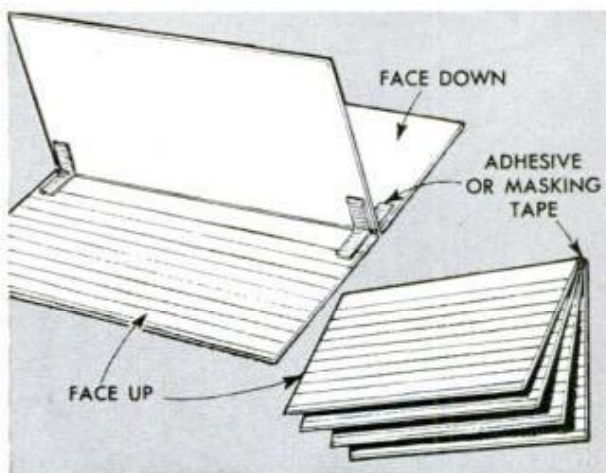
Trapping Hose Dust

When using a vacuum-cleaner sprayer attachment for painting, dust from the hose sometimes becomes dislodged and gets in the paint, or it may even clog the sprayer nozzle. This can be easily prevented by wrapping a wad of steel wool in a piece of cloth, tying both ends and inserting in the hose coupling at the top of the sprayer as shown. The tied end of the filter projects slightly for easy removal.



Cards Kept in Order

For anyone who keeps an index card file on appliance servicing and other items requiring a continuing service record, here is a tip on keeping multiple cards on each item in better order. Place the first two cards of a series back-to-back with the upper one facing down, bottom one up. Then, cut a hinge from adhesive or masking tape and apply it across the joint at the outer edges as detailed at right. Additional cards are bound into the series in the same manner, by flipping the last card face down, butting the new one against it and applying the hinges.—L. Kasper



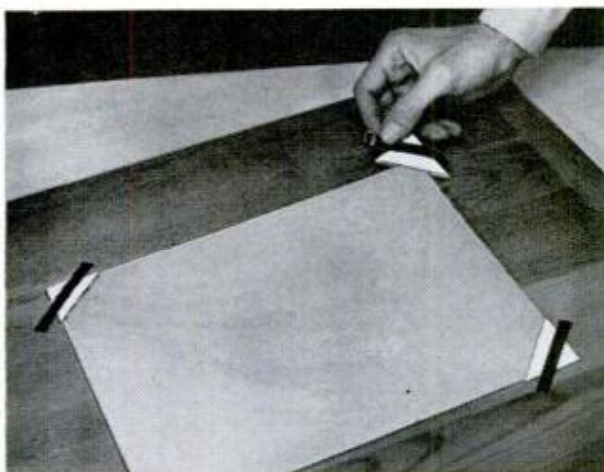
Right End at a Glance

Small rubber collars cut from an inner tube and slipped on double-end wrenches as pictured, quickly identify the end being used. This saves time and eliminates the annoyance of having frequently to try both ends before finding the right one, especially when a wrench is laid down often while making an adjustment. The collars, which also keep the wrenches propped up slightly for easy pickup with a gloved hand, should be large enough for easy grasping when sliding them to the end of the wrench being used.



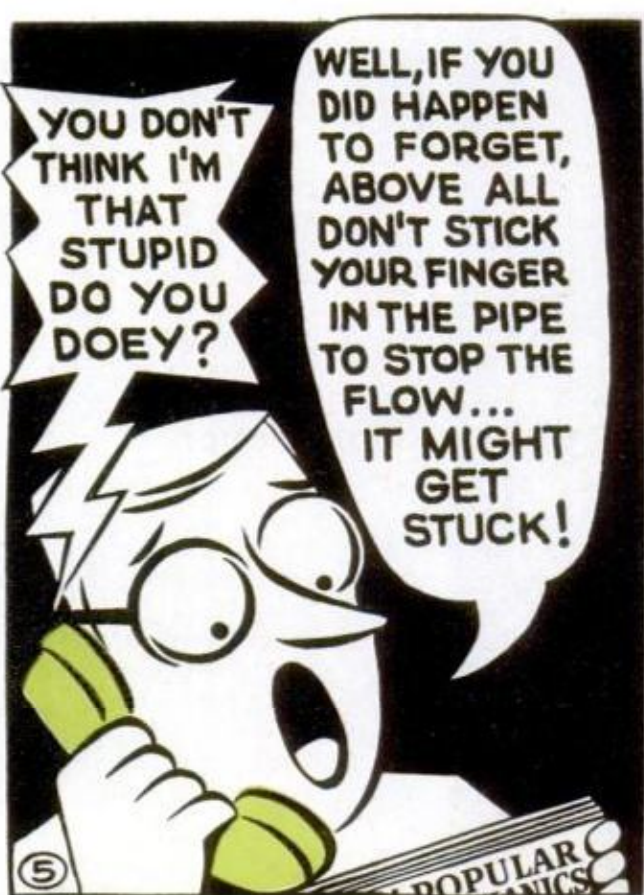
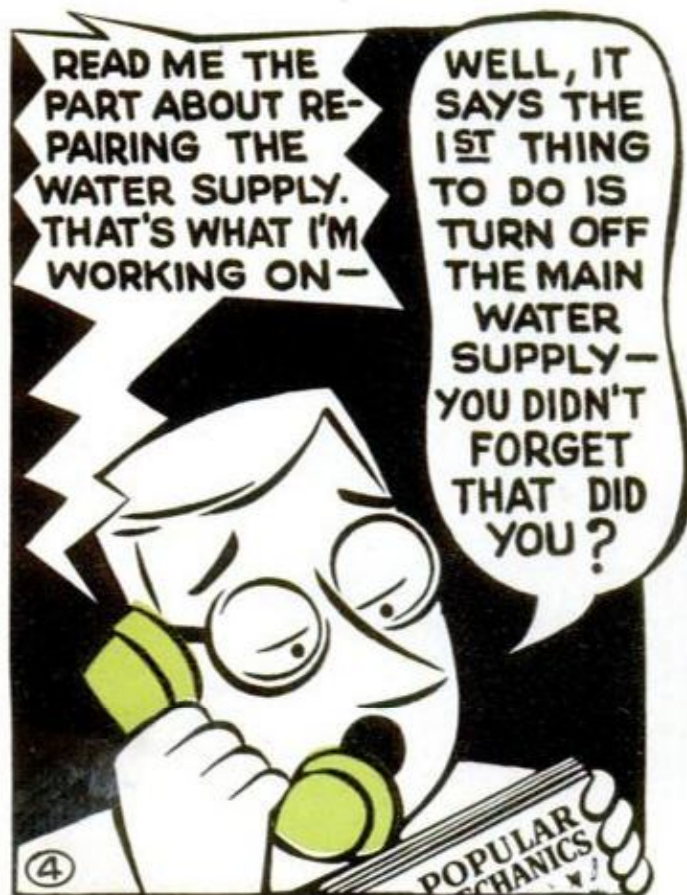
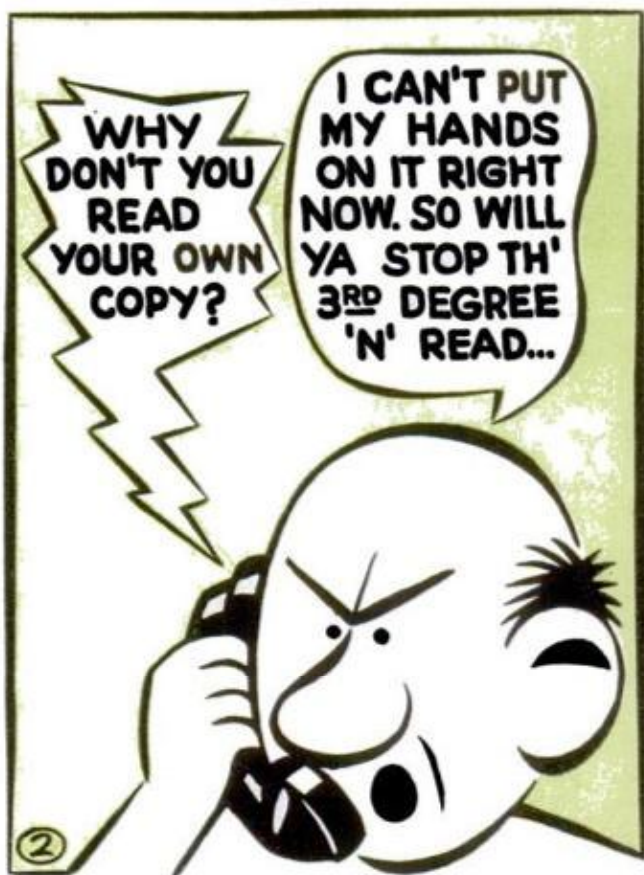
Pockets Hold Paper

When drafting or drawing paper is fastened to a board and you do not want to pierce the corners with thumbtacks, or risk tearing the paper as sometimes happens if masking tape is used, try this method of mounting the paper. Simply cut four corners from used stationary envelopes, slip them on the corners of the drafting paper and then tape the corner mounts to the board in the desired position. Since the mounts are easily removed, they can be relocated anywhere on the board to accommodate any size of drafting paper.



—R. Hanscom

MR. DO-IT AND BUNGLE



Not really the drip he appears to be, Bungle finds out last what you should do first when replacing a worn faucet washer—TURN THE WATER OFF!

O.K. O.K. IT STARTS OUT "CONTINUED DRIPPING AFTER A FAUCET HAS BEEN CLOSED USUALLY MEANS A WORN WASHER ..."

FAUCET PARTS

PACKING
CAP NUT
SPINDLE
WASHER
GROUND SEAT
LOCK NUT

TO REPLACE WASHER

- 1 Turn off water at meter.
- 2 Wrap cap nut with adhesive tape to protect finish.
- 3 Loosen cap nut with flat-jaw wrench.
- 4 Remove brass screw holding worn washer.
- 5 Measure for new washer.
- 6 Replace with one of the new press-fit swivel washers.
- 7 Screw stem back in place, turning it counterclockwise.
- 8 Replace cap nut.

REALLY, DOEY, YOU DON'T GIVE ME CREDIT FOR ANY BRAINS! NOW, I ASK YOU, COULD I HAVE DIALED YOUR NUMBER IF I HAD MY FINGER STUCK IN A PIPE?

WELL, I GUESS NOT

YA SEE THAT PROVES I'M NOT AS DUMB AS YOU THINK I AM —



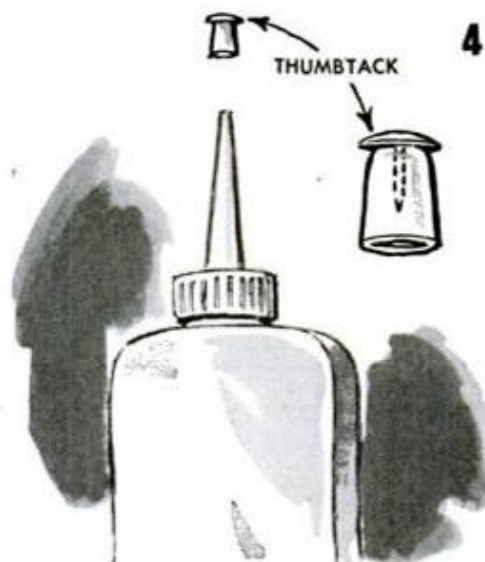
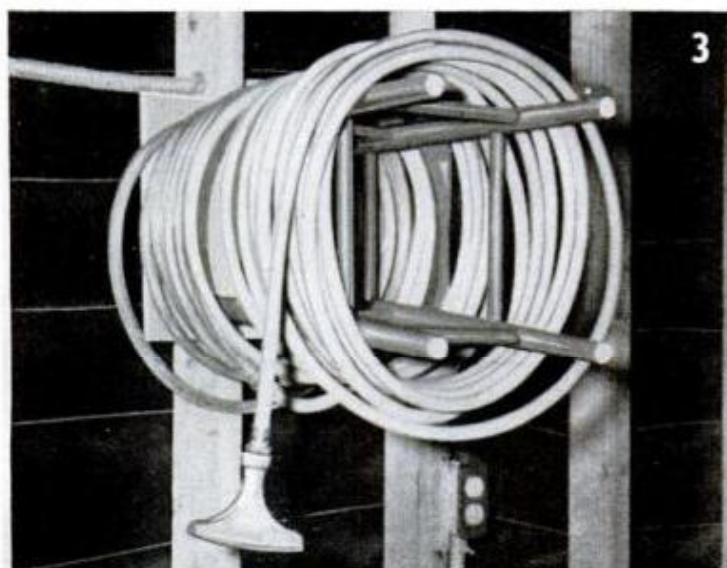
Solving HOME PROBLEMS

1. WHEN THE LIGHTS go out during a nighttime thunderstorm, or on a cold winter night, the first thing you think of is a candle. You'll probably find the candle readily enough but where's the candlestick? Don't bother. Just grab a can of peaches, hold the candle against the side of can, snap a rubber band around both and you have a safe, nontipping candlestick

2. TIGHT BOTTLE CAPS that won't let go usually can be loosened easily with the aid of a strip of sandpaper. Fold strip the long way with abrasive side out and wrap it around cap. Then grip wrapping with one hand and hold bottle with the other. Abrasive on one side of fold will cut into metal of bottle cap. The other surface will prevent your hand from slipping

3. DON'T DISCARD or destroy an old wooden chair or stool. It's still worth something other than kindling wood. For example, it's a hose rack as you see pictured. And what can you find, other than a boughten hose reel, that will serve the purpose better? Such a rack, made by cutting back off an old chair and screwing to wall, holds 50 to 100 ft. of hose without kinks

4. MODERN GLUES will set quickly in the tip of the plastic bottle unless you replace the cap immediately after each period of use. Once the glue sets in the small opening in the tip it is difficult to remove. This trouble can be prevented simply by pressing the point of a thumbtack through the center of the cap as detailed. Point of tack keeps hole in bottle tip open





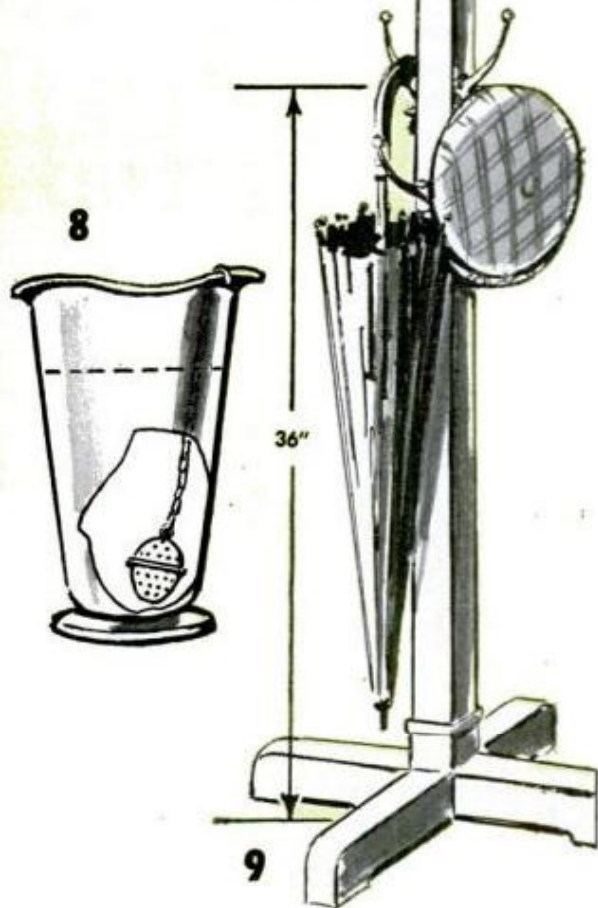
5. CONVENIENT CLIP accessory can be added to your pen-holder base with an inverted paper clamp. It will serve to hold important notes for quick reference or copy for typing at a comfortable angle. Bend one of the finger grips outward about 90 deg. just below the hole. Remove the pen holder from the base and hold the bent grip under it as you screw it back

6. FRUIT PIES often overflow and oven heat fuses sirupy drippings onto wire shelves and oven bottom, making drippings difficult to remove. Before you prepare pie and place in oven, shape aluminum foil over bottom of tin, then when ready to bake, place pie tin in shaped foil dish and expand sides slightly. Foil dish will catch drippings, save a tedious job of cleaning

7. KEEP GARDEN SPRAYS AND DUSTS out of reach of tots and tykes by placing them in empty 1-gal. paint cans with the friction covers closed tightly. Such covers can't be removed without skilful prying, something kids are not likely to try, even if they should reach cans. Sprays and dusts in small bags or cans may be hidden without removing from original containers

8. CHARCOAL added to the water in a vase of cut flowers makes them last much longer but charcoal gives the water a cloudy appearance which may be objectionable in a clear-glass vase. This can be overcome by placing bits of charcoal in a metal tea ball and suspending ball below water level and at the same time locating so that it is concealed by stems

9. DOUBLE CLOTHES TREE CAPACITY by placing four additional hooks at a point about halfway between base and top. Then you'll have a place for umbrellas and the youngsters can hang coats and snow suits on hooks they can easily reach. Use hooks that match the originals as nearly as possible, vary the height as indicated and attach to the column with small screws



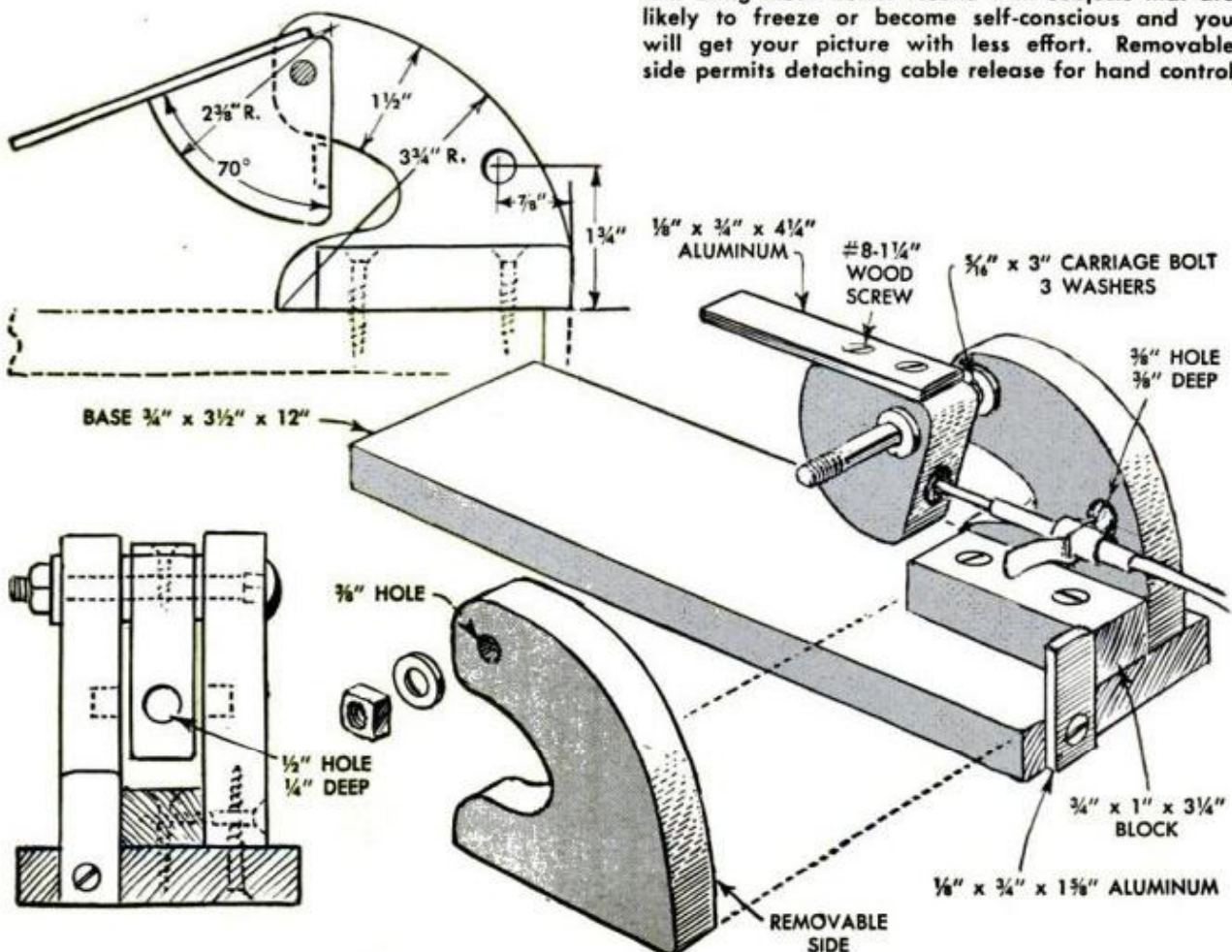


TRIPPING the shutter by foot through the use of a long cable release has a distinct advantage over a self-timer when taking your own picture—there's no waiting with mounting tension for the shutter to click. You simply shoot the instant you're ready. The foot tripper, of course, frees the hands when using a long cable release alone and allows shots to be self-posed where both hands are involved in the picture.

The drawing shows how this foot-operated tripper works. The finger grips on the release engage blind holes in the side brackets to hold it secure and pressure on the pivoted foot pedal operates the thumb plunger which in turn works the shutter. The foot pedal automatically returns to the ready position by means of the spring in the cable release.—*Manly Banister*

PHOTOS BY THE FOOT

OPERATING THE SHUTTER REMOTELY with the foot will bring much better results with subjects that are likely to freeze or become self-conscious and you will get your picture with less effort. Removable side permits detaching cable release for hand control



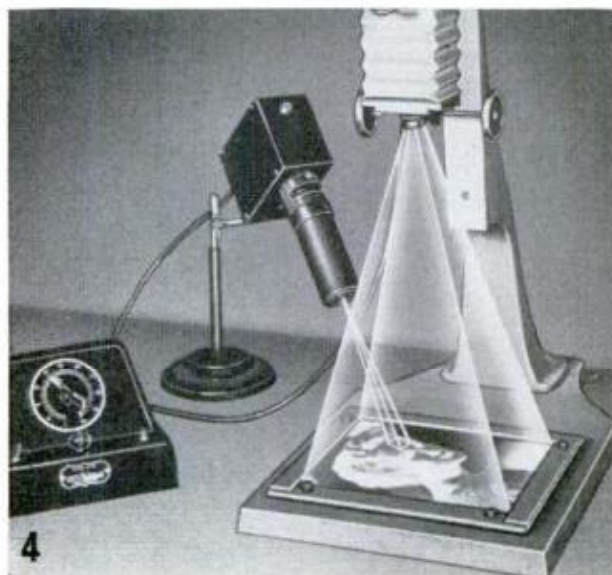
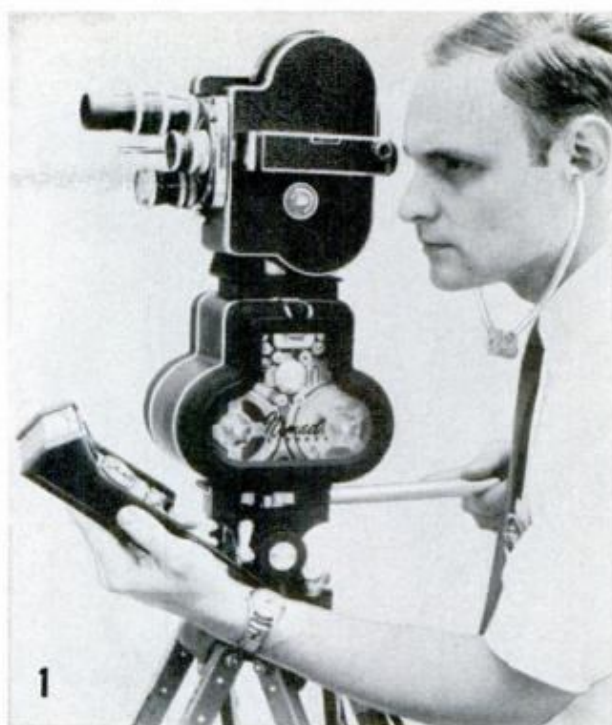
FOR SHUTTERBUGS

1. MAGNETIC RECORDER-REPRODUCER unit makes a perfectly synchronized sound camera out of most 16-mm. movie cameras. Light in weight for fast hand-held shooting and recording. Twin tracks record lip-sync sound and dubbed background effects. Fully transistorized with remote hand mixer. Magnasync Corp., 5546 Satsuma Ave., N. Hollywood, Calif.

2. SLIDE VIEWER for 16 mm. lets you see your sub-miniature transparencies as big, brilliant, lifelike images. Two penlight batteries provide bright, even illumination and the focusing optical eyepiece gives a sharp, clear picture. A strip-film carrier for unmounted slides is included. Priced at \$5.95. The FR Corp., 951 Brook Ave., New York 51, N. Y.

3. COMPACT ELECTRONIC FLASH units with transistor-controlled circuits and exclusive sunlight converters are available in either one or two-piece units. The latter also can be mounted on the camera as a single unit with a special cord reel in the power pack to retract the cord. Each unit sells for \$69.95. Burleigh Brooks Inc., 420 Grand Ave., Englewood, N. J.

4. PHOTOCELL PRINT TIMER measures and controls exposures by automatically turning off the enlarger light when correct exposure time has been reached. Interchangeable optical system permits control from smaller areas of the negative. Foot-switch outlets allow control when focusing or timing. Fotomatic Corp., 2603 Kessler Blvd., N. Dr., Indianapolis 22, Ind.



3

4



KEEP THESE IN MIND

Scooter-Board Fun

Riding this sidewalk scooter board is as tricky as riding the surf—it requires balance and then some, which comes only with considerable practice. It makes use of the front and rear parts of a single roller skate, which are separated and securely fastened to the bottom of a 1 x 6 board about 24 in. long. Extra blocks of wood provide clearance for the heel and toe clamps when attaching the skate wheels to the board. In this way, the skate is not altered in any way and can be reassembled and used for skating. The board can be covered with a rubber stair tread.—*Robert B. Ryan*

When drawing or tracing a pattern on aluminum foil you'll find that a ball-point pen makes a good substitute for a stylus. The ball point won't tear the foil yet will make a crease which is easily seen.

Saw Fills in as Grinder

If your shop isn't equipped with a regular bench grinder, your table saw can pinch hit by simply removing the blade and mounting a grinding wheel on the saw arbor. A block of wood, serving as a tool rest, permits the tool to be held at the proper angle and a neat way of temporarily fastening it to the saw table is to attach it to strips of wood positioned to engage the miter gauge grooves in the table. When grinding, dip the tool in water frequently to prevent overheating and drawing the temper, or use a vitreous grinding wheel.—*Harry S. Scholl*



COMING UP NEXT...

Colonial settle. In early American homes the settle was a mainstay of the furnishings. The high back fended off cold drafts, there was a drop shelf for a candle, a handy storage space under the hinged seat. Now once again the settle finds a place in modern homes. See October *PM* for construction details.

How to fix it. How do I fix a balky iron, a toaster that doesn't work, a vacuum cleaner that doesn't clean or a coffee pot that refuses to perk? You've asked the questions and now *PM* comes up with the answers in the "Fix-It File," a new series starting in the October issue. Don't miss the first one.

Uses for propane torch. A propane torch is hot, 2300 degrees of it! It's a portable, pencil-size, furnace-hot flame that you light with a match and take wherever it's needed. After you've read about propane torches in October *PM* you'll agree that here's about the nearest thing to an all-around tool.

Time to weather strip. Weather stripping can stand between you and a cold winter, can reduce fuel bills and induce draftless comfort from October to June. And there's a form of weather stripping for every window, every door, every crack. Next month's issue covers all kinds and tells how to install them.

SPICE CHEST

By Jackson Hand

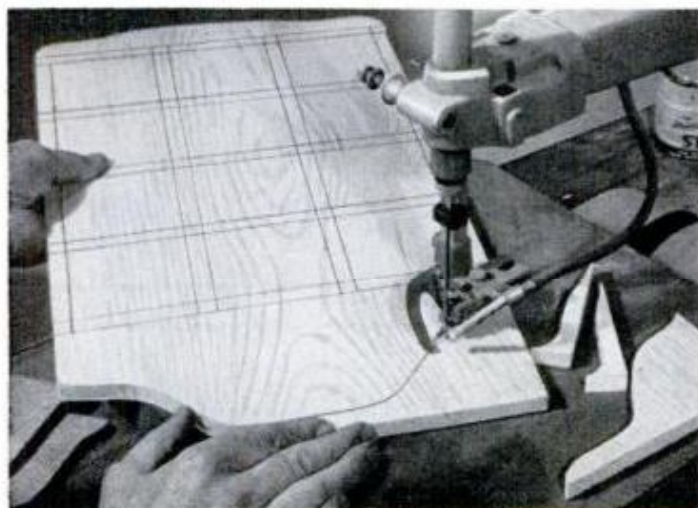
Here's a faithful copy of a spice cabinet in which great-grandmother stored sage, pepper, cinnamon, and other spices

WALL-HUNG spice cabinets probably were favorite do-it-yourself projects of early American craftsmen, for they not only served a very useful purpose but were easy to make with hand tools. The cabinet illustrated is a copy of an authentic antique and is here reproduced in complete detail for easy construction. While you can make it entirely with hand tools, a table saw and a jigsaw will speed the work.

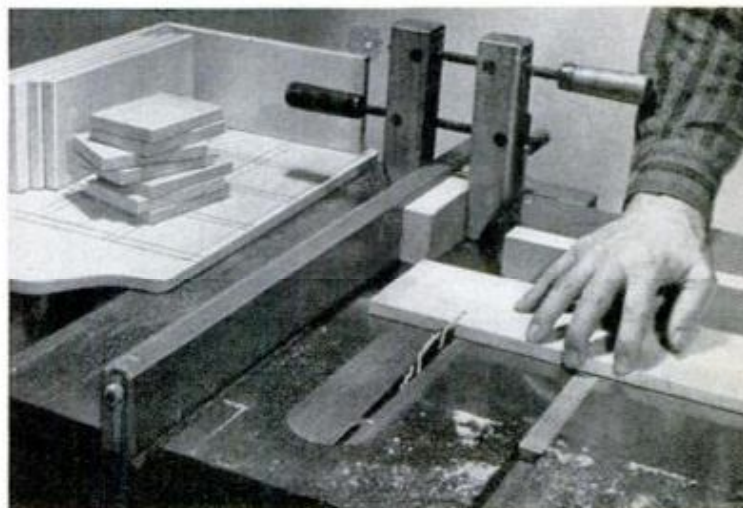
White pine in $\frac{1}{2}$ -in. solid stock is used for all parts, except the $\frac{1}{4}$ -in. plywood drawer bottoms and sides which in the

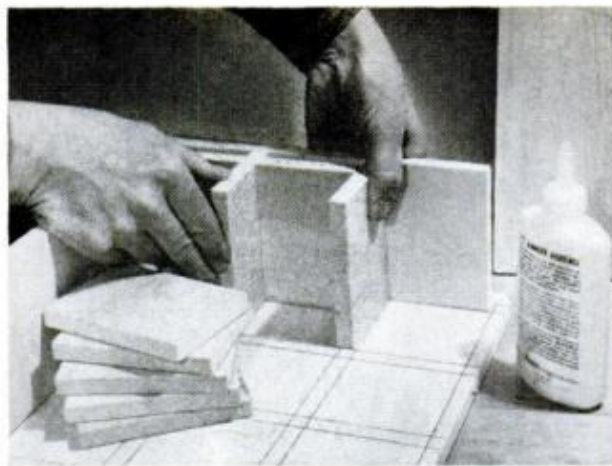
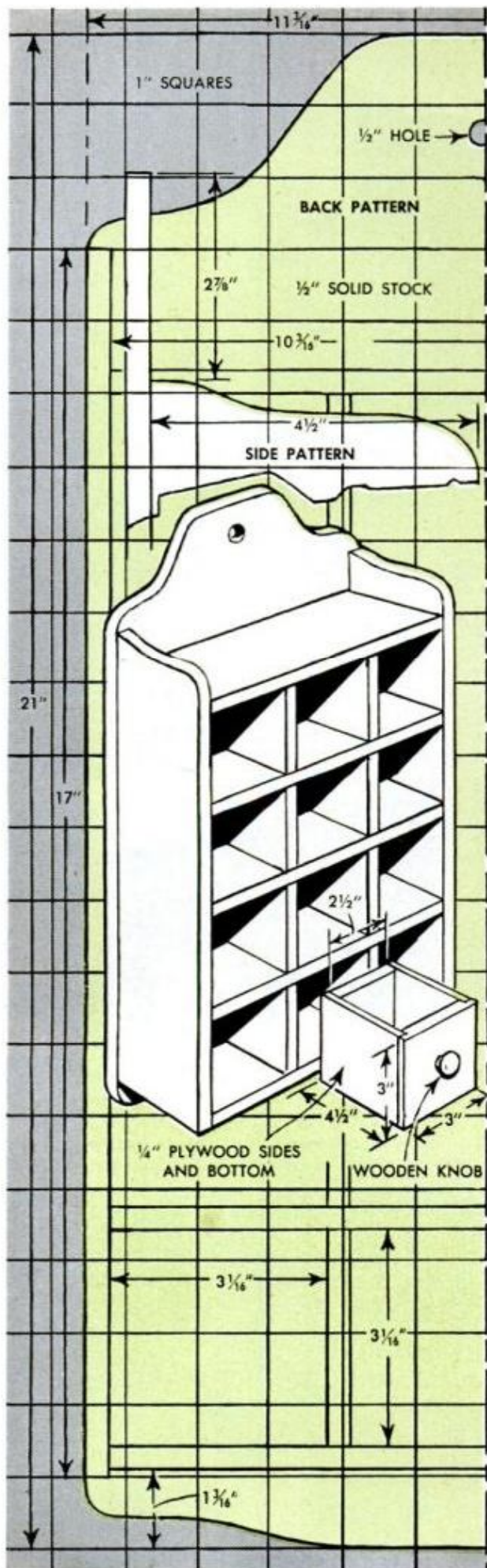


1. AFTER OUTLINING back, drawer dividers and rails on pine stock, back is cut to shape on jigsaw



2. DRAWER dividers and rails are cut to uniform length with aid of stop block clamped to rip fence



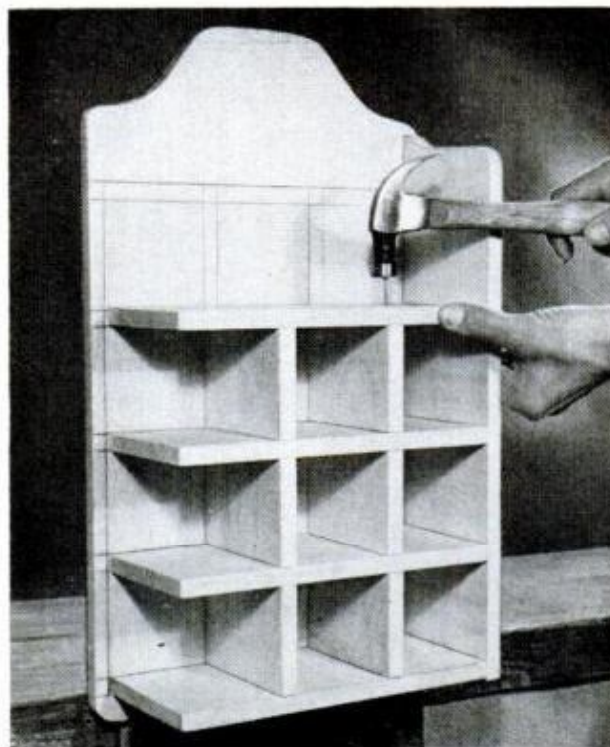


3. BACK IS first nailed and glued to one side and bottom. Dividers go on next, then rail and so on

original were of 1/4-in. solid stock. All joints are glued and nailed. The exterior surfaces are stained a medium brown color, using a wiping stain especially developed for use on pine. All inside surfaces, except insides of drawers, are enameled in turquoise.

The main steps in the assembly sequence are shown in Figs. 1, 2, 3, and 4. Holes for the knobs should be drilled before putting the drawers together. The squared drawing at the left gives the patterns for the back and sides. Locations of the drawer dividers and rails are laid out directly on the cabinet back. All exposed edges of the completed cabinet are rounded off with sandpaper, unevenly in some places to simulate wear. ★ ★ ★

4. CABINET BACK is clamped in bench vise for easy nailing of drawer rails. The left side goes on last



FOR THE MOTORIST

Hook Seizes Springs

Replacing sealed-beam headlights in some cars requires removing and replacing the springs that hold them in place. Set back in the recess as they are, there are few tools that can reach these springs through the narrow opening. A handy tool for this purpose is a small steel hook to which you weld or solder a short steel bar across the end, forming a T shape. With this tool you can unhook and replace the spring easily.
—Phil Lance

Removing metal particles from crankcase oil is easily done with a magnetized dipstick. Wrap it with about 10 to 15 turns of 20-ga. insulated wire with about 1 in. skinned off each end. Touch the bared end to the battery terminals for a few seconds then remove the coiled wire from the dipstick which is now magnetized.

Ring Short Burns Finger

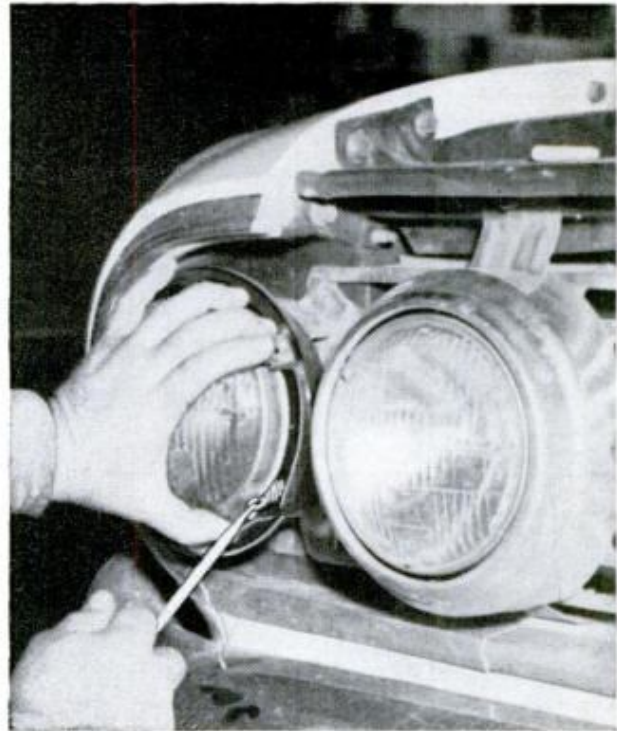
Man, watch yourself! Before reaching down among battery or starter terminals remove any rings you have on your fingers and your wristwatch. Any metal object can cause a short circuit and a ring or watch would be most likely to invite a short, with painful results. A ring will become red hot almost instantly and severely burn your finger.—Charles H. Hardy

Removing stubborn screws can be done much easier and quicker by dipping the screwdriver tip into coarse valve-grinding compound. This abrasive coating will provide extra bite to prevent the blade from slipping out of the slot and burring it.

Foil Stubborn Spots

Spots on automotive chrome and stainless steel that are too tough for ordinary cleaners usually yield to a hard rubbing with aluminum foil. Save the used foil you usually throw away because, though crumpled, it is still a good polisher for chrome plating. Form it into a wad and use as a scouring pad, rubbing with a firm pressure to remove tarnish and other discolorations and restore the luster.—Alan Linn

When parked in a position where booster battery cables will not reach, simply ease the bumper of one car against the other. Connect the two cables to make one long one and clamp each end to the positive battery post of each car, making a circuit.





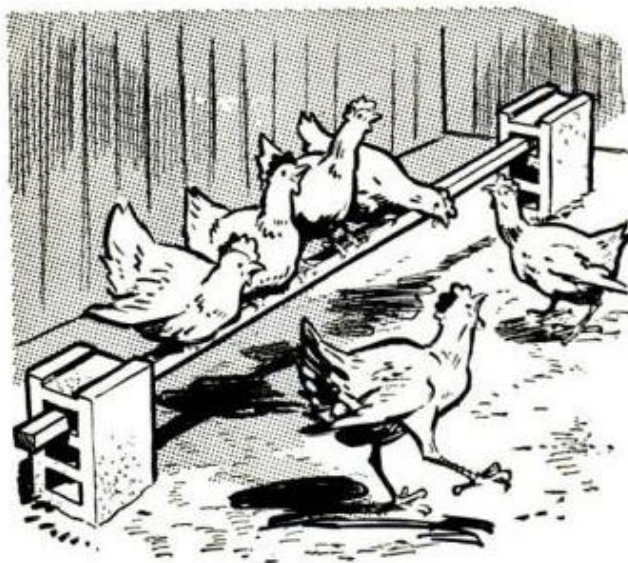
FARM TIMESAVERS

Guard That Tumbling Rod!

Serious and even fatal accidents have been caused by unguarded tumbling rods. A dangling coat or shirt sleeve or a loose trouser leg can catch and wind on the rod in an instant, resulting in a broken arm or leg, or worse. A long rod, such as that pictured, can be safely guarded with a length or two of downspout which, when slipped over the rod, will turn independent of it and thus offer sure protection to those who must work nearby when the equipment is operating. Downspout must cover the entire length of the rod to be effective.

—A. M. Wettach

A discarded tub from a wringer-type washer is easily converted to use as a rock-salt container or supplement feeder for cattle on pasture. Such tubs usually are porcelain enameled and quite durable. Rain water drains away through openings in the bottom.



Roosts Grow Up With Chicks

Young chicks learn to roost early when you provide them with these adjustable perches. To start the training period, place two concrete blocks on end and slip the ends of the perch through the lower openings in the blocks. Then, as the chicks grow in size, simply raise the perch, first to the second, and then to the third hole in each block. Use 2 x 2s for perches.

—Ann Zawistowski

When making feeders for chicks fit end pieces 6 to 8 in. high and drill a hole for a 3/4-in. dowel near the top of each. Cut bottoms out of tin cans, slip the cans over the dowel and pass ends of the dowel through the holes. A spinner made in this way prevents chicks from roosting on top of the feeder.



Sunshades Follow Turkeys

Range turkeys are always provided with shelter and shade with these light, portable sunshades, each of which will accommodate about 200 birds. The frame is assembled from 2 x 4s and covered with 2 x 8 sheets of corrugated roofing. Each T-shaped sill forms a runner and is made by laying one 2 x 4 flat and spiking another to it on edge. The rafters, each about 10 ft. long, are nailed to these sills. Purlins between the rafters provide nailing strips for the corrugated roofing. The structure is braced diagonally as indicated.



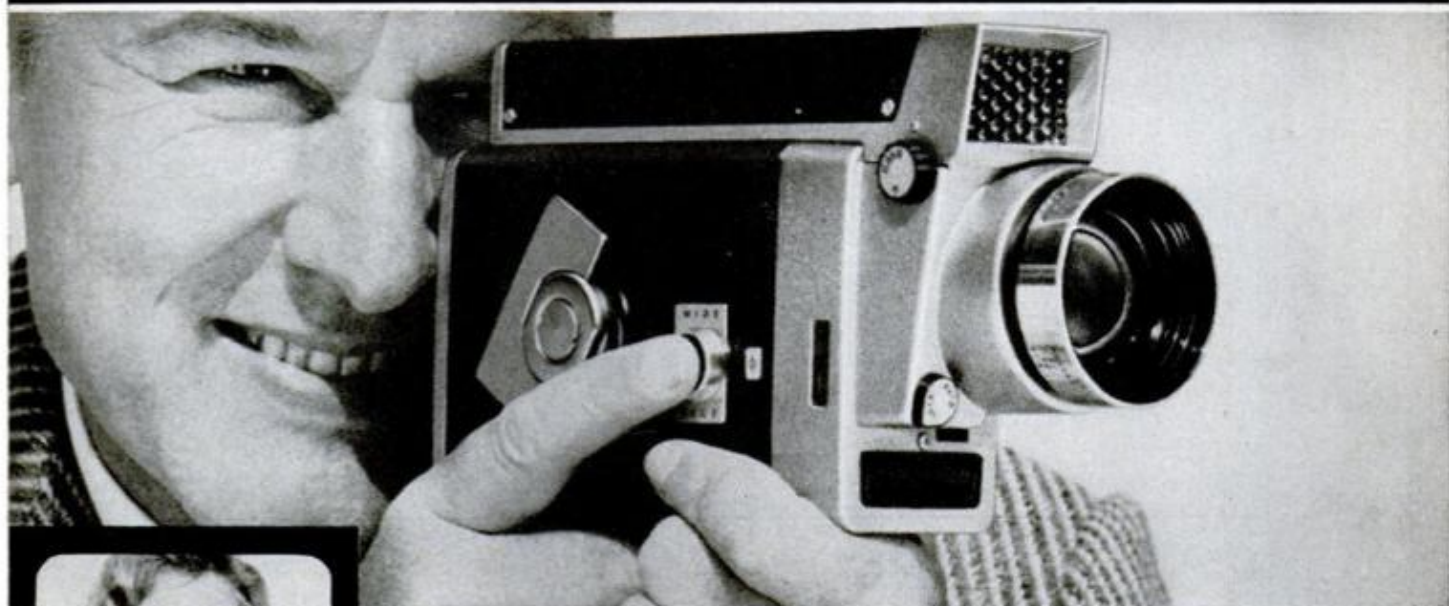
Jaguar's new XK-E convertible

Jaguar engineers specify
Champion spark plugs
because they demand the utmost
in quality and performance.
Why settle for less in your car?



CHAMPION

New Ideas in Photography



ZOOM LENS is controlled by the same button and the same motor that operate the camera. Push up for wide-angle, down for telephoto—or stop anywhere between or zoom manually for special effects.

Dramatic movie zoom close-ups made easy by new Reflex Camera

Dramatic ultra-close zoom shots are easy with a Kodak Zoom 8 Reflex Camera—because you do your viewing right through the taking lens! There's no framing error—even at close range!

With this movie camera, you can show a face—then safely zoom in for expressive eyes . . . or for a youngster's missing front tooth . . . or for an identifying badge on a cap. You know the framing will be

exactly right! You can picture a flower bed—then zoom in confidently for the center beauty. Or show a single bloom, then zoom in for the butterfly on it!

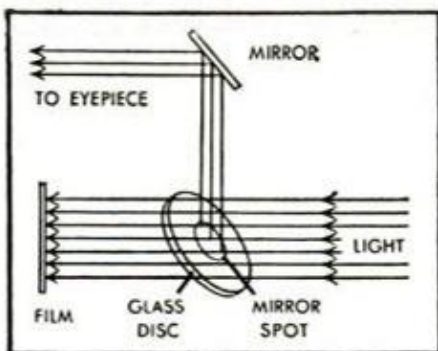
The camera's motor-driven lens lets you zoom in and out with professional smoothness. Electric eye adjusts exposure automatically. A meter lock lets you switch from automatic to manual exposure control whenever you choose.

Kodak Zoom 8 Reflex Camera is less than \$200. Other Kodak movie cameras from less than \$27.

BEAM-SPLITTER lets you see in viewfinder the exact picture going to the film. It is an angled glass disc with a small translucent mirror spot in the center. Part of the light hitting the spot is reflected to the eyepiece—to produce a sharp, clear image.



EXTREME CLOSE-UP MOVIE ZOOM is simple with Kodak Zoom 8 Reflex Camera. Through-the-lens viewing lets you compose your picture precisely. Low-cost Kodak Portra Lenses, attached to camera lens, let you come as close as 16 inches to your subject.



from Kodak

New automatic cameras solve old problems of outdoor action

Two Kodak automatic 35mm cameras are bringing new freedom to outdoor picture-taking—where action is fast and conditions change quickly.

The Kodak Motormatic 35 Camera and Kodak Retina Automatic III Camera not only set the exposure for you automatically—they also let you select fast shutter speeds to handle fast action. And the Motormatic 35 Camera even advances the film for you—keeps you always ready for the next shot!

Fast action is only one outdoor problem—when picturing sports or frolicking kids, for example. Variable light is another—as when clouds are passing across the sun. And going from sun into shade is a third.

Fast shutters . . . electric eyes

The Kodak Motormatic 35 and Retina Automatic III Cameras handle all these situations easily. On the Kodak Motormatic 35 Camera, you can set the shutter up to 1/250—on the Kodak Retina Automatic III Camera, all the way to 1/500 second.

And each camera has an electric eye which reads the light continuously. When you press the shutter release, your lens instantly sets to the right opening.

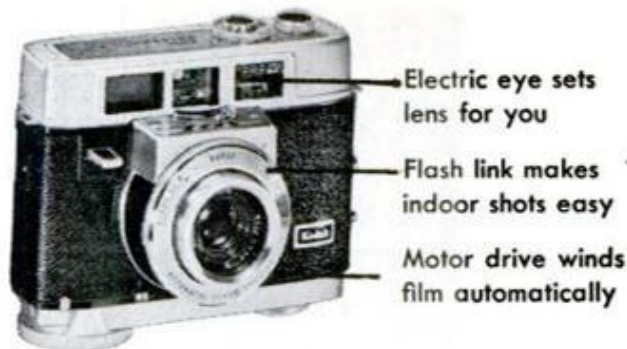
Manual setting, too

If you wish, you can set either camera manually. The Kodak Retina Automatic III Camera also has a precision lens-coupled rangefinder for measuring distance. And the Kodak Motormatic 35 Camera has a special linkage for flash shots—as you change focus, the lens opening automatically adjusts for correct flash exposure.

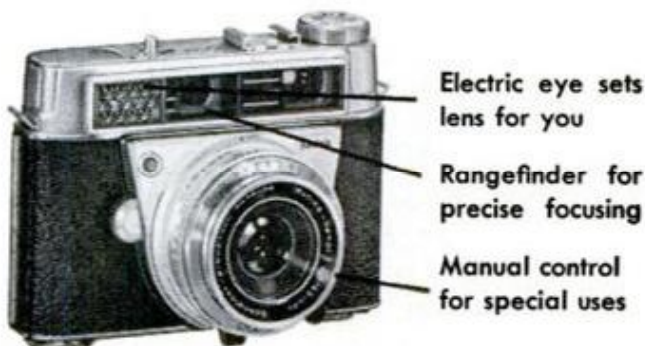
Examine these remarkable ultra-modern cameras. One is just right for *your* kind of outdoor picture-taking.

See your dealer for exact retail prices. Many dealers offer terms as low as 10% down.

EASTMAN KODAK COMPANY, Rochester 4, N.Y.



KODAK MOTORMATIC 35 CAMERA can take 10 shots in 10 seconds! After each shot, a tiny spring motor swiftly advances the film, cocks the shutter. Fast $f/2.8$ lens. Fully automatic lens setting. Full manual control. With this camera, you can keep your eye glued on the action, ready for the best shots, no matter how fast they come. For flash pictures 5 to 25 feet from subject, setting focus automatically sets correct lens opening. Less than \$110.



KODAK RETINA AUTOMATIC III CAMERA has superb Retina Xenar $f/2.8$ Lens. Fully automatic exposure setting, with override for manual control. Fast single-stroke film wind. Coupled rangefinder. Depth-of-field scale. ASA film settings from 10 to 1250. Shutter release locks if light is too dim or too bright. Less than \$130.

Now—snap fast action in color!

This weekend, start exploring the new picture possibilities opened by Kodak's ultra-fast 35 mm color film, *Kodak High-Speed Ektachrome*. With a sizzling daylight index of 160, it lets you take action shots in color that once were out of the question. Lets you get greater depth of field. Permits many indoor available-light shots with the camera *handheld*. Try it!

Prices subject to change without notice.

Kodak
TRADEMARK

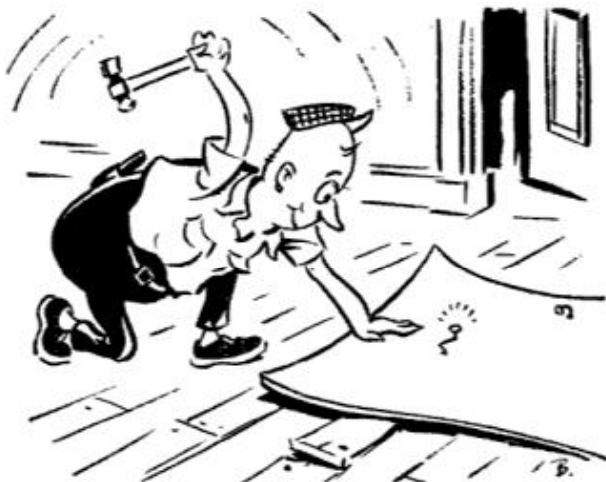
CLINIC FOR HOMEMAKERS

As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—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.

Laying Floor Tile

Q—I have taken up the old linoleum in my kitchen and I want to lay rubber or vinyl tile. The present floor consists of a tongued-and-grooved subfloor and a top floor of the same material. The subfloor is laid diagonally and the top floor boards straight, that is, at right angles to two walls. The top floor boards are warped, or cupped rather badly, so much so that the ridges showed in the old linoleum. Both the subfloor and top-floor boards appear to be loose from the joists. How should I proceed to lay a permanent, faultless tile floor in my kitchen?—O.M., Mass.

A—We wouldn't know about a "permanent, faultless" floor but we can go so far as to say that a good, sound tile floor can be laid over the present rough floor in your kitchen if you take the time and expend the effort necessary to prepare the surface properly, and lay the tile according to accepted practice. We will offer suggestions, but what we have to say should not in any way supersede what the manufacturer of the tile gives as the proper procedure. As a first step the old floor should be renailed, using nails that are long enough to go through the top floor, the subfloor and well into the joists. Two nails through each board at each joist should do it. Set the heads of both the new and original nails well below the surface. Next, use a hand



plane to level the cupped top boards. This is tedious work but it will pay well to take time to do a thorough job. Follow with an underlayment of tempered hardboard. Although 1/8-in. hardboard is often used over floors in good condition, we think it advisable to use 1/4-in. hardboard as underlayment over your floor, even though the cost will be somewhat higher. Then you're ready to spread cement and lay your tile and here's where you follow the tile manufacturer's instructions in every detail.

Water Hammer?

Q—When I open the cold-water faucet in my bathroom lavatory I get a rapid hammering sound which is most annoying if not damaging. Certainly there is a lot of vibration in the water pipes. I knew of another similar instance where just such a noise



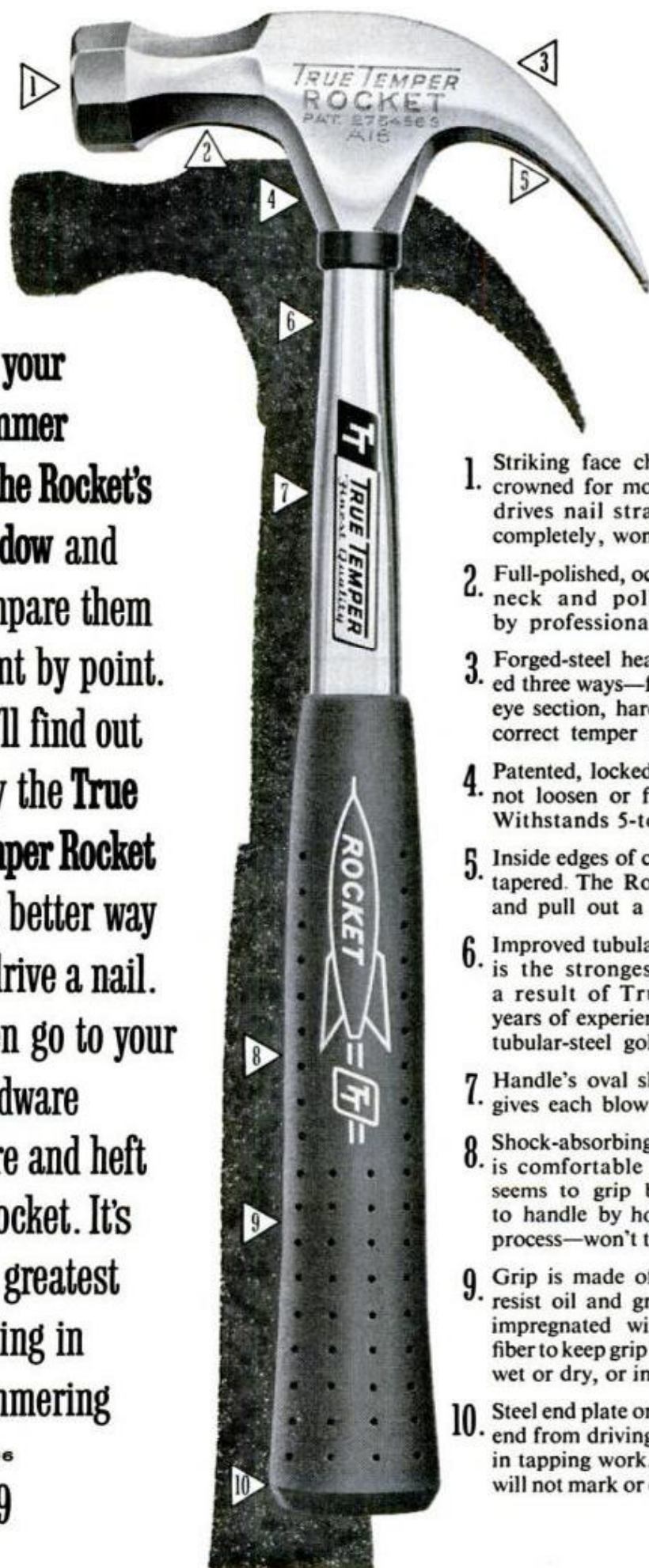
was produced in the home plumbing. This was referred to as "water hammer" and as a remedy the plumber installed what he called an air chamber on one of the water pipes. That's what I directed my plumber to do, but he says that an air chamber, or whatever it is, is not necessary. He says that the threads on the faucet stem are loose and that this looseness is causing the noise. He says he will replace the faucet or fix it, whichever I say. Sounds ridiculous to me. Can he be right?—M.V., Ind.

A—He is right. And we would suggest you have him replace the old faucet with a new one. It will be cheaper and more satisfactory in the end, as the old faucet threads are badly worn. It would take considerable time to effect even a temporary cure of the trouble, using the old faucet, as the threads would have to be upset with rows of punch or chisel marks in order to tighten them sufficiently to prevent vibration of the faucet stem when opened. Sometimes this fault can be corrected temporarily by replacing the seat washer and repacking the gland, but in sections where the water is very hard such a repair cannot be relied on. ★ ★ ★

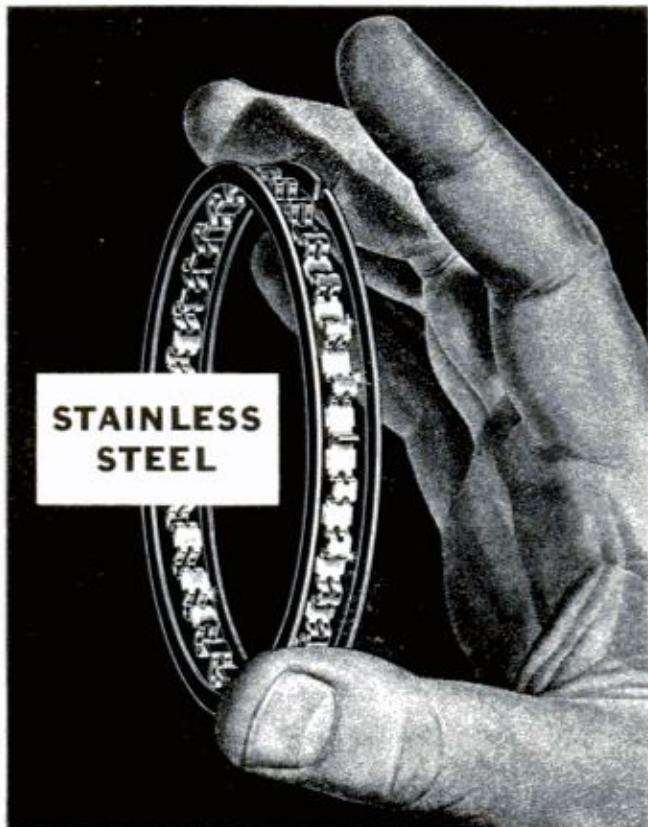
Lay your hammer in the Rocket's shadow and compare them point by point. You'll find out why the True Temper Rocket is a better way to drive a nail. Then go to your hardware store and heft a Rocket. It's the greatest feeling in hammering

No. A16

\$5.49



1. Striking face chamfered and crowned for more durability; drives nail straighter, more completely, won't mar wood.
2. Full-polished, octagon-pattern neck and poll—preferred by professional carpenters.
3. Forged-steel head, heat-treated three ways—for strength at eye section, hardness of face, correct temper in the claws.
4. Patented, locked-on head will not loosen or fly off in use. Withstands 5-ton pull tests.
5. Inside edges of claws precisely tapered. The Rocket will bite and pull out a *headless nail*.
6. Improved tubular-steel handle is the strongest made. It's a result of True Temper's years of experience in making tubular-steel golf-club shafts.
7. Handle's oval shape actually gives each blow more power.
8. Shock-absorbing cushion grip is comfortable and lively—seems to grip back. Bonded to handle by hot vulcanizing process—won't turn or loosen.
9. Grip is made of neoprene to resist oil and grease, and it's impregnated with pulverized fiber to keep grip from slipping, wet or dry, or in gloved hand.
10. Steel end plate on handle keeps end from driving through grip in tapping work. Cushion end will not mark or damage work.



U.S. Pat. No. 2,789,872

WHY DO SEALED POWER STAINLESS STEEL OIL RINGS GIVE BETTER OIL CONTROL?

It's as simple as this: Sealed Power oil rings control oil better (and longer) because they are of Stainless Steel—the finest metal yet developed for an oil ring.

Stainless Steel won't rust and it resists pitting and etching effects of gases. The oil ring surface stays bright and clean, there is nothing for carbon to cling to. Return oil vents remain open so that oil flows freely back to the crankcase.

Stainless Steel retains its tension at operating temperatures far better than carbon steel. And Sealed Power's patented end-abutment design produces proper ring tension independently of contact with bottom of piston groove. Result? No groove depth problems. Chrome-plated side rails seat instantly, of course. Sealed Power Corporation, Muskegon, Michigan.

Sealed Power Stainless Steel
oil rings stop oil pumping

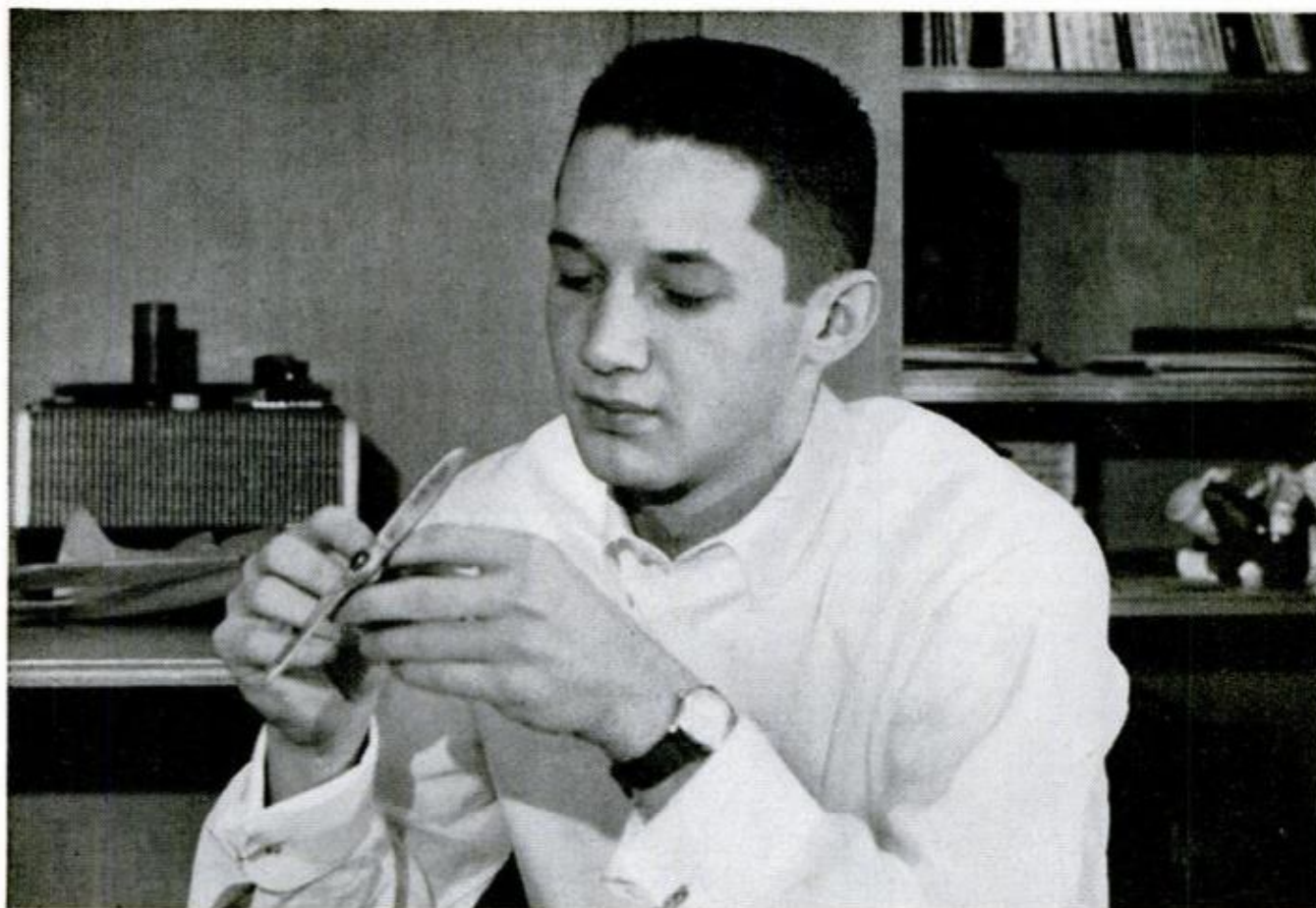
Inboard-Outboard Drives

(Continued from page 214)

Recommended uses for inboard engines are for main or auxiliary power for boats requiring more than 200 hp. and applications for which an outboard motor or in-out power is not suited. The latter category would include sailing auxiliaries over 30 ft. in length and situations for which the additional cost of the outboard drive cannot be justified.

Advantages of conventional inboard: Considerably less expensive than an in-out, when no reduction gear is required for an installation. Inboards do not have their transoms cluttered with propulsion machinery and therefore, are best when considered strictly from an aesthetic viewpoint. With the propeller located further forward and lower in the water than is normal for most stern-mounted drive units, there is less chance of cavitation (power loss from the prop turning in an air or air-water medium) when operating in rough water, a fine point of performance.

Installation of an in-out unit and engine is easy as shown in Figs. 6, 7, 8, 10 and 11. The captions explain the important steps, from converting an outboard transom to take the installation, to providing a housing for the engine. As mentioned previously, there are no complicated alignment problems, or of drilling a long shallow-angled hole through the boat bottom to take the prop shaft. The latter must be done very precisely to avoid binding, vibration and leaks, which rob the engine of power. The most important step in any installation is locating the transom hole through which the drive shaft passes and over which the drive unit is mounted. A single-unit installation should have the anticavitation plate slightly below the bottom of the boat (at the transom) on the centerline, although this will vary slightly depending upon the size of boat. Such specific instruction usually is provided in the installation manual, as well as all necessary templates for layout of holes to be drilled or cut. Units that depend upon the transom for primary support, should have that part of the boat beefed up as indicated in Fig. 7. If most of the weight of the engine is to be borne by the boat bottom, husky engine stringers should be installed to distribute the load evenly. All of this comment applies primarily to boats designed for outboard power, as an inboard hull presumably would incorporate the required design features for installation of an inboard engine. If in doubt, the engine manufacturer is your best source of information, next to a marine architect. ★ ★ ★



Career-minded Jay C. Douglass of Elizabethtown, Pa., asked...

“How should I get started?”

This year some 100,000 ambitious young people will answer this question the same way Jay Douglass did—they will become members of the Air Force. The road they will start upon leads straight into the Aerospace Age. And the organization of which they will become a part is the most important one in our world. For it is our country's first line of defense.

In time to come many of these young men will advance to the role of skilled technicians in such fields as airplane and missile maintenance, communications

equipment, computers, radar. A number of these young men will enter the vital support specialties—administration, supply, air police...to name a few. Any one of these career fields holds the promise of a bright and rewarding future—a future *you* should know about in detail right now.

Getting started in the right job, is important to any young man...or any young woman. To find out if your start might best be made in Air Force blue, clip and mail this coupon.

U. S. Air Force



Airman 2C Douglass is presently working as an electronics specialist at Duluth Air Base, Minnesota. As Air Force aptitude tests indicated, he finds he can handle his job well. He feels he has made a good start.



Career Information

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Washington 4, D. C.

I am a citizen (or resident) of the U.S.A. Please send me your illustrated booklet.

Name _____ Age _____

Address _____

City _____ County _____ State _____

10 Minutes to Survival

(Continued from page 160)

survival, but once the ammunition is gone the weapon becomes worthless. Good fishing gear is not likely to deteriorate; with care it can be used indefinitely. There's no time for sport fishing, but a reel can be stripped of line to be cut into pieces and used for a series of bank lines. Hooks can be removed from an artificial lure and used on the lines with natural baits.

After several days of poor fishing, we finally caught a 20-pound carp. At last, we thought, we would get our fill of fish. We sliced off thick steaks along the carp's sides and roasted them over a bed of coals. But the flesh, particularly the dark streak along the side which we should have removed, was repulsive and the odor which remained on our hands was sickening. It nauseated us.

Which Gun for Survival?

Any gun would do for a survival weapon, but there are some guns which are better than others. During our 10-minute alert, I had a choice of four weapons—12-gauge shotgun, .22 rim-fire rifle, .22 rim-fire magnum rifle, and .22 rim-fire handgun—and about 300 rounds of ammunition.

I weighed the factors fast. A shotgun is good on running game but it has its drawbacks. Range is one, bulkiness of ammunition another. Still another is muzzle blast. Yes, in a real survival situation a person would wish to be left alone. People will be roaming through the woods, hunger overpowering any habits of decency. They'd stop at nothing to get something to eat, not even killing or stealing from others. So isolation is important.

The .22 magnum was discarded as impractical. So I had it condensed to two weapons, both .22 caliber, the scope-sighted automatic rifle and the revolver.

It wasn't a difficult choice. Except for close-range self defense, portability and concealment, the handgun isn't in the class with the rifle. Certainly not in the hunting woods where accuracy outweighs the other factors mentioned. A scope-sighted .22 rifle hunter can place his shots, ruining little meat. He can easily kill small game up to 50 yards, and farther if he is a marksman. A well-placed head, neck, or heart shot will kill a deer or a cow—and a man, if necessary.

One of the nicest things of all about the .22 rifle, however, is that the ammunition is light, compact and cheap. A person can keep an adequate supply on hand. Five hundred rounds, eight or nine dollar's worth, will keep for years and keep the average hunter in meat for six months or

longer. The trick is being a deliberate, thorough hunter. This means hunting when wildlife is most active and unsuspecting—from daybreak to sunup and again from sundown to dusk—and working quietly and slowly for close-range, standing shots.

I had two boxes of .22 long rifle ammunition, 100 rounds. I used about 38 cartridges, and kept meat on the table through most of our stay.

Game meat became our one staple food, but cooking game presented problems. Generally the flesh of wild animals is dry, with little fat. In nature's scheme of things, where animals prey on each other, food is scarce and animals are gaunt, lean and muscular. The few exceptions are the animals which have porklike flesh, creatures such as opossums and armadillos.

All of our meat either was cooked on a spit over a bed of coals or boiled in a stew. Another possibility is baking by burying fish or game wrapped in leaves or mud in a hole filled with hot stones, then building another fire over the spot where the food is buried. We never had time.

We built a fireplace of stones carried from the creek bed. We built a fire near the mouth of the fireplace, and pushed the coals to the rear where our roasting spit was located. This way we always had a fire for warmth and light, and also an adequate supply of red-hot coals.

Wilderness Diet

A typical meal consisted of one can of vegetables (our supply was predominantly canned peas and beans), and either fish or wild game, supplemented by wild onions and water cress. We used a ration of about one-and-one-half cans of food daily. What little was left from one meal was carefully hung in storage for the next. Abby ate almost every scrap except the onions.

Here are a few of our typical meals:

Cottontail rabbit roasted on a spit; a can of peas; wild onions and water cress; coffee made from reboiled grounds, and one-fourth slice of bread per person. (The bread lasted just about a week with careful rationing.)

Squirrel stew (ingredients: chunks of squirrel, wild onions, salt); small can of fruit cocktail, and water cress.

Fish baked on a hot rock, wild onions and a can of string beans.

Squirrel roasted on a spit, boiled dandelions, wild onions and water cress.

One day we found some pecan nuts down along the creek. It was the first fatty food we'd had in days. Reed stuffed himself. To think that water cress is a treat to some people! It and wild onions became our standard vegetables for every meal.

Sanitation was another worry. Because

of our close proximity to the ground, and consequently filth and insects, there was the omnipresent danger of disease and infection. My hands, after days of immersion in cold water, cracked in several places. One raw ugly sore opened across my right thumb, hindering me considerably.

We were constantly searching our bodies for ticks. Dirt found its way into our food, ashes scattered by the wind ended up in our vegetables and coffee. Tables built of stone, although elevated only about six inches off the ground, helped immeasurably. We also made seats from rocks and improvised shelves in the trees to hang our food, getting it away from insects on the ground. One of these so-called shelves was made by placing a hub cap from the car on two clothes hangers suspended from a limb.

Salt Becomes Important

To brush our teeth we used salt on our fingers. Salt around camp was a prized item, both in cooking and for sanitary purposes. As it turned out we had enough for our two-week stay, but if our supply had run short I would have hunted a livestock supply. Wherever there is livestock you can assume there are salt blocks somewhere nearby. Also natural salt deposits can be located with some exploring.

A latrine ditch equipped with long grass took care of one disposal problem, while any garbage that the dog didn't eat, like fish bones and onion tops, was burned. Although we saw numerous flies in the air, we had no trouble with them whatsoever.

Most of the things we brought along were pressed into duty one way or another. We had a surplus of clothing, but over a longer period the extra garments would have been important, either as wearing apparel or as rags for use around camp. There were several items we overlooked which would have made our task easier. Kitchenware, for example. Or a larger stewing pan. Cooking grease. A sharpening stone.

Our legs were scratched by briars and, particularly during the first few days, our hands were scarred by the rough cedar. The bottle of alcohol and the bed sheet Marjorie thought of were a great help. We used the disinfectant on the scratches and on the bites of ticks, and the bed sheet for bandages (it came in handy in dressing a blister I got on my foot).

In my tackle box I had a tiny bottle of tincture of Merthiolate and a small tin of aspirin. When they were gone we'd have been on our own.

Regularly we boiled water and washed our faces and hands. Cuts and scratches were treated. Our bedding was removed

from the lean-to each morning and allowed to sun all day. Dishes were scrubbed with sand and scalded with boiling water. Preventive medicine becomes terribly important when no aid is available, or when a lost day means a hungry family.

On the chance that one day *your* family may have just a few minutes to abandon home and civilization and "head for the hills," it might be a good idea to have some kind of plan for getting clear. It would have helped us greatly.

I have listed a few basic and essential items as a "survival kit" on the grounds that those few things can make the difference between success and failure. Beyond that list, you'll have to depend on what's at hand. Not one person in a thousand would pack a complete kit and keep it handy—though *he'd* be the one certain to be really ready. This kit can be easily assembled and kept handy to supplement the items you can pick up in a hurry.

Fishing, Hunting Gear First

Probably the most important thing around the house is your fishing and hunting gear. Most households have something along that line, and it should come first; it'll feed you anywhere.

Next comes clothing. Easiest way to get it out is simply to strip the closet, taking everything. This is easy if your hangers are all turned to face the same way (that's the easy way to manage a closet, anyway). The same method works for drawers—take the whole lot and sort it later. Basic, warm, waterproof clothing is, of course, most important.

For bedding, the easy way again is to simply strip the beds, taking sheets, blankets and all except pillows. The material not needed for bedding can serve dozens of other purposes, from bandages to building materials.

Food, of course, is important, even though what you can carry will only serve for a short time. Preserved items like canned, dried and packaged foods are best; salt, sugar and other staples are both important and good to have. In the kitchen, a few basic cooking utensils and eating tools should go, too, and any kind of sealable containers.

In any survival or emergency situation, drugs and medicines can mean the difference between life and death. Almost anything found in a medicine chest will prove valuable; take it all. As a result of our experience we plan to keep all our drugs in a small box inside the medicine cabinet. It would take only a second to grab the entire collection, from aspirin to antibiotics.

(Continued to page 244)

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PLEASE PRINT

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**WORLD'S
BIGGEST**

In such a situation, a family should plan to work as a team, each member knowing what to get and where to go. The father can concentrate on tools and equipment, mother on food and clothing—even the children can get their own clothing to the car. You can strip a house of essentials in a matter of minutes with teamwork, and so equipped could spend a considerable time in the most hostile environment without danger of going hungry or unsheltered. It might be a good idea, while you're thinking about it, to decide on a spot or area which you can reach but which is off the beaten path and clear of traffic patterns and fall-out paths.

We came out after two weeks in the woods, feeling that we had done well. While we were never very comfortable, we had enough food, water, and shelter—our site served us well.

Our feelings after the test were mixed. We were awfully happy we didn't have to stay indefinitely, but we think we could have if it became necessary. Like a lot of experiences, it was something we were glad to have behind us, but we wouldn't want to do it again.

Let's hope we never need to. ★ ★ ★

Will teaching machines cheat your child? Or improve his education? The October **PM** will tell you what the experts think about mechanical instructors.

Radiation From Solar Flares Is a Hazard to Space Travel

If men are to travel through space and survive, some way must be devised to protect them from lethal doses of radiation released by giant solar flares.

The flares, from which jets of very high-energy radiation are sprayed into the solar system, cause radiation levels from four to nine times the present annual recommended occupational doses.

Besides the giant flares, Dr. Cornelius Tobias, of the University of California, and Dr. Roger Wallace of the Lawrence Radiation Laboratory, Berkeley, have found that the sun's monthly activity would expose men in space to highly dangerous radiation doses—from five to 100 times present permissible occupational exposures.

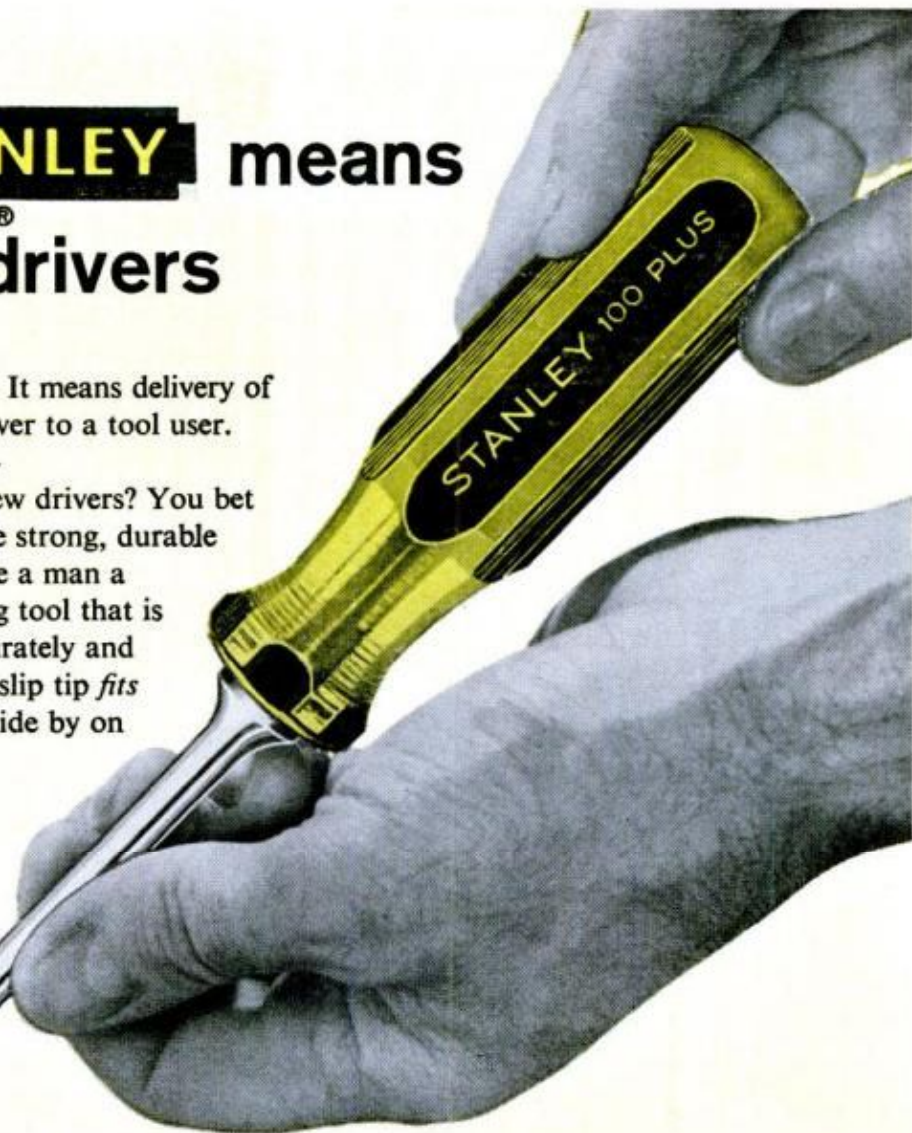
Dr. Tobias suggests the problem perhaps can be solved by a combination of a short trip, some shielding (enough would be impractical), prophylactic measures with regard to radiation sickness and traveling at a period of minimum solar activity.

What **STANLEY** means on screw drivers

Stanley is a name you know. It means delivery of everything a tool should deliver to a tool user. Take Stanley screw drivers—

Is there a difference in screw drivers? You bet a blistered palm there is! The strong, durable plastic handle is made to give a man a comfortable grip on a driving tool that is designed to *drive* screws accurately and easily. The crossground non-slip tip *fits* screw slots . . . doesn't just slide by on its way to gouge your work.

This is one of the Stanley "1000 Line" of screw drivers . . . the finest made. Available in a variety of styles and sizes. Prices start at \$1.05.



OTHER DEPENDABLE SCREW DRIVERS FROM THE TOOL BOX OF THE WORLD



No. 233H

Famous Yankee-Handyman spiral ratchet screw driver. Drives and draws screws. Drills pilot holes, too! Magazine handle contains two screw driver bits and three drill points—\$4.98 each.



No. 3006

Stanley Handyman screw driver has red "Cushion-Core" plug that adds extra resistance to pounding on the handle. It shouldn't be done but everyone does it. Prices start at 55¢ each.



No. 2702

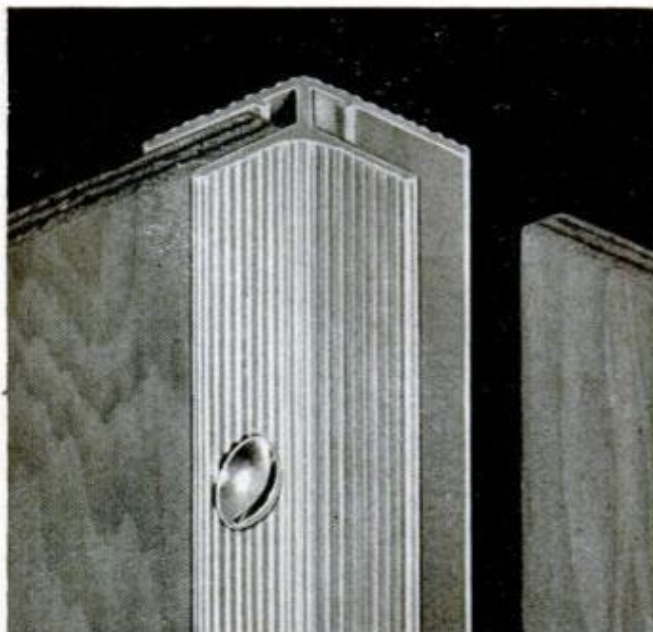
Popular wood-handled drivers for Phillips Head screws. Available in four sizes to fit the entire range of Phillips-type screws and bolts. Prices start at 55¢ each.

You get what you pay for in tools! If you lose tools, are careless with them or with your work—get cheap ones. If you value good help for your hands . . . if you are proud of your work—buy Stanley Tools.

Stanley Tools • A Division of The Stanley Works • New Britain, Conn.

SEPTEMBER 1961

STANLEY
®



New from Reynolds!

Aluminum Corner Posts

Reynolds Aluminum Corner Posts are the easy way out of any cornering problems.

- No butting of joints
- No exacting angle measurements
- No elaborate corner finishing

And they're easy to use! Just slip the material into the open slots on either side and screw or glue into place. That's all there is to it. Corner posts may also be extended to form legs or supports on chests, cabinets or desks. Storage chests, paneled walls, furniture . . . all take on a real professional look. Available in 8 ft. sections to match any cuts, without waste, made from standard 4 x 8 ft. panels; for $\frac{1}{4}$ ", $\frac{1}{2}$ " or $\frac{3}{4}$ " thick materials. Reynolds Aluminum Corner Posts are now available at your hardware or building supply dealer; see them soon!

Watch Reynolds TV show, "Harrigan & Son," Fridays, ABC-TV



REYNOLDS METALS COMPANY
Richmond 18, Virginia

Selling Your House Direct

(Continued from page 187)

crease the sale price of a modest home by as much as \$1000," says an FHA appraiser. "In general, a good exterior can add 10 percent to 20 percent to the price," he adds.

A St. Paul realtor points to identical homes side by side in a multihouse development. One owner had added shutters, shrubs, two small trees, and a fresh paint job, while the second contented himself with merely keeping the yard and house clean. Within a month, the house with the extra exterior features sold for \$13,800 to \$12,500 for the unimproved home. Yet both were identical in construction.

Don't fall into that trap of showing a prospect through the house, and confining yourself to merely identifying the rooms. Most people can tell the kitchen from the living room. Instead, remember the checklist of "plus" features you made up for your ad, and emphasize the strong points on the list. Perhaps the kitchen has eating room for six, or washable walls. Or the walls are plaster rather than plasterboard. Or the insulation is double, or the floors hardwood, or the heating costs low. Every house has its strong points. Know them and talk about them.

Be able to discuss knowledgeably the construction of your house, the heating system, electrical outlets, utility costs, and the neighborhood (churches, schools, shopping areas).

Taking the Mystery Out of Financing

Financing can be one of the strong points of your sales story. Have the home-loan officer at the bank or savings and loan association where you have your mortgage tell you how the new owner can go about taking over your mortgage, or getting a new one.

Ask two or three lending institutions to make an FHA mortgage commitment (how much money they will lend) on your house. Their appraisers will look the house over—at no cost to you—and the loan officer will then tell you: "The appraised value of your house is so much. To a qualified buyer we will lend 70 percent (or anywhere from 50 to 90 percent) of that value over 15 years (or 10, 20 or even 25 years)."

Not only do you have an independent appraisal of your house's value, but you now have another sales advantage—you can tell the prospect exactly what his monthly payments and down payment will have to be. And \$1500 down and \$74 a month sounds a lot easier than \$16,000.

There are three types of home loans:

(Continued to page 248)

FREE!



LIFETIME SHARPENING

WHEN YOU BUY YOUR **COMET QUICK-SET DADO...**



during this special offer, you will receive free sharpening by factory experts for the lifetime of the blades! You will receive a Lifetime Sharpening Certificate with your purchase of any Comet 6" or 9" Quick-Set Dado. This Certificate (plus \$1 for insurance, postage and handling) is all you need to save an average of \$4.5 each time the blades need sharpening.

Only Comet Can Make Such An Offer:

1. Because only Comet Quick-Set Dados have high speed, tool-steel blades — stay sharp 5 times longer!
2. Because only Comet Quick-Set Dados are perfectly balanced to cut clean, to eliminate the chewing/chipping at the wood that causes dulling in conventional leaf and wobble-type dados.

Take Your Choice of a Comet 6" or 9" Quick-Set Dado. Both are available with either tool-steel or carbide-tipped blades. Both are adaptable for right or left-hand rotation

for any table or radial arm saw and fit a wide variety of shafts. And—with a Comet Quick-Set Dado, you can dial the width of cut with the Dado on the arbor!

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Hurry! Send me the name of my nearest Comet Dealer:

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COMET MANUFACTURING COMPANY

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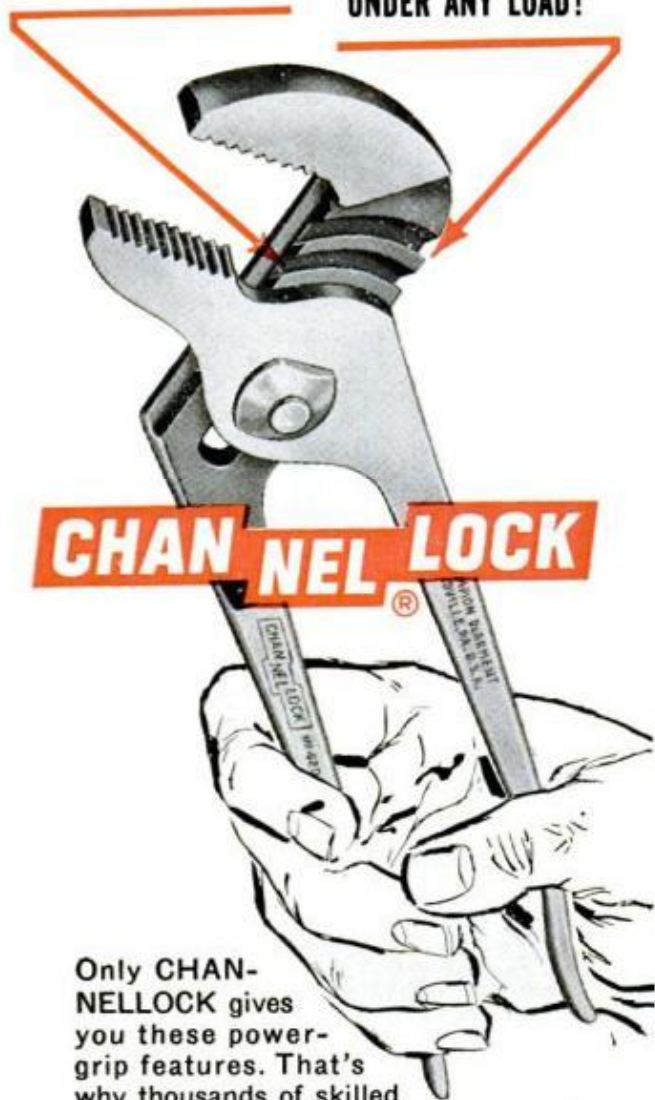
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Channels... **SMOOTH-
WORKING, CAN'T SLIP**
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And you will, too! Available in three jaw
capacities: $\frac{7}{8}$ " , $1\frac{1}{2}$ " and 2". Ask your tool
supplier for a genuine **CHANNELLOCK**
Plier. If he's out of them, ask him to
order one for you.

Write for Catalog of Complete Line of Pliers

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conventional, VA, and FHA. Chances are that your buyer's best bet will be an FHA loan, both from the standpoint of value and availability. A GI loan would be cheaper, but they are hard to get. But the FHA loan can cost you, the seller, some money. Because most lending institutions can get better interest on their money elsewhere, they must often be coaxed into making FHA mortgage loans.

This coaxing takes the form of cash—a fee for handling the loan. Since the government says they can charge the person borrowing the money only one percent of the loan as fee, they turn to the seller of the property involved. The government says nothing about him, so the lending institutions turn to him for more money. This additional charge may run from another one percent of the loan in the East to as high as three percent in the West. So figure this in your asking price.

Whether the buyer is buying through you or through a real estate firm, he must meet the lender's requirements for credit rating and income. There's nothing you can do about that.

Follow Up Can Swing a Sale

When you do get an interested buyer don't be afraid to follow him up. A Dayton, Ohio, man found one couple who "just loved the house." The size was right, the price reasonable, the neighborhood just what they were looking for. Yet after three visits they abruptly cut off negotiations. While extremely skilled in his own field (as a tool and die maker) the owner was no salesman, and was reluctant to attempt to reopen talks. Finally, urged (or perhaps nagged) by his wife, he called the prospects, found them still friendly but firm. At an impasse, he blurted, "Well, what don't you like about the house?"

The prospects told him. Their three young daughters would have to cross a much-traveled main city street to get to school, and the rush of traffic had the parents concerned. The homeowner had the answer. A policeman appeared daily to shepherd the youngsters through the traffic. Thus reassured, the prospects reopened negotiations, bought the house a week later.

Some objections can't be overcome as easily as this, although in many cases a follow-up phone call can clear up an objection or misunderstanding, and renew a prospect's interest.

One of the cardinal rules of salesmanship is "ask for the sale." So ask each prospect at the end of your tour to make you an offer. Many will.

That's where an earnest money contract

(Continued to page 250)

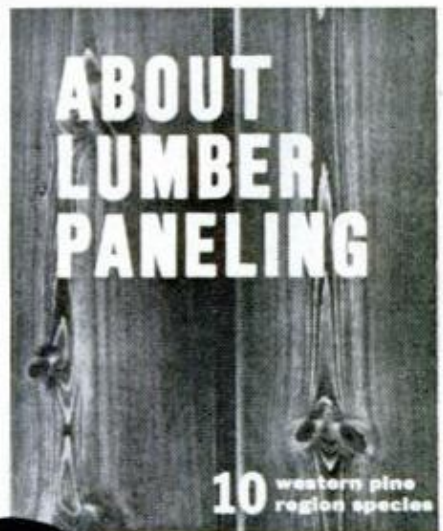
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Get this free booklet on wonderful new ideas in solid lumber paneling. See how *only* solid lumber paneling lets you obtain striking uses of color on wood . . . offers dozens of variations in pattern, design and texture. And how easy and economical it is to install. There are ten different Western Pine Region woods and numerous interesting interior textures and finishes to give your home the beauty and warmth that only genuine lumber can provide.

Your local lumber dealer will help you select the right materials and methods. See him for your free paneling booklet. If he is unable to supply you, write to Western Pine Association, Dept. M-4, Yeon Bldg., Portland, Oregon, giving us the name of your dealer. Please enclose 10c for handling and mailing.



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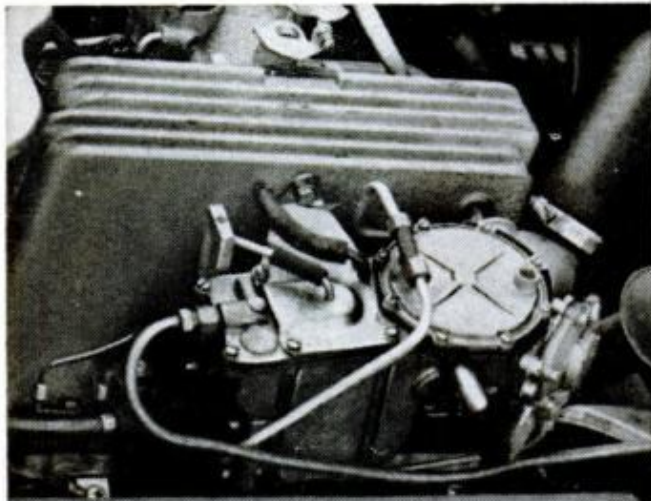


SEPTEMBER 1961

219

Test your automotive I.Q!

QUICK QUIZ BY QUAKER STATE



1. *What is the purpose of this alternative to the conventional carburetor?*



2. *What does this symbol stand for?*

The symbol stands for your car's best engine life preserver—Quaker State Motor Oil. Super-refined from 100% pure Pennsylvania Grade Crude Oil, Quaker State keeps your car on the road, out of the repair shop—saves you money! Insist on Quaker State. Available most everywhere. For your dealer's name, call Western Union Operator 25.

ANSWERS: 1. *Fuel injection system, for efficient fuel consumption.*
2. *World's finest motor oil.*



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QUAKER STATE OIL REFINING CORP., OIL CITY, PA.

comes in. It's really a contract to buy the house for an agreed-upon amount, and lists pertinent information such as who's going to pay the taxes, when the buyer can move in, and what furnishings are included in the sale. If the prospect is serious, he signs this contract and posts money (usually \$50) to guarantee that he's serious. The earnest money contract is a stock form, available at most office supply stores.

It's up to the buyer then to retain a lawyer to investigate the mortgage, the deed and liens on the property. As the seller, you don't need an attorney at all, except perhaps to check the final transaction to see that all is in order. If the buyer's lawyer finds everything in order, you merely sign the deed over and take your money.

The only trouble is that, after beautifying your yard, repainting the outside, repairing the cracks and peeling wallpaper, and checking over all the good features of the house, you may decide to turn down all offers. The house will be too good to leave.

★ ★ ★

Russians Dry and Color Trees While Trees Are Standing

Trees may be dried, colored, preserved like stone, made fire-resistant or made limber enough to bow to the ground by the use of a new Russian treatment.

Wood dried while still in tree form loses about half its weight, with no warping or cracking, and dries in three to four summer months compared to about a year for felled logs, according to P. S. Zakharov, who developed the technique with the Soviet Ministry of Forest Production.

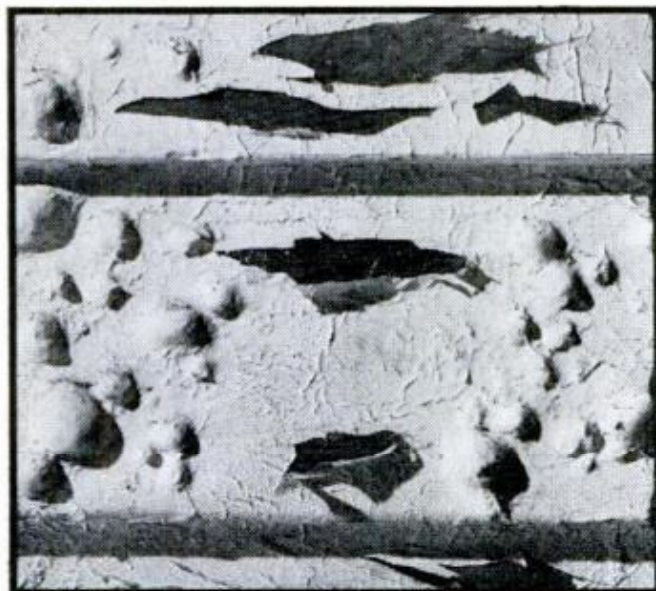
A ring of bark is removed from the tree's butt part. Then, canals are drilled along this girdle to stop assimilation of water from roots, and a network of metal tubes is inserted.

Chemical solutions are fed into the tubes from a bag hung on the tree. Main component of the drying solution, says Zakharov, is powdered sodium fluoride dissolved in pure, filtered water.

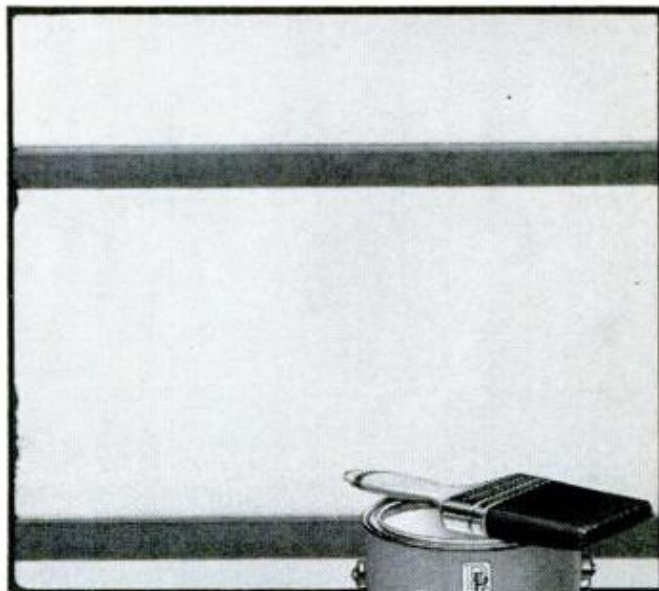
Other chemicals give special properties to the wood. Sodium dinitrophenolate is a preservative, but makes wood more combustible. Antipyrene makes it fire-resistant. Silica salts will harden a tree so it cannot be chopped or sawed.

Acetic acid gives an orange coloring to birches and beeches. Treatment with dicyanodiamide and urea made a birch so flexible in one experiment, says Zakharov, that "after long treatment... (it) was bent in an arc with the green crown touching its own root."

Remarkable new PPG LATEX House Paint guards against ugly blistering and peeling!



Left: Moisture escaping from inside the house causes some house paints used on wood siding to blister and peel.



Right: New PPG LATEX protects siding against such damage, lets trapped moisture out without harm to paint film.

Lasts years longer . . . goes on faster, smoother . . . can be applied even over damp surfaces . . . dries in just 30 minutes . . . brush or roller wash clean in soapy water!

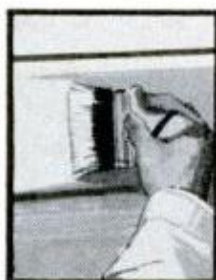
• Thorough testing . . . in various climates . . . has proved sensational new Pittsburgh LATEX House Paint superior in many ways.

• Far easier to apply, it "wraps" your home in an amazingly tough, flexible film that prevents unsightly blistering and peeling *years longer*.

• Thanks to new miracle resins, white stays whiter, and colors stay brighter—on any type of construction!

• PPG LATEX goes on right over damp surfaces . . . dries dust- and bug-free in ½ hour. Wash up with soapy water!

• For the best paint job ever, just use new PPG LATEX and follow directions.



• Saves time and work, because PPG LATEX goes on faster, smoother—without brush drag, or lap marks.



• No rain worries, no wasted week ends! Soon as the rain stops, you can start right in painting again!



• Dries bug-free and dust-free in ½ hour. You can apply second coat without even moving your ladder!



• Easy cleanup! Just wash brush, roller or spray in soapy water—wipe up spatters with damp cloth.



PITTSBURGH® PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



• For America's finest oil-base house paint, ask your Pittsburgh Paint dealer for Sun-Proof—famous for quality since 1892.

Down the Drain

(Continued from page 197)



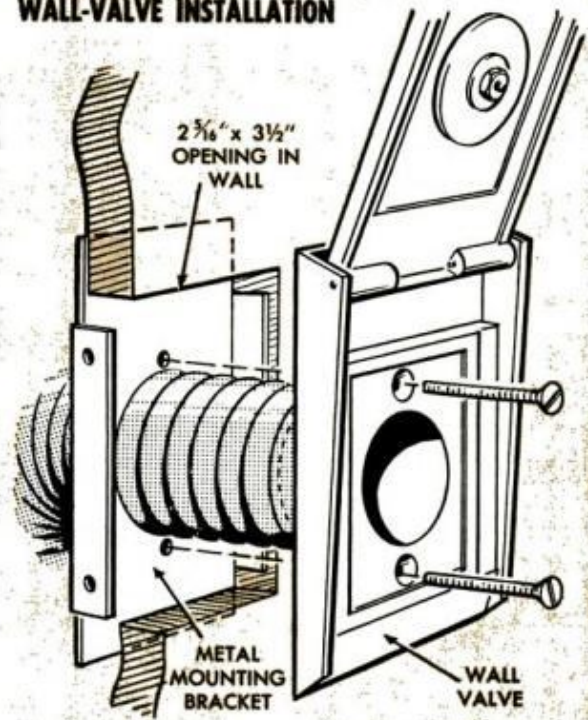
7. FLEXIBLE DUCTING is forced over stud on back of inlet valve to make airtight connection in line

Any handy homeowner can install the system easily enough in an existing home. Naturally, it is easier in new construction. Some help may be needed in connecting the unit to the home drainage system and in wiring the timer and motor to a 115-volt line. Otherwise it is mainly a job of running the ducts up (or down) through the walls and connecting them to the power unit and the inlet valves. This of course, is less of a problem in a ranch-type home than a two

8. HOLE SAW in portable electric drill is used to bore holes up through floor for passage of suction ducts



WALL-VALVE INSTALLATION



story dwelling but usually in the latter the ducts can be brought up through closets, clothes chutes and alongside cold-air returns. Where there is no basement the ducts are run overhead and connected to the inlet valves by bringing them down through the walls from the attic.

The number of inlet valves and the lineal feet of ducting required will vary with each particular installation. With a standard 25-ft. cleaning hose you'll find that as few as three valves will service the average-size home. The installation pictured here was made in a split-level home and required only two inlet valves to reach all rooms. Four valves are included with each kit (one being a utility valve), plus fourteen 4-ft. lengths of steel tubing, 12 slip-on couplings, 3 branch fittings and a 12-ft. length of flexible vinyl ducting which is used to make all turns in the system. The latter is forced over the tubing and is cut as needed with wire cutters and a knife.

Locating Power Unit

Location of the power unit is an individual problem. Whether in the basement or utility room it naturally should be located as close to a soil or waste pipe as possible so a minimum of pipe will be needed to make the drain connection. Accessibility to water and outside venting also must be considered. The power unit is hung on the wall by a sheet-metal bracket. This is mounted 42¹³/₁₆ in. up from the floor as

(Continued to page 254)

NEW STORAGE PANEL!!!

WITH THE WAINSCOT RIGHT ON IT,
SUITS ROOMS ALL OVER THE HOUSE

In children's rooms, utility rooms, workshops, G-P's new Garage Liner looks handsome, works hard, wears well. A heavy-duty hardboard, it provides storage for tools, toys, paraphernalia... makes a perfect set-up for shelves. With the wainscot right on the panel, you just add a molding and the job's done. Factory-finished, it needs no paint... costs about 22¢ a sq. ft. at your lumber dealer's. 1/4" V-groove 4' x 8' panels, perforated to wainscot.



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shown in Fig. 3 and fastened securely. If it is a poured wall, use lead anchors in holes drilled with a star or carbide drill. If you have a block wall, use toggle bolts. If it is a frame wall, use wood screws and drive them in a stud.

The lower section of the power unit is fitted with a shroud which has openings cut in each side to admit the drain pipe. The front of the shroud is removable to gain access to a drain cone, Fig. 2, and to permit making the drain connection. While the number of 2-in. elbows and nipples needed will vary, a 45-deg. elbow is required inside the shroud to center a 90-deg. elbow under the tank drain valve. This is clearly shown in the photo in Fig. 5. The code requires that a trap with a clean-out plug be installed in the drain.

Where to Put Inlets

Existing obstructions such as cold-air returns, heating ducts, water pipes, etc., will have a bearing on where the wall inlets can be located. Aside from this, the best way to determine where the inlets should be located insofar as reaching the far corners of each room with the cleaning hose is to use the hose itself or a 25-ft. length of cord. Fig. 6 shows what the inlet valves look like and how they lock in place in the wall by a metal bracket or backing plate. From a convenience point of view, the preferred height for the valves is 18 to 24 in. from the floor. This saves stooping to plug in the cleaning hose. However, if you prefer, you can line them up with the convenience receptacles. An important point in plotting the openings for the valves is to make sure you miss wall studs. The best position is midway between wall studs to provide ample clearance for the flexible ducting and to avoid trouble in boring holes up through the floor for the ducting. A trick found helpful in plotting the position of the holes through the floor so you won't miscue in coming up inside the wall is to run a small twist drill through the floor next to the shoe mold at the baseboard and at a point directly below the plotted position of the wall inlet valve. Then from the basement it is easy enough to observe the drill bit extending through the floor and to measure over roughly $3\frac{3}{4}$ in. to spot the hole and to note if it is feasible, spacewise, to bore a hole at that point. If not, perhaps you can shift the location of the hole one way or the other to a better place and then shift the plotted position of the inlet valve accordingly so it is directly above.

Each inlet valve requires an opening $2\frac{5}{16} \times 3\frac{1}{2}$ in. which can be cut out neatly in either plaster or drywall by drilling a hole in opposite corners of the penciled

outline and sawing through with a keyhole saw or a hacksaw blade.

The routing of the ductwork from the power unit to the inlet valves should be as direct as possible. In all cases, it is advisable to plan a main conveying line from the power unit and then branch off from it with the 45-deg. fittings provided. Here it is important that the branch leg of the fitting be positioned to direct the flow from the inlet valve to the power unit, and also that it be placed horizontally in installations where the fitting is located below the main conveying line. This is to avoid a straight drop into the perpendicular line rising from the inlet valve. The lines may be installed under or between floor joists and should be anchored securely with bands of perforated pipe strapping.

Hole Saw Is Best

A hole saw chucked into a portable electric drill makes quick work of boring the 2-in. holes up through the floor for the ducting. Where the saw will not pass completely through both the subfloor and the wall plate, you can continue with a sharp chisel, chipping away the wood until you break through.

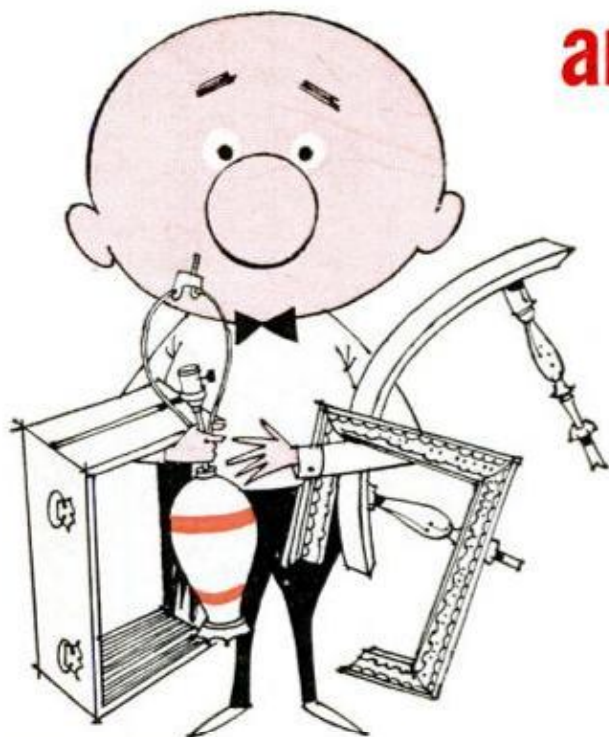
If your inlet valves are positioned low on the wall there is no need to run steel ducting up inside the wall. Being so short a distance, the flexible ducting itself can be fished up through the wall and out through the wall opening. Where the inlet valves are mounted high on the wall, steel ducting is used inside the wall as shown in Fig. 5, to conserve on the flexible ducting which is to be used primarily as elbows in making right-angle turns in the ducting. A supply of a dozen plastic slip couplings are included for joining the straight lengths of steel ducting. A regular tubing cutter is recommended for cutting the steel tubing, although a hacksaw can be used. Here a miter box is essential to make a square cut, and in using either method it is important to remove any burr on the inside.

Must Be Airtight

All joints and connections in the ducting system must be carefully sealed to prevent air leaks and consequent loss of suction power. This step is most important. A quick-setting and pliable adhesive with a brush applicator is provided. To use it, first apply a thin coat to both male and female surfaces and let dry. Then apply a second coat and let it become tacky-dry before joining the parts. You'll find that the cement will also serve as a lubricant in forcing the tight fitting flexible ducting over the ends of the steel ducting, and if the

(Continued to page 256)

Do dozens of home, hobby and shop jobs with



Easiest and best products to use for mending wood or metal, repairing and refinishing marred wood surfaces, filling and refinishing unsightly holes or cracks in wood, plaster, drywall, stucco — and more.

If it's worth fixing — it's worth fixing right . . . with Duratite! Professionals have used Duratite since 1923. Now you can, too, and get better results on home fix-up, hobby and do-it-yourself projects. See your hardware, paint or building supply dealer for Duratite wood and metal fillers, glues and adhesives.



DURATITE WHITE GLUE makes a joint stronger than the wood itself. For general purpose use, bonding wood, paper, fabrics, leather, china, tile, other materials.



DURATITE WOOD DOUGH. For filling-in deep holes or gouges in wood. Takes stain, paint and lacquer finishes. Choice of 9 popular wood-finish colors.



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DURATITE HOUSEHOLD CEMENT. Perfect for countless glueing jobs around the home. Permanently waterproof and heatproof. Dries extra fast. Colorless.



DURATITE AUTO-MARINE PLASTIC FILLER. Repairs dents, mars; fills holes caused by rust in automobiles and boats. A polyester resin. Can be filed, or ground smooth with power tools.

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Special Duratite Products for tough fix-up jobs

LIQUID SOLDER

Welds metal without heat.

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For auto body refinishing.

PORCELAIN GLAZE

Repairs chipped porcelain, sinks, etc.

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Seals leaky tub, sink joints.

CONTACT CEMENT

Bonds hard-to-mend surfaces.

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PRE-finished Bruce Crestwood Flooring

Now you can have beautiful new oak floors in less than a day. Crestwood is a modern pre-finished flooring in a special size (2" wide by only $\frac{3}{8}$ " thick) designed to be laid over your old wood floor or subfloor. It's packaged in handy cartons complete with nails.

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branch fittings seem too snug to force over the steel ducting, the tightness can be relieved by scraping the fittings a little with a knife blade. The steel ducting should enter the full depth of the fittings and the flexible ducting should lap the steel ducting a minimum of 1½ in.

To connect the flexible ducting to an inlet valve first slip the metal backing plate over the ducting. Then after cementing the ducting to the valve stub insert the plate inside the opening so it bears against the inside face of the wall. After this turn in the two screws provided. Holding both the backing plate and the valve in position while turning the screws that clamp both together is a bit of a job but it can be done if the top screw is turned partway in first so as to hold the plate temporarily and keep it from falling down inside the wall. The cover of each inlet valve has a rubber gasket which seals the valve shut when any one particular valve is not being used.

Other than making the proper water and electrical connections, a final step in the installation is venting the exhaust line outdoors. Here the hole saw is used again to bore a suitable hole through the house siding and joist boxing. An extra slip coupling makes a neat through-the-wall fitting in which to insert and cement the steel ducting. A hood of some kind should be placed over the vent as in Fig. 4.

An important point to remember in operating the power unit is that you should not operate it **without water** in the tank. If you do, the motor impeller will quickly become clogged with dust and lint, resulting in a loss of suction power and a tricky dismantling job to clean it. ★ ★ ★

QUOTE:

"We need science education to produce scientists, but we need it equally to create literacy in the public. Man has a fundamental urge to comprehend the world about him, and science gives today the only world picture which we can consider as valid. It gives an understanding of the inside of the atom and of the whole universe, of the peculiar properties of the chemical substances and of the manner in which genes duplicate in biology. An educated layman can, of course, not contribute to science, but can enjoy and participate in many scientific discoveries which are constantly made. Such participation was quite common in the 19th century, but has unhappily declined. Literacy in science will enrich a person's life."

—DR. HANS A. BETHE,
Professor of Physics,
Cornell University

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MOTORCYCLES AND MOTOR SCOOTERS

HARLEY-DAVIDSON 1962 FUN-O-RAMA!

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Here's what a popular handy-man's magazine says about the new Disston Dirk, "The unusual design makes sense (we recently won Product Engineering's 1961 Master Design Award). With your hand directly behind the bit, you can drill straighter, apply more muscle on tough boring jobs and eliminate the wobble that breaks bits and gives you oval holes."

The new Disston Dirk is the only drill with a "stand-up base." It's easier for you to change drill bits and they won't snap or bend when you set the unit aside.

See the Disston Dirk 1/4" drill now on display in your local hardware store for \$30.00 (only a nickel more than the next best drill). Once you try it, you'll want to buy it. The Dirk, made in Danville, Virginia, is another fine product from Disston, master toolmaker since 1840.



The Disston Dirk

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D20 Sabre Saw

Electric Hedge Trimmers

PORTER

DISSTON DIVISION
H. K. PORTER COMPANY, INC.

Atom Taps the Forest's Secrets

(Continued from page 147)

to plan better spacing of trees on industrial tree farms and to develop improved fertilization formulas.

Staebler constructs a grid system around an experimental tree. He injects radioactive ribidium into the tree's sap stream and, as it circulates throughout the complex root system, he charts its course, and the pattern the roots follow underground, with the aid of the scintillator.

The tree scientists are using atomic energy in another novel way. A big killer of ponderosa pine is dwarf-mistletoe, a parasite which drains the life from the pine trees. Using photographs of gamma and beta particle radiation, called autoradiograms, Rediske and his associates are investigating the introduction of chemical elements into the trees that are toxic to the parasite, but not to the ponderosa pine.

Branch Is X-Rayed

An autoradiogram is used to assist the forest scientists in determining the relationship between a ponderosa pine branch and a piece of parasitic dwarf-mistletoe attached to the branch. The branch, with the parasite attached, is injected with a radioisotope of phosphorus. The branch is then dried, pressed flat, and finally laid on a piece of X-ray film. Gamma rays from the radioisotope register on the film, the branch is removed and the film developed, and an autoradiogram is the result. The autoradiogram shows that there is a direct connection between the dwarf-mistletoe and the pine branch because the radioactive substance was able to travel freely from branch to parasite.

Thus far, thanks in great measure to the pioneer work of the "atomic scientists," in cooperation with other researchers at the center, many remarkable results have been achieved. Soil nutrient experiments, for example, have been successful in recent months in increasing seed cone production five-fold, and they also have increased tree diameter 40 percent on the company's tree farms.

Expressed in another way: The nuclear researchers are helping achieve the forest geneticist's major goal, better seed. He is looking for methods to grow top-quality trees that will grow rapidly, resist insects and diseases and above all, produce good seed in generous quantities.

Douglas fir, prime species on Pacific Northwest timberland, normally produces a good seed crop on an average of only three years out of every ten. Because of this unique cycle nature fails to do a fast enough job of stimulating new forest

growth. In order to cut the time lag between timber harvest and the start of a new forest growth, the forest scientists knew they would require a continuing source of seed. The problem then became one of finding new methods of increasing seed production.

Today, as a direct result of their test program, using radioisotopes, plus the use of nitrogen and phosphorus, in varying rates of application to determine better methods of cone production, there is definite hope that in the very near future the foresters will be collecting abundant seed crops from cone production each year, instead of only three years in ten.

Already the Johnson "pill-box" study has thrown important new light on how Douglas-fir bark beetles attack and kill trees. It is now known that the adult beetle bores through the bark and constructs long egg galleries in the inner bark. The larvae on hatching from the egg radiate outward, destroying the inner bark. All this is vital information for designing new and more effective control measures against both adult and larvae beetles.

New Insecticides

Insect destruction has long been a major problem in the forests of Washington, especially in the exceptionally poor seed year of 1958. Studies on control of the cone and seed insects in the past three years have resulted in the development of 10 promising new insecticides for use in cone production areas alone.

A current project in cooperation with the U. S. Forest Service seeks to determine whether old growth or young growth trees, or whether shaded trees or trees exposed to the direct rays of the sun produce the greatest number of bark beetles. Already the scientists, following a special study in western Washington, have made important progress. Their research indicates that young growth exposed to sunshine tends to have fewer beetle attacks than the shaded and thicker-barked old growth.

A multimillion dollar bill for damages has been run up by the balsam wooly aphid in its attacks on a half-billion feet of timber in the Pacific Northwest. Canadian and United States government entomologists have imported natural enemies of the dangerous aphids. Weyerhaeuser researchers have been helping in the colonization of these predators in infested stands of timber. Their new atomic tools of research will help these scientists to pinpoint how the aphids perform their destructive work, and will also help them determine to exactly what extent the aphids' natural enemies are able to destroy the timber-killing pests.

(Continued to page 262)



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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Atomic research in the forest is enabling the timber scientists to grow more trees in needed areas, larger or smaller trees as the occasion demands; in general to regulate the growth of trees as desired; and to help thicken or thin a stand of trees as the specific needs of a tree farm demands.

These profound changes in timber growth are achieved by altering the heredity characteristics of trees through mutations brought about by placing radiation in their germ cells, a new peacetime science in itself. Already in the 10-year-old field of atomic agricultural science, radiation treatments have succeeded in changing a freestone peach into a clingstone variety, to name but one of hundreds of genetic achievements. In the brand-new field of atomic-forestry science, equally spectacular results can be expected.

As physiologist John Rediske reports: "Nuclear research will play an ever-increasing role in forestry studies. Peaceful uses of atomic energy are working every day to produce higher quality forest products at a faster rate for use both today and tomorrow." ★ ★ ★

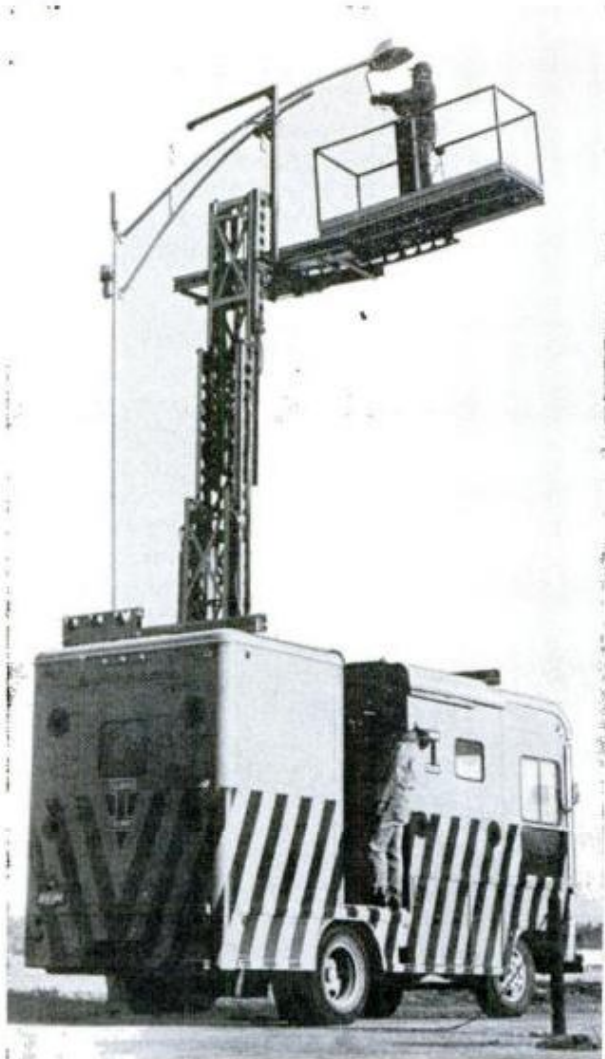
His neck is way out. Months ago, an expert weather forecaster predicted what the weather would be in **your** area in October. Find out how right or wrong he was by checking his predictions in the October issue of **PM**.

QUOTE:

"I believe as a matter of faith that the extension of space travel to the limits of the solar system will probably be accomplished in several decades, perhaps before the end of the century. Pluto is about 4000 million miles from the sun. The required minimum launching velocity is about 10 miles per second and the transit time is 46 years. Thus we would have to make the velocity considerably higher to make the trip interesting to man. Travel to the stars is dependent on radically new discoveries in science and technology. The nearest star is 25 million million miles away and requires a travel time of more than four years at the speed of light. Prof. Dr. Ing. E. Sanger has speculated that velocities comparable with the speed of light might be attained in the next century, but such an extrapolation of current technology is probably not very reliable."

—HUGH L. DRYDEN,
Deputy Administrator,
National Aeronautics and
Space Administration

POPULAR MECHANICS



Tollway Lights Stay Bright

Prowling the 187 miles of the Illinois Tollway that borders Chicago and extends from the Indiana to the Wisconsin line, is a traveling "dishwasher." It lifts workmen aloft to change any of the tollway's 3900 lights and washes and dries their glass coverings in its kitchenlike interior.

The lift raises 33 feet above the pavement and is often used by such other workmen as welders and painters. Inside the van are three tubs and a hot-air dryer.



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World's Largest Manufacturer of Shears, Scissors, Pinking Shears, Skalloping Shears, Metal Cutting Snips and Garden Shears

Engine With Built-In Wings

(Continued from page 134)

verting Rotary Motion Into Unidirectional Motion."

What this means might best be explained with an illustration. When you whirl a stone on the end of a string, you generate a tremendous amount of centrifugal force with very little expenditure of energy. The trouble is you can't do much with it; as long as the stone keeps whirling in a circle, the big forces cancel themselves out with each revolution. But if you could extract just some of that tremendous force and make it go in one direction for an instant. . . . Well, look what David did to Goliath with a slingshot.

Dean's Space Drive does just that. Its basic component, a pair of eccentric masses, counter-rotate in a frame mounted on a sliding track. Spun by a motor, the eccentrics cause the frame to slide back and forth in the track. This unit, for all practical purposes, is a simple oscillator. Dean has made an arrangement of solenoid-operated clutches to grab and release the sliding frame in a precisely phased rhythm. Thus, part of the force of the spinning masses is transmitted to a one-directional force.

Wheels Aren't Needed

What is one-directional force? "Let's take a car, for instance," Dean explains. "The engine in an ordinary car turns the wheels and the car moves forward because the turning wheels move against the ground. That's two-directional force. With one-directional force, the engine has no connection with the wheels. Instead, it produces thrust **inside** the car. Wheels simply give the car something to roll on."

The usable force from a single pair of spinning rotors can't exceed 180 degrees in any cycle, Dean says. Instruments showed him further that peak thrust fell within a 90 degree arc in the forward swing. "It's usually advisable," he says, "to use only the peak of the wave that falls within an arc of 60, 70 or 90 degrees." Harnessing the centrifugal force of even these short arcs in the orbit of the counter-rotating masses, Dean discovered he could develop tremendous one-directional thrust.

"A single pair of brass eccentrics three inches long, with a radius of $\frac{3}{4}$ of an inch each, will, when spinning at 1200 r.p.m., lift a weight of 25 pounds $\frac{1}{64}$ of an inch each cycle in a frictionless atmosphere," he says. "At the same speed, the unit will pull itself, and a 25-pound load, across the floor."

One unit produces thrust for only a fraction of each 360 degrees that its rotors spin. To get continuous thrust, you'd need a machine with multiple rotor units, synchronized so that one followed another. "The one-unit machine I'm using here," said Dean, "would certainly not take off, anymore than a one-legged cat could climb a tree." However, he has built a six-unit model that actually lifted itself from the floor.

The potential of the space drive becomes apparent as Dean projects data he has gathered over the past five years. "A six-unit engine with three-inch rotors," he says, "could be put in a tube the size of a jackhammer. It would weigh less than 40 pounds. But it would knock over the brick wall of a building by sheer push."

The bigger the rotors, the larger the thrust. According to Dean, a six-unit machine using five-pound rotors would fit in a box measuring about one by one by three feet. It would weigh about 110 pounds. "With only 23 horsepower spinning the rotors at 2800 r.p.m. in a frictionless atmosphere—or add 25 percent if you want to include a broad margin for friction—" he says, "a device using this propulsion system could put a 3000-pound Jeep into a condition of zero gravity. If you increased the rotation by a single increment, you'd begin to lift the Jeep. As you increase the rotation of the shaft, the lift increment increases in geometric progression.

"This darn thing is basically a truck. It will lift or pull anything. Its most logical use will be to perform the world's heavy work. It could be used effectively in heavy truck transmissions. Instead of grinding wheels on the ground, you'd be pulling the whole works with a directional force—almost as though the truck had an invisible propeller up front."

Space, and Space Drive

Though he doesn't stress it, Dean is aware of what his system can mean in air and space travel. "It is a self-contained unit capable of moving itself in any direction," he points out. "With it, you could stack traffic in cities. Trucks could unload at any given floor of a skyscraper simply by hovering in space, if that seems practical. Newton's law says that objects in motion tend to move outward in a straight line if gravitational effects are nullified. So here's an interesting thought to contemplate: Give one of these engines zero gravity. It has the velocity of Earth because it is on Earth's surface. As the rotating surface of Earth turns away under it, would our engine move off into space at 700 miles

(Continued to page 266)

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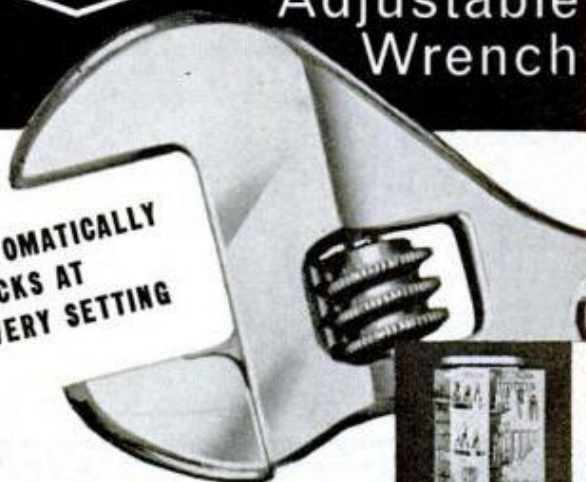


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BASEMENT DOOR

an hour? Allowing for atmospheric friction, it should, theoretically."

Just why and how Dean's space drive system works gets complicated fast. But, in simple terms, by use of his oscillating mechanism, he has managed to polarize centrifugal force in two alternate horizontal directions. Then, by means of his solenoid-activated clutch, he has managed to grab the tail of the sliding oscillator, during one direction phase, and extract a burst of horizontal thrust in that direction.

"The important thing to remember," says Dean, "is that centrifugal force of the spinning rotors on their axis in the oscillator (not the oscillator itself) is really doing the work.

"Think of force in terms of electricity. An alternating current moves in two alternate directions. Then you rectify that alternating current to get direct current. We do much the same thing."

Action and Reaction

The idea of one-directional thrust produced from an alternating force is what causes consternation among some engineers. Action and reaction, they point out, are equal and in opposite directions, according to Newton. Dean agrees thoroughly. "But the effects of action and reaction aren't necessarily simultaneous," he says. "They can be sequential. The second point has to do with Niels Bohr's established physical law: When an orbit is shortened, it releases energy; when lengthened, it demands energy.

"Here, the load to be moved is part of the system. In operation, it moves during a phase when the rotors describe a shorter arc through space. The negative phase is completely unopposed and is longer in distance than the positive phase. The rotors would like to take more time traveling that distance. But since both orbits during both phases are required to be of exactly the same time duration, the orbit which tends to lengthen draws the same amount of energy from the motor that was realized during the positive phase. In this way, there is a cyclical demand and release of energy.

"What the system does," Dean sums up, "is to combine Newton's law of action and reaction with an additional effect—which is not simultaneous."

Not everyone is sure just what that means. But one thing is certain. Whether or not the time-honored laws permit it, Norman Dean's Space Drive system moves. If he is right in his theoretical assumptions, it may some day be moving a lot of things for a lot of people in a lot of places—including outer space. ★ ★ ★

Radioactive Iodine Helps Heart

Some heart diseases respond to treatment with radioactive iodine.

Patients with severe pains (angina pectoris), congestive heart failure and irregular heart rhythms are given small, harmless doses of the iodine. It is taken up by the thyroid gland, which influences the body's metabolic rate. The radiation reduces thyroid activity, metabolism is slowed and the heart's work load is decreased.

Of 202 patients treated in a study sponsored by UCLA and the University of Southern California medical schools, 167 showed marked improvement.

B-36 Engine Helps Railroaders

By aiming the powerful exhaust of a surplus B-36 jet engine, New York Central Railroad crews blow snow from the tracks, minimizing frozen switches and delayed trains.

Mounted on a caboose, the engine blasts a path free of snow and ice for a distance of about 100 feet. It has been modified to operate on regular diesel fuel, which is less costly than jet fuel. A nozzle on the engine can be swung up and down and sideways.

Sound baffles control the noise and safety devices automatically shut it off if it is operated improperly.

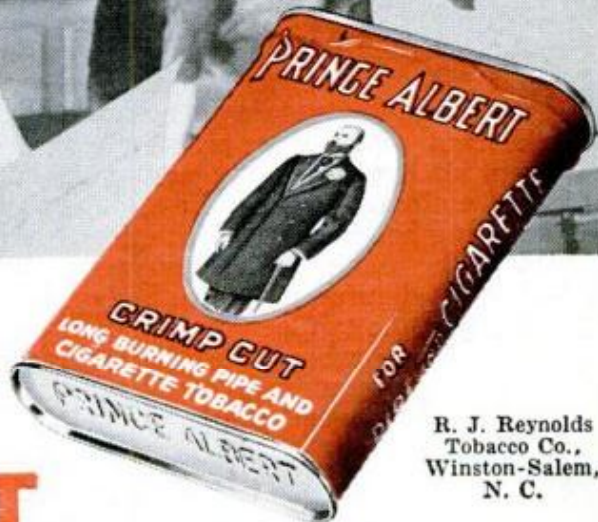
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R. J. Reynolds
Tobacco Co.,
Winston-Salem,
N. C.

SEPTEMBER 1961

67

PM's House of Imagination

(Continued from page 162)

We approached the prominent East Coast architect, Grosvenor Chapman of Washington, D.C., with these requirements:

Our 1961 house must make the best use of new building and household products . . . it must appeal to the active type of person who reads *PM* . . . and it must be a good example of contemporary planning—yet appealing both to those who like long, low modern styling and those who prefer a more traditional appearance.

Let's look at the house he designed.

How about the use of new products?

A glance at the color photographs on pages 163 through 168 is convincing evidence that the House of Imagination is "made for" new products. From the sliding glass doors (an architectural feature) to a remote-indicating weather station (owner's option), it's an imaginative showcase of modern building materials and conveniences.

Does it appeal to people who have lots to do—like our readers?

Well, it's hard to imagine anything you'd want to build that couldn't be built in the shop and its "annexes."

The shop itself has plenty of space for small jobs. If you want more roofed-over space, just move the project and tools (see page 178 for a rolling toolbox) through the door into the garage. For a really big one—like a boat—simply move into the project area at the rear of the garage. (The garage has overhead doors front and rear, so there's no problem in getting back to the project space.)

There's lots of storage along the outer wall of the garage for garden tools, bicycles and other possessions of an active family. (Note that the garden storage space opens *outward* so that lawn mowers don't have to travel through the garage.)

For other hobbies, informal entertaining and television, there's a large family room next to the workshop. The family area and kitchen combine into a warm and friendly gathering place appropriately called the "farm kitchen" by architect Chapman. Located well away from the quieter living room and bedroom wing, the farm kitchen can be the scene of boisterous teen parties that don't disturb others in the house.

Mother, too, will enjoy her own corner of the house where the laundry, sewing and ironing equipment are conveniently grouped. One particularly appealing feature for a much-interrupted mother is the folding door that quickly hides sewing-room litter. The laundry-sewing-ironing room is just a few steps from the kitchen.

Now, what about the design and plan of the 1961 house? Does it really make everybody happy?

There are several options that give you a chance to "design" the house the way you want it. Initial choice is between the long, low roof (cover) or the more traditional one (page 163) for the 1833-square-foot home. (The garage is an additional 468 feet.)

The latter is Chapman's original concept of the house; he calls it New England country style. There's a reserved air about it, though the warmth of board-and-batten siding eliminates any feeling of austerity.

For our pilot model, which was displayed at the Los Angeles Home Show in the spring, we went to the low-roofed version because of the regional preference. Designated a Gold Medallion home by the Los Angeles Department of Water and Power it was visited by thousands during the show.

The House of Imagination is designed for a suburban lot that slopes gently toward the street (as many do). The main portion of the house is 16 inches higher than the level of the wings. The two-level design keeps the profile of the house low, and, more important, creates some truly striking interior scenes. The most charming is the view from the family area up toward the kitchen (see page 163).

There is an alternate version of the plan for a one-level house and another for adding four feet to the width of the main section. All versions are included in the single seven-sheet plan.

As for the over-all plan (page 164), you'll see its many good points as you imagine yourself touring the house.

Note the view a visitor has as he enters the court at the front of the house. And imagine the striking view he has of the interior when he goes in the front door and sees the dining and living rooms—with the cathedral-type ceiling sweeping up to the peak of the roof. A further dramatic element is the tall fireplace that divides the two rooms. Note, too, how handily the kitchen serves the dining room (via a pass-through) and the family room.

In the bedroom wing are two baths (a third is next to the kitchen). Large walk-in closets serve both the master and middle bedrooms. There's even an outside door to the front bedroom—a feature boys will like.

That's the 1961 *PM* home. Because of the versatility and flexibility of design, as well as its striking architectural features, we think you'll agree with the name we've given it—the *PM* House of Imagination. ★★

Further information on the Popular Mechanics House of Imagination is available from the lumber dealers listed on page 81.

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Are You Taking Counterfeit Drugs?

(Continued from page 118)

Nevis E. Cook, director of FDA's Boston district office, explains that a counterfeit drug is "a drug which is manufactured for the specific purpose of being passed to-and-by the retailer when filling prescriptions as the product of another manufacturer."

The great danger to the general public from the counterfeits, he says, "is that critically important medications do not pass through the safety clearance or manufacturing-control procedures necessary to assure compliance with the Federal Food, Drug and Cosmetics Act. Therefore there can be no assurance that they contain the proper potency and purity of the drug alleged to be present."

Shipped as "Machine Tools"

Some counterfeits have been shipped via air freight to distributors under such false billings as "machine tools," "ceramics," "water softener" and "glass beads" and are frequently delivered to the local pharmacists by personal automobile. Sales to the retailer are usually made on a cash basis without invoicing or other billing.

How are the FDA chemists and other laboratory specialists able to identify counterfeit drugs? As explained by John L.

Harvey, FDA deputy commissioner: "We use a 'ballistic' method not unlike the one used by big-city policemen to pinpoint a particular gun that fired a certain bullet. It includes a systematic comparison of unknown tablets with authentic samples from the known manufacturing sources."

Genuine Tablets

This is how genuine tablets are made by ethical manufacturers:

After compounding and mixing, the tablets are formed by presses which operate at pressures up to three tons per square inch between two punches in a die. Simplest type of press is the single-plate machine which has only one pair of punches. The granulation (drug and filler mixture) is fed into the die and compressed as the upper and lower punches come together. Any deviation of the punch faces from a smooth, flat surface is shown in reverse on the tablets' surfaces. Most manufacturers use rotary presses, requiring 16 pairs of punches, each pair operating like a single-plate machine.

Many kinds of punches are used. Their outline may be round, rectangular or heart-shaped. The faces of the punches may be flat, concave or convex; they may be un-scored, single-scored, double-scored, or no

(Continued to page 272)

PARAGON *Automatic* TIME CONTROLS

Electric servants that never forget... work for pennies a day



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- 4 MODEL FA51 is a flush-mounted, interval TIMER that fits into a single, gang-switch receptacle or handy box. It is ideal for automatic time control of kitchen and

attic exhaust fans, yard lights, built-in heaters, and other interval timing applications.

- 5 MODEL AT3160-0 is a compact, attractive interval TIMER with 0-60 minute range with one-minute dial graduations. It controls the time for sun lamps, vibrators, heating pads, sterilizers, and other appliances.
- 6 MODEL AC1 is a 24-hr. automatic, air-conditioner Time Control that assures cool comfort when desired... and reduces maintenance costs due to needless overwork. It comes complete with a 3-wire cord set to meet code regulations, 3-wire grounded receptacle, rubber feet, and back plate for easy mounting. Available 120 or 240V, up to 1-hp full-rated load.

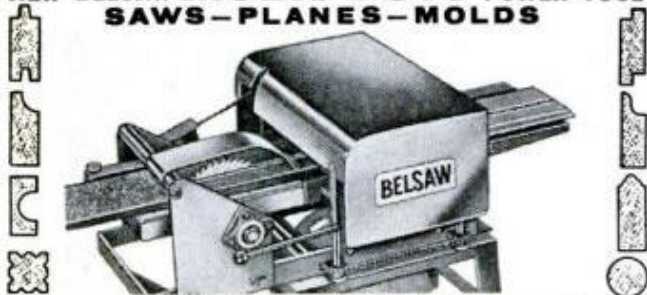
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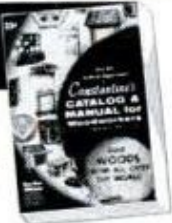
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bevel at all. Each type includes variations, such as the degree of curvature or convex faces, bevel angle, groove or score angle, width and depth of groove. Also, upper and lower punches may be combined.

The first step in tablet identification is the examination of the tablets for these "gross punch marks," and it usually doesn't require magnification. Punches, even when new, show various characteristic microscopic marks that can be used to differentiate them. As the punches are used they develop other characteristic shapes, marks or imperfections that are impressed into the tablets and positively identify the tablet with a given manufacturer's punch, just as fingerprints identify a human being.

Rough handling of the punches may cause characteristic scratches, pits and ridges on the punches, which are matched in reverse on the tablets. Sometimes the upper and lower punches hit together with no granulation between them; this damages the punches, usually by flattening the score marks of the upper punches and correspondingly denting or scoring the lower punches. This may happen to only one of the punches of the set, or to all of them. The extent and character of these imperfections depend on what types of punches are used, how much of the punch surfaces hit together, whether the punches rotate before hitting again, or other factors.

Telltale Ridges

If the punches fit loosely into the die, some of the granulation is squeezed into the gap between the punch and die as the material is compressed, and a ridge forms at the tablet edges. Sometimes punches are not highly polished when they are made or when they are reworked, and the marks of the grinding wheel or file show up on the tablets as curved striations.

By mounting a tablet so that a silhouette of the tablet is projected, or by mounting the tablet with the groove vertical, the width and depth of the groove and the groove angle can be measured.

The punch marks detected and measured on the tablets suspected of being counterfeit can then be compared with the punch marks of tablets of legitimate manufacture.

The final step in tablet identification is determination of the ingredients and study of their microscopic habit by the optical-crystallographic method. Each crystalline compound has its own set of peculiar and specific optical properties that serve to identify and differentiate it from all other compounds. These properties include refractive index, extinction angle, sign of elongation, optic sign and axial angle. Each

may be pinpointed for each crystalline substance present by mounting a portion of the crushed tablet in a liquid of suitable refractive index and examining it under a polarizing microscope with polarized light. The results of this analysis are then compared with the results of a similar microscopic analysis of tablets of known manufacture, and to the manufacturer's formula.

Summing up, by making these comparisons of gross and microscopic punch marks and identity and microscopic habits of ingredients of the suspect tablet with those of tablets of known manufacture, the manufacturer of tablets of unknown origin can be determined.

Deputy Commissioner Harvey says there are not nearly so many counterfeits of capsule drugs as of the tablet varieties. However, capsule identification proceeds in somewhat the same way. It is more difficult than tablet identification because there are fewer external characteristics that can be used, and capsules usually contain fewer ingredients. The capsule size, shape, color and weight are determined, and any characteristic markings are observed. Some manufacturers use special shapes, others have monograms molded into the capsule. Still others print a name or monogram on their capsules.

In the case of time-disintegration capsules, the external characteristics of the pellets are determined, such as glossiness, colors, size, shape, mottling of color pattern and lumpiness of surface. All of these characteristics, as well as microscopic habit and identity of ingredients, are utilized in the identification of drug capsules.

FDA chemists and other laboratory specialists have been successful in determining by these methods the manufacturing source of many counterfeit drugs. Some particular lots have resisted identification for a while, but eventually a telltale mark or ingredient will furnish the clue needed.

How to Be Safe

Can the consumer tell if he is buying bootleg drugs? Not always, according to FDA officials. However, in most cases he can "play it safe" while making his prescription purchase, granted that his physician has made out the prescription for a well-known branded drug. The consumer can follow these simple safety rules: First, be sure you're dealing with a known drug-gist. Next, when you hand your pharmacist your prescription, ask him if he will show you the sealed, clearly branded container while he is measuring out the tablet amount of your purchase. Thus you can be virtually certain that you are getting the genuine drug. ★ ★ ★



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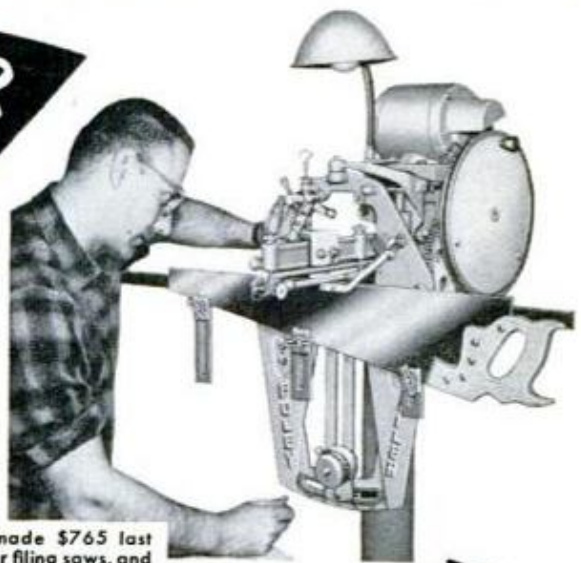
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—James B. Williams

"Last year's profit amounted to \$3,000. Not so bad for a one-man outfit."
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"I have done 4 or 5 thousand saws in my spare time in the 4 1/2 years since I got the outfit, and they are all coming back with repeat orders."
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Report on the Corvair Family

(Continued from page 109)

SUMMARY OF OWNERS REPORT:

EXCELLENT 70.0%  AVERAGE 25.4%  POOR 4.6% 



Satisfied with automatic economy?	Best-liked exterior features	Is Corvair only car in family?
Yes, satisfied.....69.6%	Low, clean, trim lines.....26.7%	Yes, it is.....53.2%
No, not satisfied.....30.4	Sensible trim, no fins.....10.0	No, it is not.....46.8
Satisfied with manual economy?	Sports-car look.....4.6	Make of other car?
Yes, satisfied.....74.4	Front end.....3.8	Chevrolet.....15.6
No, not satisfied.....25.6	Side view.....3.0	Other G.M. make.....16.9
Best-liked features	Least-liked exterior features	Ford.....5.9
Handling ease.....65.6	Front end.....3.5	Other Ford Co. make.....3.5
Riding comfort.....32.3	Trunk space.....3.5	Chrysler Corp. make.....5.4
Styling.....26.1	Rear end.....3.0	Other U.S. make.....2.4
Economy.....19.4	Bumpers.....2.4	Decision to buy Corvair based on:
Traction on snow, ice, mud.....17.5	13-inch wheels.....2.2	Economy.....61.7
Roominess.....16.7	Best-liked interior styling	Style.....54.9
Parking ease.....14.3	Bucket seats.....29.1	Size.....45.4
Most-frequent complaints	Flat floor, no hump.....12.9	Rear, air-cooled engine.....9.2
Poor workmanship, paint, rattles.....19.9	Fold-down rear seat.....12.4	How is dealer service?
Insufficient leg, headroom.....8.9	Instrument panel.....10.8	Excellent.....45.5
Difficult entry, exit.....7.0	Least-liked interior features	Average.....37.5
Sluggish engine.....6.7	Seats too small.....9.1	Poor.....17.0
Heater operation.....6.5	Windshield, dash-panel glare.....5.4	Make of car traded in
Noisy engine.....5.9	Gearshift, selector lever.....2.7	Chevrolet.....33.9
Had mechanical trouble?	Lack of gauges.....2.2	Corvair.....3.5
No trouble.....44.4	Did consider another compact? 55.6	Other G.M. make.....12.4
Some trouble.....47.0	What make?	Ford.....12.4
Considerable trouble.....8.6	Falcon.....43.5	Other Ford Co. make.....3.5
What was trouble?	Valiant.....12.6	Chrysler Corp. make.....5.1
Carburetor.....8.9	Volkswagen.....12.6	Other U.S. make.....4.3
Oil leaks.....8.1	Rambler.....7.7	Would buy another Corvair?
Fuel pump.....7.5	Comet.....6.3	Yes, would buy.....71.5
Valve lifters.....7.3	Tempest.....6.3	No, would not buy.....17.2
Manual transmission.....6.7	Lark.....3.4	Undecided, don't know.....11.3

also on curves."—New Jersey salesman.

"I like the ride. I average over 100 miles per day while working at my sales job, and every day is just as enjoyable as the preceding day." New York salesman.

"My Corvair may be small but it rides like a big car."—Michigan machinist.

Independent suspension all-around and low center of gravity are big factors in Corvair's smooth road personality.

"I'm quite happy with its nice, clean design."—Illinois architect.

"I like its sporty appearance."—New York hairdresser.

"The car has a nice, rakish appearance."—Michigan attorney.

"On my first tank of regular gas I got 21.6 m.p.g. Now I burn ethyl gasoline, drive about 1000 miles per week in and about Los Angeles, and get 23.5 to 24.5 m.p.g."—California editor.

He isn't saving any more money buying the more expensive premium, but he's got two or three more miles per gallon to talk about.

"My Corvair Monza has given me many miles of comfortable, economical transportation. To date, I have had not one single mechanical difficulty although I have driven an average of over 1500 miles per month."—California attorney.

"My mileage is 20.8 m.p.g. over-all, based

on an accurate record of gasoline purchased. My total transportation expense has been reduced by over 25 percent compared with the '59 Chevy Six I formerly owned."—New York mechanic.

"This Corvair is wonderful in winter. It will take slippery hills that other cars cannot negotiate, and without chains.—Connecticut architect.

"In last year's heavy snowfall, I did not have to use chains or snow tires once."—New York secretary.

We have never seen a Corvair with chains on.

"I like its roominess, interior space and trunk space."—Wisconsin insurance agent.

And now for complaints, here are the first six; again, in the order of frequency of mention.

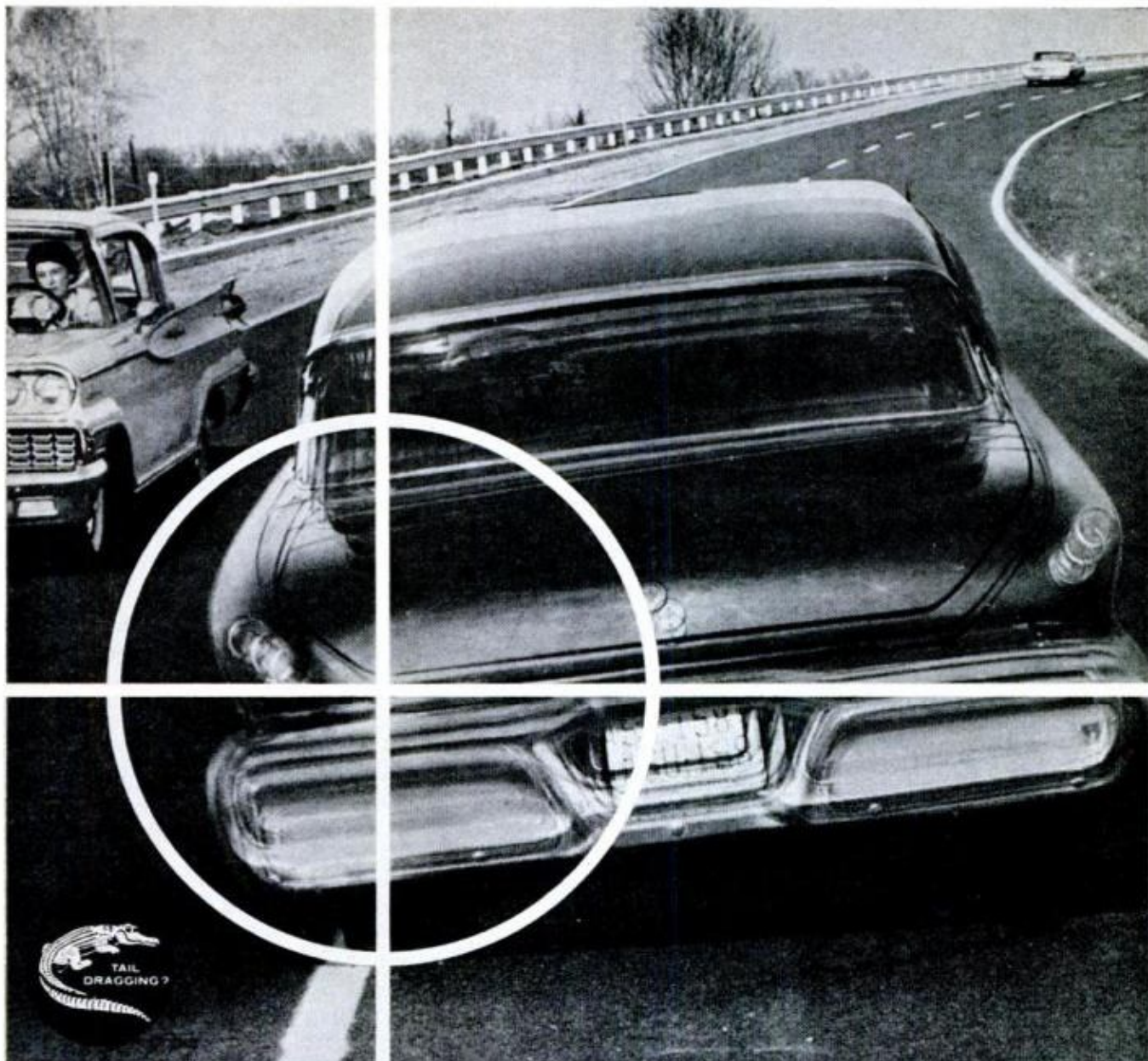
"I'm six-feet, two-inches tall and the front wheel well cramps my left foot."—Michigan physician.

Move over Doc, we're 6' 2½" and have the same problem! Say, have you tried riding with your left foot in depression beneath clutch pedal?

"Larger persons are likely to be slightly cramped if they're driving."—New York mechanic.

"I was unable to drive comfortably until

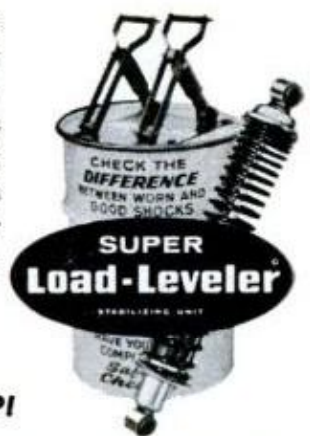
(Continued to page 276)



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 TUNE-UP KIT
 WITH THE NEW PACCO
 INSTRUCTION HANDBOOK**

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 goof-proof instructions for carburetor
 tune-ups today, and we'll send you free
 a \$2.25 (List Price) Pacco Tune-Up Kit
 for 1950-56 6-cyl. Chevrolets (for
 Rochester applications). Offer good
 while supply lasts, so hurry.

MAIL THIS COUPON NOW

Enclosed is \$2.25 (check or money order).
 Send my Handbook and free Tune-Up
 Kit.

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PRECISION AUTOMOTIVE COMPONENTS CO.
 Manchester, Missouri

I installed brackets to move the front seat
 farther back—but this makes rear-seat leg-
 room practically nonexistent." Virginia ra-
 dar technician.

**Let's face it, the Corvair is just a bit too
 small for us six-foot-and-over guys. More's the
 pity, too!**

"Very poor quality control on the assem-
 bly line."—Massachusetts teacher.

"Within the first week, I had to have a
 new fuel pump installed."—Florida house-
 wife.

"Almost every bolt and screw was loose
 when I took possession of the car."—Mon-
 tana salesman.

"Getting in and out of this car is difficult
 and the step-down design makes it even
 more so, especially for the ladies."—Ohio
 physician.

"It is difficult for normal-sized men and
 for older people to get in and out without
 hitting their heads on the door frame."—
 California secretary.

**Corvair is America's lowest car, actually
 half an inch lower than Chevy's Corvette, an
 out and out sports car! For many people it's
 too low.**

"Slow response when trying to accelerate
 engine after idling. This often causes slow
 start-up after change at stop light."—Flor-
 ida engineer.

"Not enough passing power at speeds
 from 40 to 65 m.p.h."—N. Carolina trucker.

"Car heater continues to throw heat in
 summer even with all the switches turned
 off."—Pennsylvania housewife.

**This is an almost universal complaint with
 the new heater. Many dealer service depart-
 ments seem unable to lick it either.**

"Heater gives off heat even with the vent
 closed."—Ohio administrator.

"The heat regulating cable seems to be
 subject to kinking and breakage."—Penn-
 sylvania pressman.

"This car has one of the worst paint jobs
 I have ever had on a new car, and the Chev-
 rolet people didn't seem to care whether it
 was taken care of or not."—Ohio parts man-
 ager.

"I would like to see them produce a bet-
 ter paint job as this one has quite a few bad
 spots."—California serviceman.

**Back to the brighter side of the picture,
 here are the features most approved, rank-
 ing seven through twelve.**

"I like the beautiful way it handles—you
 can turn corners or parallel park with hard-
 ly any effort."—New York housewife.

"Tremendous parking ease."—Illinois
 nurse.

"Our Lakewood station wagon is small
 enough for city driving, yet large enough

for a family of six (four small children). We all like its added trunk space which most wagons lack."—California plant manager.

Lakewood is probably best Corvair for family use. Its roof is higher than the sedans, giving higher seating and better headroom.

"I do not feel dwarfed by the other cars on the road, yet this is a small car, attractively designed and with plenty of room inside."—New Jersey finance manager.

"Being a small person, I always had trouble seeing over the steering wheel and out of all the windows. In my Corvair I have no trouble seeing in all directions."—Illinois office manager.

"This Monza is real fast—1st, 45 m.p.h., 2nd, 75 and 3rd, 87 with a high of 104 m.p.h."—California educator.

Bet you he doesn't teach Driver Education!

"With the 98 hp. engine and the four-speed transmission, there is plenty of go. Yet I still have a small and economical car."—Missouri mechanic.

Yep, this Ozark monkey-wrench commando is right. The hot engine and four-speed box makes Corvair the poor man's Jaguar.

"I have worked around electric welders driven by air-cooled gasoline engines, and they worked so faithfully I figured Corvair would be the same."—Pennsylvania retiree.

"I knew that this type of engine was used in light aircraft . . . this type of engine is pretty efficient and I was influenced considerably by this fact."—Illinois technician.

The air cooled flat-type engine has also made quite a name for itself in light automobiles!

"It is very easy to handle at normal road speeds and holds the road well on curves."—New York engineer.

"Better handling all around, especially in sharp turns at higher speeds, than any car I have ever had."—Michigan designer.

And, as the other side of the coin turns up again—here are complaints numbering seven through thirteen in their order of mention.

"Too much engine noise in this particular model—the Lakewood station wagon."—California builder.

Sad, but true. Lakewood wagon's design closets engine and passengers. Try covering engine hatch with a couple of layers of rug cushion material.

"Too many rattles coming from the dash."—California maintenance engineer.

"The gas mileage is a disappointment. They said I'd get 28 m.p.g. with the four-speed transmission."—Iowa farmer.

(Continued to page 278)

Professional Paint Spray Outfit \$29.50*

Outfit No. 680
Fits any 1/4 hp motor
*less motor

Prices slightly higher—West Coast

Speedy Sprayer

Do it yourself and pay for a Speedy Sprayer from the savings on the first paint job! Sprays fences, screens, shutters, furniture rough walls, floors, big jobs in minutes instead of hours. Finish is smooth, flawless. A real professional tool proved by 40 year's use. Get a Speedy Sprayer!

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Plaster
Brick
Paint
Wallboard
Tile
Canvas
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Fabrics

Prevents warping, swelling, mildew, mold, water stains, seepage, dampness, rot.

Keeps moisture out 5 years and longer.

Use on all woodworking jobs, boats, patio furniture, planter boxes, shutters, screen doors, window sash, shingle roofs. Stops seepage in basement walls, concrete silos, foundations. Waterproofs canvas, tarps, tents, awnings, leather boots, shoes, outdoor clothing. Won't harden or crack leather or fabrics. Perfect underseal for oil base or alkyd paints. Deep penetrating, colorless. Apply by brush, spray or roller. At paint or hardware stores or order direct. 16 oz. spray can \$1.89, Qt. \$1.75, Gal. \$5.35, 5 Gal. \$25.25, ppd., tax incl. Send check or money order to **E. A. Thompson Co.** 1355 Market St., San Francisco 3, Calif. No COD's please. (Since 1929.) Dealer and jobber inquiries invited.

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T-50 All-Purpose STAPLE GUN

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Powerful . . . jam-proof . . . with heavy all-steel construction. Perfect for insulation, ceiling tile, screening & 1001 other jobs. Uses 6 staple sizes up to 9/16" and CEILTILE.

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Household Tackling!

Light . . . compact . . . easy to operate. Ideal for housewife for making valances, lining shelves and closets, tacking curtain tie-backs, etc. Uses 1/4" and 5/16" staples.



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"My gas mileage—18 to 21 m.p.g.—isn't as good as I thought it would be."—California engineer.

"They should either use a bigger heater blower, or find a way to put more air through the defrosters."—Colorado ambulance driver.

"The choke control binds and is hard to work."—Ohio accountant.

"I've had trouble with the choke and with carburetor flooding."—Florida minister.

"My Corvair is overly wind sensitive."—Illinois accountant.

"The steering ratio is too slow. They should decrease the steering ratio or provide an optional ratio as they do for the rear end."—Ohio foreman.

"Because of the light front end, the steering traction is slow to respond in mud and snow at speeds above 30 m.p.h."—Ohio draftsman.

There are some people who think that you shouldn't go over 30 m.p.h. in mud or snow. Black rocks lurk under that white stuff.

"The shifting linkage was fouled up. It kept jamming in reverse gear."—California draftsman.

"I think the gear-shift lever should be two or three inches longer."—California TV engineer.

Back to the plaudits and the compliments. Here are the best-liked features ranking fourteen through nineteen.

"Corvair's oversteering has been effectively controlled and is no problem in normal driving."—Utah engineer.

We couldn't have phrased it any better ourselves.

"This car has beautifully detailed appointments."—Maryland engineer.

"Among several things I go for is the aluminum engine in the rear."—Florida store manager.

"The Monza-bucket seats are the most comfortable I have sat in to date."—Ohio salesman.

"I like the comfortable bucket seats."—Virginia electrician.

"Having owned foreign jobs with four-speed boxes, I can truthfully say the four-speed Corvair transmission is comparable to anything the foreign cars have to offer."—California retiree.

"I like the fact that the back seat tips forward to make additional room."—Michigan trucker.

You need that extra room for luggage on long trips. This seat would be a useful option on other makes too.

"This car has a roomy trunk for a compact."—Massachusetts secretary.

(Continued to page 280)

Weld. cable No. 0, 100' \$24.50, 50' \$12.95
 G-1 150-250 amp Record \$19.50 Good \$12.95
 R-1 300 amp G.E. Record \$24.50 Good \$16.95

Accessories Kit For Arc Welder for above generators has helmet, gloves, elect. holder, volt reg, rheostat, volt-meter, Gr. Clamp, including switch & R. C. relay With G-1 generator **\$26.50**
 Kit With G-1 160-250 Amp Gen. plus 30' cable & reactor coil **\$36.45**

Multi-Weld[®] D.C. Arc Welding Kit Complete with G.E. R-1, 300-350 amp gen, incl. accessory kit reactor coil w/ solenoid control **\$47.50**

24-12V DC MOTORS
 *Reversible
 H.P. Amp. R.P.M.
 Delco 1/4 8.4 2500 **\$5.95**
 Bendix 75-1bT 2A 7 **\$7.50**
 Bendix 1/4 8 4000 **\$6.50**
 With 10-1 gear red. **\$12.95***
 Dumore 1/20 5 200 **\$4.75***
 with 54-1 gear red.
 Rotator Mtr. 1.5A 1 1/2 RPM 75 lb Torque, 12V.D.C. instr. incl. **\$7.50**

New Linear Actuators with 24 V DC motors, runs on 12 to 32V adj. travel & reversible

HP watts	RPM	Amps.	Travel	Tens-Comp	Price
1/8 HP	7500	9	5 1/4"	2800 lbs	\$7.50
1/15	7500	8	4 1/2"	750 lb	\$6.95
.04 HP	10,000	3	3 1/2"	350 T	\$4.95
1/4 HP	1800	17	7"	1800 lbs	\$ 9.95
1 HP	7500	75	8"	7500 lbs	\$17.50

HYDRAULIC CYLINDERS
 Hvy Duty 2000 P.S.I. air-oil
 * with tie rod construction

Bore	Stroke	D. Shaft	Long	Double Action	Price
1 1/2"	4 1/2"	1 1/8"	10"	3 1/2 lbs.	\$ 3.75
1 3/8"	4 1/2"	1 1/8"	13"	5 lbs.	\$ 3.95
1 5/8"	2 5/8"	1"	38"	11 lbs.	\$12.95
2 3/8"	13-18"	1 1/4"	30"	11 lbs.	\$14.50
1 1/2"	8 1/2"	3/4"	13"	8 lbs.	\$ 7.50
2 7/8"	35 3/8"	2 1/4"	13"	10 1/2 lbs.	\$ 7.95
2"	24"	3/4"	24"	6 lbs.	\$10.50
2 1/2"	4"	1 1/4"	13"	6 lbs.	\$ 4.95
*2 1/2"	3 1/2"	3/4"	12"	5 lbs.	\$ 7.50
2 7/8"	16"	1 3/4"	33"	16 1/4 lbs.	\$18.75
*3"	10 1/2"	1 1/4"	19"	13 lbs.	\$14.50
*3"	10 1/2"	1 1/4"	19"	10 lbs.	\$17.50
3 1/4"	10 1/2"	2 1/8"	23"	29 lbs.	\$18.50
3 1/2"	2 1/8"	1 3/8"	31"	15 lbs.	\$24.50
4 7/8"	8"	2"	22"	35 lbs.	\$29.50
4"	18 1/2"	1 5/8"	30"	30 lbs.	\$29.75

BUILD YOUR OWN HYDRAULIC PRESS
 Complete kit consists of New Heavy Duty D.A. cylinder 3" bore x 10 1/4" stroke 3000 PSI, heavy duty Weaver hand pump, control valve, gauge reservoir, hose, fittings and 1 gal. oil. Rated output 9 tons. Instructions incl. \$125.00 value, save \$67.50. Only **\$57.50**

HYDRAULIC PUMP BARGAINS 1500 P.S.I.

Type	RPM	GPH	*Reversible	Price
*Pesco Gear	4500	270		\$ 9.95
*Vickers 410	3750	375		\$17.50
*Stratopower PD	4500	375		\$15.50

Hyd. hand pump 1.5 cu. in. p-stroke **\$6.75**

NEW HYDRAULIC SYSTEM KIT
 #400 K heavy duty power driven, rated 16,000 lbs. lift. Consists of 2 D.A. hyd cylinders 3 1/2" bore x 2 1/8" stroke ea. rated 8000 lbs. with 1000 PSI, 1 four way hyd control valve with built in relief = 821, 1 Vickers hyd pump 375 GPH 1000 PSI 3750 RPM filter, gauge 2000 PSI hose & fittings. Value \$169.95 save \$90.00 **\$79.95** Same kit with two D.A. cylinders 3 bore x 10 1/4" stroke **\$69.95**

12 1/2 TON NEW HYDRAULIC POWER KIT
 Consists of 2 DA cylinders 4" bore x 5" stroke each rated 12500 lbs. with 1000P.S.I. working independently. 1 four way Hyd c. valve with press relief 1 stratopower hyd pump 375GPH 1400PSI 1 accumulator 3000 PSI press gauge, filter, tank, unloading valve, unloads pump at predetermined press setting. Hose and fittings \$248.10 value. Save **\$148.00**. Kit price **\$94.10**

Water pump & 1/8 motor runs on 12-24 VDC adj. press 400GPH **\$12.95**
 1 700GPH & 1/4 mtr. **\$14.95**

GENERAL SALVAGE CO Check or M. O.
 2922 E. 27 St., Dept. 196, Kansas City 27, Mo.

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 SUPER-PENETRANT

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APPLY IT YOURSELF

the high gloss enamel that's so easy to apply!

This alkyd enamel is ideal for kitchens, bathrooms, woodwork and furniture. Keeps its brilliant porcelain-like finish after repeated scrubbing. So durable, people even paint boats with it!

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SUPERPLY SATIN, 100% Latex Paint

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Just brush or roll it on... no laps or brushmarks, no trace of touch-ups. Dries in 20 minutes... no unpleasant odor.

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"I also like the extra storage room that is provided when the rear seat is folded down."—California realtor.

Rounding off the owners' commentary, here are the last of the complaints, numbering fourteen through sixteen.

"My Corvair doesn't start very well."—Maryland assemblyman.

"It seems to be a bit sluggish about cranking and I have to use the hand choke each time in starting."—Florida forester.

"The shift throw from 1st to 2nd is too far when shifting up. When shifting down it isn't so noticeable because I'm usually leaning forward a bit."—New Hampshire salesman.

"Dealer service may be good elsewhere, but it's Ali Baba and the Forty Thieves here in the Bay area."—California shipping clerk.

"I've been in and out of the dealer's for service and it's nothing doing. Their comment: 'We are learning along with the customer the various problems with this car'."—Pennsylvania office manager.

Where, Oh where did those "factory-trained mechanics" go to?

"It seems to me that once again the buyer has been taken advantage of through poor engineering. I am referring to the inability of this car to perform on regular gas."—Florida air-traffic controller.

"Apparently the dealer's service managers haven't heard that the Corvair was designed to run on regular gas. Or was it?"—California salesman.

Well, that wraps it up, the pros and cons of the 1961 Corvair as frankly expressed by a cross section of owners from all over the U.S.

Earth Has a Dusty Halo

Nosing 102 miles into the sky above White Sands, N.M., a rocket has located a dense band of micrometeorites that seems to encircle Earth.

The nose cone of an Air Force rocket was built to open during the four minute rise and fall between 65 miles and 102 miles altitude. During this time, dust particles struck each square centimeter of the opened cone at the rate of 10 each second, then the cone closed.

The dust particles bored through various plastic layers in the nose cone, and pitted one layer of plexiglas. A few of the dust particles were collected, but most vaporized on contact with the nose-cone layers.

Analysis of trapped particles from the halo of dust will take a number of years.

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FRESH WATER SYSTEM PUMP — For boats, campers & trailers. Output 10 to 200 gal. an hr. Variable rheostat controls output. 1/2" pipe thread into bronze impeller housing. 12 V.D.C. Radio noise filter. 5.2 amp. draw. Explosion-proof const. Shpg. wt. 11 lbs. Complete with mounting instructions & wiring diagram. Approx. GOVT. COST, \$200. NEW, \$10.95.



BUILD YOUR OWN ARC WELDER, LIGHT PLANT OR BATTERY CHARGER \$37.50
Kit incl. 1 Navy NEA-5 Gen. combination AC-DC type. AC 115 V, DC 24 V., 200-300 Amps. 2 complete generators in 1, yet no larger than reg. gen. Ideal for home, shop and farm lighting plants. Delivers 1200 Watts AC, DC side for charging batteries, welding and operating war surplus motors. Also in kit: 1 DC Voltage Reg., Reverse Current Relay, 30' New Welding Cable, Rheostat, Electrode Holder, Toggle Switch, Welder's Shield, Wiring Diagram for kit. Wt. under 100 lbs. Approx. GOVT. COST \$650. KIT—\$37.50. Navy NEA-5 Gen. as above, purchased separately, \$23.50.

225-1 REDUCTION GEAR For beaching boats, winches, hoists. Ideal motor in golf or boy's electric car. DC motor and clutch. Easily reversible wiring diagram furnished. Hi torque, 105 RPM. Runs on 6-12 or 24-32 V. 65 lbs. gross. Approx. GOVT. COST \$300. \$13.50. Matched splined gear—\$3.00 ea. *140-1 Reduction Gear—\$12.00.

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ELECTRIC STORAGE BATTERY WINCH

Fully reversible with heavy-duty, 2-way drum switch. Heavy-duty motor, 150 to 1 reduction. Drum will handle 60 ft. of 1/4" cable. Can be operated manually by hand crank. Use on 6, 12, 24, 32 V. battery. Lift cap. 2000 lbs. plus. Ready to install & operate. Dim: 17" long x 9" wide x 7" high. For jeeps, trailers, boats, trucks, etc. Approx. GOVT. COST \$400. NEW, \$46.50

DC JET GENERATOR ARC WELDING KIT Complete with GE Type CM-77 Generator (30 volts D.C., 400 Amp., 3000 RPM up: ampere rating is for continuous duty, intermittent amperage is 500 to 600 amps.), also 2 rheostats, 1 voltage regulator, 1 voltmeter, 1 electrode holder, 2 ea. 25 ft. lengths No. 0 welding cable, 1 welder's mask, 1 toggle switch, 10 lb. vacuum packed 1/4 in. welding rods, pair welder's gloves & spline coupling. All units guaranteed pre-tested. Wt. 110 lbs. Approx. GOVT. COST \$700. All items, now only \$64.50.

*G.E. Generator noted above can be purchased separately. Makes deluxe heavy-duty welder comparable to the finest commercial welders available. Wt. 90 lbs. Approximate GOVT. COST \$600. Gen. alone—\$49.50.



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A tool for every need... with quality you can actually feel.

CHICAGO 32, ILLINOIS / DEFIANCE, OHIO

We'll Learn From the Astronauts

(Continued from page 103)

This is the one that will make Mercury look like the Wright Brothers at Kitty Hawk.

Shepard's Suggestions

Shepard made four recommendations for improvements. First, he suggested the astronaut enter his space capsule much later during the countdown to reduce waiting time—he waited 4 hours and 14 minutes; Grissom waited 3 hours and 32 minutes. Second Shepard suggested the number of monitoring tasks and switch flippings be reduced to give the astronaut more time for observation. In the first 2 minutes and 22 seconds of his powered flight, he observed the cabin pressure gauge 12 different times and glanced at the clock timer, position and speed indicators, oxygen supply gauge, acceleration meter, and the peroxide fuel supply gauge each at least five times. Third, Shepard suggested moving the space suit gauge from the left forearm of his suit to a more readily visible place. To lessen vibration, he also suggested more foam rubber padding be put under the spacemen's helmets for head support. On a more personal note, Shepard also expressed the hope that the space medics would spare the needles and take less body fluid samples before and after future flights.

In addition to these minor changes, NASA and the McDonnell Aircraft Corp. engineers have incorporated a "picture window" porthole with double the viewing area of the eight-inch portholes in Freedom Seven, and with lines inscribed which permit astronaut to match capsule's attitude with the horizon. Unfortunately, on Grissom's flight, extensive cloud cover prevented a real evaluation of this improvement. For the orbital flights, too, the beryllium heat shield used in the up-and-down ballistic flights will be replaced by a resin-and-glass fiber shield able to withstand the friction-red heat of re-entry from orbit.

The entire orbital flight will be a far more

severe test of both man and machine. For two minutes after blastoff, Shepard and the capsule were subjected to up to 6.2-Gs, which means that crushing acceleration forces made his weight, in effect, six times normal. In the Atlas orbital flight, the acceleration forces during launching will be the same, but will last two minutes longer. In their flights, Shepard and Grissom were weightless about 5 minutes. Top speeds were 5,180 and 5,310 m.p.h. The orbital flight calls for three turns around Earth at 17,500 m.p.h., or over four hours of weightlessness. The astronaut will be expected to eat and drink and perform certain regular tasks in orbit. Although Yuri Gagarin's flight has already indicated that such tasks can be carried out, NASA scientists want to observe for themselves the effects of prolonged weightlessness and the transition from high launch-Gs to zero-G and then to re-entry-Gs.

When Shepard returned to Earth, his flight path was essentially fixed and predetermined; the temperature on the heat shield rose only 30 degrees F. from normal. But, when the orbiting vehicle makes its re-entry, the angle of attack must be precisely determined to insure return along the narrow "safety" corridor. The heat will reach as high as 200 degrees F. as the shield glows an incandescent orange-white during the atmospheric plunge.

Earth is the Lab

Where Freedom Seven's flight was confined to a strip of space from Canaveral out 302 miles in the south Atlantic, the orbital flight will turn the whole globe into a test laboratory. A single communications belt will link 20 ground monitoring stations on a 30,000-mile circle spanning North America, Africa, Australia, Hawaii, the Atlantic, Pacific and Indian Oceans. Radio and radar, telemetry, telephone and teletype, leased land lines and overseas radio and cable facilities will keep the Goddard Space Flight Center in Greenbelt, Md., informed of the

(Continued to page 284)

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Starting next month, **Popular Mechanics** will offer its readers even more of its famous do-it-yourself help. We're starting a new **SERVICE AND INFORMATION CENTER** that will tell you how to get the newest and latest

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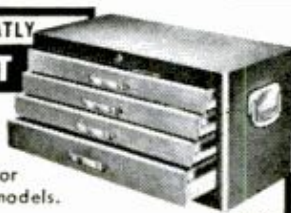
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DYNAMIC INDUSTRIAL TYPE TRANSFORMER WELDER

WELD-CUT-BRAZE-SOLDER-HEAT
IRON-STEEL-BRONZE-BRASS
ALUMINUM AND OTHER METALS



Professional Electric Arc Welder. Ideal for Home, Shop, Farm or Industrial use. The handiest tool in your workshop. Weld, Braze, Solder, Cut, Bend all metals. Do expert work on your first job. Build or repair Boats, Trailers, Auto Bodies, parts, fenders, metal and ornamental iron furniture, fixtures, farm equipment, garden tools, bicycles, toys, etc. Operates on any properly wired 110 V. A.C. line. Complete with helmet, arc torch, electrode holders, flux, rods, cables, instruction book. FULL YEAR GUARANTEE. 10 day money back trial. ONLY \$38.50 f.o.b.

Only \$38.50 f.o.b. Send only \$6.00 check or m.o. Pay postman balance plus charges. EASY PAY PLAN. Low down payment. Pay as you weld.

DYNAMIC WELDER CO. 1808 SOUTH FEDERAL STREET Dept. D2-J, CHICAGO 16, ILL.

Another NEW Taft Kit! "2 SEASON" AIR BOAT & Snow Sled KIT (not shown)

with surplus aircraft engine
\$223⁷⁵ Down \$38⁰⁴ Per Mo.

FREE Catalog of many models

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DRAINS cellars, cisterns, wash tubs; \$7.95
IRRIGATES - CIRCULATES - SPRAYS

1,001 uses. Stainless shaft. Won't rust or clog! Use 1/8 HP motor or larger. 3/4 HP for up to 2,400 GPH; 450 GPH 80' high; or 1800 GPH from 25' well. 1" inlet; 3/4" outlet. Coupling included free. \$7.95. HEAVY DUTY BALL-BEARING PUMP. Up to 5,200 GPH; or 3,000 GPH from 25' well. 1 1/4" inlet; 1" outlet. \$12.95. Postpaid if cash with order. MONEY BACK GUARANTEE. Centrifugal and Gear Pumps in All Sizes. LABAWCO PUMPS, Belle Mead 7, New Jersey

Print Your Own

Cards, stationery, circulars, etc. Save money. Print for Others, Good Profit; easy rules sent. Raised Printing like engraving, too. Junior press \$15; Senior \$35 up. Sold direct from factory only. We furnish everything. Write for free details. KELSEY PRESSES, Y-37 Meriden, Connecticut

ALVA ALLEN Heavy Duty PUNCH PRESSES

1 to 25 Ton Capacity Punch Presses—in hundreds of different model combinations

Moderate in Price Fully Guaranteed

Write for Free literature giving complete information and prices on Alva Allen Heavy Duty Presses.

Alva Allen Industries, Dept. PM, Clinton, Mo.

Keep Tools in Tip-Top Condition

Lubricate · Clean · Prevent Rust

3-IN-ONE® OIL

REGULAR—OIL SPRAY—ELECTRIC MOTOR

HANG FIXTURES SECURELY...



USE **MOLLY**®
SCREW ANCHORS and JACK NUTS®

BETTER THAN NAILS & SCREWS—Molly lets you put fixtures where you want . . . not just where studs are. Spider backing reinforces area in which used, won't pull through. BETTER THAN TOGGLE BOLTS—Easy to install, needs much smaller hole, fixtures can be removed and replaced in same anchor! Inexpensive, guaranteed. Ask your hardware dealer for genuine Molly . . . the name is stamped on the cap.

JACK NUTS GRIP ANY MATERIAL, WORK IN NARROW SPACE

Jack Nuts need only 3/8" expansion space . . . now you can fasten fixtures to flush doors! Grip any material up to 3/4" . . . perfect for use in thin materials where wood or sheet metal screws won't hold!

SEND \$1.00 FOR SAMPLE BOX OF 12

EXPANDS BEHIND WALL
MOLLY® Corp., 200 N. 5th St., Reading, Pa.

Enclosed is \$1.00 for sample box of (check one) Mollys Jack Nuts

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screens, upholstery, carpets...

hundreds of other uses.

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Staples practically anything. Exclusive push-button loading and built-in staple extractor. At your stationery, department or hardware store.

only **4⁹⁵**

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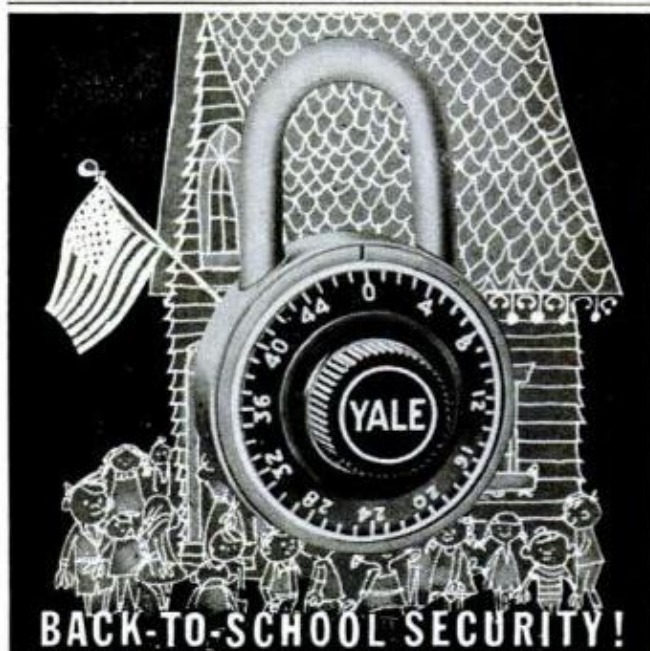
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"TIPS FOR TACKING" Booklet . . . shows you how to save time, money and effort — with a SWINGLINE AUTOMATIC STAPLE GUN



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YALE® COMBINATION PADLOCKS

Books, clothing, personal belongings — all are safe when a student's locker is protected by a dependable Yale combination padlock. 3-number dialing . . . 10,000 possible combinations. Available wherever better locks are sold. Product of The Yale & Towne Mfg. Co., Yale Lock & Hardware Division, White Plains, New York.

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capsule position at all times. The stations are so placed that at least one can always communicate with the capsule. A medical doctor at each monitoring station will listen in on the telemetered record of the astronaut's heart beat, respiration, and body temperature. He will share a position at the console with the technicians monitoring the flight's engineering phases. Thus, both man and machine are under constant surveillance during the entire mission.

Following the 4-hour and 30-minute orbital mission, later Mercury-Atlas missions will take astronauts on a 24-hour Earth-circling mission sometime in 1963. By then, the three-man Apollo program will begin to take over as Mercury is phased out. Riding atop an eight-engined Saturn rocket with a thrust some four times greater than that of the Atlas, the crew of Apollo "A" will go on leisurely week-long Earth orbits in 1964. Apollo "B" and its crew will make flights around the moon in 1966, picking out, among other things, a likely landing site for the Apollo "C" crew. The seven astronauts, wise old birds all in their forties, will, in all likelihood, stay on in the Apollo program as senior instructors to a new breed of true "space cadets."

Lengthy Apollo

Where Shepard's Mercury capsule weighed hardly more than a ton (exclusive of fuel) and measured nine feet high and six feet wide at its broadest, the Apollo will be 40-feet long and 12-feet wide. Its landing rockets will add another 60 feet in length, and the total weight will be 150,000 pounds. Three men will be able to live, work and sleep aboard it for three weeks.

The towerlike escape rocket used on Mercury, which wrenches the capsule away from the booster rocket in the event of failure may also be adapted to Apollo. Apollo may also return to Earth blunt end forward in the same manner as the Mercury ship. And the Mercury-type contour couch will be used to seat the Apollo's spacemen. Suit design, environment control, reaction jets for steering in space, and other Mercury features may also be used in Apollo.

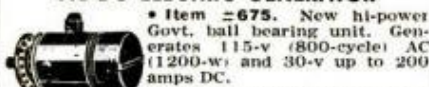
Not all flights in our step-by-step journey into space will succeed as well as the Shepard and Grissom trips. There may well be failures — aborts on the pad, incorrect trajectories, re-entry disasters. "This is a risk we have to take," says Trevor Gardner, Chairman of the Air Force Space Study Committee. "It's like testing high-speed aircraft in which men have died. The risks are there, and they have to be faced."

They do, indeed, if we are ever going to achieve and maintain an equal footing in space with the Soviets. ★ ★ ★

SURPLUS SALE

GOVT. SURPLUS
EXCESS INVENTORY
BANKRUPT STOCK

AC-DC ELECTRIC GENERATOR



• Item #675. New hi-power Govt. ball bearing unit. Generates 115-v (800-cycle) AC (1200-w) and 30-v up to 200 amps DC.

• Very versatile. Use for 115-v AC lights or stove or for DC 200-amp welder. Drive with tractor, engine, etc. Size 14"x8"x6". Wt. 55 lbs. Govt. cost over \$250. **SALE... \$15.85 FOB**

SELF PRIMING WATER PUMP



• Item #204. New Govt. units. Fine for boat pumping, sump pump, etc. Timken bearings, 1 1/2" intake and discharge ports, 3/4" shaft. Size 12"x10"x18". Wt. 32 lbs. Cost \$97.50. **SALE... \$19.49 FOB**

STORAGE BATTERY WINCH



• Item #311. Powerful fully reversible, ball-bearing gear reduction winch. 1000-2000 lb. pull. Use on 6 or 12-v battery. Holds 40' of 1/4" cable. For trucks, docks, boats. Govt. cost \$280. **SALE... \$49.95 FOB**

DIAL PHONE

• Item #716. W. E. phone, same type used in telephone offices. Use as extension or main line phone. Set up your own private system. Wt. 8 lbs. Black. **SALE... \$7.95**



Color (specify) Coral, Yellow, Lt. Green, Buff. **SALE... \$11.95 FOB**

GOVT. GEARED BATTERY MOTOR



• Item #569. Powerful geared-down motor. Runs on 6 or 12-v. Use for golf cart, boat, farm winch, etc. Reversible. Speed 25-85 rpm. Wt. 35 lbs. Govt. cost \$250. **SALE... \$21.79 FOB**

• Our most popular item.

POWER PLANTS

• Item #607. Super Special!



Finest Deluxe 10,000-w, 115-230-v, 60-c, water cooled 4-cyl. engine. Full instrumentation. Many features. New condition. Ideal for emergency or full time use. Be prepared for war or peacetime power failures. Size 68"x39"x28". Wt. 1495 lbs. Govt. cost over \$2,000. **SALE... \$649 FOB**

• Many other buys down to \$69. See catalog.

HYDRAULIC SPEED REDUCER

• Item #1304. 1 hp variable speed hydraulic transmission. Variable speed 0 to 350 rpm. Instantly reversible. Ideal for lathes, midget cars, etc. Roller bearings, and complete with 3-phase 220-v AC ball bearing motor. Size 21"x9"x20". Wt. 200 lbs. Shaft fitted with pulley (specify diameter desired). Govt. cost over \$900. **SALE... \$89.50 FOB**



BATTERY REMOTE CONTROL WINCH

• Item #322. Powerful Govt. DC hoist with "up-down-off" push-button control switch, 20' cable. • 35' 4000-lb. hi-strength super-flexible steel cable on self leveling pre-grooved high-strength 5"x6" drum. Winch rating 1000-lbs. on 12-v, 1500 lbs. on 24-v. Fine for boats, loading docks, trucks, jeeps, garages, farms, etc. Easy to install. Electric automatic locking brake. Works off any car-truck 12-v battery. Wt. 90 lbs. Size 12"x14"x8". **SALE... \$58.25 FOB**



FLEXIBLE POWER CABLE



• Item #1105. Finest War Surplus 3-conductor super flexible No. 8-ga. heavy duty power cord. Ideal for contractors, builders, factories, farmers, etc. • Use for motors, large power tools, air conditioners, etc. Fine flexible stranding long life neoprene cover. 100 ft. coil—Wt. 38 lbs. 225 ft. coil—Wt. 85 lbs. Std. price—90¢ ft. **SALE—100 ft. \$19.90—225 ft. \$44.50 FOB**

SPECIAL OF THE MONTH!

ARMY AC GENERATOR



• Item #626. Brand new, original crate, all ball bearing Deluxe heavy duty 115-v 3,000 to 4,000-w, 60-c generator. 1,200 rpm. With voltage control and voltmeter panel, etc. • Drive with tractor, old auto engine, etc. Ready to use. Great emergency unit for farm, etc. Size 21"x14"x20". Wt. 260 lbs. Govt. cost over \$600. **SALE... \$139.50 FOB**

• A four star buy—171 units available.

HYDRAULIC EQUIPMENT BARGAINS



Savings to 80%. Build loaders, diggers, presses, etc. All brand new. • Control Valve, 1 or 2 way... **\$18.00 PPD** • Tractor Pump 1000 psi... **49.75 PPD** • 12-v Motor & Pump 1000 psi... **16.95 FOB** • 2-Way cyl. 3" bore, 8" str... **19.70 FOB** • Hyd. Press-gauge 1500 lb... **3.49 PPD**

AIR COMPRESSOR BARGAINS

For painting, cleaning, tires, control termites. Assemble your own outfit. Lowest prices in U.S.

• DELUXE KIT. Compressor, tank, gauge, regulator, paint gun, fittings. How to build instructions. List \$52. **SALE... \$49.50 FOB**

• Compressor 1-cyl. **\$21.50**. 2-cyl. **\$54.75**. Govt. Air Tank, **\$10.95**. Regulators, **\$3.95**. Pop Off **\$1.75**. Pres. Gauge, **\$1.75**. Finest paint gun, **\$11.50**. Auto switch, **\$4.75 FOB**.



FREE CATALOG Electronics, Tools, Binoculars, Hydraulics, Plants, Compressors, etc. New 1962 cat. now ready (send dime or stamps).

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LINCOLN, NEBR. DEPT. 811



Life Jackets for Space

Scale models of foamed plastic "space life jackets" have been made under simulated space conditions to demonstrate how an astronaut could build his own protective shield after bailing out of a space vehicle for a quick emergency return to Earth.

In use, the plastic foam would fill an envelope pre-cut to re-entry vehicle shape, enclosing the astronaut and protecting him from the severe heat and shock of re-entry.

If it's worth painting
it's worth sanding...
with sandpaper by



CARBORUNDUM

The astronaut would bail out of his orbiting vehicle wearing everything necessary for his safe return to Earth including, in addition to the life-jacket material, his pressurized space suit, oxygen supply, location and recovery aids, survival gear, and retro-rocket package. The plastic envelope, when it is formed, would enclose everything except the retro-rockets.

After placing himself in a re-entry trajectory with the rockets, the astronaut activates the foaming-plastic system.

ARC WELDING PAYS BIG MONEY

NEW AC SHOP TYPE WELDER, the 180 amp. "Hustler" welds, cuts, burns holes, hard surfaces and heats metal for bending and forming. Comes complete with accessories. Meets REA requirements.

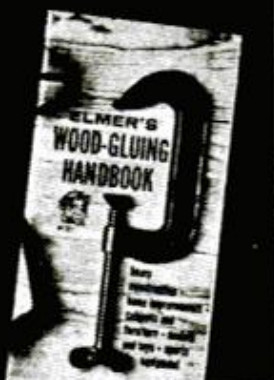
If It's Metal
WELD IT!
WITH EITHER OF
THESE TWO LOW
COST HOBART UNITS

NEW WELDER/POWER COMBINATION, the 200 amp. "Power/Weld" furnishes DC current for welding and 110/220 volts AC power for running lights, tools, etc. Can be invaluable in a power failure emergency.

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FREE "HOW-TO" HANDBOOK ON GLUING



NEW 12-page Elmer's Wood-Gluing handbook gives you details on gluing for heavy construction, home improvements, cabinets and furniture, models and toys, sports equipment. Contains hints, tips, and shortcuts. Includes drawings, as well. Tells you what glue to use indoors and out. Send stamped, self-addressed envelope for your free copy. Elmer, The Borden Company, Dept. PM-91, 350 Madison Ave., New York 17, N. Y. (Available in Canada.)

Remove Paint in one easy scraping - NOT COAT BY COAT

You'll save yourself time and work with famous Wonder-Paste. This deep-penetrating remover softens up the toughest paint or other finishes. Makes them come off clean. Stays moist and active indoors or out. And it does not run on upright surfaces.

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CAULK with RUTLAND

Seal cracks in concrete, masonry, around doors, windows. KLIP-TIP* gives 3 sizes from one spout.
*Reg. & Pat. Pend.

other quality
RUTLAND PRODUCTS
Glazing Compound
KEX Spackling
Patching Plaster
Concrete Patcher

RUTLAND FIRE CLAY CO., Rutland, Vt.



PM Tests Volkswagen's 1500

(Continued from page 130)

mostat on the oil cooler and the thermostat on the intake manifold heat pipe crossover will do the job and the engine won't overcool in winter. They should know.

The engine has four cylinders in opposed pairs mounted horizontally and air cooled. Larger in displacement, it produces 53 horsepower compared to the current model's 40.

The engine was "flattened" to provide space for the luggage compartment by mounting the cooling blower on the end of the crankshaft and providing for a side draft carburetor and horizontally-mounted oil cooler.

Acceleration Brisker

Acceleration is very good through gears. It gets to 50 m.p.h. in about 13 seconds. The car will peak out comfortably at 70 m.p.h. (120 k.p.h.) in third gear. The 0-60 m.p.h. time is about 21.5 seconds with two 190-lb. men aboard.

Top speed worked out to an honest 80 on the VW test oval. That speed can be held indefinitely as the engine is understressed like the Model 113 and has low piston speeds and, accordingly, lower inertial forces.

We were unable to test fuel economy in the short time at the Wolfsburg proving ground but Volkswagen engineers told us that the current 1961 regular VW will make about 30.03 m.p.g. and that the new VW 1500 will make about 24 m.p.g. for the same distance.

As any Volkswagen owner can tell you these are very conservative figures; most '61 VW's deliver around 33 m.p.g. in average use.

Riding qualities are better in the VW 1500. The car has a typical firm but not harsh VW ride, yet there is less pogo-stick bounce on the really rough, uneven pavement. The newly-designed suspension has crisscross torsion bars fastened to the lower control arms and cased in the steel tubing of the axle housing.

The upper control arms are attached to the antiroll bar, also enclosed in housing, so that the entire front axle assembly, including steering gear and shock absorbers, is an integral, aligned unit bolted to the spine frame of the body platform.

Rear tread is 3-inches wider than the current car's for greater stability. The car is thoroughly pleasant to drive. Shifting down to 3rd or 2nd is, if possible, softer and easier than with the Model 113. Noise at 80 m.p.h. on the prototypes was a bit noticeable, but at 50 to 60 m.p.h. the car whispers.

There were no rattles, and no wind noises from the sun-roof.

The steering wheel is the same as the regular VW's, set at the same approximate angle, too.

The gearshift lever is shorter and its action firmer, with less throw and little of the wobbly feel of the older model. It's much more sporting in action. It has a thicker shaft and bigger knob. Clutch and brake pedals are the same. Brakes are the same diameter, but have larger lining area due to increased lining width.

Handling is excellent. Oversteer has been almost completely eliminated. You can "bend" the car until tire scrub commences yet there's actually a feeling of understeer until finally the rear end does break loose. The current Model 113 has been vastly improved in this respect, but the VW 1500 is still better.

The VW 1500 has an excellent array of accessories and interior comforts. The forced-air heating system has a vent in the back seat as well as on front door stills (as in the regular model). Heating is still controlled by a handwheel on the tunnel, but there are interior vents beneath the panel and a de-mister on the windshield with two sets of controls for left and right vents so that you can spray warm and/or cool air on the inside of the windshield all at the same time.

The windshield itself has a gentle curvature and vision forward is great due to the down-sloped hood between fenders. Wiper coverage is good, too. The instrument panel consists of three dials: speedometer, fuel gauge, and clock, with lights for generator charge, oil pressure and turn signals.

Roomy New Wagon

For those who travel as most of us do, with more luggage than they need, the VW 1500 station wagon may be a practical answer. With rear seat folded forward there is a flat load area 67 inches long, 30 inches high and 48 inches wide. Between the wheel wells the load bed narrows to 36 inches. With the rear seat occupied you still have about 40 inches of load space. And, of course, there's the front trunk to add to the wagon's capacity.

To sum it up, the VW 1500 is larger and more impressive than its famous older sister, but every extra pound and every extra inch provides a genuine increase in comfort, convenience, and usefulness.

At an increase of 30 percent over the price of the Volkswagen Model 113 (now approximately \$1175 in Germany), the VW 1500 should find a warm welcome in European countries. If and when it reaches the U.S., the welcome may be warmer. ★ ★ ★



PORTABLE CORNELIUS AIR COMPRESSOR AND MOTOR ASSEMBLY

Ideal for filling Diving Tanks or wherever high pressure air is needed. Each unit consists of a surplus Cornelius Compressor combined with a NEW Gasoline or Electric Motor... compact and easily portable. Designed to displace 0.6 cu. ft./min. Operates at 2250 PSI continuous and tested to 3000 PSI.

Compressor Assem. No. HPC-GE
With 2½ HP Clinton Gas Engine as illustrated.

Compressor Assem. No. HPC-115
With 1/2 HP, 115/230 V., 60 cycle AC electric motor.

SAVE 99.50 EA.

HIGH PRESSURE AIR PURIFIER ASSEMBLY

A complete 3-tank filter unit for use with the above compressors. Has a 3000 PSI gauge and a safety valve set at 2250 PSI. **32.50**

AIR TANK FILLER ASSEMBLY

A 3000 PSI Hose and Fitting for filling ALL tanks that have J, K, R or S type valves. NOW ONLY **12.50**

BUILD YOUR OWN DIVING LUNG - SAVE 50%



ONE TANK SKIN DIVING KIT

Has 38 cu. ft. tested and dated Air Tank... allows approx. 45 minutes diving time. Comes with shut-off valve, surplus dilutor-demand regulator, connector assembly, air hoses, mouth piece, web cradle and harness, weight belt, etc. No. PSD-11 **39.95**

SPECIAL TWO TANK DIVING KITS

This diving kit allows approximately 1 hour diving time. Has two 22 cu. ft. tested and dated tanks, shut-off valves, air hoses, surplus dilutor demand regulator, plus harness, safety belt and weight belt. **45.95**

JUNIOR SWIMMING and DIVING TRAINING UNIT - 6.88

A "snorkle" type swimmer - portable and compact. Perfect to instill confidence in the child learning to swim. Child can swim along surface or release float pantoon and enjoy submarine swimming to depths of 2½ to 4½ feet. Complete with face mask, hoses, snorkle air valve, floating "tanks," carrying bag and instructions.

PORTABLE ARMY ICE PAC

Of extra heavy Neoprene rubber with an insulated inner liner. Keeps food or liquid cold all day. Ideal for packing and icing-down small game and fish. Waterproof and salt resistant. Two sizes.

SAVE
Approx. 16" x 13" x 8" Shpg. Wt. 10 lbs. **1.99**

Approx. 21" x 16" x 12" Shpg. Wt. 20 lbs. **2.99**

STAINLESS STEEL MESS TRAYS

One-piece stainless steel. Has 6 compartments & rolled edges. Easy to stock and clean. No. CMT1 **1.59 each**

NAVY HAND MICROPHONE

Has bakelite case with push-to-talk button control. With 4 ft. rubber covered cord and jack. No. EL-HMRS38A **1.88**

SPECIAL GOV'T SURPLUS BARGAINS






A - British combination PICK-HOE tool - \$1.29 ea. 2 for **\$2.29**
 B - Army BAYONET with scabbard. Has 14" blade. **\$2.98**
 C - Army MACHETE w/Vanadium steel 27" blade & sheath. **\$1.98**
 D - Special Swedish folding BAYONET. 7" blade. **\$1.98**
 E - Officer's LENSATIC POCKET COMPASS - Ideal for Hunter, Camper, Boy Scout, etc. A \$5.95 Value **3.49**

4-WAY HYDRAULIC VALVE

No. H-V7A-1 **3.95**
 A spring loaded, poppet type valve. Pressure balanced. Off in neutral. Has ½" tube parts. Cost Gov't approx. \$30

SAVE

1500 PSI - Double Action CYLINDER

Bore 2-3/8", Stroke adjustable from 7-3/8" to 9-5/8", Shaft 7/8", eye-to-eye length is 20".
 No. H-17USU - Used **7.88**
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 LOS ANGELES 58, CALIFORNIA

You CAN Detect a Good Used Car

(Continued from page 125)

up with replacement of plugs, coils and points is usually needed. New front-end bearings and bushings or ball joints may be needed. Generator and starter may need overhaul. Brakes may need relining.

Cars four to six years old are subject to the same potential ailments listed for the younger cars, plus some additional woes. Fuel and water pumps may be shot. Valves may need regrinding. Universal joints, transmission and rear end may need repair.

Cars seven to ten years old are usually junk, and these are the ones that may be gimmicked up to keep them running. Heavy grease is still shot into rear ends of older cars to quiet unwanted noises and into steering wheels to take up slack in worn steering columns. Heavy oil is still put into motors to keep an oil-burning engine from smoking temporarily.

The Canned Milk Cap

Where canned milk, which congeals under heat, used to be used to seal radiator core holes; liquid solder is used today. It works for minor leaks, but is not adequate where major repairs are needed.

Now and then I have a customer ask me for the name of the car's former owner. I always supply this, but this is not always an infallible check on a car's condition. Many a used-car salesman has friends who obligingly pose as former owners, and give a glowing account of the car's virtues when the unsuspecting customer telephones them.

Does the dealer make repairs on the used cars he offers? Well, he frequently gives the customer a 30-day, 50-50 guarantee. This means the dealer agrees to pay half the cost of parts and labor if anything goes wrong with the car in the 30-day period. If the customer does come back with a complaint, the dealer makes the repairs and recovers his costs from the "half" the customer pays him. So the dealer loses nothing in the transaction. Of course, he hopes that no repairs will be needed, and the fact that so many customers do not return is more of a tribute to the stamina of the modern American automobile than to anything else.

The truth is that, under the pressure of competitive selling, dealers simply cannot afford to make repairs without some method of getting their money back.

I know of a way, however, by which dealers could make needed repairs without going broke and thus would be able to guarantee customers that the cars were in sound mechanical condition.

This would involve bringing repairs—

and defects—out into the open, making them an integral part of the whole used-car deal. Repairs would be made on all late-model used cars and a sticker listing repairs and costs would be placed in the car window—just as price stickers are now posted in new cars.

The repairs would be made by the dealer at rock-bottom prices and the total added to the car's asking price.

The Truth at a Glance

The prospective buyer would then know at a glance what had been wrong with the car and that the defects had been remedied. He would be paying wholesale prices for the repairs in exchange for the peace of mind that would come from knowing the car was in sound condition.

As things stand now, he is going to pay in any event—either under the so-called 50-50 guarantee, or after the 30-day period is over. Add to this the fact that the dealer would benefit from word-of-mouth advertising by satisfied customers and everybody would benefit—customer, dealer and the automotive business in general.

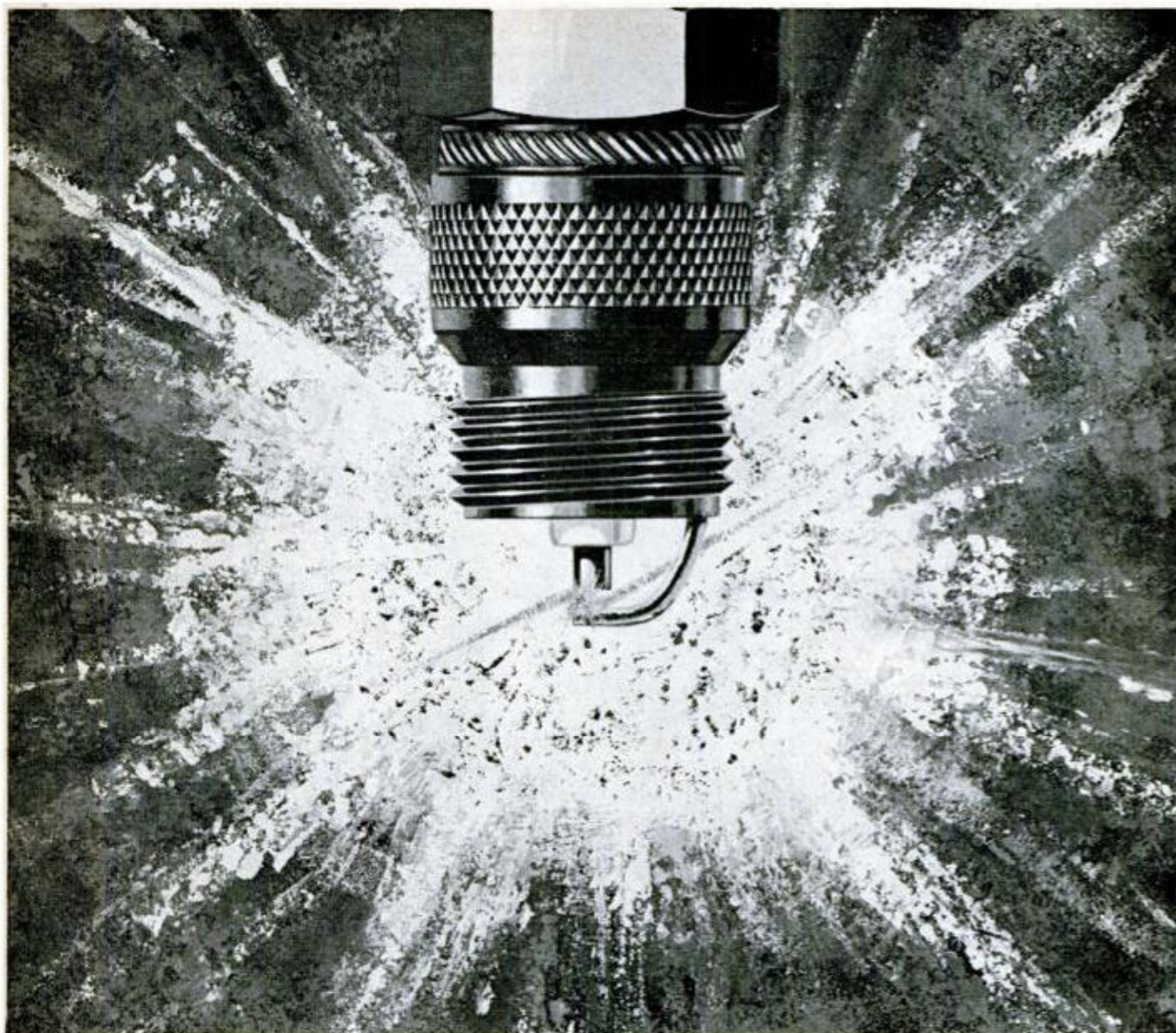
Since this is as yet only a desirable prospect, how does today's used-car shopper minimize the risk of being cheated? He can go only to long-established dealers with good reputations in a community. And he can keep his eyes and ears open as he inspects a used car, and not be shy about checking out the points I have mentioned.

Above all, he can ignore the glitter and the shine. ★ ★ ★



Emergency Stethoscope

When a seaman on the USN's *Kimbro* was injured during a recent storm, medics discovered that there was no stethoscope aboard. Equal to the emergency, Chief Engineer Norman A. Roman made one on the spot from rubber hose, copper tubing, tube fittings, a plastic funnel and some tape.



*Autolite, the sparkplug that cleans itself
while you drive,
is now standard equipment on the Ford Family of Fine Cars.*

This unique performance and economy feature is one of the reasons why Ford Motor Company, and several other car makers, specify Autolite Spark Plugs as standard equipment on every car they build.

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 - Architecture
 - Arch. Drawing and Designing
 - Building Contractor
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 - Carpenter Builder
 - Carpentry and Millwork
 - Carpenter Foreman
 - Heating
 - Painting Contractor
 - Plumbing
 - Reading Arch. Blueprints
- ART**
- Commercial Art
 - Magazine Illus.
 - Show Card and Sign Lettering
 - Sketching and Painting
- AUTOMOTIVE**
- Automobile
 - Auto Body Rebuilding and Refinishing
 - Auto Engine Tuneup
 - Auto Technician

- AVIATION**
- Aero-Engineering Technology
 - Aircraft & Engine Mechanic
- BUSINESS**
- Accounting
 - Advertising
 - Business Administration
 - Business Management
 - Cost Accounting
 - Creative Salesmanship
 - Managing a Small Business
 - Professional Secretary
 - Public Accounting
 - Purchasing Agent
 - Salesmanship and Management
 - Traffic Management
- CHEMICAL**
- Analytical Chemistry
 - Chemical Engineering
 - Chem. Lab. Technician
 - Elements of Nuclear Energy
 - General Chemistry
 - Natural Gas Prod. and Trans.
 - Petroleum Prod. and Engr.
 - Professional Engineer (Chem)
 - Pulp and Paper Making

- CIVIL ENGINEERING**
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 - Construction Engineering
 - Highway Engineering
 - Professional Engineer (Civil)
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 - Sanitary Engineer
 - Structural Engineering
 - Surveying and Mapping
- DRAFTING**
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 - Architectural Drafting
 - Drafting & Machine Design
 - Electrical Drafting
 - Mechanical Drafting
 - Sheet Metal Drafting
 - Structural Drafting
- ELECTRICAL**
- Electrical Engineering
 - Elec. Engr. Technician
 - Elec. Light and Power
 - Practical Electrician
 - Practical Lineman
 - Professional Engineer (Elec)
- HIGH SCHOOL**
- High School Diploma

- Good English
 - High School Mathematics
 - High School Science
 - Short Story Writing
- LEADERSHIP**
- Industrial Foremanship
 - Industrial Supervision
 - Personnel-Labor Relations
 - Supervision
- MECHANICAL and SHOP**
- Diesel Engines
 - Gas-Elec. Welding
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 - Industrial Instrumentation
 - Industrial Metallurgy
 - Industrial Safety
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 - Mechanical Engineering
 - Professional Engineer (Mech)
 - Quality Control
 - Reading Shop Blueprints
 - Refrigeration and Air Conditioning
 - Tool Design
 - Tool Making
- RADIO, TELEVISION**
- General Electronics Tech.

- Industrial Electronics
 - Practical Radio-TV Eng'g
 - Practical Telephony
 - Radio-TV Servicing
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 - Diesel Electrician
 - Diesel Engr. and Fireman
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- Combustion Engineering
 - Power Plant Engineer
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 - Stationary Fireman
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- Carding and Spinning
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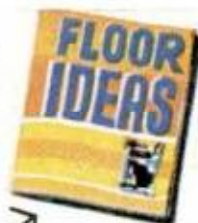
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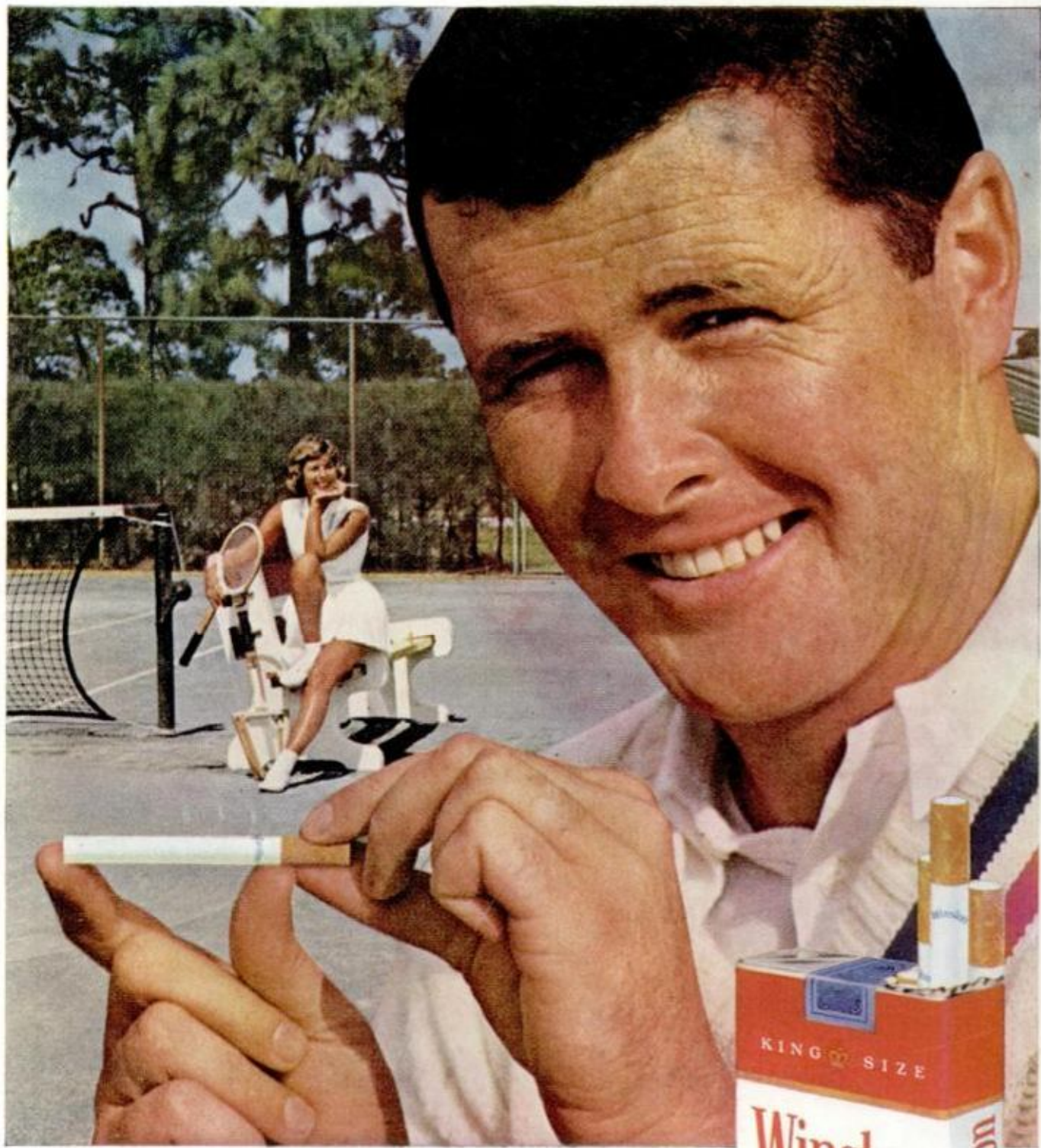
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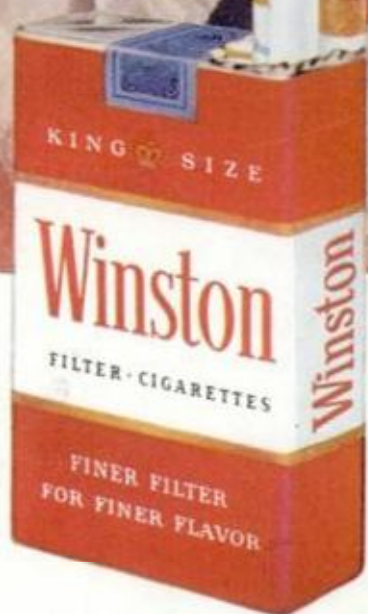
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