

SPECIAL: 10 Hideaway Vacations

POPULAR MECHANICS

MAY, 1961

35 CENTS

**What Owners Think of the
85 and 101-hp. COMETS**

**WILL A
COMPACT
CAR
REALLY
SAVE
YOU
MONEY?**

—page 85



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• Also adding to the silence of the ride is extra sound insulation.

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• Millions of car frames are shaped like an "X." Weak in the middle, they can be twisted out of shape. Guardrail frames in the Ford and Mercury cars curve out. They are strong in the middle. Guard rails also protect passengers in the unitized bodies of Falcon, Thunderbird, Comet and Lincoln Continental.

• Doors in the Ford Family of Fine Cars are stronger. They are

braced with steel ribs. This means they are more rigid and therefore close tighter and quieter. They are less subject to distortion, reducing the likelihood of developing squeaks and rattles.

These are four of the many reasons we think you will find (upon comparing our cars with other cars) that Ford Motor Company builds better bodies.



American Road, Dearborn, Michigan

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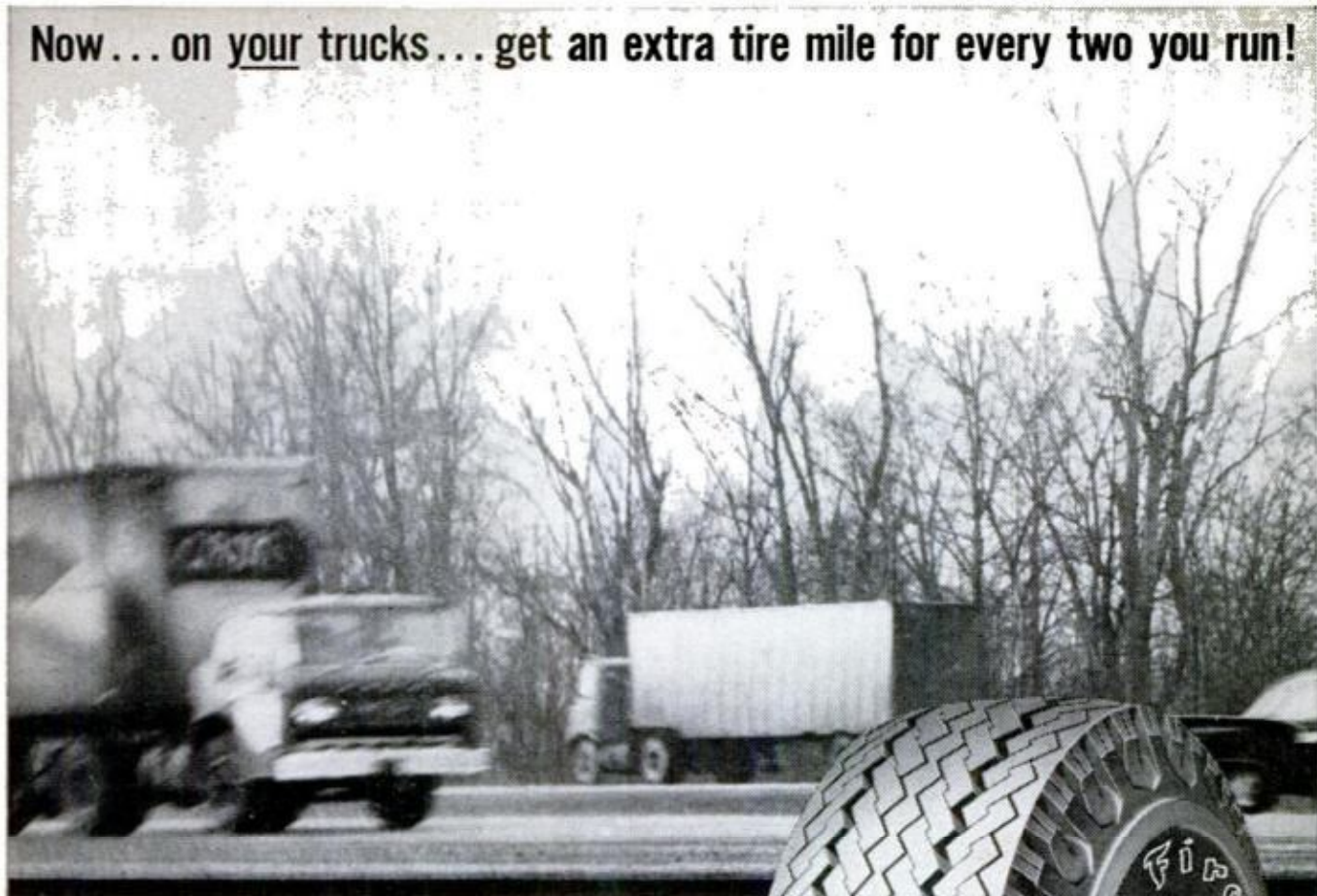
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POPULAR MECHANICS®

MAY 1961
VOL. 115 NO. 5

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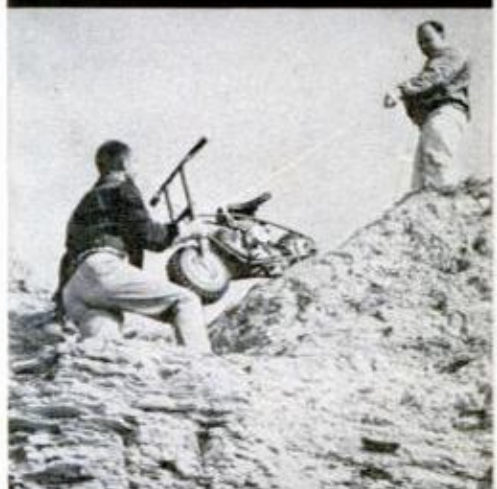
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This One



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Your whole family can go along with you. Take along your friends, too, if you like. You're allowed up to 11 guests. Your party can include 12 people in all. And you'll be able to live in style while you see the sights of

a lifetime, because you'll be given \$5,000.00 in cash for spending money.

It's easy! Anyone can win! You don't have to buy *anything!* Just go to your favorite service station, car dealer or garage. Get a free spark plug check and a Champion entry blank. It gives you complete details and contest rules. (You just write a simple statement in 25 words or less!)

Contest opens April 11—closes May 31. Winners will be notified about July 31. Trip can be taken any time during the following 12 months. So drive in and ask for your free spark plug check and entry blank *today!*

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Comet 2-door sedan—This is the new 1961 model. Equipped with heater and whitewall tires.

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250 Coleman camp stoves—Lightweight and clean-burning for camping or backyard barbecue.

700 Coleman picnic coolers—Lightweight, Snowlite coolers with thick, protective insulation.



CHAMPION

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OVER THE EDITOR'S DESK

Greasy Fork Roadability

Got a kick out of the Ben Davis article on driving in snow (January PM). Here in Washington, D. C., some jerk will always say the people just don't know how to drive on snow and ice. Why, back home, the story goes, we drove easily through worse conditions.

Baloney. Cars aren't designed to take it today, no matter how good the driver. Car manufacturers rave about test driving from coast to coast through sun, heat and cold but what good is an economy-run record when you can't even get to work?

One answer is four-wheel drive that can be switched in when wanted. Another might be some means of shifting from automatic to standard transmission for winter driving. Still another would be emergency chains that could be put on without back-breaking effort. Snow tires with metal cleats might be useful.

My '59 convertible is pretty reliable but holds the road like a greasy fork holds a piece of slippery spaghetti. With luck and chains, you arrive.

Falls Church, Va. Willard R. Moody

You make some good points, Will, but the main trouble is probably the faulty memories of those announcers who reminisce about what happened back home. Like Grandpa's version of the blizzard of nineteen-ought-six.



Underwater Walking Lung

For years your magazine has always been first to print new gadgets. Here's one, for walking underwater to a depth of 10-11 feet. Just walk in, reach up and pull down



the round charger can and air is forced into square reserve can and thence through small round valve box into mouthpiece. Air can only go one way. About one pull-down a minute does it. Walker uses 30 pounds of lead or seven bricks.

St. Louis, Mo. Capt. Max W. Taylor

What do you undersea strollers think of this gadget?



Ancient Waker-Upper

I consider myself a bit of an inventor and gadgets fascinate me. One such gadget, dear to my heart, wakes me in the morning, gives a warning ring, turns on the light and provides me with a welcome cup of steaming tea.

My modern outlook on the subject of gadgets was somewhat shattered, when, on a recent visit to the British Museum in London, I came across a traveling alarm clock made by a German in 1590.

Setting the clock to the desired time of waking, the hour hand operates a trigger which in turn sets in motion a revolving wheel against flint. The resultant spark sets off a small charge of gunpowder which causes a short tallow candle to light.

This ingenious German had the answer almost 400 years ago.

R.M.S. *Mauretania*, John D. Gaul
Cunard Steamship Co., Ltd.



Welded Frustration

Old cannon balls attract children, especially to the Stark County courthouse lawn here. But there was a problem of rounding up cannon balls after they had been bowled, shot-put or whatever use small boys thought of for them.

Fasten them together, someone suggested, so they were arc-welded by Ed

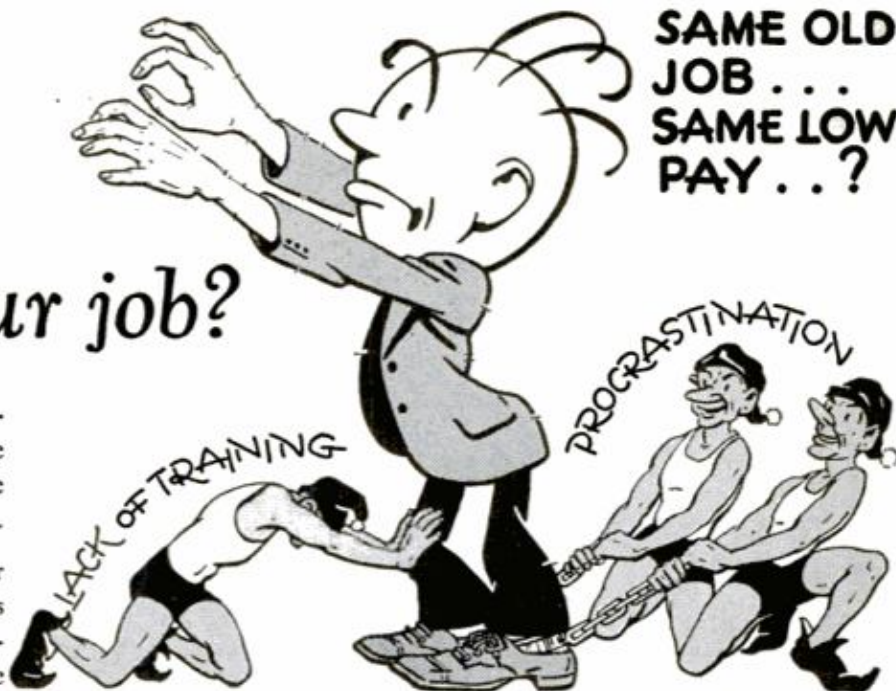
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Are You "STANDING STILL" on your job?

**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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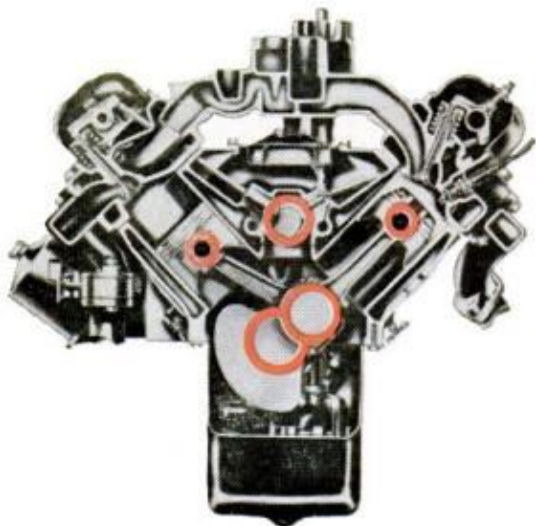
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Get a complete overhaul

New valves and rings are not enough. Why? Piston rings usually control oil from slipping into the combustion chamber, but even new rings can't control the more than 25 times normal amount of oil thrown off by worn bearings. This excess oil is forced into the combustion chamber where it burns to carbon and varnish. Deposits build up on valves, rings get clogged, and plugs become fouled.

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Precision engine bearings are vital to getting maximum efficiency from your engine. That's why Federal-Mogul bearings are made to tolerances that give exact oil clearances . . . tolerances as close as .00025". And that's why Fm replacement bearings are best for your car—American or import.



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Blank of Toulon. Now even a husky lad like Dennis Hamilton, shown here, has trouble just lifting them.

Toulon, Ill. Ernest Robson

What happens when the bigger boys use the cannons for baseball bats, Ernest?



Eager for Gas Additive

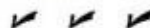
Read with great interest your article on the new gas additive (March PM). When will it be available commercially?

Thoroughly enjoy your magazine and wish it came out twice a month.

Montgomery, Ala. Ronald W. Kinney

Because of the tremendous response from PM readers, Fuels Research Corp., 2114 Curtis St., Denver 5, Colo., has agreed to supply 12-ounce cans of the gas supplement (enough to treat 96 gallons) for \$1.75 each postpaid.

Your remark about publishing two issues a month just gave gray-heads to the few young fellows around here who have some hair left to turn gray.



PM's Longevity

Rummaging around the attic I came across an April 1904 issue of PM. Is this a collector's item? When did your first magazine come out?

Lebanon, Pa. Raymond C. Bixler, Jr.

We like to think any issue of PM is a collector's item, Ray. To answer your question, though, the first issue of PM was published January 11, 1902.



This man is a "security risk"!

Age, 29. Married. Two children. High school education. Active in local lodge, church, veterans' organization. Employed by large manufacturing concern. Earns \$82 a week.

SOUNDS like an Average Joe. And he is. Too average! He's got a job. It pays fairly well. He's satisfied.

But here's the catch. With the right kind of training, this young

man could be stepping into better jobs. He could be making \$7-8000 a year. He could be cashing in on those spare-time hours he now wastes.

As it stands now, he's stuck in his job. Can't seem to make any headway. He's reluctant to try. So he just hangs on.

This man is a "Security Risk" to his wife and children.

His family probably will never enjoy the comforts, the prestige, the good living that could be theirs. If hard times come, they are almost sure to be hurt. For an Average Joe can't expect to compete with trained men when the chips are down.

A man like this would do well to start a planned program of self-improvement. In his spare time. In a field related to his interests and abilities. Right NOW!

One good way to start—a way proved by hundreds of thousands of once-Average Joes who are making good today—is to enroll for special training with a recognized correspondence school. One like I. C. S., the oldest and largest in the world.

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SIDELIGHTS

ON AVIATION



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It's quite true. The British government, which sponsored the giant Princess flying boats, had to halt production in 1954 because of delays in producing a suitable engine. Then the land-based long-range jets came along and all but made the flying boat obsolete. The three Princesses have been stored in plastic cocoons ever since.

The British war office disposals organization, which will handle the sale, hopefully points out that, even if no flying purpose is discovered for the three airships, their huge hulls may meet other requirements.

They'd make dandy yacht clubs.

Despite the recent rash of air crashes, it's still safer in the air than on the ground — about three times safer. The Civil Aeronautics Board claims the rate of death on scheduled airlines is less than one person killed per 100,000,000 passenger miles flown. For each 100,000,000 passenger miles driven in automobiles and taxis, there are nearly three deaths.

There's the old joke about the girl who was dancing with knees in her eyes because the boy in her arms was too tall. She should date jet pilots—they grow shorter under certain conditions.

Swedish scientists, after examining Swedish Air Force pilots who were forced to bail out of their planes, announced that the tremendous G-forces which they are subjected to when shot out by the ejector seats compress the vertebrae and make the pilots about an inch shorter. The spine straightens itself out in time and apparently is stronger than ever after such pressure.

How carefully are packages handled in shipment? To find out, the Air Force recently conducted tests using standard containers, inside of which were shock-sensitive recording instruments, and shipping them on a series of cross-country flights. Incoming packages got better treatment than outgoing packages; packages marked "Fragile" got the same treatment as the others; and the maximum distance packages were dropped was 29 inches.

Kevin V. Brown

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Own a business—and enjoy independence! Thrill to the satisfaction of being the boss. Give orders—not take them! The refrigeration field is ideal for getting started on your own. You can make friends as you make service calls. In time, you'll have a list of potential customers. You can also sign service contracts with food stores, taverns, restaurants, etc. Ever so many CTI graduates have their own successful shops. Most of them began with nothing more than their new training and pluck. You, too, can start small and grow big. Be a business man!

You could get into the profitable new auto air conditioning field

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You must look into your opportunities

Thousands of CTI graduates (and students) tell us they are getting better jobs, earning more money, working steady. Many are going in business. It is surprising how many report the best benefit of all is that they gained self-confidence. With so much at stake, can you afford to neglect *your opportunities?* Isn't it worth a few minutes of your time to *find out?* Just fill out and mail the handy coupon! Be sure to act today.



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BULLETINS FROM THE WORLD OF SCIENCE

DON'T USE DETERGENTS to wash your hair with, warns Joseph B. Jerome, a consultant to the American Medical Assn. They are made for heavier duty than shampooing, and are "likely to contain caustic ingredients which are irritating to the more sensitive areas of the skin. In using such products," he says, "one must always consider the possible damage not only to the hair and scalp but also to the eyes."

Earth's equator, it seems, is not round at all. It's egg-shaped. Astronomer Imre G. Issak of the Smithsonian Astrophysical Observatory came to this conclusion after studying photographs taken by cameras in the Vanguard I and II space satellites. He says the equatorial diameter is about 1400 feet longer from a point near the Admiralty Islands above eastern Australia than the diameter from a point on the equator below Southern California across to a point below Iran.

Earth's speed of rotation is another puzzle. It slowed down from 1955 to 1958 but—don't hold your breath—it has speeded up again. Dr. William Markowitz of the U. S. Naval Observatory, comparing atomic time with time based on the Earth's rotation, said Earth slowed down by one-thousandth of a second during those years and then speeded up since then by three-fourths of a thousandth of a second.

Observations of the Moon for the past 300 years have shown the Earth's rotation varied in speeds. It was not until the construction of an accurate atomic clock in 1955 that it has been possible to determine if the changes in speed were gradual or sudden. Dr. Markowitz says the latest change was a gradual one.

Another ill wind has blown good. British scientists have found that a moth that got mixed up in the French A-bomb test in the Sahara Desert last February flew on to England. This proved a theory that some English moths winter in Africa rather than Europe. The moth was carrying a single radioactive particle "entirely typical" of particles seen after atomic explosions on ground level.

(Continued to page 16)



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Electricity as an anesthetic has been successfully used by three University of Mississippi doctors in two operations. The patients, both women, recovered consciousness quickly after the current was turned off. The doctors called the results most gratifying.

A new metallic compound developed by DuPont researchers becomes magnetic when the temperature rises above a certain point. This point can be adjusted over a range of several hundred degrees by changing the composition of the compound.

More than 50 radio stars, many beyond the Milky Way galaxy, have been found by the new Radio Observatory at the California Institute of Technology.

Optical radar may some day be used to record pictures of distant objects under conditions unsuitable for use of cameras.

University of Michigan scientists recently sent a beam of very intense red light from a laser (light amplification by stimulated emission of radiation) across Willow Run airport and were able to measure the light reflected from an experimental target three miles away.

The laser, as opposed to conventional radar, emits energy of very short wave lengths and does not need a large antenna to confine the energy to a very narrow beam.

Over 500 oceanography jobs are currently open yet only a dozen or so U.S. schools offer training in this field.

James Biery

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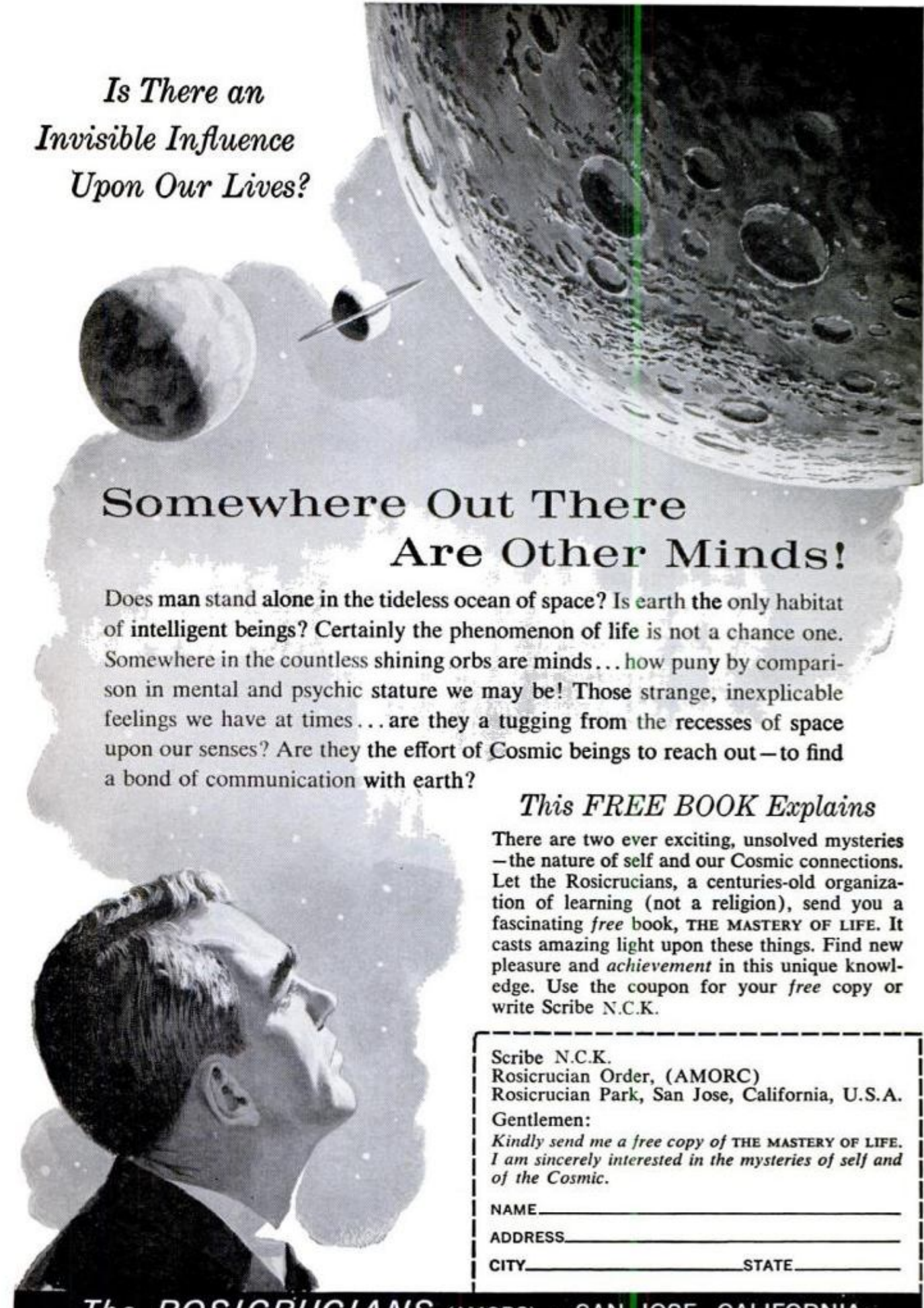
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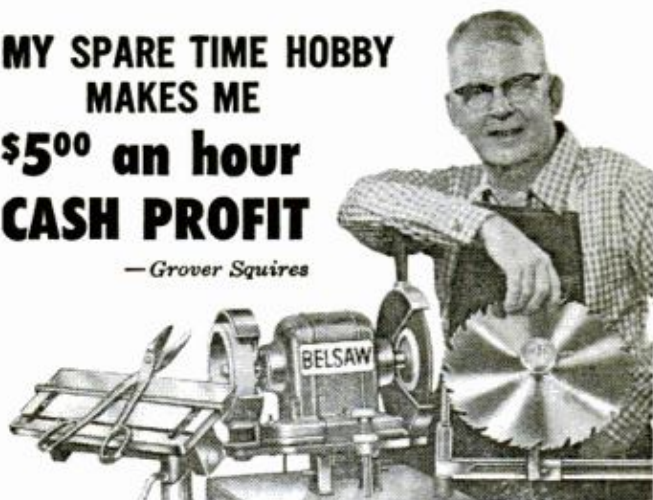
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**ITEMS FROM
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OUTBOARD SPEED gets to be a little more important every season, and with the current trend toward catamarans, hydrofoils, and point-planing hulls with high-performance motors, the outboard propeller is the weak link in many outfits.

With such hulls, the prop ends up in a position nearer the surface of the water than usual, and the conventional prop begins to slip and cavitate.

A new speed wheel, specifically designed for high-transom operation on the bigger outboards, eliminates that problem. It's good for another two miles an hour on a fast rig, and will operate efficiently on transoms two inches higher than standard. It's the new Prop-Rider by Michigan Wheel Company of Grand Rapids, Mich.

The same outfit has come up with a good-looking guarantee: They'll replace any outboard prop made of their Michalloy-K bronze if it breaks at the hub.

Another good new product from a respected old company is the Wondershaft hollow-fiberglass golf-club shaft made by the Shakespeare Company, long-time leaders in the manufacture of fiberglass fishing rods and archery equipment.

The Shakespeare process, apparently very similar to their Howald process for tubular glass rods, makes a tremendously strong, yet flexible, shaft with half a million parallel full-length glass fibers. A club built around the new shaft will add yards to drives, and has the additional advantage of needing no lacquer, varnish, or other protection—it won't rust, rot, warp or lose its color. The shafts will be sold to club manufacturers in any color.

There's good news for dog owners in this month's third new product. It's a drug named Ectoral, developed by the Pitman-Moore Co., of Indianapolis, Ind. You give it to your dog in pill form. It goes through his blood stream, killing fleas, mange mites and other parasites in less than an hour. Available sometime this spring through veterinarians, the pills are administered one-every-other-day for eight days, then only one a week to keep the dog flea-free. The pills will cost about 25 cents apiece.

Dick Kichpatrick

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SIDELIGHTS FROM THE PENTAGON

By William R. Kreh

A PAIR OF "hands" will be added to the Navy's bathyscaph *Trieste* when it makes its next series of research dives this summer off Bermuda. The deep-diving sphere will have remotely controlled claws which will enable operators to pick up samples of material on the sea floor. The bathyscaph will also have a new three-camera closed-circuit television system to see what's going on in its eerie underwater world.

Ice breaking is getting a new break from electronics in the Antarctic. The Navy is testing a method of clearing ice from harbors, dock areas and channels by using electrical motors to drive specially shaped propellers. The motors are lowered through small holes blasted in the ice and the propellers generate a swift current which eats away the ice sheet from underneath. Using two 10-hp. motors, a channel was cleared by the current in about a week. The propellers were also lowered to draw warmer water from the depths to the surface. This helped widen the channel. The ice was originally seven to eight feet thick.

The Army has a new machine to teach soldiers how to drive tanks. The device simulates the complete driving cycle of the M48A2 medium tank, including sound effects. An elaborate electronic system reproduces all instrument and gauge movements and the sounds of start-up, main engine, auxiliary engine and transmission, all according to how the driving controls are manipulated.

Marine Lt. Col. Frederick E. Hughes has received a patent for an unusual magnetic fish lure that wiggles at the right time. The artificial bait contains a permanent magnet. When the line is slack, the lure turns in the water to align itself with the earth's magnetic field. This little wiggle, the colonel says, has an "irresistible" effect on fish.

How good are sentry dogs? The Air Force has an answer.

Its sentry dogs have been so effective guarding base weapons-storage sites and parked aircraft that the Air Force's own trained "saboteurs" have given up in disgust. These saboteurs are members of the office of special investigation whose job is to test the security of Air Force bases by

trying to get into them anyway they can.

Unlike their handlers, the dogs were not aware that occasional "surprise" penetrations were all part of the security routine. So they treated all trespassers alike—ferociously. Now the OSI men avoid those areas patrolled by dogs wherever they can.

The idea of sinking 1000 scrap automobiles off Miami Beach to create an artificial reef has been scrapped by the Navy. It might create a good fishing area, which was the purpose behind the suggestion, and the Navy's all for that. But it might also create a good submarine cover, and the Navy's against that. It says an enemy sub could hide alongside the metal reef and underwater detection devices would be unable to detect it.

The Air Force is experimenting with a "vocoder," a gadget designed to relieve congestion on crowded radio-communications channels. It ignores redundant sounds in speech and transmits only those sounds needed to make speech intelligible. By doing this, the vocoder can use a narrower frequency band for transmitting.

Instant rifles?

The Army is now supplying some of its units with "canned rifles." Packed in hermetically-sealed containers, they are ready for instant use. Historically, rifles were packed with heavy grease in wooden crates. They had to be de-greased with special equipment and inspected before use, a tedious process. The new method features 10 rifles in each air-tight container, ready to go. They can be safely parachuted to troops in the field.

The USS *Spinax* claims a unique "first." It has flown a kite while submerged.

One of the submarine's officers, to idle away some time during a long Pacific crossing, whittled some kite sticks from an orange crate, put them together and made a few kites. He tried to fly them while the sub was cruising on the surface, but they weren't strong enough to withstand the rough ocean winds. But the kite bug had bitten.

At an island stop, he and a few crewmen picked up some bamboo sticks and built a really big kite. It was made from five and seven-foot lengths of bamboo, a garment bag picked up at Pearl Harbor, cellophane tape and about 1500 feet of nylon line. First they flew it from the surface, then they decided to try it from underwater. They tied it to the rigging and, while the sub submerged to periscope depth, the crew took turns watching their handiwork through the periscope. ★ ★ ★



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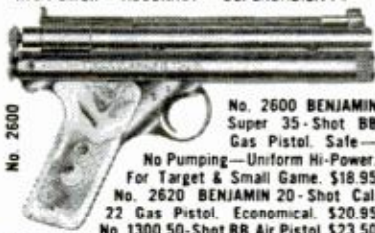
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TUNE IN ON THE INVENTORS



THREE REALLY IMPORTANT inventions stand out in the last few issues of the Patent Office Gazette.

AVOIDING AIRCRAFT COLLISIONS is the purpose of the invention of Richard Miner of Port Washington, N. Y. His new warning system alerts pilots by sounding an alarm at any time they are on a collision course with another, similarly equipped aircraft. The system uses radio beams which are continuously transmitted from both planes.

On the basis of the strength of an incoming signal, a computing device automatically gauges the possibility of a collision, then sounds an alarm. Other systems give frequent false warnings, but the Miner system greatly reduces that possibility. His patent is number 2,969,539.

SMOG PREVENTION may not seem too important unless you've spent some time in a smog-bothered city like Los Angeles, but it's plenty urgent there. Inventor Joseph Falzone, of Old Bethpage, N. Y., has just patented an antimog attachment for auto engines that not only reduces pollution but also increases the car's efficiency.

With Falzone's system, a filter in the exhaust pipe picks up unburned hydrocarbons from the exhaust gases and recirculates them through the carburetor, where another trip through the combustion chamber burns them off. His patent, number 2,969,782, is his third.

STOPPING DUTCH ELM DISEASE could keep that beetle-borne fungus from eliminating the elm as a shade tree—as it already has in some areas. Glenn Brown, of Huntington, Ind., was awarded patent number 2,967,377 for a chemical solution which dissolves the fungus which otherwise will clog the food canals of the tree. The solution, which contains sulfur, tartaric acid and iodine, is poured into a hole bored in the trunk, and is circulated by the tree's own system. Tests over 18 months have showed that treated trees survived with only negligible losses in areas where more than 50 percent of the untreated trees died. Since 18 months is the life expectancy of an elm with the disease, it is believed that the Brown solution may be the cure.

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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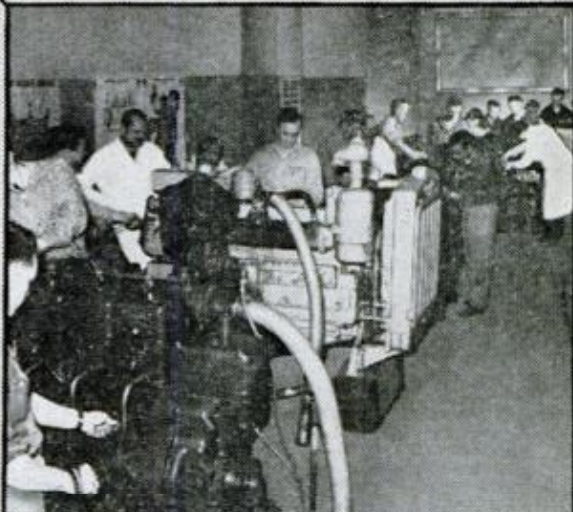
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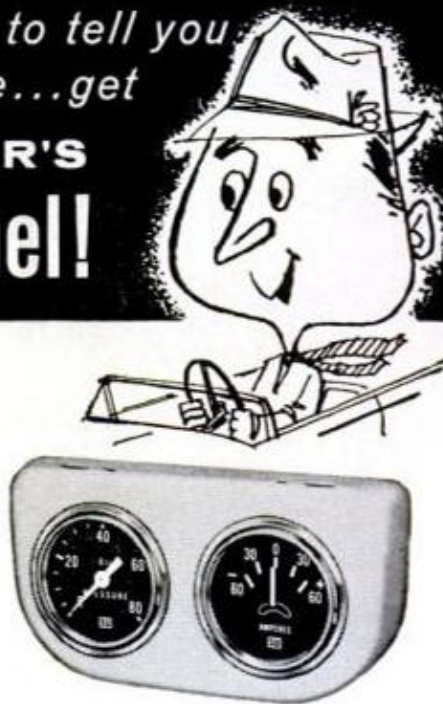
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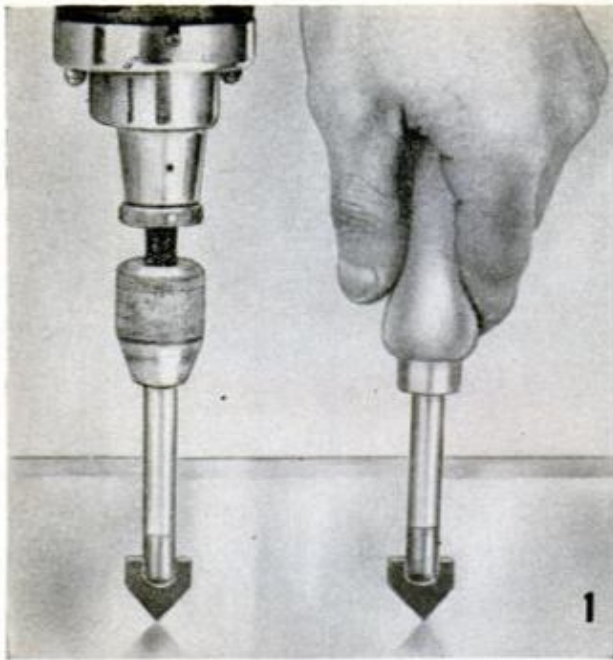
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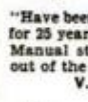
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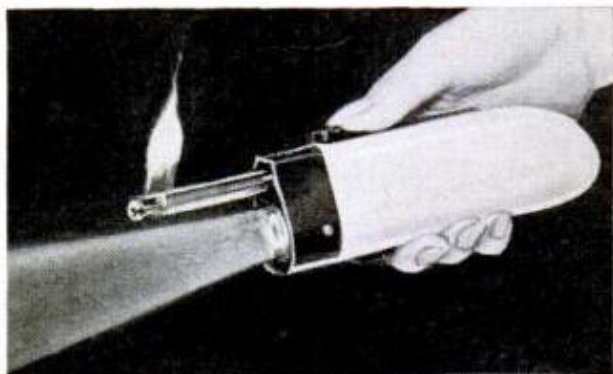
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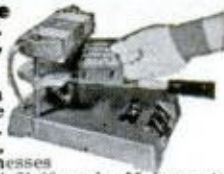
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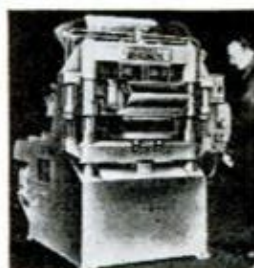
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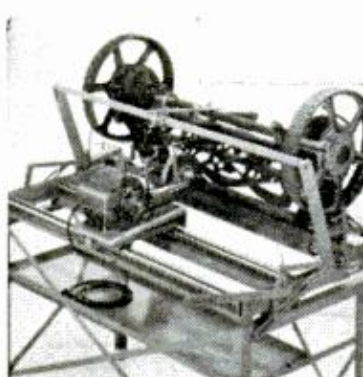
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MAILORDER, Beginners plans. Free information. Armstrong's, 154 Darrington S.W., Washington 24, D. C.

SIMPLIFIED "Bookkeeping System" for mailorder beginners. \$1.00. Neil H. Tasker, Shamokin, Pennsylvania.

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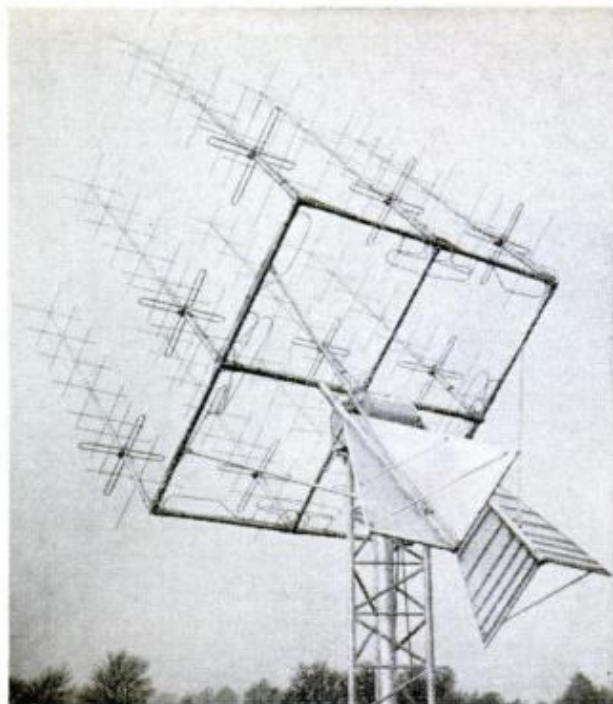


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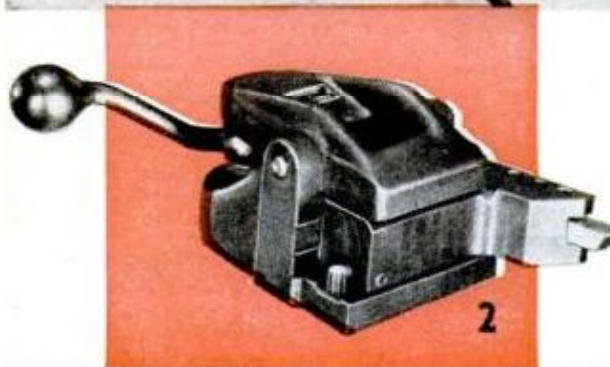
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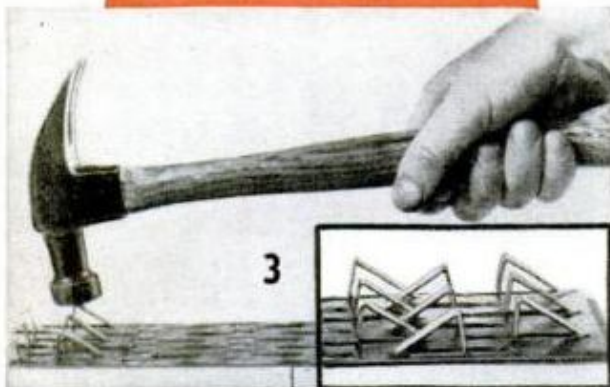
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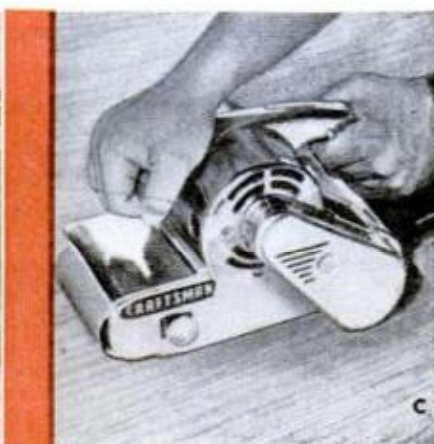
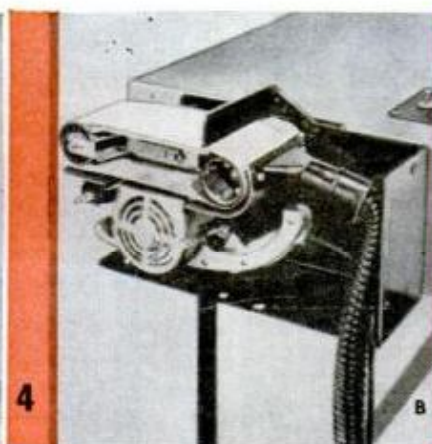
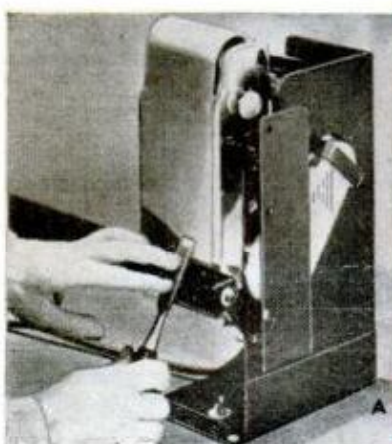
1. STROBOSCOPIC TACHOMETER pictures the torque and power-loading characteristics of electric motors in actual operation. Dynamometer is fitted on motor shaft. In use, dynamometer on shaft is viewed by stroboscopic tachometer while rotating. Transmitted torque is read on dynamometer dial and r.p.m.s. are shown on dial on stroboscope, the setup being made as pictured. Micro Pump Corp., Box 392, Danville, Calif.



2. CAM-ACTING TOOL POST for lathes grips and releases tool holder by a short throw of the ball handle. Holds tools more rigidly than conventional tool post, increases machining speed and accuracy and simplifies special tooling setups. Comes in three sizes and is easily and quickly installed on any conventional lathe having a standard compound. Mounts with a T-block. Rhucor, 1313 Lincoln Ave., Pasadena 3, Calif.



3. SELF-NAILING TRUSS CLIP makes it possible to assemble a home-type roof truss from precut materials with a claw hammer. Reduces the labor cost of building light roof trusses as much as 50 percent. Units are made of zinc-coated steel in four sizes to span butt joints of the standard framing members used in assembling light trusses. Integral nails are driven home with single blow. Panel-Clip Co., Box 4025, Dearborn, Mich.



4. PORTABLE 4-IN. BELT SANDER, photo C, can be converted to vertical or horizontal sander, photos A and B, with a simple accessory which provides for dust collection by means of a vacuum cleaner. Accessory supports sander on top of workbench as stationary table sander or on bench top or on workshop wall as a vertical sander. Sands under its own weight of 16 lb. Sears, Roebuck & Co., 925 S. Homan Ave., Chicago 7

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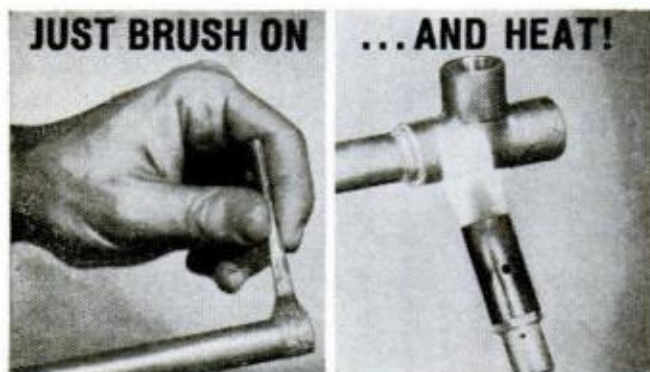
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SPOTLIGHT ON THE
Peugeot 404



PM's AUTO EDITOR found superbly suspended Peugeot at home on snow-covered roads in the French Alps

IF YOU THINK that a five-passenger compact capable of 25 miles per gallon must be a plodding and unexciting car, take heart. There's a brand new import from France that will change your mind in a hurry.

We're talking about Peugeot's 404, a lively, crisp-lined four-door sedan that will outrun and out-handle some two-seater sports cars.

The new car will supplement, but not replace the solidly-built Peugeot 403, a car that's won the respect of import devotees since 1958.

The 404 has an entirely new unit-construction body styled in a modern yet conservative manner by Pininfarina. The styling idiom is typical of the famous Italian designer's recent work on medium-priced sedans, but in my opinion it's the best.

The car design has considerable of the lean, taut look found in good aircraft design, and like an efficient airplane, the 404 does its job with a minimum of poundage. It has a curb weight of 2259 pounds, actually a few pounds lighter than the 403.

The 404 looks smaller than its companion car for the very simple reason that it is smaller—length is 174 inches versus 181, and width is 64 inches compared to the 403's 66.8. It's lower, too, 57 inches compared with the older design's height of 61 inches.

But interior room is just as good if not

(Continued to page 60)



For Traveler's Suit 'n Iron

Always at hand for a traveler is an electric iron that fits into the top of a suitcase so that its handle also serves as a handle for the luggage. To use the iron, the traveler simply slips it out of its recess and plugs it into an outlet. It operates on alternating or direct current. The side of the suitcase may be used as an ironing board. Available from Weller, Inc., 191 Varney St., Manchester, N. H., the 21-inch Iro-Case comes in gray or blue and sells for \$18.50.

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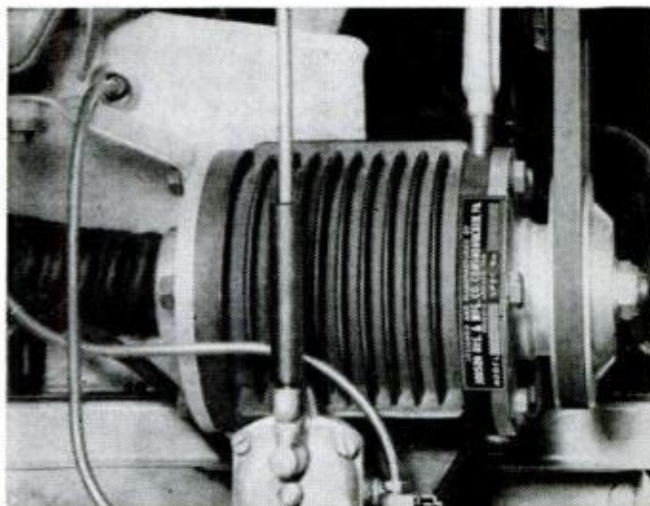
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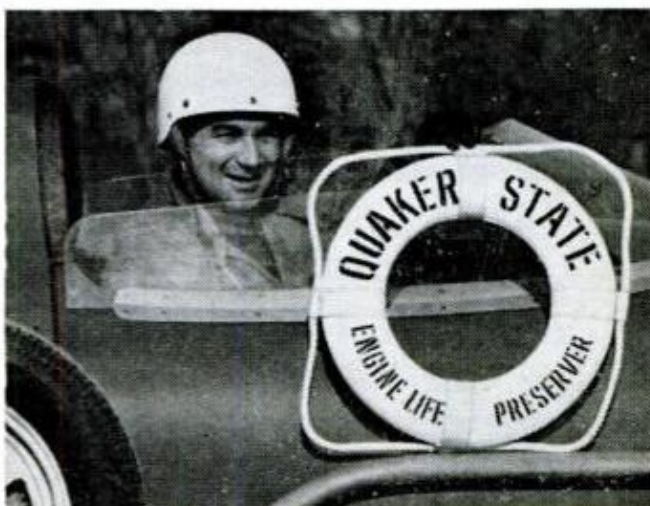
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better. In fact the 404's interior dimensions are comparable to the average U.S. compact with 55 inches of seat width, headroom of 35½ and 34½, front and rear, and leg-room of 43 inches front. Rear kneeroom ranges from 32 to 27 inches depending on front seat adjustment.

The new car has individual adjustable front seats of bench-type soft foam rubber covered with attractive nylon jersey material which looks fragile but is much more durable and practical than it appears to be.

Forward visibility is excellent, thanks to really narrow pillars and a down-sloped hood. Driver's side vision is even better due to elimination of ventpanes from the front windows. Ventilation is indirect through ducts terminating in grilles at each end of the instrument panel. Airflow is regulated by dampers. This feature permits you to cruise at high speeds minus wind roar or whistle.

Another noise-eliminating factor is the automatic, thermally-actuated clutch which permits the engine fan to idle until coolant temperature climbs to 184° F. This means that even in summer driving the fan will normally be in use only at slow speeds. As a result of these factors, plus a good sound-deadening job, the Peugeot's interior is pleasantly quiet at 70 to 80 m.p.h.

Engine vibration, another fatigue inducer, has been cut way down on the 404's new engine by a careful balancing job on all major moving parts. This makes it difficult for passengers to believe that they are being propelled by just four cylinders.

The 99-cubic-inch displacement, 72-horsepower engine is slanted 45 degrees to the right to permit lower hood line and lower center of gravity. The engine revs smoothly and quickly from idle to 6000 r.p.m. Transmission is a four-speed unit with a direct high gear. All forward speeds have excellent synchromesh action.

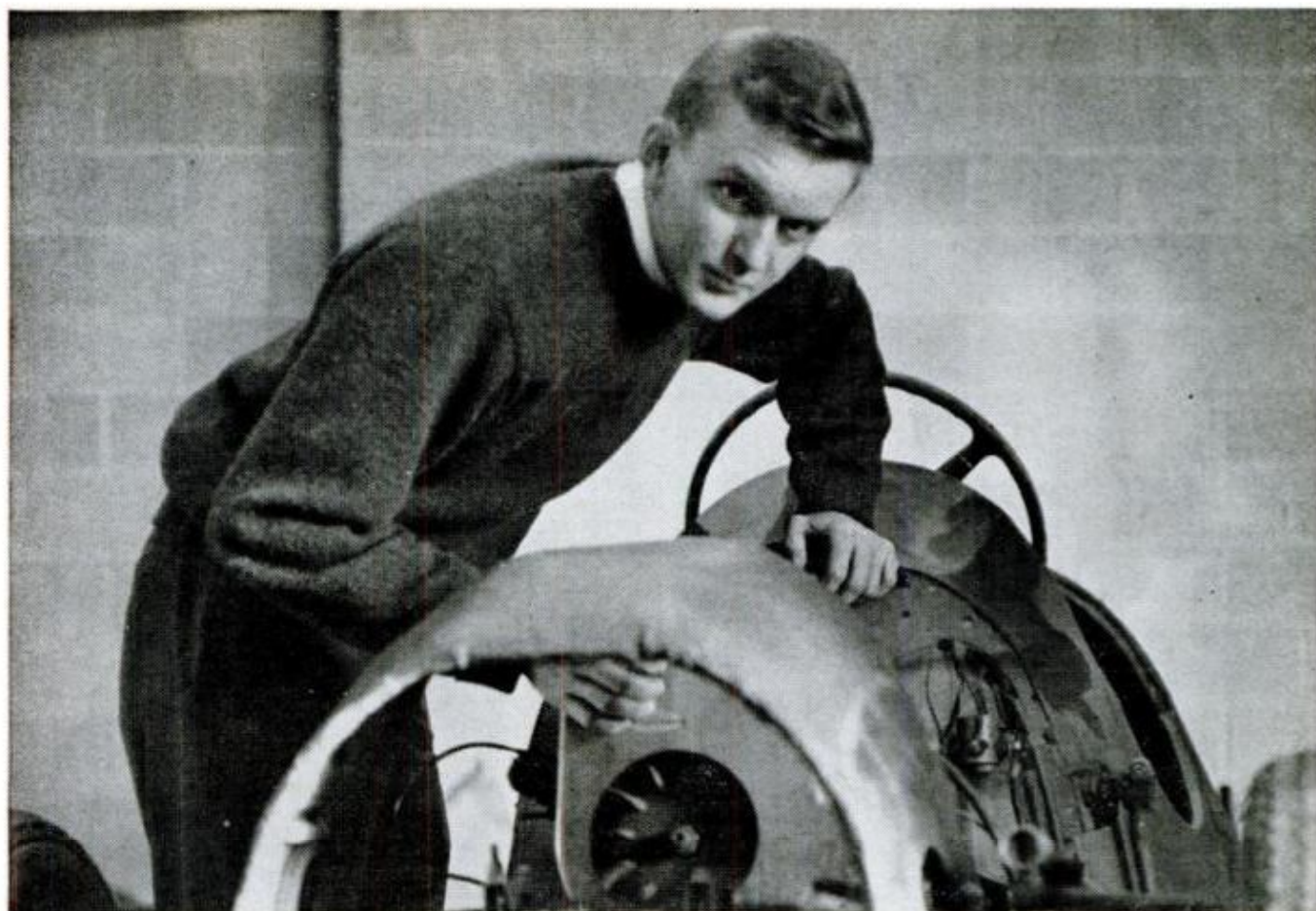
The column shift has the same pattern as the 403's. It's designed for slow and deliberate rather than "snap" shifting and is a bit out of character with the other very responsive controls.

Best of all is the rack-and-pinion steering—not too quick for comfort, but very precise, giving excellent high-speed control.

Suspension on the 404 is a new setup for Peugeot. It consists of front coil springs set coaxially around a tubular strut which combines the function of steering kingpin and direct-acting shock absorber. The support point is high up in the body giving unusually good roll resistance.

The rear axle is positioned by the torque tube and a lateral track bar. Rear springs too, are coils.

(Continued to page 62)



18-year-old Ronald Satterfield of Atlanta, Georgia, asked...

“Where should I build for the future?”

Ronald Satterfield answered this question last year by joining the Air Force. This year about 100,000 young men will also choose this highroad to the future.

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Numerous personal benefits go with service in the Air Force. Steady advancement, the opportunity for more education, medical and dental care, thirty days' vacation yearly. Most important, the Air Force can help a young man prepare himself for the age in which he will have to make his way—the Aerospace Age.

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U.S. Air Force

Airman 2C Satterfield whose civilian hobby was building “hot rods,” is presently enrolled in a 45-week electronic computer course at Keesler Air Force Base in Mississippi.



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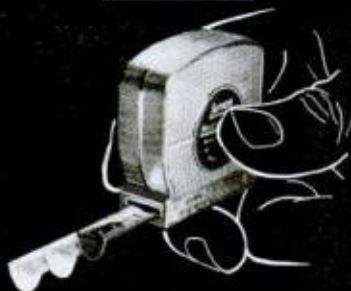
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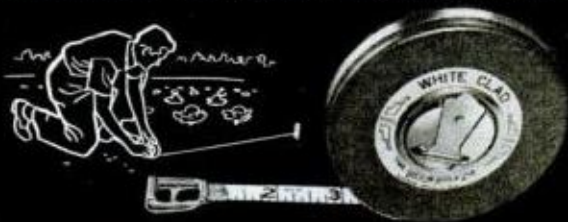
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CRISP LINES of Peugeot's 404 are pleasing from any angle. Square shaped trunk has 20 cubic foot capacity

This novel but highly successful combination of elements, coupled with Michelin "X" tires, gives the 404 an unusually comfortable ride for a 104-inch-wheelbase car, plus roadability that's hard to beat. It corners at speed with a minimum of roll and stays right on the "line" that you steer.

Barreling the 404 down a high-crowned, winding macadam road at high speed is sheer delight for people who love to drive. Those who thought that the 403 was a roadable car, and justifiably so, will be amazed at how much Peugeot was able to improve matters in the 404.

This suspension and steering, as well as the low noise and engine vibration levels, make the 404 a car that is comfortable all day long at 75 m.p.h.

People making a comparison of this car with U.S. compacts (and it's one that should be made) will find that its East Coast price of \$2575 is somewhat higher than that of the average compact. However, it should be duly noted that the 404's price is all inclusive.

You get sliding roof, whitewall tires, adjustable front seat backs, heater, defroster, windshield washer and a thoroughly deluxe, but not gaudy, interior with center rear-seat armrest, horn ring, clock and lighter. Standard under-the-hood equipment includes a full-flow oil filter and oil-bath air cleaner.

In short, if you're looking for a well-made compact and can forego an automatic transmission, the Peugeot 404 offers a whole lot more than just routine economical transportation. ★ ★ ★

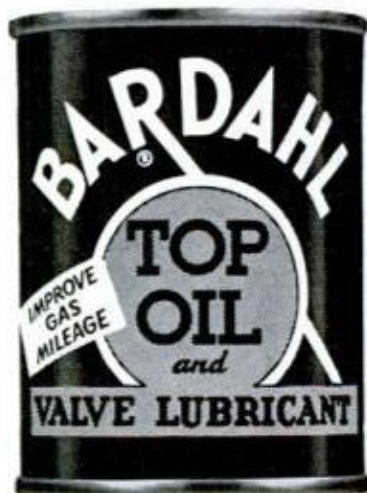
Jim Whipple



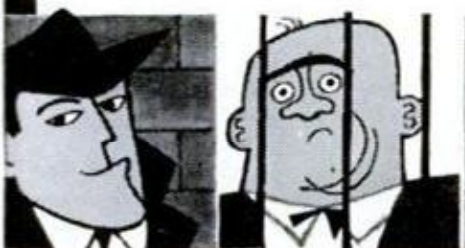
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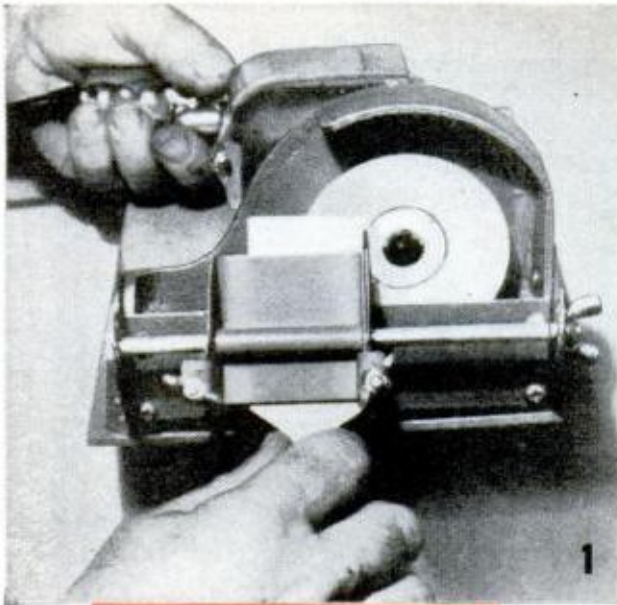


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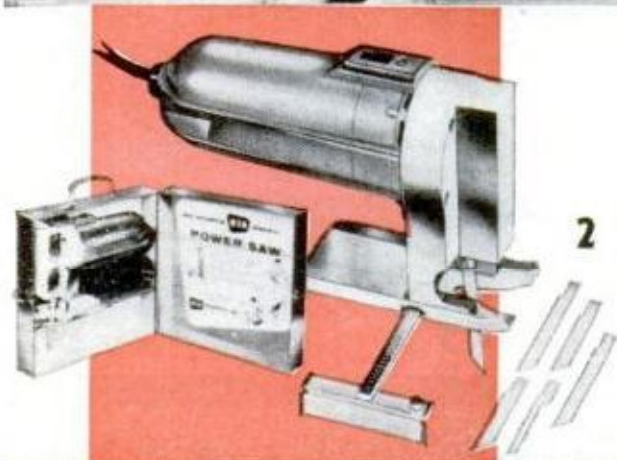


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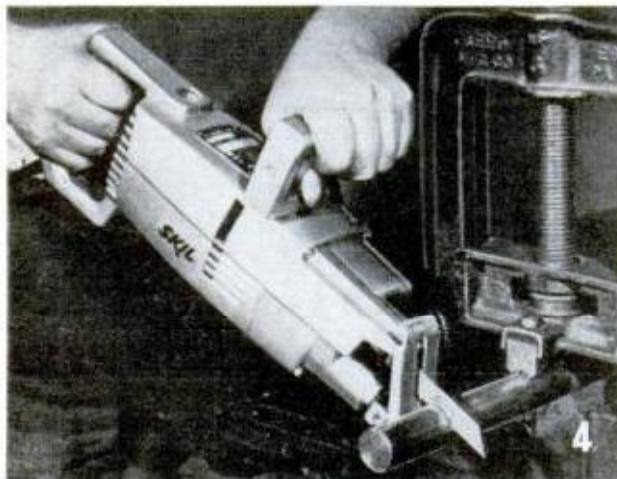
1. CHISEL SHARPENER can be powered by any 1/4-in. portable drill. Does a craftsman's job on any blade up to 2 in. wide. Blade holder permits operator to grind a straight, true edge with a precise bevel across full width. Comes with instructions and is priced at \$5.95 by Easy Tool Co., Box 41, Eugene, Ore.



2. PORTABLE JIGSAW KIT includes jigsaw and assorted blades in handy carrying case. Jigsaw can be used for ripping, crosscutting and any curved cuts on stock up to 2 in. thickness. Cuts steel up to 1/2 in. thick. Weighs 3 1/2 lb., stroke 3/8 in. Ripping fence included. Wen Products, Inc., 5810 Northwest Hwy., Chicago 31

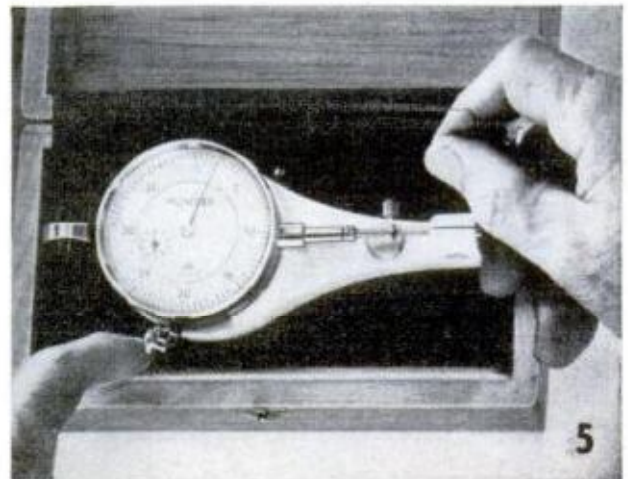


3. NOW YOU CAN BUY nylon machine screws and nuts packaged in lots of 10 to 100 for easy handling and storage. Come with round, fillister, flat, oval and setscrew heads in assorted sizes from 0-80 through 1/4-20. Five washer sizes also are available. Machine Parts Supply Co., 15 E. 37th St., New York 16



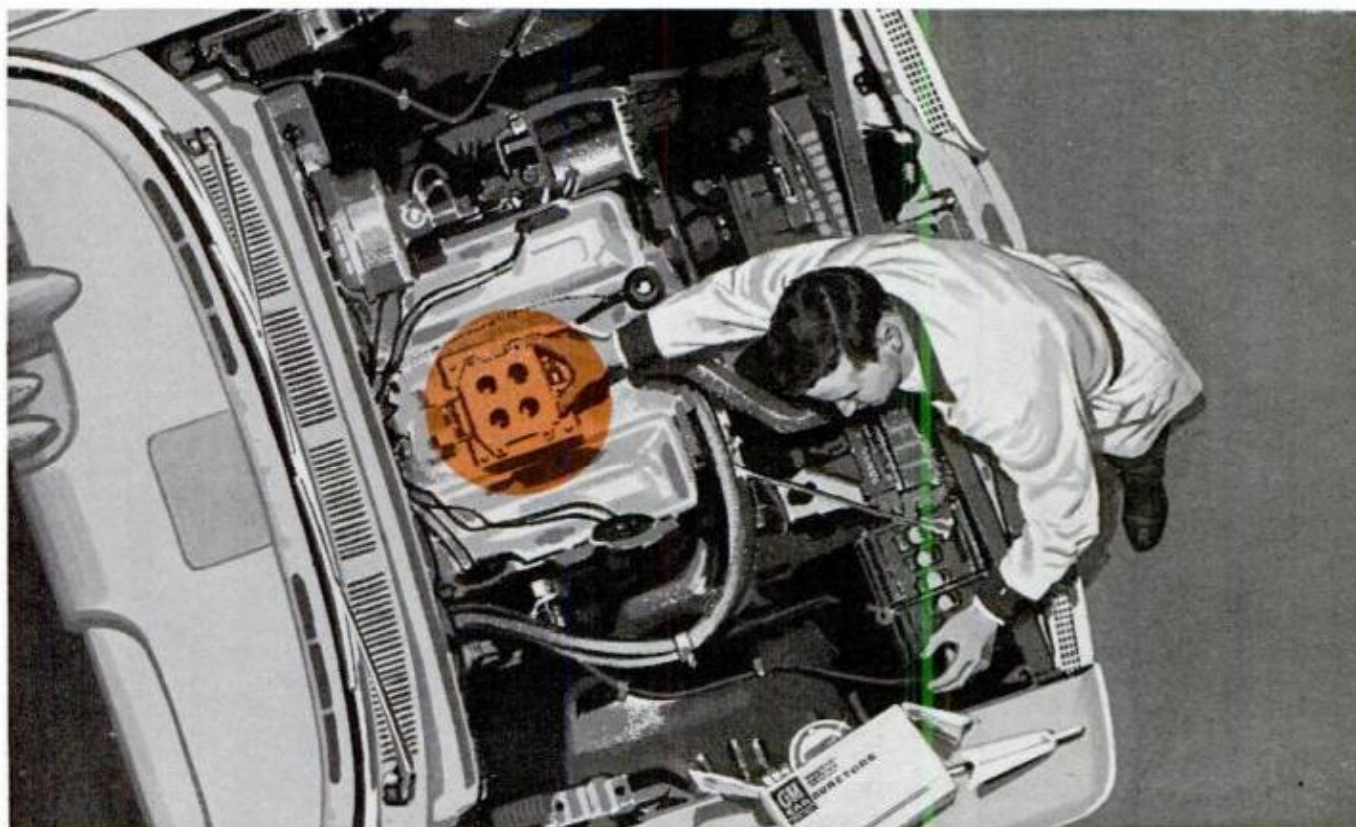
4. TWO-SPEED PORTABLE SAW for cutting all metals, even difficult-to-cut stainless. Unit is reciprocating type with blade speeds of 1000 and 1400 strokes per minute. Low speeds are used for cutting stainless steel and other hard metals, high speed for softer metals. Skil Corp., 5033 Elston Ave., Chicago 30

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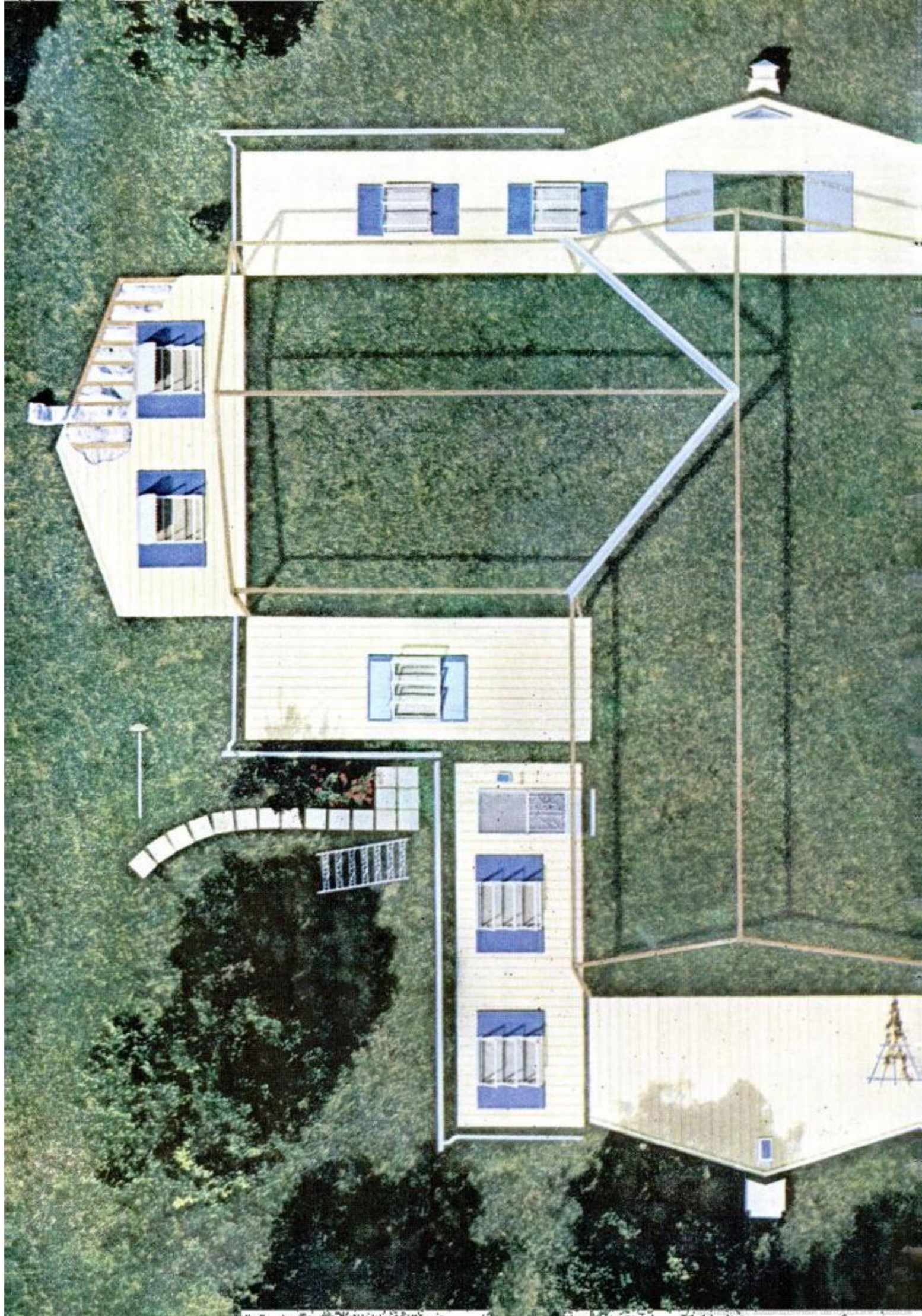


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POPULAR MAY 1961
MECHANICS

Are We Licking Our Missile Fizzle?

By Tom Stimson, Jr.

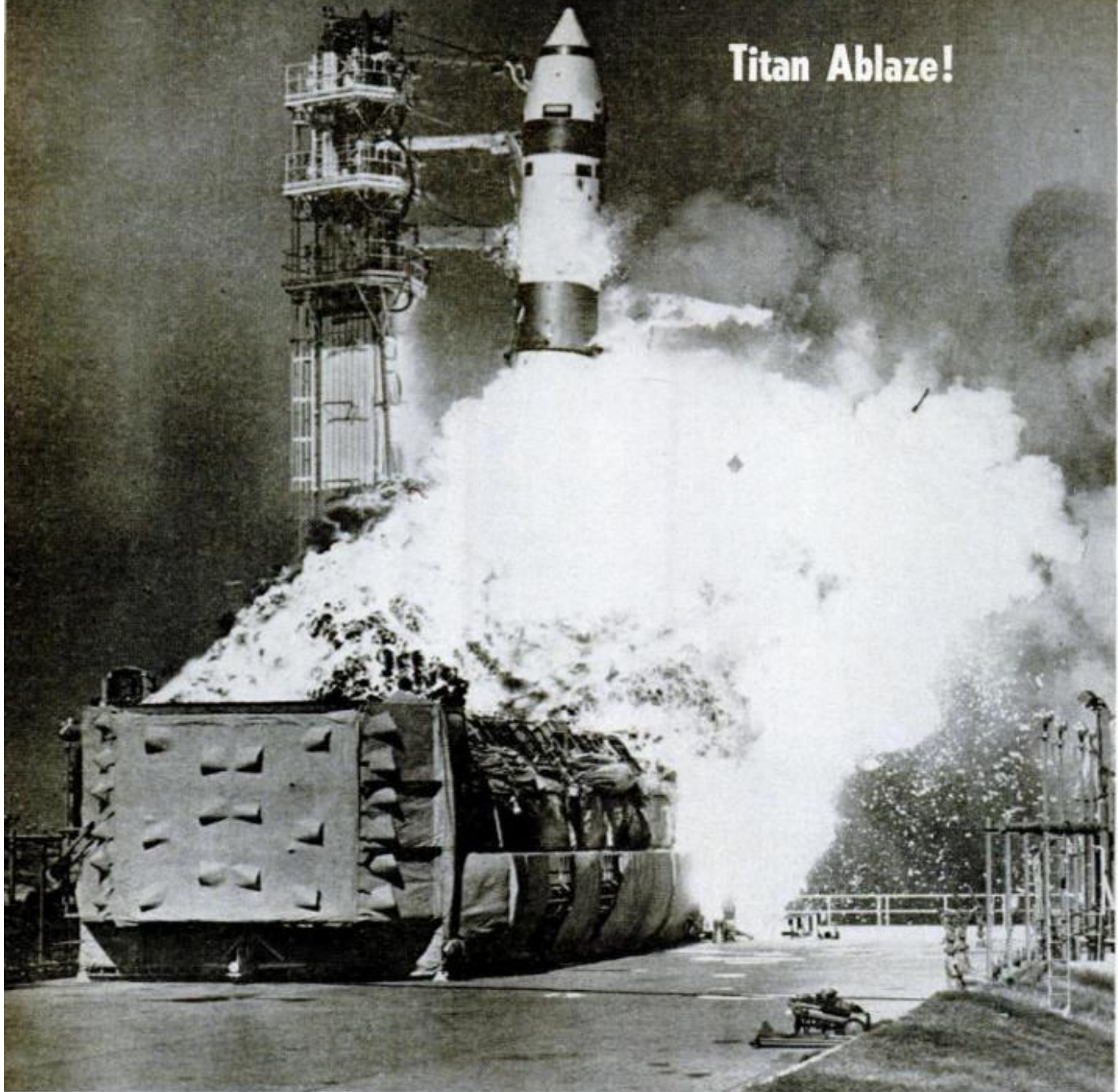
ALMOST HALF of our space flight attempts have been flops, and a substantial number of our big military missiles have fizzled. Lots of mistakes have been made, some of them pretty stupid.

This is a harsh indictment in view of recent successes. These days it is almost commonplace to fire another satellite



**Atlas
Kaput!**

Titan Ablaze!



into orbit or send another ICBM to its downrange target.

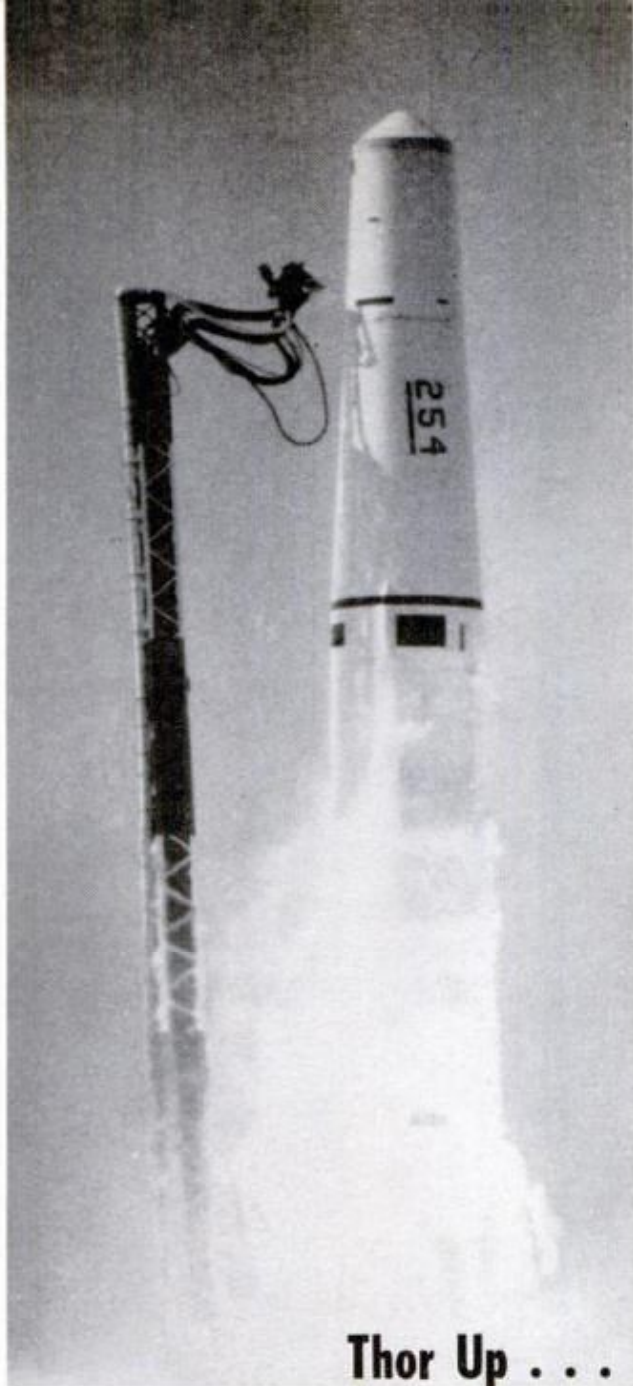
Yet today's successes have come, in large measure, from carefully analyzing yesterday's failures. And there are signs that this "education by mishap" is beginning to be worth the millions of supposedly wasted dollars it has cost the United States to date.

Specifically, what have we learned that will enable us to avoid future failures? What has been wrong, and have we succeeded in correcting it?

People in the industry say that these failures are to be expected. They say our missiles and spacecraft are the most complicated mechanisms ever designed and that most of them are experimental. They say

PERSONNEL of the 6593rd Launch Squadron make a system check on a complex Agena B satellite vehicle

POPULAR MECHANICS



Thor Up . . .



. . . and Down!

they are doing the best they can in view of the "state of the art."

Much of this is true. But some of it is humbug.

Last year the Air Force became alarmed over the way its missile program was going. The basic designs seemed good. All the money required was being extracted from the taxpayer. Yet missile after missile was blowing up or going astray. The Air Force hired Stanford Research Institute to analyze the trouble.

An SRI team examined the reports of 4248 malfunctions connected with nine missile projects. The team found that, depending on the project, from 20 to 53 percent of all malfunctions were caused by human error.

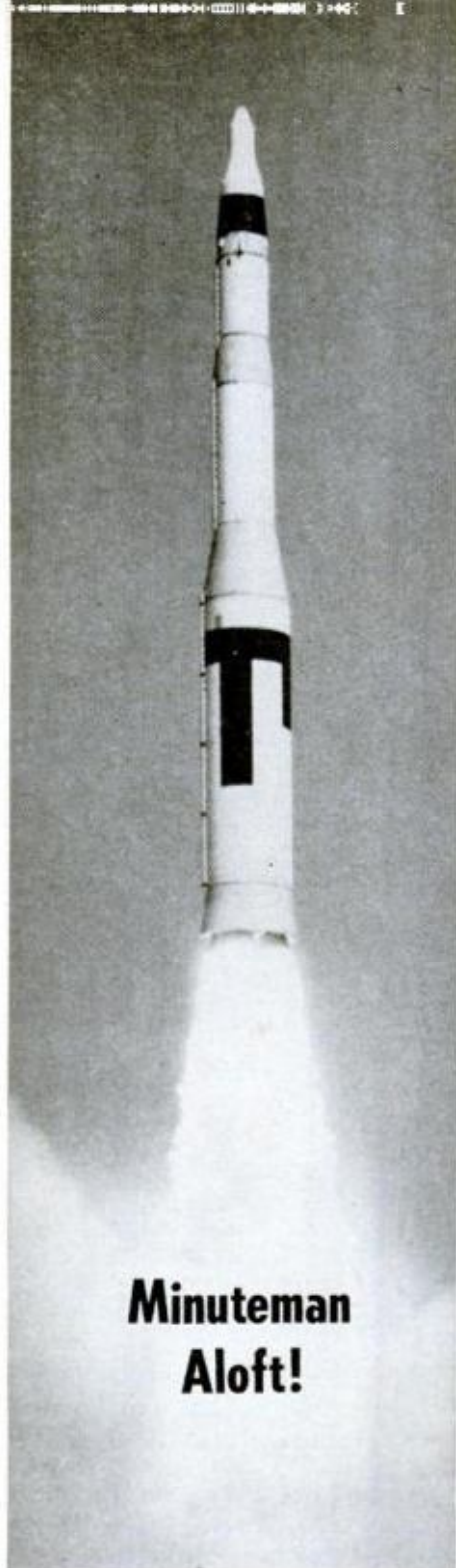
What does human error mean?

It means someone goofed. In one case a

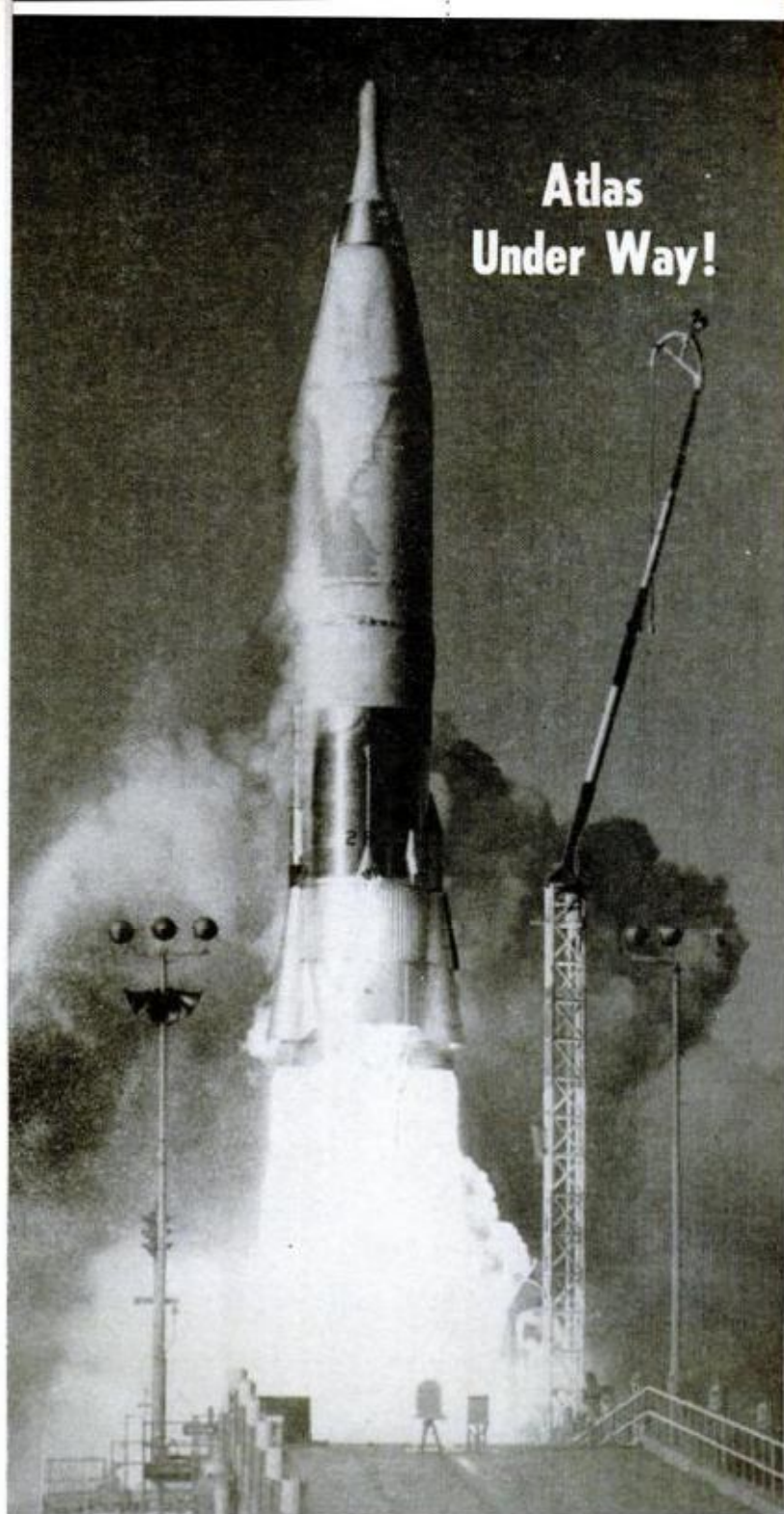
workman dropped a precision part on the floor and damaged it, then installed it in an assembly without reporting the damage. In another case a wire wasn't soldered. In another a wire was stretched so tightly that it pulled loose from vibration when the rocket motor fired. Once the improper torquing of a nut on a 3000 psi hydraulic control line caused the loss of a missile intended to travel a third of the way around the world.

Careful inspection would have detected these mistakes but inspection was sloppy.

Another expensive botch occurred when someone carelessly plugged a 110-volt source into a 28-volt circuit. A wiring assembly, not waterproofed as it should have been, shorted when rainwater leaked onto it. In one instance an electric battery heater was left on. The electrolyte boiled over



**Minuteman
Aloft!**



**Atlas
Under Way!**

onto a maze of wires. Insulation was eaten away and the circuit failed under load. The list goes on and on.

Human errors have even been made by company officials who had the job of determining why their missiles failed. That's a charitable way of expressing it. One missile builder had assigned all its malfunctions to faulty equipment, none to human error. After investigation, the Stanford research team came to the conclusion that human error actually was the reason for 193 malfunctions.

Privately, one missile expert has said he would hate to see us get into a rocket-throwing duel with Russia today. He thinks

a good percentage of the long range rockets on which America is betting its life would fail to hit their targets because of "technical difficulties." In one factory an experienced engineer says "We aren't hiring know-how and common sense these days. We are hiring college degrees. We pay \$10,000 a year and up to graduates fresh out of college simply because they have doctorate degrees." The secretary to an executive of another company said "In this plant the missile work is just a big boondoggle."

This criticism does not apply to the men of the Air Force's Ballistic Missile Division. They have been fighting to get reliable weapons. And there is no criticism of the

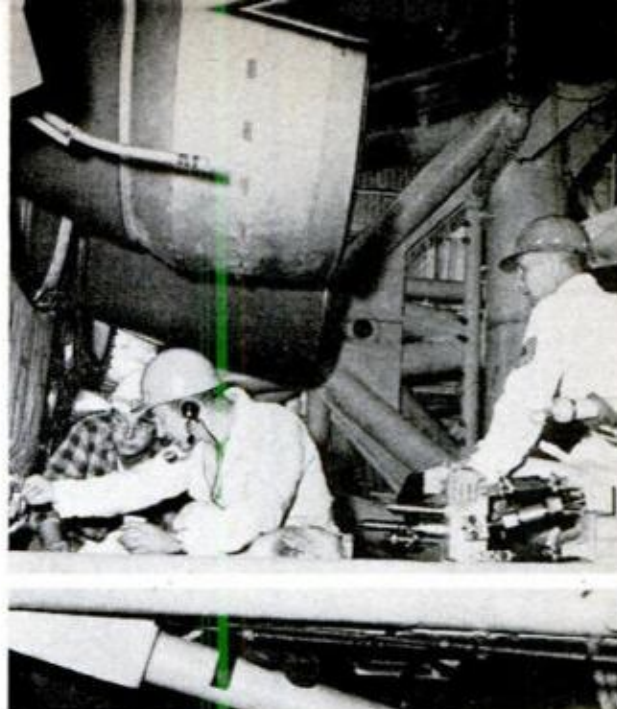
scientists of NASA, the government's space flight research agency, or of the conscientious engineers and employees in the rocket factories. There are many of them.

Fortunately the picture is a lot brighter than it has been. BMD project officers are insisting on better quality control and more careful inspections. In some cases they have had company departments reorganized. These days each new missile has to pass its tests before it leaves the factory. First it gets a complete electrical and hydraulic check, then it is "flown on the ground." It is bolted to a test stand for a "sequence compatibility" check and its first-stage motor is fired. Any troubles that develop have to be corrected.

The story isn't entirely one-sided. Contractors complain that they are handicapped by many restrictions. One company may find that a particular brand of electric motor does just what is needed, yet by law it must call for bids and accept the motor that is priced the lowest, even though its performance is marginal. The spokesman for another company says that when money isn't available to develop a reliable component, it has to use "off the shelf" items. These can and often do fail.

You never get a rocket back, once it's fired. If it fails, how can anyone find the reason? Radio telemetering that relays a rocket's performance back to earth usually indicates the area in which trouble develops. After that, shrewd detective work by BMD officers and company technicians trace the trouble to its actual source.

Good examples of how failures are analyzed are found in the *Discoverer* series of research satellites. Most but not all of these have been intended to put an instrument capsule into orbit and later make aerial recovery of it. Here's how an officer close to the program describes the shots:



TECHNICIANS preflight checking an Atlas ICBM propulsion system at the Cape Canaveral test center

Discoverer I. Successful orbit, no capsule recovery intended.

Discoverer II. Orbited, but capsule came down near Spitzbergen instead of near Hawaiian Islands when operator at tracking station gave wrong command to capsule. Human error.

Discoverer III. No orbit. Neither stage developed expected power. Human error in the paper work.

Discoverer IV. No orbit. Same human error as above. From then on, more powerful fuel was used in first stage, weight of second stage was reduced.

Discoverer V. Orbited but second stage was propelled in wrong direction due to cocked separation. Second stage became the "black satellite."

Discoverer VI. Orbited but capsule disappeared. Retro-rockets for capsule were

[\(Continued on page 228\)](#)

How to Frustrate Missile Engineers

ALL TOO OFTEN today, missile engineers are not encouraged to use their creative and critical talents in devising more effective fizzle-free missiles. Here, in capsule form, are some sad examples of this waste of talent:

Case One: After a missile failure from loss of thrust and directional control, one eager young engineer suggested that one of its four engines had ceased firing. When his boss pointed out that this was virtually impossible, the engineer, thoroughly familiar with firing system complexities, proceeded to show his boss how it could have happened. The boss remained unconvinced—in no uncertain terms. The young engineer soon left the company. And an examination of the missile, when recovered, proved that he had been completely right about the cause of failure. . . .

Case Two: In his spare time, one engineer designed a valve which met a particular demand

of a missile's liquid-fuel system. His company, when shown the model, turned it down scornfully. The thwarted engineer took the model to a subcontractor who enthusiastically put the unit into production. What happened? You guessed it. The subcontractor sold the unit to the firm for which the engineer worked! But the engineer was forced from his job because of the incident.

Case Three: A company whose product had been fired at a testing range received a complete report from their staff at the firing site, telling what had happened, what parts had failed, and giving recommendations as to ways in which the product could be improved. And what was the company's answer? A memo reminding the range staff that their job was simply to get the rocket aloft and tell what ensued, and that their recommendations were neither needed nor welcome!



Versatile Gama-Goat Is Sure-Footed Troop Carrier

Greater mobility for ground forces is offered by the swivel-backed Gama-Goat, which takes on hills, ditches, snow and swamps. Built by Chance Vought, its de-

tachable rear section can be delivered loaded to its destination and exchanged for an empty one. Powered by an automotive engine, it will do 50 miles per hour.

Two-Wheeled Sprayer Gets Pressure From Garden Hose

Turn on a water faucet and the Garden Genie goes to work fertilizing the lawn. The lightweight sprayer throws a 25 to 30-foot spray under pressure of a garden hose.

A plastic jug holds the liquid fertilizer—or insecticide or fungicide. A product of Sawyer's, Inc., Portland, Ore., the sprayer sells for \$19.95.





Radio-Controlled River Boat

Modeled after an original Ohio River excursion boat and built by a hobby-shop owner, the $\frac{3}{16}$ -inch-scale *Island Queen* is controlled by an eight-channel radio receiver. Power comes from three motorcycle wet-cell batteries. It also has a built-in tape deck playing calliope music.

World's Largest Outdrive?

Based on exactly the same principle as the familiar inboard-outboard drive system for pleasure boats, a new German "power rudder" boasts engines up to a 16-cylinder, 570-horsepower diesel monster. It is built to drive and maneuver 600-ton river barges.

Except for its size, the system is the same as its smaller counterpart. It rides over underwater obstructions, turns to provide powered steering and reverse, and can be lifted out of the water as shown, though in this case the lifting must be done with a hydraulic mechanism. The units are built in four sizes from 225 to 570 horsepower by Henschel Works of Cassel, W. Germany.

☐ Potatoes can be stored at 55 degrees F. for as long as a year without sprouting if they are treated with a chemical commonly known as CIPC — isopropyl N (3-chlorophenyl) carbamate.

MAY 1961



Headless Club Helps Golfers

You can practice driving in your living room with a new practice golf club that rewards a properly-grooved swing with a sharp "crack." It works on centrifugal force, and won't sound off if your form is off. Sold by Swing-Rite Inc., 140 E. 40th, New York 16.



OWNERS REPORT

A NATIONWIDE SURVEY

BASED ON 1,117,269 OWNER-DRIVEN MILES

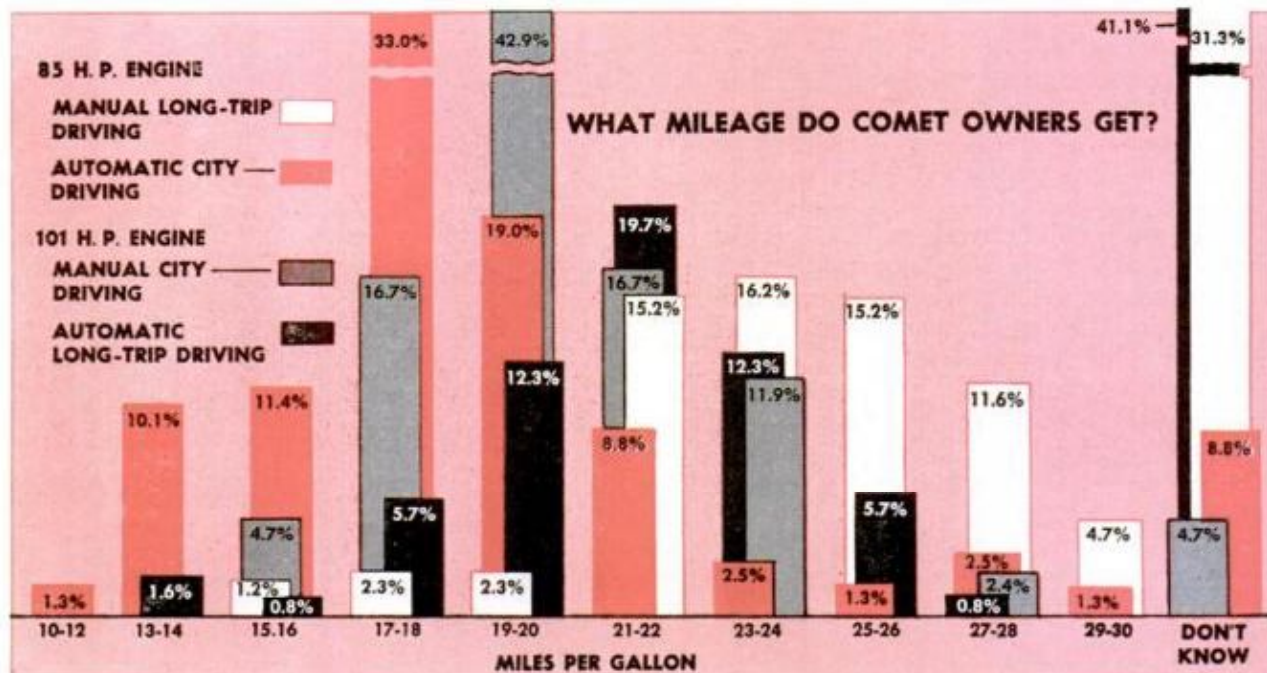


INTO ORBIT, is where PM's test car appeared to be going, cresting the hillside RR crossing at 35 m.p.h. Shock-absorber action was good, however, and driver felt that the car was under perfect control



DOWN TO EARTH it came with a thud of rubber suspension bumpers, but driver was surprisingly comfortable throughout. Many owners reported they felt their Comets rode as well as so-called "full-sized" cars

GRAPH COMPARES MILEAGE EXPERIENCE of Comet owners. Thriftiest rig was the 85 hp. engine with manual shift, delivering 21 to 26 m.p.g. Yet owners of 101 hp. engine with automatic got 19 to 24 m.p.g. on the road





COMET'S STYLING is right on target for most owners who appreciate the car's solid, conservative lines. A number were also delighted with its "Thunderbird Look" which is due to the "squared-off" roof line

Big-Car Feel, Easy Handling, Economy, Delight Comet Owners

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

JUDGING FROM their reports, Comet owners seem to be a pretty discriminating group of people. They knew what they were looking for in a car and three out of four of them examined other compacts before they bought the Comet. Of this group, 41 percent considered Falcon, 19 percent Corvair, 14 percent Valiant and 10.8 percent Rambler. An additional 19 percent considered buying a small foreign car.

Owners Report indicates that Comet owners like their cars very well. A solid 81 percent rated their cars as excellent, 18 percent felt their choice was average, and an exceptionally low percentage of only 0.8 felt that their Comets were poor.

Proof of owner approval came in answer to the question "Would You Buy Another Comet?" A whopping 89.5 percent of all replies were "Yes." A small 6.6 percent were as yet "undecided," while only 3.9 percent were positive that they were not going to buy another Comet.

However, all was not peaches and cream. Comet owners are a dollar-conscious group who were looking for a car that would save them money as well as garage space.

Most frequent owner complaint dealt with disappointment in Comet's gasoline economy. While 48.5 percent of the owners responding felt that mileage was as good as they had expected and 16.6 percent felt that it was better, 34.9 percent felt that they were not getting as good mileage as they had anticipated or been led to believe.

To aid in comparing the economy potential of one car in relation to other, *Popular Mechanics* has added precision-metered fuel-consumption testing to the Owner's Reports. We measure fuel against distance traveled at a constant speed over a smooth, nearly level pavement, taking the average of two-way runs to compensate for incline or wind resistance.

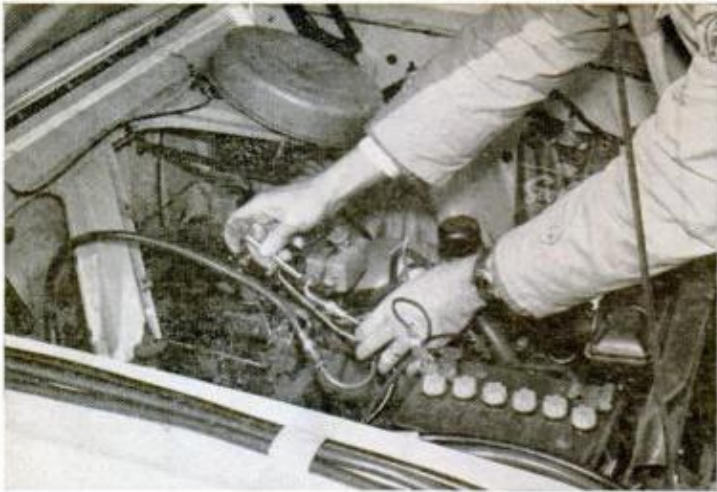
Our fuel meter consists of a 1/10-gallon burette which

This "poor" percentage of 0.8 is significant because it's unusually low. That means Comets have caused very few owners any really big trouble which would make them label car as poor.



The unhappy 34.9 percent could very well be those owners with automatic transmissions who do mostly city driving. They seem to get around 17 m.p.g., while the stick shifters on trips get approximately 23.5 m.p.g., (see graph on facing page).





HOOKING UP PM's fuel-consumption meter between the engine's gas pump and the carburetor before "economy runs"



FUEL FLOWS by gravity from 1/10-gallon burette to electric pump, then to carburetor

Such figures are a measure of the relative fuel economy potential of different cars rather than an indication of mileage under average conditions. Here's where they get the "up to 30 miles per gallon" phrases that you see in the ads. →

This lady may have the real secret of Comet's success—it's a car that takes the problems out of driving. →

He's one of many. But, there's another side to this coin. A few T-Bird owners reported (PM, Sept. '60) that they disliked other Ford products "imitating" their dreamboat. →

gravity feeds directly to an electric pump. This pump in turn sends gasoline under normal pressure direct to the carburetor's float bowl. Here are the constant-speed figures corrected for 2.3 percent odometer error and 8 percent speedometer error. Test car was a Comet 4-door sedan with automatic transmission and the larger, optional 101-horsepower engine. (Fuel mileage with the 85-horsepower engine and a stick shift would be substantially better, of course.)

29.0 miles per gallon at 30 m.p.h.

27.5 miles per gallon at 40 m.p.h.

24.5 miles per gallon at 50 m.p.h.

21.0 miles per gallon at 60 m.p.h.

18.0 miles per gallon at 70 m.p.h.

Simulated traffic pattern: 15.9 miles per gallon.

Over-all tank mileage for entire test, including starting, idling and warmup: 19.8 miles per gallon.

Now, let's see what Comet owners think of their new cars. Here in order of frequency of mention are the first five best-liked features.

"I like the way it steers with a light touch. When coming to a sharp curve at fairly high speed, it hugs the road and takes the curve with little effort on my part."—Michigan machinist.

"It has enough maneuverability to eliminate the need for power steering or brakes."—Virginia government worker.

"Really enjoy driving it, despite the fact that I don't generally care for driving."—Minnesota social worker.

"It handles very well on the highway, even up to speeds of 80 miles per hour."—Ohio salesman.

"I am a driving instructor and chose a Comet for its simplicity of design, controls, and ease of driving. Even my students compliment me on my choice."—Minnesota driving instructor.

"Very easy to handle both in traffic and in tight parking situations."—Louisiana tabulator.

"It almost seems to have power steering."—N. Dakota lineman.

"I took to the distinct Thunderbird styling right away."—Georgia air-traffic controller.

"I feel I got the most car for the money. The size is ample, it is attractive both inside and out and it handles like a dream."—Pennsylvania model.

"Exterior styling makes this look like a more expensive car."—Vermont lodge owner.



SOME OWNERS, who probably have long legs, complained about the entry and exit



COMET'S TRUNK drew favorable comments from a good number of owners, but the location of filler pipe drew gripes

"Though this car doesn't knock you over with status, it is acceptable to any circle of friends with taste."—Pennsylvania production manager.

"I like the general Thunderbird styling, especially the roof and the area around the back windows."—Colorado printer.

"This is one car that doesn't give me driving fatigue on long trips."—S. Carolina lab assistant.

"The long wheelbase teamed with an excellent suspension give a ride you would expect for a big car."—Pennsylvania draftsman.

"My Comet steers, handles and rides as well, if not better than any car I've owned in the last 38 years."—Massachusetts housewife.

"I like the big-car ride."—New Jersey inspector.

"The seats are very comfortable and there is sufficient room for five passengers."—New York retired banker.

(Continued to page 234)

This is part of Comet's charm, it's so-called "big car ride." But remember ← **when 114-inch wheelbase, 194-inch overall length was a big car?**

COMET Owners Report

Excellent
81.1%

Average
18.1%

Poor
0.8%



Satisfied with economy?

As expected	48.5%
Better than expected	16.6%
Not as good	34.9%

Best-liked features

Handling ease	60.8%
Styling	42.1%
Riding comfort	34.2%
Roominess	29.0%
Economy of operation	28.4%
Easy to park	18.2%
Size	17.9%
Power, performance	17.1%

Most-frequent complaints

Poor gas economy	12.4%
13-inch tires	7.4%
No light on gear selector	7.1%
Sluggish engine, under-powered	6.1%
Lack of leg, headroom	4.7%
Noisy engine	4.5%

Had mechanical trouble?

No trouble	77.1%
Some trouble	22.1%
Considerable trouble	0.8%

What was trouble?

Carburetor	3.2%
Ignition system	2.6%
Clutch	2.6%

Best-liked exterior features

Straight, clean lines	14.2%
Thunderbird styling	13.2%
Roof	10.8%
Big-car styling	6.3%
Grille	4.5%

Least-liked exterior features

Taillights	9.0%
Grille	7.1%
Windshield	3.5%
Fins	3.2%
Parking light in bumpers	1.8%

Best-liked interior features

Upholstery	21.8%
Dash panel	15.8%
Seats	14.7%
Trim	4.7%

Least-liked interior features

Step-down floor	10.0%
Ash trays	6.4%
Glove compartment	5.8%
Transmission hump	2.6%

Considered another compact?

Falcon	41.5%
Corvaire	19.5%
Valiant	14.6%
Rambler	10.8%
All others	13.6%

Did consider an import	19.5%
Volkswagen	58.3%
Renault	9.7%
Austin	4.1%
All others	27.9%

Comet is only car in family?

Yes, it is	60.3%
No, it is not	39.7%

Make of other car?

Ford, other Ford Co. make	16.1%
Chevrolet, other G.M. make	17.1%
Chrysler Corp. make	4.7%

How is dealer service?

Excellent	51.3%
Average	38.5%
Poor	10.2%

Would buy from him again?

Yes, would buy again	66.1%
No, would not buy again	12.9%
No answer, don't know	21.0%

Make of car traded in?

Ford, other Ford Co. make	36.8%
Chevrolet, other G.M. make	24.4%
Plymouth, other Chrysler make	13.6%

Would buy another Comet?

Yes, would buy	89.5%
No, would not buy	3.9%
Undecided, don't know	6.6%



By Jim Whipple



Do absent inches make more fuel miles? Look for free seat-belt mountings on your '62 car

Results of this year's Mobilgas Economy Run seemed to prove again that "nothing beats cubic inches," or rather the lack of them, as the smaller displacement compacts swept the field.

Falcon proved what you can do with an expert at the wheel of a light car, running 2560 miles from Los Angeles to Chicago with stick shift and 3.10 to 1 axle ratio. Falcons took 1st and 2nd places with 32.68 and 31.62 miles per gallon respectively.

Corvair led the automatic transmission compacts with 29.35 and 29.32 m.p.g. for first and second places in its class.

But a look beyond the winners list turns up some interesting points. For example, the lowest mileage posted by the compact V-8s with automatic transmissions, a **Lark** at 23.0 m.p.g., was barely shaved by the winning low-priced, standard-size Six, a **Plymouth Savoy** at 23.15 m.p.g. **Lark** displaces 259 cubic inches, **Plymouth 225**.

Pontiac entries proved that four cylinders aren't the answer if there are V-8s around in lighter cars. A stick-shift **Olds F-85** with its 215-cubic-inch V-8 racked up 25.46 m.p.g. in Class A (compacts, manual transmission), while the best manual-transmission **Tempest** with its 194.5 cubic inches scored a lower 25.23 m.p.g.

The story of the Economy Run might have been quite different if a disagreement over carburetors and technicalities hadn't caused **American Motors** to withdraw their two **Rambler American** entries five minutes before the start of the run. Now, we'll have to wait until next year to see just how many miles the new **American** with overhead-valve six can squeeze out of a gallon when driven by an expert.

The industry took a giant step toward greater safety recently when it announced that seat belt-mounting hardware will be standard equipment on all 1962 models at no extra cost. This includes brackets and reinforcing plates which will be welded into the body or frame structure at the factory. All the safety-conscious owner need do is buy the belts and buckles.

He'll be able to install them easily himself if he wants to and save an estimated \$20 to \$40 now spent to drill through the

car floor for installation, or in some cases for fabrication of mounting hardware.

This move places the responsibility for safety part way back where it belongs—in the hands of the individual car owner.

The more cars we drive and the more owners we hear from, the more we have realized that the relative position of the driver's seat is all-important in making standard sizes of cars comfortable and safe for nonstandard-sized people.

Detroit builds dummies that represent the average man. These dummies, dubbed with cute titles, like "Mr. X Ray," help determine seat design and steering-wheel location. The seats then suit about half the adult populace perfectly.

But, what about the rest of us anthropological odd-balls; the long-legged and short-waisted, the short-legged and long-waisted, the short-legged and long-armed, the slims, heavy-sets, shorties and basketball centers? We all drive, too, and unless we can ante up \$100 or more for a multi-directional power seat, if such is available, then we've got problems.

On compacts, where the space problems are even more critical, due to shorter passenger compartments, there are no four-way or six-way power seats available.

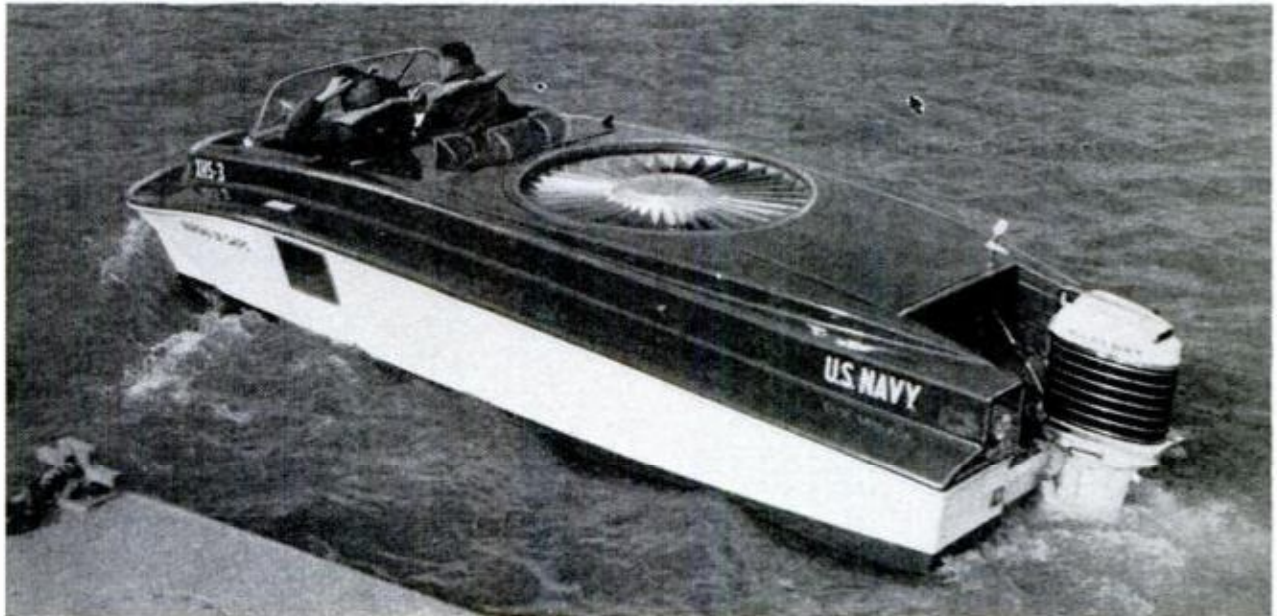
The conventional fore-and-aft adjustment is a compromise that may suit only three out of ten people really well. How many people all over America ride down the highways in \$3000 cars made comfortable only by virtue of a \$3 backrest cushion?

What's the answer? Well, **Chrysler Corporation** has one possible solution already built into its full-sized cars. The supports, or mounting plates, of the front seats are made in two sections on each side—a top flange fastened to the seat and a lower flange bolted to the floor.

These two pieces are fastened together with four bolts through alternate vertical and horizontal slots. Loosening the bolts permits a wide variation in seat tilt and elevation and some fore-and-aft movement.

Too few owners know about this ingenious feature which raises the cost over the conventional seat by all of 16c.

That's four cents per nut and bolt!



Experimental Outboard Skims Over Water on Air Cushion

Traveling over water rather than through it, an 18-foot Hydroskimmer cruises on a cushion of air provided by a large fan located amidships. It is driven forward by a 70-horsepower outboard motor. The research craft, developed by Bell Aerosys-

tems Co. for the U. S. Navy Bureau of Ships, has an eight-foot beam and weighs 2300 pounds. The hull is made of fire-retardant polyester resin reinforced with glass fiber. Two fins run the length of the hull to help trap the air.

Hovering Wheelbarrow

Air is used to cushion loads moved by construction workers in Orpington, England.

Builder Ted Drewery came to the aid of his workers, who had to push heavy loads over muddy building sites, by constructing a barrow that hovers nine inches above the ground.

The Hoverbarrow has a square top in which can be carried a load of 500 pounds. A single-cylinder engine mounted in the middle drives a large-bladed propeller, causing a downward thrust which keeps the machine balanced inches above the ground. A canvas band around the bottom of the barrow helps trap air. The barrow will run for eight hours on a gallon of gas.





Inflatable Gangplanks for Nuclear Submarines

Crew members walk on air each time they disembark from a nuclear submarine. The gangplank—or brow—is made of air-inflatable rubber. The 23-foot gangplank, arched to support 1500 pounds on its two-

foot walkway, is easily deflated and rolled up to minimize storage problems. It also has a nonskid corrugated rubber matting cemented to its floor and nylon handrails supported by metal posts.



Trap Catches and Holds Bait

Catching — and keeping — minnows for fishing is effortless with a plastic trap that lets 'em in but not out. Plug the end holes and it's a carrying container; you reach them through the top. Sold by Retco Molded Products of Cincinnati, for \$6.95.



Drivers' Navigating Aid

Combining a flashlight with a magnifying glass, a map-reading outfit makes map locations easily visible, even at night. The light and lens move across the map board on a pantagraph arm. Magnamap is made by Peninsular Products, Ltd., Gibsons, B. C.

William Beebe, scientist and prolific author, has ranged the globe exploring the world of nature. His travels took him also 3028 feet below the sea in the famous Bathysphere for a first-hand look at life there. He presently is curator of ornithology for the New York Zoological Society



My Most Exciting Moment

EXCITING IS A UNIQUE WORD. Like *interesting* it has no real definition or else it has a host of synonyms. It was exciting when after sliding and slithering down a steep slope in the Himalayas, as I lay spread-eagled in the dirt, I felt something slowly twisting between my fingers and through the dust saw a really big king cobra crawling away from me. It was exciting when we saw water dripping into the Bathysphere on our first descent. But these represent the use of the word exciting in a poorer sense.

I choose rather a slightly offcenter semanticism, one whose synonyms are amazing, startling, astonishing, wondrous, surprising, astounding but containing an element of the unknown.

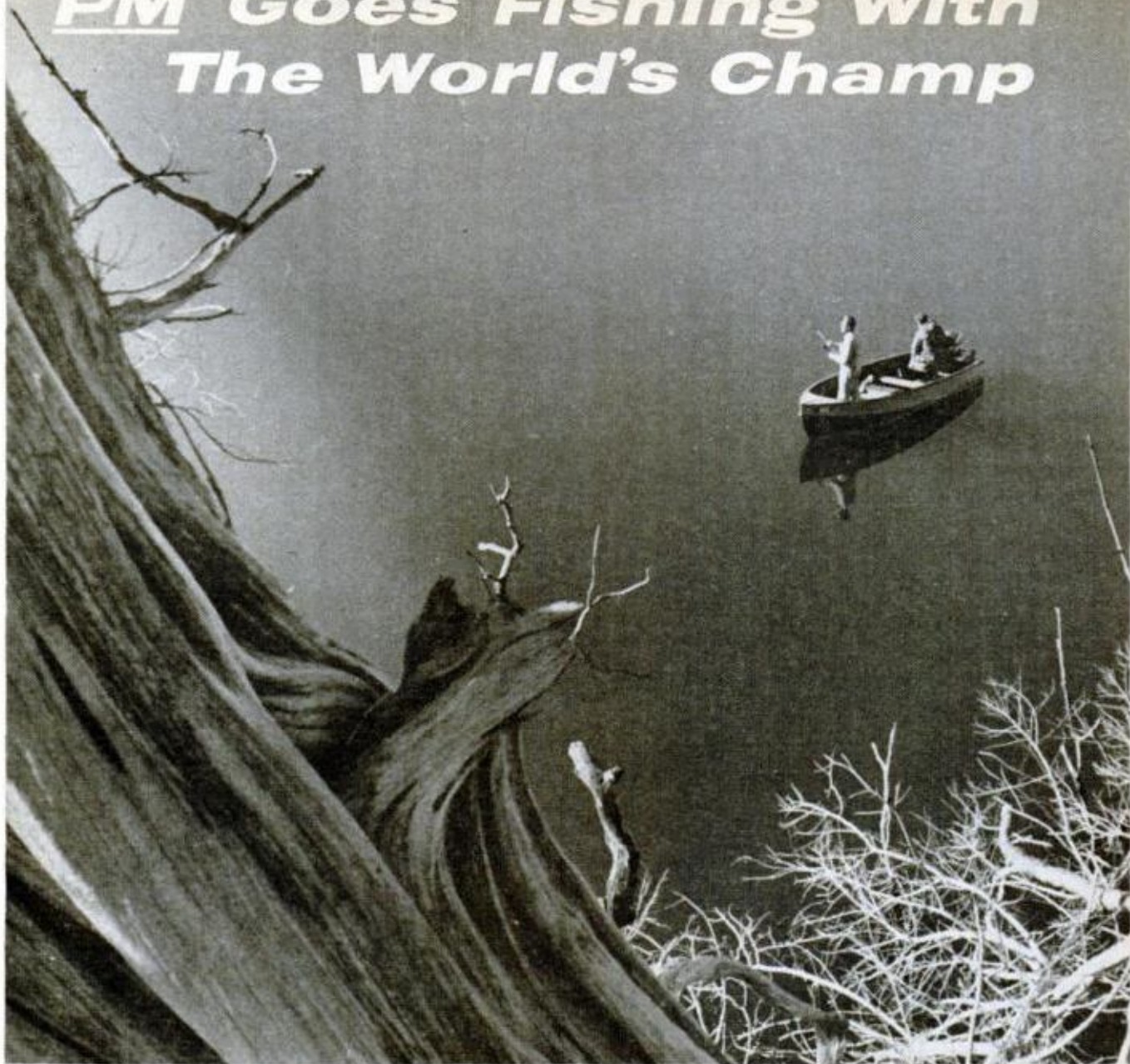
The moment I have in mind happened to me when I was only 14 years old. I was possessed of a desperate phobia — a morbid dread of speaking in public. The *modus operandi* was simplicity itself. I stumbled up six steps to the rostrum, bowed to the principal and recited, in tremulous voice, (prompted every line by my elocution teacher) a meaningless jumble of words, such as the “WRECKOFTHEHESPERUS.” For weeks, day and night, this performance obsessed me. One day my science teacher told me to stop thinking about it until he told me to. This only added to my worries but I obeyed him. On the morning of the horror he told me to tell my audience of fellow students some of the things I did in the tide pools of Fundy on my recent trip to Nova Scotia. Somehow I got on the platform and seemed to go into a trance of sorts, from which I was awakened by the principal touching me on the shoulder and telling me I had been talking for ten minutes.

From that day to this, in the course of hundreds of lectures, I have never felt a qualm of self-consciousness or prepared a set talk. A strange feeling of detachment seems to be aroused, probably what psychologists would call the subconscious. Whatever it is there seem to me two *me*'s operating—part of me is planning what I want to write when I get back to the hotel, while another part is carrying on with the lecture. Again and again I have said to someone after the talk that I wish I had mentioned a certain incident, and the reply has been that I had done so in full detail. By a little-understood change of approach I am able to pass on the pleasure of my discoveries to many people without agony.

It is a curious affair and the distress I went through in my boyhood is still so vivid that its elimination remains the most amazing, astonishing or exciting event in my life.

Wm. Beebe

PM Goes Fishing With The World's Champ



SPINNING for big Ozark crappies along the shore of Bull Shoals Lake. Champion Harold Ensley is standing

LAST OCTOBER, in Union Lake, Mich., Harold Ensley of Kansas City was proclaimed World Champion Fresh-Water Sport Fisherman. In eight grueling days of competitive fishing all over that state, he had consistently taken more fish than his 50-odd determined and usually expert opponents. And he proved his ability to catch fish when the chips were down.

Interesting? Sure, but what's in it for you? Plenty. Every fisherman, every time out, faces the same problems that Ensley did during the tournament. It stands to reason that the same skills and techniques that paid off for the champion will raise *your* average next time out.

To find out for *PM's* readers what Ensley's secrets might be, I visited the Kansas City outdoor sports expert and spent a couple of days fishing with him on Table

Rock and Bull Shoals lakes, two of the Ozark "great lakes" along the Missouri-Arkansas border.

Nobody ever had a more congenial companion. The only trouble was that, as it turned out, there isn't really any secret. Everything Ensley does is common knowledge to most serious fishermen. The big difference is that he *does* the right things instead of talking about them.

First thing you notice about the champion is his "tackle box." His fishing transportation is a big red station wagon. And there's more hunting and fishing gear in that station wagon than in some sporting goods shops. No matter what sort of situation he encounters in his travels, Ensley can sort out the appropriate gear and go right to work.

The champion prefers to fish from a boat,

By Dick Kirkpatrick
photos by author



↓ **BANGING OUT** a long cast down a Table Rock shoreline with guide Bob Bright handling the electric motor



ENSLEY the happy fisherman with the Ford trophy after winning the World Series of Sport Fishing



THE KILLERS — the champion's six favorite lures. See page 83 for description and identification





FEELING CAREFULLY for bottom while a lure sinks; bass often hit on the way down. Note second rod

BACK-YARD PRACTICE pays off in accuracy. Champ puts a crappie jig against a tree branch; he can bounce lures off logs, rocks or shoreline at great distances

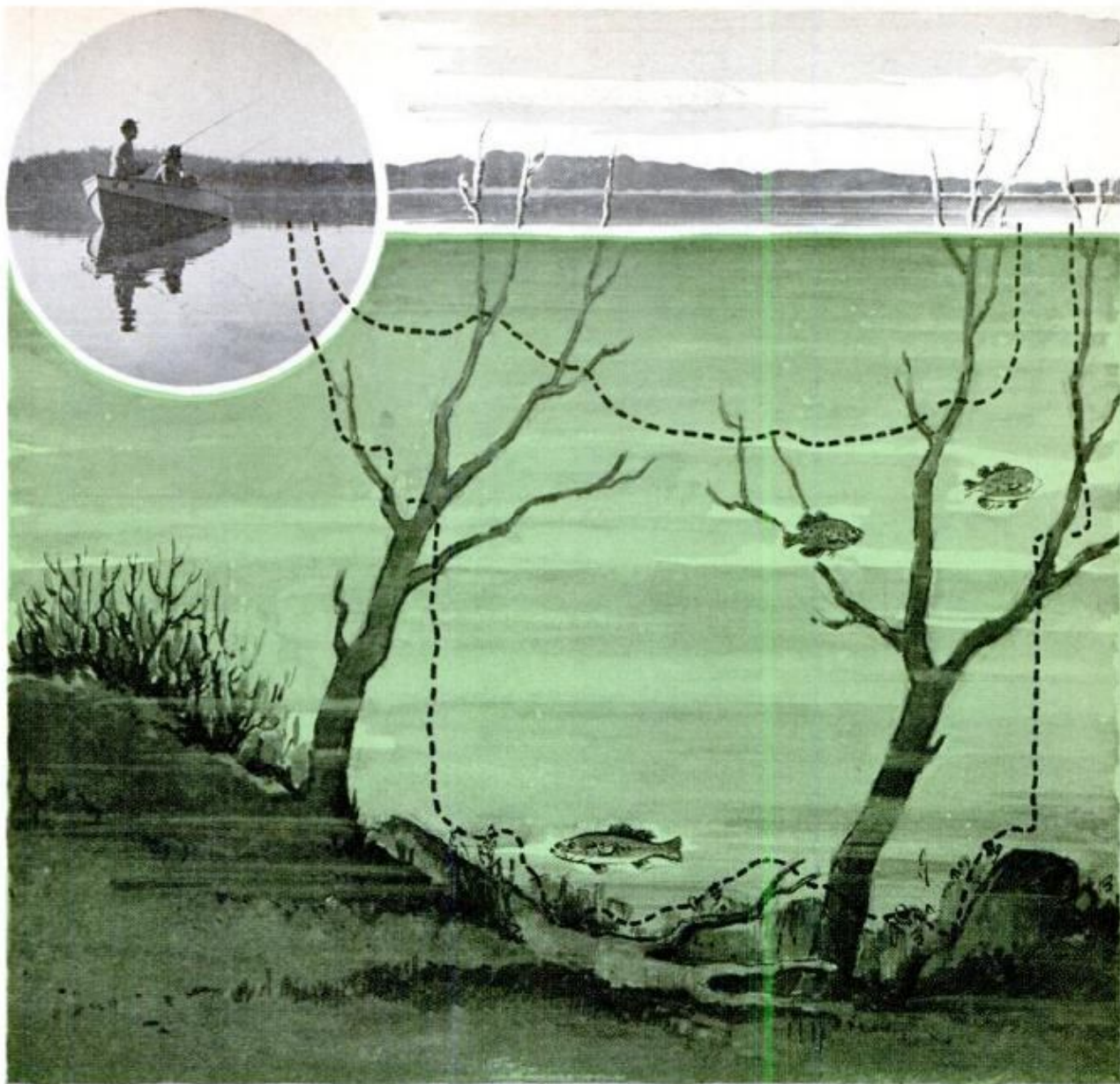


mostly for the greater mobility afloat, and his favorite outfit is the choice of most of the Ozark guides—a 16-foot open fishing boat with a good-sized outboard for transportation and a little electric trolling motor for fishing.

Watching him load the boat, the first thing you notice is the amount and type of tackle he carries. While most fishermen take along one or perhaps two rods and a big assortment of equipment, Ensley carries as many rods as he can—at least two, and preferably four or more rods, both spinning and casting. But he carries a surprisingly small amount of equipment; a lot of lures, but only four or five types, and often still on the retailer's display card; a big landing net; a couple of jars of pork-rind eels for added attraction on his lures; a knife and maybe a pair of pliers or clippers, and he's set.

The champion fishes almost entirely with artificial lures, and fishes almost exclusively by casting, though he'll troll or use live bait if that's the only thing that'll catch fish. He agrees wholeheartedly with most experts that it's better to pick a few good lures and fish them correctly than to change lures frequently to "find what they're taking." Even more important than the lure is the job of finding the fish.

While he's fishing, Ensley gets each rod rigged with a lure that matches its action,



TYPICAL RETRIEVES—dotted line at top threads among submerged trees for crappies; bigger lure at bottom roots out the big bass. You find a lot of snags this way, but can catch a lot of fish in the process

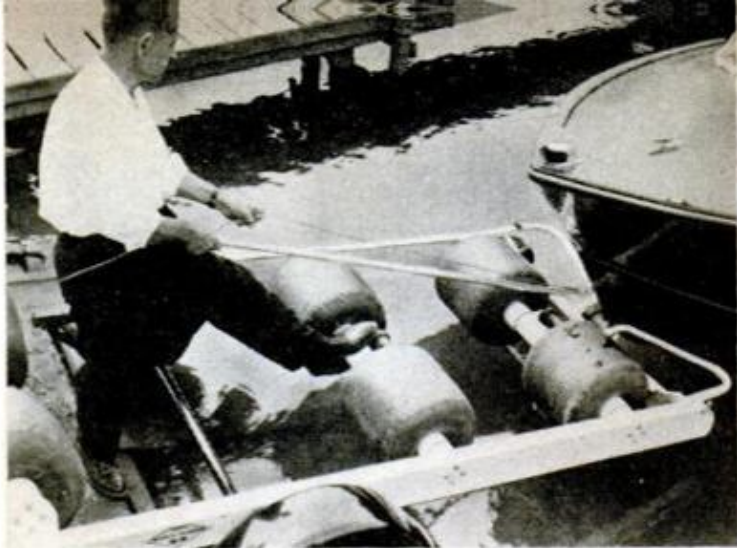
then changes outfits instead of lures. When the water looks better for crappies than for bass, he simply puts down the casting rod and picks up a spinning outfit. With that method, he gets as much as 25 percent more actual fishing done in a day's time than the average fisherman; he really keeps at it.

We were fishing fairly deep for big Ozark bass and crappies. His selection of lures for that situation—and they're his over-all favorites as well—are shown on page 81. Clockwise, from the top, they are: Two "Bass-Buster" marabou feather jigs, a quarter-ounce gray and a half-ounce red-and-white; a jig-and-worm combination in black (though he also likes red and natural shades); a $\frac{5}{8}$ -ounce "Gold Bug" offset-

(Continued to page 250)

THE OZARK fisherman's ace in the hole—big crappies. This is about a fourth of our catch on the second day, all on marabou jigs. They were delicious





Boats Ride on Balloons

Inflatable rollers made of Neoprene and nylon support boats riding on this trailer. The trailer can be converted for general hauling by the addition of a 50-pound steel body that has a 500-pound capacity.

Inflated to four pounds pressure, the foot-long balloons spread against a boat hull. Each gives 100 square inches of support and protects against sprung seams, gouging and scuffing. Manufacturer is the Dana Corp., Reading, Pa.

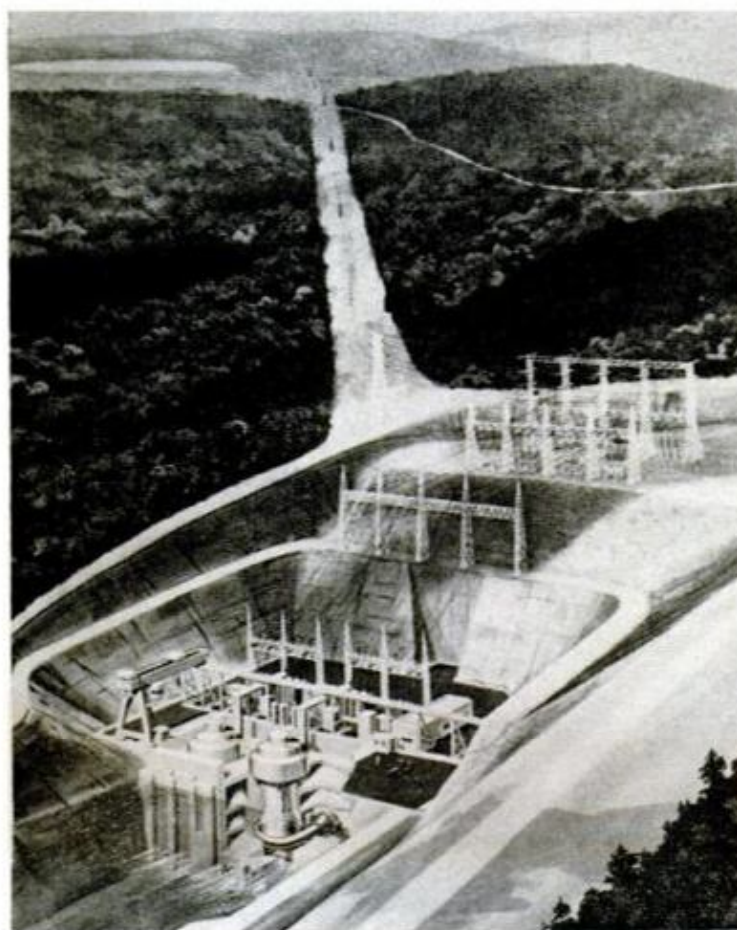


Russian Timber Tractor

Working on waterways used to float timber to mills in Russia, an amphibious tractor aids in assembling rafts of logs.

It has a boatlike hull, and both steering and propulsion work on the jet principle. Water is sucked in from the front and pumped out through ports in each rear quarter of the vehicle.

There is a hooked lifter which operates at the front of the tractor to pick up floating logs for assembling the rafts.



Water Goes Up Mountain

Water will go uphill at night and downhill in the daytime at the Taum Sauk power project 90 miles southwest of St. Louis, Mo.

Two reservoirs, one atop Profit Mountain and another 800 feet below in the Black River valley will alternately hold the water.

Twin pump-generators, operated at night by steam when the drain of power from the station is low, will pump five million gallons of water from the lower reservoir. During the day, acting as generators, the two units will convert the downhill flow of the water to electrical power.

Taum Sauk will be the largest pumped-storage power plant in the nation when completed in 1963. It will add 350,000 kilowatts of daytime power to Union Electric's generating capability of 2,387,000 kilowatts.

It will take 1½ billion gallons of water to fill the lake atop the mountain.



Can a Compact Really Save You Money?

By Watson Fenimore

AS THE CARE and feeding of the family automobile has become more costly, millions of budget-haunted Americans have turned to compact cars.

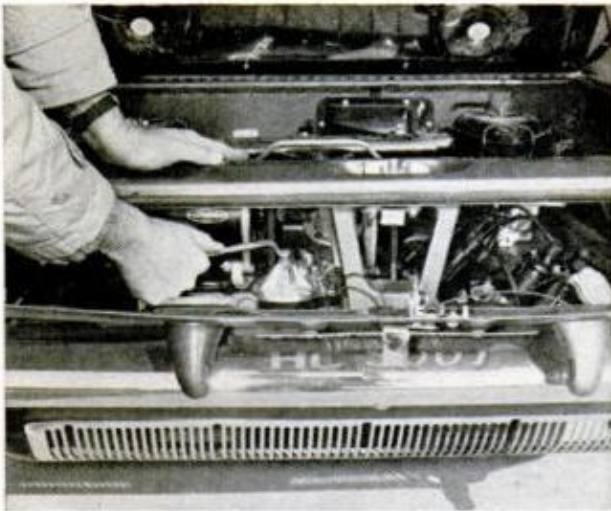
They felt that a smaller, lighter car with a less powerful engine would be cheaper to buy and to run. So strong has this trend been that sales of compacts have risen to 34 percent of the total car market.

At the same time, other motorists have been busy ridiculing the so-called savings of compact car ownership. They insist that gas savings don't amount to much, and that the better "deals" which dealers have been giving on larger size cars offset the lower price tags on the compacts.

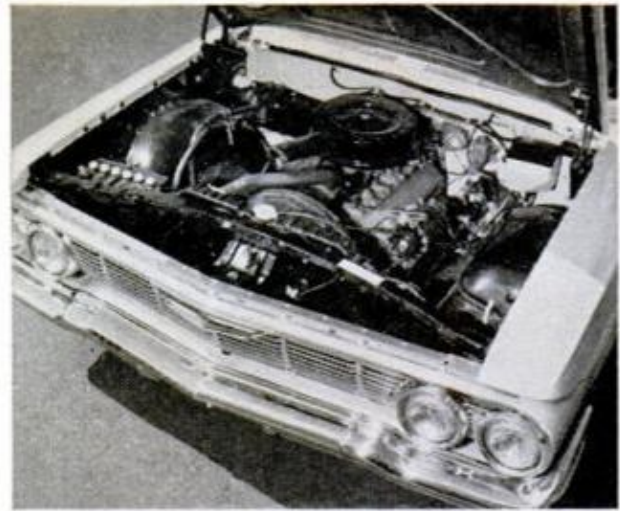
What are the facts? Are the savings in compact ownership real or mostly mythical? Have many people sacrificed such big

THESE FIGURES from PM's Owners' Reports show the range of fuel consumption in both '60 and '61 Compacts and low-price "big" cars, covering bumper to bumper city driving and wide open country cruising. Figures include both manual and automatic transmissions unless otherwise indicated.

	Mileage Range
Valiant (manual only).....	19.5-23.5
Lancer	18.8-20.5
Comet (85 and 101 hp.).....	18.5-23.0
Buick Special	16.5-19.5
Rambler American	19.5-24.5
Falcon (85 hp. with manual).....	24.0-27.5
Corvair (automatic only).....	19.5-23.0
Lark (Six and V-8).....	15.5-21.5
Chevrolet (Six and V-8).....	11.0-18.6
Ford (Six and V-8).....	11.0-17.5
Plymouth (Six and V-8).....	11.0-17.7



REAR-ENGINEED Corvair is easy to service yet offers no appreciable savings in routine maintenance



A BIG CAR like this Chevy can cost more to service if it's equipped with a V-8 and power accessories

car virtues as greater seat width, a more luxurious ride, more luggage space and more powerful performance just to save a few pennies a week?

Compact Versus Standard Prices

A major item in the sales pitch for the compacts is their lower purchase price, operating and maintenance costs. But many a dealer boasts that he can furnish a stripped-down standard model for only a few dollars more than the price of a compact. Here are actual comparative factory-suggested retail prices for one compact model and for its popular, six-cylinder big brother. These figures were taken from the Federal price stickers as the cars stood side by side in a show room.

The cars were a four-door Corvair 500 (the least expensive series) and a four-door six-cylinder Chevrolet of the economy Biscayne series. Each had an automatic transmission. Each had a minimum of accessories. The difference in price between the two cars, equipped and ready for sale, is approximately \$337, as is shown in the chart below.

Many dealers, however, will discount the list prices of their cars, either by granting an over-allowance on trade-ins or by cutting new-car prices if there is no trade-in.

Because the profit margin on standards

is larger than on compacts, dealers will usually give larger discounts on the bigger cars. Gross profit on the Chevrolet Biscayne, for example, is \$545. On the Corvair it is \$440. You can usually count on getting some of that \$105 in added discount if you buy the Biscayne instead of the Corvair.

Thus your actual savings in such a deal might be only \$232, instead of the \$337. Over-all savings in most compact versus standard deals have proved to be in this approximate range—between \$225 and \$250.

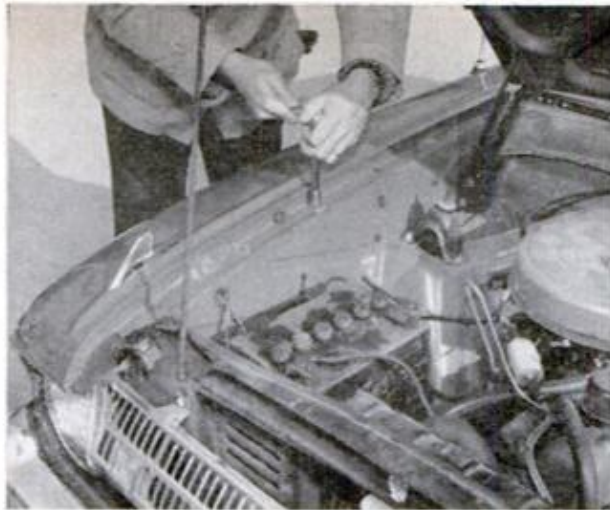
On some of today's best-selling compacts, the savings may be even less. This is also true regarding some of 1961's newer and higher-priced compacts which at this writing have not been deeply discounted and which have not made nearly as much of a dent in the market as the Big Three's original compact offerings made a year ago.

Operation and Maintenance

Biggest money-saving claim in the operation of compacts is that of fuel economy. Do they really give up to 30 miles per gallon as enthusiastic dealers and even some owners assert? Reports, tests and statistics agree that the smaller cars do run farther per gallon than the usual 14 to 19 miles obtainable on standard six-cylinder models or the 12 to 17 m.p.g. averages experienced by owners of cars with V-8 engines.

CORVAIR	
List price	\$1974.00
Radio	62.45
Heater	74.25
Automatic transmission	156.60
Visor, arm rests, cigarette lighter	10.80
Freight	54.50
Total	\$2332.60

CHEVROLET	
List price	\$2316.00
Radio	62.45
Heater	74.25
Automatic transmission	188.30
Foam-rubber front seat.....	7.55
Deluxe steering wheel.....	3.80
Oil filter	9.15
Freight	68.00
Total	\$2669.50



WHAT DOES A FRONT FENDER COST? Falcon's bolt-on fenders, \$30.55, \$15.00 labor; Ford, \$43.86 and \$18.00

But the miles-per-gallon figures for the compact cars vary widely—from the low ranges of 16 to 19 for some makes introduced this year, to highs of 21 to 29 for Ford's Falcon and Rambler's American.

Runzheimer & Co., Inc., of Chicago, auto cost experts for companies owning fleets of business cars, struck an average of 22 m.p.g. for the compacts and 15 m.p.g. for six-cylinder standards in a study based on actual operation of representative compact and standard models in the metropolitan Chicago area.

Using 34 cents per gallon as a "normal" gas price, the company calculated gas and oil costs for a typical compact car at \$0.0168 per mile. Costs for a typical six-cylinder standard were calculated at \$0.0242 per mile.

For 10,000 miles of driving—the annual average for many motorists—gas and oil expense for the compact would be \$168. That for the larger car would be \$242.

Savings in gas and oil on the compact over the standard are thus about \$74. Small

LESS ANTIFREEZE is used to protect Falcon cooling system which holds 8.7 quarts versus Ford Six's 15



ARE COMPACTS really "economy" cars? This table compares annual operating costs of a typical compact with those of a standard Six, on the basis of a three-year ownership. Comparative yearly savings on purchase price and depreciation are **annual averages for the three-year period.**

Purchase Price

Standard model	
6-cylinder four-door sedan, R&H., auto. trans.....	\$2669.00
Compact model	
6-cylinder four-door sedan, R&H., auto. trans.....	2332.00
Saving on compact.....	337.00
Less extra discount available on standard model.....	105.00
Net purchase-price saving on compact.....	232.00
Average annual saving on purchase price on compact	77.00

Operating Costs

Standard model	
Gas and oil per mile.....	\$0.0242
Maintenance per mile.....	.0075
Tires per mile.....	.0038
Total per mile0355
Total per 10,000 miles	\$355.00
Compact model	
Gas and oil per mile.....	\$0.0168
Maintenance per mile.....	.0070
Tires per mile0032
Total per mile0270
Total per 10,000 miles	\$270.00
Annual saving, compact operation	\$ 85.00

Insurance Costs

Annual premium on standard Six sedan (liability, property damage, comprehensive, collision)	\$135.00
Annual premium on compact....	112.00
Annual insurance saving on compact	23.00

License Costs

Estimated annual saving on compact	5.00
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Depreciation Costs (estimated over three-year period)

Standard model	\$1475.00
Compact ..	836.00
Saving on compact.....	638.00
Average annual saving in depreciation on compact	213.00
Total annual saving—compact vs. standard	\$403.00



MANUAL CHOKES on Pontiac Tempest, Corvair, Falcon enable skillful operators to save on fuel, repairs

savings for oil included in these figures were based on the fact that oil changes would cost somewhat less for the compacts because of their smaller crankcase capacities.

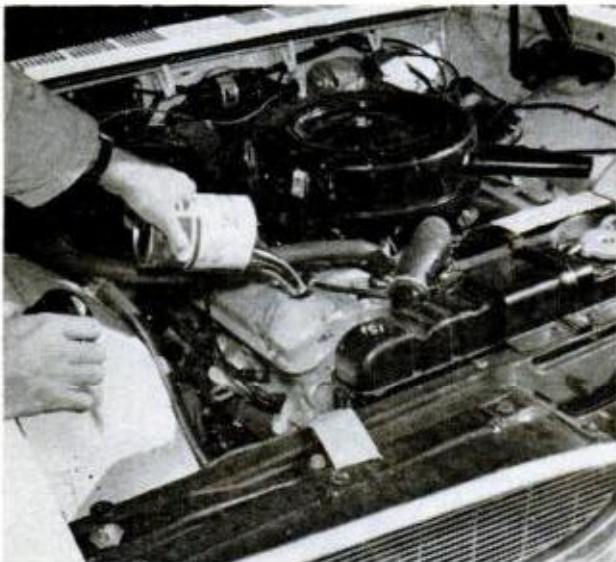
How About Tire Wear?

In tire wear, the study assigned slight savings to the compacts because their lighter weight apparently more than offsets the smaller tire sizes, and because of probable dollar savings in the cost of replacement tires.

Runzheimer figures for tire wear were \$0.0032 per mile for the compacts; \$0.0038 for the standards.

In maintenance, the company's statisticians gave the compacts another narrow edge on the basis of some savings in lubrication, tune-ups and other costs. But comparable jobs on compacts may cost as much and sometimes a bit more than on standard

OIL CAPACITY for the average compact is about 1/2 quart below that of full-sized six. Saving is small



COST OF LABOR on muffler replacement is about equal between big six and compact, but compact part is less

six-cylinder models, as is indicated in the chart on page 89. Thus the company's figures—\$0.007 per mile for compacts as against \$0.0075 for the standards—which include cost of parts and material indicate a cost difference which is almost negligible.

Together, tire and maintenance costs for the compacts would be \$102 for 10,000 miles of driving. For the standards, the costs would be \$113—a difference of \$11.

Total yearly operating and maintenance savings for compacts over standard-size cars thus comes to \$85.

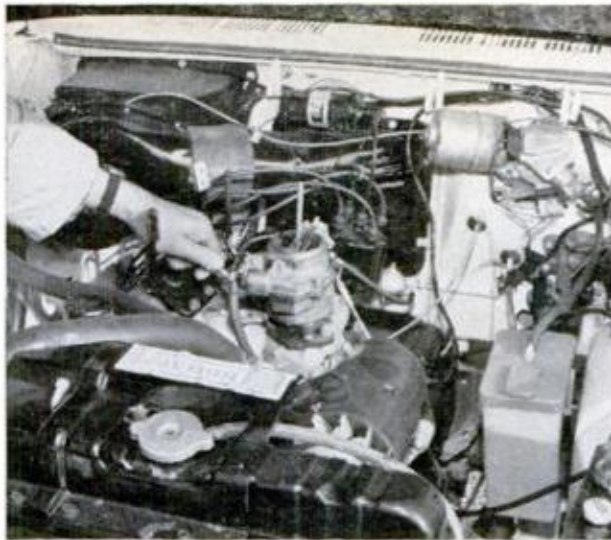
Insurance and Licenses

The advent of the compacts has brought some lower insurance costs. Discounts from 10 to 15 percent from their rates are offered by many insurance companies on compacts.

Here, for comparison, are actual annual premiums quoted in one Eastern metropoli-

A TUNE-UP is a tune-up whether on a compact or full-sized six as the operations are basically the same





FOUR-CYLINDER ENGINE of Pontiac Tempest offers savings in major overhaul as it requires fewer parts



SIMPLICITY SAVES money on replacement parts, labor in cases like Falcon's one-piece grille, single lamp

tan city for four-door, six-cylinder sedans:

Public liability — \$10,000 to \$20,000 and \$10,000 property damage: Compact, \$53.60; Standard, \$63.20.

Comprehensive (fire, storm, theft, etc.): Compact, \$13.20; Standard, \$16.80.

Collision (\$50 deductible): Compact, \$45.80; Standard, \$55.

Totals: Compact, \$112.60. Standard, \$135.00. Annual premium savings on the compact—\$22.50.

Savings in license fees, if any, depend on state regulations. In some states, no savings over comparable standard cars are possible. In others, savings of \$5 per year may be realized.

That Ol' Debbil Depreciation

This is the hardest cost of all to figure. Depreciation is the amount by which your

REPLACING TAILLIGHT on the Pontiac Tempest, below, costs \$13.40. Same job on big Catalina costs \$28.18



MAY 1961

car loses value each passing year. Many car owners have only the haziest idea of what depreciation costs amount to.

But every auto owner should take account of depreciation in reckoning what it

(Continued to page 244)

COMPARATIVE COSTS for repairs on a standard Six Ford and a Falcon Six are given here. Figures are for labor calculated on basis of \$5 per labor hour or fraction thereof, and for parts where applicable. Labor costs are indicated in lightface figures; cost of parts in **boldface**.

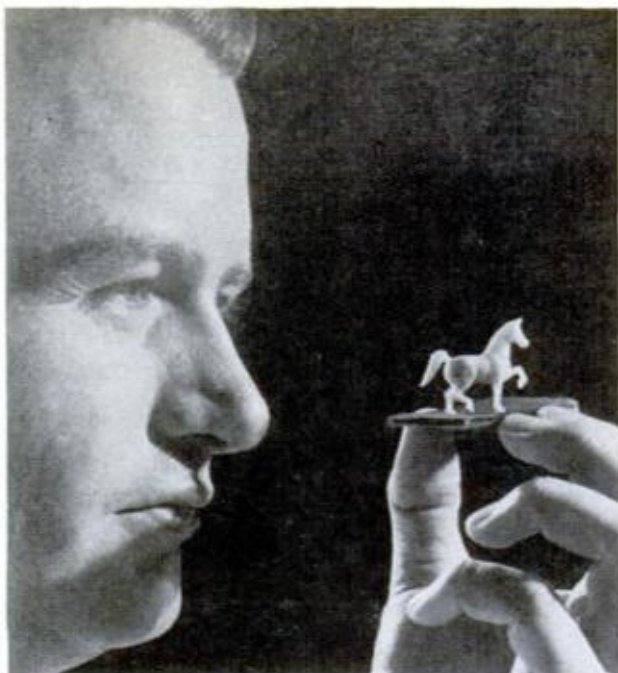
Ford Six Falcon

Ignition tune-up: timing adjustment, voltage reg. adjust., ignition-coil test, plugs cleaned and tested breaker points replaced	\$ 8.50	\$ 8.50
Carburetor adjustment	1.50	1.50
	4.85	4.85
Tappet adjustment	3.00	2.00
Brakes relined	9.00	8.00
	20.75	19.75
Replace fuel pump	1.50	1.50
	8.70	6.82
Clean carbon from cyl. head, grind valves, adjust tappets	15.50	18.50
Balance wheels	6.00	6.00
Replace muffler, and tail pipe	4.00	3.50
	18.75	10.61
Replace clutch plate	3.00	4.50
	14.60	13.50
Adjust both bands on auto. transmission	4.50	4.50
Replace front fender	18.00	15.00
	43.86	30.55

Labor costs are calculated on basis of hour units per Ford Motor Co. Suggested Time Schedule, multiplied by an average labor cost of \$5.00.



FIRST-YEAR STUDENTS in the USC School of Dentistry use dental tools and wax in test of manual dexterity

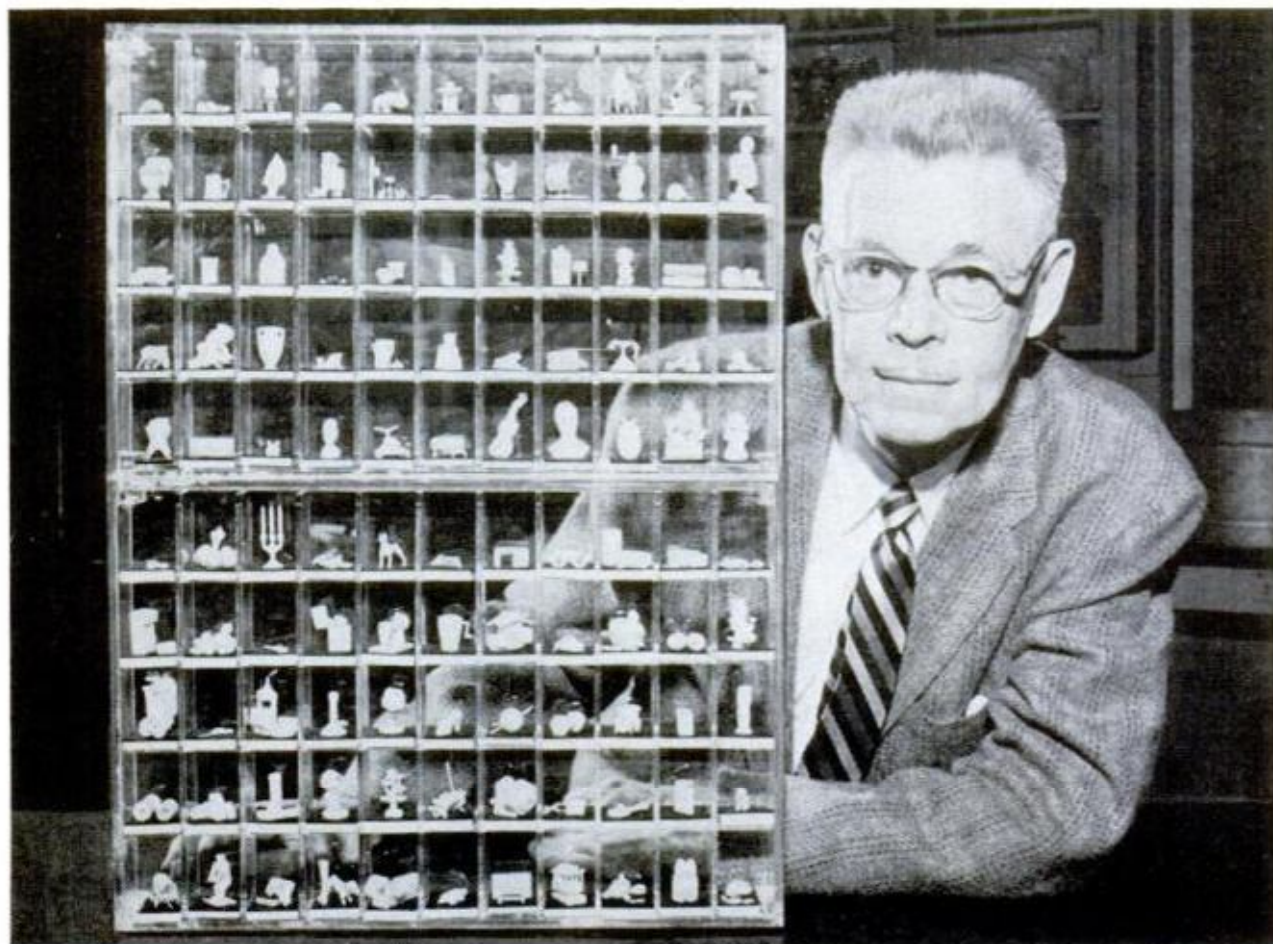


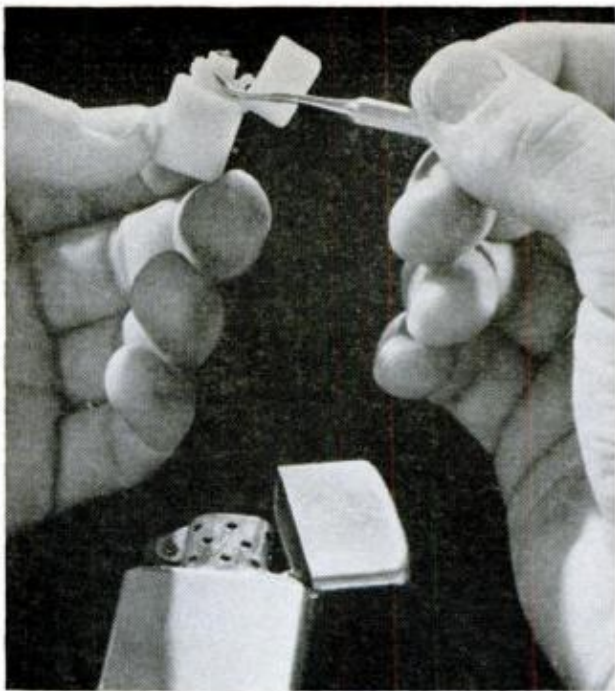
EXPERT DENTIST in the making? Probably, since his excellent carving shows a deft and artistic touch

Test for Dental Dexterity

By Jack B. Kemmerer

Photos by Leonard Nadel

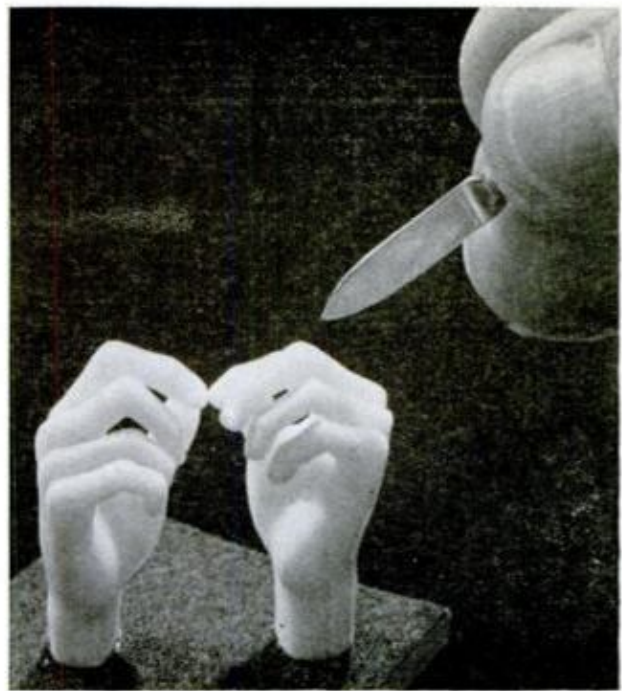




CIGARETTE LIGHTER became model for one student's miniature carving in the unique eight-hour exam

YOUR DENTIST, working inside your mouth from an awkward position and under poor visibility, probably ranks as one of the best contemporary miniature sculptors. In fact, one college professor has found a close correlation between a student's ability as a sculptor and his performance as a dentist.

Dr. William Harrison (below, opposite page), of the University of Southern California School of Dentistry, developed a unique test of manual dexterity for his first-year students in 1929. He gave each of them a piece of hard dental wax about an



FINAL TOUCHES go into a pair of hands good enough for exhibition in any display of miniature sculpture

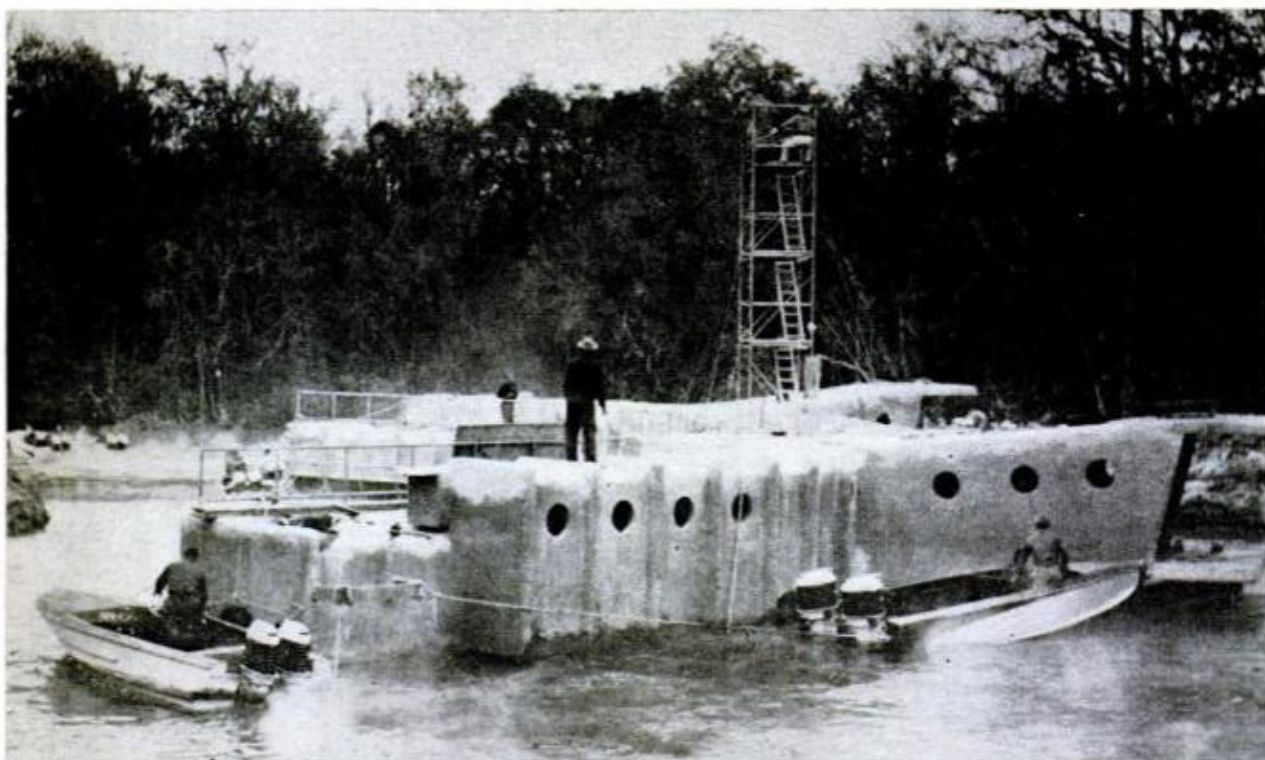
inch square, a set of dental tools and a pocketknife, and allowed eight hours in which to produce a miniature carving of any subject they chose.

As the years — and classes — passed, he observed that the best sculptors invariably became the most proficient dentists, so he uses the "trial by sculpture" to determine which students need extra work on the craftsmanship of dentistry. After 31 years of testing, Dr. Harrison's office has become a museum in miniature, with over 2000 carvings. A few are shown on these pages.

★ ★ ★

DR. HARRISON, opposite, displays a case of miniatures. Below, student shows off intricately carved ship model





Outboards Tote 900,000-Pound Underwater Theater

Built high and dry on a sandbar, a 900,000-pound underwater theater was set afloat in a lake dredged under it and then towed more than a mile to its permanent site at Silver Springs, Fla.

Called on for the towing job were seven ski-tow boats, each powered by twin 80-

horsepower Mercury outboard motors. Two skindivers led the procession and a director worked atop a 30-foot tower on the theater as the big load was taken upstream and put into position in one hour.

The 150-foot crescent of concrete and steel will hold 250 spectators.

People-Fishing Pole

Swimmers — or nonswimmers — in trouble can be fished out of water easily with a life-saving pole designed and built by a fishing-tackle manufacturer for the public swimming pool in Ware, England.

Built for strength and lightness so it can be used by any bystander, the device is a 22-foot metal pole with a rubber-padded hoop and two plastic-foam buoyancy balls on one end. With the hoop end balanced to almost negative buoyancy, the hoop can be floated out to a swimmer on the surface, or forced underwater if necessary.

The hoop offers an easy grip to a struggling person, or it can be maneuvered around his body if he's unconscious. Once inside the ring, the swimmer can be pulled easily to the edge and lifted out. The equipment enables even a nonswimmer to manage a rescue without endangering himself.



Railroad-Car Cleaner Blows Up a Storm

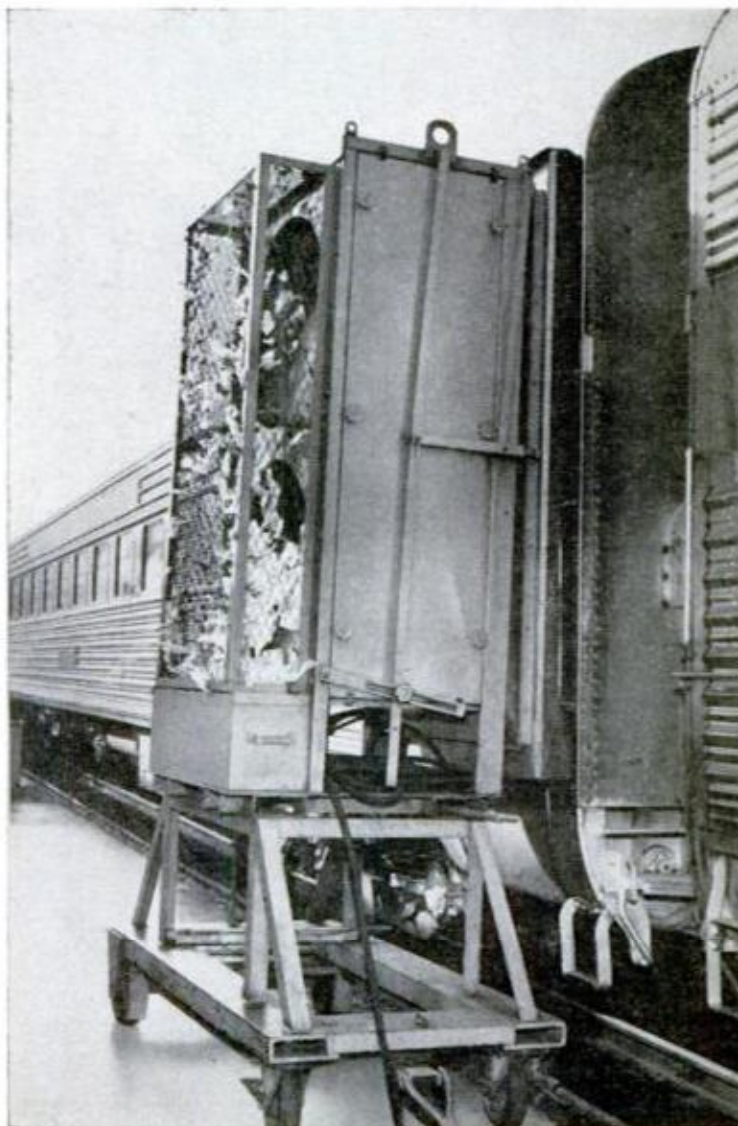
Accumulated refuse in Santa Fe Railway cars is quickly cleaned up by a machine that literally blows a gale through the cars.

The portable machine, the Windjammer, consists of two 24-inch exhaust fans mounted together with a wire mesh receptacle on a movable carriage. It is attached to one of the car's entrances while the other is left open.

As one man moves through the car with an air hose dislodging refuse, the fans, capable of moving 32,000 cubic feet of air per minute, pull the refuse into the receptacle.

The Windjammer has proven so effective that the carriage carpets which formerly required washing four times a year now need attention only once a year. Developed by the Farr Company of Segundo, Calif. and Chicago, the machine is used to service cars after transcontinental runs between Los Angeles and Chicago. It is also used to clean dust from generators, motors and other intricate parts of diesel locomotives.

☛ The earth, in its annual journey around the sun, travels a distance of 590 million miles.





PLUSH INTERIOR of Buick Special Skylark sports coupe, left, has bucket-type front seats. View below shows Skylark's distinctive rear-end treatment. Front view, right, shows new grille—a preview feature which will appear on the '62 Specials



Spring Crop of Compact Coupes

THREE NEW two-door models have been introduced recently by Buick, Pontiac and Dodge. The success of the Corvair Monza coupe last year obviously set other carmakers to speeding plans for compact coupes of their own.

So now we have Buick Special's Skylark, a Pontiac Tempest coupe version and a Deluxe Dodge Lancer two-door 770 model with distinctive trim. Oldsmobile is also joining the parade with an F-85 sports coupe to be called the Cutlass.

The Buick and Pontiac compact coupes are true coupes, having close-coupled seating and shorter greenhouses.

Comet too, has joined the "bucket-seat brigade" with a new two-door sedan, the S-22. It has individual contoured front seats separated by a "glove-box" console.

Buick Special's Skylark has a good deal more than just its coupe body shell to set it apart from the wagon and four-door sedan.

It has a different grille, a new type of fender ornament "porthole" and changed

rear-quarter trim and tail lamps. In fact, the Skylark's styling is a preview of the 1962 Special.

Skylark's top, too, is distinctive in that the steel roof pan of the coupe is covered with orlon fabric to simulate the look of a convertible. The rear window or backlight is slightly smaller than that of the Pontiac Tempest coupe.

Interior of the Skylark has been given a "sports" treatment as well, with individual bucket-type front seats and "button" upholstery on cushion and backrest.

Adding Barrels. Under the hood, Skylark's standard engine is a high-performance version of the Special's 215-cubic-inch displacement aluminum V-8. This engine has a compression ratio of 10.25 to 1, and sports a four-barrel carburetor and two-inch exhaust pipe.

It develops 185 horsepower at 4800 r.p.m. and has a torque rating of 230 at 2800 r.p.m. Transmission may be either three-speed synchromesh or automatic.



LANCER'S NEW sports coupe is an upgraded and distinctively trimmed version of the two-door sedan. PONTIAC TEMPEST, below, has its coupe version but with no special styling or mechanical changes





SCIENCE OVERSEAS

By William Kreh

SWISS SCIENTIST Jacques Piccard has cleared up a mystery surrounding the depth of the dive of the U.S. Navy's bathyscaph *Trieste* in the Mariana Trench last year. The depth was first said to be 37,800 feet, which was 2000 feet deeper than the figure given by echo soundings. Piccard had the *Trieste's* pressure gauge inspected. It appears that the Swiss manufacturer of the instrument had used fresh water — since Switzerland has no seacoast — in setting the gauge. Sea water is about 2½ percent denser at ocean surface than fresh water, more than that at the bottom of the Trench. When this was taken into account, the depth reached by the *Trieste* was figured to be 35,800 feet—just about the figure given by echo soundings.

The Chinese are making a coallike fuel out of waste products. Husks of wheat, rice or other crops are mixed with mud, wood chips, grass roots, tree leaves and salt. Water is added and the mixture is formed into balls then dried in the sun. The product doesn't smoke when burning and 100 pounds of it is said to give the same fuel value as 60 to 90 pounds of coal. Its ash is used for fertilizer.

A French company called Babbitless has delivered a rotary crusher with a 38-inch opening to a cement mill in Verona, Italy. This 125-ton machine can grind blocks of siliceous limestone measuring more than 35 cubic feet at a rate of 500 tons an hour.

South Africa is erecting a six-foot-high fence around the 590-mile perimeter of Kruger National Park. It will take two years to erect, use 5900 miles of wire, 1180 miles of reinforcing elevator cable. The fence, it is thought, should stand against the charge of an elephant.

In England, a robot that can see, read, write and talk is being built at the University of London. Its developer, Dr. W. K. Taylor hopes the machine eventually will be able to recognize people and faces. It has 4000 cells—compared to man's 10 billion—and an eyelike scanner of 100 photoelectric cells. When finished next year, it will talk by emitting squeaks of varying pitch.

The British also are converting two small World War II aircraft carriers into fishing factory ships which would shuttle between

fishing fleets and ports with cargoes of the quick-frozen catch.

Russia has not yet claimed invention of the flying platform, but it is testing platform models at the Moscow Aviation Institute. They are equipped with four engines, one at each corner, with horizontal propellers like those of helicopters. It's said the platforms can carry 40-ton loads.

Russian scientists also claim they have been partly successful in their efforts to clear up clouds and fog by using powerful sound generators. But they admit to making little headway toward solving another problem: What has made the Caspian Sea, largest inland salt-water body, drop eight feet—to 92 feet below sea level—since 1930? The occurrence has cut in half the annual fish catch—one-third of the Soviet harvest.

Norwegian fishing boat skipper Ole Alvestad has invented a machine that automatically baits fishhooks. It was demonstrated at an Arctic Fair in Tromsøe.

Deception Island, due south of the tip of South America, is being wired as a radio antenna to help scientists find out what happens 8000 to 20,000 miles in the sky when clouds of gas given off by solar flares sweep past Earth.

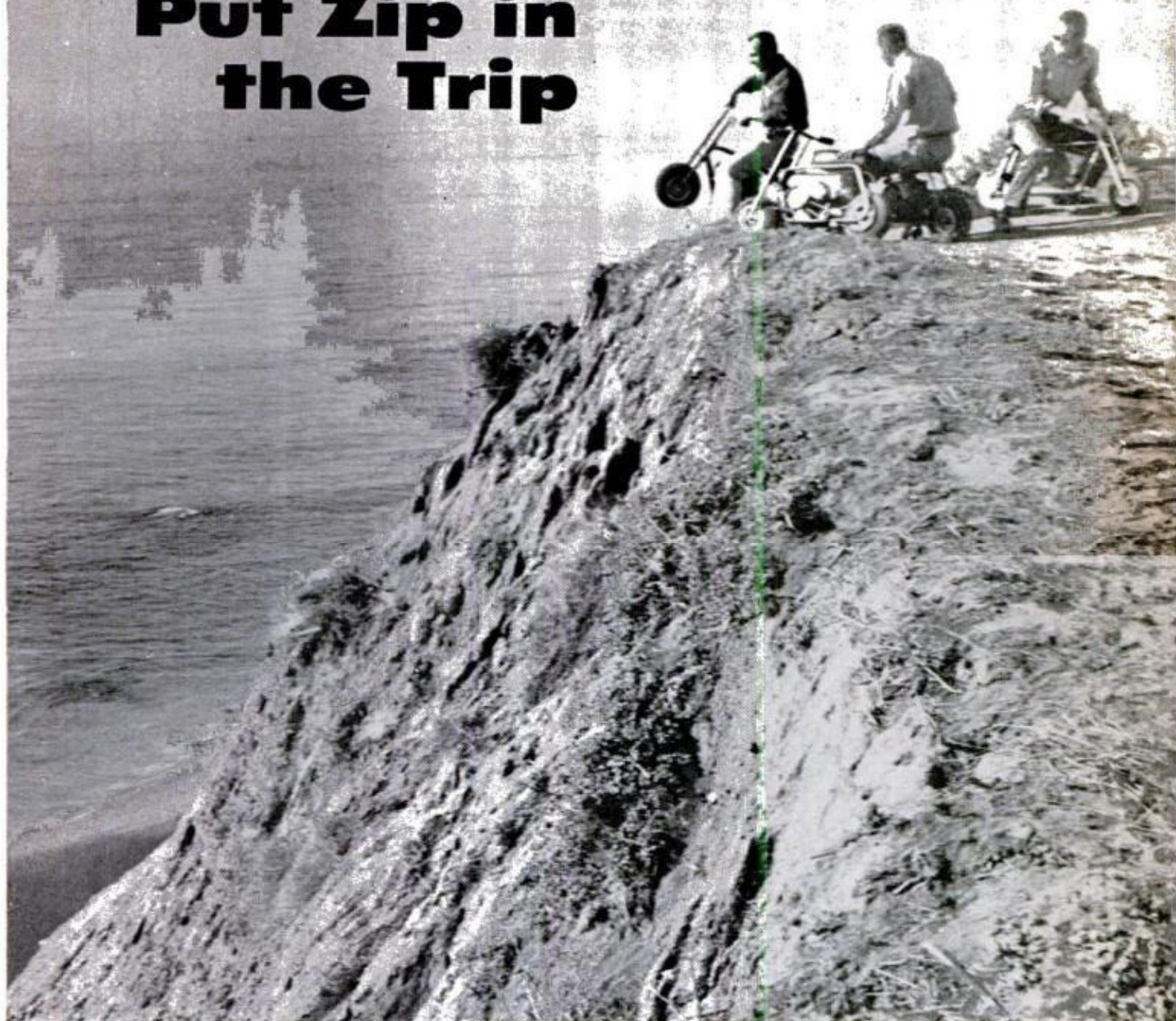
Electric wires are being strung across the U-shaped harbor to send ultra-low-frequency radio waves. Unlike ordinary radio waves, they will follow the horseshoe-shaped force lines of Earth's magnetic field, traveling up one side of the horseshoe, curving around, and returning to Earth down the other side of the horseshoe.

Scientists believe that when solar flares hit, these force lines of Earth's magnetic field are distorted, making one end of the horseshoe jump around. By placing listening posts in the right spots, the amount of bending can be figured to give scientists an idea of what's going on out there.

Austrian professor Karl von Frisch says Italian bees speak a different language than Austrian bees. He says a bee told its comrades where food could be found by doing an elaborate dance. It pointed its hind end toward the sun and waggled right or left to indicate the distance.

Austrian bees do lively dances, he says, while Italian bees are more sedate. ★★

Motorized Mites Put Zip in the Trip



FEW AREAS are off limits to the mini-bike. Here seacoast cliffs provide a challenge for a group of riders

By V. Lee Oertle

THERE'S A NEW SOUND invading the outdoors. Woods, hills and lonely stretches of beach are echoing to an impertinent pop-pop. It's the sound of the mini-bike, a vehicle that's a cross between scooter, motorcycle and bicycle.

Unlike the latter three, the mini-bike is designed not primarily for street use, but as a "mechanical animal," bred to the rugged back hills and winding trails of the deep woods.

The mini-bike is something of a hybrid

owing to its bicyclelike frame, scooter-type engine and a motorcycle's power train. And the combination of the three adds up to something no one of them possesses—a high degree of versatility and maneuverability that at times give the man riding a mini the impression it's a mechanized extension of himself.

The mini-bike combines light weight and diminutive size. With a 65-pound over-all weight, it's an easy matter to heft the midget two-wheeler about as need be, and



FIRST LEG of a trip is made by car or truck. Three bikes fit into a station wagon behind the second seat—a fourth will fit with rear seat folded flat

TRAVELING CROSS-COUNTRY, mini-bikes get riders into terrain only a hiker can see—but faster. Bike's one-quart fuel tank takes a rider about 20 miles



with a 31-inch height and 41-inch length, it stows easily in a car trunk. This makes it an easy matter to drive a car out to the edge of a favorite stretch of woodland or hills, unpack the mini-bike and "bike" it the rest of the way. In any case, once in sight of the brush, you've only to give her a running start, hop on and away you go. There's practically no terrain that you and the vehicle can't negotiate together.

It isn't all a free ride, however. The mini-bike's versatility depends on the skill and effort put into using it. Crossing rough

terrain, steep slopes and difficult uphill climbs becomes a matter of man and machine working together, and the better the rider the more useful the machine.

On ascending trails, the mini-bike's wide-tread tires provide a good grip on well-packed ground. Downhill runs turn out to be as much fun as uphill—only faster. Using foot drag and the mini-bike's spot brakes, you partly roll, partly skid downwards until the slope grades off, and then you're off again into the brush.

Experienced riders have worked out a



↑ **TWO-CYCLE ENGINES** are sensitive to changes in elevation of only a few hundred feet. To maintain maximum power, the carburetors must be adjusted

LIGHT ROPE is essential for steep cliffs. With one → person paying out rope and another "walking" the bike down, machines are easily lowered to a beach

BEACHCOMBING can be mechanized, too. With the tide out early in the morning, riders can explore vast stretches of beach looking for objects washed ashore ↓



technique for taking steep hills where the ground is too soft for good traction. In this situation, the rider dismounts, cracks the throttle a bit and, hanging on to the handlebars, runs along with the machine. Traction is enough to pull the bike up and at the same time helps pull the rider's weight up the slope.

Mini-bikes are not restricted to woods and mountains, however, but have proven almost as much at home on the beach. With about half the air let out of the tires to increase traction, the bikes have pro-

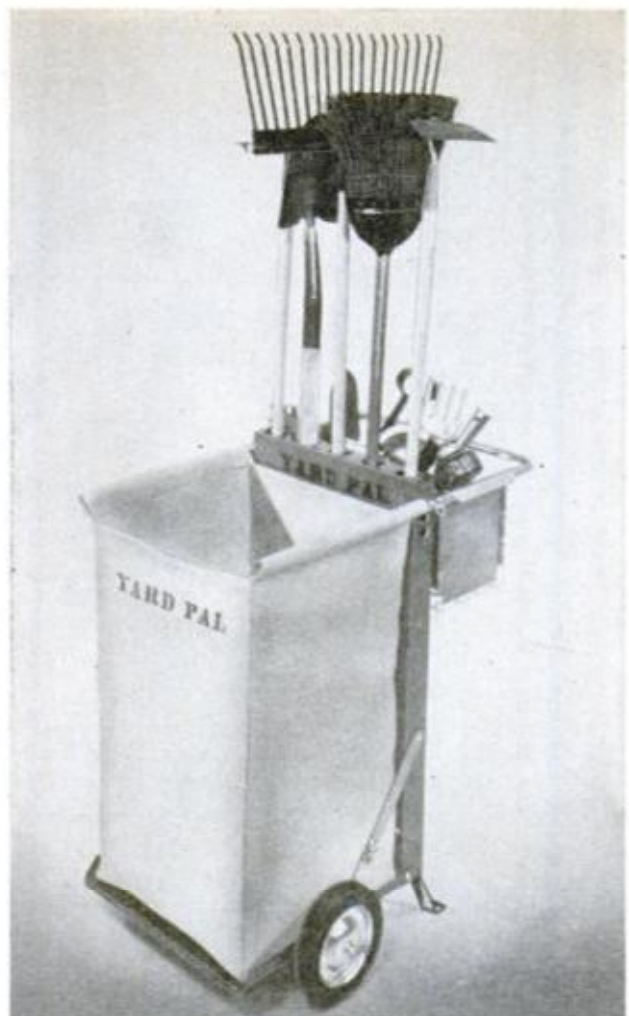
vided beach sport for entire families. Groups of explorers have followed the tide lines for miles and have even ventured up into the cliffs bordering the ocean—areas few would venture to cover on foot. On a mini, this becomes a pleasant combination of biking and mountaineering.

- Several manufacturers produce mini-bikes at the present time. Prices range from about \$100 up to almost \$400, depending on the size of the engine and accessory equipment. The most popular model sells for about \$170. ★ ★ ★



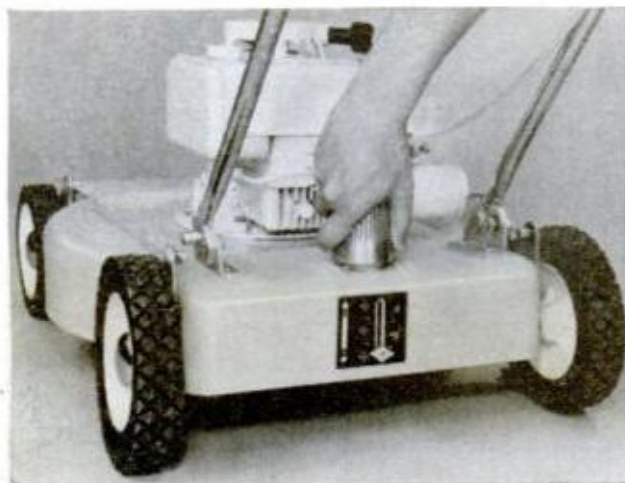
Capture Cold for Capsule

Starting your car on a cold morning in Duluth is simple compared to the problem of keeping an instrument capsule operating at minus 250 degrees through the 17-day lunar night. Engineers at the Ford Motor Company's Aeronautic Division are testing space capsules in a test chamber cooled by liquid nitrogen to minus 320 degrees. Inside the capsule, sample electronic equipment operates at 75 degrees while remote thermometers measure its heat loss and the efficiency of its heating system.



Garden Carryall

Garden equipment can be stored and carried in a two-wheel cart that also features a removable bag for leaves and weeds. The frame has space for five long-handled tools, and a small metal basket on the cart handle has room for sprays, clippers, trowels and other hand tools. The large bag, which has a two-bushel capacity, can also be used to haul fertilizer and other material to the working area as well as to haul debris away for dumping. The unit is sold at \$14.95 by Kol, Inc., 2323 Ellis Ave., St. Paul 14, Minn.



Dial the Cutting Height

Adjusting the cutting height of a rotary lawn mower becomes as simple as tuning in the television on a new model that allows the operator to raise the entire cutting assembly from 1 1/8 to 3 1/8 inches by turning a height selector knob. There is no need to adjust the wheels, with the result that the blade stays level at any height. The cutting height can be adjusted any time during a mowing job without even stopping the engine. The feature is built into the new Duo-Master A-Series mowers made by the Eclipse Lawn Mower Co. of Prophetstown, Ill., and is available in 20 and 22-inch sizes.

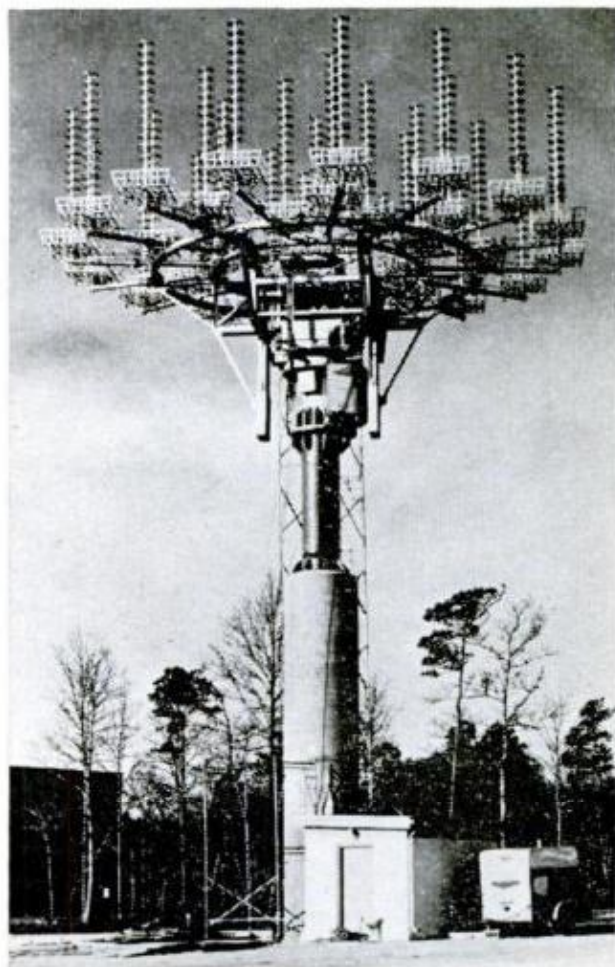


Giant Water Gun

Blowing a 350-foot stream of water over an Hawaiian sugar-cane field at the rate of 3000 gallons per minute, a new "water cannon" creates a downpour heavy enough to irrigate the dense crop. It also dumps water on the crop so fast that harmful minerals present in the water soak in and drain off before they can sterilize the soil. A 275-horsepower diesel engine powers a pump that sucks water from a supply canal, then pushes it through two spray nozzles at 115 pounds of pressure.

Lightweight Tracking Antenna

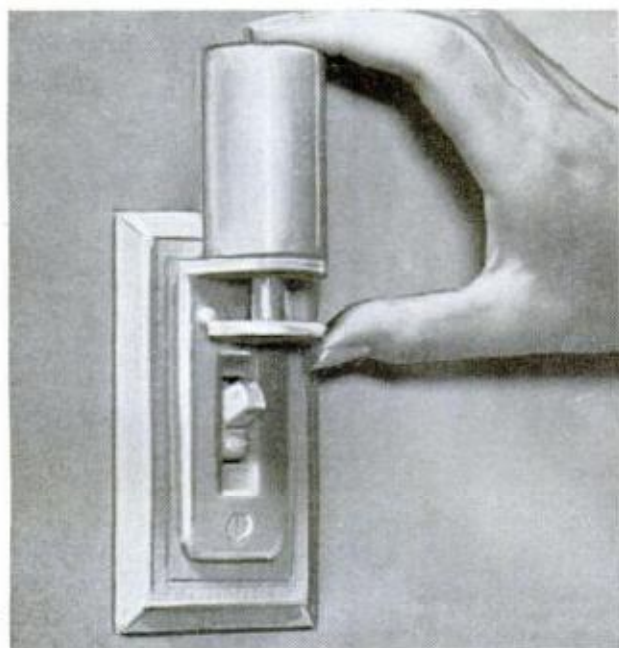
Used to record telemetry data from missiles being tested at the Wallops (Va.) Space Flight Station by the National Aeronautics and Space Administration, a newly designed antenna is smaller, lighter and less expensive than the conventional dish-type paraboloidal antenna. Using the end-fire principle, by which signals are received directly off the ends of its 33 individual rod elements, the antenna array follows the missiles by moving in azimuth (around the compass) and elevation. Because it can be erected with less manpower, it is expected to be used at remote mountain-top and far-north stations.





OPERATED BY FORCED WATER PRESSURE, the Hydromatic dishwasher requires no installation. It simply connects by hose to kitchen faucet and drains into the sink. The unit washes, rinses and dries table service for four or five people. Manufacturer is Spaulding Industries, 3520 N. Spaulding Ave., Chicago; price is \$49.95

DELAYED-ACTION SWITCH turns lights out minutes after you've left the house. Pulling the plunger creates a vacuum, and air seeping in lets plunger fall to close the light switch. Switch can be used on appliances and electronic equipment and set for one to 15 minutes. Manufacturer: C. H. Bracken Co., Pacoima, Calif.



BOOKS STAND UPRIGHT between these spring-tensioned rods. They can also be used to hold up magazines and records. The rods adjust for 9½ to 14-inch shelf heights. They are made of anodized aluminum tubing, with rubber tips to prevent marring finishes. Product of Structural Products, Inc., Charlotte, Mich.





SPRAY PATTERNS TO ORDER are possible with a new turret sprinkler. Turret snaps into one of four possible positions to cover 5 by 10 or 10 by 50-foot strips, 20 by 40-foot rectangles and squares up to 30 by 30 feet. Manufactured by Melnor Industries, Inc., of Moonachie, N.J., the four-in-one unit sells for \$3.95

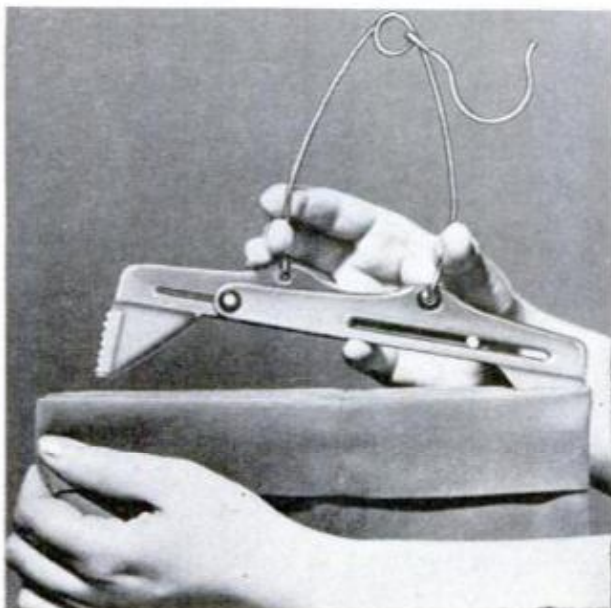


VACUUM BASE on meat grinder allows the grinder to be anchored to any surface without clamps. A removable hopper makes the unit easy to clean. The grinder is made by Rival Mfg. Co., Kansas City 29, Mo.

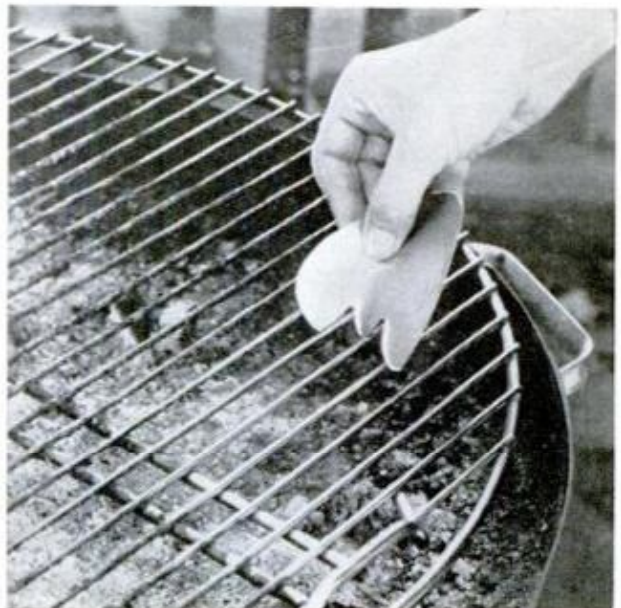


FIBERGLAS BATHTUB weighs less than 75 pounds and can be installed by one man. Available in many colors, tub is impervious to stain and won't crack or chip. Manufacturer is Loup Engineering Co., Columbus, Neb.

TROUSERS HANGER adjusts automatically to fit 7 to 10-inch cuffs. Spring-tensioned base has serrated edges which grip the cuffs on the inside, leaving no marks. Made by Venti-Kuff, Box 11171, St. Petersburg, Fla.



GENERAL-PURPOSE SCRAPER of steel cleans pans and barbecue grills, and can even be used to scale fish. Priced two for \$1, Scrape-All is made by Mercury Products, Inc., 22 Kirkpatrick Street, New Brunswick, N.J.



Civilization Comes



↑ **BLEAK 10,000-FOOT** peaks of the Admiralty Mountains form the spectacular setting of joint U.S.-New Zealand base at Cape Hallett, where biologists are busy



← **LOOKING FOR LIFE** that propagates in temperatures dropping to 120 below, scientists have strung out bug nets like this one, left, all over Antarctica

AUTHOR PASSES TIME of day with Weddell seal → and new pup. Weddells, one of four Antarctic types, grow about nine feet long and weigh half a ton

to Antarctica

Our airlift is toting supplies for revolving greenhouses on the pole, permanent atom-heated towns under the snow, and mountains of equipment for pioneering polar scientists

By Richard F. Dempewolff

OUT ON THE south polar plateau in Marie Byrd Land, two 20-ton "snow millers" have been shooting up geysers of pulverized snow. They are gouging canyons in the mile-high icecap to build a sub-surface town.

Some 800 miles to the east, on the slopes of Mt. Erebus, thundering blasts rain volcanic ash on the huts of our McMurdo Sound air facility. Here, the footings are being prepared for the first of four nuclear reactors that will provide electric heat and power to each of our Antarctic bases.

And at far flung outposts on the bleak snow prairies, fur-hooded communications crews are erecting 110-foot steel towers for antennas that will blast through magnetic storms and radio blackouts.

The commotion in Antarctica this year is the start of a giant program that soon will make permanent towns of our temporary camps on the icecap.

Sitting in his carpeted quarters in front of a three-layered picture window over-

looking frozen McMurdo Sound and the distant Royal Society Mountains, Adm. David Tyree, Deep Freeze's Naval Support Force Commander, explained it to me this way:

"Our seven major bases in Antarctica were designed to last through the International Geophysical Year that ended with 1958. And they did. Then Congress established a permanent office of U. S. Antarctic Research Programs to continue the scientific work begun during the IGY. Logistical Task Force 43 has the job of consolidating and building permanent facilities to support the new program.

"Our primary bases will be this one at McMurdo, Byrd Base and South Pole Base. We gave Ellsworth, on the Weddell Sea, to Argentina. Wilkes Base, on the coast of Wilkes Land, was turned over to Australia. Cape Hallett is being operated jointly with New Zealand.

"Little America V, out on the Ross Ice Shelf, is now on stand-by because it is un-



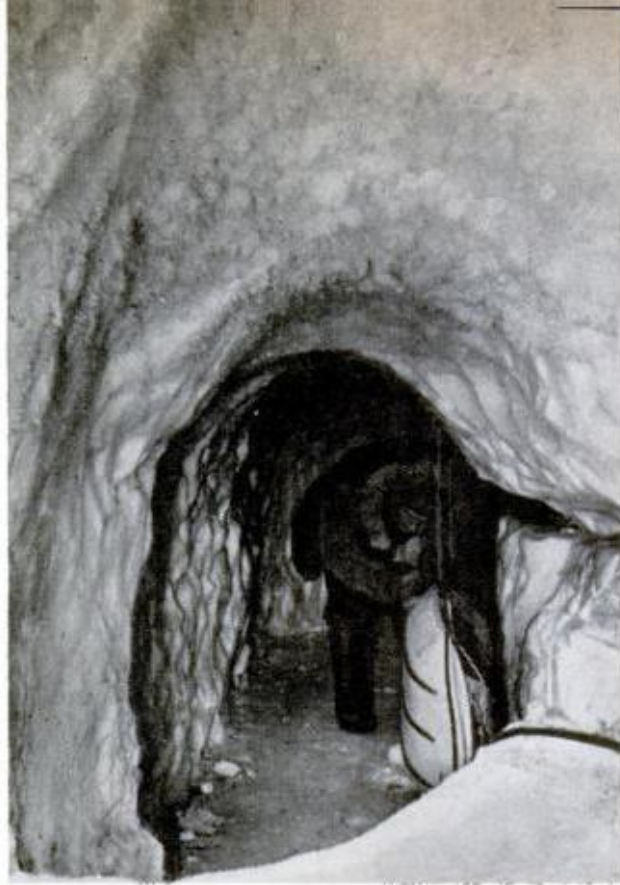


DOWN the hatch to Byrd Base's nine-building town

safe. Drifting snow has covered it. When we opened it briefly last summer, the galley roof collapsed under tons of snow while it was occupied. The same thing is happening to other icecap bases, so we must rebuild them completely—along the lines of Century City in Greenland.”

A few days later, when a C-130 Hercules prop jet sat me down on Byrd Base's snow runway, 800 miles out on the high polar ice, I saw what the Admiral meant.

Lt. Eugene “Doc” Bartlett, 1960's base commander, met us at the strip. It was 30 below zero. A steady wind lifted a veil of drift that hissed through the stilt legs sup-



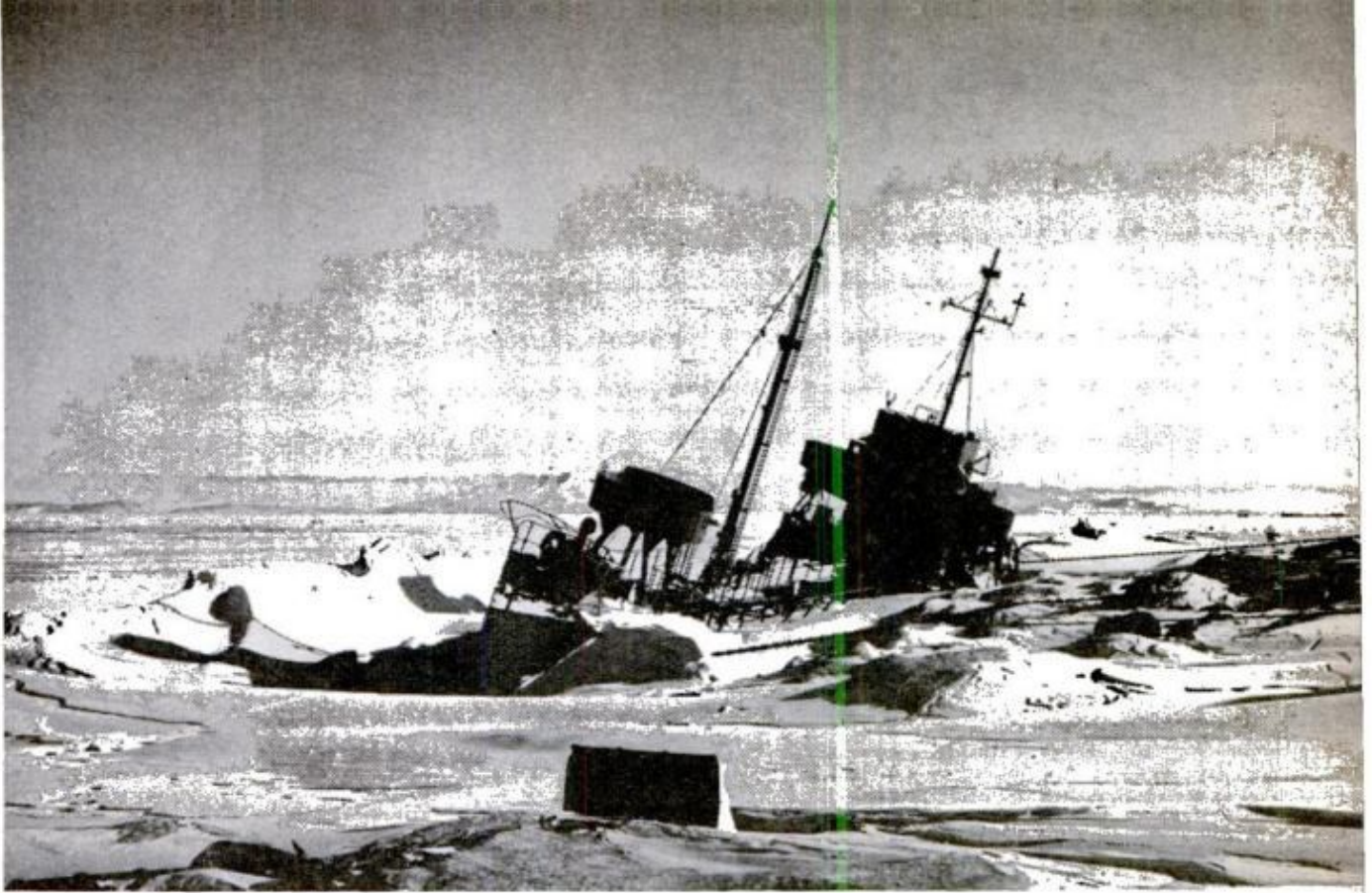
TUNNELS covered with ice crystals lead to main street

porting a massive rawin dome and aurora tower. These two structures, along with a meteorological balloon inflation shack, are all of Byrd Base that shows above the snow. The remaining nine buildings are deep beneath the surface.

A midnight sun silhouetted the gaunt surface structures perched on the central plateau of a 4,500,000-cubic-mile chunk of glacial ice that measures up to two miles in thickness, and sweeps to altitudes of 14,500 feet. On the endless snow prairies, winter night temperatures have been known to hit 124 degrees below zero. Metal freezes to human skin on contact, exertion brings

LIGHTS along McMurdo's main street will be powered by nuclear reactor during 1962's six-month polar night





TANKER was deliberately frozen in the sea to serve as fuel depot for airstrip five miles out in Sound

bloody froth from frost-seared lungs, and fuel oil congeals to the consistency of grease.

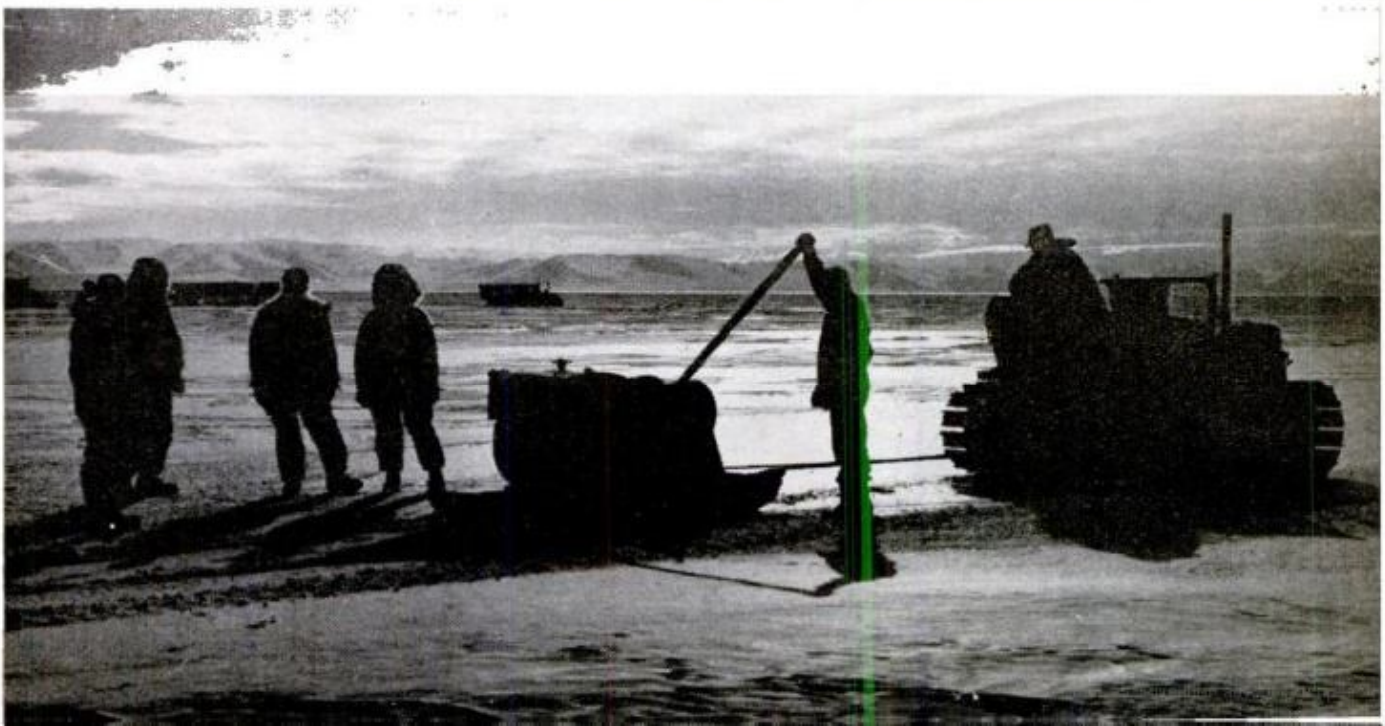
Doc led us through a trap door covering the shaft to his subsurface town. Descending a vertical ladder and a flight of steps carved in the ice, we walked through snow tunnels whose walls glittered with rime crystals. A bend in the white corridor brought us to a main street from which branched the Base's nine insulated buildings. Light came from bare bulbs.

Frost and icicles laced the overhead, which sagged beneath the weight of 15 to 30 feet of snow that had accumulated above

the station since 1957. Even emergency columns of welded steel oil drums had failed to hold the tons of snow and ice. Doc pointed out several that had telescoped into themselves. "It's still safe enough," he said, "but another year will see the end of many areas where the ceilings have caved dangerously."

The menace out here is drifting. Even the slightest obstruction sets up the mechanics of the process. In a borrowed Sno-Cat Dr. Wallace Joyce, head of the National Science Foundation's Special International Programs, and I rode across the snow to see a plane that had crashed the year be-

TRACTOR pulls a giant chain saw that slices through 10-foot-thick ice to carve out berths for other ships





NEW BUILDINGS go up at Pole Base in deep pits. Snow is bulldozed over top to make level, driftproof surface

fore. Not only was it half buried, but, on its leeward side, a giant snowdrift some 15 feet deep stretched away for 30 yards.

This problem will be solved in the new Byrd and Pole Bases when the snow chewers have finished their job. Seabee crews using them by now have completed a complex network of trenches 24 feet wide and 16 feet deep. Over the corridors, arched steel forms were placed. Pulverized snow blown over them will cure into arches as solid as concrete. When all the trenches are roofed over, no projections will mar the surface of the snow prairie. With a clean sweep, blowing snow will not pile up. In the roomy tunnels, insulated buildings of light construction can be erected free of snow pressure.



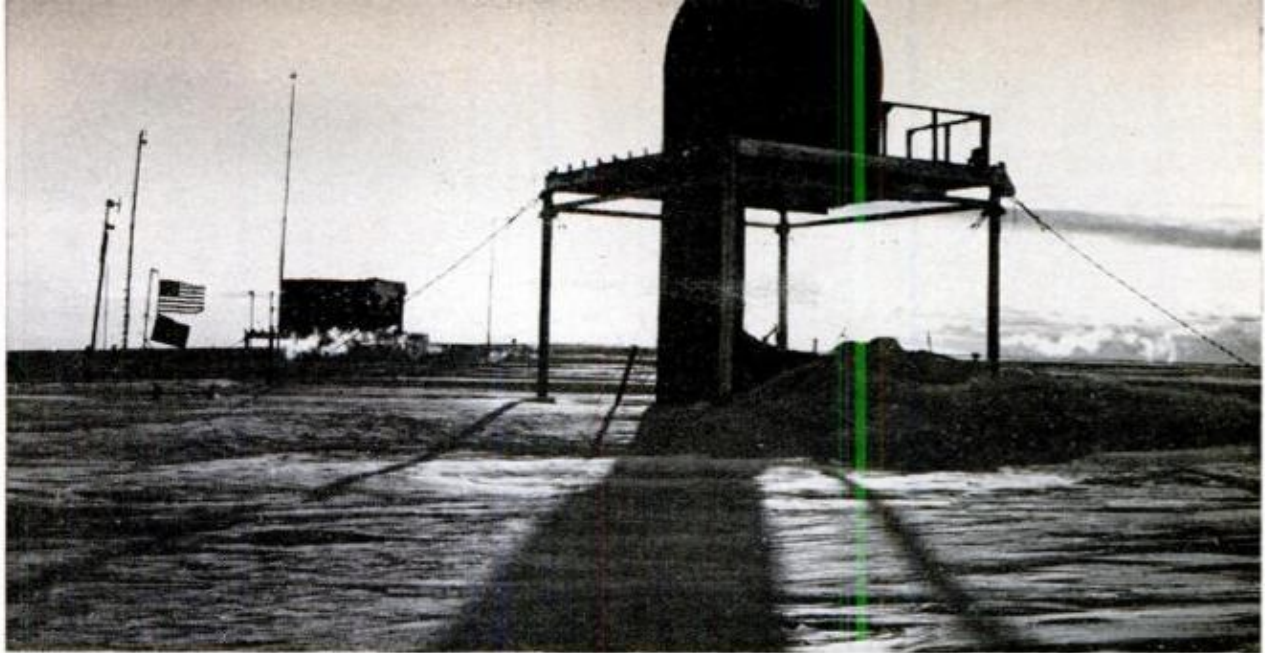
HEAVY DRIFTING over buildings at Byrd Base has started cave-ins. Even welded oil drum columns are buckling under 15 feet of ice and snow

At Byrd and Pole Bases, year-'round parties of 24 scientists and men will live in warmth and comfort, with spare facilities to accommodate summer parties that will raise their population to 70. Six side tunnels branching from the main corridor will contain snug dormitories, mess hall, galley, powerhouse, lavatory facilities, laundry, scientific laboratories, garage, recreation space and offices.

From the aurora laboratory, a narrow shaft will spire upward 45 feet through the surface to an observatory tower above the snow. Here, huddled beneath plastic domes, physicists will be able to observe the polar night sky, and record it with an all-sky camera. A similar shaft will lead up to the rawin dome on stilts, housing the tracking antenna for meteorological balloons. Tunnel extensions will lead to distant facilities.

At the end of one corridor will be a deep water pit known as a "Rodriguez hole." This is a huge cavity produced by melting the ice with a heating unit. Once the hole is created, the immersion heater keeps the water from freezing, and makes more as the liquid is used. It will provide the base's main water supply.

Atomic Heat and Power. Most spectacular innovation for these isolated bases, however, will be the nuclear plants to provide their electrical heat and power. At McMurdo, Art Ritch, engineer for the Martin Co. whose job it is to install the units, climbs the volcanic slopes each day to oversee progress on the first reactor now building on Observation Hill. "It's the prototype for the next three—one for Byrd, one for Pole, and another for here," he explained to me. "It's a Kaiser system and comes in 18 separate packages designed to fit in a C-130 cargo hold."



RADOME, foreground, and aurora tower at Byrd stand on stilts above drift. Chimneys jut from underground

Trundled across the sea ice on tractor-drawn sleds, the components will be fitted together like a prefabbed house. Flat-topped buildings, comprising its safety shell, will be perched on a terrace, while the 30-foot tanks containing reactor, spent fuel and generating steam for the closed system will be dropped to a lower level in a hillside cut. "The plant has a two-year core life," says Art, "with detachable units for waste disposal. And the entire thing can be picked up and carted home as easily as it was moved in."

All the construction hijinx in Antarctica will enable scientists to carry on the job of

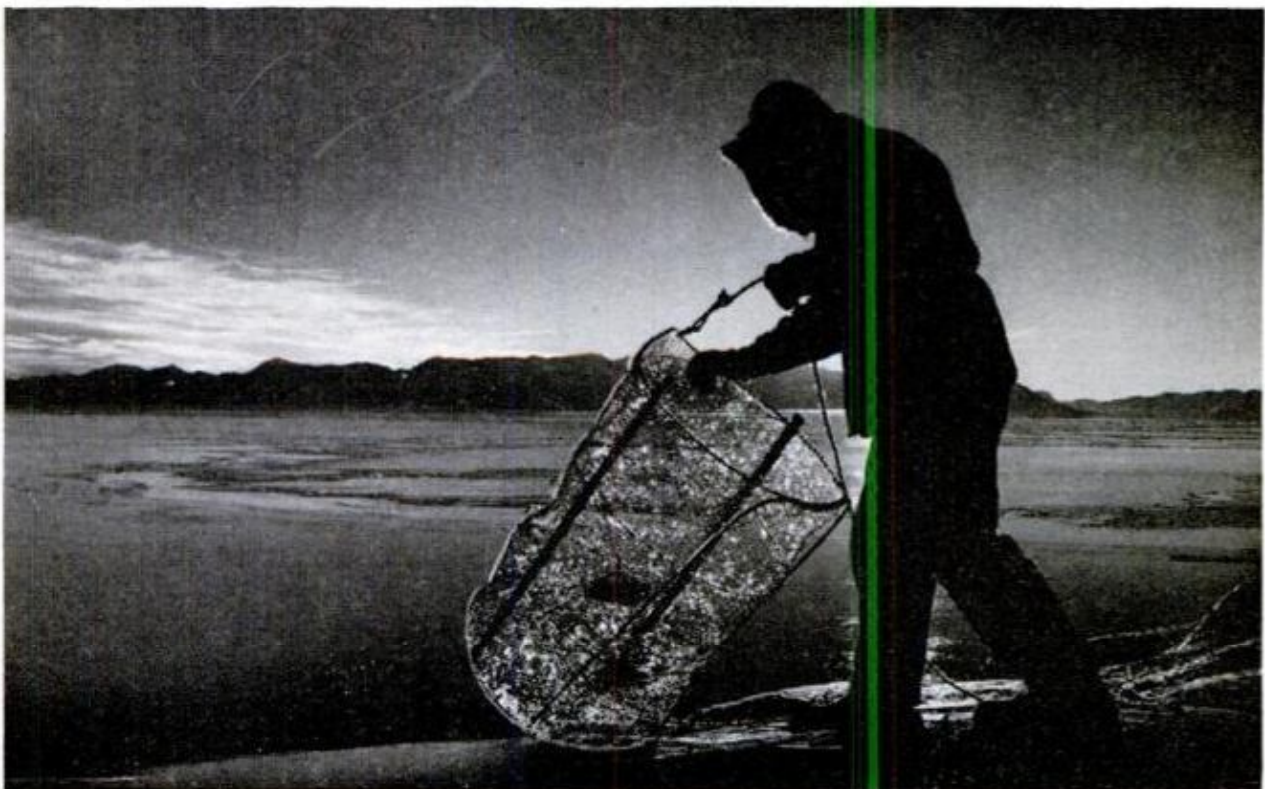
exploring a continent that still clutches cosmic secrets in the frost of centuries.

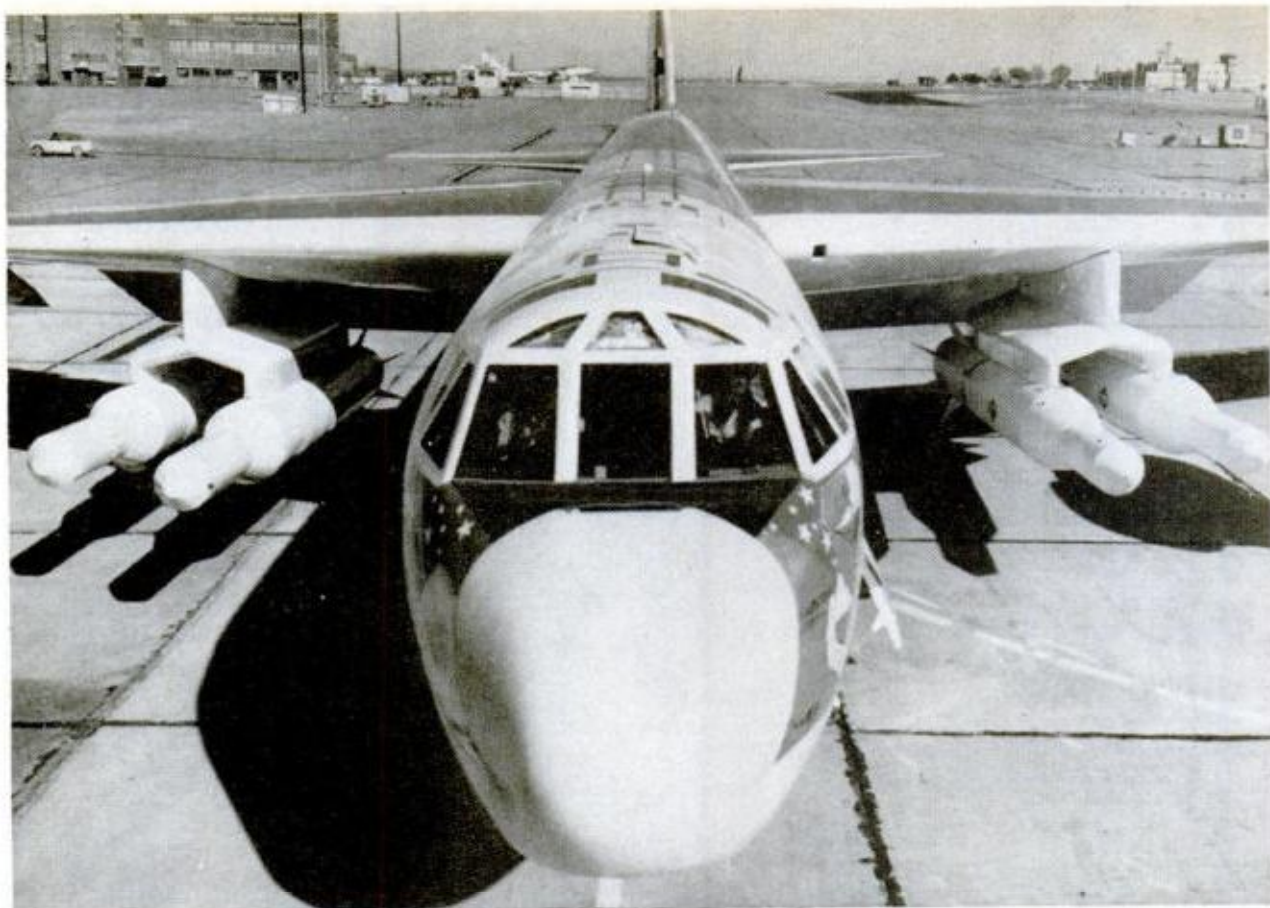
Under scientific leader George Toney at McMurdo, the United States Antarctic Research Programs (USARP) today involve some 45 scientists who man the laboratories at various polar bases 365 days a year. In summer (October to March), about 120 additional explorer-researchers come down on special projects. Each year important discoveries have been made.

Warm Lake Water. This year, three University of Kansas researchers, Dr. Rufus Thompson, Dr. Kenneth Armitage, and

(Continued to page 224)

SCIENTIST sets up a wire fish trap at ice edge to collect specimens for new, stepped-up biology program





Aerial IRBM

Launched from a wing of an airborne B-52, the Air Force's newest ballistic missile, the Skybolt, is designed to follow a trajectory above the atmosphere and hit a target more than 1000 miles away. It is the first ballistic missile to be fired from an aerial platform. The B-52 has a range of 10,000 miles.



Versatile Gardener

Powered by a two-horse-power gasoline engine, the Hobby Gardner features a three-tined tilling attachment, an edging tool, a mechanical hoe and special tines for cultivating. Fingertip controls allow blades to expand or contract, allowing cultivation within a fraction of an inch of plantings or obstacles. Produced by Outboard Marine Corp., Waukegan, Ill., the unit sells for approximately \$100.



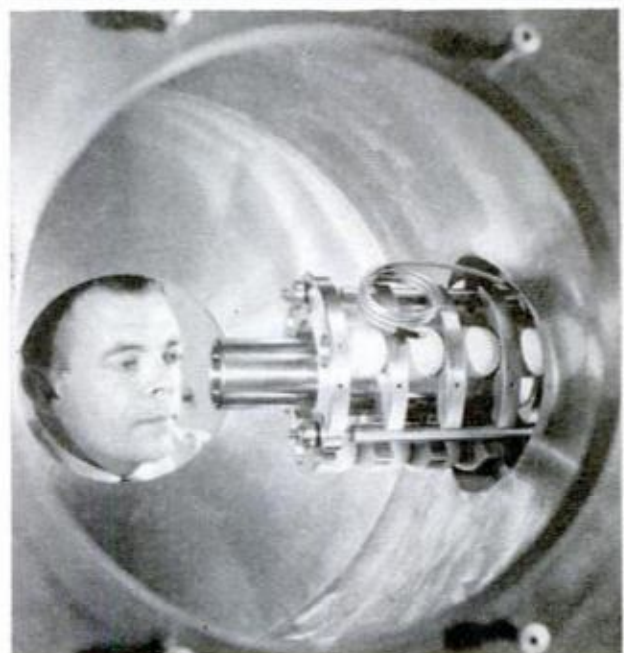
Indoor-Outdoor Carpet

Outdoor carpet? Why not? A new vinyl plastic carpetlike floor covering developed by U. S. Rubber Co. bridges the gap between "hard" and "soft" floor coverings and, since it's almost everything-proof, it'll do as well on a patio or pool side as it will in a family room or entrance hall. Available in eight colors in 54-inch rolls, it's applied with an adhesive. It is a resilient, nonskid floor that's tough enough for any traffic and which can be cleaned as easily as hosing off your driveway.



Ion Engine for Spacecraft

Speeds beyond 100,000 miles per hour may be produced for future interplanetary vehicles by an ion engine which operates by firing a beam of electrically charged particles. A full-scale prototype is shown. The engine would operate in conjunction with an electrostatic generator and an atomic reactor and turbine. The reactor would produce the mechanical energy needed to turn the generator, which would produce the electrical energy needed by the ion propulsion system for thrust. Chemically powered rockets will still be used for "short trips" to the moon, Mars and Venus, but for longer voyages, more exotic and longer lasting propulsion systems such as the ion engine will be needed.



22 Pages of Holiday-Fun Ideas

10 Hideaway Vacations



... or where to get away from it all



See page 210 to learn where you can write for further details.



1 Dawson City

"Skookum" Jim and "Dawson" Charlie struck gold on Bonanza Creek in Yukon Territory on August 17, 1896. The Klondike rush was on. In two years Dawson City mushroomed to 25,000 population. Miners took \$100,000,000 in gold from Klondike placers between 1897 and 1904. They danced in the Nugget Dance Hall,

drank and fought in half a hundred saloons and for their malfeasances were pursued by the Northwest Mounted Police.

Today Dawson City, shrunk to 700 inhabitants, is the world's largest ghost town. There you can stay in hotels built for miners and relive the Klondike gold rush in a town full of memories.

2 San Juan Islands

Roasting hotdogs over a family bonfire on a lonely island in Puget Sound makes you feel remote from the city's bustle. As the sun sets, other islands of the San Juan Archipelago take on the semblance of vessels at anchor. The San Juans are fir-forested, sparsely settled islands nestled

between British Columbia and Washington.

Beaches are crowded with butter clams awaiting your shovel, and crabs scuttle within easy raking range. You can catch salmon, hook ling cod from the kelp beds and scour the hills for luscious wild strawberries and huckleberries.





3 Big Bend

Even the Texas Rangers feared to venture into the tumbled mountains and 1500-foot-deep canyons along the Rio Grande River's Big Bend. From their stronghold in the rugged Chisos Mountains the Apaches raided new settlements and kept the Big Bend for their own.

Although it is now a national park, the Big Bend is still a last frontier where you

can live in an adobe cottage in the Basin and explore on foot or horseback such fabled Apache haunts as Boquillas Canyon, the South Rim and Lost Mine Ridge from where a great expanse of northern Mexico can be seen. Desert mule deer browse in the lowlands, and javelina root among the Grapevine Hills. Mountain lions and the golden eagle also live there.

4 Glen Canyon



The completion of Glen Canyon Dam by fall will bring to an end the greatest of all the river-float trips, the descent of the Colorado through the towering cliffs of Glen Canyon, Utah. This summer you have a last chance to take your ease while drifting down the river among the sandstone domes and spires where cliff dwellers, fur trappers and outlaws have gone before you.

You will see historic hole-in-the-rock where Mormon pioneers cut a wagon trail to the river, the Indian petroglyphs near Music Temple and one of the West's great natural wonders, Rainbow Bridge. The canyon is a photographer's delight and a paradise for rockhounds and archeologists. At night the expeditions camp on sand bars. Veteran guides lead the Glen Canyon floats.



5 Martinique

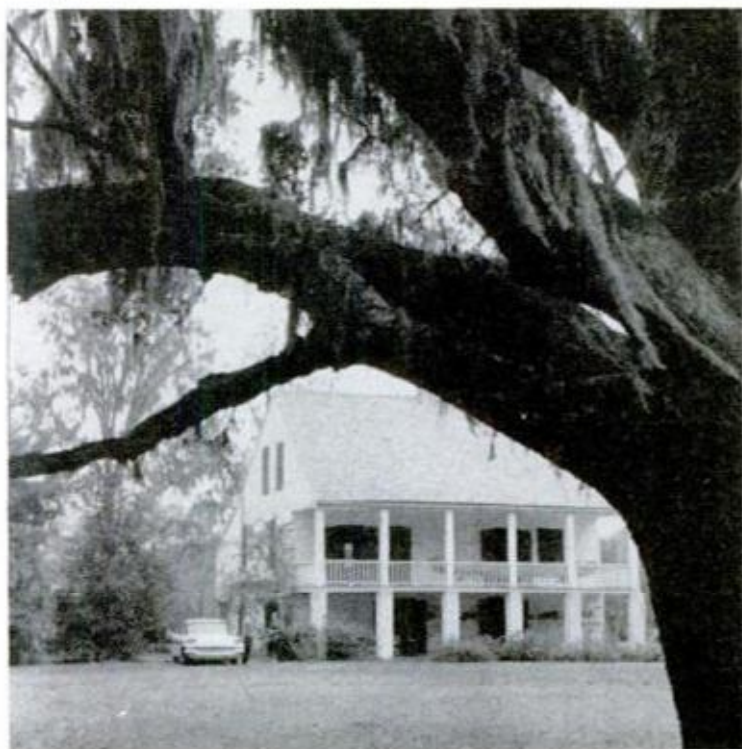
Martinique, since 1947 a department of France, is the queen of the lesser Antilles. You can relax into an open-shoed, palm-shaded life and forget mainland cares. Here where the beguine began, you can watch snake and mongoose fights and dine on such tropical French dishes as *escargots de Bourgogne*, yams baked with cheese and butter, cool salads of palm and coco-

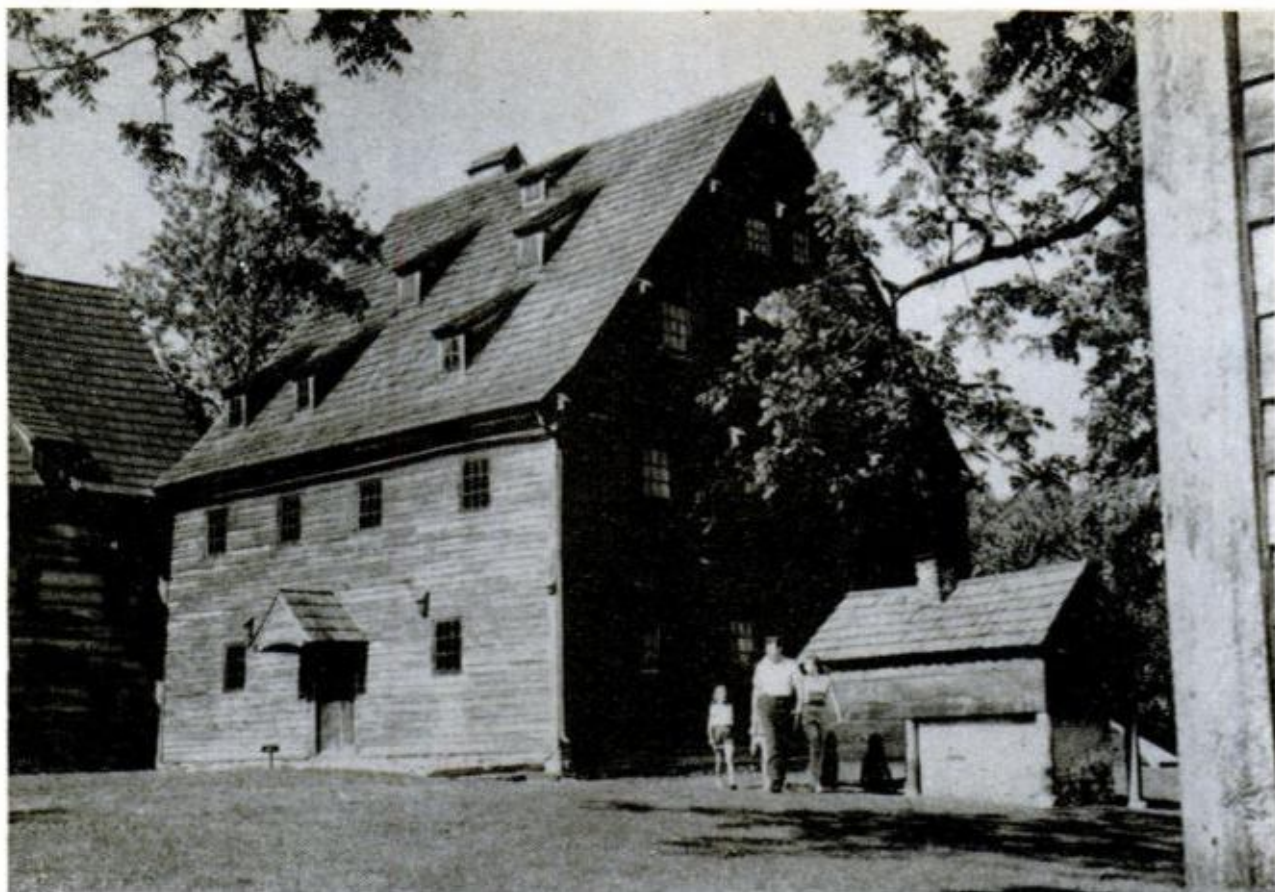
nut hearts, and other gourmet delights.

From serene coastal villages where nets hang to dry you can put out to sea for a good day of fishing. But Martinique has a tragic face to show you, too, for on the west coast of the island you will visit the "Pompeii of the New World," St. Pierre, once a town of 40,000 which, in 1902, was destroyed by the volcano, Pelee.

6 Cajun Country

Every Acadian house has a gallery which is meant for sitting, for sipping strong Louisiana coffee and for telling tales. You can chat with your new Cajun friends, hunt for ducks or search for crawfish to make a tangy bisque. You can climb carefully into a pirogue, which Cajuns say can float on a light dew, and glide over the bayou beneath the oaks draped with Spanish moss. The mother muskrat peers at you from her lair. An alligator barks somewhere in the world about you which is half land and half water. When evening comes, you can take a flashlight and shine it on the bank of the pond to bemuse the bullfrogs. Then you pin them with a long pronged stick or seize them with your bare hands. You can go to a Cajun town and dance 'til dawn at a "Fais-dodo."





7 Amish Land

Pennsylvania's plain and fancy Dutch will welcome you to Lancaster County. Whether you stay in town in a modern hotel run by a fancy Dutchman who dresses as you do, or board on the farm of an

Amishman who wears plain dress (broad-brimmed black felt hats, heavy homemade pants and shirts), you will eat the heartiest of provender, proof that you are in the richest agricultural county in America.

8 Mount Washington

For 100 years Americans have been ascending Mount Washington, N. H., the roof top of New England, for the view. In 1861 the first Concord coach climbed the newly completed carriage road. Now you

can take the oldest cog railway in the world, go by the auto road or hike up the trail. You stay at Summit House, explore the only Alpine meadows in the Eastern United States and ski as late as June.





9 Magdalen Islands

Until recently visitors to *les Iles de la Madeleine* flew there on an irregular schedule, landing right on the hard-packed sands of the beach. Although the islands now have an airport, they remain un-

spoiled. You join islanders in trapping lobsters or going to sea for herring or cod. If you tire of French-speaking fishermen, you cross a narrow strait to one of the Magdalens inhabited only by Welsh.

10 Isle Royale

Isle Royale, which lies like an enormous, rock-bound battleship in Lake Superior, is the only U.S. national park which has no roads. You can go there by boat (below) or seaplane, stay in a rustic

cottage and explore the wilderness on foot. Rowing a boat up Washington Creek, you may see a great blue heron, a bald eagle or a moose. You can fish in one of the island's 83 inland lakes.



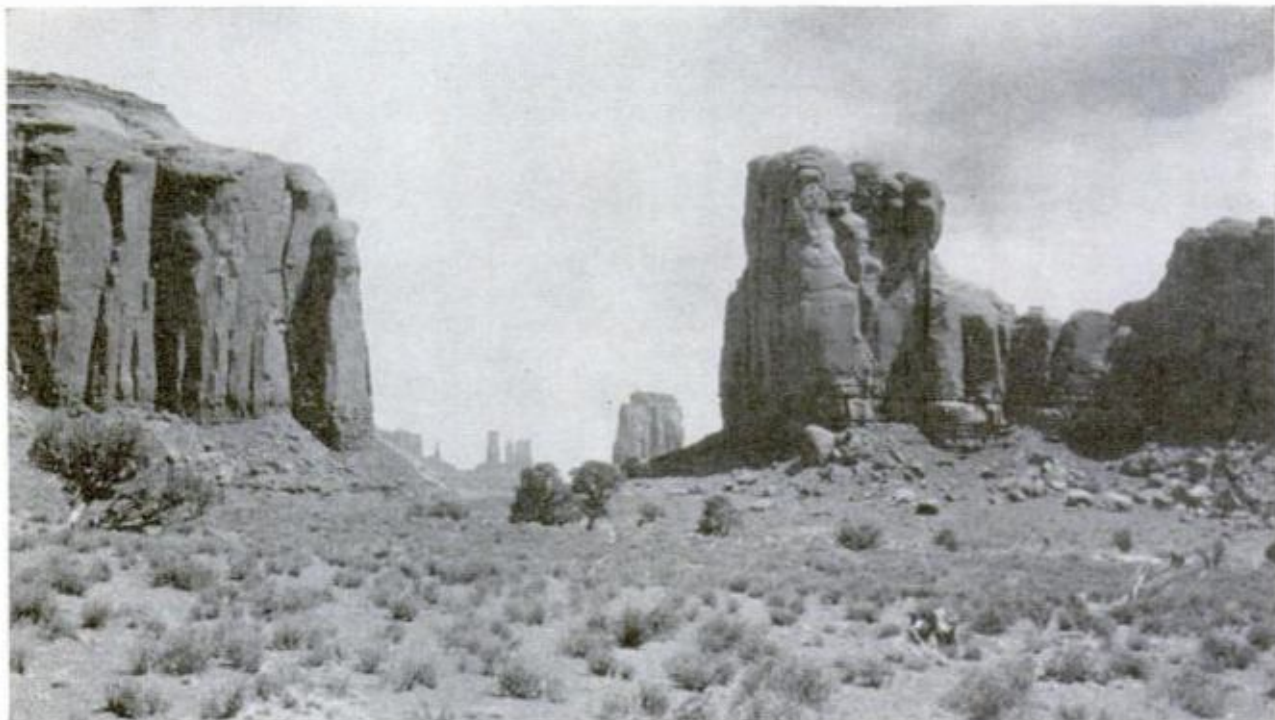
Favorite Vacation Photos

Seven celebrities, all ardent shutterbugs, describe the scenic spots they like the best, and illustrate them with their own pictures



Monument Valley

By John Wayne



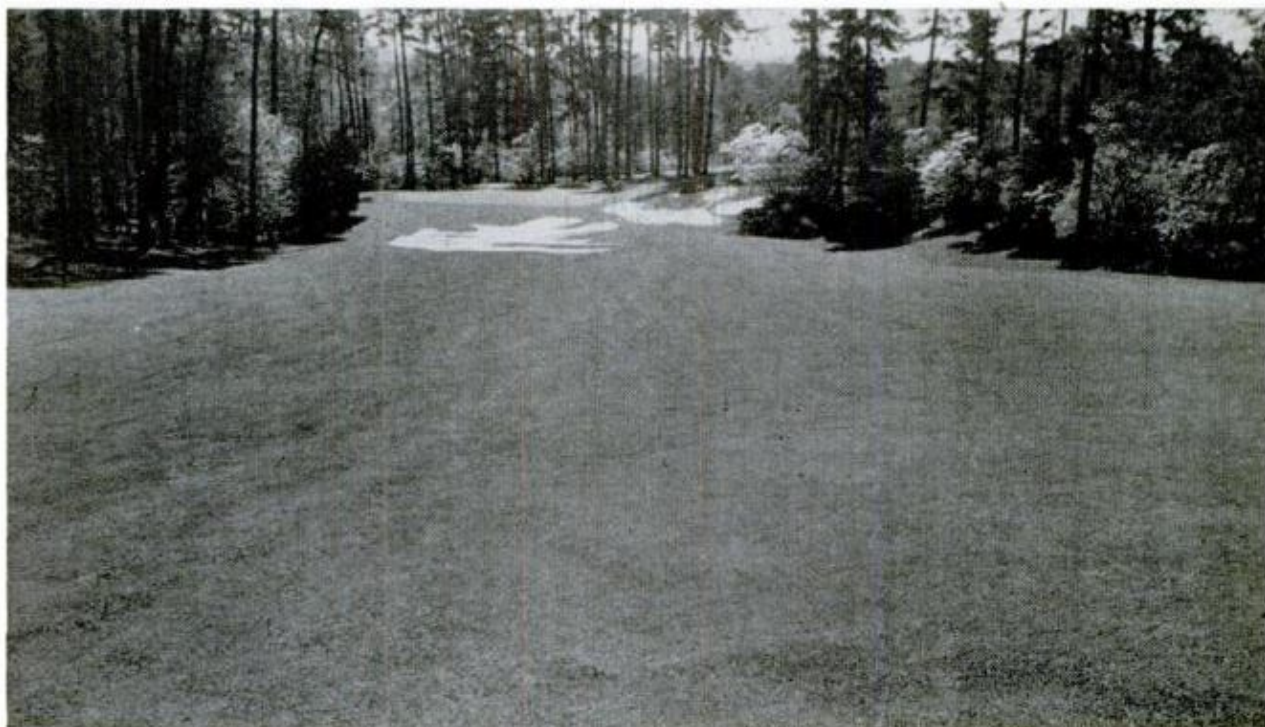
BECAUSE OF my work in movies, I've traveled the world over many times. I've seen most of its cities and countries, mountains and valleys, deserts and seas. But none of it is as awe-inspiring to me as Utah's Monument Valley. Its sunrise is an emotional experience. So is the sight of a lone Navajo outlined on a pinnacle as he makes his morning prayer. The majesty of nature's sculpture of monolithic imagery defies description. The restfulness of awakening to the clean windswept desert skies far from civilization is unique. The bitter winds of winter, the sudden gathering of storm clouds, the lonely hogans partially hidden in sagebrush—all these are real and inescapable elements in a dramatic and overpowering land. Some places do not inspire a return visit, but I've been to this wondrous place many, many times. I know I'll be going back. It is part of me now.

of Famous Amateurs



10th Hole at Augusta

By Bobby Jones



THE 10TH HOLE of the Augusta National Golf Club course appeals to me as one of the most beautiful in the world, especially at the time of the Masters Tournament in April when the dogwood and redbud are in bloom.

The striking contrast of the white sand of the bunkers with the lush green of the turf emphasizes the dominance of golf in the scene. Yet the tall, straight pines around the green provide something of the feel of an ancient cathedral.

My prejudice in this is understandable, I'm sure, but I feel that no matter where I might travel I would not find a scene of more meaningful or nostalgic beauty, the sheer splendor of an elegantly lovely spot and the peculiar beauty of a place and a game that has been so large a part of my life.



Arizona

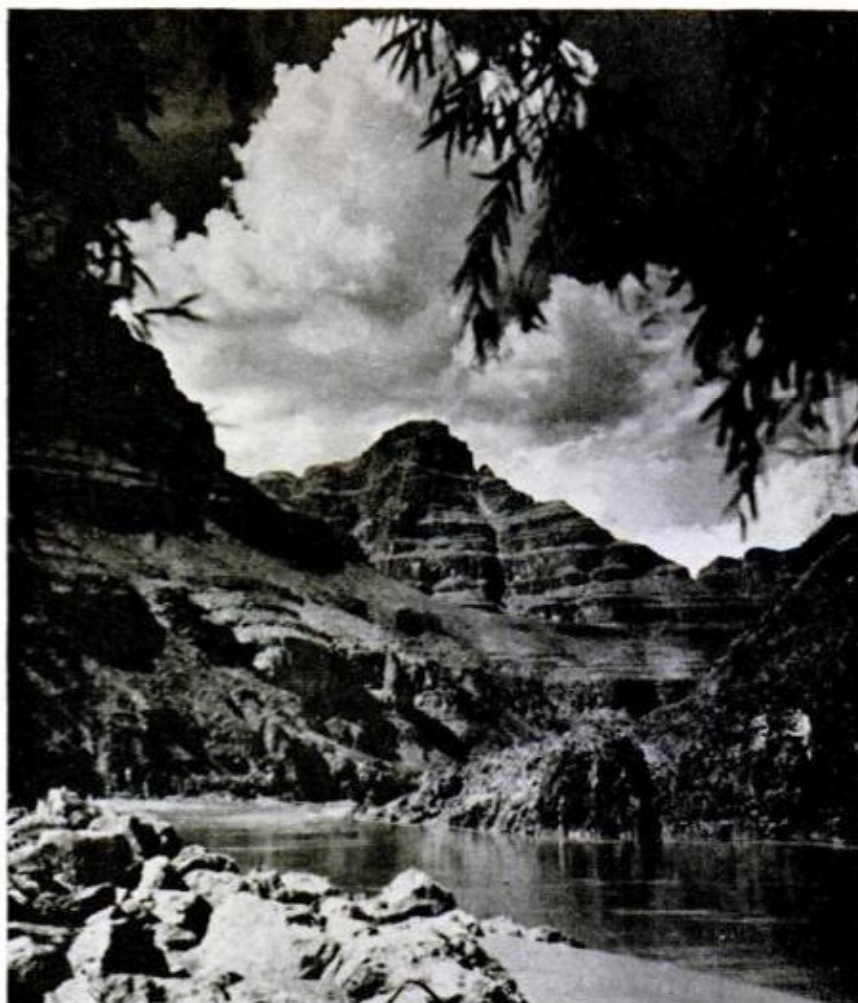
By Sen. Barry Goldwater

Deserts

Forests

Canyons

Mountains



WHERE THE cross and religion first came into what we now know as the United States is also where God most abundantly created nature's beauties. This is Arizona, with her deserts, her spreading green forests, her deep canyons and high mountains, the shimmering flat mesas of the Hopi land, the agelessness of the Petrified Forest.

But the deserts and canyons sweep through my mind first as I think of Arizona. Sometimes the desert's beauty comes in a show of nature's awesome strength, as stormy winds tear at its surface, followed by rain which brings out the clear pungent smell of wet greasewood and sage. Then in late spring come carpets of yellow poppies and flowers from every cactus and tree—too colorful for description.

The canyons show the strong patience of nature. They tell the story of time and the relentless sureness of God's plans. In them, man is reminded of his insignificance as their deep shadows cool his troubled mind. This is the inner beauty of consolation by which man is reminded of his place as a spiritual being in the scheme of Life.

California's Palm Desert

By Bing Crosby



I'VE COVERED most of our fair country—working or just playing. The lure of good golf, good hunting and fishing, even good weather has always been irresistible. And I know some beautiful spots. But I think I'd have to name California's Palm Desert as *numero uno*.

More and more I find myself looking for good weather. Palm Desert has the greatest. I have a little place nestled against the desert foothills, with a sweeping view of the mountains and the valley, and to sit up there in the late afternoon and early evening and watch the changing colors on the hills is one of life's serene experiences.

Of course, the fact that there are 10 golf links within easy range doesn't hurt a bit—and the warm, dry desert air does wonders for my aging muscles and creaky joints.

Truly my favorite spot.



New York City

By Sammy Davis, Jr.



I THINK New York City is unique—special by day and most special by night. When the sun goes down the city comes alive. There's always something doing until four in the morning and, if you're lucky, until dawn.

By day and by night the look of New York is different. You can stay there 10 years and never see the same thing the same way twice. And for those who don't live in the Big Town, but just visit it, there is always something new.

When I am driving down a highway late at night and spot a lonely house with a light in the window, I am always intrigued. I always wonder what is happening behind that window. Some time back I had a penthouse atop the Gorham Hotel in New York. I pointed my camera out a window and took this picture. All of these lighted windows are like the single window in the lone house in the small town, just like that only multiplied by the thousand. It is a beautiful and dazzling scene, one you can find only in New York. If you pause to look at it for more than a moment or two, inevitably you start to wonder about what's happening behind all those windows.

Crater Lake

By Harold Lloyd



I THINK one of the world's great beauty spots is Crater Lake, more than 7000 feet high in the Cascade Range just across the California border in Oregon. As you drive up the winding mountain road, the sudden sight of the gorgeous, glistening body of water is unexpected and for that reason that much more exciting. The thrill of discovery adds to the thrill of the view.

I've been there summer and winter and like it best in summer. The water seems to be at its bluest then. But Crater Lake is always lovely and peaceful and a wonderful place to spend a vacation, especially for someone like me who loves to shoot pictures. They have boat trips around the lake, and the cliffs which surround it rise from 500 to 2000 feet high and are very inviting camera subjects. And you can just as easily photograph by land. A road circles the Lake and there are several observation points where you can park your car and aim your camera at the marvelous scenes.

I am told there is good fishing in the lake, but that doesn't interest me. I'll take a camera to go after what I want.



Hawaii

By Jerry Lewis



BEAUTY IS NOT JUST a wonderful sight. Beauty is also a frame of mind. Two people can look at the same thing. One may see beauty in it, one may not.

I think, in a way, this photograph illustrates what I mean. I took it on a trip to Hawaii last year. The young coin divers swimming around our ship would not ordinarily qualify as an outstandingly beautiful scene. Their presence in the water does not have the allure of great mountains, winding streams, cloud-filled skies, sweeping landscapes—the usual elements for handsome scenics. But a look at these men maneuvering in the water, with the reflections of the sun producing rich patterns, was to me a scene of great beauty. This simple activity became almost an abstract painting.

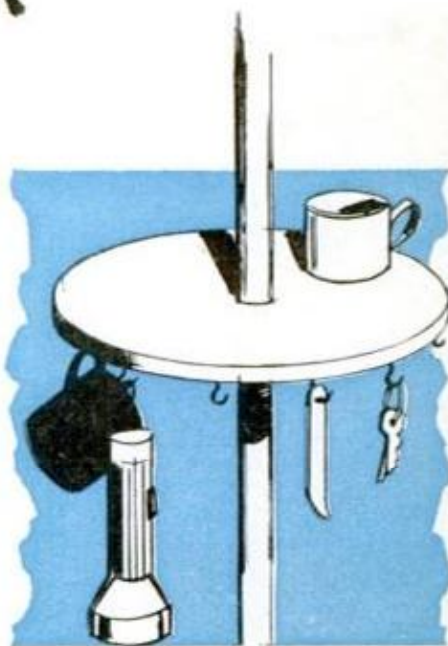
Photography has helped me see things better. My camera offers me a chance to see life from a much more critical point of view than that of the casual observer. I think my life is richer because of it. There is beauty all around us.

Work Savers for Vacation Campers



CAMPERS are an ingenious lot. Dedicated to living outdoors as comfortably as possible with as little equipment as possible, they become masters of improvisation, getting double and triple duty out of everything they use. We're always fascinated with the ideas that *PM* camping readers pass on to us, and we'd like to share a few good ones with you.

The couple above has solved the camp furniture problem—simply by bringing along aluminum outdoor furniture. Lightweight, durable and collapsible, it gives them a campful of good furniture without adding much to their load. Some campers don't like center tent poles, but one *PM* reader wouldn't be without one. He drilled a hole (same diameter as the pole) in a circle of plywood, holds it table-high with a peg through the pole, and has a table and holder for small items (right).





WHETHER YOU fell your own timber or take leftovers at a campground firewood pile, you can't beat a camp saw for making fast firewood out of logs. Three good tips: Get one with "raker" teeth (above), rig a sawhorse, and let the saw's weight do the work



SAVE A FORK if you don't have a chopping block; a log braced as shown is easy to split and stays put, saves your ax, too. Start around the outer edge, then work in toward the center



ANOTHER SUBSTITUTE for a chopping block is a level sawed-off stump. Stand the logs upright (if they're sawed, they'll stand) and split them inward from the edges, so every blow will break off a clean billet. Hitting the center only wedges the ax.



A SHEET of plastic film has a thousand uses. It'll make a tent or a windbreak or a sunshade



THE SAME SHEET makes a fine raincoat or poncho for sudden showers. Get the heavy-duty dropcloth type; install grommets if you'll be using it for a tent

THE PLASTIC will even make a bath or washtub; dig a hole, cover with the sheet and fill 'er up



LOST AND FOUND insurance for camping kids: Give each one a dime-store whistle; teach 'em to answer when called, or to blow often if they're separated

DON'T KILL the grass for one fire. Cut an "H", peel back two rolls of sod; rods hold utensils. To clean up, roll 'er back



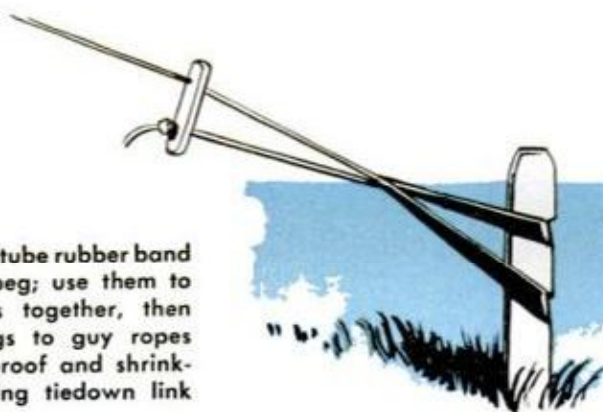
CAR CAMPERS needn't sleep in a damp sleeping bag. Stop in the next town and use the dryer in an automatic laundry. Dried bag is also lighter, softer, more comfortable in cold weather



NO SMART CAMPER throws away all his tin cans; they're worth their weight in gold occasionally. A pair of tall cans with both ends cut out will protect your firesticks from charring (above left); a can cut to fit will keep a soaking rain from leaking in around a tent pole (above right); a can under each table leg, filled with an inch of water and a little gas or oil, will keep insects away. And a miniature camp shower, made by punching half a dozen holes in a can and hanging it from a branch, will make a hand shower that'll let you wash your hands without an assistant. Just pour the water in the can; it'll run long enough for the job



CUT ONE inner-tube rubber band for each tent peg; use them to keep the pegs together, then to connect pegs to guy ropes make a shockproof and shrinkage-compensating tiedown link



10 DAYS ABROAD AT \$10 A DAY

By Thomas E. Stimson, Jr.



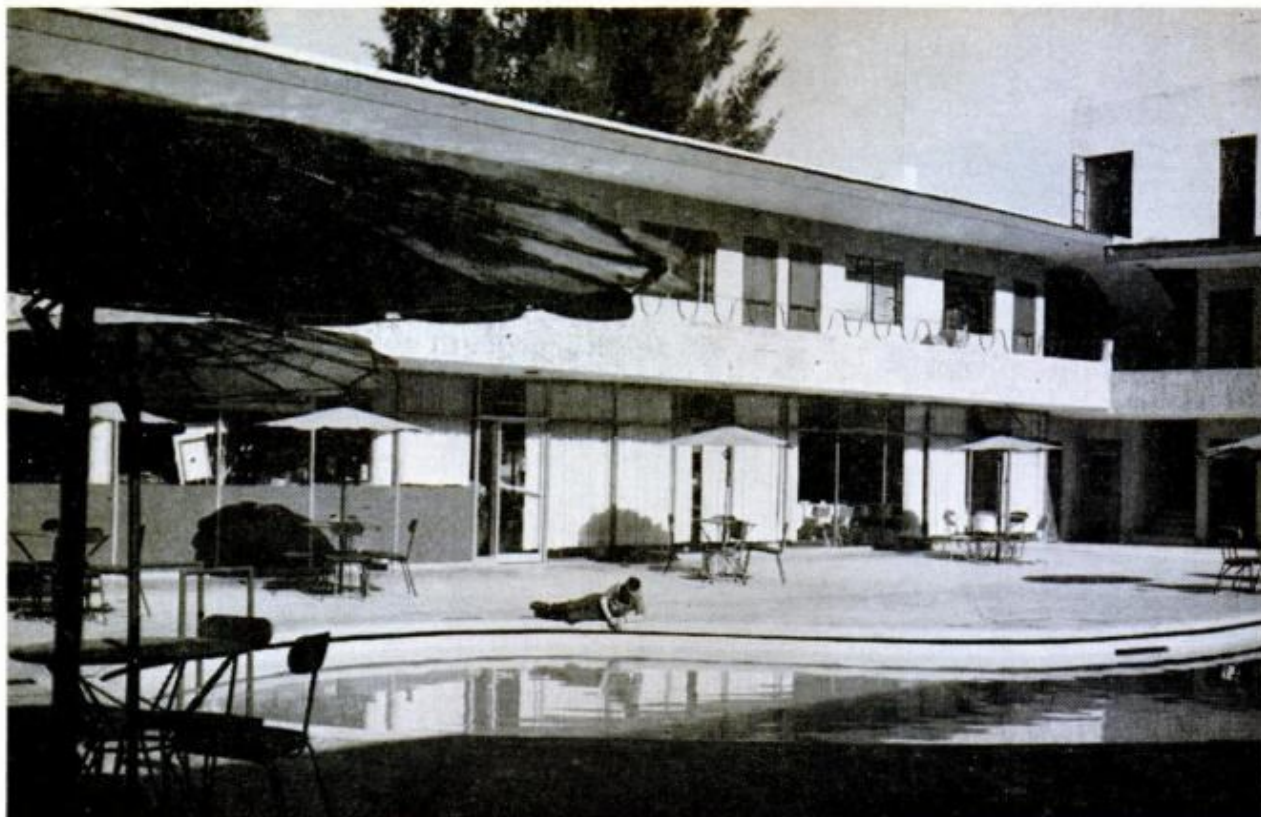
CROSSING THE BORDER into Mexico is like entering another world. The costumes and customs are different and often as old as Mexico itself

YOU CAN TOUR Mexico in your car for less than \$10 per person per day. Thousands of people are discovering this bargain in foreign travel. Last year more than 150,000 U.S. citizens drove south of the border with their families on vacations that lasted from one to three weeks.

They lived as comfortably as at home. They saw sights they never dreamed they would see. They took pictures they'll treasure all their lives. They learned they didn't need to know a word of Spanish, that border regulations have been made easy for them.

To find out how much it costs to spend a vacation abroad I recently took my family (wife and daughter)





MODERN LIVING has made inroads in Mexico. Motels are as up-to-date as in U.S. — and less expensive

on a 10-day tour of parts of Mexico. We weren't on a budget and we were going to do what we wished. Of course, that didn't mean we were going to stay at the most expensive resorts or fling money away at night clubs.

After we returned home I found we had spent \$29.25 per day. That's \$9.75 per day

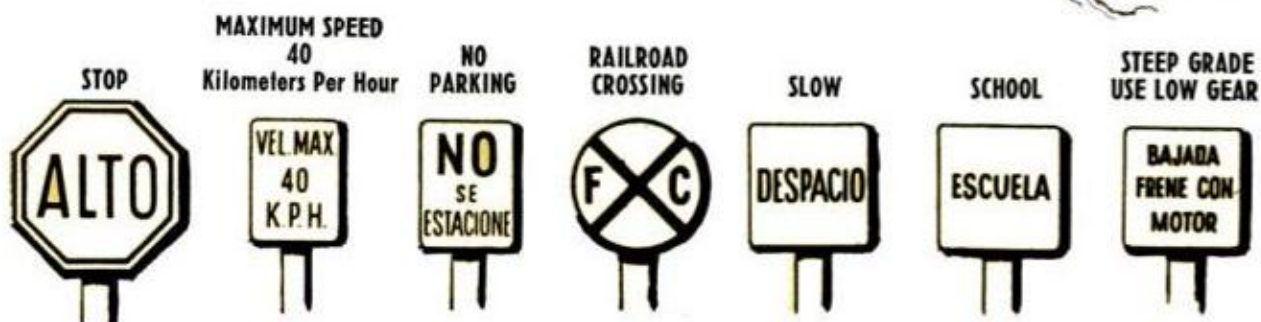
for each of us. And it included everything —border fees, Mexican automobile insurance, tips, film, gas and oil, postcards and airmail postage. It even included the small fees for exchanging dollars for pesos. The one thing it didn't include was the purchases that all of us made. On such a trip you are allowed to bring back up to \$200

FLOATING GARDENS near Mexico City are popular tourist attraction, not only for visitors but natives as well





MAP OF MEXICO shows major routes to and from Mexico City, hub of all travel there. Story gives details. Below, with translations, are common road signs



TAXCO, MEXICO, is amateur photographer's paradise

How Much Is Your Money Worth?



About 12½ pesos per dollar. You can make the exchange at border, in large cities, at hotels and motels, banks or American Express offices, for a small fee. Travelers' checks are honored

When Buying Gas . . .



Credit cards won't work, and gas is sold by liter, not gallon. However, it's equivalent to about 32 cents per gallon and it's easy to figure. Just pay price shown on pump meter. Make sure you have enough pesos for gas from border to Mexico City





MEXICAN BUSES are like no others. They carry everything—passengers, produce, poultry, what have you . . .

worth of purchases per person duty free. And everyone brings back at least a few souvenirs. Pottery, glass objects and many other "tourist" items cost only a fraction of what you are used to paying.

By coincidence, the day after I returned home a friend called up to rave about Mexico. He and his wife had just driven to Mexico City and back. I asked him what the trip had cost him and he reported that

it worked out to \$20 per day for the two of them.

Any time of year is a good time to visit Mexico. In the summer there may be rain along the tropical coasts and a short sharp shower every afternoon on the central plateau. Winter is the dry season in most areas. Light clothing is most comfortable, both winter and summer. A knowledge of

(Continued to page 214)

SMALL TOWN, typical of Mexico, shows thatched-roof homes, bullocks used for hauling carts, plowing fields



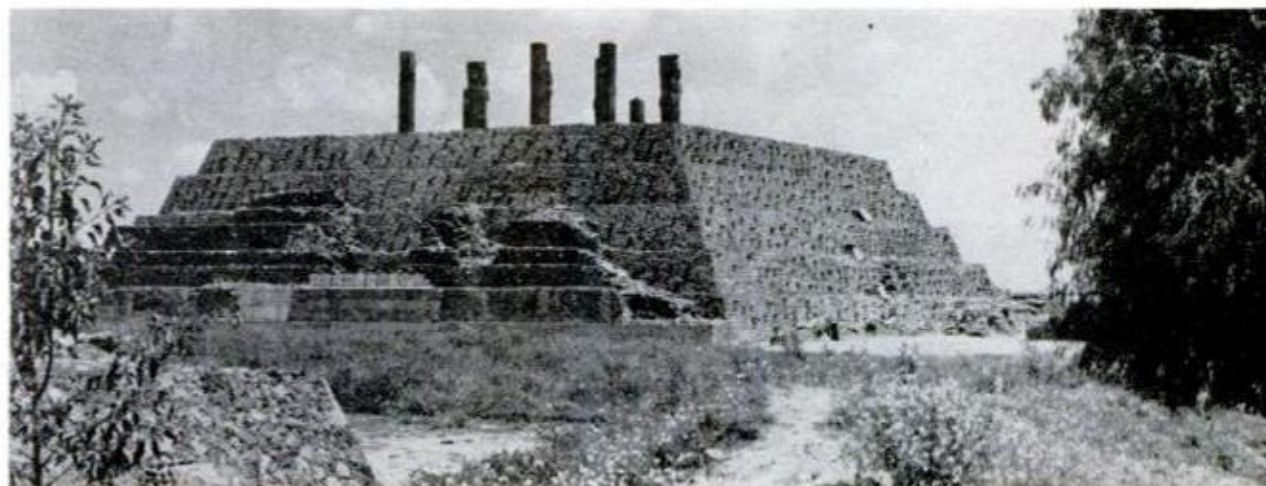
BIG CITY, like Mexico City, has regular bull fights, a great spectator sport south of border. Race tracks also attract their share of fans



ANCIENT RUINS abound in Mexico, and no visit is complete without touring some. These are located at San Blas on Pacific coast



PYRAMID AT TULA is among attractions of recently opened archeological area in northeast Mexico



UP AND OVER

on this backyard tumbler. It's full size, can double as a wading pool



WHAT KID hasn't found great delight in bouncing on a bed only to be reprimanded for breaking the springs? Now, lively youngsters can bounce to their heart's content on an outdoor tumbler that will stand all the bounce they can give it. This one differs from others in that it is designed to convert to a king-size wading pool by removing the tumbling bed and lashing a waterproof plastic liner to the supporting framework.

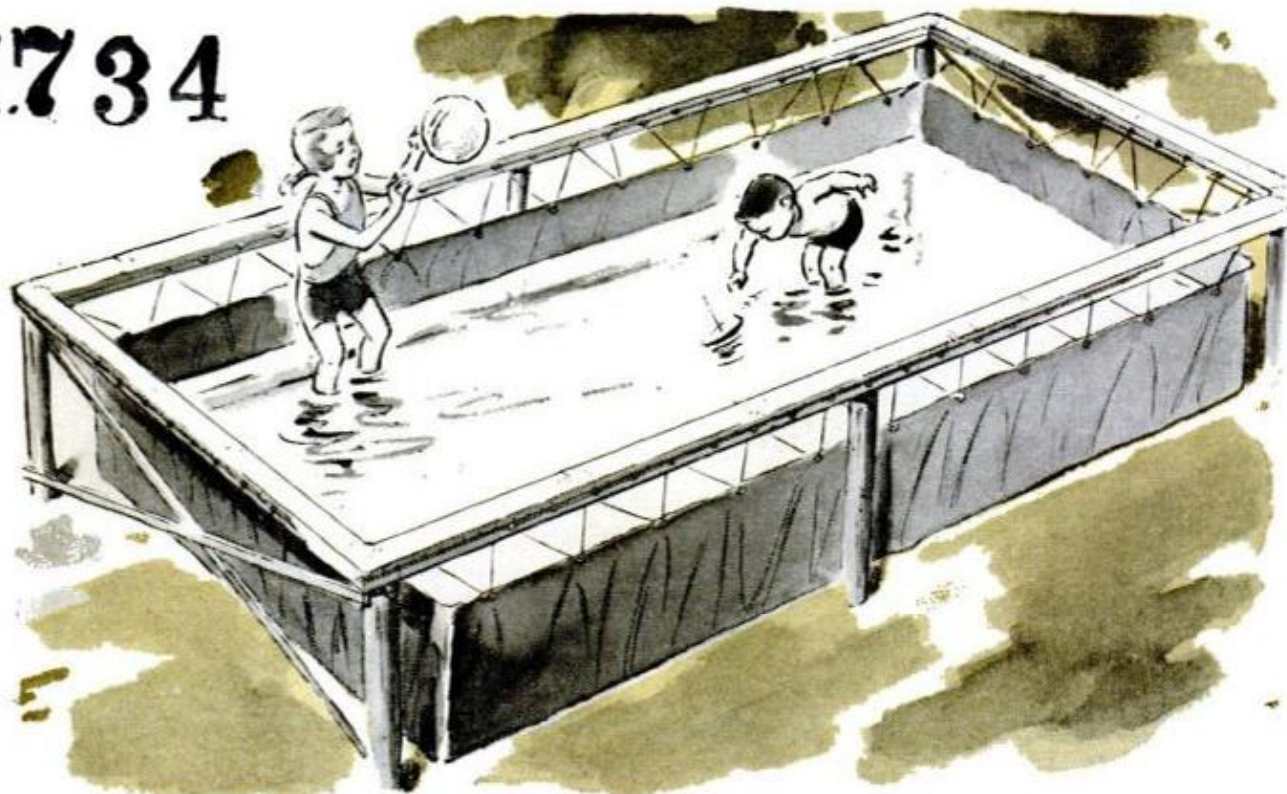
The bed part of the tumbler measures 5 x 10-ft. and may be made of cotton or nylon duck, or strips of nylon webbing woven and stitched together. Nylon duck gives a little better bounce than cotton duck and is much lighter in weight. However, nylon webbing, woven or sewn, has more spring than nylon duck and gives the greatest bounce. A kit including everything but the lumber for this tumbler is available from The Boyt Co., Des Moines 6, Ia.

As detailed in the drawings, the supporting frame is made of doubled 2 x 6s, alternately lapped at the corners and nailed together with 12d common nails. The 2 x 6s are supported by six fence-post legs to which they are bolted securely with 8-in. lagscrews. Three standard 7-ft-long creosoted fence posts, sawed in two, will make

THE WOODEN FRAME is lagscrewed to the six fence-post legs which support it 30 in. above the ground. Pilot holes should be made in the posts for lagscrews

PLASTIC LINER lashed to tumbling frame converts whole thing to king-size wading pool. Polyethylene film makes sturdy liner, sells for about \$29.00

X734



SHOP NOTES AND CRAFTS



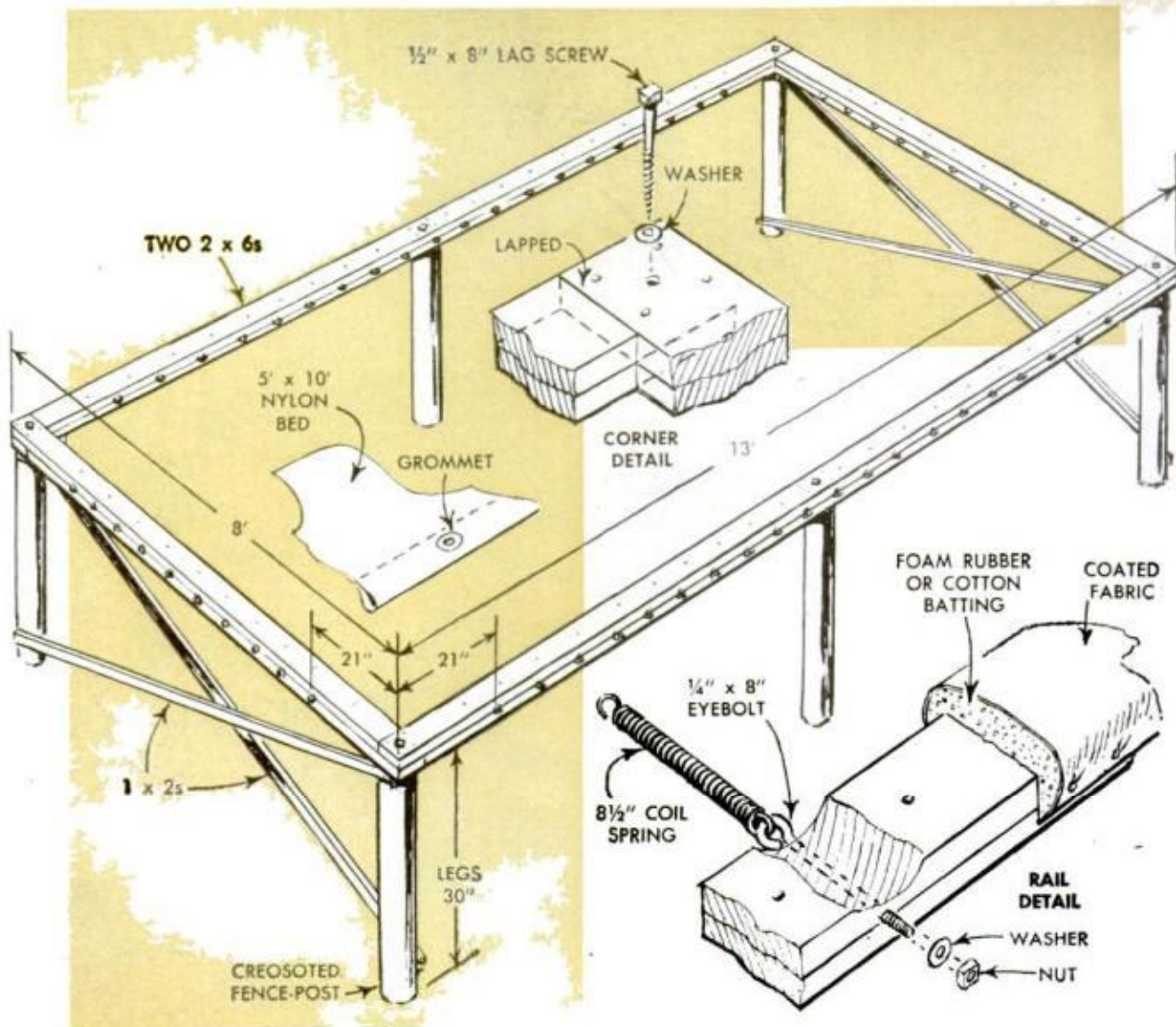
the six legs. These are cross-braced at the ends with 1 x 2s. Make sure the legs are set the same height so the frame will be level. Check with a carpenter's level as you go along.

A total of 60 eyebolts, $\frac{1}{4}$ x 8 in., are required to attach the springs which support the bed. Holes for these are spaced 6 in. apart and bored edgewise through the 2 x 6s with the bit cutting across the joint. Ten eyebolts are installed at the ends of the frame, twenty along each side. Washers and nuts are placed on the outside.

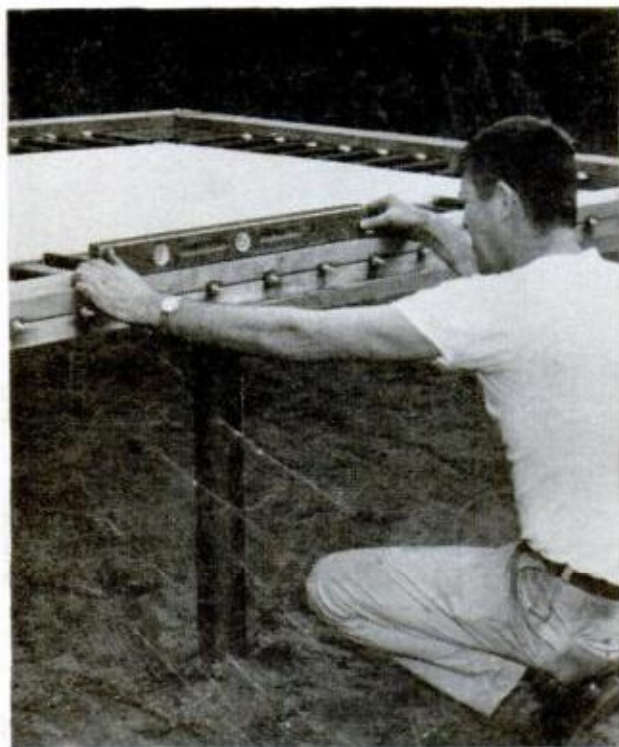
A total of 61 coil springs are needed, the extra one being used as a hook when stretching the nylon bed. The edges of the latter should be rolled under to form hems, after which webbing is sewed to the underside for reinforcement. Then 60 grommets of the spur-tooth type are spaced around the reinforced edges of the bed. The job of stretching the springs to

HOLES FOR EYEBOLTS are made at joint between 2 x 6s as at right. These are spaced 6 in., and washers are used on outer ends of bolts to prevent pulling through



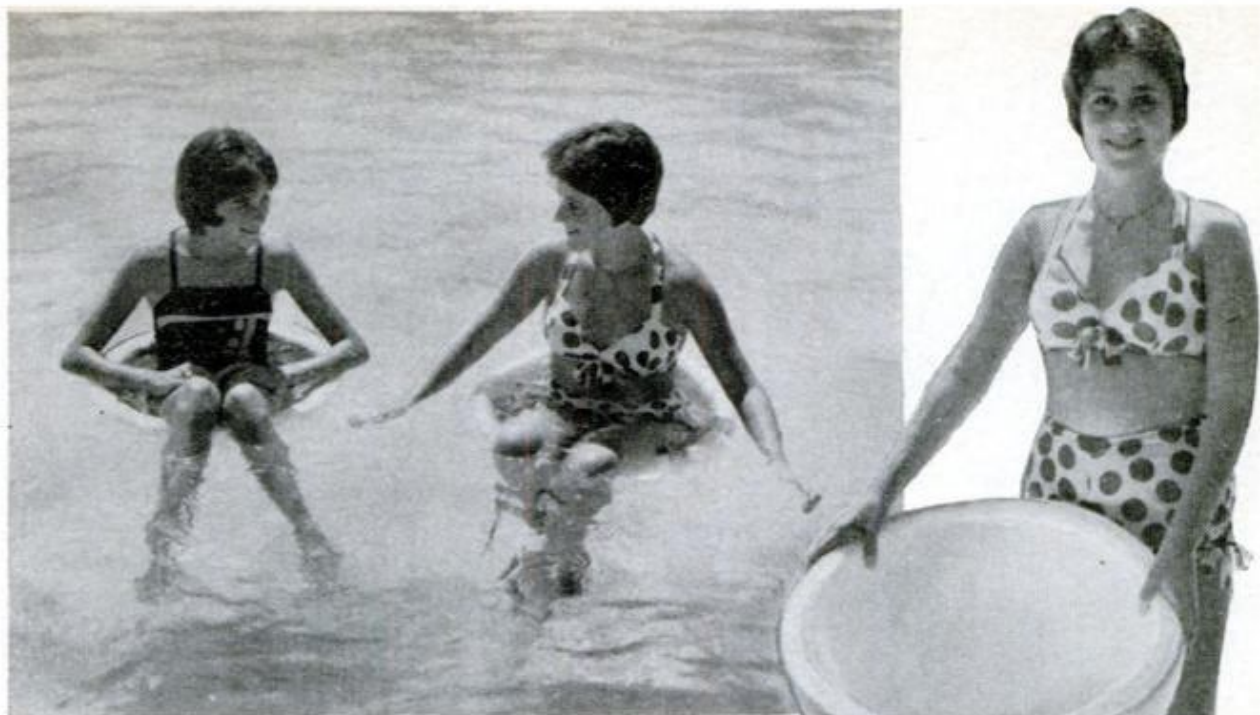


THE SUPPORTING FRAME of the tumbling bed should be level. Check this with a level at the time the posts are set and again when the tumbler is completed



pull the bed taut works best with two persons working together. Begin by hooking springs into the eyebolts and grommets at the corners at one end, then do the same at the opposite end. The extra spring is used as a stretching tool, hooking it to the spring being stretched and pulling on it until the spring can be hooked to the eyebolt. After the end springs at the ends are hooked in place, the end springs along the sides are hooked in the same manner. With this done, the rest of the springs are installed, opposite springs being hooked in place alternately around the frame. Finally, the wooden frame is padded with a 1-in. layer of foam rubber and covered with a plastic-coated fabric tacked to the underside of the 2 x 6s.

Strong 12-mm. polyethylene film makes a good wading pool liner. The edges are reinforced with webbing and then grommets are installed so it can be lashed to the eyebolts with light rope. Here an extra eyebolt is required at each corner of the frame to support the folded corners of the liner. A liner measuring approximately 12 x 17 ft. is available which will make a king-size wading pool. ★ ★ ★



BOWL OF FUN

It rocks, it rolls and it spins! Called Tip-A-Tub, it's the latest fun maker for pool play. You can't sink it for it's made of foam plastic and being as light as a feather, it bobs about like a cork—lets the swimmer literally sit on top of the water. Safe for even the small fry, it comes in red, white or blue and is manufactured by Gym Plastics, Box 615, North Hollywood, Calif.



Table Fork Converts to Rake

When you're in need of a small garden cultivator to loosen the surface around plants or to mix fertilizer with the soil, you can make one simply by converting an old table fork to this use. The tines should be bent at right angles to the handle, as illustrated below. The cultivator is small enough to carry in a garden-tool caddy.

—Fred Lettino



Planting Guide Spaces Seedlings

This simple planting guide gives a fast, uniform method of spacing seedlings when they are transplanted. On a long piece of scrap lumber, mark off the proper spacing between plants. Then, drive finishing nails into the board at each of these points. Dig a trench to the correct depth and set the guide parallel with it. Set a plant opposite each nail.—Bil Toman

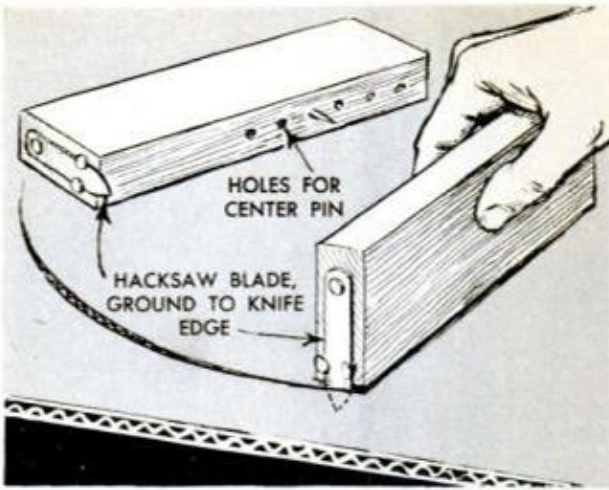


WORTH REMEMBERING

Round Cardboard Disks

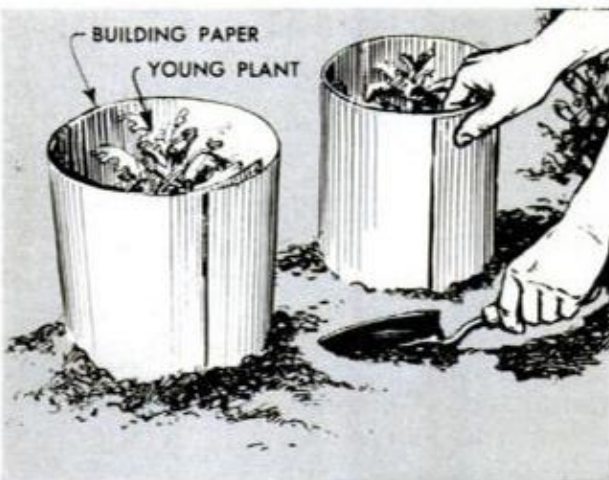
At some time or other you've probably tried cutting a true disk from corrugated cardboard and you know just how difficult a job it can be. The material is light, cuts uncertainly, and is impossible to hold steady by any ordinary means. So one goes at it in a bare-handed fashion and ends up with a disk that's anything but round. A surer way is first to make the gadget detailed. Keep the cutter razor sharp and you'll get a true disk, every time.

—Daniel Bousha



Longer Arm Reach

A piece of plywood or hardboard that is wider than your arm span is a handling problem any way you figure it, more especially if you have to carry a number of pieces any appreciable distance. Of course, you can always balance the piece on your head and carry it quite comfortably but then there's the problem of getting through a door. A better way is to use a wrecking bar to extend your arm reach as pictured. Just tuck the panel under your arm, catch the lower edge with the hook end of the bar and away you go.—R. Hanscom



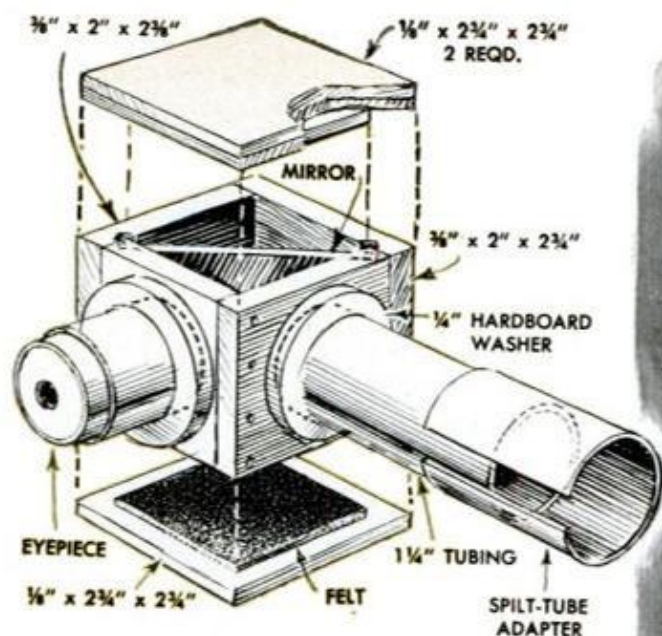
Fool Those Cutworms

Cutworms can create havoc in an early spring planting, toppling tender transplants by the dozens overnight. To serious gardeners who have nurtured plantings from seedlings to hotbed to garden plot this isn't funny. Early plantings are in danger from cutworms the moment they are in the ground so one must be ready with defensive measures. One of the simplest and surest is to cut building paper into strips, then cut the strips into short lengths and wrap around the plants. Hold in place by ridging with loose soil.—O. V. Schaeffer

Brad Clutch

Starting tacks, brads or small nails can be rough on your thumb and forefinger, also the project, if you happen to miss with the hammer. But you can save time, temper and dents simply by holding the tack, brad or nail with a small artificial sponge or a thin slice of sponge rubber. Insert the nail or brad in the sponge, place it and tap with the hammer; or drive part way home if you wish to take full advantage of the ability of the sponge to hold the nail straight. Then pull the sponge up over the nail and drive home.—Bil Toman





TELESCOPE ELBOW

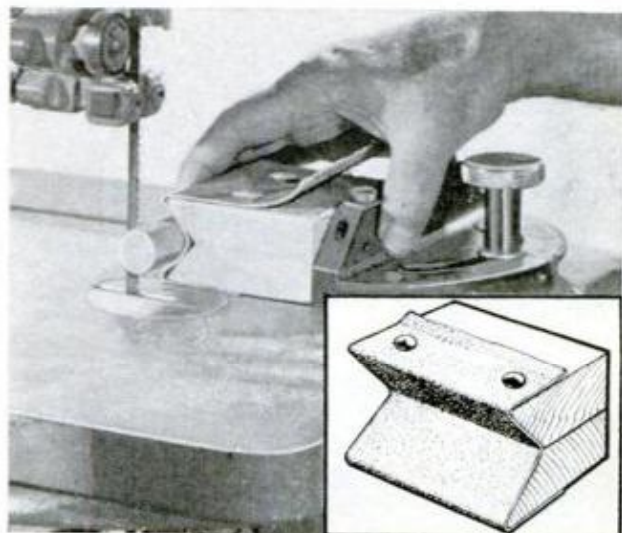
This eyepiece holder with split-tube adapter substitutes for a zenith prism, lets you look down to see up when you're viewing objects overhead with a refracting telescope. It's a simple, light-tight box constructed of balsa wood to provide a mounting for a conventional eyepiece at right angles to the axis of the objective. A mirror mounted diagonally in the box reflects the image focused by the objective into the eyepiece. One side panel of the box is made removable by attaching with small screws to permit access to the mirror for cleaning. All inside surfaces are coated with photo black enamel, including the inside of the tubing over which the split adapter is fitted. Join all fixed parts with waterproof cement. Supporting hardboard flanges, or rings, for the adapter



tube and the eyepiece also are cemented in place. The opening for the eyepiece should be felt-lined, the felt being of sufficient thickness to provide an easy, sliding fit of the eyepiece in the opening. Finish the exterior of the box with two coats of flat-black enamel.—John Michel

Cutoff Jig for Dowels

One of the dangers in cutting dowels to length on a bandsaw is that the dowel may unexpectedly rotate under cutting pressure. This can cause the blade to break and may even result in a painful injury to the operator. Whenever you need to cut dowels to length, guard against this danger by making the simple jig detailed and pictured in use. Cut a 90-degree Vee in one edge of a 4 or 5-in. length of 2 x 4 and thumbtack a piece of fine sandpaper in the Vee. Then place the square edge of the block against the crosscut guide, press the dowel into the Vee and you have the cut under control.—G. E. Hendrickson

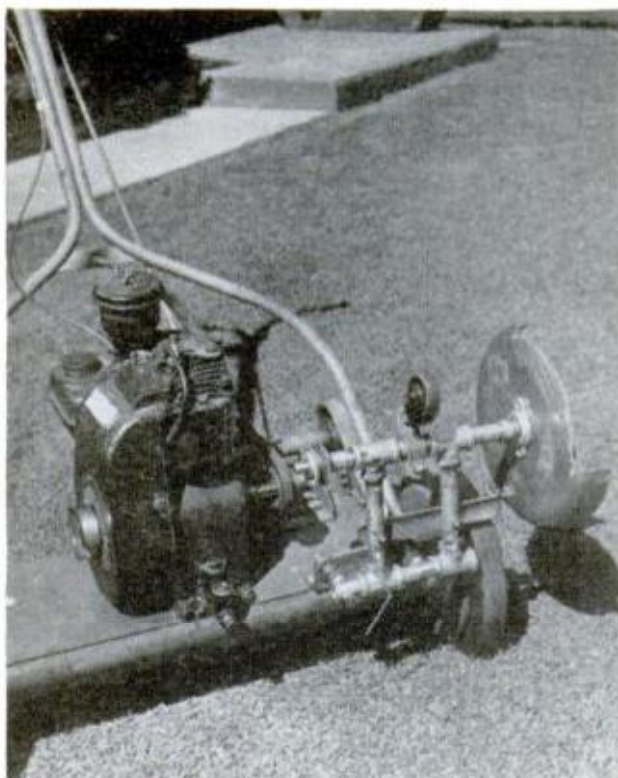


LAWN EDGER GOES ALONG FOR THE RIDE

By
William G. Waggoner



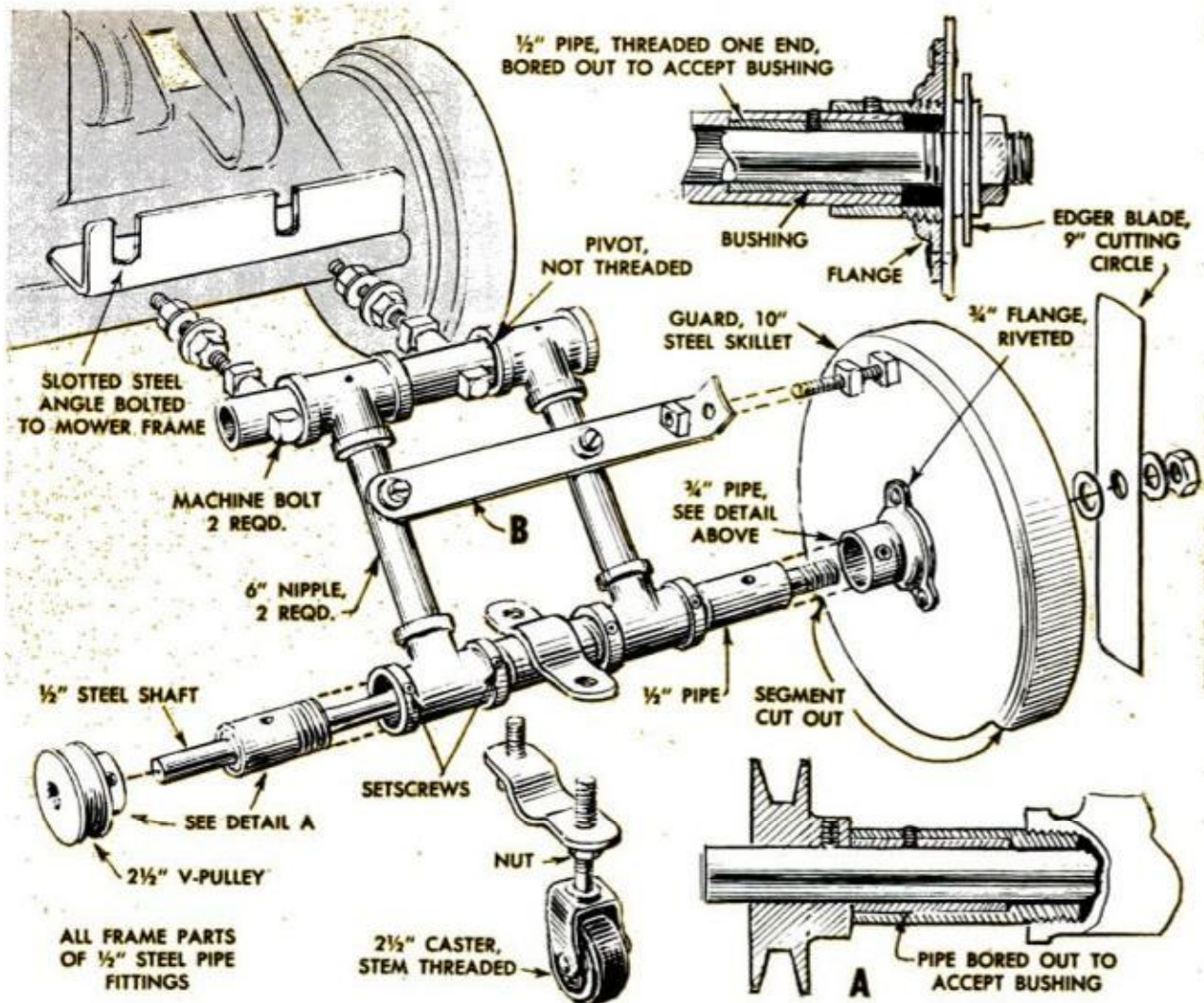
EDGER IN OPERATION is pictured above. Note position of mower wheel in relation to edger and that the edger floats on an adjustable caster. Below you see the unit in raised position while mower is in use



EDGING a hundred feet of walk both sides by hand power can get you blisters and a lame back, unless you take the whole weekend for the job, and who wants to do that? Better to build an edger right on your power mower and utilize the mower engine to drive it when you finish mowing the lawn.

The edger pictured can be made to fit nearly all reel-type power mowers. Above you see it in the working position and at the left in the raised, or idle position. The photo on the opposite page shows the position of the edger blade relative to the mower drive wheel when the edger is in working position. The offset is necessary to assure that the mower wheel always runs on the walk.

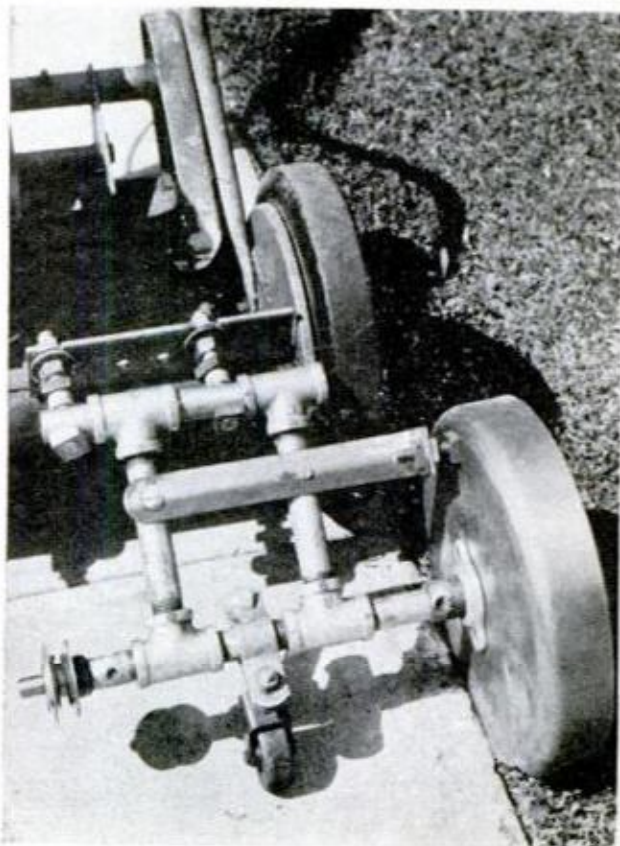
Materials you need to make the edger attachment are readily available almost anywhere—a few pipe fittings, a single caster, a piece of steel angle, a length of flat steel for the blade and a steel skillet which serves as a blade guard. The details show how to put these parts together. Only a few are dimensioned as general dimensions will vary with the type and size of mower on which the attachment is mounted. Notice that about one third of



the rim of the skillet blade guard is cut away to provide clearance for the blade in the working position. Notice also that the handle of the skillet is utilized as a brace for the guard, detail B.

The sectional views show how the blade shaft is provided with bushings fitted into reamed counterbores in the short lengths of pipe threaded into the Tees. Often the necessary size can be attained simply by reaming the pipe for a thin-walled bushing, making a boring operation unnecessary. Bushings need not be as long as those shown, detail A. The entire shaft housing, including the bushing housings, or mounting sleeves, is held in place with hollow setscrews. The V-pully is a standard item and when assembling it should be mounted in a position to give the shaft about $\frac{1}{16}$ in. end play. The pivot is an unthreaded length of pipe drilled transversely for the mounting bolts. In the idle, or raised, position the assembly is locked by two hollow setscrews turned into holes tapped in the Tees. Before you obtain parts or cut the shaft to length, make sure that when parts are assembled the edger blade will be in the correct position relative to the mower wheel. ★ ★ ★

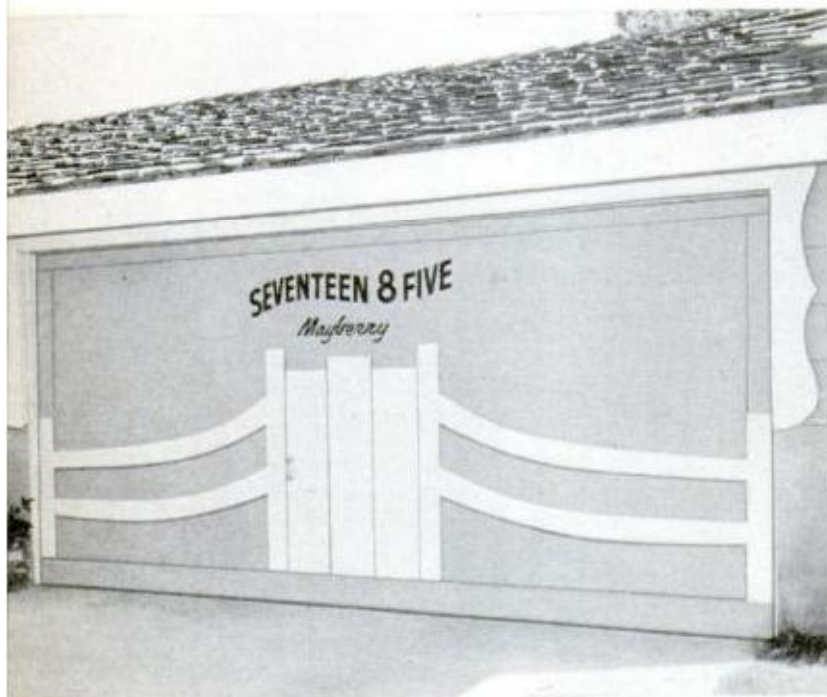
CLOSEUP OF EDGER after lowering to working position. Blade runs inside guard made from steel skillet



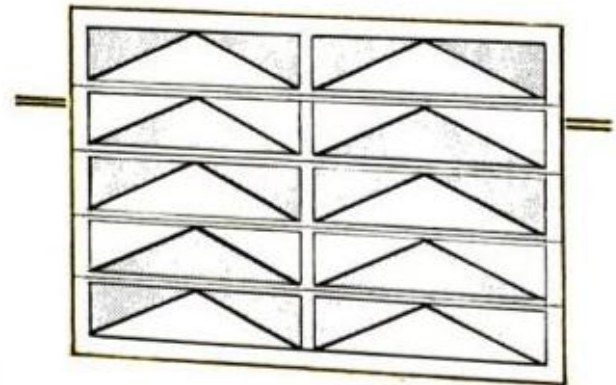
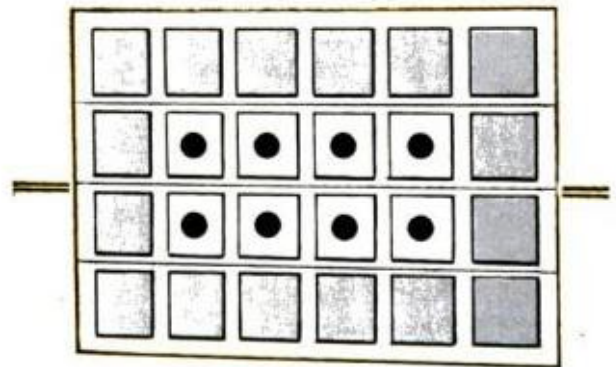
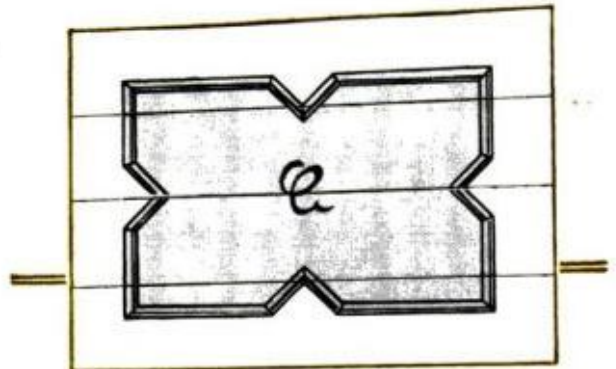
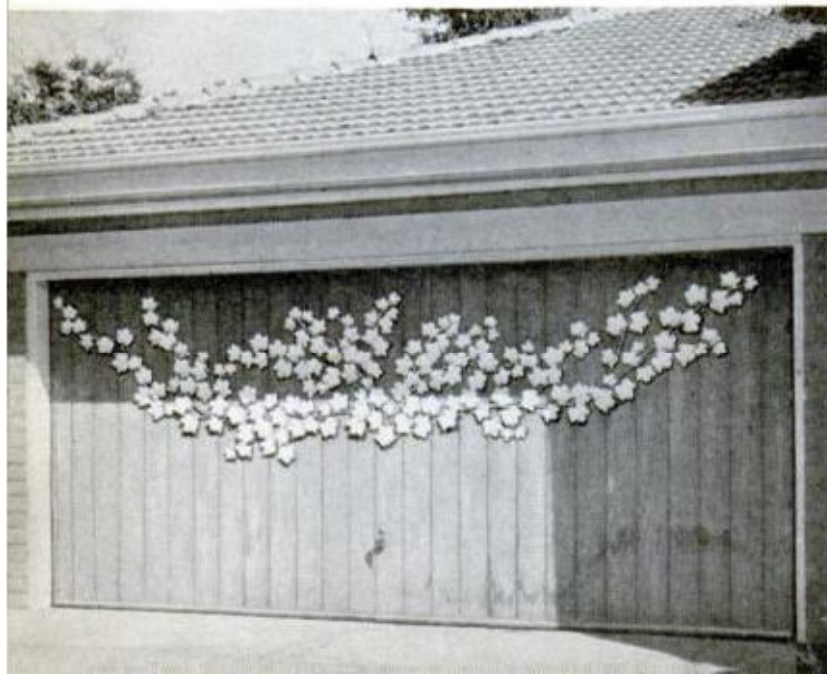
Glamour



OWNER'S INITIAL framed by diamond with two sides parallel to roof line, provides perfect motif for ranch-style garage



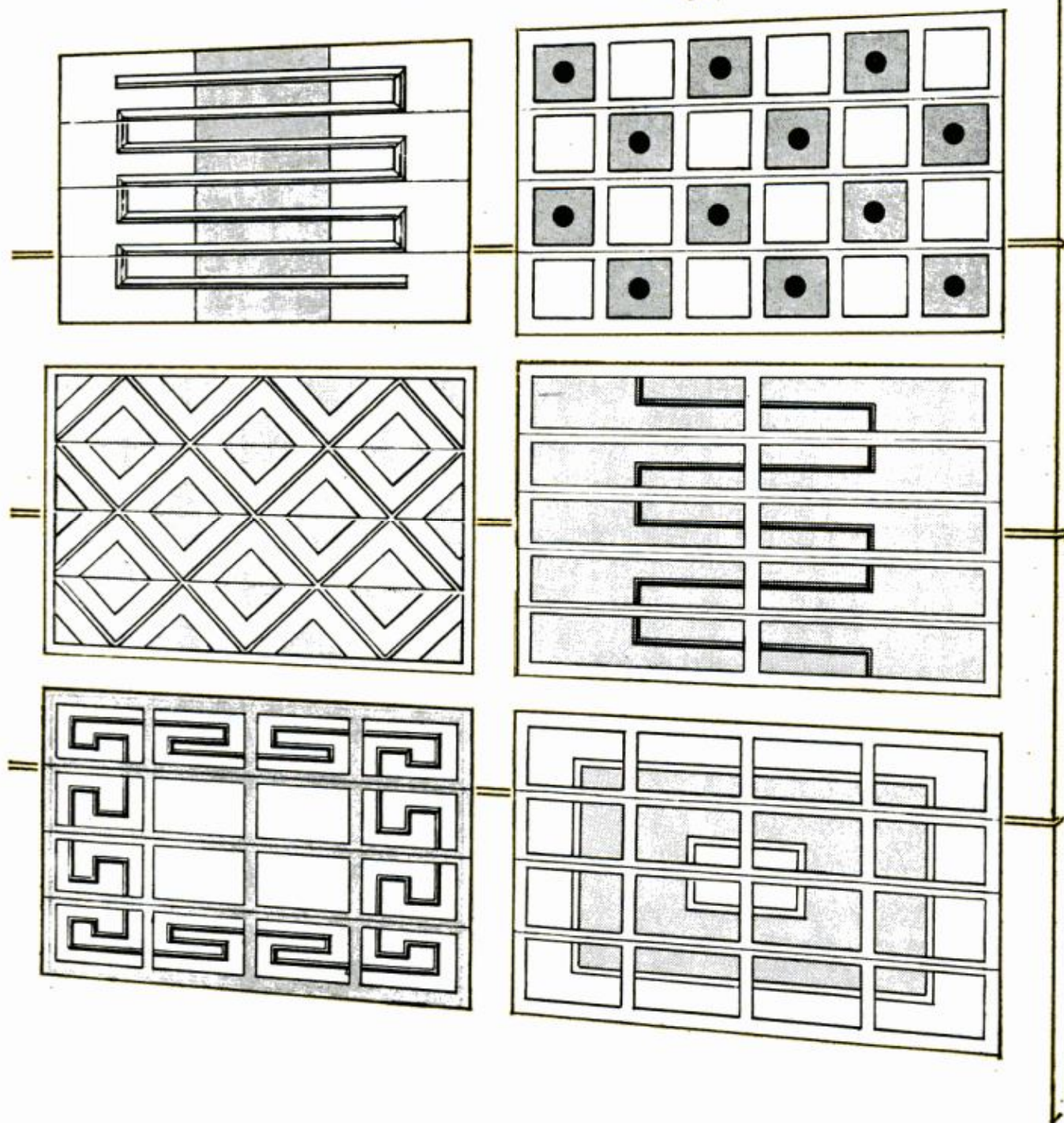
GARDEN-GATE CUTOUT with street address, above, perks up plain door fronting on street. Below, leafy vine in wide pattern de-emphasizes vertical lines, adds point of interest



By Hi Sibley

YOUR PLAIN garage door is an open invitation to home beautification. By attaching square or round wooden rosettes, or molding strips arranged according to a distinctive design as in the drawings, such a door can be given a customized appearance that will complement and enhance your home. The rosettes and moldings are available at most building-supply stores and garage-door distributors. Other

FOR YOUR GARAGE DOOR



decorative effects can be obtained by making hardboard cutouts of special patterns and mounting them on a door as shown in the photos. When these are painted to complement or match the exterior color scheme of your home, an attached garage will appear to be an integral part of the house itself, rather than a lone orphan. You should first make a scale drawing, locating door sections and panels accordingly. Then,

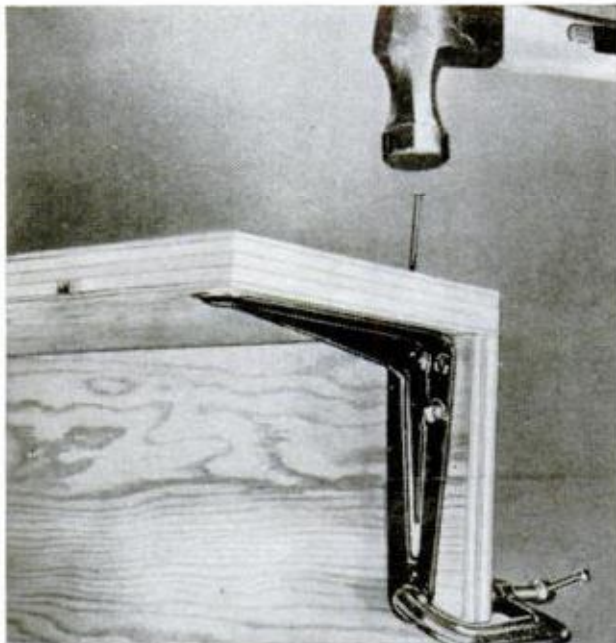
you can experiment on paper with various designs and color arrangements. Next, make cardboard patterns of the preferred layout and tape the pieces in place on the door for a final check. If a contrasting color is to be used as a background, it should be added before attaching the overlays with nails or screws. In the case of panel doors, fastenings should be driven from the inside.

QUICK AND EASY

Clothespin Is Rose-Stem Tongs

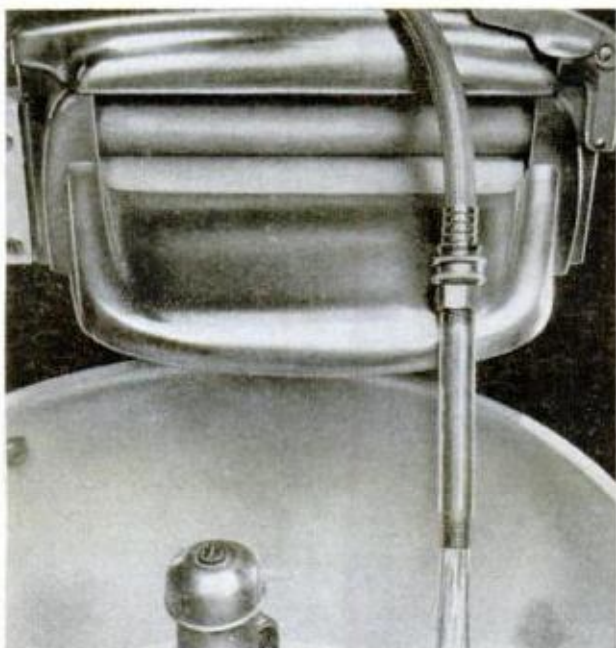
You can avoid painful scratches from thorns when cutting roses by using a spring-type clothespin to grip the stem. A wooden clothespin is best for this purpose, as the comparatively rough edge grain exposed in the notched jaws does a better job of gripping the stems than do plastic ones. The gentle pressure exerted by the jaws is sufficient to hold the stems firmly without injuring the plant, and lets you cut them without actually handling.

Wooden darning egg makes a fine pestle when one is needed for crushing sugar cubes or certain candies used in baking. Use small, deep bowl as a mortar.



Shelf Bracket Is Nailer's Helper

If you are working alone and have two boards to nail at right angles to one another, here is an easy way of gaining a "third hand." Simply clamp a shelf bracket to one end of the vertical piece to support the horizontal one while driving the nails as shown in the photo. For long boards, a bracket should be clamped at each end. Used in this manner, such brackets not only lend a helping hand but serve as a check for squareness of the edge to which the overlapping board is nailed. If some truing of the edge is necessary, simply clamp the board between two brackets positioned so that they hold it on edge for easy planing. Such brackets can be used for many other holding jobs, wherever parts must be fastened at right angles.



Pipe Tames End of Garden Hose

Most everyone has had the experience of getting doused accidentally by an unattended garden hose, when it flipped free of a pail, sprinkling can or wringer-type washing machine. This humorous (when it happens to someone else) situation can be avoided by attaching a 10 or 12-in. pipe nipple to the hose, using a bushing or hose adaptor to make the connection. Since the end-ballasted hose stays put, even at full pressure, it also is useful for washing a dog, filling a plastic swimming pool and many rinsing or flushing jobs. Also, the pipe nipple is a help when connecting the hose to some types of lawn sprinklers. The weight of the nipple adds some stability to the sprinkler on uneven ground. File the ends of the nipple so the washers seat tightly.—Jerry Thompson

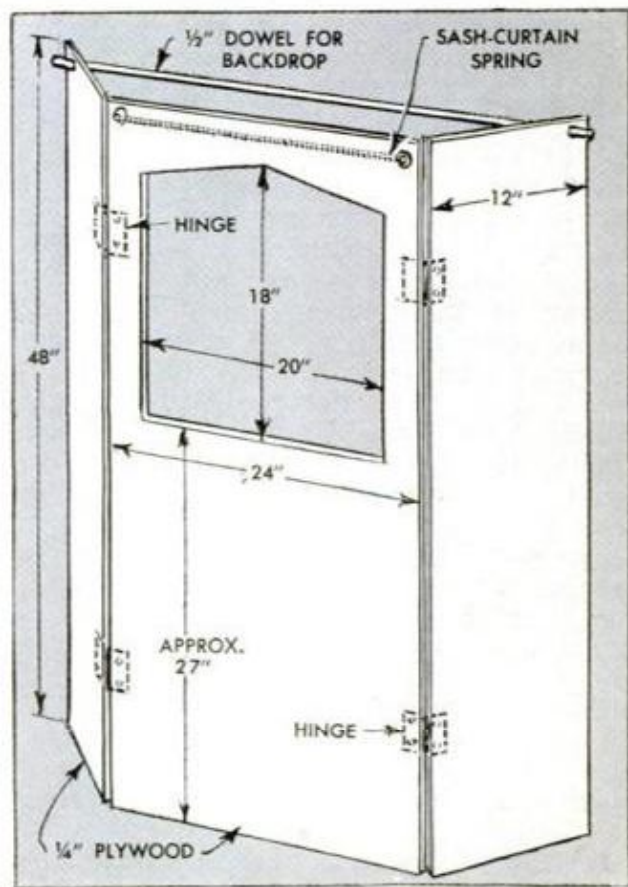
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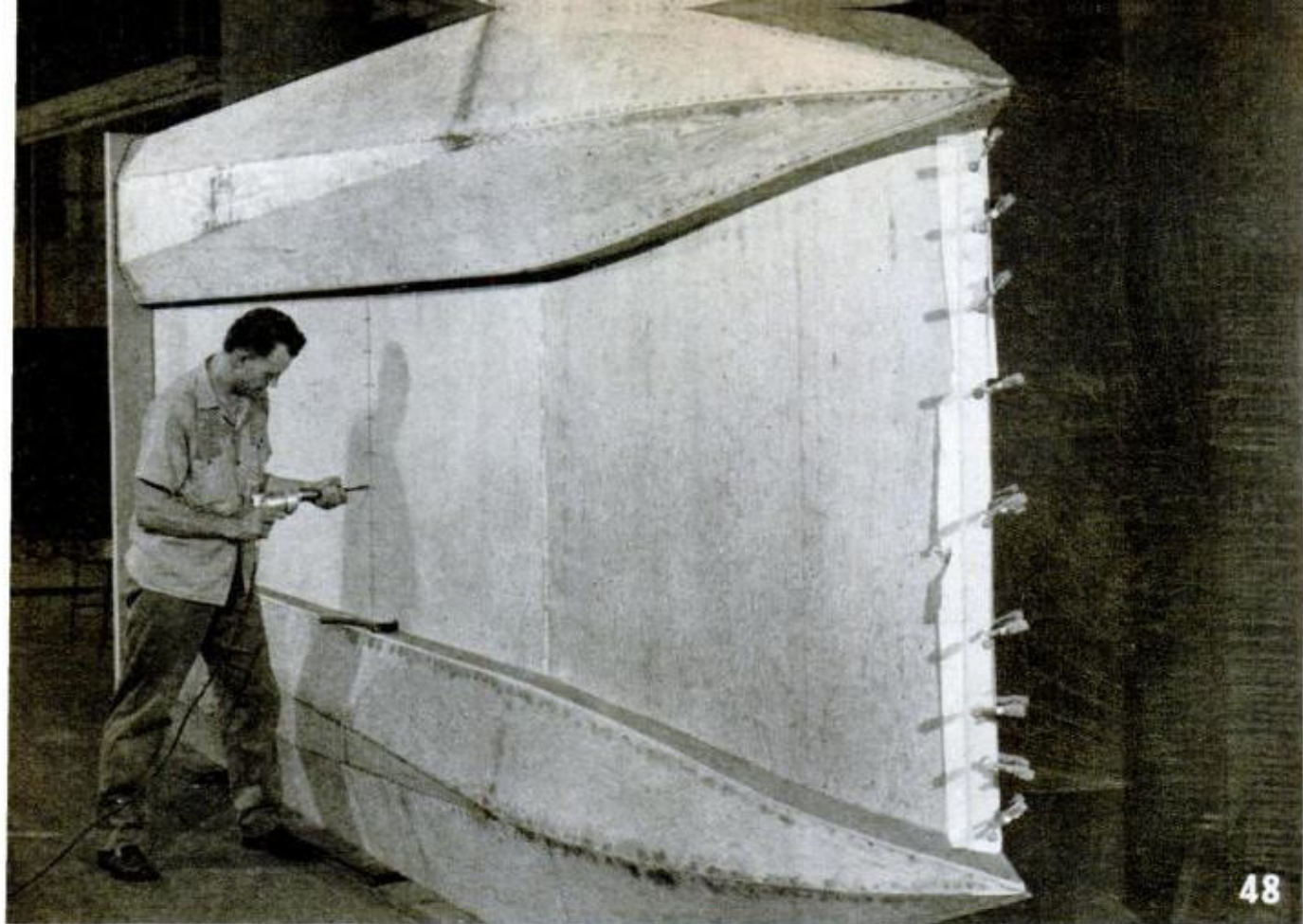


PUPPET THEATER

By H. J. Kennard

COME THE warm and wondrous summer months, birds, buds and kids flourish and though the flowers may take some tending, it's the kids who really have to be watched and kept out of mischief. The best way to keep them out of trouble and out of your hair is to keep them busy—occupied with something in which they themselves can participate—something which will put their avid little imaginations to work. For this, the little puppet "theater" illustrated above is ideal. You'll get a bang out of eavesdropping on their dramatized versions of bedtime stories, TV adventures, movies and anything else around which they can wrap their inventiveness. Essentially, the theater is a screen made of 1/4-in. plywood, the center panel measuring 24 x 48 in. and the hinged wings 12 in. wide. An opening is cut near the top of the center panel to serve as the stage and a sash curtain spring and a 1/2-in. dowel support the stage curtains and the backdrop. The dimensions suggested will afford ample room for the more ingenious members of the troupe to "work" behind the scenes in a kneeling position, using the hand or finger-type puppets.





BUILD PM's POP-CAT

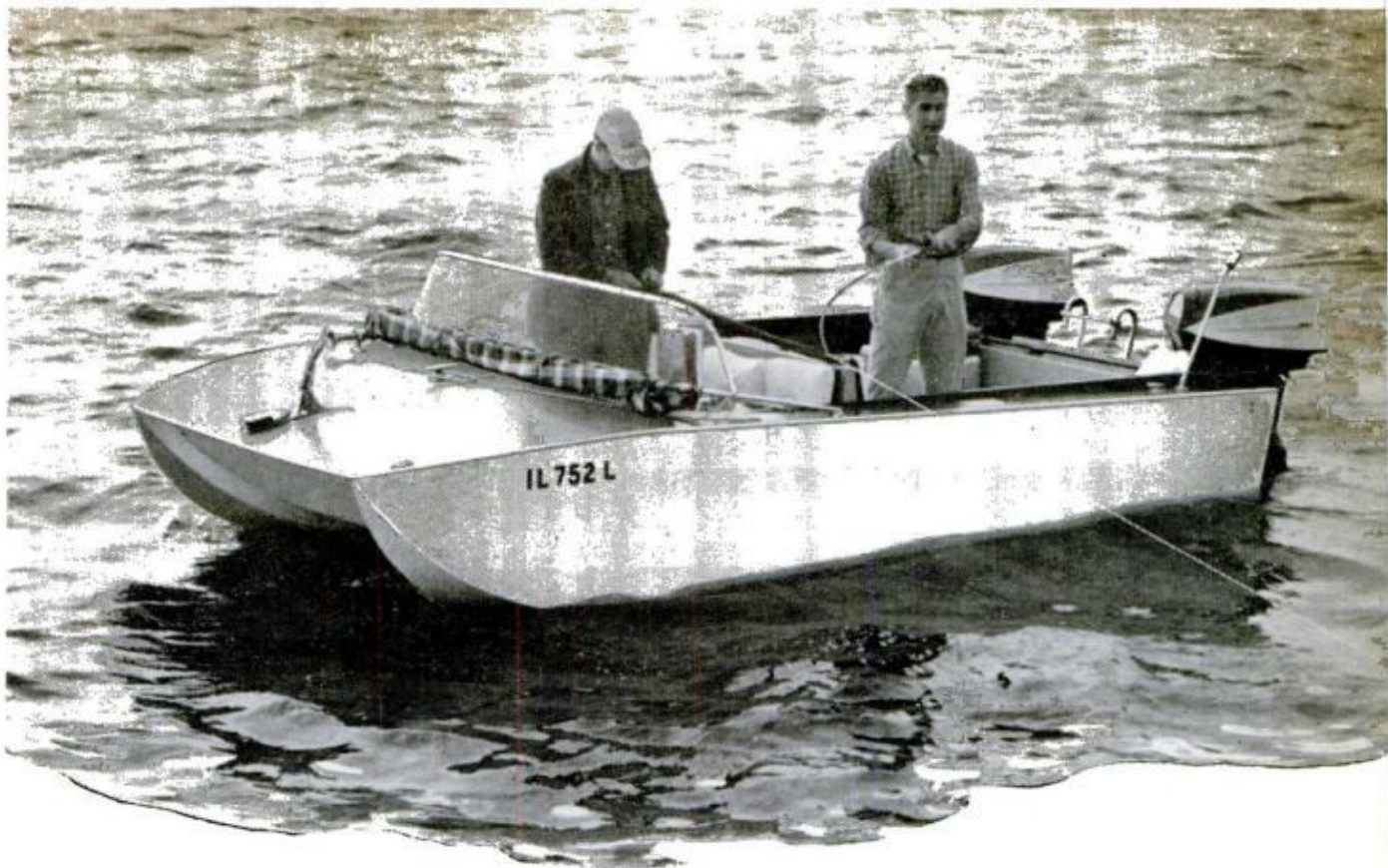
PART III

By Earl Wobeck

AFTER COMPLETING the individual hull units and joining them together with the wing deck as detailed in Parts I and II (March, April issues) builders of Pop-Cat now are ready to install the deck battens. A full $\frac{5}{8}$ -in., 4 x 8-ft. panel cut to the beam dimension, covers the joint formed by the first and second wing-deck panels, overlapping it by 3 in. and extending aft to the transom bulkhead. The forward edge of the panel is beveled 45 deg. to eliminate a potential source of tripping. The inside $\frac{3}{4}$ -in. plywood transom lamina goes on next (note the transom detail in Fig. 50), after which the hull is tipped on its side for installation of the outer transom lamina and the 12-in.-wide wing-deck batten at bulkhead 2, Fig. 48. While $\frac{5}{8}$ -in. plywood was used for the batten in the pilot model, $\frac{1}{2}$ -in. stock will do. The batten is drawn up tight in the tunnel area (space between hulls below wing deck) with brass bolts, after gluing and nailing it to the wing deck over the hulls. Though the side-tipped position is absolutely necessary for the latter step, it also makes it easier to screw the glue-coated outer transom lamina in place

and to trim off the waste after it is fastened. Next, the hull is placed upright again and the extension bulkheads are glued and nailed to bulkheads 1 and 2 as in Fig. 50. A 4-in.-wide filler piece cut to fit between the No. 2 bulkheads, is glued to the extension piece at the upper edge for appearance. To provide clearance for the seat construction, cutouts are made in the No. 2 bulkheads, Fig. 50. The vertical cut is made at a point $4\frac{1}{2}$ -in. in from the sheer log.

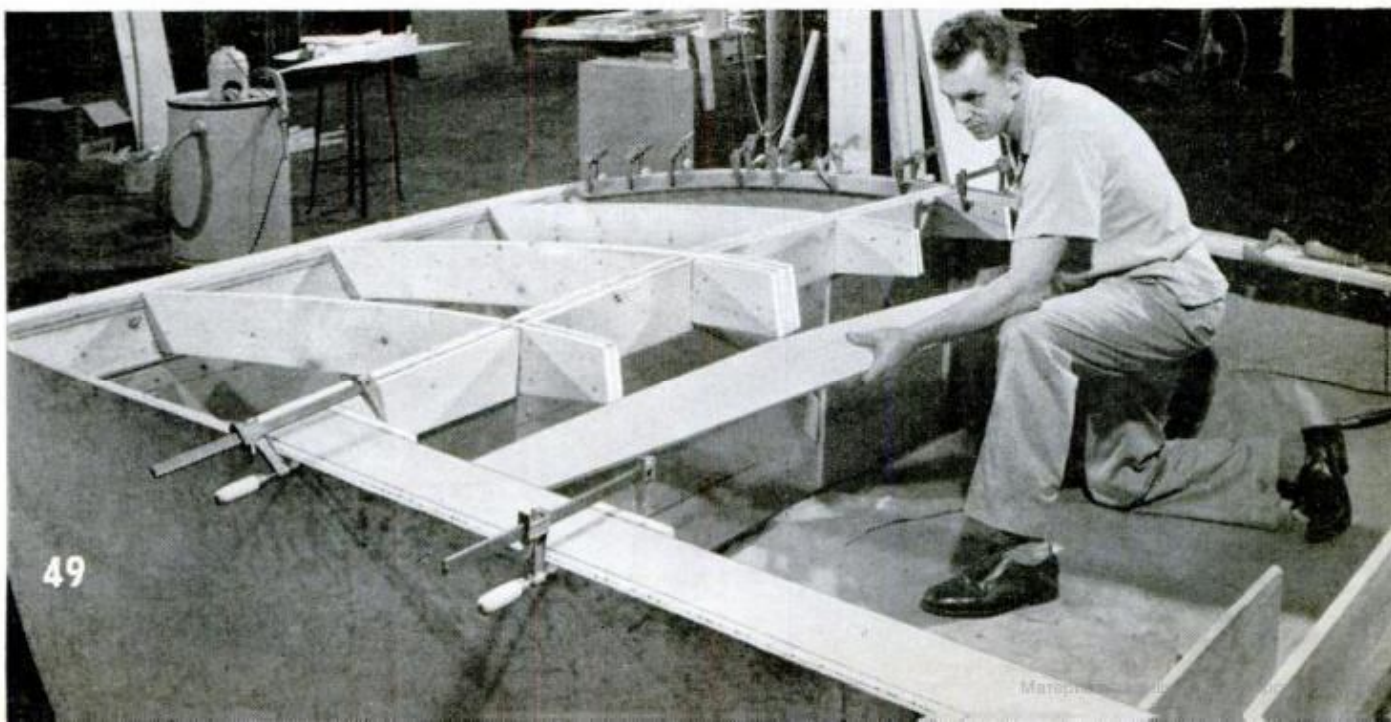
Before starting the deck construction, the upper edge of the sheer logs and the attached planking must be faired to a straight line from the transom to bulkhead 3, to a smoothly curving line from the latter to the stem. If sheer logs were kept straight when fastened in place, very little fairing will be required at this point. A good way to check this is to snap a chalk line stretched between the transom and bulkhead 3 and positioned flush with the upper edges of the sheer at bulkhead locations. If any portion of the sheer falls slightly below the line, correction can be made by snapping a new line that will touch the lowest dip. When faired to the

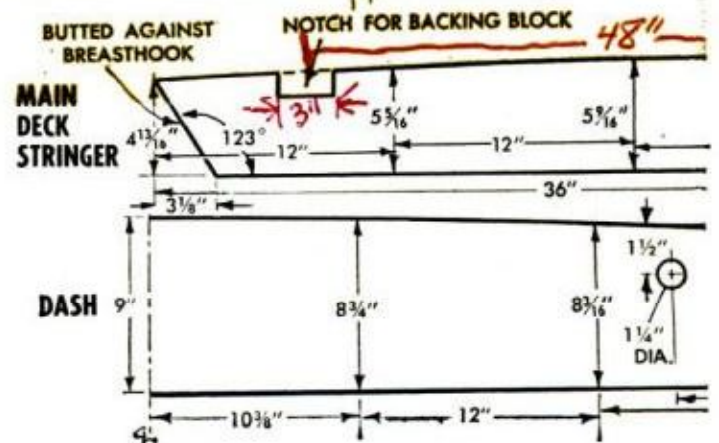
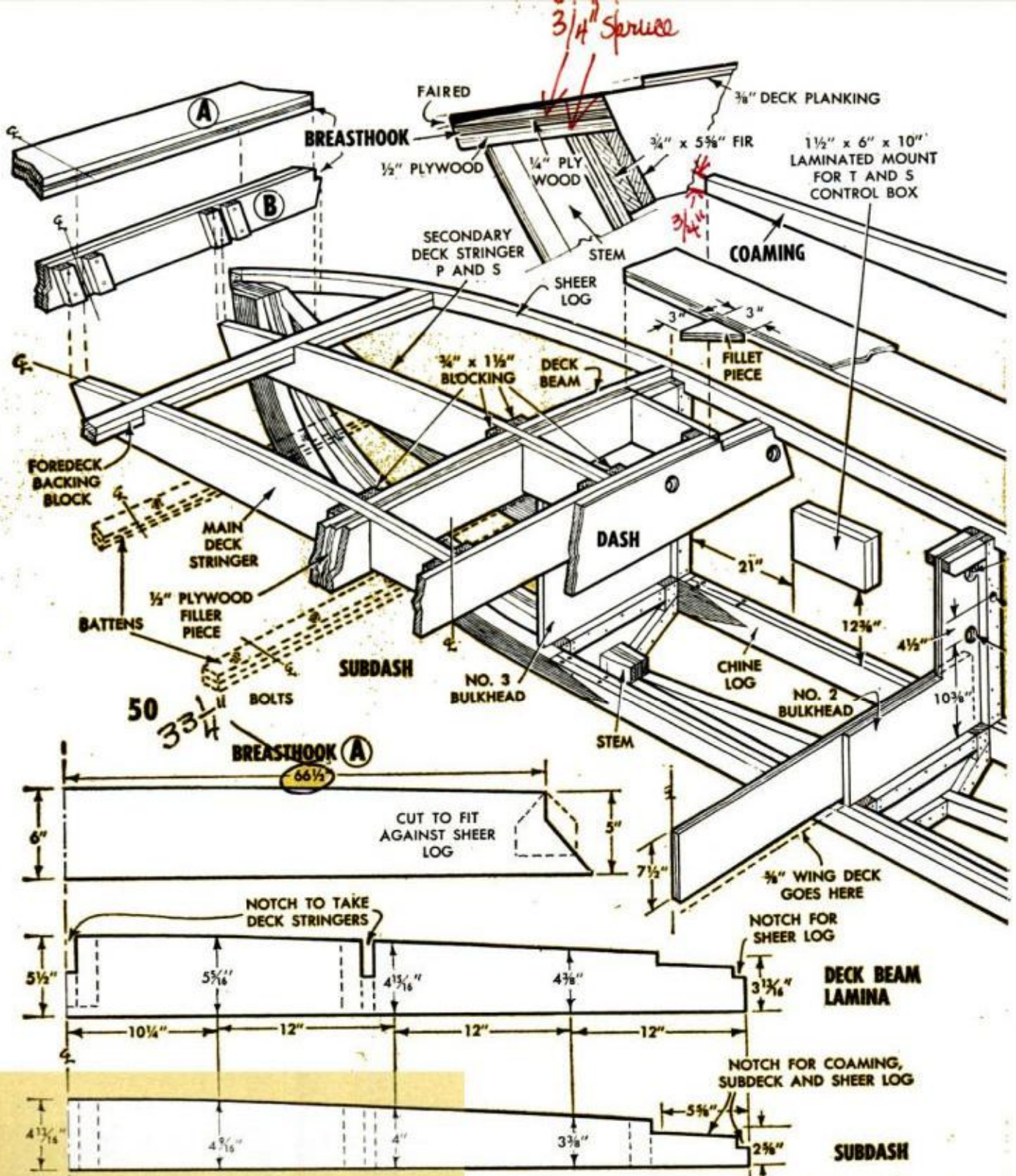


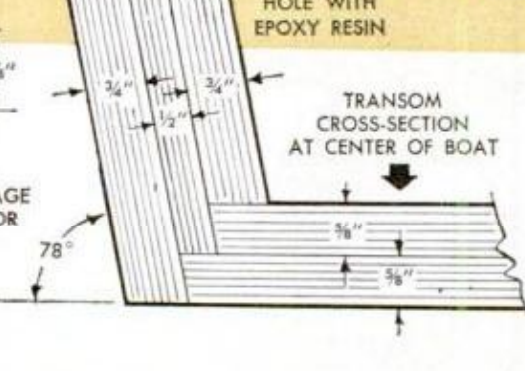
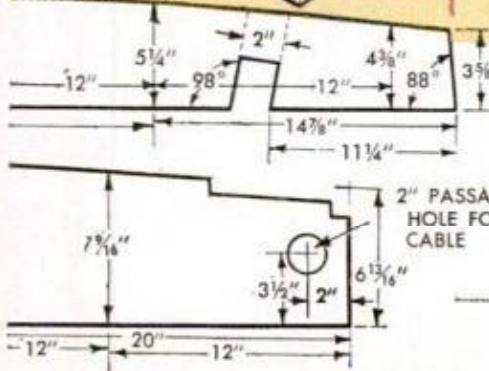
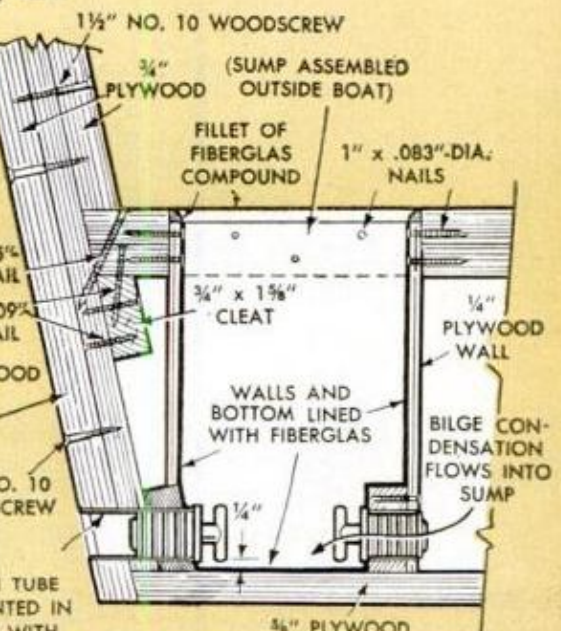
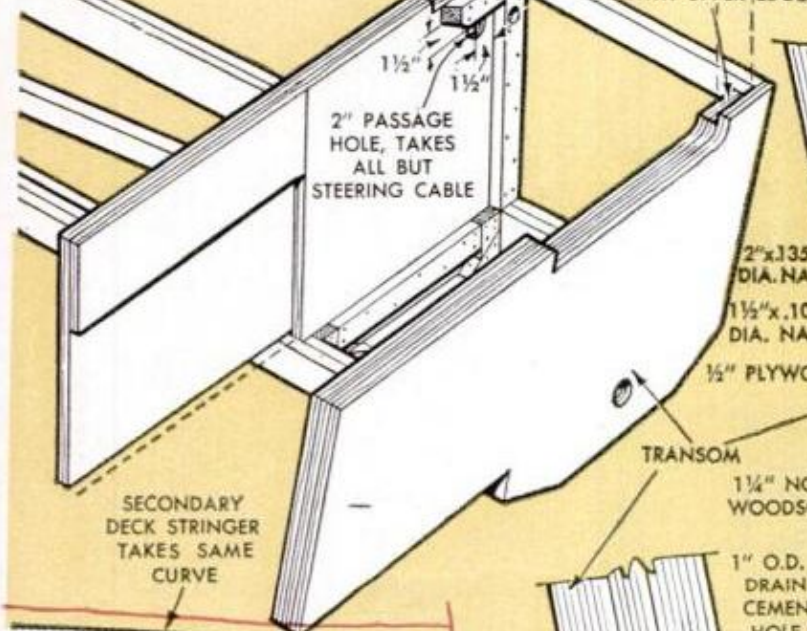
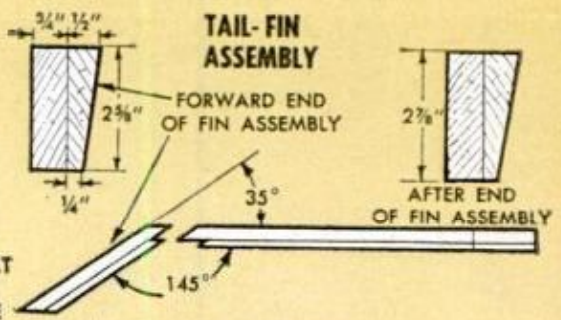
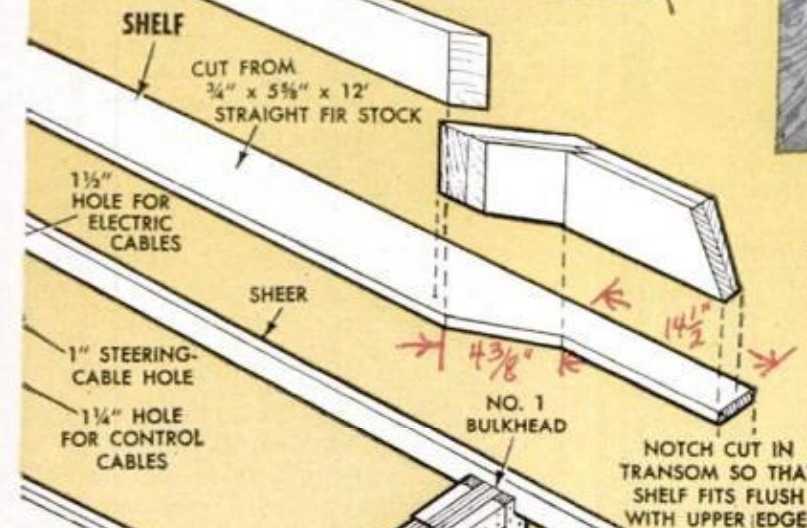
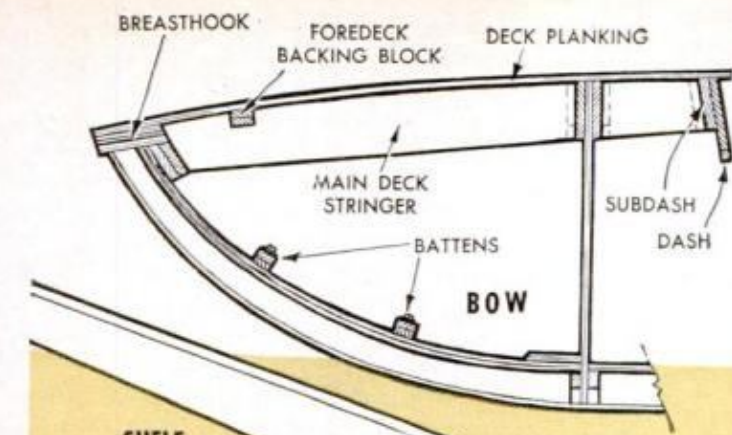
new line, the freeboard (height of the top-side above water line) will only have been reduced slightly, an exceedingly small penalty for having erred. If by some chance the sheer dips more than $\frac{1}{4}$ in. below the first chalk line, it is best to laminate a filler strip in place on the low spot to provide sufficient material for correcting it. Clamps should be used for applying pressure, not nails. This same procedure may be used elsewhere in the construction if an error is made, an easy way out of an embarrassing situation. It is used to beef up the sheer log in the bow — note the strip of wood clamped to the inside of the log in Fig. 49. If the planking appears to be too wavy to

permit accurate snapping of the chalkline when truing the sheers, it may be necessary to cut the shelf to shape and clamp it in place temporarily as in Fig. 49. The shelf is not glued in place until all of the fore-deck framing is installed.

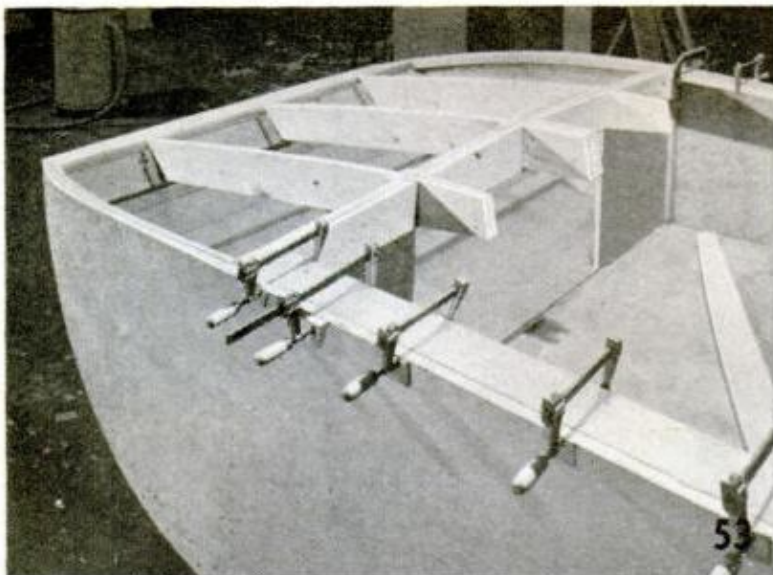
The primary function of the shelf is to clamp the sheer in a straight line permanently, although it serves as reinforcement for the side deck and provides a gluing surface for the coaming as well. The cut-back part at the stern end, to which the flared tail-fin assembly is fastened, measures $14\frac{1}{2}$ in. from the end to the angled edge. The latter joins the straight edge at a point $4\frac{3}{8}$ in. aft of bulkhead 1. Only the $14\frac{1}{2}$ -in.-long







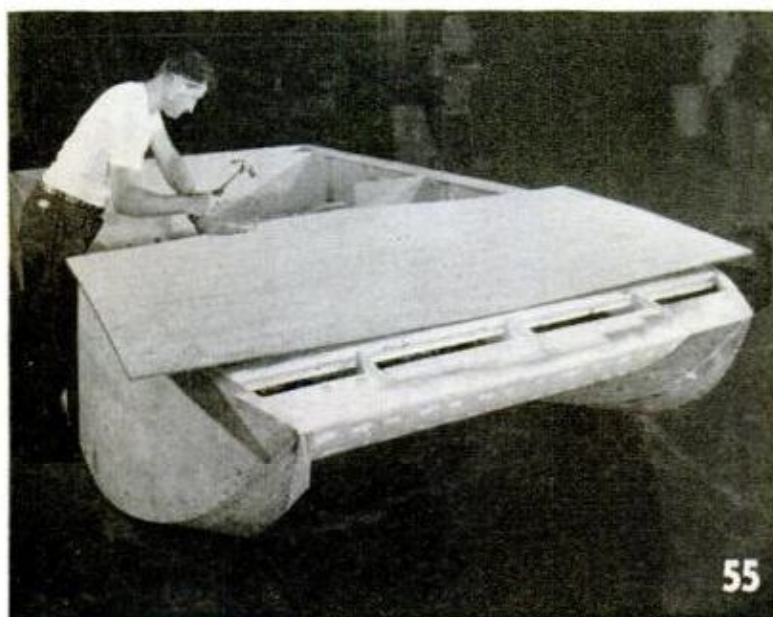
TRANSOM DETAIL AND DRAIN SUMP



FORE AND AFT deck stringers and deck beams, above, are glued and nailed in place. Subdash and deck backing block go in next



DECK FRAMING and subdecks, above, have been faired and are ready for planking. Below, foredeck panel is nailed from center outward



edge is beveled 30 deg., to match the angle of the transom cutout into which it is notched.

As mentioned in the first part of the story, (March issue) Pop-Cat builders may fit the boat with a cabin rather than finish it as a runabout. The decision to do so can no longer be deferred, as the deck beams and stringers, next up on the building schedule, extend aft only as far as bulkhead 3 in the case of the cabin plan. On the runabout they extend 12-in. aft of the bulkhead. The cabin sides replace the coaming in the runabout. The exterior dimensions of the cabin are given in Fig. 59. Note that the after end of the cabin is formed by a full bulkhead fastened to bulkhead 2. A 24-in.-wide door is mounted in a cutout in the center of the bulkhead. For construction of the exterior, $\frac{3}{8}$ -in. plywood may be used throughout, or it may be used only for the sides, forming a hand-molded top from a fiberglass-on-foamed-plastic layup such as custom boat builders do to get soft-radius corners. A small galley, head and overnight accommodations for four may be fitted inside. This is left entirely up to the individual builder to do as he chooses. However, before the cabin is started, the boat should be turned over and the bottom fiberglassed to the chines, carrying the cloth a few inches up on the topside planking. This includes the color-pigmented resin coats as well, but do not apply paint at this time. The bottom of the prototype boat received color in the last two resin coats only.

Breasthook Assembly

The breasthook is made up of two parts, labeled A and B in Fig. 50. The lower part (B) goes in first and is laminated from two pieces of $\frac{3}{4}$ x $5\frac{5}{8}$ -in. fir nailed and glued one at a time to the laminated wing-deck planking and chines. Next, the upper edges of these pieces are faired to the angle of the stemhead. Using the latter as a guide, saw cuts are made into the edges as a means of deter-

mining the exact amount of waste to be removed as in Fig. 51. This is done first at each stemhead. To complete fairing of this part, straight lines are drawn across the remainder of the unfaired breasthook along the forward and after sides, using the previously-faired surfaces as reference points. The pieces of upper part (B), a laminated sandwich of $\frac{3}{4}$ -in. spruce (top layer), $\frac{1}{4}$ -in. plywood, and $\frac{1}{2}$ -in. plywood, are cut to shape from the dimensions given and then glued in place, one piece at a time.

Next, the main-deck stringer laminae, secondary deck stringers, deck-beam laminae and subdash are cut to shape following the dimensions given on the details in Fig. 50, notched and glued in place. Though a separate detail is given of the dash, the upper edge takes the same curve as the subdash. The dash in the prototype was formed from $\frac{3}{4}$ -in. spruce stock to which a mahogany-grained sheet of plastic laminate is bonded (using contact cement), before gluing it to the subdash. While solid mahogany could be used, it is more expensive and requires more maintenance than the laminate. The large drawing of the boat and cross-sectional detail of the bow, Fig. 50, shows the relation of the bow-deck beams and stringers. The deck-beam laminae (laminated in place) at bulkhead

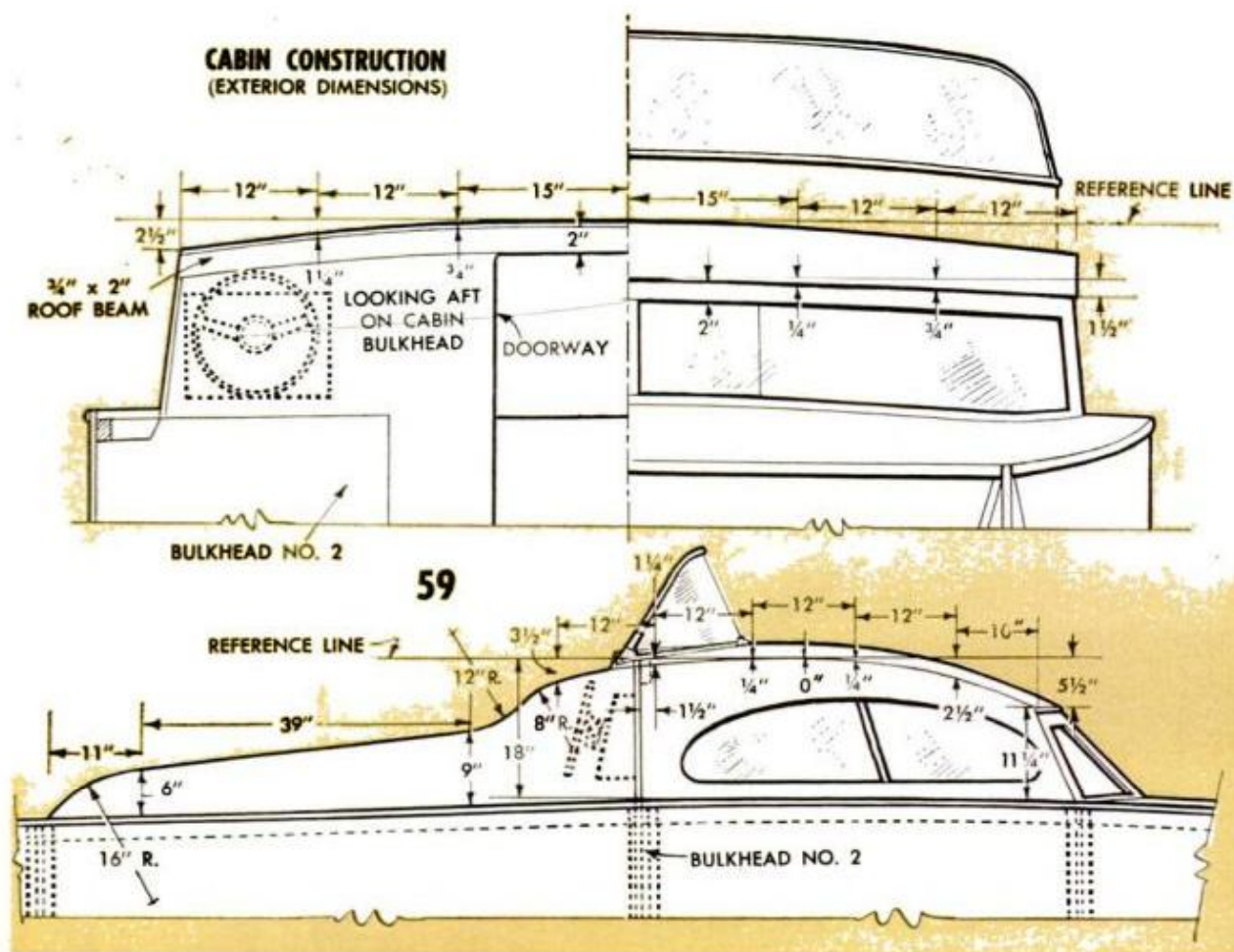
3 go in first, followed by the main-deck stringer (laminated beforehand), secondary stringers, foredeck backing block, subdash and dash. All joints of intersecting members are half-lapped, except for the foredeck backing block which fits in a full $1\frac{1}{2} \times 3$ -in. notch cut in the members it intersects. Omitted in the drawings the on-center location of the backing block is $46\frac{1}{4}$ -in. forward of the subdash.

After the deck beams are in, Fig. 53, all surfaces to which the foredeck planking is nailed are faired, using a batten to check the fairing as it progresses. Fair in a fore and aft direction first, which means you will place the batten across the beam of the boat in order to check the results. If assembled accurately, very little fairing will have to be done to these members. Use a sharp plane or rasp for this and check the results

(Continued to page 202)

POP-CAT PLANS

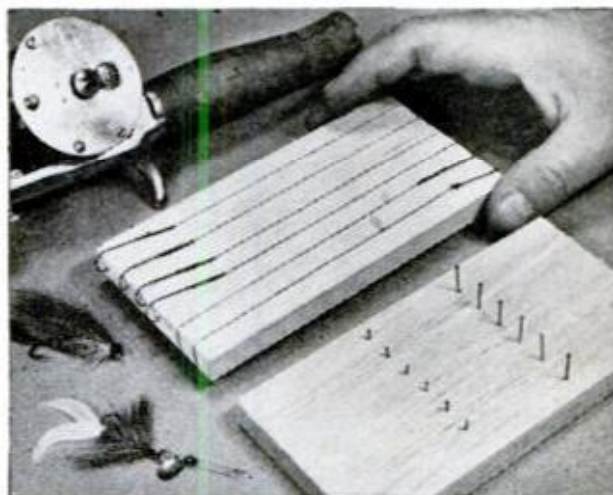
If you prefer the convenience of working from plans larger than magazine-page size, a set, together with a booklet containing the text and photos, can be purchased at \$5.00 by writing to Popular Mechanics, Blueprint Dept., 200 East Ontario St., Chicago 11, Ill.



FISHING HINTS

ANYTHING THAT latches onto a bare fishhook underwater or overhead gets hooked fast. That's why a dangling lure is such a nuisance to fishermen who work a wooded stream from the bank. No matter how one carries the rod or pole when moving through the undergrowth from pool to pool, just let the eye wander from the hook for an instant and it's sure to snag something, a tree branch overhead, a thorny shrub, your hat or your ear. After a number of trying experiences of this sort, one fisherman saves his tackle and his temper by carrying a small plastic bag and a rubber band for the purpose of treeproofing the lure each time he moves along the stream. He simply reels the lure up to the rod tip, slips the plastic bag over it, snaps the rubber band over the bag and goes anywhere in the underbrush his rod will go.

And then there's the storage problem of snelled hooks. Store a dozen of them loose in any container, let the leaders dry out and the resulting snarl is about as safe to handle as a disgruntled porcupine. Unsnarling the mess when you want one hook is something just as bad, if not worse. The wise angler strings 'em on a piece of balsa wood, seating the lethal barbs in one end of the block and pulling the leaders over and around the other end where the looped ends are dropped over brads. Then it's safe to reach into the tackle box any time, even after dark. If the block is dropped overboard it will float.



COMING UP NEXT . . .

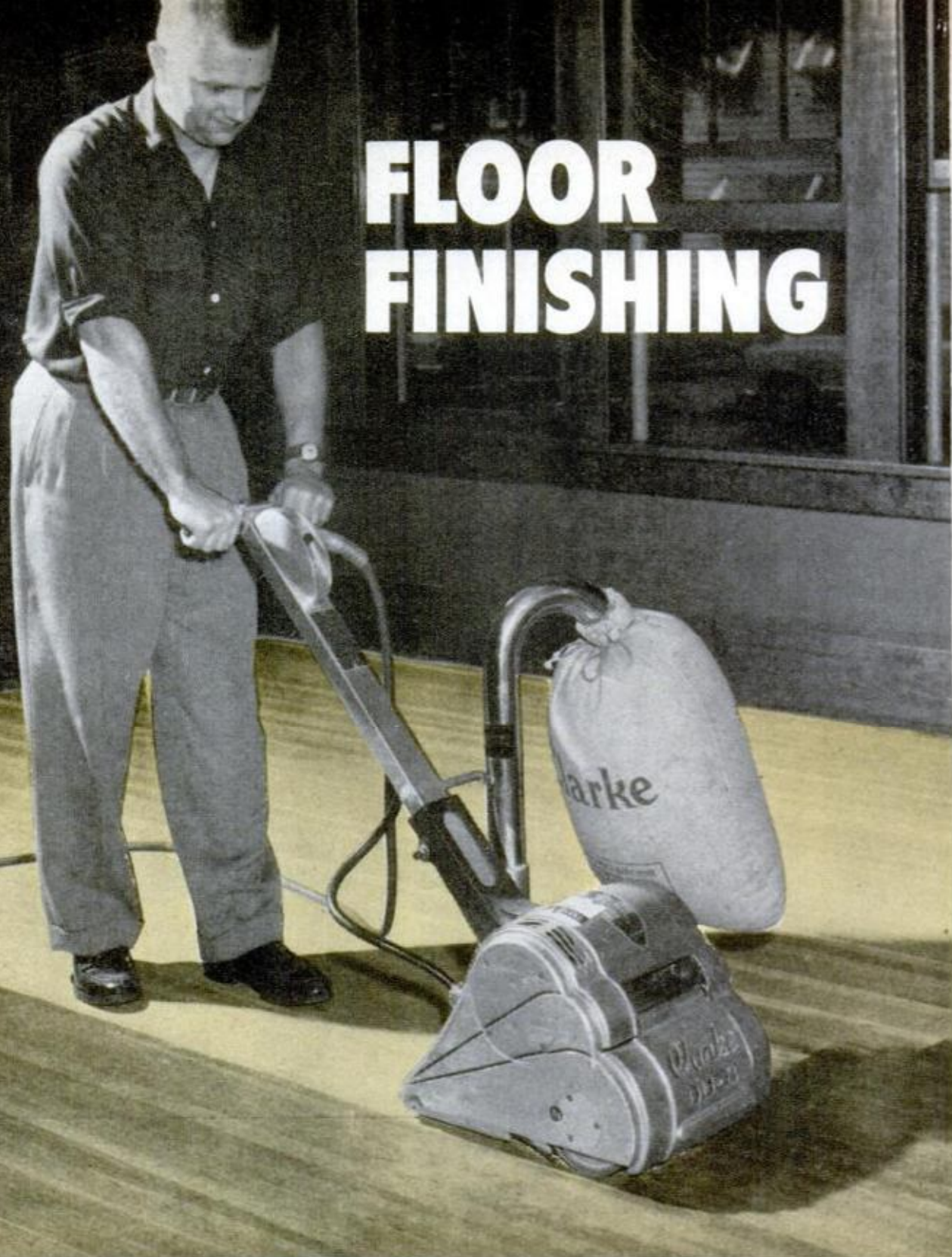
Fairyland Playhouse. That venerable nursery rhyme about the "Old Lady Who Lives in a Shoe" becomes a reality in the form of a one-of-a-kind playhouse. Plans in the June issue show you how to build the 'shoe,' a rough framework affair that is covered with woven wire and coated fabric.

Stop That Drip! What drip? The water that drips drop by drop all summer long from those cold-water pipes, making your basement a dank, swampy place of rust, corrosion, mildew and smells. Next month we'll tell you how to stop the drip, not just temporarily, but for keeps.

Replacing Sealed-Beam Headlights. Comes twilight and you switch on your driving lights. Or did you? Maybe the fellow going the other way sees only one headlight. Or maybe the upbeams, downbeams and taillights are not working. Next month PM will tell how to replace headlights, how to check your car's lighting system.

Linoleum-Block Printing Press. No regular greeting card ever brought with it the warmth and feeling expressed by the card printed on a linoleum-block press from a handmade cut. It carries the sender's personal touch. In June PM begins a two-part feature showing in detail how to build the press.

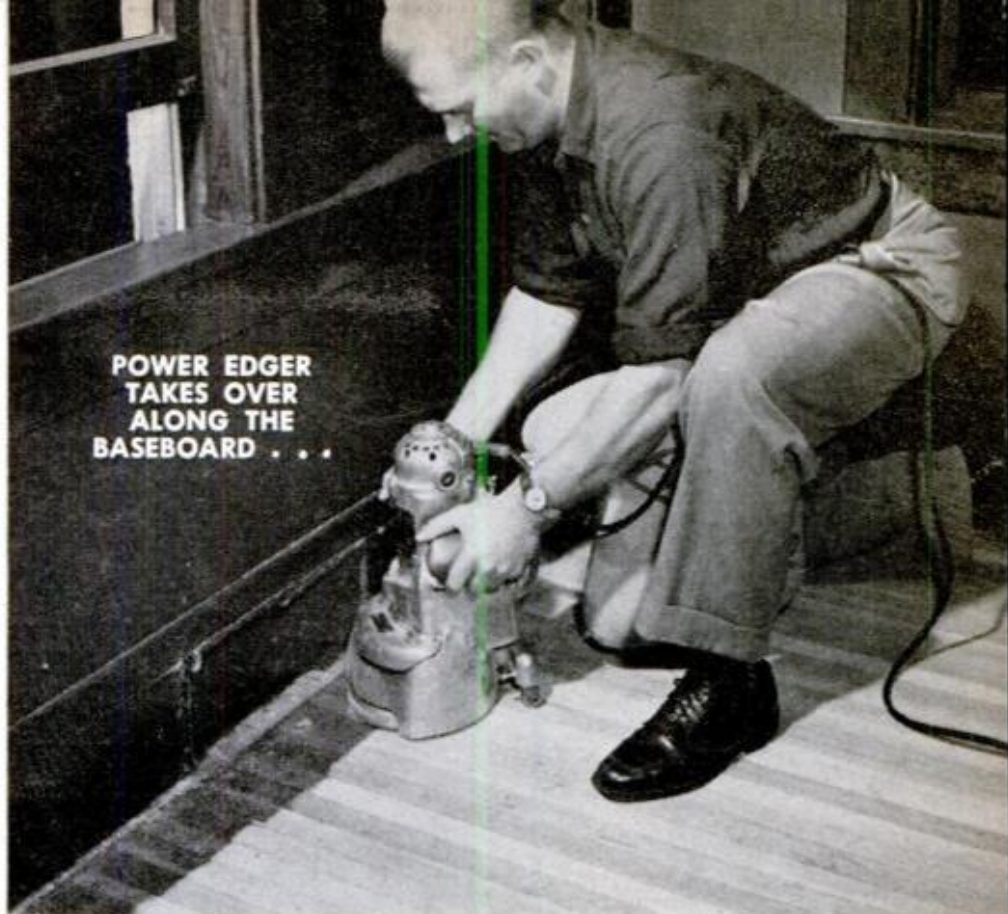
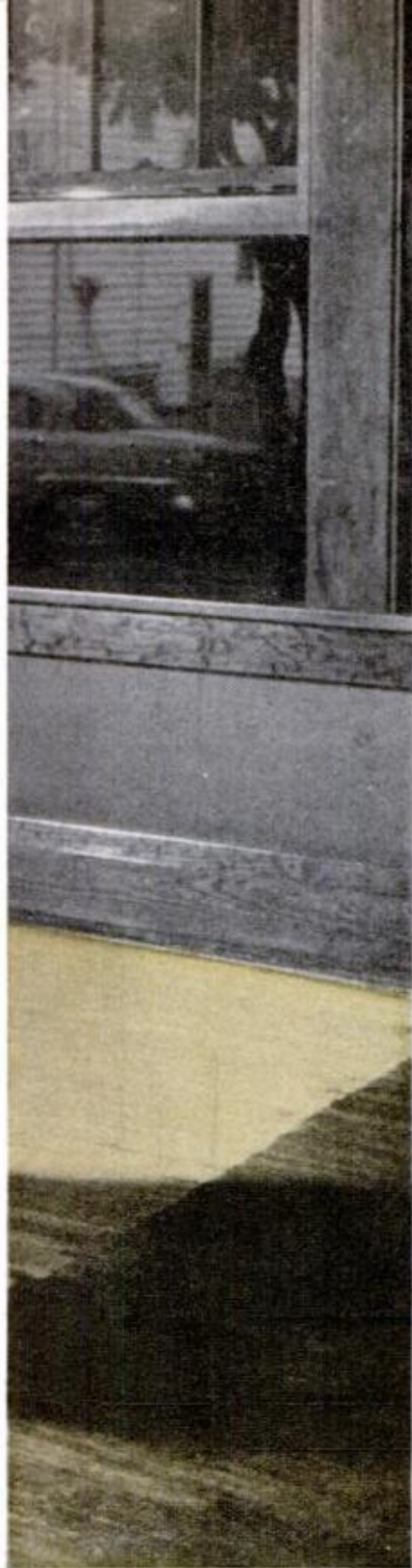
FLOOR FINISHING



Thanks to modern methods and materials, you can now "trade" old floors for new at nominal cost and effort

WITH THE increasing popularity of natural wood finishes throughout the home, chances are your wife has been taking a long, hard look at her wood floors. Unless they're in real good shape, you can expect to hear "We've just got to do something about these floors."

Happily, modern methods, equipment and materials make it possible for the average handyman to do a top-quality professional job with a minimum of fuss, bother and upset. What's more, if you use a fast-



**POWER EDGER
TAKES OVER
ALONG THE
BASEBOARD . . .**



**AFTER FIRST
REMOVING SHOE
MOLD (QUARTER ROUND)**

drying product, you can do the whole job in one day from sanding off the old finish to moving the furniture back in.

First step is a trip to your paint, hardware or tool-rental dealer. To remove the old finish you'll need a power floor-sanding machine, an edger (to sand close to walls), a hand-scraper (for corners) and sandpaper. Machine-rental rates are reasonable, so is the cost of sandpaper. Better pick up a paint brush (or roller) unless you have one at home in good condition.

Then there's the finishing material. You can choose from several types — shellac, varnish, floor seal or the new synthetic-resin chemical coatings. The properties of shellac and varnish are well known; chances are your present finish is one of these, probably shellac. Shellac is fast-drying, easy to use, wears well if waxed regularly and contact with water is avoided. Varnish is slower-drying, tends to scratch easily unless protected with wax, but outranks shellac in water-resistance and gloss.



Floor seals are designed to sink into the pores and seal the floor against the penetration of dirt, moisture, stains, etc. Because the surface of the wood remains unfinished, sealed floors require waxing for satisfactory appearance and wear. Like shellac and varnish, the synthetic-resin types are almost the opposite of floor seals in principle. They are surface coatings, and the object, as pointed out by Pierce and Stevens Chemical Co., is to provide a surface so hard and tough that the wood itself never receives any wear at all. Most brands are fast-drying, should be flowed on (preferably with a roller) rather than brushed on. The finish is attractive, durable, easy to keep clean; some brands never require waxing.

Because oak floors have an "open" grain, paste wood filler is sometimes used under shellac or varnish to provide a level finish. This practice is dying out, however, because it slows up the job (requires overnight drying) and adversely affects adhesion, often resulting in shorter finish life.

Once you've assembled all the necessary equipment and materials, you're ready to start. Clear out all rugs, furniture, drapes, etc. Remove shoe moldings along the baseboard (use

BEFORE SANDING go over entire floor and renail any loose boards, countersinking all exposed nail heads that would tear paper on machine

COARSE ABRASIVE paper (bordering on clinkers) is used for the initial sanding. Second and final sanding is done with finer grades

FLOOR IS SANDED between coats by hand, using a fine-grade paper to knock off any raised grain caused by the application of the finish

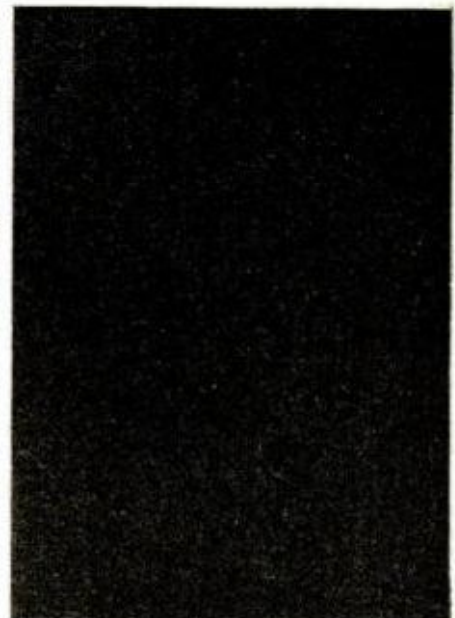


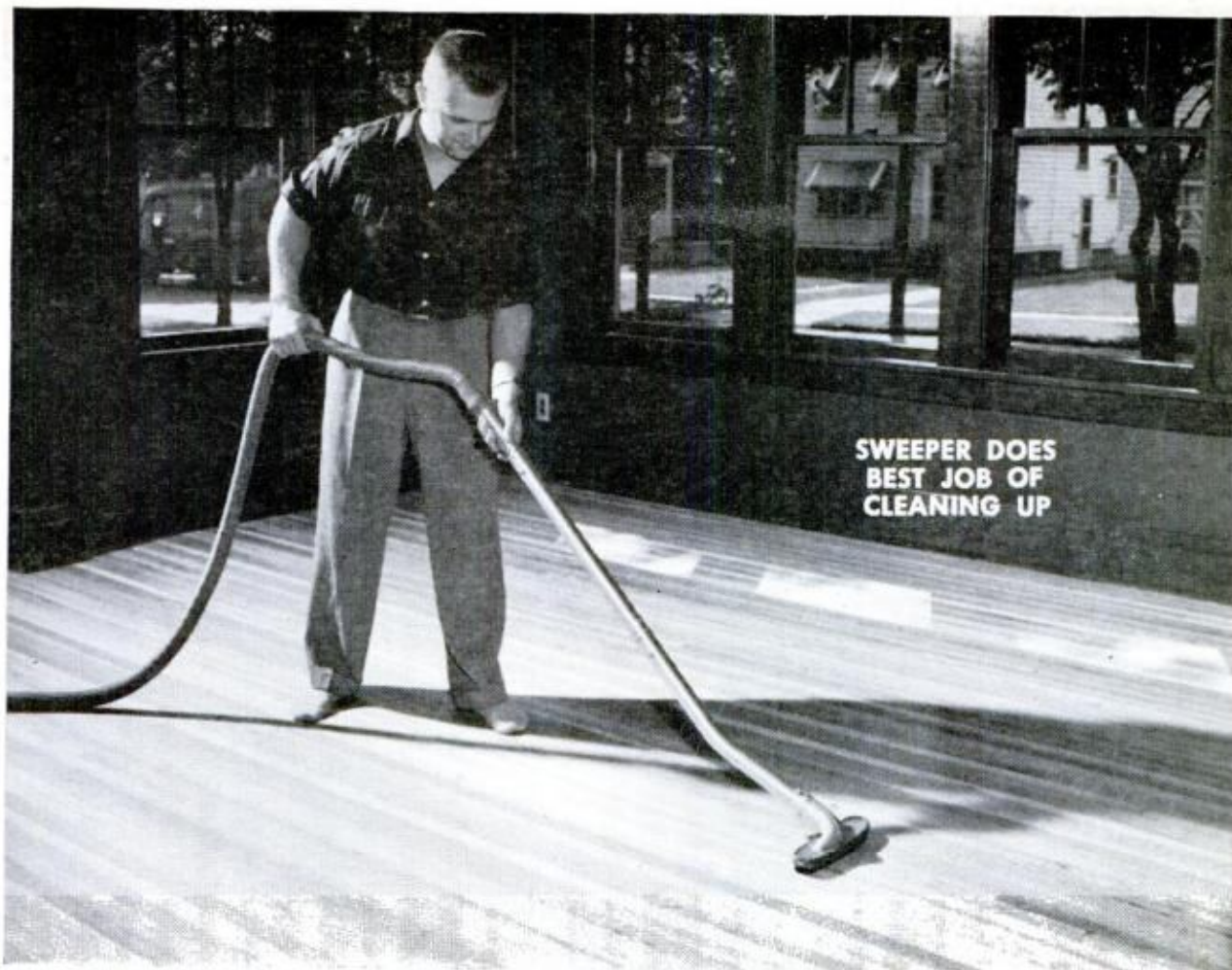
CHART OF SANDING OPERATIONS — OLD FLOORS

FLOOR	OPERATION	TYPE OF PAPER	
Covered with Varnish, Shellac, Paint, etc.	First Cut	Coarse	3½ (20)
	Second Cut	Medium	1½ (40)
	Finish Sanding	Fine	2/0 (100)

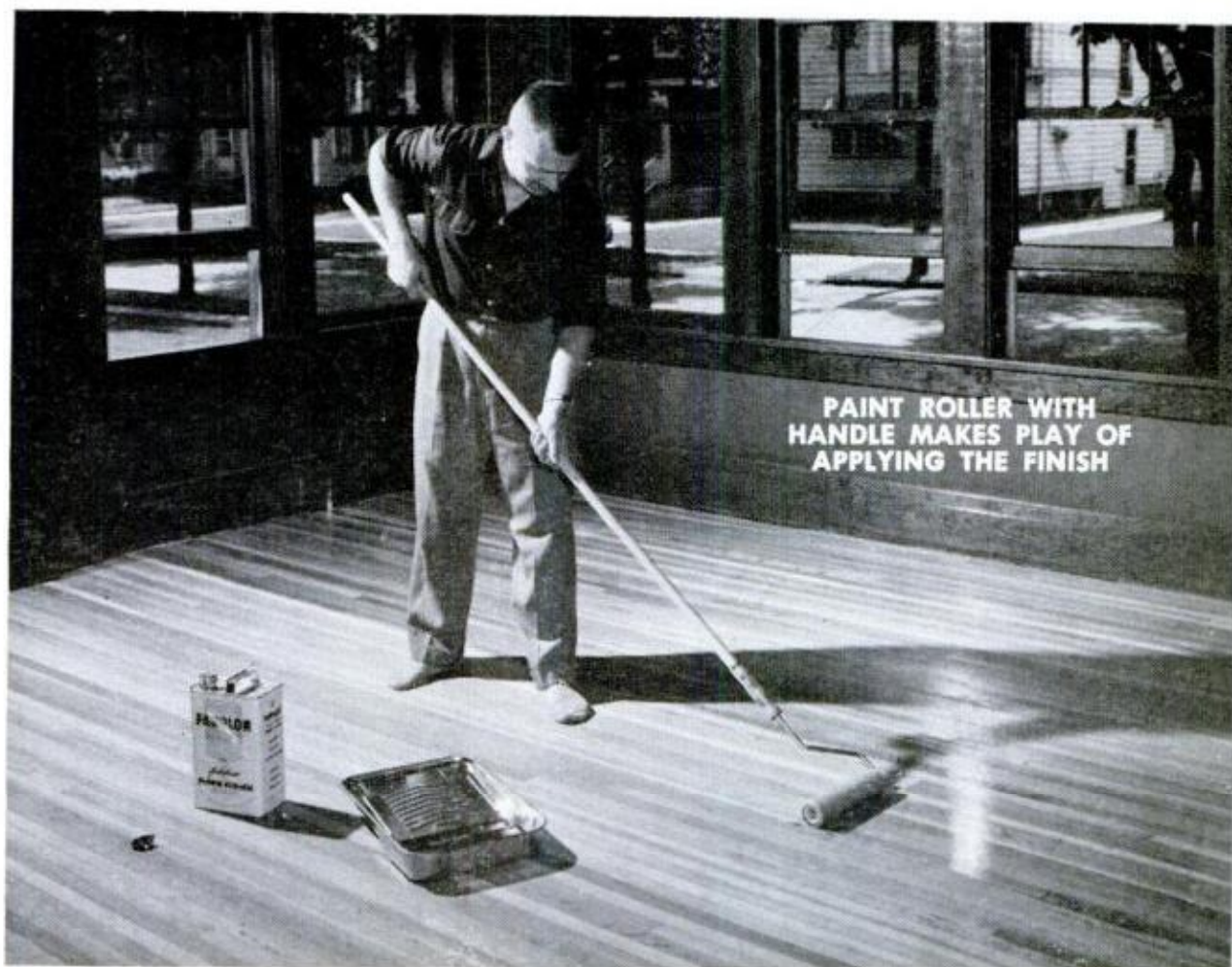
care to avoid breaking), fasten any loose flooring boards, countersink exposed nail heads to guard against ripping sandpaper or damaging felt pad on the sanding drum.

Use the power sander with the correct grade of paper (see chart) to remove the old finish down to the bare wood. If you've never used one before, running the sander may be a little tricky, but you'll get the hang of it in no time. For best results, always sand *with* the grain. Be careful not to rest

(Continued to page 220)



**SWEeper DOES
BEST JOB OF
CLEANING UP**



**PAINT ROLLER WITH
HANDLE MAKES PLAY OF
APPLYING THE FINISH**

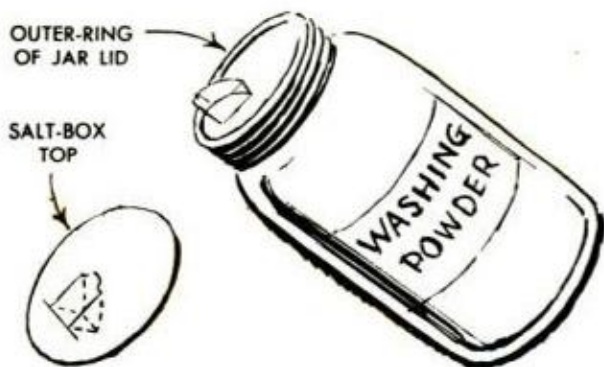


WAX JOB given periodically to ash tray, left, prevents tobacco ashes from adhering to bottom. Cleaning is easy, requiring a wiping with soft facial tissue after tray has been emptied. No more washing to remove ashes and tobacco stains. Paste wax is applied with soft cloth, giving glass trays more sparkle, ceramic and metal trays higher luster

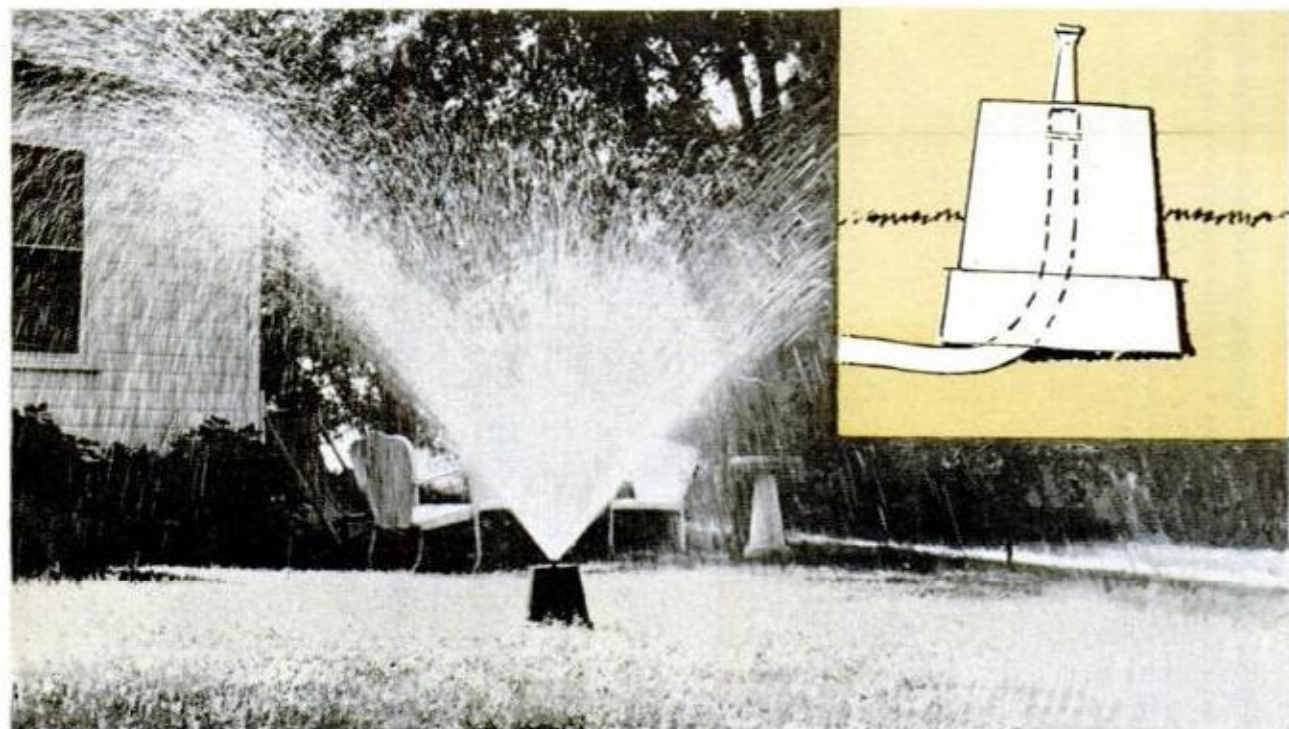
LOW-CUT DRESSES that have narrow shoulder straps usually fall to the closet or wardrobe floor at the first nudge when hung on standard wooden or metal clothes hangers. In the case of wooden hangers, this nuisance can be avoided by cutting 1/4-in.-deep notches near the ends, below left. Similar notches can be formed on wire hangers, with pair of pliers



NEAT DISPENSER for washing powder, left is easy to assemble from quart-size fruit jar (with 2-piece lid) and top of salt box having pouring spout. Box top is cut to same diameter as jar-lid insert, which it then replaces. Same idea can be used to make other dispensers of various sizes to accommodate sugar, popcorn, birdseed and other substances



NEED AN EXTRA lawn sprinkler? A really serviceable one can be assembled in few seconds, below, simply by inserting hose nozzle in drain hole of large clay flower pot, which then is placed upside-down on lawn in center of area to be sprinkled. If hole in pot is too small to take nozzle, it can be enlarged by chipping or filing the clay as necessary



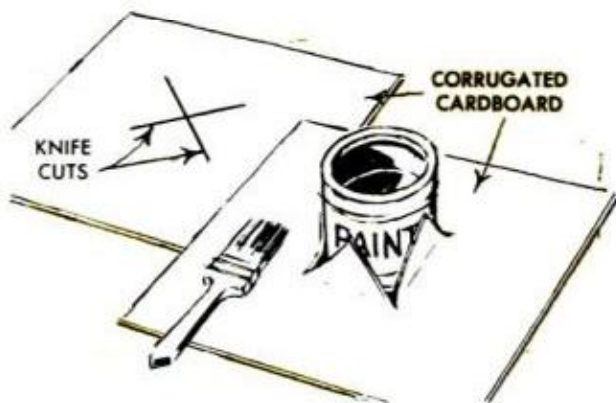
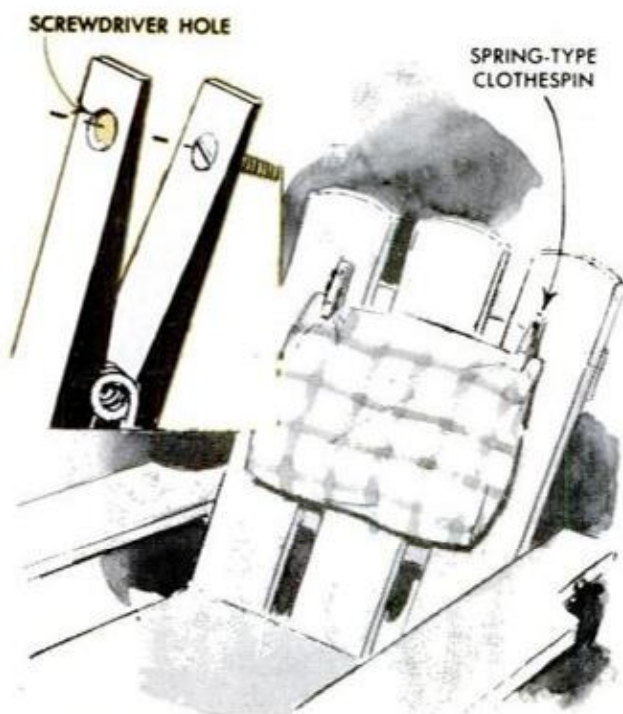
Solving HOME PROBLEMS

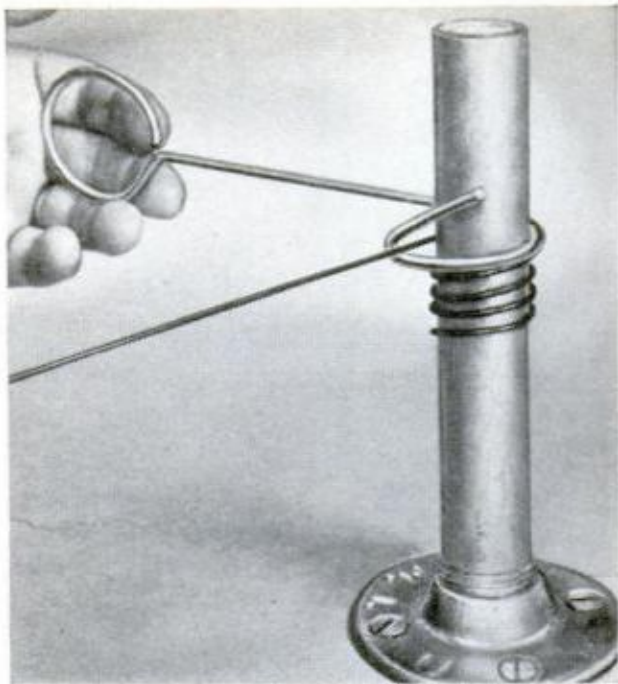
INDIVIDUAL "GREENHOUSE" provided for seedling transplanted early in growing season is large plastic fertilizer bag propped up by three wooden stakes driven in ground. Mouth of bag is folded back to form cuff which is filled with earth to keep chill winds out and anchor lightweight bag securely in place

SMALL PAINT CAN is almost impossible to overturn accidentally, right center, when doing touch-up jobs if a cardboard holder is used as shown. Holder can then be placed on it. It also provides resting place for brush and catches paint that may splatter from brush

ARE YOU DISCOURAGED with having the birds of the neighborhood feast on your cherry tree each year, just when the fruit begins to ripen? You can out-wit them, below right, by cutting strips of fur from a discarded coat and tying them to upper branches so that fur looks like their natural enemy, tabby

JURY RIG for holding headrest pillow in place on back of wooden lawn chair, below, is two spring-type clothespins screwed to back. To provide screwdriver clearance, one leg of clothespin may be forced aside temporarily, or a hole can be drilled in it as detailed. Use sheet-metal screws on metal chair





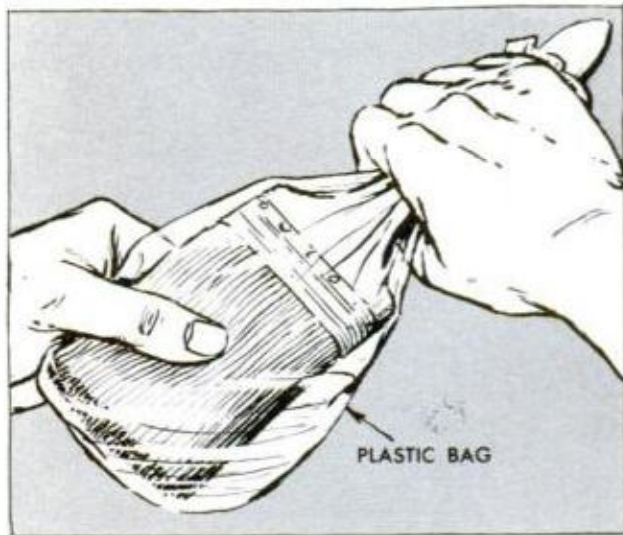
WORTH REMEMBERING

Handy Shop Wire Winder

Without the special equipment ordinarily used, it's no simple trick to form a truly round ring of medium-heavy wire to a given size. Provide the setup pictured, using a length of pipe slightly smaller in diameter than that of the ring needed. Make a bender of $\frac{1}{8}$ -in. steel rod, drill a small hole in the pipe to catch the end of the wire to be bent and you're all set to form any number of rings of the same diameter.

—Bil Toman

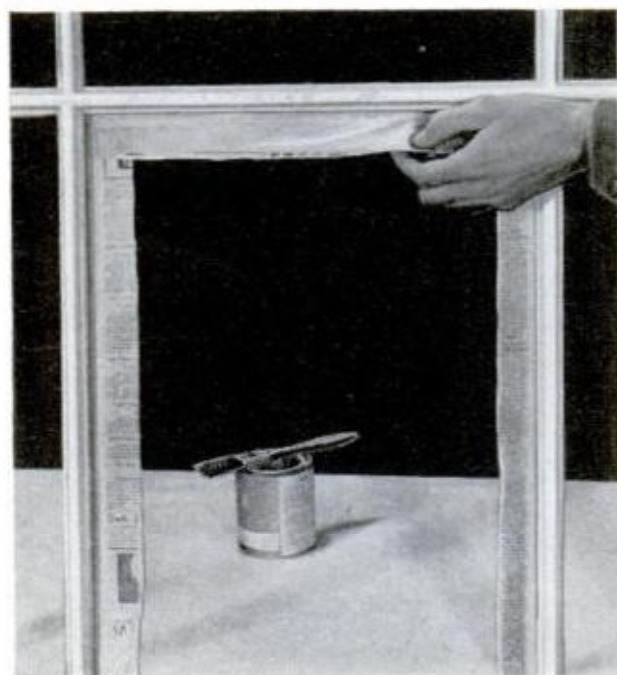
Leather welding gloves are made to fit loosely so they can be removed quickly. If you prefer cuffed cotton gloves having an elastic band across the back, remove this so the glove can be pulled or thrown off.



Brush Cleaner Protects Hands

You know, of course, what a messy job it is to knead solvent into a paintbrush. Rough on your hands, too. But it's the only sure way to get a brush clean so that it won't harden when stored between painting jobs. Instead, pour the solvent into a plastic bag (not lacquer reducer as this will soften some plastics) drop the brush in the bag and then hold as illustrated, or snap a rubber band over the brush handle and the top of the bag. Kneading can then be done even more efficiently than by other methods and you keep both hands out of the mess from start to finish of the cleaning job.

—Joseph Federico

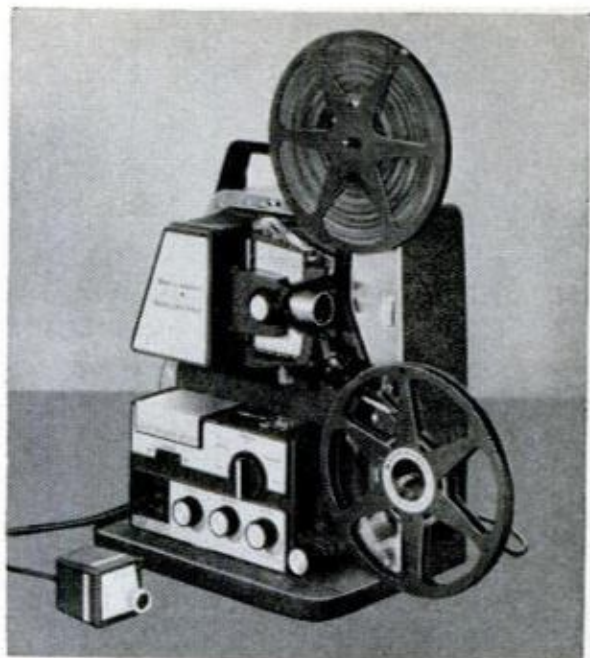


Masking Sash With Newspaper

Strips cut from a newspaper and immersed in water until soaked through make good masking "tape" for use when painting sash. Cut the strips about $1\frac{1}{2}$ in. wide with one straight edge, wet thoroughly, allow excess water to drain off and then place along sash rails, stiles and muntins as pictured. The wet paper will adhere to the glass long enough to permit painting to be finished on one small sash. Be sure, however, to peel off the paper before the paint is thoroughly dry.—R. Hanscom

Some large drill chucks won't close tightly on small diameter drills. Cut a short length of resin-core solder, roll until straight, then force over the drill shank. Place in the chuck and make sure the drill and sleeve are centered before you tighten the chuck jaws.

FOR SHUTTERBUGS



DUAL/LECTRIC 8MM. PROJECTOR takes over as film is inserted in automatic threading device. In seconds it threads film, turns off room light, turns on projector lamp, winds film and starts movie. Remote-control unit containing electronic tube, uses mercury switches and puts machine through paces as it is turned in the hand. Sells for \$239.95 and is manufactured by Bell & Howell, 7100 McCormick Rd., Chicago 45, Ill.



COLORTRU CONVERTER changes color temperature of regular 120v. lamps to 3200° and 3400° Kelvin, is completely portable and may be plugged into regular household outlet. Unit handles up to nine 100-w. lamps or equivalent wattage. Interlocking switch provides brief warmup to extend life of lamps. The ColorTru sells for \$49.50 and is made by Natural Lighting Corp., 630 S. Flower St., Burbank, Calif.

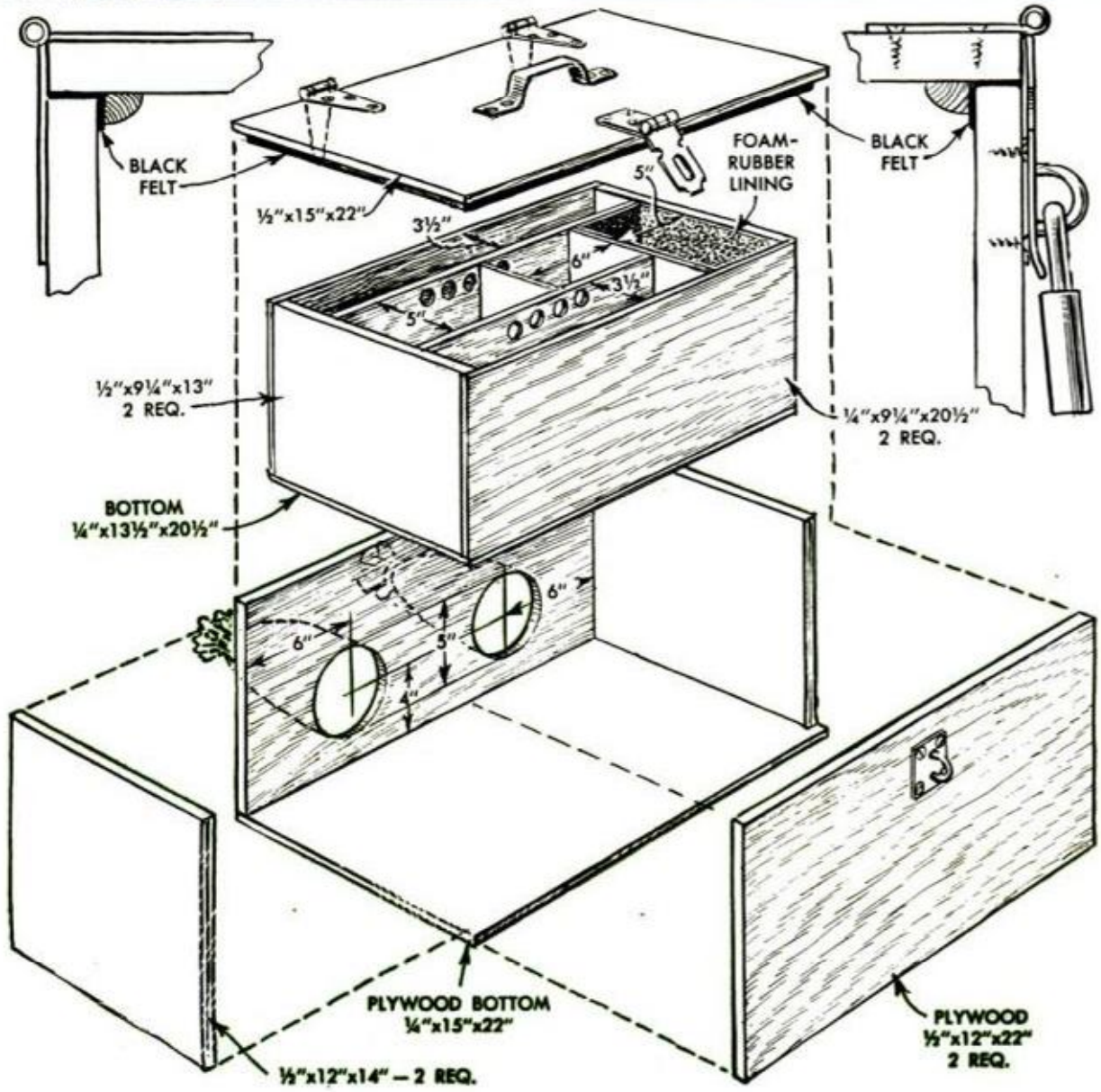
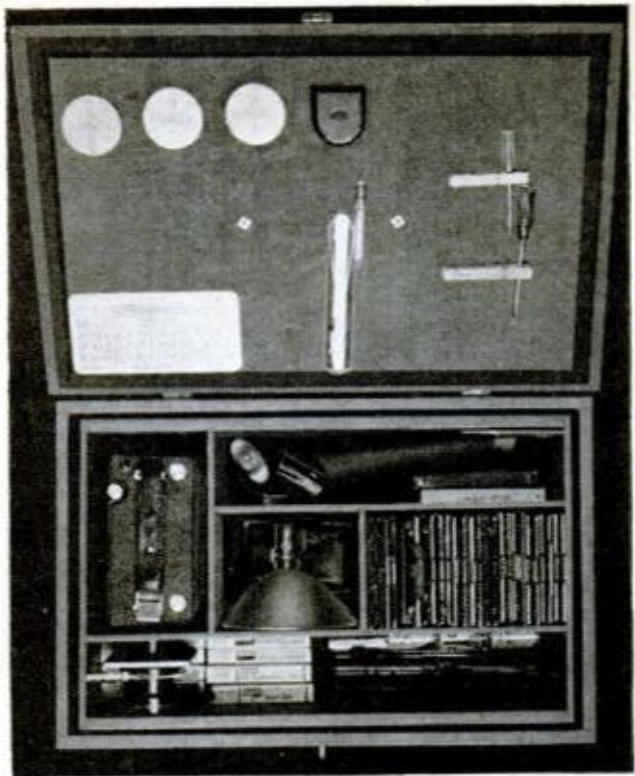


ELECTRIC EYE 35MM. CAMERA automatically sets exposure under most lighting conditions. Other features of Samoca camera include single-window coupled range-finder-viewfinder with parallax correction. Camera synchronizes with both flashbulbs and electronic flash, features an f:2.8 lens with speeds from 1 sec. to 1/300 sec. The camera is distributed by Scopus, Inc., 404 Park Ave. South, New York 16, N. Y.

PREPAID PROCESSING MAILERS for Kodacolor film are now available. They will be supplied for the most popular-size Kodacolor prints. Price, according to Eastman Kodak Co., Rochester 4, N. Y., will be approximately equal to current price for developing a roll of Kodacolor film, plus charge for prints. If any negatives are unprintable, a certificate will be returned to customer entitling him to a future print



X474C





INNER CASE lifts out of combination box and leaves a light-tight unit for loading and changing films

HANDS IN A BOX

give you a darkroom away from home and furnish a storage case all in one compact unit

By Wayne Floyd

MILES FROM a darkroom your camera jams or you run out of film holders just as the best shot of the day appears. Any cameraman would give plenty to have a portable darkroom right then. This situation has happened to me so many times that I finally decided to do something about it and made this a combination portable darkroom and photographic equipment case.

The compartmented section of the box was custom made to fit each piece of my equipment. You can do the same by making a similar box to fit your own photographic equipment. I had my lumber dealer cut each piece of plywood to the exact size I needed and the complete box only cost a little over \$5.

The weight of the case can be evenly distributed by arranging the heaviest pieces of equipment at opposite ends to balance each other. My press-type camera is kept at one end and all the film holders and other heavy items, such as flash guns, are arranged in compartments at the opposite end. My roll-film camera and the reflector for my flash gun are light objects, so they are stored in the center section. Other items



such as extra film, lenses and accessories are carried in the other sections of the box. I also made use of the box lid by gluing a couple of clothespins to it to hold two screwdrivers that I use for repairing my equipment. A discarded toothbrush holder keeps my cable release where it will be handy. And my filters and close-up attachments are also attached to this lid, in their own plastic cases. Felt weather stripping, plus quarter-round molding applied to the edges of the lid, are used to make the box completely light-tight when the lid is closed. The felt is glued to the quarter round and to the lid. To further insure that there would be no light reflections, I painted the inside with flat black paint.

All that is needed to convert the carrying case to a darkroom is to remove the inner box and close the lid. To make the inner box easy to lift I bored four finger holes to use as a handle. Cloth sleeves fit the two holes in the back of the box to give access for the hands when the box is used as a darkroom. The sleeves are made of two thicknesses of black opaque material with elastic to fit the wrists. ★ ★ ★



CONVERTIBLE POWER UNIT makes a real workhorse for the enthusiastic gardener. The unit can be used either as a walking or riding mower. Besides using reel or rotary mowing units, suitable attachments can be added to do such jobs as cultivating the garden, grading a new lawn or clearing away the snow in the winter



POWER-PROPELLED MOWERS take the work out of mowing open areas and hilly ground



POPULAR MECHANICS



ELECTRIC MOWERS are quiet to operate and require the least amount of maintenance, but many consider power cords a nuisance. Once a good mowing pattern is established the cord should never be a bother

By Robert L. Hering



SIZE UP YOUR LAWN BEFORE YOU BUY A MOWER

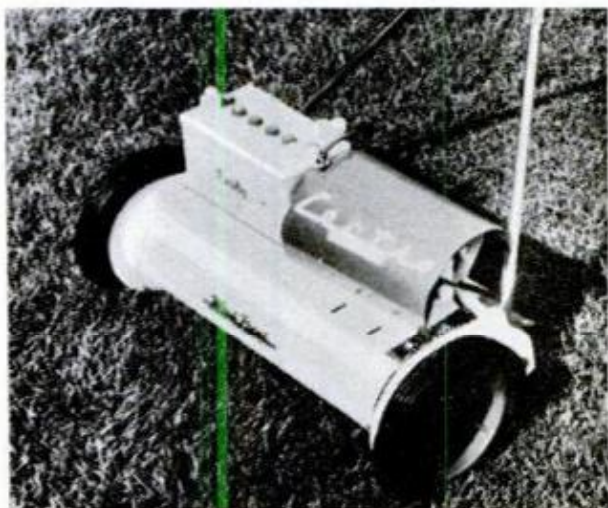
IT'S JUST good sense to "consult" your lawn before buying a new power mower. Surprising as it may seem, a buyer often gets so carried away when viewing the many types and models of mowers that he completely forgets how important it is to choose a mower that fits his particular lawn. Obviously, if you have a large, open lawn area, you should shop for a different type of mower than if yours is a small lawn dotted with many plantings.

Bewildering can be the word for it when you shop for a new mower. So, to narrow your selection, decide first the type of cutting unit that will be best for your lawn. Practically all lawn mowers use either a rotary or a reel cutting unit. Which of these two basic cutting units you should pick depends on the type of lawn you have and how you like to maintain it. More homeowners buy rotaries than reels because rotaries are more versatile than reels and their price range is greater. But, if you prefer a putting-green appearance, you should consider a quality reel unit.

The rotary mower has certain basic cutting advantages. Its blade chops up long clippings and weeds, whereas the reel unit simply knocks down the long blades of grass and weeds and passes over without cutting them. Most rotaries tend to ball

and clump damp grass, but some models are much better than others in distributing the clippings. The design of the housing probably has the most influence on how well a mower discharges grass, but a practical test is about the only way you can be sure that the mower doesn't clump the grass. If grass is dry, there's little tendency for it to clump, but otherwise clippings tend

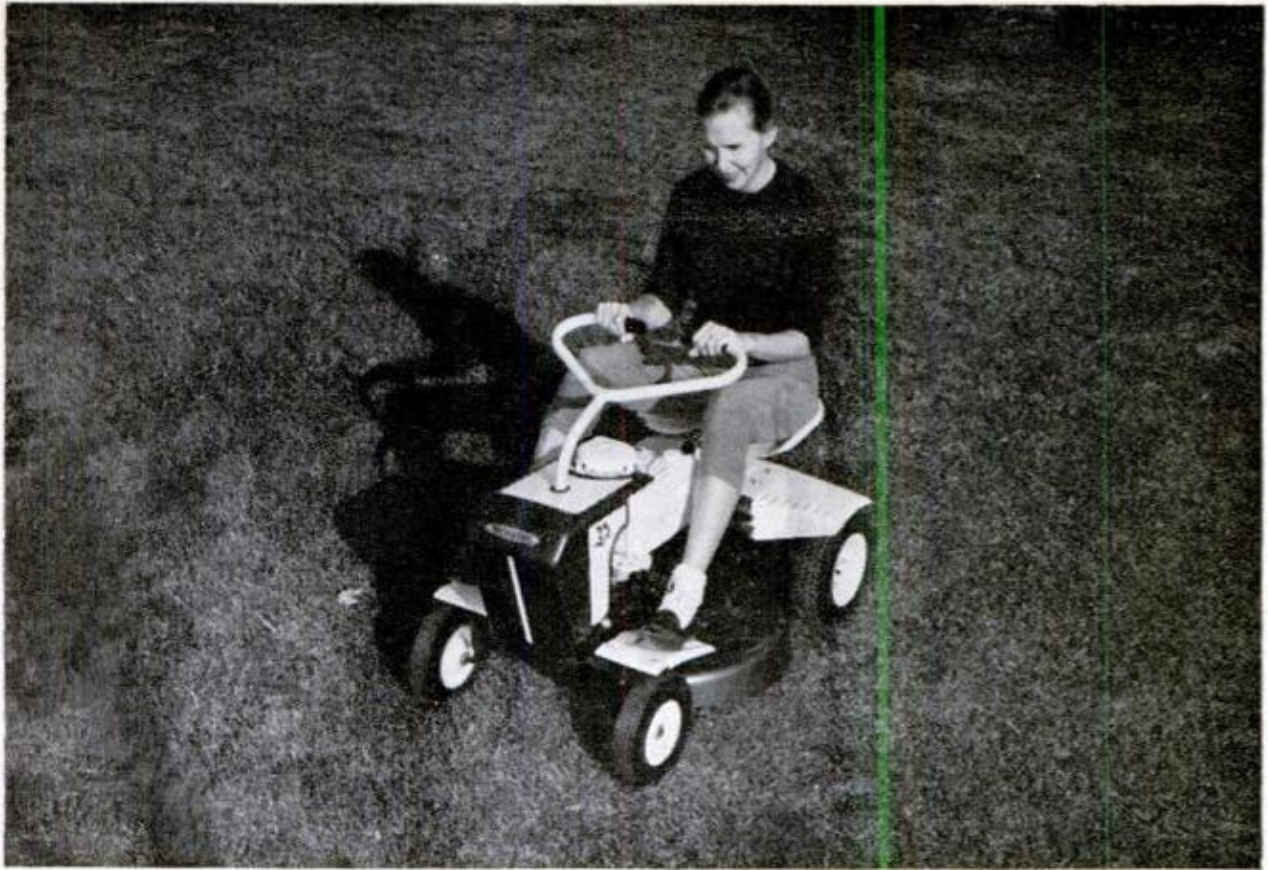
NEW BATTERY-POWERED ELECTRIC eliminates the cord but retains many advantages of regular electrics. Between mowings, battery is easily recharged by plugging into 115-v. house outlet for a few hours





REEL MOWERS are all power-propelled units which are especially good for mowing level, closely cropped lawns. Push-type rotaries, as below, are favorites among homeowners living on average-size urban lots





RIDING MOWER is a great time and work saver on large, open lawns, but on the average lot a rider has no advantage over the inexpensive walking mower

to stick to the underside of the housing. Clumps of grass remaining on top of the lawn, especially during wet periods, can smother the turf.

Different types of lawn grasses require various cutting heights. Many rotaries are unsatisfactory to use on lawns that are cut shorter than one inch; for these a reel mower is generally preferred. The basic construction of the reel mower gives it certain advantages which are not found on the rotary. Its narrow cutting strip minimizes scalping—shearing grass only along the edge as the revolving blade passes the bed-knife. This basic reel construction makes scalping no problem when compared with the scythe action of the rotary blade over a much larger area. A rotary has a tendency to scalp because the large pan bobbles over rough ground, high spots and crests of slopes. Manufacturers use a number of methods to reduce this scalping tendency—guards set below the blade, special wheels and staggered wheel designs. The rotary deck and whirling blade create a high-velocity wind tunnel under the housing which helps pull the grass upright while the high-speed blade cuts it off.

Either the reel or rotary can leave a ragged turf if the cutting blades are dull or not properly adjusted. The rotary blade

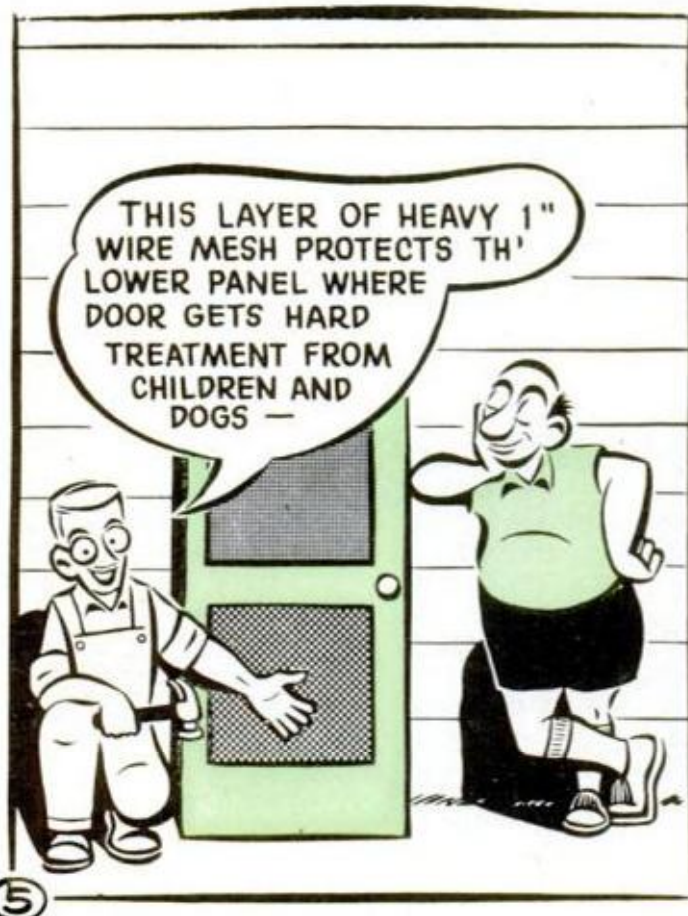


should be touched up frequently to retain its cutting edge. Mowing with a dull rotary blade causes the tips of the grass blades to fray and turn brown. A rotary blade can be sharpened easily by the operator, but a reel cutting unit must be sharpened with relatively expensive sharpening equipment, usually found only in professional shops.

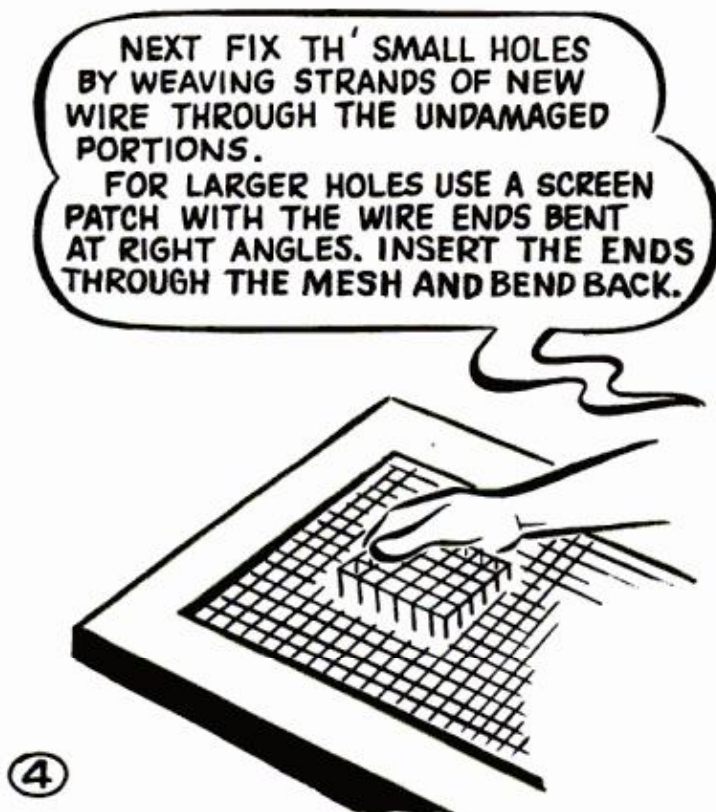
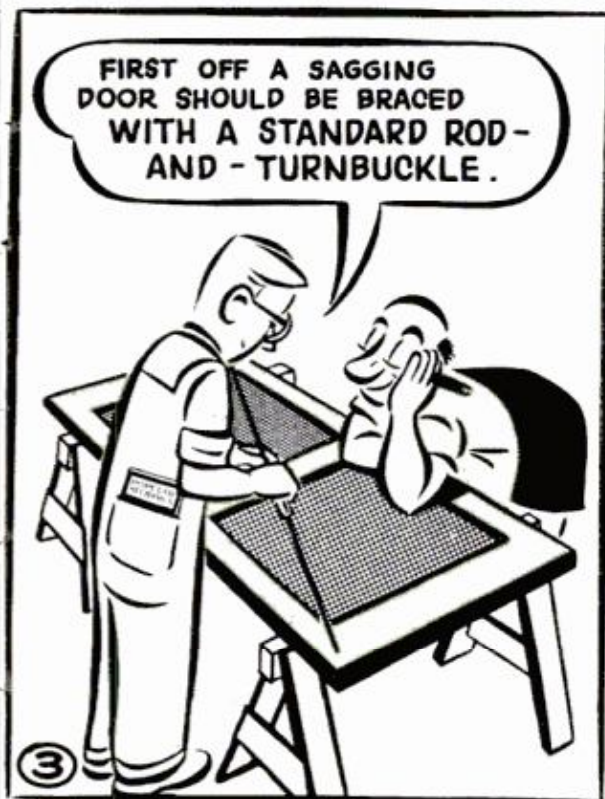
The cutting unit on the reel mower rotates at a much slower speed than the rotary blade and therefore is not subjected to the vibrations of a rotary unit. Even the reel engine operates under relatively clean conditions, since the blades do not create the fanlike turbulence made by rotaries. Because of these basic differences of operation the reel mower may be expected to outlast a rotary by several years. Its smooth, level cutting action often makes the reel mowers preferred for use on lawns having thick, lush growth and in open areas

(Continued to page 212)

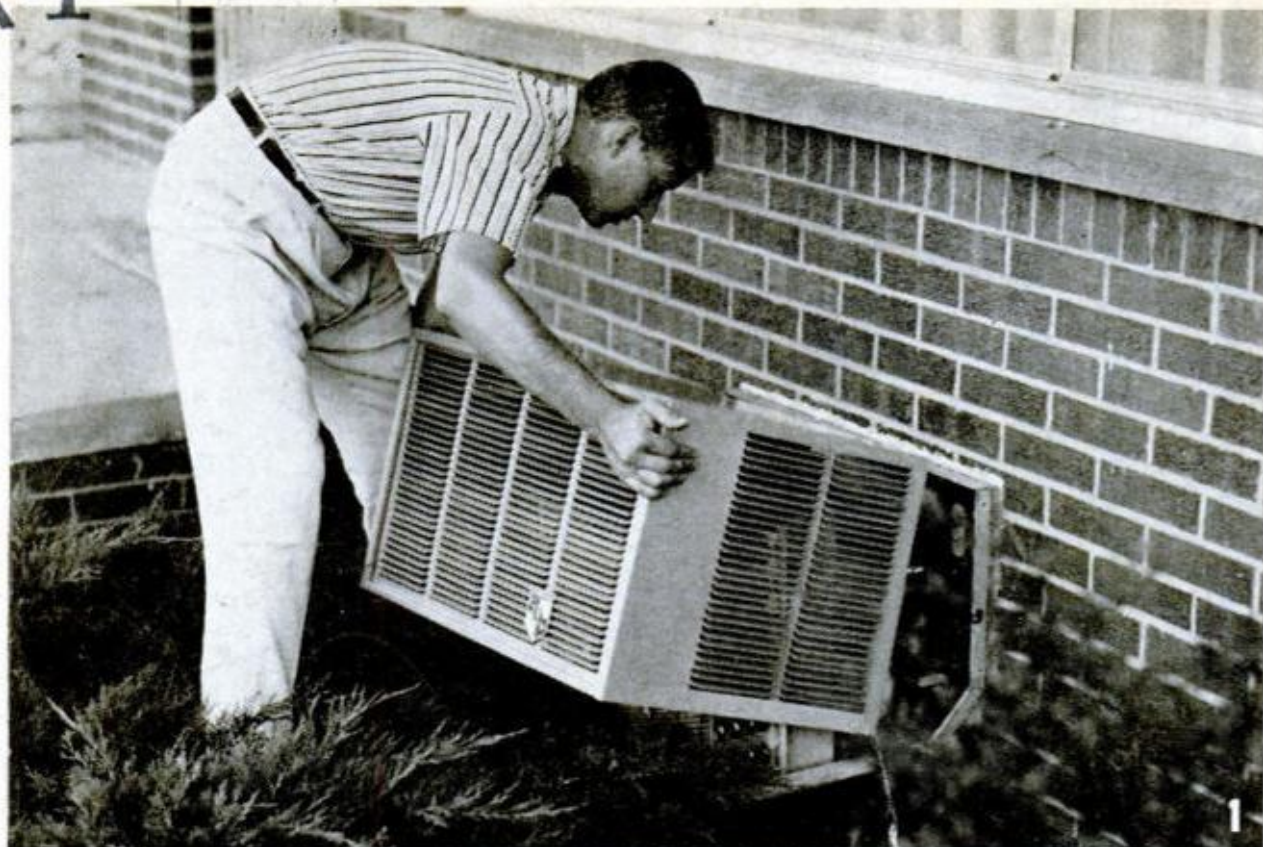
MR. DOIT AND BUNGLE



Kids and dogs and flies do their best to make screen repair an annual affair unless you beat them to the punch. Here Bungle learns how to do it the easy way



x4



C-O-O-L YOUR WHOLE HOUSE

For the Price of Two Window Units

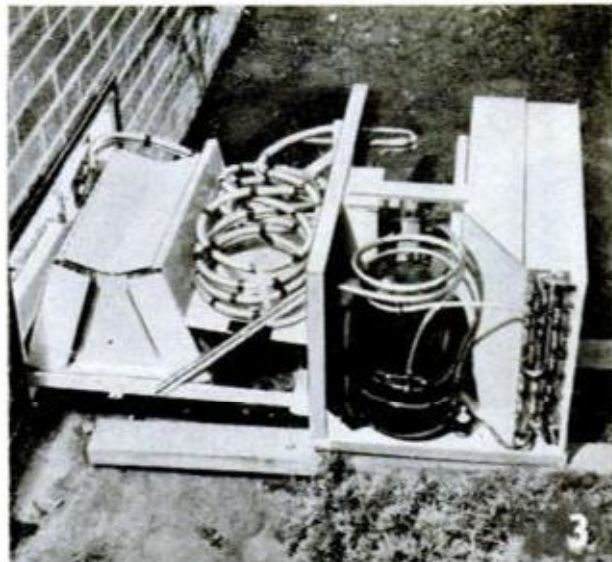
By Harvey A. Burley

MANY HOMEOWNERS think of air conditioning as cooling one room for sleeping comfort. It's true that room air conditioners do a nice job of pumping cool, dry air into a bedroom on a sticky summer evening. You might buy just one this sum-

mer and one or two more next summer and eventually cool the whole house. But this is the long way 'round and, of course, is more expensive than installing central air conditioning and cooling the whole house with one unit. And you'll be surprised how

WHERE A BASEMENT WINDOW is not handy it will be necessary to cut an opening of suitable size in wall

AIR CONDITIONER comes as unit consisting of A-coil, condenser, compressor connected by flexible tubing



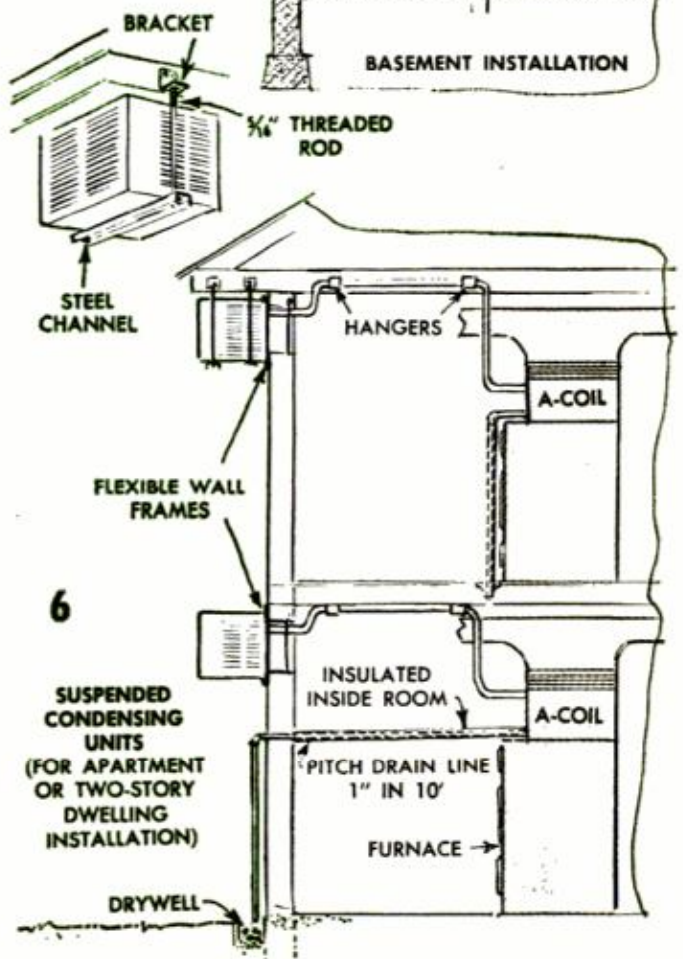
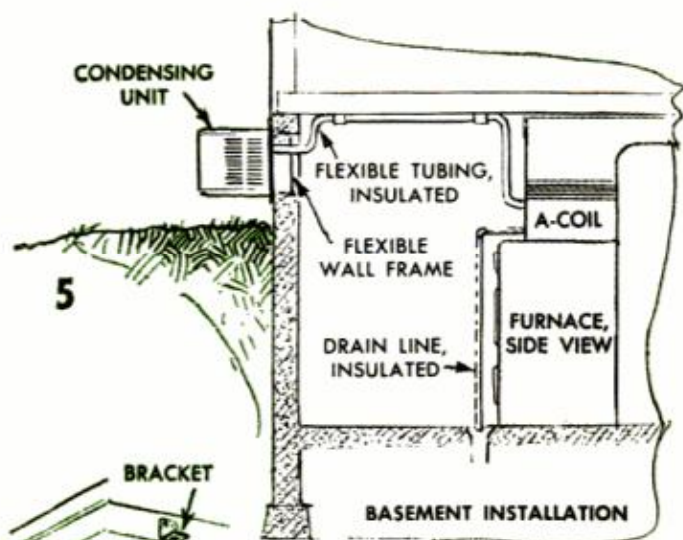
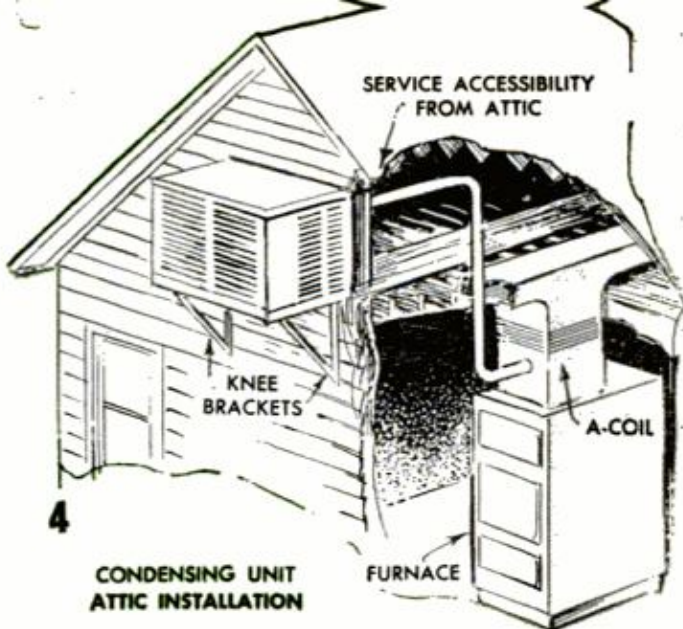
simple and easy it is to install your own central system. The conditioner comes as a unit consisting of the air-cooled condenser and an A-coil or evaporator, connected with about 18 ft. of flexible tubing. The unit has been evacuated and filled at the factory and is ready to operate as soon as it has been installed. The condenser must be located outside the house, Fig. 1, as it is air cooled. Locations are preferably on the east or north side where it will be shaded during the hottest part of the day. The A-coil is placed in the warm-air plenum of the furnace, Figs. 7, 8 and 9, the flexible connecting line being uncoiled and attached with hangers to the floor joists.

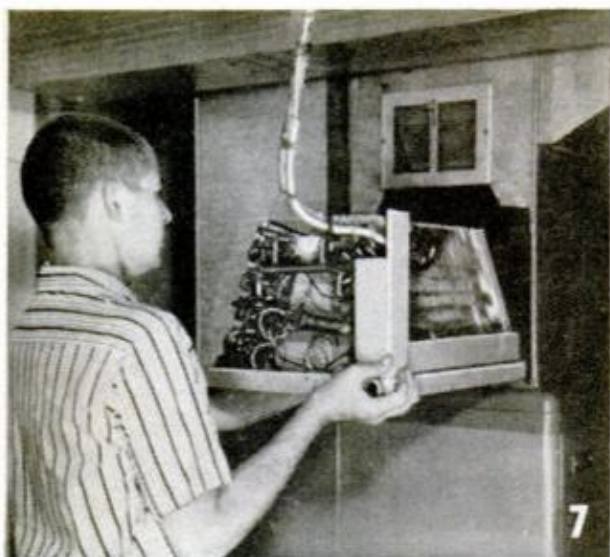
Average sized, self-contained conditioning units of the type pictured will effectively cool one-floor homes of 1200 sq. ft. floor area or even more if the structure is well insulated and other factors are favorable. One rule of thumb that some air-conditioning men use is that a capacity of 15 BTU's per sq. ft. will lower inside temperatures from 12 to 15 degrees in a well built and properly insulated structure. This rule is reasonably accurate for average capacity calculations.

In Basement Window

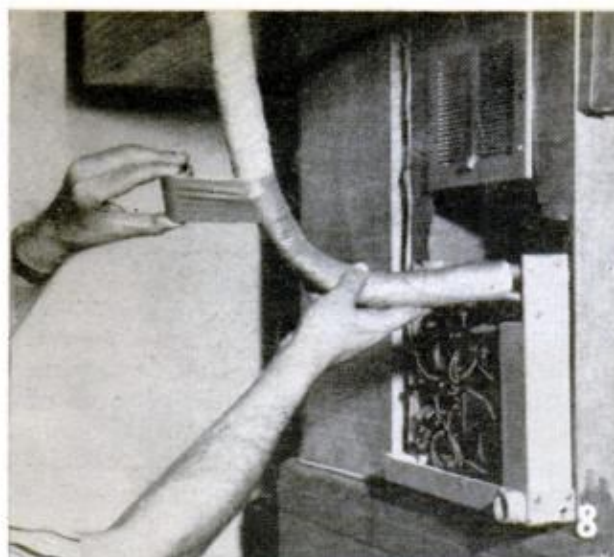
In a basement installation like that in Fig. 5, the compressor-condenser unit can be located just outside the basement wall and about 18 ft. from the furnace. If a basement window is not handy, or is not the required size, then you must cut an opening in the wall as in Fig. 2. A steel unit is available for framing this opening, making the mounting of the compressor unit much easier, Figs. 1, 3 and 11. Keep several points in mind when you're deciding where to locate this outside unit. You'll get much more efficient cooling if the compressor is located where it will not be exposed directly to the sun, especially in the afternoon. Although the operational noise level of the compressor is very low, it still may be objectionable to a next-door neighbor under some conditions. Take this possibility into account when planning location. Noise from the unit is directional, which makes it somewhat easier to control. Often this can be accomplished by placing a low-growing shrub in the sound path. But remember that the unit is air cooled and requires a clear breathing space of 2 to 3 ft. on the three exposed sides. Finally, in choosing the location make sure that when installed the rear of the unit is accessible from inside the basement. Figs. 4 and 6 show installations made in an attic, Fig. 4, and in an apartment, Fig. 6, where it is necessary to hang units above grade level.

There are thermostats available for con-





A-COIL IS INSTALLED in furnace plenum. Note flexible tubing connecting unit with compressor outside wall

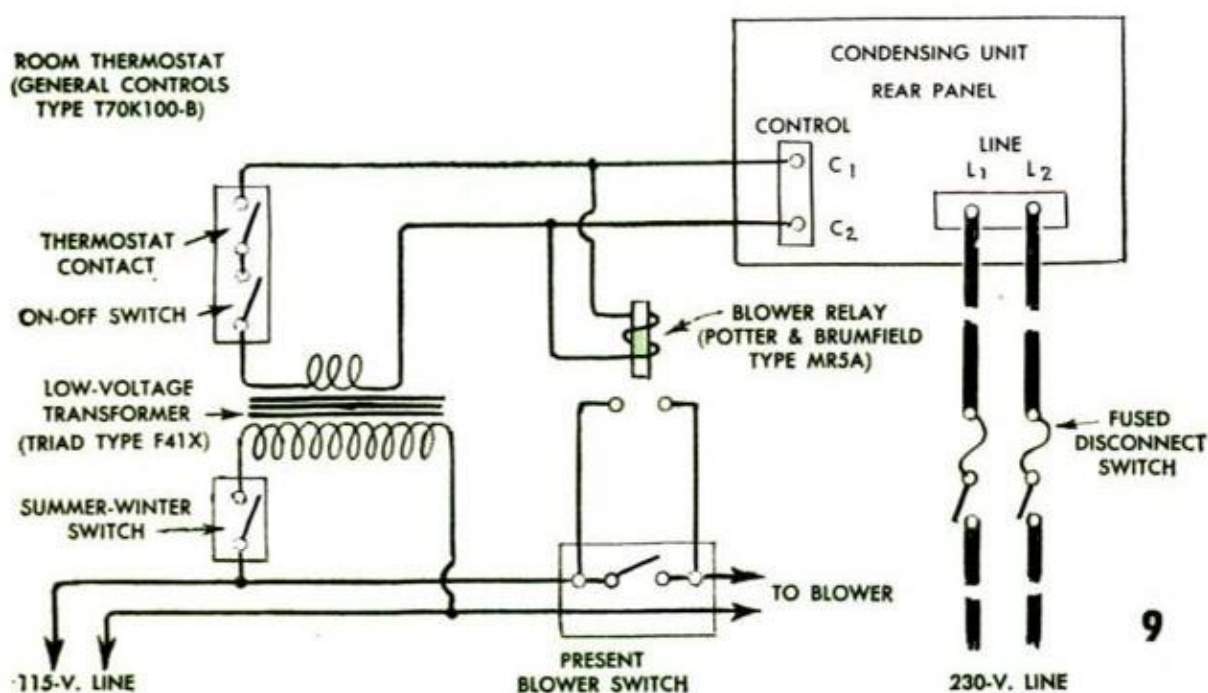


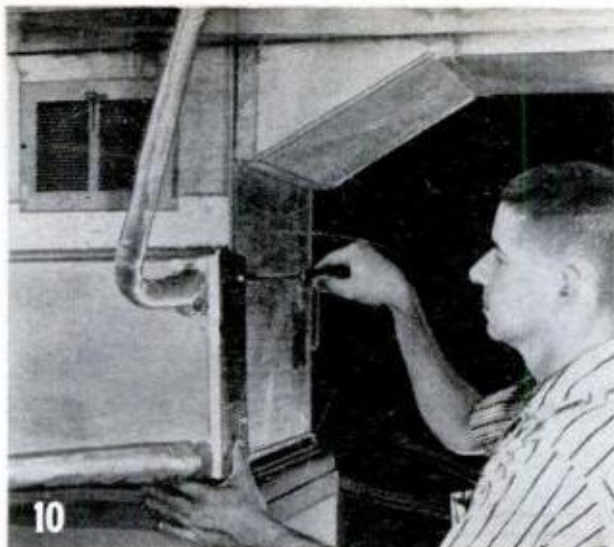
FLEXIBLE TUBING is insulated throughout its length and protected with a wrapping. Support it on hangers

trolling both heating and cooling units but if you don't already have one installed, then you'll probably be better off to install a separate thermostat to control the air conditioning unit. The control unit specified in the wiring diagram, Fig. 9, does the job nicely. This unit is fitted with an anticipator which prevents wide temperature variations as the conditioner goes through its on-off cycles. To turn the furnace blower on and off along with the conditioner, another 24-volt relay is wired in parallel with the one in the compressor and its normally open contacts are connected in parallel with the blower on-off switch. To operate the compressor you will need to connect it to a 230-volt line and unless you are an experienced electrician, you'll need outside help for this installation.

If you have warm-air registers that deflect the air downward or straight out from the wall, it's a good idea to replace these with the type that deflect the warm air upward. This gives a more comfortable distribution of cool air. In basement installations it is permissible to install a similar register in the furnace plenum, Fig. 7, to allow basement air to be drawn into the system. Due to reduced vacuum in the returns the blower will then deliver more cooled air.

Some improvisation may be necessary when installing the A-coil (evaporator) in the plenum. Keep the opening cut in the plenum to the minimum size required, Fig. 7, and provide some means of rigid support for the unit. Insulate and wrap the flexible tubing as in Fig. 8. Finally, cover the open-



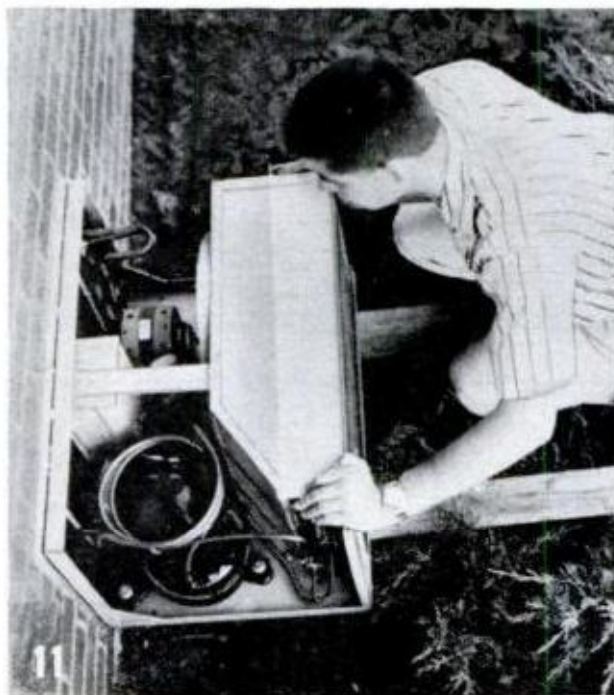


CLOSE PLENUM OPENING with tight-fitting sheet-metal cover after installing A-coil as in Figs. 7 and 8

ing with a tight-fitting sheet-metal cover as in Fig. 10. This usually must be made with an offset to fit over the projection of the A-coil. Attach with sheet-metal screws.

Now a bit of simple plumbing and your central air-conditioning unit is ready to cool your home on the hottest summer day. To carry away condensate there must be a drain line from the tap on the A-coil to the nearest drain, or, in some installations, to a dry well. If you lead the drain pipe to a floor drain, you can use plastic pipe or tubing, attaching it to the A-coil with a special fitting made for the purpose. Or, if it's more convenient, use ordinary $\frac{3}{4}$ -in. steel pipe. Insulate that portion of the drain line which is exposed in the basement. ★ ★ ★

PLACE AIR CONDITIONER on 2 x 4s level with opening and slide unit into wall frame. Then bolt in place

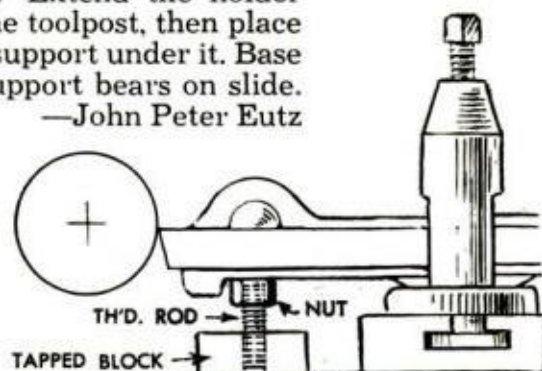


MAY 1961

Tool Support

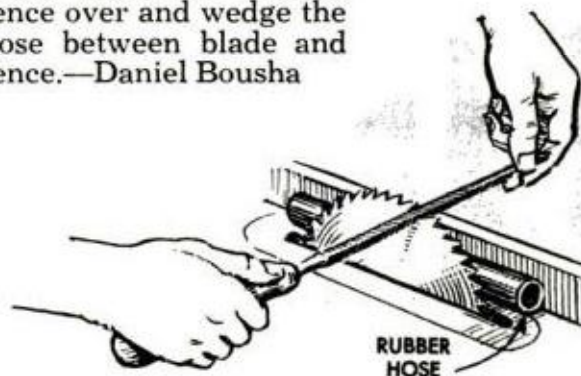
Excessive chatter of a cutoff tool can be prevented by providing it with an adjustable support. Extend the holder in the toolpost, then place the support under it. Base of support bears on slide.

—John Peter Eutz



Blade Wedge

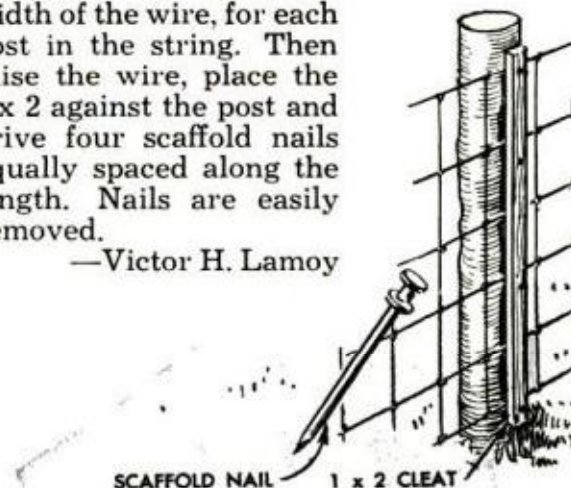
A short length of hose makes a good wedge to hold a circular saw blade while touching up the teeth. Slide the ripping fence over and wedge the hose between blade and fence.—Daniel Bousha



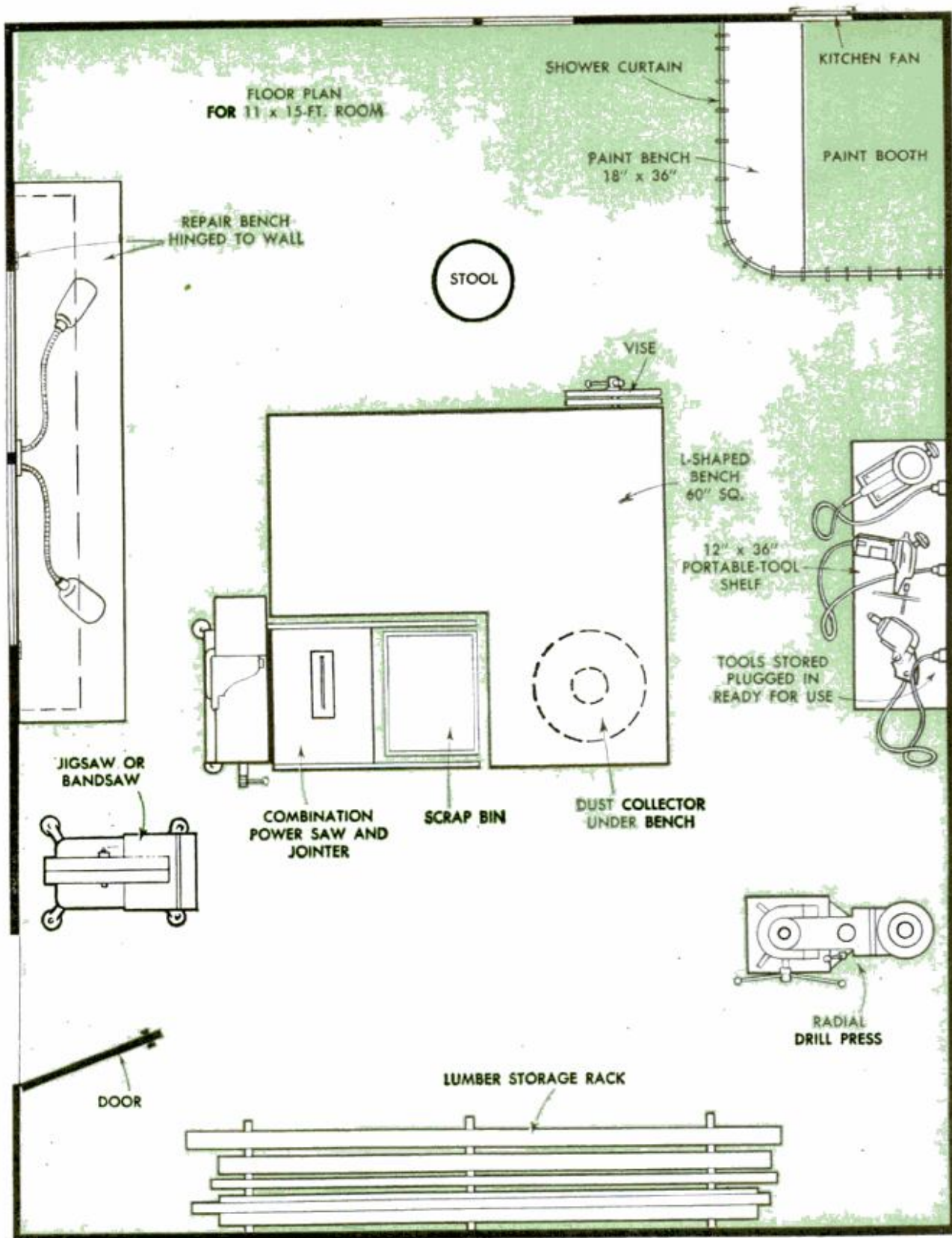
Temporary Fence

Here's a quick way to put up a temporary woven-wire fence around a feedlot or through a pasture: Cut a 1 x 2 strip, slightly longer than the width of the wire, for each post in the string. Then raise the wire, place the 1 x 2 against the post and drive four scaffold nails equally spaced along the length. Nails are easily removed.

—Victor H. Lamoy



173



SELECTION OF BASIC HAND TOOLS

Set of 4 regular screwdrivers
 Pointed awl
 Claw hammer
 Two nail sets
 Mallet
 Set of 6 wood chisels
 Combination oil stone
 Hand drill
 Set of drills 1/16" to 1/2"
 with 1/4" shanks
 Hand brace

Set of auger bits 1/4" to 1"
 Countersink and screwdriver bits
 for brace
 Crosscut handsaw
 Rip saw
 Compass saw
 Coping saw
 Hacksaw
 Set of 6 file shapes
 with handles
 Large wood rasp with handle

Jack plane
 Block plane
 Hand-sanding block
 Four 6" C-clamps
 Four 24" bar clamps
 Medium pipe wrench
 Soldering iron
 Metal-cutting shears
 Set of 3 cold chisels
 6' folding rule
 6' steel-tape rule



MASTER-PLANNED SHOP Centers Layout Around Unique Saw-Bench

COMING YOUR WAY at last is the home workshop that has everything. One whole wall is a tool panel, there's an island workbench having a wrap-around top that forms wings, or extensions for the saw table, making it really king size for ripping and cross cutting large panels. There's a spray booth, tinker bench, lumber rack and left-over work space for individual power tools. It's been worked out by

a shop designer for an 11 x 15-ft. room and you can locate it in your basement off the rec room, upstairs adjacent to the family room or perhaps there's space in your breezeway or garage.

As will be seen from the floor plan on the opposite page the L-shaped workbench is the mainstay of the whole layout. It serves every purpose of a regular workbench, acts as a side and back extension for the saw

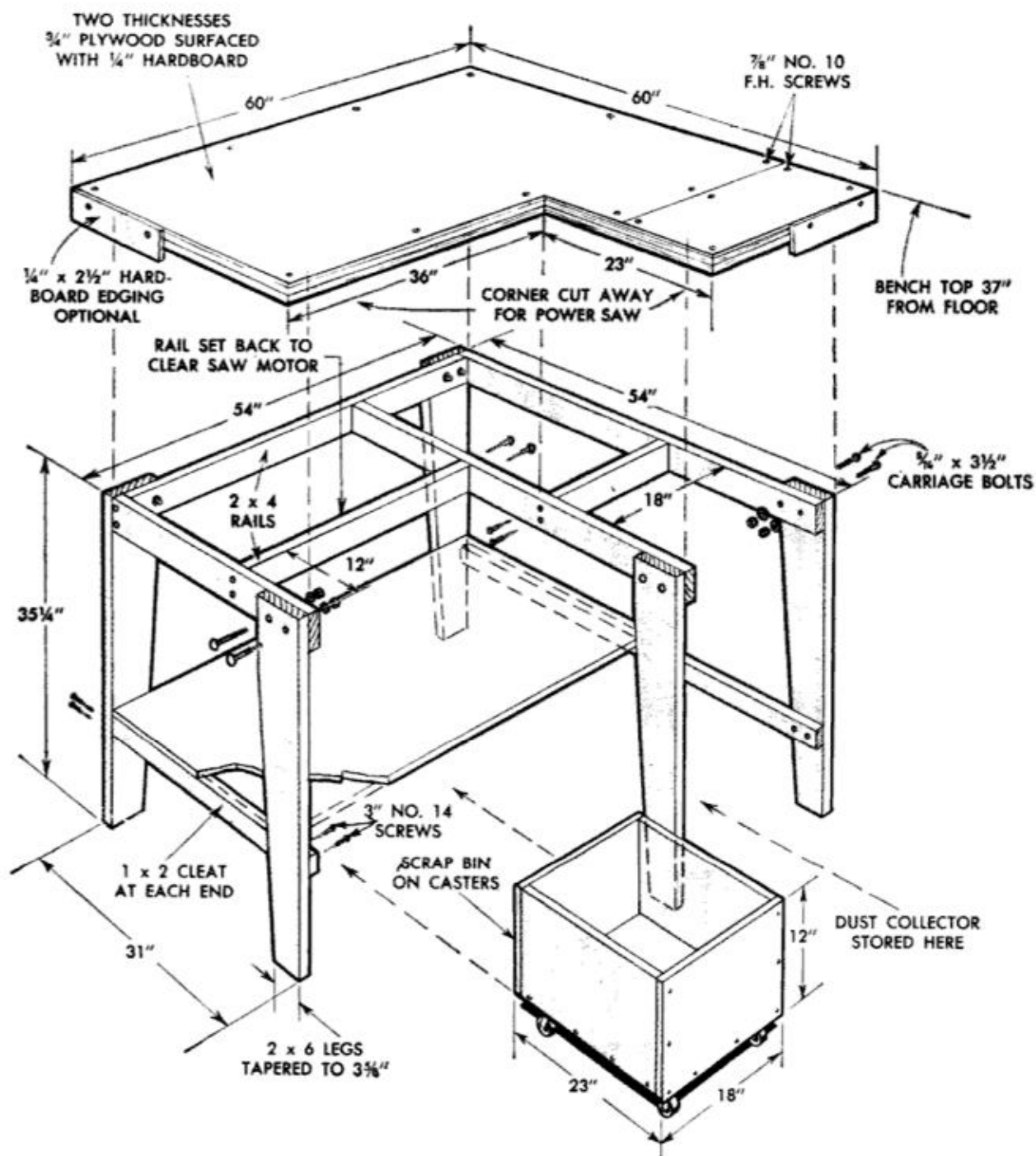


table and like the saw-jointer unit it is easily moved to the wall to clear the center area of the shop. The detail above shows how to assemble the open frame and the cutaway top. Size of the top given is about the maximum for the 11 x 15-ft.-room plan, but if you have more space available, you can, of course, make it proportionally larger. It will be noted from the photo on page 175 that the bench pictured differs somewhat from that detailed. It was originally made with three 4 x 4 legs but was found to be less stable than that detailed.

The shelf detailed serves well as an open storage space but if you wish, you can go a step farther and build in four, six or eight drawers. Some all-metal cabinets containing drawers also can be adapted to the

space under the bench top, making a cabinet-type workbench with drawers opening on the vise side. There'll still be room for storage of the dust collector and scrap bin. Any sturdy wooden box of approximately the over-all dimensions given will do for the bin when fitted with casters. Or you can easily make a bin from plywood.

Note that there's also a small bench in the spray booth and one on each wall at the right and left of the island workbench. These are special purpose benches, one being hinged, the other supported on shelf brackets. A listing of the basic hand tools is given. Start with this selection and add to the list only as the need arises. Of the portable power tools available, a drill, sander and jigsaw will prove most useful. ★ ★ ★

KEEP THESE IN MIND

Wheelbarrow Tool Toter

You can carry a shovel or spade and a rake comfortably, using both hands, but add another tool and the three can become unmanageable. So you make two trips or you add this tool-toter bar to your garden wheelbarrow and take everything you are likely to need in one trip. It's simply a band about 3 in. wide cut from a big inner tube and snapped around the barrow handles. It doesn't interfere in any way with normal use of the barrow. Builders can make use of the same idea for wheeling long lengths of lumber and pipe safely.—Charles Carroll

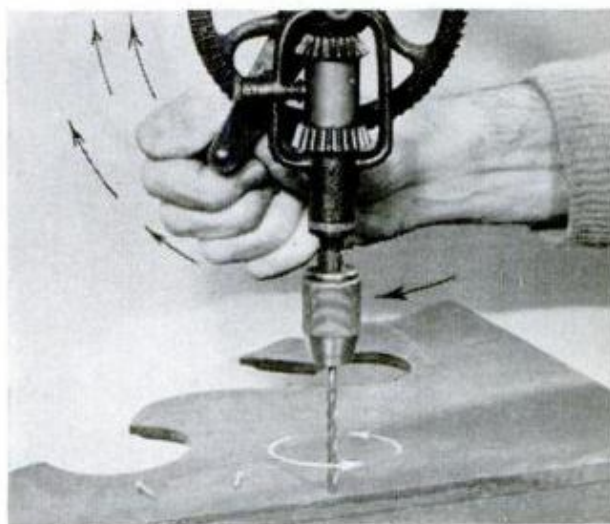


Bevel Battens for Novel Effects

Building contractors and do-it-yourselfers will do well to remember this novel treatment the next time they install board-and-batten siding. Tilt the table saw to about 30 degrees and bevel-rip a 1 x 12 into 2 1/4-in.-wide strips. This gives battens with beveled edges. Placed with the wide side against the wall they give a soft shadow; reverse the batten and they give a sharp, deep shadow.—John J. Bahr

Countersink With Twist Drill

When you don't have a rosehead countersink at hand you can countersink a hole for a flat headed screw with a twist drill. Select a drill about twice the diameter of the screw hole, chuck in a hand drill, place the tip in the hole and turn the hand drill backwards. The backward-rotating drill does a perfect job, especially in soft woods that splinter easily.—Walter E. Burton



Rack Up Your Hacksaw

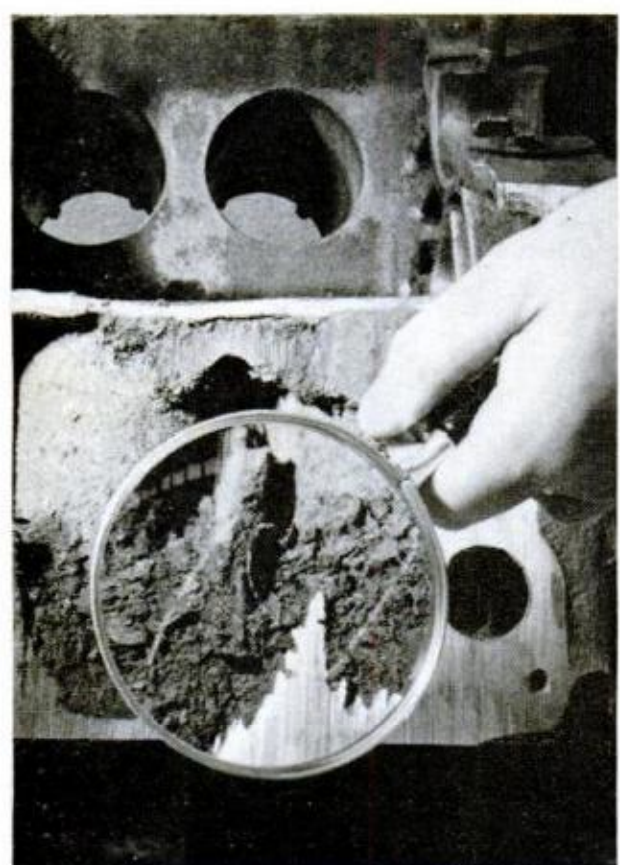
Usually it's easy to locate the hacksaw frame, but suppose you want to change the blade? Finding that spare could take time you can ill afford on a week end. If you follow through with the rack pictured, the tool and a selection of blades are always findable. Screw two spaced coat hooks into the wall and there you are.—R. Hanscom

*I've got
Summer
flu!*



**WATER IS
THE THING
TO WATCH IN**

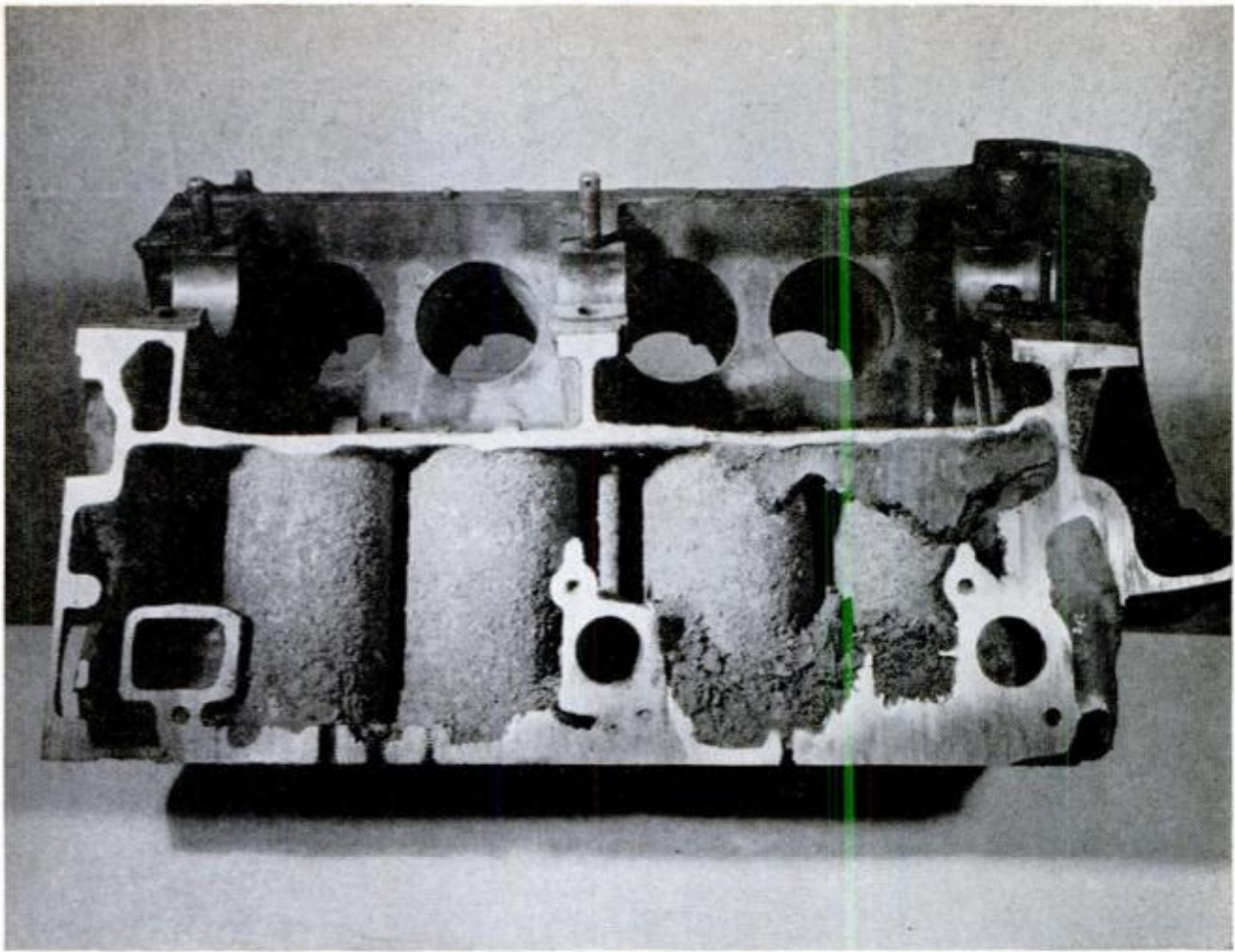
YOUR COOLING SYSTEM



PLAIN, NATURAL WATER is many things and some of these went into your car's cooling system when you drained the antifreeze and refilled the radiator. To most of us water is just water but a chemist will tell you that it can contain magnesium, sodium, iron, potassium, manganese, nitrates, chlorides, fluorides, bicarbonates, carbonates, sulfates and various dissolved solids!

The sliced-through engine blocks pictured on these pages show what only a few of these chemical contaminants can do to the water passages in the block, given time and the right amount of neglect on the part of the car owner. The pictures show graphically how the dissolved minerals build stone-hard deposits that act as a barrier to the normal transfer of heat from the metal to the water in the block. This process adds up to trouble that can come quickly in some localities with exceptionally hard water and much more slowly in others where the natural, untreated water is relatively soft.

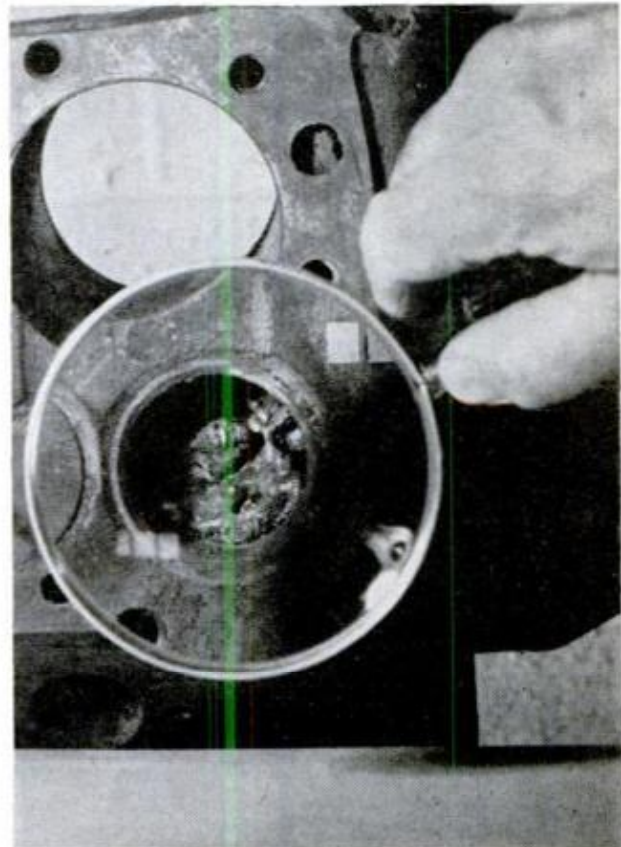
CUTAWAY OF ENGINE BLOCK reveals a buildup of corrosion residues, rust and sediment which has completely sealed off coolant in passages at rear of block

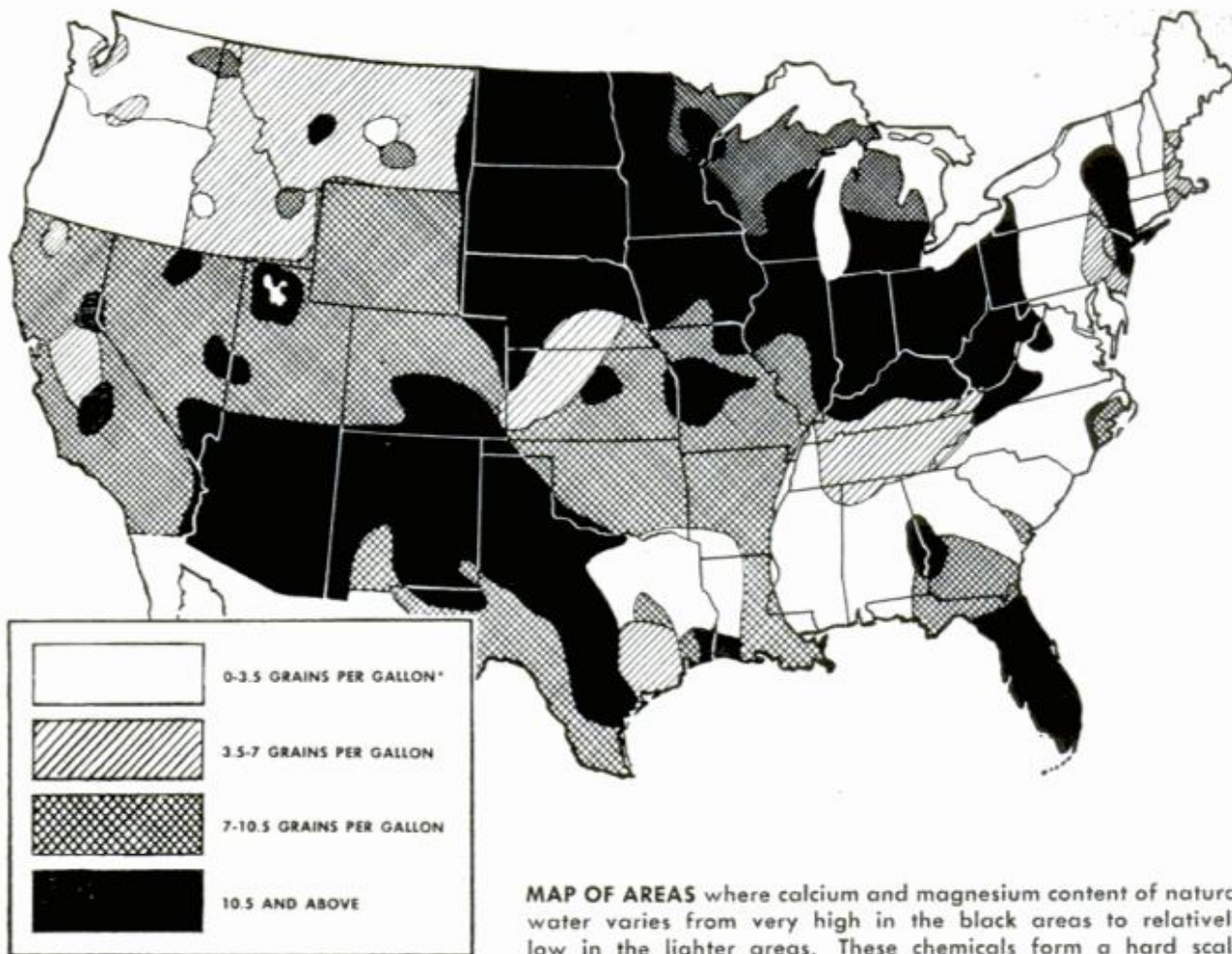


Calcium and magnesium are common water impurities that form scale. The map on the following page shows hard-water areas where the calcium-magnesium content of water ranges from high in the black areas to comparatively low in the lighter areas. The scale resulting from the presence of these two impurities usually builds fastest on those metal surfaces of the block which are hottest when the engine is running on warm summer days. Conditions produced by heavy traffic are especially favorable for the formation of scale in the water passages of the block. The effects of scale build-up are cumulative and show up in engine performance as a gradual loss of power and eventually as preignition, burned valves and possible scuffing, or scoring, of pistons and cylinder walls. All five processes of normal engine operation are affected by the presence of scale in any appreciable amounts — lubrication, compression, carburetion, ignition and cooling. A clean, efficient cooling system assures peak performance of the other four, assuming that each is in good condition.

Another common group of water impurities that can cause a lowering of cooling-system efficiency are the chlorides, sulfates and bicarbonates. These are highly corrosive and attack metals in the units of the cooling system. Where the cooling water

SLICED-THROUGH V-8 ENGINE BLOCK above shows how scale builds up on cylinder barrels and in passages. Below, typical example of complete valve failure due largely to corrosive activity of water impurities





MAP OF AREAS where calcium and magnesium content of natural water varies from very high in the black areas to relatively low in the lighter areas. These chemicals form a hard scale

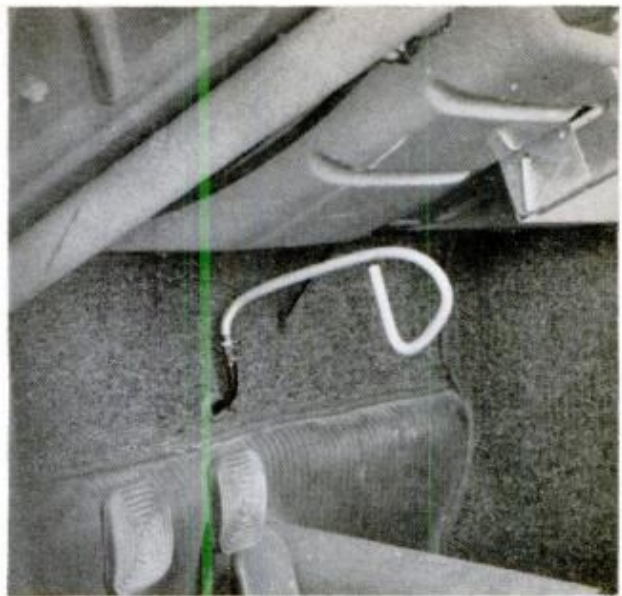
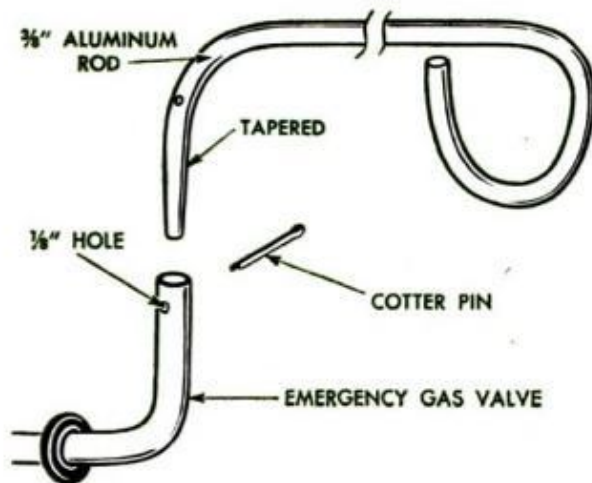
contains these in unusually high concentration they may even break through the protective coatings deposited by cooling-system additives unless, of course, the system is serviced at regularly spaced intervals. These chemicals not only attack the metals directly, in time they tend to build a hard, iron-like deposit that can damage water-pump impellers and bearings and restrict narrow passages in the engine block, particularly around the valve seats. The hard deposits also can build up gradually in radiator tubes. These build-ups of the products of corrosion result in continually rising coolant temperatures and, in more extreme cases, can cause perforation of the metals at some more vulnerable points in the cooling system. The end result of impairment of the cooling system by any combination of these water impurities is poor performance, an increase in fuel consumption and probable serious engine damage.

It's a good practice for car owners to keep a cooling-system maintenance check chart just as is done to assure approved lubrication care. Or have this done by your regular serviceman. He will know your car and he is equipped to keep close tab on the condition of the cooling system. If you prefer to do the actual work of servicing the system, then follow approved pro-

cedures. First, you drain the radiator, engine block and heater. Then remove the thermostat before flushing. Cold water used in flushing the system will close the thermostat and prevent circulation. Then check the entire system for leaks, faulty radiator cap (if faulty it won't maintain pressure), hoses, gaskets, thermostat, drain cocks and plugs, fan belt, fan and water pump. Make any replacements necessary. Don't make the old do unless you're sure the part or parts are still serviceable. Remove leaves and any other debris from the radiator core. The fan and fan belt should have special attention. Often fan belts become so badly worn that the belt no longer bears on the sides of the Vee in each pulley, but actually bears only on the bottom of the Vee. A belt worn to this stage, or near it, will slip and slow both the generator and fan. Clean the leading edges of the fan blades with a solvent to remove the hardened grease, road grime and lint that collects on the edges and may greatly reduce the ability of the fan to move air.

Then fill the cooling system with clean water (soft water preferred) and add an inhibitor. Or you can fill the system with one of the new year-'round coolants, such as Dow Chemical's Dowguard, or Telar, made by the DuPont Company. ★ ★ ★

FOR THE MOTORIST



Less Reach for VW Owners

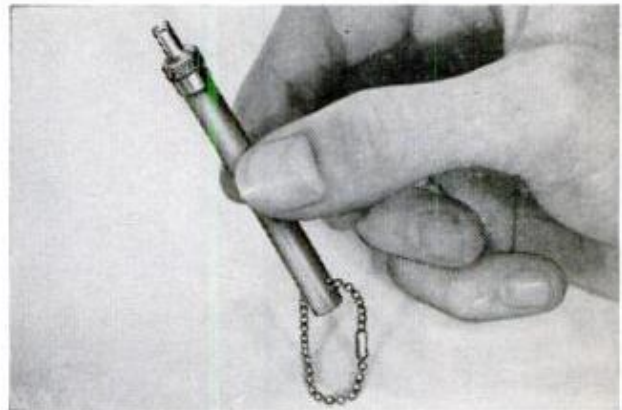
The emergency gas-supply valve on a Volkswagen can be made more convenient to reach by fitting the regular valve handle with an extension. All you need is a length of 3/8-in. aluminum rod about 20 in. long which is bent to the shape shown. One end is filed to a long taper so it fits the valve snugly and is secured with a cotter pin inserted crosswise through holes in both handle and valve. One of the easiest ways to bend the aluminum rod to the shape shown is between the jaws of a monkey wrench clamped in a vise.—Hugh F. Williamson

AUTO HINTS PAY OFF

Saving money by making your own car repairs can prove doubly profitable. Not only do you save the labor bill but the short cuts you may run across in making the actual repair could very well pay for the price of the repair part itself. How? For the best of these auto repair hints *Popular Mechanics* is ready to pay you cash. So if you have found a helpful short cut that other Saturday mechanics might like to know about, we invite you to tell us about it. If we can use it, we'll pay you \$15.00. Send your hints to Auto Short Cuts, 200 East Ontario St., Chicago 11.

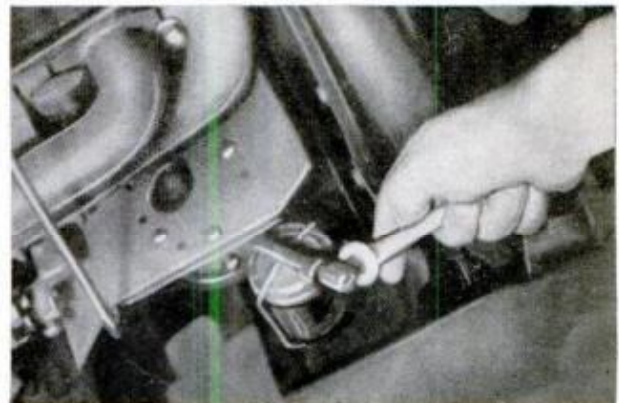
Valve-Core "Extractor"

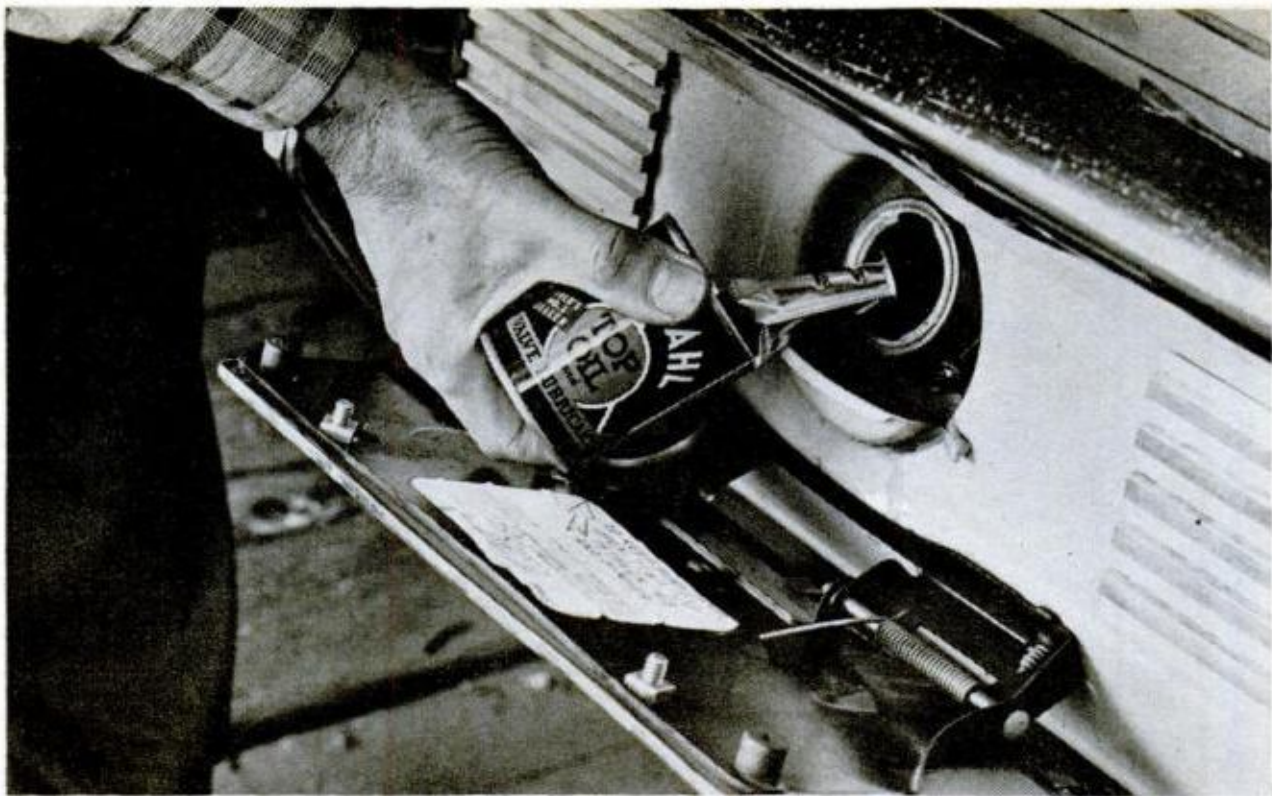
Since the dome-type caps on valve stems of modern tires have no provision for backing out or screwing in the valve cores, a deflating tool carried in the glove compartment will come in handy. As shown in the photo, the tool is nothing more than a deflator-type cap screwed onto the end of a short length of wooden dowel, the opposite end of which is drilled and fitted with a chain for hanging.—Henry Hanscom



It May Be a Dirty Screen

What's wrong when you know you have a full tank yet the engine chokes off momentarily as you drive along, then catches hold again? Chances are it's due to a dirty screen in the carburetor or fuel pump. You'll know for sure by removing it and driving a bit without it. It's easy enough to get at the screen by merely backing out the plug near the fuel inlet of the carburetor, or by removing the fuel-pump bowl as the case may be.





FUEL-TANK ADDITIVES lubricate upper ends of cylinders, upper rings, valve guides, reduce carbon deposits

KEEP THINGS HUMMING

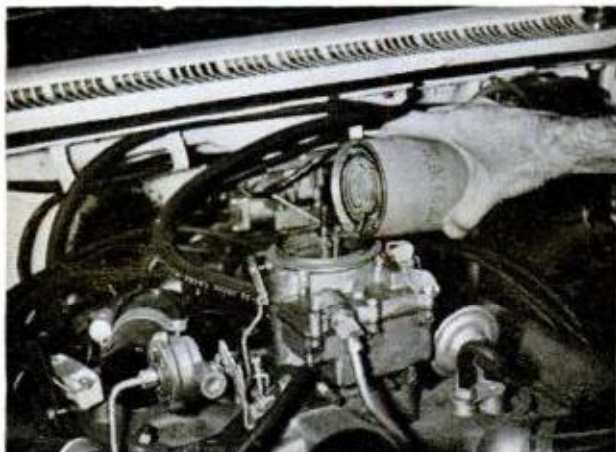
with new oil additives that give your auto engine new-car snap, make your lawn mower run easier, quiet that venerable sewing machine

ADDITIVES are something added to something else, extras designed to supplement the work of the original. Added to regular lubricants they up performance, provide stand-by protection and increase the life span of wear parts. Additives do these three things for your car, lawn mower, power tools, sewing machine, any

appliance having bearings or gears in which metal contacts metal while in motion. With the right additive in your car you'll note right away that it starts easier, gets away faster, runs smoother and uses less fuel to go the same distance under the same driving conditions. Over the long pull you'll find that repair costs are less because

ENGINE TUNING comes in can. No need to take things apart. Remove air cleaner and pour into carburetor. Takes out gum deposits, frees stuck valves and rings

COOLING SYSTEM is protected against corrosion, hard scale and sediment which clog water passages in engine block and radiator. To use, follow instructions

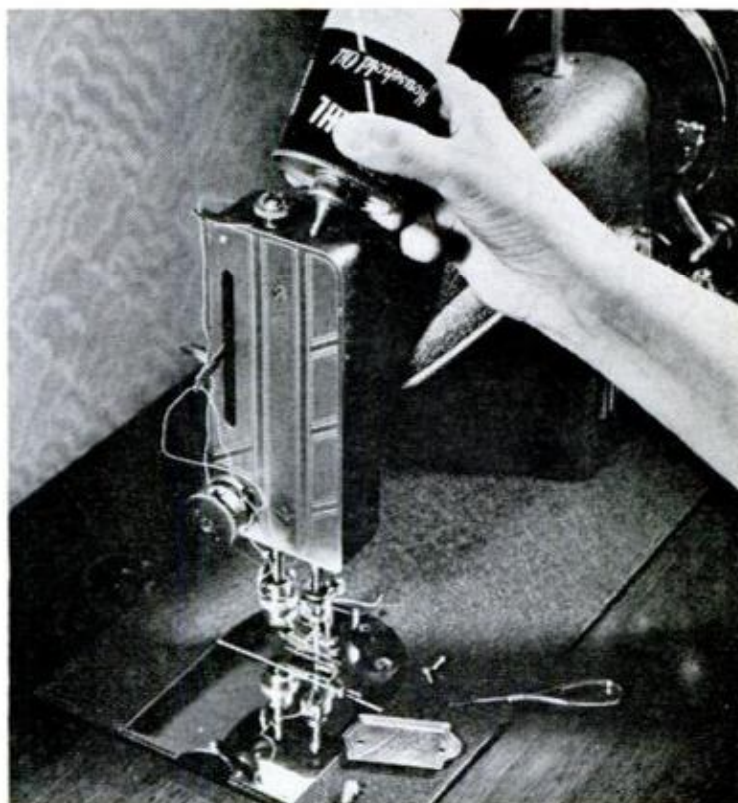




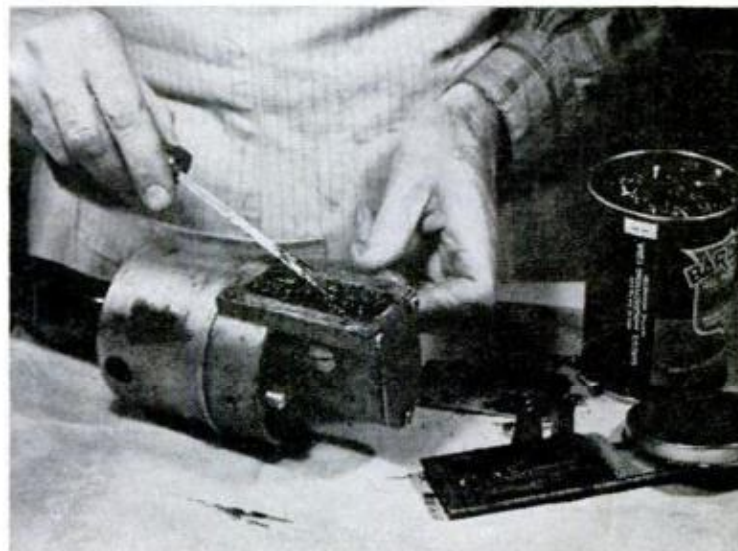
TWO-CYCLE ENGINES such as the one driving your mower need special oils plus the right additive. There's one made for adding to fuel-lubricant mixture

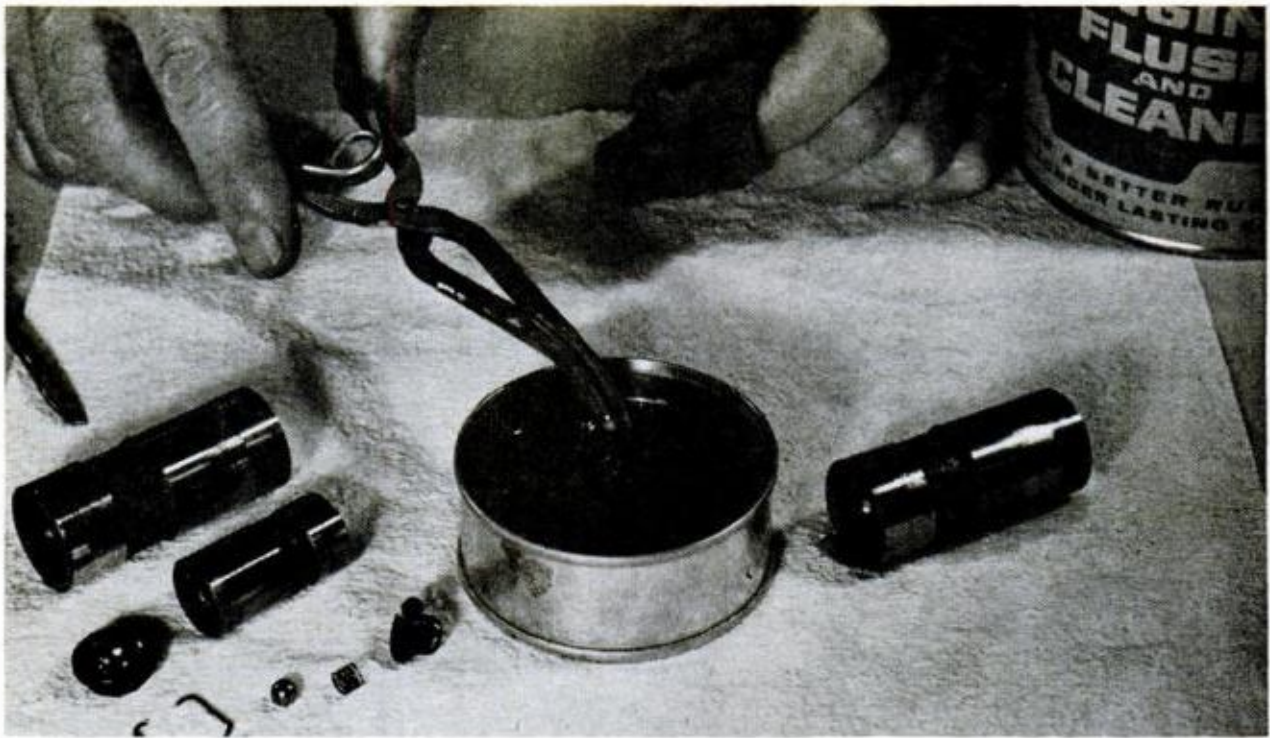


NEW LIFE for new and not-so-new sewing machines comes in an additive-fortified household oil in a handy container with a one-drop spout. Use as directed



HEDGE SHEARS and power tools that have enclosed drives need special lubrication. Additive conditioned grease gives smooth operation at high speeds





FLUSHING OILS that contain additives can be used to clean or degrease small parts before reinstalling

build-ups of carbon, gums and varnish are so greatly reduced that they are not likely to become performance factors until the car is long past middle age.

Additives intended for use in oil and fuel are usually considered the most important. But there are other types of additives designed for use in the cooling system to prevent corrosion and provide lubrication for water pumps, to counteract vapor lock and fuel-line freezing and to promote smoother operation of automatic transmissions and power brakes.

Basically, the function of an oil additive is to build protective films on wear surfaces between which a film of lubricating oil maintains itself under normal engine temperatures and bearing pressures. This process alone results in an appreciable reduction of friction. But the additive does more. The film it builds on the metal consists of various substances including solids which have the property of sliding, one over another, and producing a lubricating action in the absence of the film of regular oil. Should the regular oil film break down completely under extreme bearing pressures and abnormally high engine temperatures which develop due to some unusual operating condition, the protective film, or "plating," built on the metal by the additive can fill in and prevent for a time a failure of moving parts.

Crankcase oils contain detergent compounds which are added at the time of refining, but if you drive long distances with infrequent oil changes or if most of your

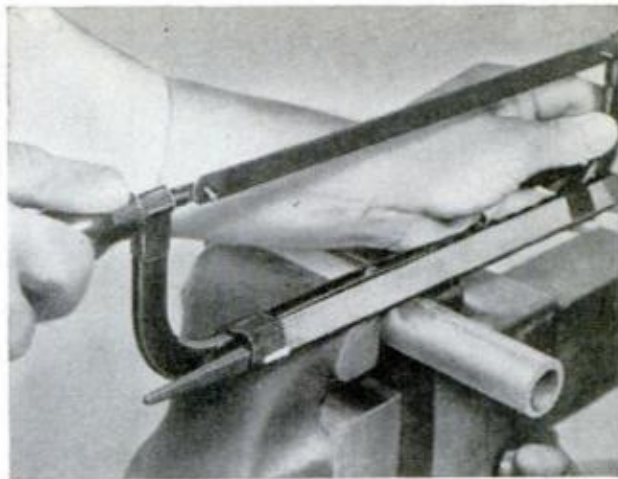
driving is stop-and-go, then the detergent in the oil may be consumed between oil changes. This possibility makes it advisable to use a detergent additive regularly, especially during the winter months. In addition to lessening gum, varnish and carbon accumulation in engines, detergent additives help oil to flow more freely through bearings and oil passages, prevent filter elements and screens from clogging and also improve valve, ring and hydraulic-lifter lubrication. It is these aids to regular lubricants which help to bring about that noticeable reduction in engine noise any driver is sure to appreciate.

Additives are available in small amounts for individual use in upper cylinder lubrication through the fuel tank and carburetor of auto engines, also for use in preventing corrosion in cooling systems, as pictured on page 182. There's an additive made especially for use in the fuel-lubricant mixtures for two-cycle engines of the type used to power rotary lawn mowers and also one supplied for use on sewing machines and other light household appliances. Specially prepared greases containing additives are available for lubricating transmissions, gear boxes, any mechanism designed for grease lubrication. These additive-bolstered oils and greases increase efficiency and reduce wear in light units in the same manner and by the same processes that occur when fortified lubricants are used in autos and industrial equipment. It's important that you follow instructions in all details when using these special lubricants. ★ ★ ★

SHOP SHORT CUTS

Accurate Starts With Hacksaw

Starting a cut on round workpieces with a hacksaw can be difficult when the blade slides sidewise and refuses to take hold just where you want it. Overcome this tendency by taping a three-cornered file to the back of the saw frame. Then mark the work for length, invert the saw and file a notch on the mark or in the waste as accuracy requires. The filed notch guides the blade on the first few strokes.—Bil Toman



How Deep Is It?

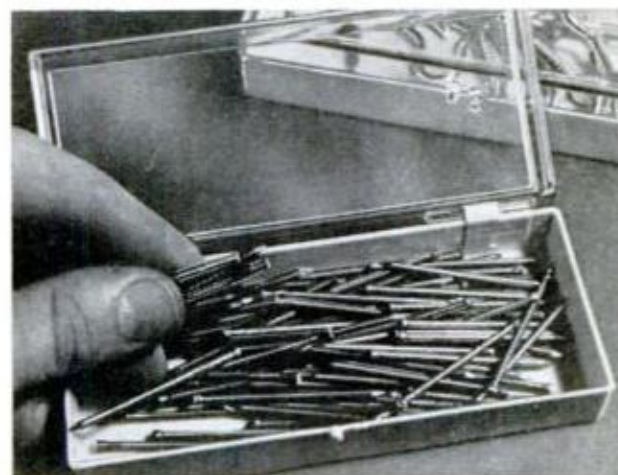
Slide a Fahnestock clip onto a length of coat-hanger wire and you have a gauge that will measure hole depth with acceptable accuracy for all but the most critical work. The clip will grip the wire with sufficient tightness to prevent it from moving out of place when transferring a depth measurement or checking depth of a hole being drilled. Once set, the distance from the edge of the clip to the end of the wire is easily and accurately measured with a rule.—H. Hanscom



Save Those Plastic Boxes

Many home craftsmen and shop men have a rule they've learned to live by, don't throw away any small, usable container. They are the fellows who never lose anything. Mention it and they'll bring out one of those clear plastic boxes, likely the one the last bow tie came in, and there in it is the item you asked for. Small, clear-plastic boxes, also metal boxes, make it easy to keep track of small parts, nails, screws, screw eyes, washers, anything that is easy to lose and hard to find. There is always a good use for those you save.

—Wayne Floyd



Twist-Drill Safekeeper

Usually when one loses a tiny twist drill he just gives up looking and goes and buys another. But that can get expensive, that is, if one uses nothing but high-speed drill bits. One way to keep tiny drills always at hand is to stick 'em in a square of foam plastic the instant you finish a drilling job. Unlike a regular drill stand the foam plastic grips the shanks and holds drills even when it's turned upside down or dropped on the floor. A piece of foam plastic about 3 in. square will hold a dozen or more drills securely.—Martin D. Koehler

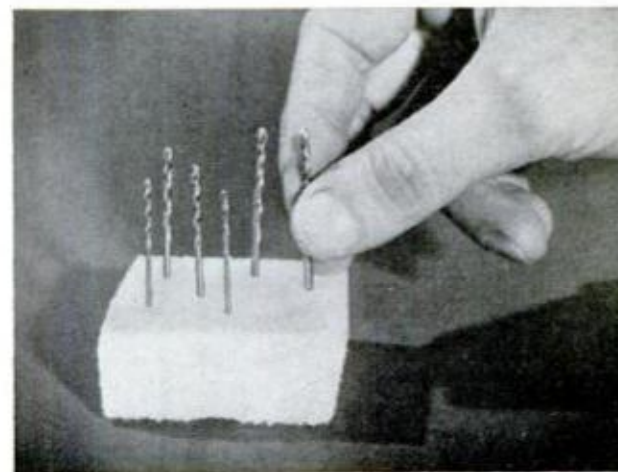
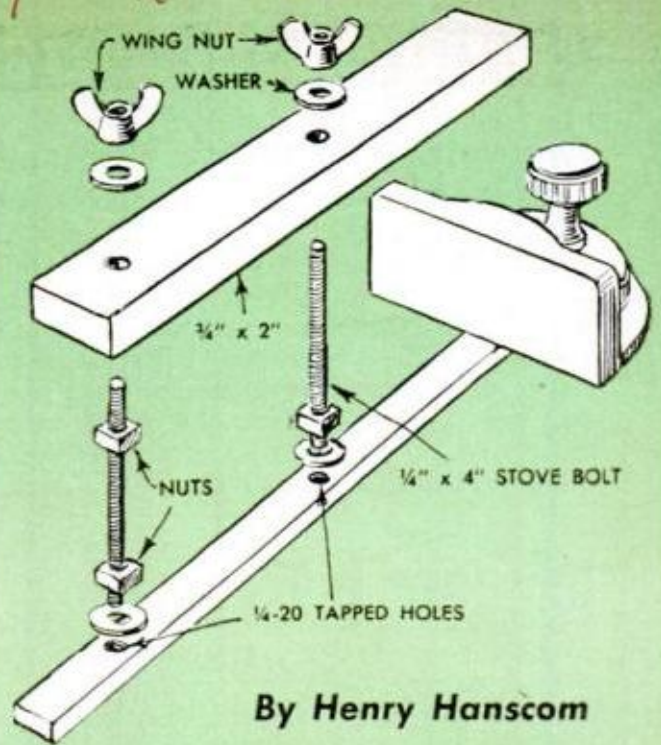
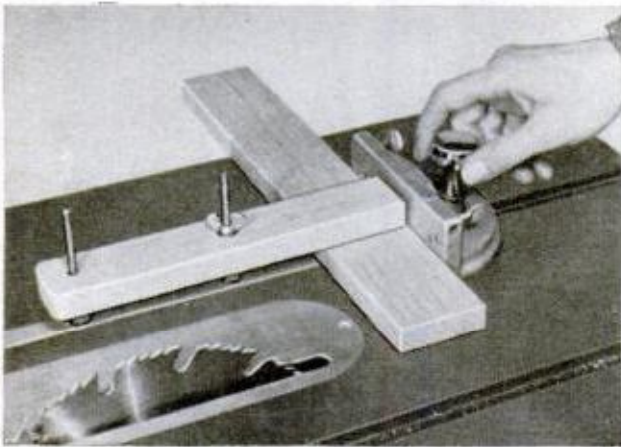
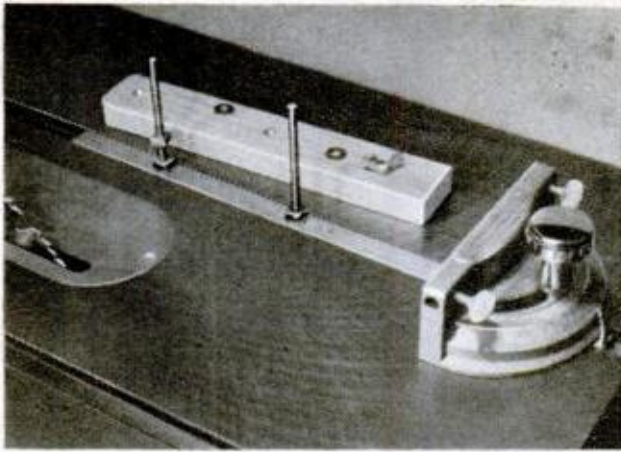


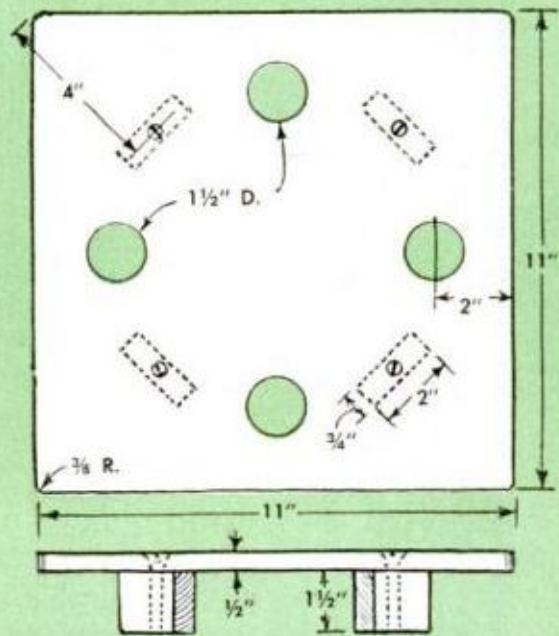
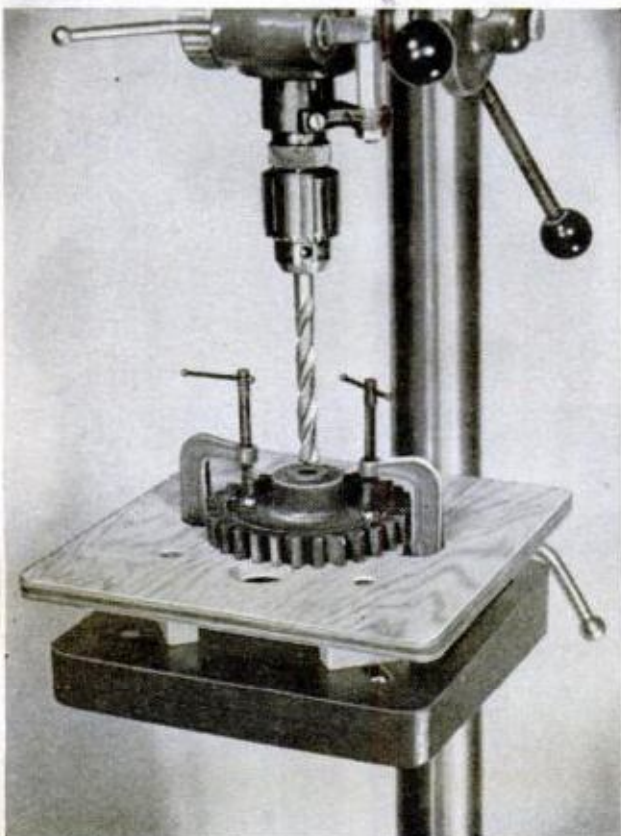
TABLE-SAW HOLDDOWN



By Henry Hanscom

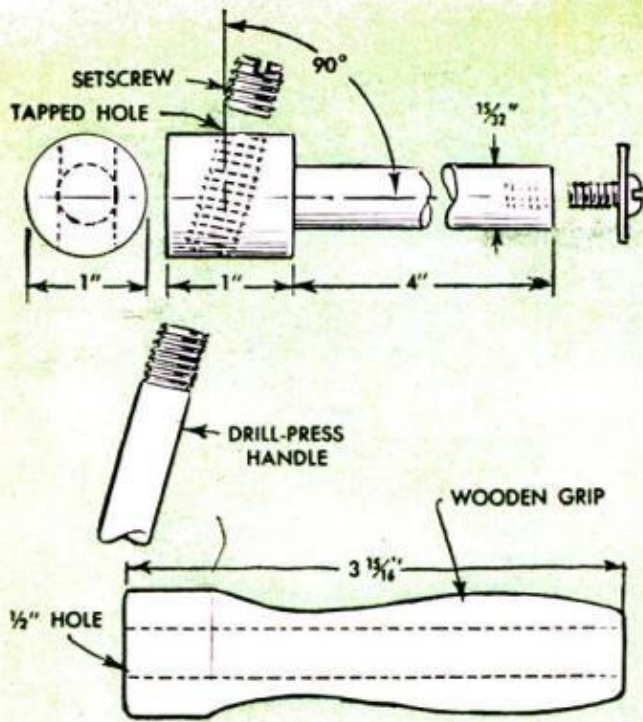
USING A HOLDDOWN is about the only sure way of preventing stock from creeping while crosscutting on a table saw. It takes only a few minutes to make one, from a strip of hardwood, two threaded studs, washers and suitable nuts. Drill and tap the miter-gauge blade and assemble the unit as detailed. Note that the bar just clears the face of the gauge. End of bar can be rounded for mitering

PIGGYBACK TABLE



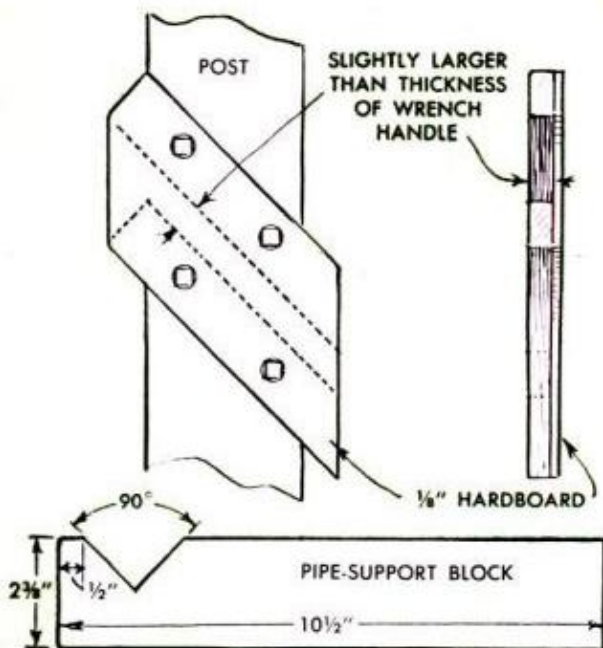
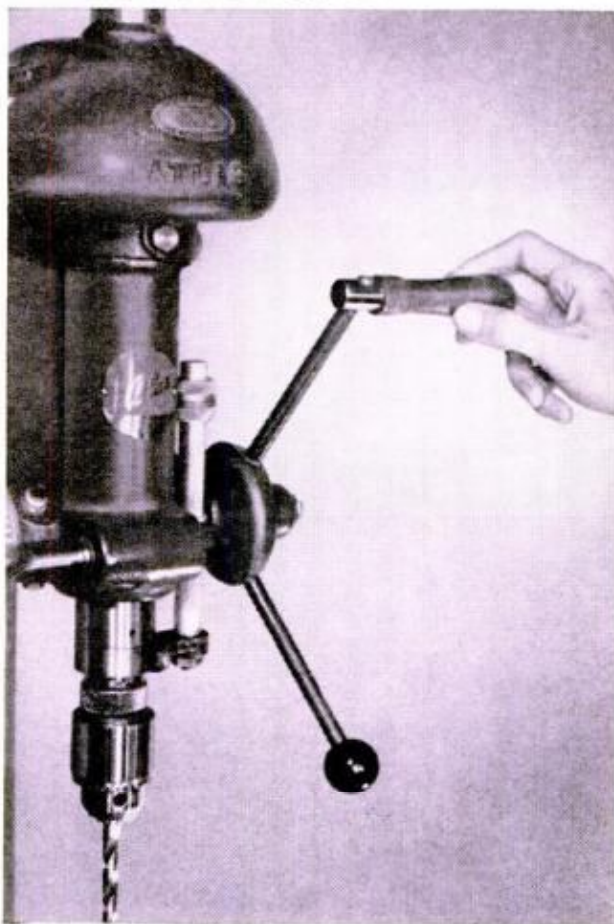
MATERIAL MUST BE CLAMPED in place before drilling large holes with the drill press. By making an auxiliary table of plywood you can use C-clamps to hold round, square or irregular shaped workpieces. Long bolts passing through spacers, or legs, hold the auxiliary table in place. C-clamps are dropped through holes drilled in the top of the table, which can be of any convenient size

POPULAR MECHANICS



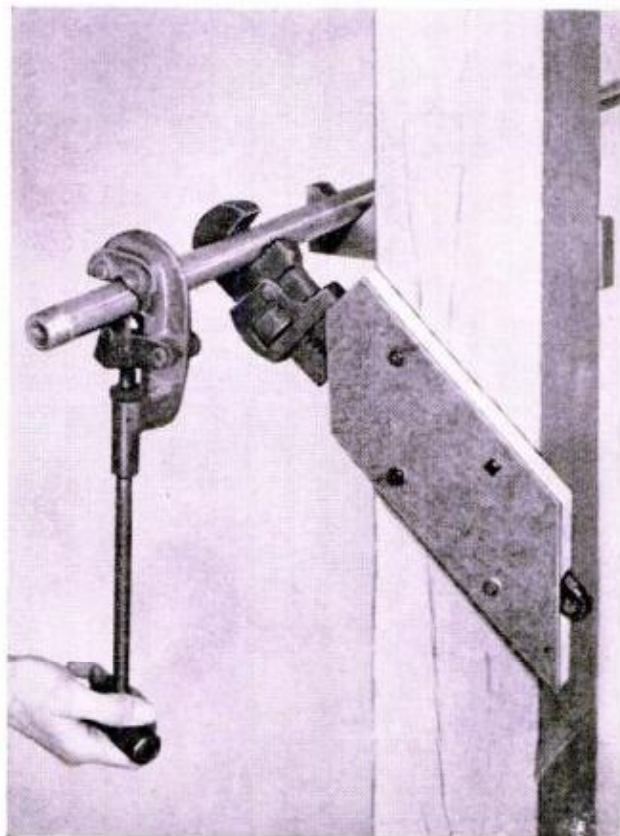
REPETITIVE WORK on a drill press is much less tiring if one arm of the feed wheel is fitted with a conventional wooden grip for an easier, more comfortable handhold. Spindle to take the rotating handle is turned and shouldered from 1-in. stock, is end-drilled and tapped for a capscrew and washer. Note that the hole taking the threaded end of the arm is drilled and tapped at an angle

EASY-GRIP HANDLE



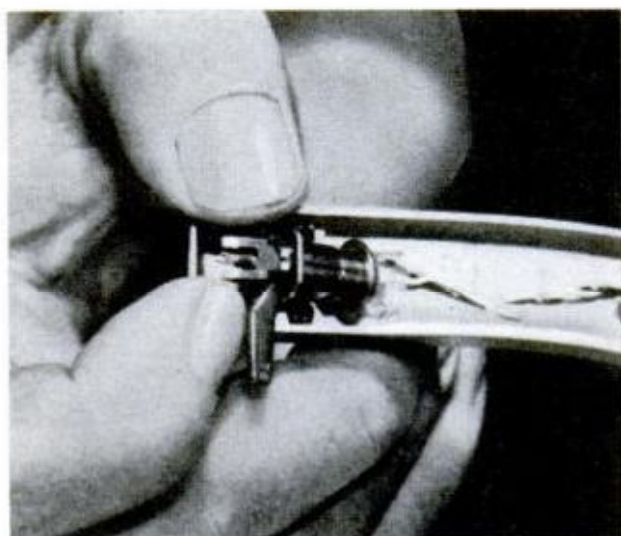
WHEN YOU NEED A PIPE VISE for that once-in-a-blue-moon job don't buy or borrow one. Make one in a few minutes, using a pipe wrench, four lag screws, two short strips of hardwood and a piece of 1/8-in. hardboard. The detail shows you how to assemble these parts and lag-screw the whole thing to a post in the basement. For long pipe you'll need a notched support attached to post

QUICKIE PIPE VISE

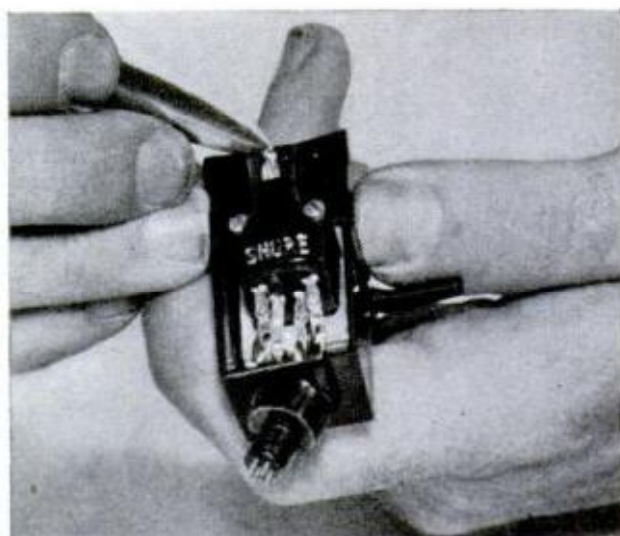


The Knack of Changing Hi-Fi Needles

By Morton J. Schultz

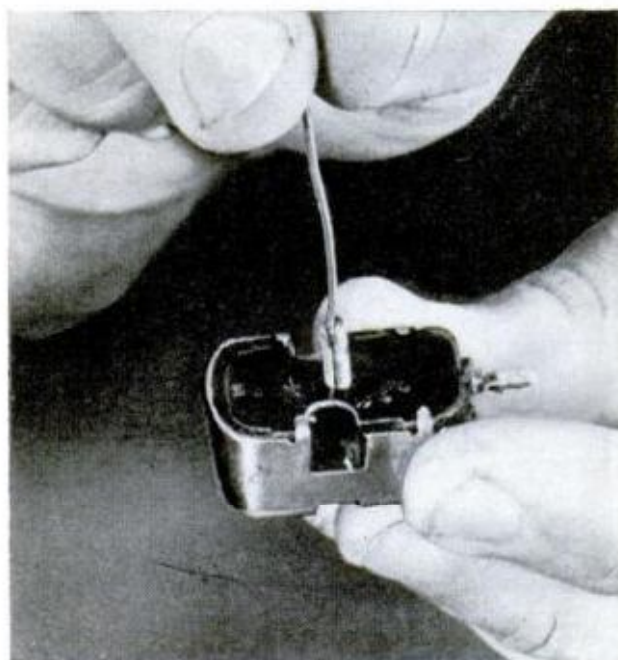


Pull the slip-in-type assembly from mounting. Observe keyway slot when inserting the replacement

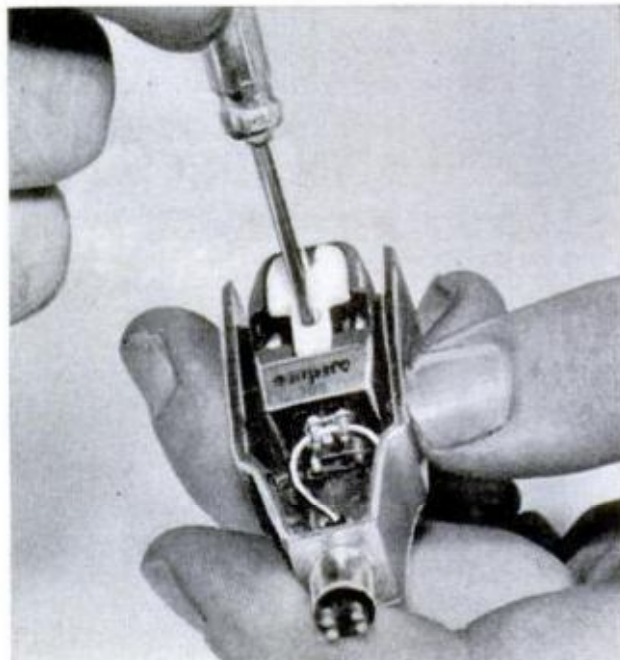


Place pointed instrument on spoon-shaped lip near stylus. Forward pressure removes Shure-type stylus

Remove GE-type stylus by inserting a stiff wire in from top of cartridge. Pressure forces stylus out



Empire furnishes miniature screwdriver with cartridge. Remove screw, insert new stylus, replace



CHANGING NEEDLES (called styli) in today's high-fidelity systems may seem to be a complex job for most hi-fi owners. So complex, in fact, that they often call in servicemen.

Actually there are only eight ways in which needle assemblies are held in the cartridges of both monophonic and stereo turntables and record changers. Replacement of all types is not a "pro" job.

The stylus assemblies can be classified according to the manner in which they are mounted to the cartridge and held in place. The photographs show the various mountings and the way to make changes.

Once you have determined which type of assembly matches your own, you can easily change your own stylus. First how-

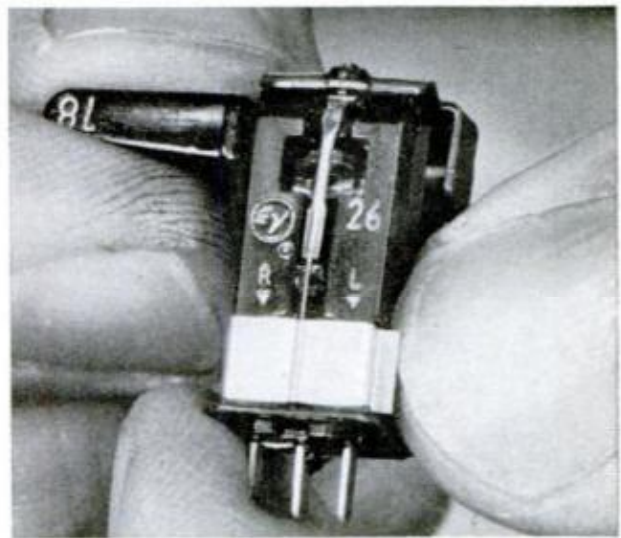
ever, it is important to determine that it is a worn needle which is causing trouble rather than a faulty cartridge. Needles can be examined under a high-powered microscope, or using an optical shadow reflecting device. You can purchase one of these yourself, or your local hi-fi dealer can examine your stylus with his.

As a needle wears, it flattens at the sides, chipping away at the peaks which produce high notes in the groove of a record. By the time any change is noted in the sound of the record, the damage has been done.

You can count on a diamond stylus for about 1000 hours of playing time, a sapphire stylus up to about 60 hours. The osmium stylus loses its value after only a few plays. ★ ★ ★

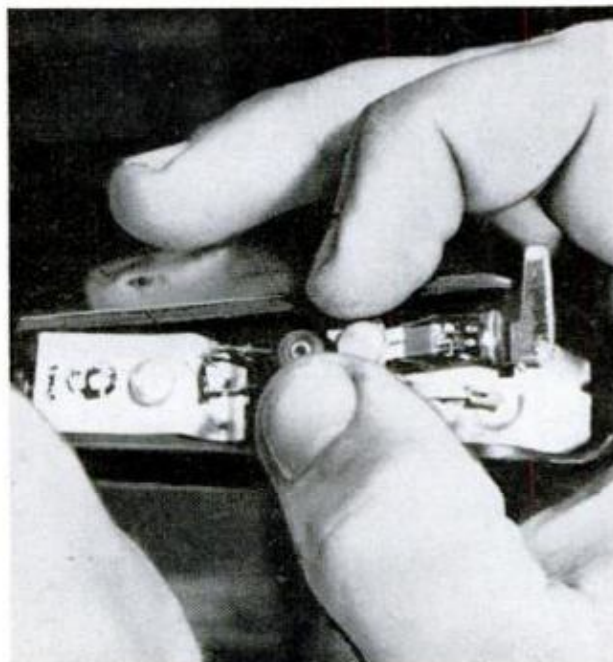


The Pickering stylus assembly is almost completely plastic encased. Slides in and out on grooved key

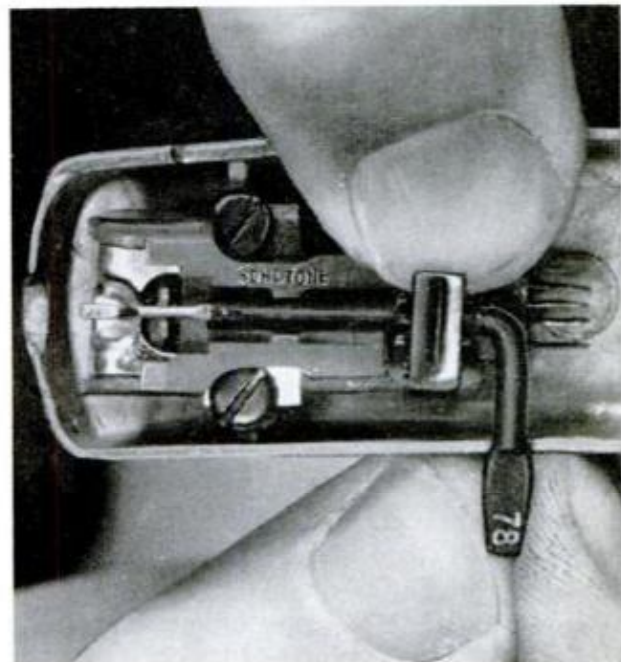


Snap-off stylus flips away with thumbnail pressure on back flange. Align new stylus, press in place

Knurling helps remove this thumbscrew-type stylus. Align new stylus, replace thumbscrew and tighten



Grasp turnover lever of this spring-type stylus with one hand, then raise spring with other thumb



Ultradirectional Listening



CONNECTED TO a small radio or intercom, this *Hearphone* provides individual listening without having to wear bothersome earphones. The high degree of directionality achieved by the acoustic design makes it possible for the listener to hear clearly while others in the same room are not disturbed. In an office, when connected to a dictating machine or tape recorder, the unit can be placed on a secretary's desk and permits her to transcribe recordings without musing her hairdo with earplugs.

The *Hearphone* was originally designed for audio-supplemented public displays where numerous side-by-side listening stations would be used. In the hospital ward,

several of these units can be connected in a series/parallel circuit to the audio output of a TV, and each patient can then use his own individual loudspeaker.

In the home or office, it may be suspended from a ceiling fixture, mounted on a wall bracket or used with an accessory base as shown here. It is made of polyethylene plastic which will flex instead of cracking or breaking if it should be struck accidentally.

The manufacturer, Hearphone, Inc., 5300 W. 63rd St., Chicago, will soon make these units available with lamp sockets as well as loudspeakers, to provide attractive groupings of light and sound.

Satellite Speakers Separate Stereo Highs, Save Space

Jensen Loudspeakers, Inc. provide a unique application of audio principles. The ear is unable to locate low-frequencies. Highs on the other hand, travel a straight

line. Jensen's Galaxy speaker system uses a woofer at the center, divides the high and mid-range frequencies which feed a pair of smaller stereophonic wing speakers.

Reverberation Fills the Gap

WHILE the idea of using a third loudspeaker to fill the stereo gap is not new, the Utah Loudspeaker Co. provides a new solution to the *hole-in-the-middle* problem. A high-quality mixer and amplifier used with a reverberator drives a loudspeaker to provide center-channel reverberation.

This entire RVB-1 speaker system is self-contained in the finished wood cabinet shown. At the lower right front of the speaker, a single knob control pulls out to turn on, pushes in to turn off.

Preset Controls

To increase the reverberation effect, you rotate the control clockwise. This means that once a setting has been established, the unit can be turned on and off without disturbing the setting.

A double set of phono jacks is provided on the back, with necessary connecting cables. You can connect the RVB-1 to the speaker output of the amplifier itself, or directly to the loudspeakers of a stereo system. If the amplifier has a third or phantom channel output, the RVB-1 can be connected here. To use the unit with a monophonic system simply to add reverb, parallel the input connectors.

New Feature

Another feature of the unit is the unique pilot lamp arrangement. At first glance, what appears to be a fault in the weave of the grille cloth shows up, when the unit is turned on, as a pilot lamp flush-mounted behind the cloth.

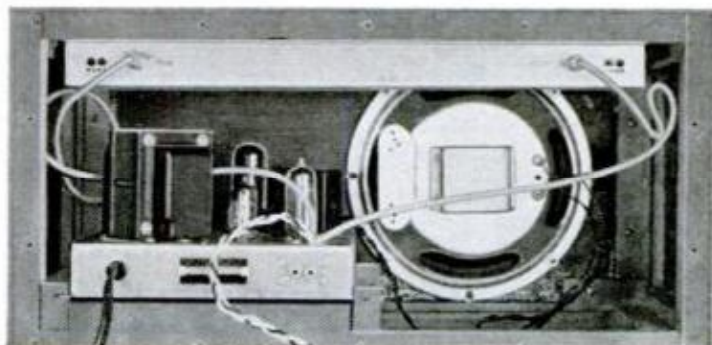
The units are available in any of several attractive wood grain finishes or unfinished for stain.

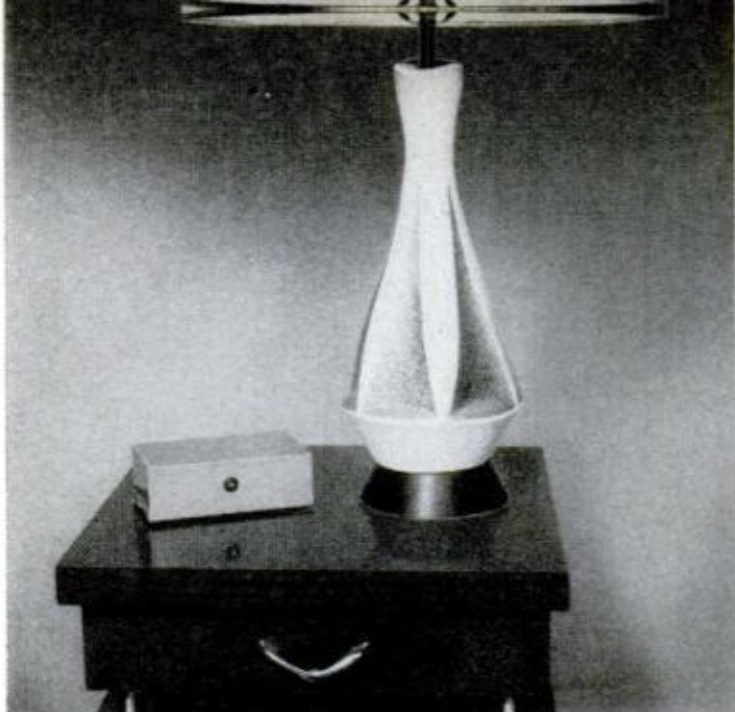
For the stereo enthusiast who wants a simple way to add reverberation, this dual-function loudspeaker is an answer. Less than five minutes are required to make the necessary connections, and the unit is ready to operate. ★ ★ ★



RVB-1 UNIT ADDS REVERBERATION to reduce "ping-pong ball effects" when placed between two speakers of stereo systems. Attractive styling of bookshelf enclosure blends with any decor. Notice volume control-ON-OFF switch near model's right hand

REAR VIEW OF RVB-1 with back removed. Note Hammond Reverberator attached to top of cabinet. All external connections provided at rear panel. In spite of the additional equipment placed inside the cabinet, acoustic design remains unaffected





Cadmium-operated photo switch is housed in a fully enclosed metal box. Cell is shock mounted through the rubber grommet

Midget Cadmium Control Switch

By Charles Caringella, W6NJV

YOU CAN plug a lamp into this silent watchman when you leave home for the evening. The lamp will light automatically when darkness approaches.

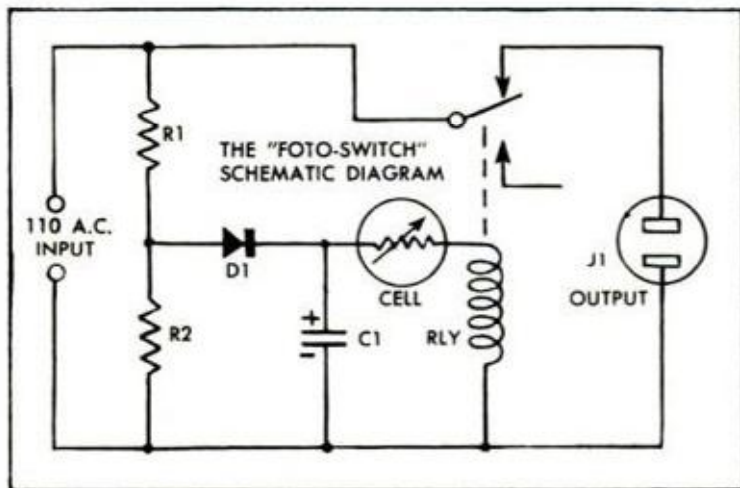
The photo control switch will also turn the lamp off again at dawn. It is ideal for vacationers who want to discourage burglars. The heart of the unit is a Cadmium Selenide (CdSe) photo cell.

The resistance of this material changes inversely as the intensity of the light striking it. The brighter the light, the lower the cell resistance. With such a high ratio of dark-to-light resistance, the cell behaves much like a switch. Using a sensitive relay eliminates the need for amplifier circuits.

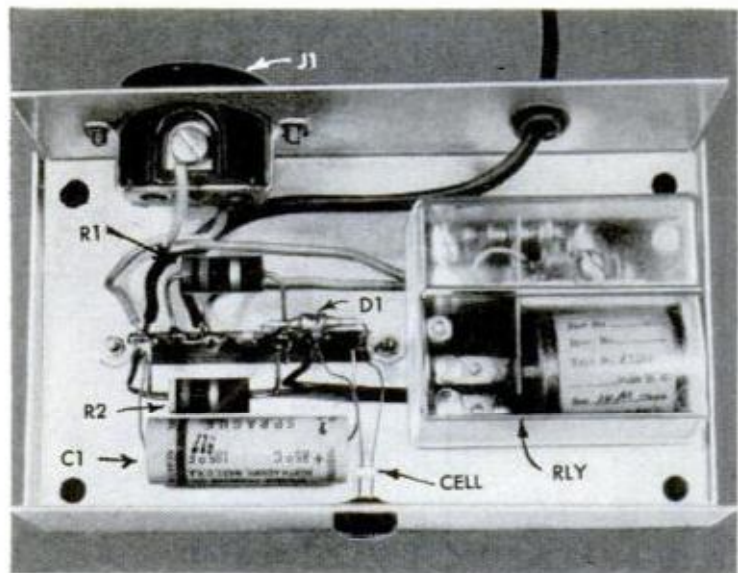
The unit is housed in a 2 x 3 x 6-inch box chassis. The photograph at lower left provides a suggested layout, parts placement is not critical. A $\frac{3}{8}$ -inch rubber grommet is used as a "cell window."

After construction, check the wiring carefully and then plug the unit into an a.c. line. Pointing it toward a window should cause the relay to click on. Shielding the unit from the light should make the relay turn off.

Now plug a lamp into the receptacle (J1), sit back, and let the watchman go to work! ★ ★ ★



Schematic diagram (above) illustrates simplicity of wiring. Part values are given in list (below right). Parts placed as shown below permit ample room for unconfused wiring and adding one terminal strip helps simplify component mounting



PARTS LIST

- R1—6800 ohms, 1 watt
- R2—4700 ohms, 1 watt
- D1—1N34 Germanium Diode
- C1—10 mfd., 150 v.d.c. electrolytic capacitor
- Cell—Clairex CL-603 or CL-3 cadmium selenide photocell
- RLY—Advance relay SV/1C/14000D, coil 14,000 ohms
- J1—Amphenol chassis receptacle, 61-F
- Terminal Strip—Jones #28F685, 7 terminals
- Chassis—LMB No. 138, 2 x 3 x 6-inch
- Grommets—Two required, $\frac{3}{8}$ inch. One for line cord, one for cell mounting

Sleeps Four... Seats Eight... Saves Hundreds!



Easy-to-assemble metal furniture "living quarters" kit, including cushions and window screens, sleeps four. Priced about \$160.

NEW FORD Econoline STATION BUS

America's new route to vacation fun!

There's a big sky and a wide country waiting . . . and here's a new kind of Ford for the outdoor vacationer. The Econoline Station Bus can be equipped with a metal furniture conversion kit which provides four bunks by night, sitting room by day, table and benches at mealtime. But rent-

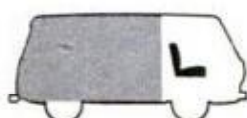
free, carefree vacationing is only one way you save with Ford's Econoline. It offers twice the interior room of the biggest station wagons, costs less* than most compact wagons, and its proven Falcon engine delivers "economy car" gas mileage. See your Ford Dealer, today.

*Based on a comparison of latest available manufacturers' suggested retail delivered prices

FORD DIVISION, Ford Motor Company,



It's a station wagon!
Roomy seats for eight,
install easily.



It's a work wagon!
Loadspace: 204 cu.
ft. with seats out!

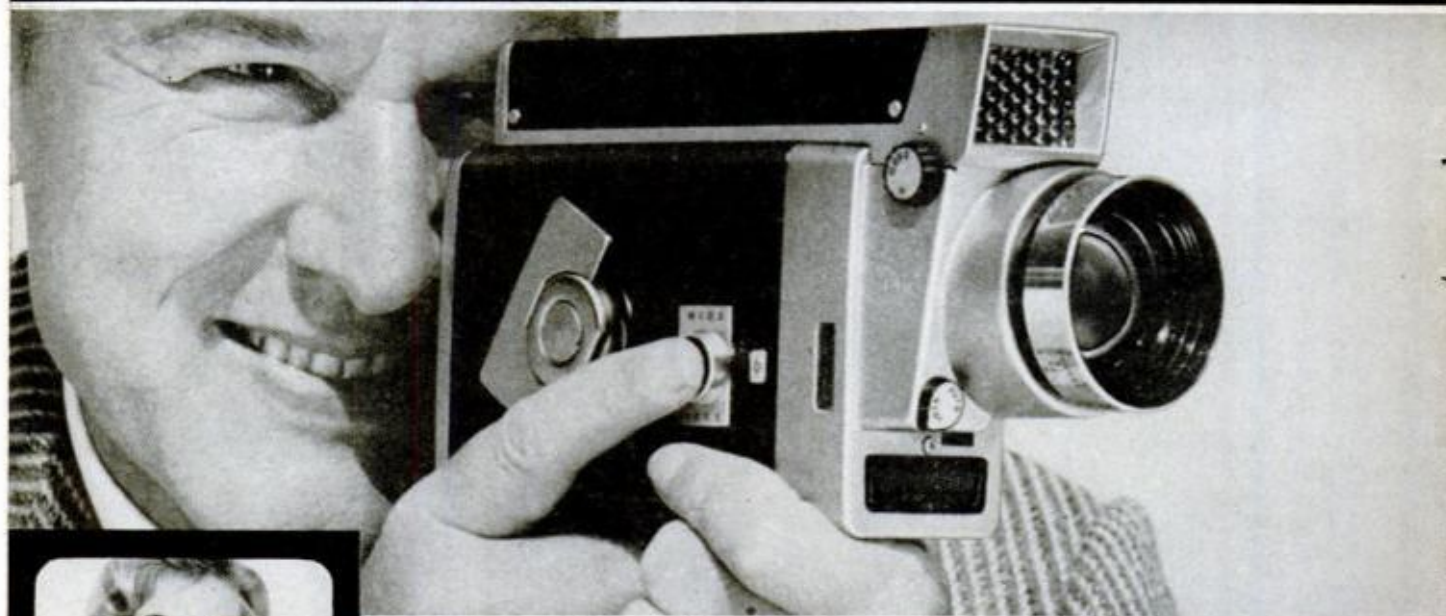


It's a sports wagon!
Bunk-bench unit avail-
able for camping!

**For full information
about truck and
camper-body models . . .**

**See your
FORD DEALER**

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!

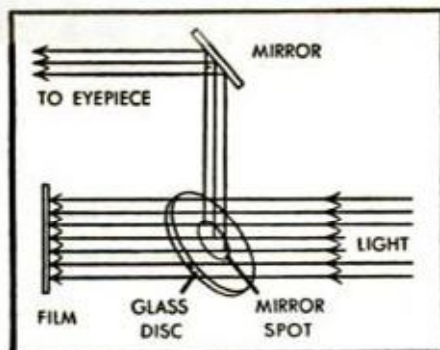
With this movie camera, you can show a face—then safely zoom in for expressive eyes . . . or for a youngster's missing front tooth . . . or for an identifying badge on a cap. You know the framing will be

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

These fully automatic cameras are also fully adjustable!

Each of the Kodak 35mm cameras at right is two cameras in one. Each is fully automatic . . . each is fully adjustable . . . whenever you wish!

Fully automatic. Each camera actually sets its own lens—doesn't just tell you where to set it. This can be a big help when drifting clouds suddenly change the brightness of the scene. Or when your subject—say, a romping boy—quickly moves from sun to shade. You keep your eye glued to the action, getting the best shots, while the electric eye selects correct exposure.

A novice who borrows your camera will especially appreciate the automatic lens-setting. It brings fine-camera results with simple-camera ease.

Fully adjustable. When you want to set your camera manually, just lock out the automatic control. Then take your choice of lens opening and shutter speed to get the exact effect you wish.

These two-in-one cameras are the modern way to fine 35mm slides. Examine all three at your Kodak dealer's. Ask your dealer for exact retail prices.

Get BOTH of these advantages in your next slide projector!

Check two important points when you shop for an automatic slide projector:

Reserve light power—to fill a large screen, or a distant screen, or to bring out the sparkle in dense slides.

Even brightness all over the area—no distracting "hot spots" or dark corners.

You get both advantages in a Kodak Cavalcade Projector. And it's completely automatic, shows your slides for you. You can join the audience to enjoy the show . . . yet keep full control. See your dealer—and see for yourself! From less than \$110.



KODAK MOTOMATIC 35, most automatic of the automatics! After each shot, spring motor advances film, cocks shutter. You can click off 10 shots in 10 seconds! For flash pictures 5 to 25 feet from subject, setting focus automatically sets correct lens opening. $f/2.8$ lens. Shutter speeds from $1/40$ to $1/250$. Drop-in film loading. Less than \$110.



KODAK AUTOMATIC 35 has $f/2.8$ lens, two shutter speeds. One-stroke thumb lever quickly advances film. Bright-frame viewfinder lets you frame scene quickly; signals if camera is set for "manual," and if light is too low; also reminds you to wind film. Less than \$90.



KODAK RETINA AUTOMATIC III, newest in the world-famous Retina series. $f/2.8$ lens. Shutter speeds from $1/30$ to $1/500$. Fast single-stroke film wind. Coupled rangefinder; complete depth-of-field scale. Shutter release locks if light is too dim. ASA index settings 10 to 1250. Less than \$130.

Prices are subject to change without notice.

Many dealers offer terms as low as 10% down.

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EASTMAN KODAK COMPANY, Rochester 4, N. Y.

See Kodak's "The Ed Sullivan Show" and "The Adventures of Ozzie and Harriet"

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Paint better and easier with any kind of paint, on any surface with well-made brushes filled 100% with Du Pont tapered **TYNEX**[®]

Why spoil your next paint job by getting an inferior brush? Du Pont has established a quality mark which is your guarantee that brushes are filled 100% with tapered **TYNEX**[®] nylon filament . . . a filling material made for quality paintbrushes. Properly made brushes of tapered **TYNEX** give you these advantages: smooth, even flow of paint . . . easy "cutting" into corners . . . easier cleaning. You'll find that well-made brushes of 100% tapered **TYNEX** work well with any finish, and are recommended for use with water-emulsion paints. That's because natural bristles can absorb 15% of their weight in water and swell as much as 25% becoming bushy and difficult to use.

To determine higher-quality brushes, look for these features:

FULL STOCK: They will contain enough filling material to feel firm at the heel and soft and flexible at the tip.

MIXED LENGTHS: Better-made brushes contain a mixture of different-length filaments.

FINISHED TIPS: Properly made brushes are processed to give a soft finish to filament tips to assure top performance.

... and be sure to **LOOK FOR THIS SEAL** that guarantees your brushes are made 100% with tapered **TYNEX**.



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CLINIC FOR HOMEMAKERS

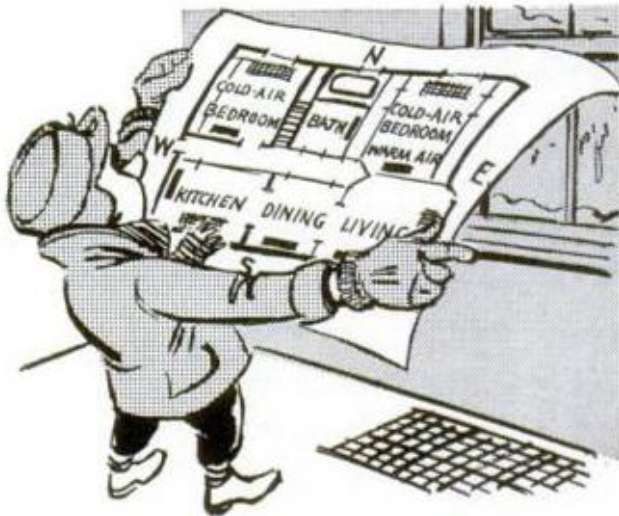


As a service to our readers in solving the hundreds of problems pertaining to a home—inside or out—editors of Popular Mechanics invite you to present your problems to The Clinic Editor for help and advice. Address your questions to The Clinic Editor, Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Ill.

Heating Problem

Q—I have a five-room home, all on one floor, and facing east. I have a forced warm-air heating unit, with only two cold-air registers on the north side of the house, one in each bedroom. These two rooms, particularly the northwest bedroom, did not heat well last winter and there was moisture on the north walls near the ceilings in both bedrooms and in a closet between. I'm enclosing a rough sketch of the floor plan. What's the cause and remedy?

—L.T., S. Dak.



A—We assume that the floor plan you have enclosed shows all the cold and warm-air registers and that the latter are wall registers and not floor registers. We find it easy to believe that the bedrooms are cold, in fact, we wonder how you find them livable in severely cold weather. It is difficult for us to be sure at such long range, but we think you need to install at least one more cold-air return leading from the bay window at the east end of the living room. You may also find it advisable to install a fourth cold-air return in the kitchen at the southwest corner of the house. This should give

(Continued to page 198)

SEE your "extras" in new **DeWALT!**



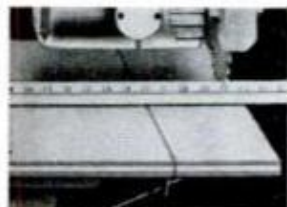
Model
925-H



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stop saw instantly



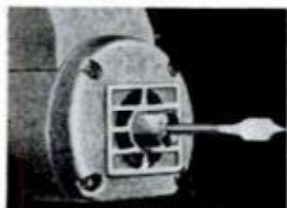
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quietly, smoothly

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Springtime . . . and the lady of the house wants new screens for home or summer cottage. What easier way than to "do-it-yourself" . . . with Reynolds Aluminum, of course! Window size or type is no problem; casement, awning, or regular windows of any size and shape are easily screened to individual measure. And there's no elaborate manufacturing process! With Reynolds Aluminum materials, your screens are practically ready to assemble. Everything you need is available at your nearby hardware or building supply dealer. Pick up the free instruction booklet with its "how-to" project sheets; purchase the Reynolds Aluminum screen materials you need and then "do-it-yourself" . . . with Reynolds Aluminum.

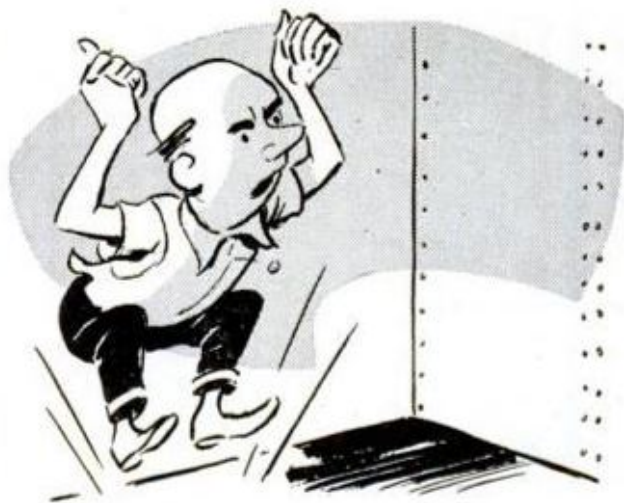


Reynolds Metals Company
Richmond 18, Virginia

you adequate air circulation and a more nearly uniform temperature throughout the house. Improved circulation also should eliminate the condensate from the walls in the bedrooms and closet. There remains the question of the size of the cold-air returns. You did not give the size of the registers and ducts of the existing cold-air returns but ordinarily these should be of a uniform size. However, in your installation we think those in the north bedrooms should be the larger as there will be a greater volume of cold air in these areas. Larger returns here will tend to prevent excess cold air from being drawn across the house to the new returns in the living room and kitchen.

Popping Nails

Q—Recently I finished a 1-room addition to my home with plasterboard. I puttied the joints according to instructions and sanded down all joints before painting. Now the heads of the nails show, actually they seem to be forced out for some reason, lifting the putty. But only in certain areas and on certain joints do they appear raised above the surface of the putty. It's a mess! What do I do now?—R.C., Mich.



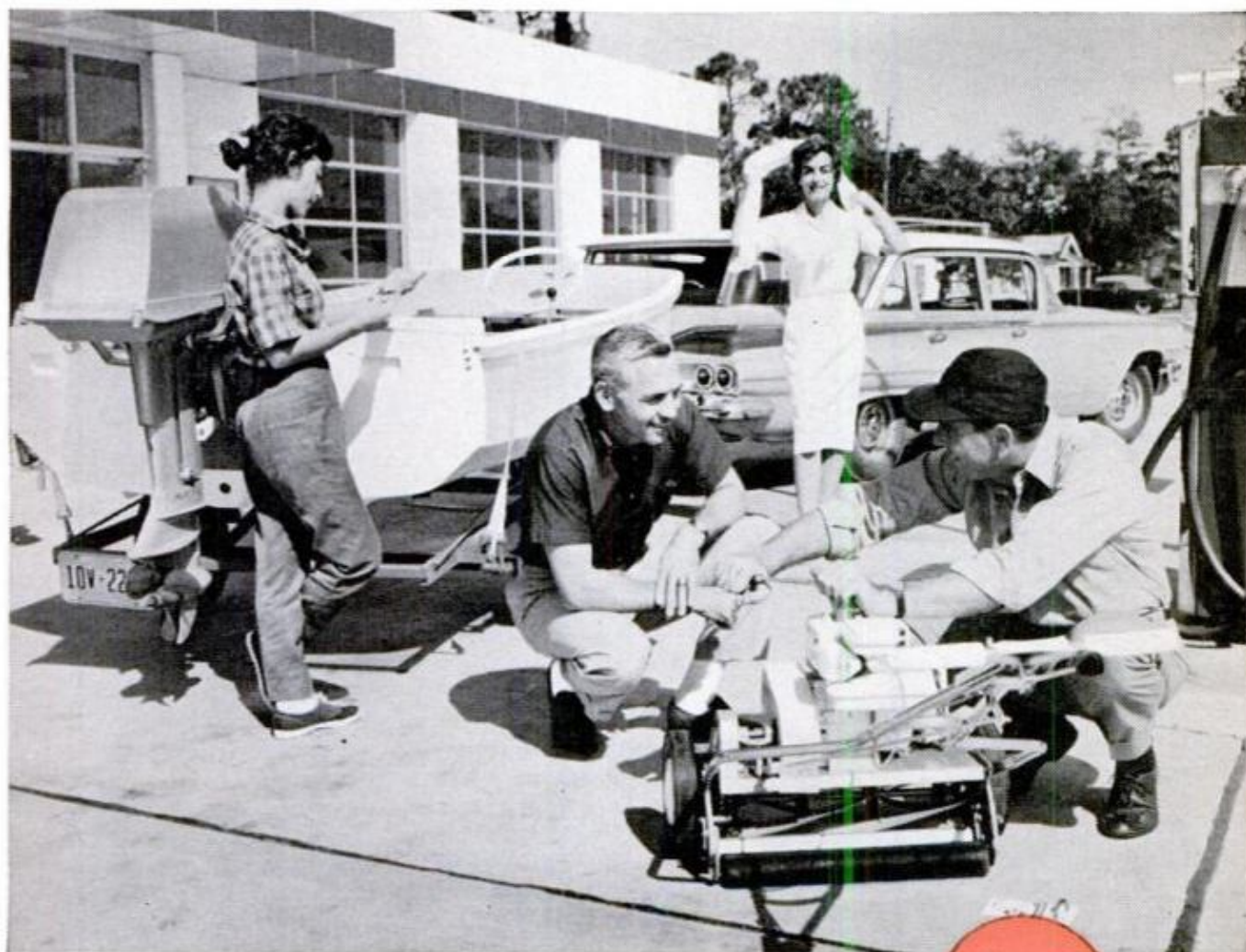
A—We assume you used the recommended nails and that you seated them according to accepted practice. In new construction shrinkage of as little as $\frac{1}{32}$ in. can cause nails to pop, especially if the framing units are under slight stress when installed. We think likely this is the source of your trouble. It is never possible to anticipate it with any certainty as occurrence is dependent on several variable factors, such as settling of the structure, a slight change in position of the framing members during a period of stabilization and the slow equalizing of stresses throughout the structure. If your trouble can be attributed to shrink-

(Continued to page 200)

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when you...



spark-up for power



In your car, your lawn mower, your outboard or any gasoline engine, AC Fire-Ring Spark Plugs support the performance your equipment was designed to deliver. AC's exclusive nickel alloy electrodes resist wear and gap growth, prime sources of spark plug trouble. Ultra-hard AC insulators are highly resistant to fracture. A vastly superior sealing process prevents gas leakage and damaging pre-ignition. Spark-up for power with self-cleaning AC Fire-Rings at your AC dealer's!



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MAY 1961

199

New Weedone



with Silvex
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lawn weeds
than any other
weed killer!



**Don't be puzzled about weeds!
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For a weed free lawn insist on **NEW WEEDONE with SILVEX**. Made by **AMCHEM PRODUCTS, INC.**, originators of 2,4-D and 2,4,5-T Weed Killers.

EASY TO APPLY—LIQUID OR DRY!

Still the same low price—8 oz. can (liquid) only \$1.00; 5 lb. bag (dry) \$2.25 (larger sizes available).



WEEDONE

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age of framing members, and we think this a most likely cause, then it is quite certain that the members will stabilize at some point. If the nail heads are carefully re-seated and the joints reputted after movement has ceased it should be reasonable to assume there will be no further trouble.

Efflorescence

Q—Last winter I shoveled snow from the walk which runs along the side of my brick house. There is a narrow flower bed between the edge of the walk and the wall and I threw the snow onto the bed and up against the wall. Now a white, powdery substance has formed on the wall taking almost the same shape as the snow bank I shoveled against the wall. Surfaces of the bricks seem to be affected also, as some bricks are flaking. What is this and how can I stop the damage?—H.K., Mass.



A—The powdery coating is known as efflorescence and it forms when soluble salts contained in the masonry leach to the surface and dry. Usually this action requires that dampness be present for relatively long periods of time but apparently the snow laid against the wall long enough to activate the latent salts. Below the snow level the wall would probably be warm enough to slowly melt the snow and maintain a continually damp condition. Probably the best remedial steps to take are to apply a very mild solution of muriatic acid to the affected surface, allow it to remain only a minute or so, then wash off with clean water. When you are sure the surface is thoroughly dry, coat with a masonry sealer. This treatment usually cures the trouble. *Caution:* Observe precautions when handling even a very mild solution of muriatic acid. Wear rubber gloves. Apply with a cloth swab. Protect your eyes from spatters and destroy all unused portions of the acid solution. ★ ★ ★

Weekend Painters get a break with a new kind of Latex House Paint!

If you're planning to paint the outside of your house this year, there's a new kind of house paint from "Dutch Boy" that can make your job a lot easier. It promises professional results to even first-time painters!

Until recently, the weekend or vacation painter had to wait for an extended period of good weather. Now new "Dutch Boy" Latex can be used even right after a rainstorm. And it's specially helpful for the stop-and-go kind of exterior painting that most homeowners have to do. With this remarkable new paint, you can pick up right where you left off. Lap marks won't show. Skips and holidays can be touched up any time.

Extremely easy to apply, there is no tiring brush-drag with new "Dutch Boy" Latex. On certain exterior surfaces, you'll find a roller works perfectly. This new paint literally flows on over wood and masonry—and it covers fast and evenly. This easy application means that two coats go on in little more than the time it takes to apply one of regular paint.

When repainting surfaces with "Dutch Boy" new Latex, there's no need for a separate oil-type primer with all its complications. Instead, you simply use the easy-to-mix additive, PBL, with the first coat... "Dutch Boy" does the rest.

You have a paint job that dries, bug-free, in just 30 minutes. Add the second coat when convenient.

Messy solvents and thinners are unnecessary, too. Brushes and equip-

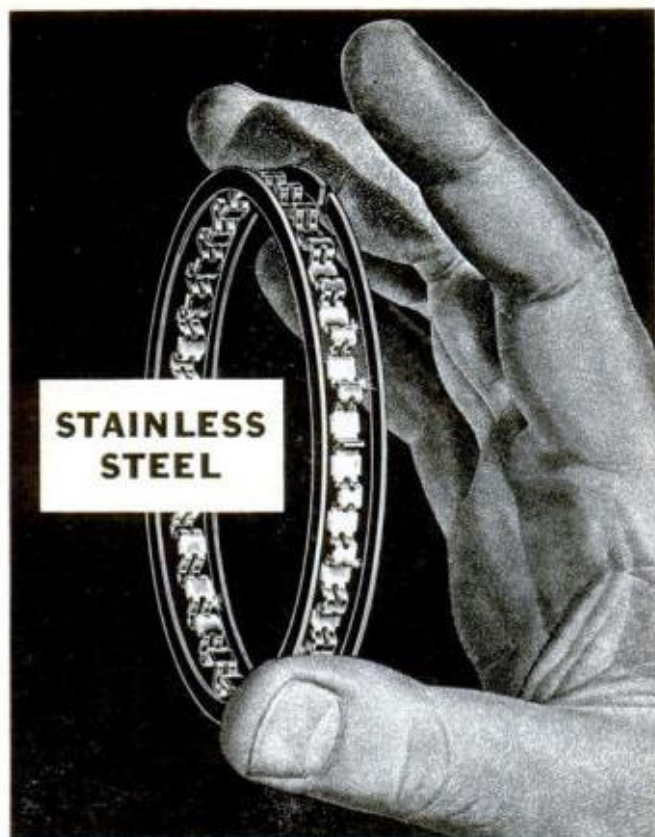
ment—like the painter himself—can be cleaned up with soap and water.

Homeowners who have used new "Dutch Boy" Latex House Paint claim it ends exterior house painting as they've known it before. It's an easy, simple, low-cost way to have a complete exterior paint maintenance program. Once applied, new "Dutch Boy" Latex lasts for years and years. Colors will stay bright and clear. Simple one-coat touch-up is all you will ever need. The part of a house exposed to more severe weathering can be repainted at any time *without repainting the whole house*. So long as you keep the same color, your Latex program means that you may never again need to repaint the outside of your entire house at one time.

Properly applied, this new paint can eliminate most blistering and peeling problems caused by trapped interior moisture. New "Dutch Boy" Latex House Paint "breathes"—allowing interior moisture to escape yet sealing out the weather.

This new paint promises much to the do-it-yourself homeowner. Check with your nearest "Dutch Boy" Dealer listed in the Yellow Pages, or write for informative free booklet to: NATIONAL LEAD COMPANY, General Offices, 111 Broadway, New York 6, N. Y.





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

Build PM's Pop-Cat

(Continued from page 152)

frequently, always springing the batten in both directions (across the beam, then fore-and-aft), as waste trimmed from a member to correct a curve in one direction automatically affects the curve that lies at right angles to it.

When satisfied with the deck-beam fairing, the shelf is cut and fitted if not done previously when truing the sheers. Notches are cut in bulkheads 2 and 3, and in the two inside laminae of the transom to take the 4½-in.-wide shelf. The notch in bulkhead 2 must be made an additional ¾-in. wider to accommodate the coaming. Notches in the deck beam, bulkhead 3 and subdash take the same curves as the deck at these



locations, while the notches in the bulkheads aft are at right angles to the side of the boat. Cleats glued and nailed to bulkheads 1 and 2 flush with the bottom of the notches, provide gluing and nailing surfaces for the shelf at those locations. Since the shelf must fit flush with the sheer log, it is best to cut these notches slightly shallower than required and then rasp them down while fitting the shelf.

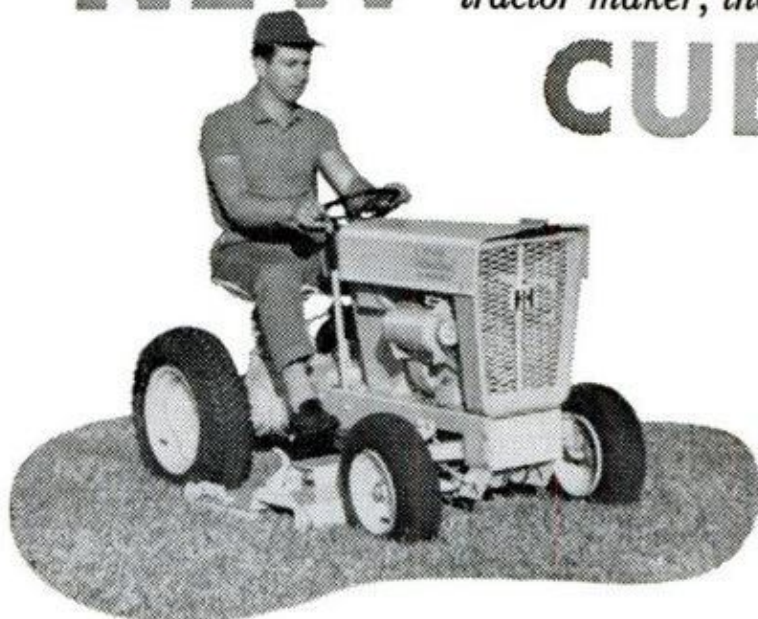
After both shelves are in, all surfaces that receive deck planking are sanded smooth, checking the curves on the bow beams with a batten again and making sure that no hardened beads of the glue remain on mating surfaces. Fig. 54 shows the boat ready to receive the decking. All decks are ¾-in. plywood, fastened with glue and

(Continued to page 204)

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842 ELM PLACE, RICHMOND, IND.

nails—1-in., .109-dia. for side decks, 1¼-in., .109-dia. for the foredeck.

First to go on is a 4 x 8-ft. panel, positioned so that the after edge overhangs the dash by ⅛-in. The forward edge should lie approximately on center of the foredeck backing block. After two coats of glue are applied on the faired members and one on the mating areas of the panel along the edges, the center of the panel is clamped in place fore and aft to the backing block and dash, respectively. Nail from the center outward to assure contact of the panel with all structural members underneath, Fig. 55.

Next, the bow panel cut to fit previously, is butted against the full panel and fastened, after which the excess at the ends of the panels is cut off to within about ⅛-in.



of the topside planking, Fig. 56. The edges are planed and sanded flush after the glue hardens.

The side-deck planking goes on next. If the decks are to be fiberglassed, as was done on the PM model, they may be made up of several pieces butted together if no material is left from which 12-ft. lengths can be cut.

The coaming, which actually includes the tail-fin assembly, is cut to shape from the dimensions given and fastened in place as shown. Note that the straight section is glued and nailed to the inboard edge of the shelf, while the laminated tail fin is edge-glued on top of it next to the inside edge as shown in Fig. 52. The straight piece goes

on first, after which the tailfin laminae are coated with epoxy resin (used in place of glue for its superior strength characteristics in this type of application) and clamped in place. The height of the coaming at deck level ranges from zero at the forward end, to 2 $\frac{7}{8}$ in. at the transom. A $\frac{3}{8}$ x 3 x 3-in. plywood fillet piece epoxy glued on edge in each of the dash corners formed by the junction of the foredeck and side deck planking as indicated in Fig. 50, provides a one-piece molded appearance when rounded to a soft radius.

The laminated mount for the throttle and shift controls may be made up from any stock available. When laminated and trimmed to the dimensions given, it is glued and nailed to the planking as indicated, the nails being driven through the planking from the outside.



The drain sumps, installed in 5-in.-square cutouts located 1 in. forward of the transom, are assembled outside of the hull. The walls are $\frac{1}{4}$ -in. plywood epoxy-glued together. The forward wall of each sump is fitted with a drain plug, the tube of which is installed in a cleat glued to the bottom end as indicated in the drain-sump detail, Fig. 50. When installed, the sump is glued and nailed to the cutout edges. The bottom and sides are lined with fiberglas, securing it to the bottom planking and forming a watertight enclosure. A fillet of fiberglas compound applied around the stepped upper edge of the sump, gives it a molded-in appearance. Overboard drains located in the transom and centered on each bilge, should be installed after the cutout for the sump is made but before the sump is fastened down. When drilling the hole for the drain tube, be sure it follows a straight course parallel with the boat bottom. The

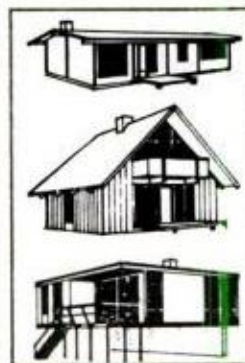
(Continued to page 208)

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PM-MY

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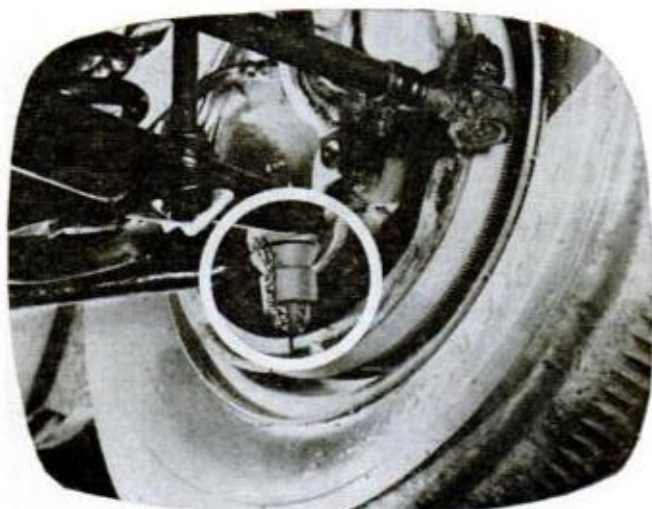
Address _____

City _____ Zone _____ State _____

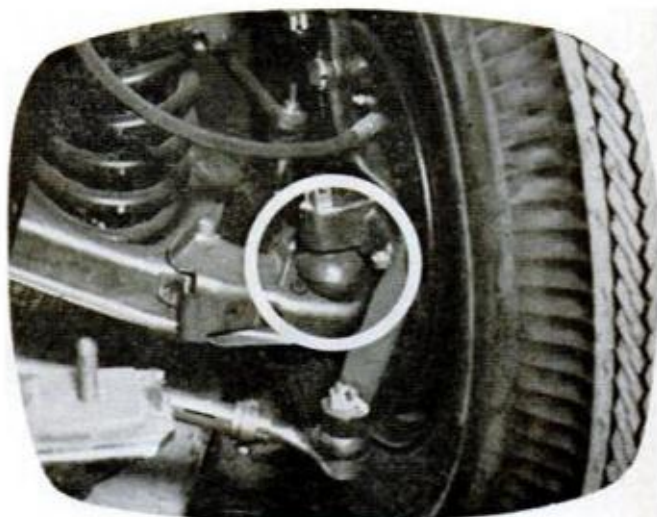


TV's Professor Jonathan Karas uses
 "shock treatment" to prove...

Professor Jonathan Karas, physicist at Lowell Technological Institute, demonstrates, as he does on Ford TV shows, why Ford goes 30,000 miles between chassis lubrications.

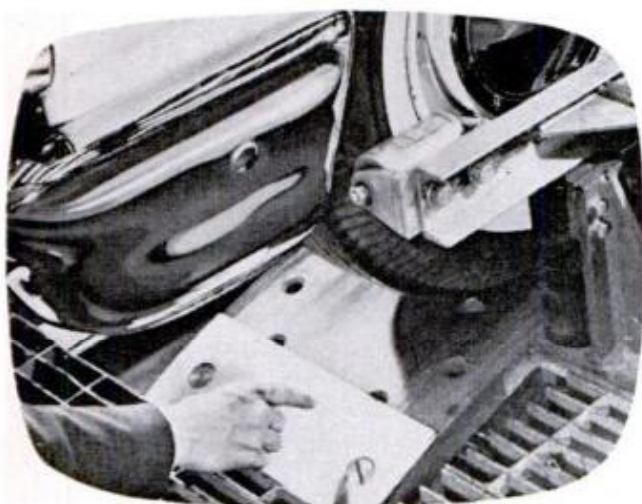


3. "Hours later, we looked at both suspensions. Here's the one on the *other* '61 car. See how the ball joint leaked? This is why most cars need chassis lube every 1000 to 2000 miles.



4. "Now look at Ford's suspension. No leaks. No ordinary grease fittings. Each ball joint is completely *sealed in*. No wonder Ford can go 30,000 miles between chassis lube jobs!

You can't pound out Ford's sealed-in lubrication!



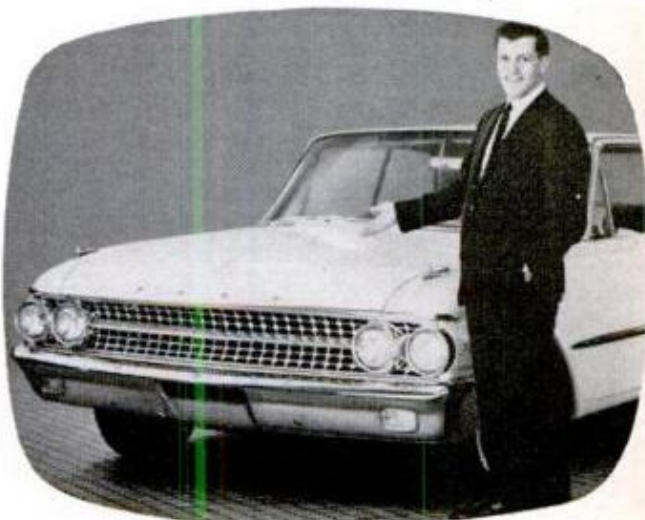
1. "On this dynamometer is a '61 Ford, on the other one, a different '61 car. Each dynamometer has bumps attached to its rollers to give a severe shock to the car's front end.



2. "Now, we'll turn on the dynamometers and start the test. The punishment these machines dish out can be compared to a ride on a badly rutted, bumpy road.



5. "When finally you *do* lubricate, this plug is unscrewed, new molybdenum disulfide grease injected, and the plug replaced. The job costs only about \$4.00—takes about 20 minutes.



6. "30,000 miles between chassis lubrications . . . 4,000 miles between oil changes . . . self-adjusting brakes. All are features of the '61 Ford, beautifully built to take care of itself."

FORD DIVISION, *Ford Motor Company*.

flared end of the tube goes on the inside. The excess that extends from the transom is cut flush with the latter prior to epoxy gluing the tube in place. Before the resin hardens, the outboard end should be flared slightly, to be absolutely sure it won't pull out of the hole.

Except for the seats, construction of Pop-Cat now is completed. These are made almost entirely of plywood as shown in Figs. 57 and 58. Seat boards and walk-through are $\frac{1}{2}$ -in. plywood, while the backs, ends and fronts are $\frac{3}{8}$ -in. stock. After cutting the parts to size they are assembled (glued and nailed) in the boat, starting with the backs. As with installation of the seat fronts, cleats first are fastened to the backs at the bottom edges. The seat spreader also is pre-fastened to one of each pair of backs. The backs then, are glued and nailed directly to the wing deck as in Fig. 58.

Note that the aft-facing backs are set on top of a wing-back batten, requiring that they be cut $\frac{5}{8}$ in. shorter than the forward set. Joints that do not have corner cleats are sealed with epoxy compound. This effects a saving of weight while keeping seat storage compartments watertight. The walk-through between the seats is formed by gluing a $\frac{1}{2}$ x 8 x $17\frac{1}{2}$ -in. piece of plywood to the after face of the forward seat backs. Then a top piece of $\frac{1}{2}$ -in. plywood is fastened to cleats glued to the bulkhead extension at the back and to the $17\frac{1}{2}$ -in. piece at the front as detailed in Fig. 58. Note that seat bottoms are in three pieces, with only the center one of each removable.

Preserver Cushions Recommended

While the seats may be upholstered with a vinyl cover fastened over foam rubber or other cushioning material, it is recommended that removable cushions be used of the type that have safety straps and which are United States Coast Guard approved as a life-saving device. No stock sizes were available that could be combined dimensionally to fit the seat dimensions when the boat was built. (Kapok-filled, vinyl-covered 17 x 17-in. patio cushions were used for the prototype.) A marine safety products company recently has announced availability of such seat cushions in sizes that work out very well on Pop-Cat. Manufactured by Style-Crafters, Inc., Greenville, S. C., these vinyl-covered cushions are available in two-tone red or black with white in 15 and 20-in. lengths.

In the case of Pop-Cat, one 15 x 15-in. seat and back, and one 15 x 20-in. seat and back would be used for each of the four seats, providing seating accommodations for eight.

Snap fasteners are placed on heavy strips at the front of seat cushions and at the top of back cushions. These snap on the male part of the fasteners attached to the plywood construction. To better accommodate these cushion sizes (15-in. and 20-in. placed side by side) plywood seat width should be increased to 36 in. When installed, back cushions extend behind the rear edge of bottom cushions.

After completing the seats, the boat is turned upside down and prepared for fiberglassing. Be sure to block up and cushion the boat at the coaming when flipping it to protect seats and foredeck. First, make sure all nail heads and other metal fasteners are driven flush with the planking. Then, fill hammer marks, nail countersinks, gouges and scratches with surfacing compound as in Fig. 60. Be sure the compound you use for this is not an oil-base type. Duratite and Lakerfill surfacing compounds are two products that are compatible with fiberglass resins. Both dry rapidly, permitting the filled surfaces to be sanded flush within an hour of application. Power sanders speed this phase. Use an orbital pad sander, disk sander with flexible shaft or coupling, or belt sander as in Fig. 61. Be careful not to gouge the planking if either of the latter two are used.

Applying Fiberglass Fillets

The last step before fiberglassing is to apply a fillet of fiberglass compound along the corners formed by the wing deck and inboard chines as in Fig. 62. The index finger works fine for this, although the blade of a dinner knife also makes an excellent applicator. The latter is more durable than skin, too. Sand the fillets smooth after the compound hardens. This same material also can be used as a surfacing compound.

Fiberglassing will be covered in the next (final) part of the story, in addition to applying a finish to the cockpit, installation of hardware and outfitting a trailer with which to haul and launch Pop-Cat. A hardware list also will be given to simplify equipping Pop-Cat.

Blood Enzyme Dissolves Clots

Heart conditions which are complicated by formation of blood clots may be relieved through the use of fibrinolysin, an enzyme isolated from human blood. Doctors at Cornell University Medical College have found the enzyme effectively dissolves already-formed clots in a good percentage of cases. It is hoped fibrinolysin may also prove useful in treating other circulatory ailments, such as phlebitis.



**SOME
SPARK PLUGS
LEAK**

SOME DON'T!

Problem: Some automotive spark plugs leak. Even when new. They leak because the insulator is not perfectly sealed to the outer steel shell. And this leakage, as you might expect, does nothing to improve either your gas mileage or your pick-up and performance. How can you avoid buying spark plugs that could leak? Simple. Just look at them before you buy. Appearance tells you a lot about how the plugs were sealed. Take the shiny plugs you may have seen on your dealer's shelves. Most of these shiny plugs are sealed with powdered talc. They're not guaranteed against leakage.

They are not acceptable for severe military service. What other kind of spark plug is there? The blue kind. The kind Autolite makes. In these plugs, the shell is sealed to the insulator under tremendous heat and pressure. Autolite guarantees every plug against leakage. We also sell many thousands of them to the military.



AUTOLITE
SPARK PLUG DIVISION • TOLEDO 1, OHIO

Suggestion: There are two ways to make sure your next set of spark plugs does not leak. Take a good look at them before you buy, or, easier still, simply insist on Autolite. We make a set to fit almost anything with wheels. Remember, the color is blue, the name is Autolite.

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Dawson City: Yukon Travel Bureau, Whitehorse, Y.T., Canada.

San Juan Archipelago: Tourist Promotion Division, Department of Commerce and Economic Development, General Ad. Bldg., Olympia, Washington.

Big Bend: Superintendent, Big Bend National Park, Texas.

Glen Canyon: Glen Canyon Boating, White Canyon, Utah or Western River Tours, Richfield, Utah.

Martinique: Pan American World Airways, P. O. Box 1790, New York 17, N. Y.

Cajun Country: Department of Commerce and Industry, State of Louisiana, Baton Rouge 4, La.

Amish Land: Chamber of Commerce, Lancaster, Pa.

Mount Washington: Mount Washington Cog Railway, Mt. Washington, N. H.

Iles de la Madeleine: La Province de Quebec, Tourist Bureau, 710 Grande Allee Est., Quebec, Canada.

Isle Royale: Superintendent, Isle Royale National Park, Houghton, Michigan.

Scientists Detect Sound Waves Of Earthquakes And Tornadoes

Whispering in too low a frequency to be heard, sound waves from earthquakes and tornadoes nevertheless are passing along the secrets of location of these natural phenomena. Scientists at the Bureau of Standards, Washington, D. C., set up four microphones, in an experiment near that city, that caught these infrasonic waves coming from a Montana earthquake in 1959 and from tornadoes more than 1000 miles away. To record the waves, the microphones produced frequency-modulated voltages from sound pressures received. These voltages were then transmitted by telephone wires to a station where they were demodulated, amplified and recorded as ink traces on paper. When a sound wave of enough magnitude is present, similar traces are produced on each of the paper records from the four microphones. The direction from which the wave is coming, and its speed, are learned by comparing the different times it hits the microphones.

There are many sources of infrasonic waves, but only a few have been identified so far. To increase its knowledge, the Bureau is planning to install a similar sound-recording unit near Boulder, Colo.

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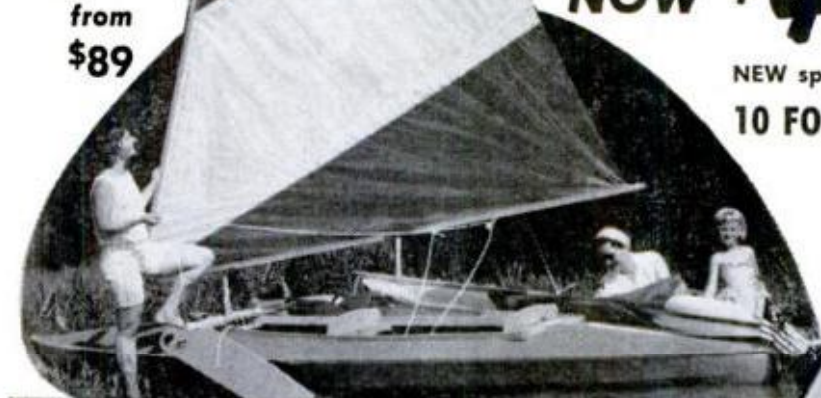
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Before You Buy a Mower

(Continued from page 167)

where there are few trimming problems.

There are a few trimmer-type reel mowers that trim grass as close to the edges as the rotaries do, but these are comparatively expensive, deluxe mowers. Other reel mowers leave a strip of uncut grass along the mowing edge when the mower is operated next to a wall or similar obstruction.

Mowers are powered with either gasoline or electricity, and both types have their own special advantages. Electric-powered mowers operating from regular house current are most efficient when used on small, open lawns, within easy reach of outdoor outlets. The cord is a nuisance if used on a lawn cut up by several flower beds, shrubs and trees. But an electric saves time, since there's no fuel to bother with, and starting the motor is as easy as snapping on a light switch.

A wife may be willing to mow with a lightweight electric mower but refuse to use one of the heavier gasoline mowers. The large mower is often difficult to get in and out of storage, especially if it must be brought up from the basement. Likewise, a gasoline mower must be serviced, and starting the engine may be troublesome for the inexperienced operator. But the electric mower eliminates all of these problems.

Riders for Estates

Where an acre or more of open lawn is mowed, a riding mower with either a reel or a rotary cutting unit is the most efficient. If the lawn includes large open areas as well as restricted, crowded sections, a combination riding mower and small push-type rotary mower can be used to advantage. The 18-in. or 21-in. push mower is used to mow around bushes and in confined areas where the riding mower would be difficult or impossible to maneuver. If the lawn is maintained at a height of less than 1½ in., use a rider with reel-type cutting units for a smooth, level cut.

For the man who has a lot 75x150 or larger and who enjoys working in his garden, a convertible walking mower may be the tool for him. Such a unit is usable for most outdoor jobs where power is needed, yet is compact enough for easy storage. One engine is used to power several attachments. Convertible units are available in either walking or riding units, and some are converted from walking to riding by adding sulky attachments. With attachments you can do such jobs as plowing the garden, grading a new terrace or mowing the lawn with either a reel or rotary cutting unit, plus doing many other jobs re-

quiring power. Several reel units may be arranged in a gang to mow a swath eight or more feet in width.

While lawn maintenance can hardly pass as recreation, it can be a time for relaxation and a change of pace. But if you've been outside all day doing hard physical work, mowing is just another job to get out of the way as soon as possible.

On slopes and hilly terrain the landscape may be a delight to look at, but the uneven ground complicates mowing. It's harder to push the mower, and whenever the slopes are wet, footing becomes slippery, creating a safety hazard. It's all too easy for a foot to slip under the rotary deck and into the spinning blade. Or, the handle may flop over and let the mower roll back on the operator. On slopes, the power-propelled rotary is the most convenient — either a walking or riding model.

Many average-size lots in the old established neighborhoods are so cut up by plantings, flower beds and walks that only a small push-type rotary mower is practical, one you can maneuver back and forth around trees, shrubs and fences. Anything else is generally just too awkward and time-consuming to use.

Trimming the Lawn

Trimming also takes a lot more time on a crowded lawn. Most rotaries trim fairly close, and a few models feature special trimming slots that make it possible to trim even that last quarter inch of grass. If a mower doesn't trim close, you may find yourself working longer at hand-trimming the edges than the time spent in mowing the lawn. But you can avoid this extra work by using a trimmer mower or by edging the lawn with a brick border or similar building material laid at ground level. Such a border makes your mowing easier and keeps weeds and undesirable plantings from crowding out lawn grasses.

Over open, flat lawns the wider the cut the easier and faster it is to finish the mowing job. A power-propelled mower takes much less energy to do the work. On large, estate-type lawns, which usually are maintained in top condition and mowed frequently, the gang-type reel unit is often preferred, cutting swaths some 10 feet in width. But an open lawn of four or five acres can be mowed rapidly with a 25 to 36-in. riding mower using either a rotary or a reel cutting unit. Naturally, the wider the cut the quicker it is to finish the job. On open, flat or sloping ground this holds true, but where you must do a lot of trimming around plantings, a lightweight push-type mower is usually best. ★ ★ ★

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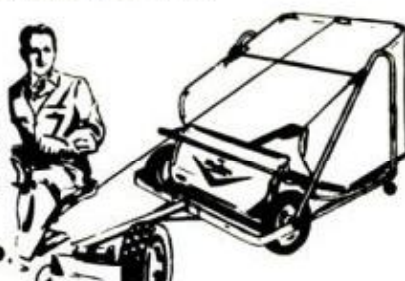
Art Linkletter

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(Continued from page 133)

Spanish isn't necessary but it's helpful as well as fun to pick up a few words. Motels on main routes all have English-speaking clerks. It doesn't matter if no one at a gas station speaks English; you simply pay the pesos and centavos shown on the meter of the fuel pump after your tank is filled.

You can get free road maps of Mexico from gasoline stations on this side of the border. The American Automobile Club has a 296-page book free for its members that has maps, tells where to stay and is full of travel tips. The Mexican Government Tourism Department issues literature and maps from offices in nine U.S. cities including New York and Chicago. Or you may write the Tourism Department at its main office at Pasco de la Reforma 35, Mexico City, for booklets and maps. Another source of free literature is Pemex Travel Club, Avenida Juarez 89, Mexico City.

Border Informalities. About all you need is proof of U.S. citizenship (birth certificate or a voter's registration slip), a certificate of vaccination against smallpox and your driver's license. If you are not the legal owner of your car you need a notarized statement from the lien holder authorizing you to take the car into Mexico.

Entering Mexico you will be issued a tourist permit (\$3.10) for each adult. Children under 15 are included free in a parent's permit. A free permit for your car also is made out, and for a trailer if you are hauling one. Dogs and other pets require a vet's certificate of good health plus a certificate of inoculation against rabies given within the last six months.

Mexican customs inspection usually consists of opening the trunk of your car and affixing seals to a couple of your bags. The seals should not be broken until after you stop at a second customs station possibly 100 miles south of the border.

Returning to the United States is just as painless. In my case it was only necessary to state that we were U.S. citizens, present the certificates of smallpox vaccination and open the lid of the trunk to show the baggage. There was no customs search, though the customs officer told me that this isn't always the rule.

Automobile Insurance. Most U.S. car and public liability insurance does not apply in Mexico and you will need a policy written by a Mexican company. You'll find offices in all border cities. The AAA and other auto clubs also act as agents. Pretty complete protection can be bought for \$2 per day. Mexican insurance is very important

(Continued to page 216)



New from Wolverine!

WORLD'S LIGHTEST SERVICE SHOES

Most comfortable ever! Weigh a pound less than ordinary work shoes. Their exceptional lightness is so easy on the feet. Uppers are flexible elk-tanned leather . . . soles are springy, oil-resistant, neoprene cushion crepe, nearly three-quarters of an inch thick. Steel shanks, of course. And smart sports styling plus handsome Burgundy color add good looks to the comfort.

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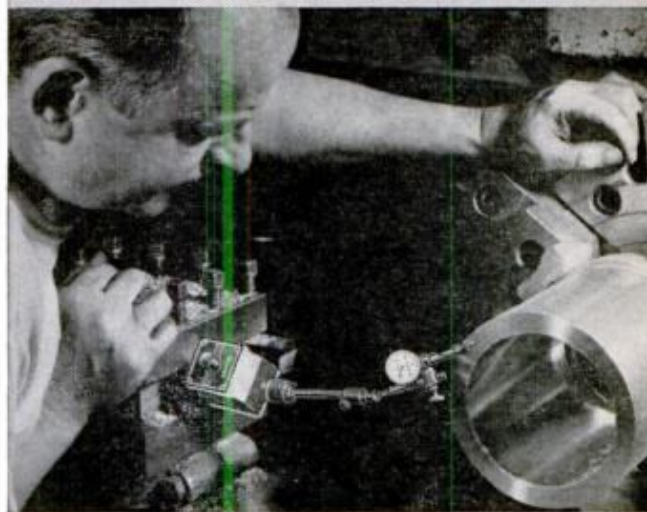
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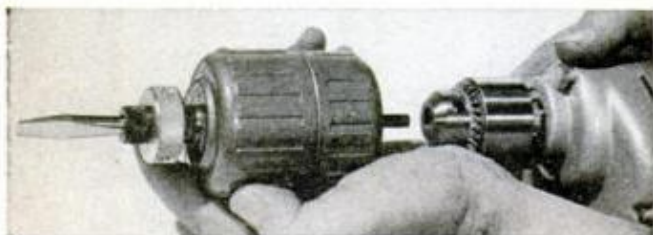


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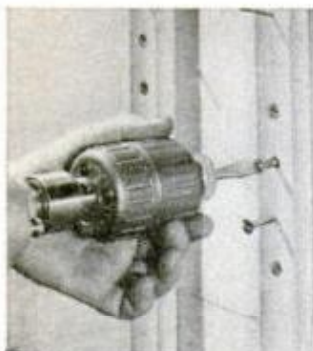
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1. After drilling pilot holes simply attach a Versamatic to electric drill. Fits any make.

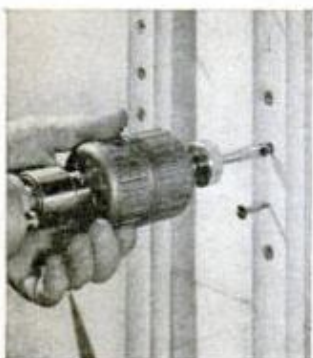


2. Place screw in hole; drive it easily with slight forward pressure . . . hold housing in fingertips.



3. Your fingers act as a clutch . . . starting, stopping action instantly. Simple and safe . . . no blisters.

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4. Versamatic runs in reverse for removing screws. You won't believe how easy it is until you try it.

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indeed, as traffic accidents are handled on a criminal instead of civil basis there. Your car can be impounded and you can be taken to jail. Valid Mexican insurance makes a great deal of difference.

Mexican Money. The peso sign is the same as the sign for our dollar, even though the peso is worth only eight cents in U.S. currency. You are apt to feel pretty rich when you exchange 100 dollars for 1250 pesos but don't let that large sum fool you. Those pesos are going to flow out of your pocket like water.

You can buy pesos at the border or wait until you reach a city such as Monterrey or Chihuahua. Motels and hotels will convert \$20 or so into pesos for you; larger sums are exchanged at a bank. American Express and other international travel checks are accepted almost anywhere. Some hotels and gift shops give you, free, a handy reference card showing the dollar value of various amounts of pesos. In addition to what you plan to spend you should carry an extra amount against possible car repairs or other emergencies.

Motels. Those catering to tourists are as clean, comfortable and modern as those in the United States. All have showers, hot and cold water, comfortable beds and their own restaurants. The domestic water supply may not be pure, so special and safe drinking water is provided in every room. Many motels have swimming pools with filter apparatus. Motels such as these are found at the principal towns on all routes between the border and Mexico City. I paid as little as \$5.20 to as much as \$8.80 for three people per night.

Restaurants. Food was the most expensive item on our trip because we purposely ate at the best places where the food could be considered safest. Menus are printed in both Spanish and English. Except in a few places where fresh vegetables are sterilized it's safest not to eat lettuce or other uncooked vegetables. Avoid milk unless it is "certificado." Pure water is served at the tables; in case of doubt you can order bottled water. Lunches to take along in the car can be ordered at breakfast.

Driving Conditions. All main roads are paved, some lack center stripes and some are narrow by our standards. Signs that warn of hazards are excellent and your road map will show the English translations of their meanings. "Alto" means Stop, "Despacio" means Slow. Numbered highway markers are relatively few and this can be confusing when driving through a town in which the route takes several turns, as around a plaza. The best bet is to follow the heaviest traffic.

(Continued to page 218)

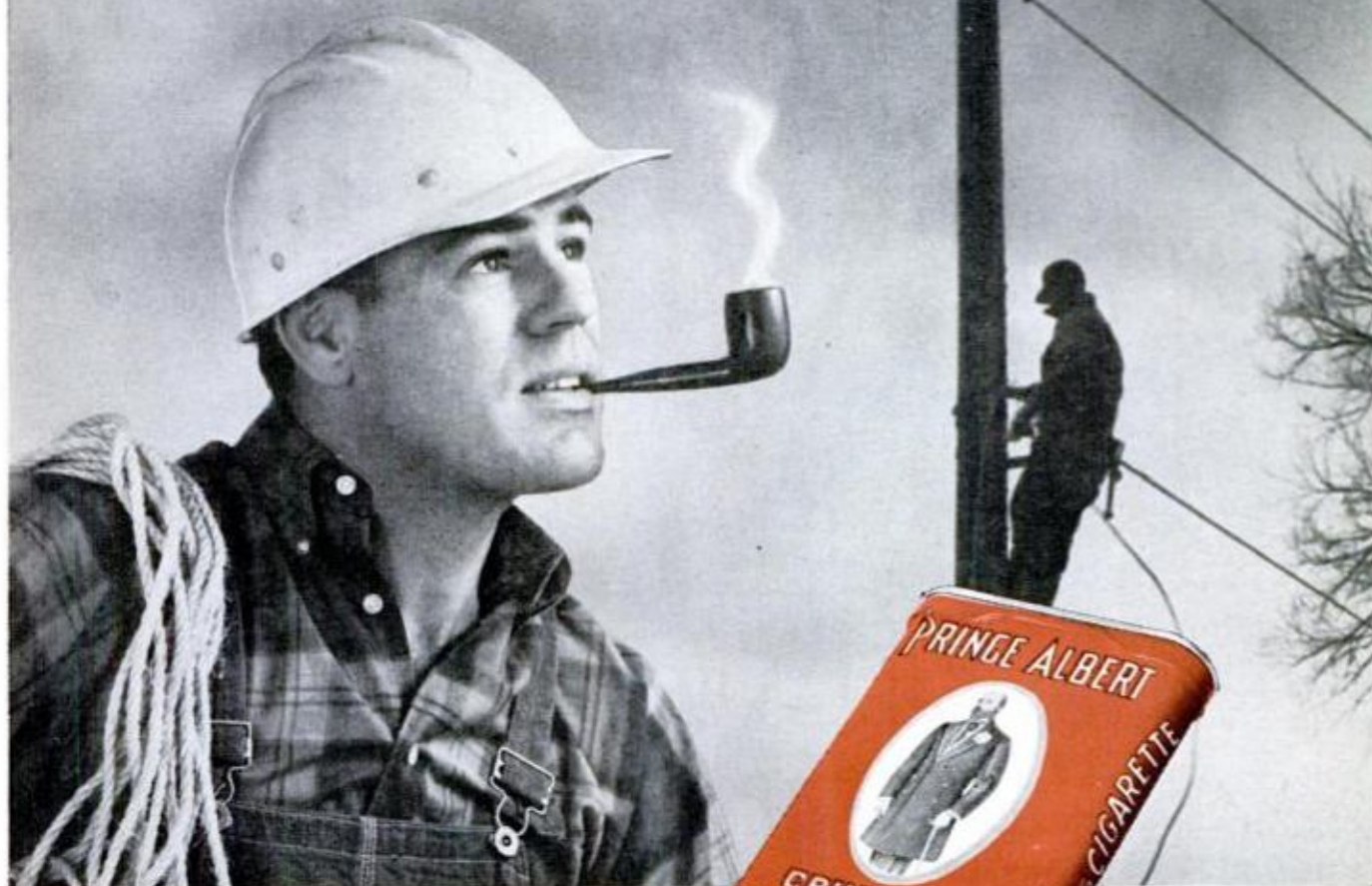
Missile-Tracking System Predicts Impact Points

Scheduled for full-time duty this year, the new \$10,000,000 Azusa Mark II electronic missile-tracking system replaces a system in use at Cape Canaveral since 1954. The advanced system will increase the accuracy of tracking missiles, predicting instantaneously their impact points at any time during their flights. It can also be used to calculate satellite rendezvous points in space, to track orbiting space vehicles or determine interception points for satellite recovery missions.

The Mark II system tracks a missile by transmitting radio signals to a small transponder installed in the missile. The transponder beams a continuous signal back to earth. It is caught by parabolic antennas and relayed to a computing system which converts the information into data shown on a large plotting board. Both the earlier system and the Mark II were designed and built by Convair (Astronautics) Division of General Dynamics Corp., located at San Diego, Calif.

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Distances are measured in kilometers and speed limits are indicated in kilometers per hour (k.p.h.). A speed of 40 k.p.h. is the same as 25 m.p.h., 100 k.p.h. is 62 m.p.h. Maps contain conversion tables.

Gasoline credit cards are no good below the border. Fuel pumps measure gasoline by the liter, actually a "big" quart. Gasol-mex is the premium grade of fuel although it is of only fair antiknock quality. It sells at the same price in most parts of the country, one peso per liter, equal to 32 cents per gallon.

What about Mexican drivers? They are just as good or better than the average U.S. driver. There are a few reckless ones, as is true anywhere. In some 3500 miles of travel below the border I saw only one bad wreck (a car hit a bus), one minor fender tangle and two cases where trucks wandered off the road into the ditch.

The worst road hazards are after dark and it's best to do no night driving at all. Horses, burros and cattle roam the roads. So do horse-drawn wagons with no lights and there are also unlit trucks that have broken down and are left on the street.

Streets are posted for one-way or two-way traffic in most towns and cities. Look for an inconspicuous metal arrow attached to a wall or building near the corner. The direction of the arrow designates the direction of travel on one-way streets. If the arrow points both ways (arrowhead at each end), travel is in both directions.

Traffic signals are often quite dim. If a traffic officer is on duty you may find him directing traffic from the center of an intersection or he may be standing on a shady corner. Look for his brown uniform. Street parking in downtown areas often is handled by a concessionaire who expects to be tipped. In a city it's wise to leave your car parked at the motel or in a garage and to use the taxis, which are plentiful and cheap. Pay the meter fare plus one peso.

Main Highways. Mexico is now criss-crossed by a network of paved roads (see illustration). One recently-completed road now links Merida on the Yucatan peninsula with the rest of Mexico, allowing visitors to drive all the way (except for a couple of long ferry crossings) to the world-famous Mayan ruins at Chichen-Itza. From Merida, too, one may now drive over good dirt roads to British Honduras.

Of the four main routes from the U.S. border to Mexico City, the oldest and most interesting for sightseeing is Mexico 85. It starts at Laredo, Texas, traverses native villages and colonial cities in the tropical lowlands, then climbs spectacularly through the mountains to the central plateau. Mexico 85 is the shortest but not the fastest

POPULAR MECHANICS

road because of its many twists and turns. Counting time out for many pictures it's easy to spend two and a half to three full days on this road.

The "speed" road is Mexico 57 that starts at Eagle Pass, Texas, and more or less parallels Mexico 85 all the way to Mexico City. Its 818 miles can be driven in as little as 15 hours. The road detours most centers of population and has no major grades.

Mexico 45 leads south from El Paso, Texas, through desert and flat agricultural areas that have little interest until after Durango is reached. Because of its lack of grades it is a good road for house trailers. Distance from El Paso to Mexico City is just under 1300 miles.

The west coast road, Mexico 15, from Nogales in Arizona is almost 1500 miles long. It touches the Pacific at several points and then climbs easy grades to Guadalajara and the interior.

You won't find "typical" Mexico close to the U.S. border on any of these four highways. The farther south you go the more interesting the land and its people become. Many tourists drive south on one highway, return north via another. Or they make a circle tour in the area of Mexico City and use one of the new cross-routes to return to their original highway. One of the newest of these cross-routes now connects

Durango in the interior with Mazatlan on the Pacific. It is a highway that almost "couldn't be built"—one of the most spectacular mountain highways on the continent. For miles it is cut into the side of a sheer rock palisade 1000 feet or more high.

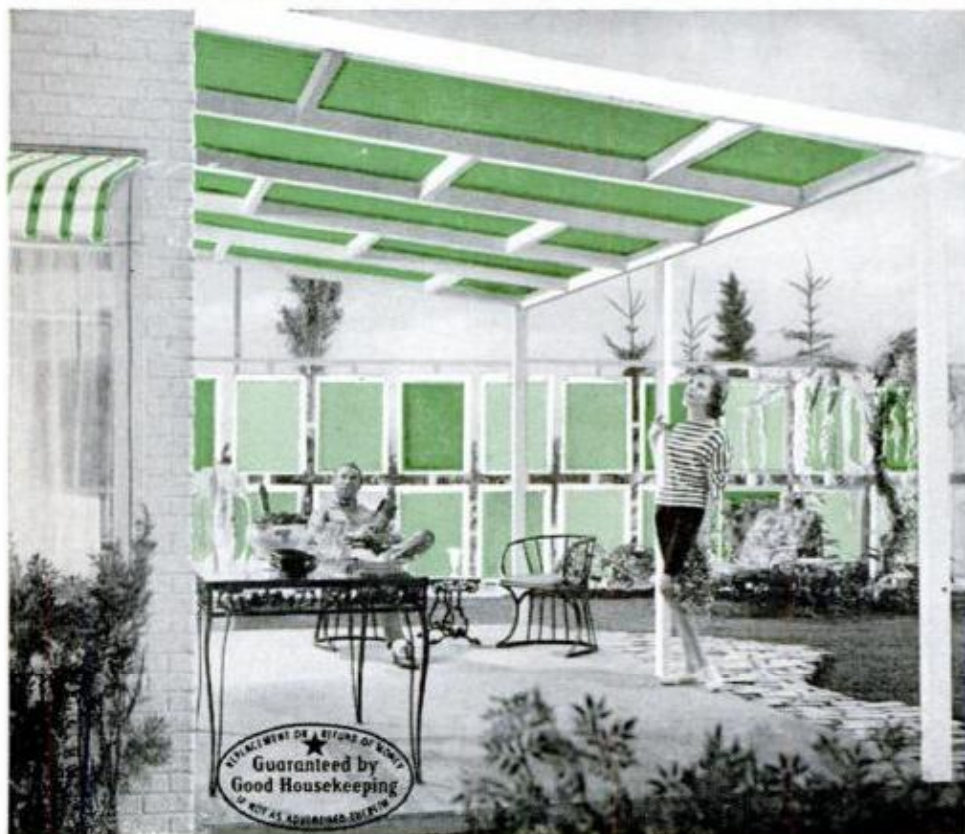
What To Do. Simple sight-seeing is almost enough in Mexico on your first trip because there is so much to see. From the squalid thatch-roofed mud villages of the lowlands to the fabulous buildings of the University at Mexico City the whole country is a land of contrasts.

One of the things to see, in fact it's hard to avoid seeing a few of them because of their number, are the pyramids, temples and other ruins of the civilizations that existed in Mexico thousands of years ago. The central portion of Mexico City itself rests on ruins which in one area have been opened up for visitors to see. Archeological maps of Mexico actually show more ancient sites than the number of cities and towns that exist in the country today.

There are bullfights in most of the principal cities, as well as other spectator sports such as jai-alai and horse racing. You can deep-sea fish off such coastal tourist centers as Tampico and Mazatlan. Hunting expeditions can be arranged. Information on all such subjects can be obtained from motels and hotels. ★ ★ ★

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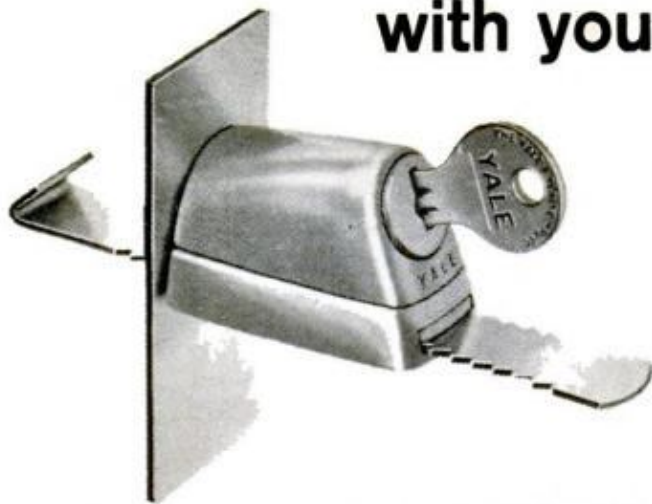
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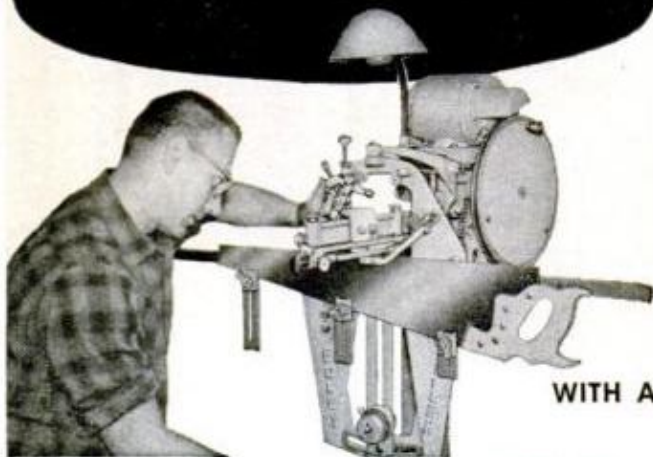
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Floor Finishing

(Continued from page 157)

the sanding drum in one spot while it's running; this could gouge out a pocket you won't be able to level off.

After removal of the old finish with coarse paper, two finish-sanding operations with finer papers are required. This insures a good, smooth surface, a "must" if you want a first-class job. After sanding, remove all excess dust with a vacuum cleaner.

Final step is application of the finish. Whatever product you've chosen, you'll get best results if you follow manufacturer's directions to the letter. Unless instructed otherwise on the label, use a paint roller with an extension handle to apply the finish. You'll do the job faster, easier and better. Lightly hand-sand with fine paper between coats to cut off any raised grain.

How long will the job last? Depends on the type of finish used, amount of traffic and how the floors are maintained. If manufacturer's recommendations are observed, most types of finishes will give several year's service under average traffic conditions. The harder, synthetic resin types will probably last longer with least care, especially those which require no waxing.

A point to remember is that resanding need never again be done provided the finish is not allowed to wear off down to the bare wood. When worn spots begin to show in heavy-traffic areas, "blend-patch" by applying another coat of finish to these spots. This way, you can end shabby floors—and major refinishing—forever. ★ ★ ★

Kodak Introduces Faster Kodachrome Color Film

Kodachrome II, a new, faster version of the venerable color film, Kodachrome, has been introduced by the Eastman Kodak Co. With an exposure index of 25 for the daylight type and 40 for Type A (photoflood), Kodachrome II is less grainy than Kodachrome, has lower contrast and higher latitude, produces more saturated colors and has a thinner emulsion for increased sharpness of the image.

Kodak will continue to produce the slower Kodachrome, presumably for as long as there is a demand for it. Kodachrome II will be priced slightly higher than the present version.

It will be available in the same sizes as Kodachrome, with the exception of 50-foot rolls of 16-mm. movie film. Sizes include 35 mm. and 828 for still cameras and 8 mm. and 16 mm. for movie cameras. There are no plans to introduce a Type F Kodachrome II for flash.

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108

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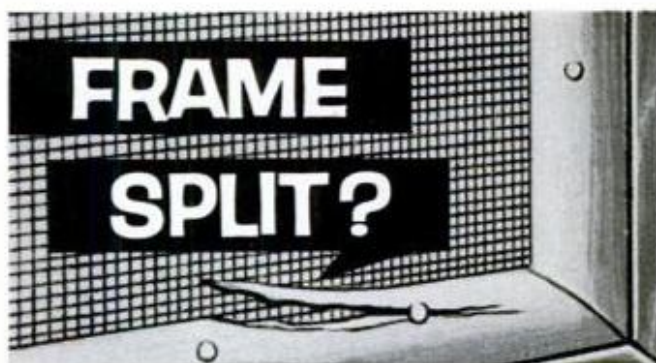


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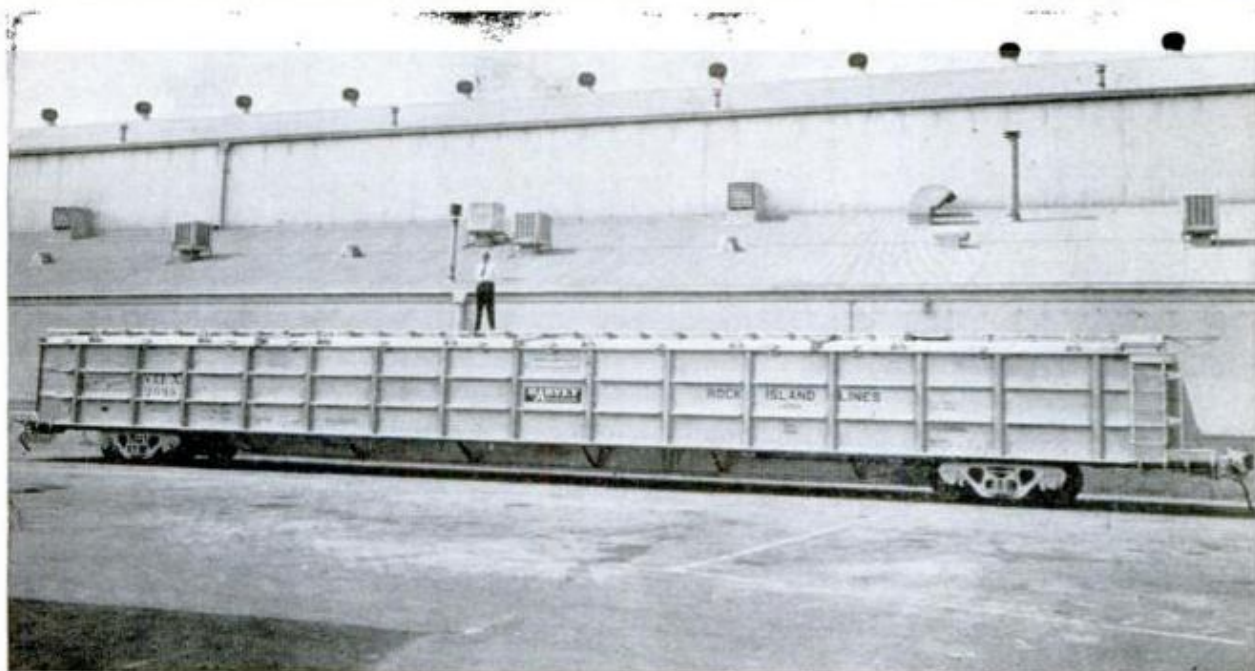
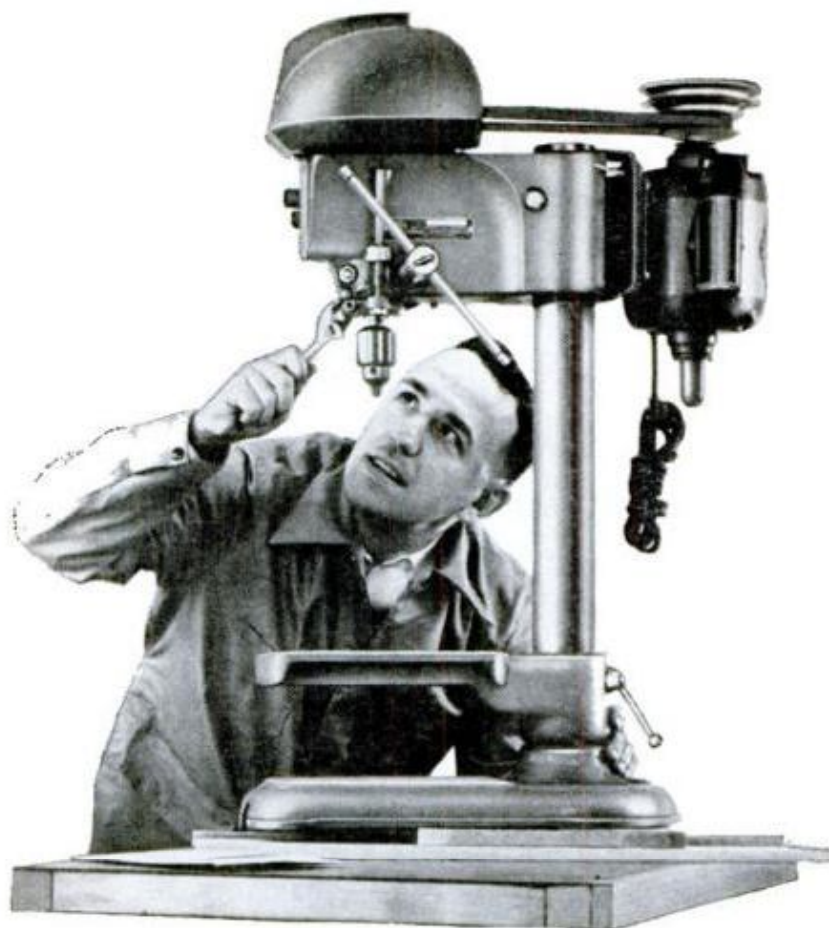
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The body is formed by six huge aluminum extrusions. 82 feet long by 25 inches wide. Three of these channel sections are stacked one atop the other and joined to form a side. Panel-type extrusions make the four 20-foot sections for the roof. Overall weight is 75,900 pounds.

Civilization Comes to Antarctica

(Continued from page 109)

Hugh B. House were making biological investigations through the ice of fresh-water lakes 80 miles west of McMurdo. To their amazement, temperature readings showed some water beneath to be 71.6 degrees F. Why? No one knows.

Antarctica's ice cap, which comprises 90 percent of all the ice in the world, still holds secrets. The gigantic polar ice cap flows constantly off the continent—like pancake batter spreading on a griddle. At Little America, Dr. A. P. Crary laid out a two-mile line which he checked each day for a year. At the end of that time, the line had stretched 14 feet.

Through the winter night at all our bases, scientists monitor the night sky, collecting data on aurora and ionosphere. Weather or no weather, meteorology balloons fly aloft on schedule, with dangling radiosonde that sends back temperature, humidity and pressure from high altitudes. Luis Aldaz, last season's scientific leader at Byrd, and his assistant Bill Freyerharm, got one up to 125,000 feet for a record.

Strange Hisses. Dale Reed, from Halliwell-Stanford, spent the winter night in Byrd Land listening to "whistlers"—radio interference noises like wolf whistles—that follow the earth's lines of magnetic force. "They originate as lightning strokes around Hudson's Bay," he says. "There were other sounds, too, not described in literature—roars, hisses, risers—a regular zoo. We don't know yet where they all come from; perhaps particle clouds from the sun."

Across a volcanic ridge south of McMurdo, Lt. Cdr. James Lennox-King of the Royal New Zealand Navy runs his country's Scott Base. This is a tidy arrangement of prefabricated structures interconnected by arched steel tunnels. Hillary and Fuchs headquartered here during the Trans-Arctic Expedition. The "whistler" expert at Jim's camp has calculated that lightning noise travels a 428,000-mile path to Antarctica from Unalaska in 2.8 seconds. Aurora men at Scott have traced the oxygen, nitrogen and sodium lines in the aurora australis. "The job," they explain, "is to tie up physical chemistry with what's going on in the sky."

In a hut on the slopes of Observation Hill, overlooking McMurdo, you can stop in on Dr. Hugo Neuberg. Here in a pile of lead bricks, surrounded by some \$20,000 worth of electronic recording equipment, Hugo is counting the low energy cosmic particles pouring in from outer space through the polar funnel of Earth's magnetic field.

"Here we get four times the count you'd

get at the equator," he says. "There's a similar setup across the continent, and we compare notes during scientific radio round tables every month. It's all basic study for use later—perhaps in space travel," Hugo says.

Spiders and Squid. This season, Dr. Donald E. Wholschlag of Stanford set up Antarctica's first real biology lab at McMurdo. Happily, five miles south across the barrier, Dr. Willis Tressler, a gray-bearded patriarch from the Navy's Hydrographic Office, had dug a four-foot-square hole through 25 feet of ice. Over it he erected a building complete with heat. He uses it for taking bottom samples and measuring deep currents and stratified temperature layers.

Through this hole, Wholschlag's team has brought up brittle starfish, urchins, sea spiders and squid. The marine creatures go into spinning aquariums enclosed in—of all things—refrigerators. "The sea life must be kept in cold water, but it can't freeze up," Wholschlag points out. "The refrigerators keep them at a constant cool temperature, but unstuck."

By spinning the containers, the fish must work to stand still. Hence, they consume oxygen from the water. "By measuring the diminishing oxygen content," explains the scientist, "we can calculate the fish's consumption and get his rate of metabolism. Antarctic fish have a high metabolism rate, and may grow a foot in five years."

One of Antarctica's mysteries was that no one had ever found a big fish in the surrounding waters. In 1912, Captain Robert Scott's expedition found the remains of what appeared to be a five-foot headless fish on top of the ice—a fact that also baffled scientists.

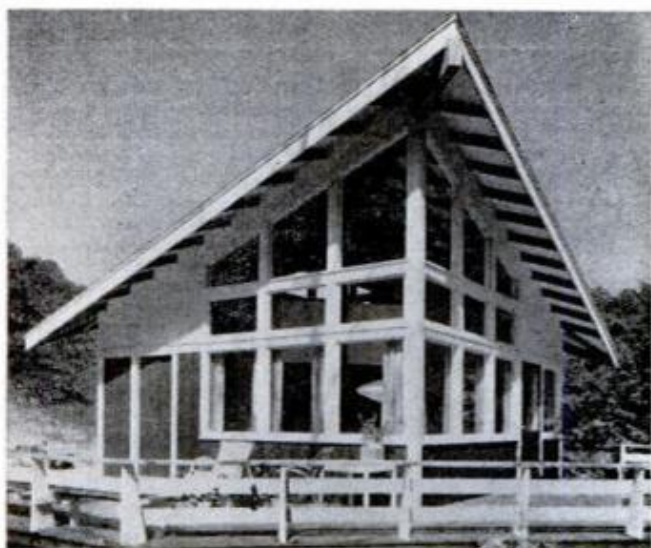
This summer Dr. Frank Debenham of Cambridge, and Dr. Charles Swithinbank of the University of Michigan, excitedly sledged into McMurdo with a load of giant frozen fish. "We were out measuring ice movement on the Ross Shelf, some 50 miles south," reported Swithinbank, "when suddenly we saw a whole group of fish frozen in the ice. Then we found more on the surface—along with sea bottom sponges and delicate coral in perfect condition."

The discovery led Debenham to propose that the Ross Ice Shelf may be freezing from the bottom and that, as it ablates from the top, anything frozen in it works its way to the surface. "From the ablation rate, we can guess our fish must be 200 or more years old," he says.

Most curious scientific endeavor of the year in Antarctica was conducted by Dr. Karl Hamner of the University of California. With two researchers, 22 hamsters,

(Continued to page 226)

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AMERICAS FINEST
BASEMENT DOOR

jugs of cockroaches, fruit flies, mold fungus and beans — as well as an assortment of queer cages and equipment, Dr. Hamner (soon dubbed Dr. Hamster) flew to the South Pole. There he set up his plants and animals on 36 turntables. Some rotated counter to Earth's motion at the same speed — so that the living things were stationary in space. Others went faster or slower; some turned with the earth as controls. Object: to find if the rotation of Earth had any effect on the biological clocks of living things.

Built-In Clocks

"Plants flower in season," Dr. Hamner explained to me, "birds migrate at the same time every year, hamsters go to sleep and get up at precise times. Regular growth cycles indicate that living things have built-in clocks. Except in a few instances we haven't discovered what cues them off. At the South Pole we will be able to tell if Earth's rotation has any influence." Later Dr. Hamner came up with the answer. No effect.

The manner in which plants and animals around Antarctica's rim store and use precious energy has always been a mystery to scientists. The little Adelie penguins, for instance, go for weeks without eating during nesting season. Even more amazing are the three-foot-tall Emperors, who hatch out their eggs during the winter night when temperatures cascade to 70 below zero along their coastal rookeries. These fellows often sit in drifting snow up to their beaks, holding the egg on top of their feet, covered only by a fleshy dewlap at the base of the penguin abdomen.

This year at Cape Hallett, researchers under the direction of Dr. Kurt Schmidt-Nielsen of Duke University, studied salt gland development in young penguins. They also explored changes in salt and water balance of the Adelie during the 40-day starvation period while eggs are incubated. What they learned may some day enable physicians to understand more about kidney diseases in which the body fails to excrete salt.

But no one has yet explained the penguin's incredible stamina. Last year, five Adelies from a rookery on the Wilkes Coast were banded and flown to the opposite side of the continent. Since penguins are known to come back to the same nest each year, scientists wanted to see what would happen. This year, all five of the birds were back home—having transited sea and pack ice for a distance of 2500 miles.

There's still plenty to learn about Antarctica. Scientists there say it is just beginning to get interesting. ★ ★ ★



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CAMPBELL-HAUSFELD

Are We Licking Our Missile Fizzle?

(Continued from page 69)

later tested on the ground. All of them blew up. The plastic liner inside the rocket case had deteriorated, allowing flame to travel too fast. Design was changed.

Discoverer VII. Orbited but a power inverter failed, preventing capsule recovery. New solid state inverter was designed, has given no trouble.

Discoverer VIII. Orbited but second stage motor fired too long, causing extended orbit. Capsule overshot the target area.

Discoverer IX. Hot gases burned through instrument line in first stage, causing motor to shut down. No orbit.

Discoverer X. Poor gyro caused fishtailing. Vehicle was destroyed 56 seconds after launch by range safety officer.

Discoverer XI. Orbited but one of the stabilizing spin rockets on capsule failed to fire. Capsule followed wrong trajectory. Spin rockets have since been replaced by jets of gas from pressure bottle.

The 12 Most Significant Aircraft of All Time? See which ones the experts choose, in the June issue. Includes action portraits in full color.

Discoverer XII. No orbit. Bad gyro was suspected because bird kept dipping its nose until it went in. But telemetry reported that gyros did what horizon scanner told them to do. A duplicate instrument package was placed on the bench and studied. It was found that the horizon scanner circuitry was sealed against dirt but was not shielded against possible radio interference and that it was being affected by signals from the nearby telemetry antenna. Poor design, human error. Circuit is now shielded.

Discoverer XIII. Orbited. Water recovery of capsule accomplished.

Discoverer XIV. Orbited. Aerial recovery of capsule accomplished.

Discoverer XV. Orbited but capsule landed in water outside recovery area.

Discoverer XVI. No orbit. Second stage failed to separate because of imperfect timer that had passed previous tests.

Discoverer XVII. Orbited. Aerial recovery of capsule accomplished.

Discoverer XVIII. Orbited. Aerial recovery of capsule accomplished.

Discoverer XIX. Orbited. Recovery was not planned. MIDAS infrared detection apparatus operated as expected.

Discoverer XX. Orbited.

(Continued to page 230)



WITH A FLAT ROOF that's ideal for carrying skis and a wide-open design that takes advantage of breezes, the Fiat Caprera is a car for the outdoor enthusiast. The car is shown as it went on display in Turin, Italy



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PROVIDENCE 2, R. I.



Of the 20 shots listed here, seven were perfect. Four were incomplete because of human error, nine were incomplete because of faulty equipment. That is, more than half the failures were equipment failures. Yet aside from the deteriorated plastic liner, all the equipment had previously worked perfectly. One reason for the failures is that not everything is known as yet about the conditions of vibration, acceleration, vacuum, weightlessness and other factors that occur in flight. And another reason is that a complex mechanism always gives more trouble than a simple mechanism.

The consensus of many engineers is that rocket systems can be simplified, and must be. They say that too many people in the missile business love to design unnecessarily complicated structures and circuitry. They tell the story of the chief engineer who was appalled when he saw the "sophisticated" sequence timer that one of his groups had proudly designed.

"Gentlemen," he said, "I want all of you to look at an ordinary household washing machine. It has a timer that turns the water on and off, spins the bowl, drains the rinse water, whirls the clothes dry and shuts down the machine. The timer is simple, cheap, reliable. Use it as a model."

I Fly Kites With the Champ. The daughter of a champion kite flyer reveals some of the secrets of this exciting sport. Here's your chance to meet Indian fighting kites, giant space kites that take three men to handle, stickless kites and others. You'll find the story, complete with plans for building some unusual kites, in the June issue.

The authors of the recent book "The Crisis We Face" call for a new mental attitude on the part of designers, industrialists and government officials. They say there is great danger in supercomplexity. As an example they cite our missile systems as being too complicated to be reliable.

One of the problem areas in rocketry is electronics, and it's no wonder. Some electronic systems are so marginal that they are backed up by other, parallel systems. If the first one fails, maybe the second or third one won't. This is waste-making philosophy at work.

Here's how one control system is described, slightly reworded for brevity:

"More than seven miles of wire interlace a dozen systems made up of 10,000 components. All this is crammed into a space smaller than a phone booth. Space and weight are at a premium. The maze of circuitry feeding off primary and secondary

(Continued to page 232)

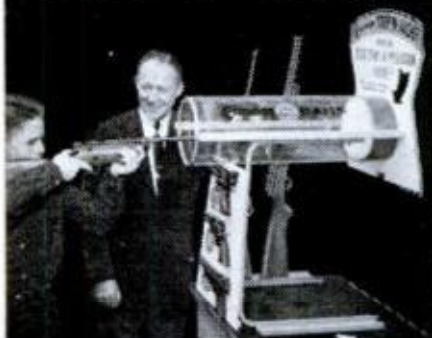
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RIVERLIN WORKS MILLBURY, MASS.

power sources presents electronic problems called 'glitches.' A 'glitch' is a minute change of voltage in a wire which is enough to trigger another system out of proper sequence."

Possibly it was a "glitch" that caused one big ICBM to commit suicide. The enormous bird was fueled and ready to go, secured to its pad only by the four explosive bolts that would hold it down while the first stage was developing full power. Everything looked good and in the blockhouse the final button was pushed, taking the rest of the countdown out of the hands of the human crew.

The first stage ignited and ran up to full thrust. An automatic sequencer began a final check of the missile's many components. At that moment the release circuit prematurely operated and exploded the hold-down bolts. The missile slowly lifted off the pad. Meanwhile the sequencer had interrogated the gyros and found that one of them was sick. As it was supposed to do in case of trouble, the sequencer automatically shut off the motor. By now the missile was 10 feet in the air.

It collapsed in a fantastic explosion, wrecking the whole launch area.

Since then the automatic launching circuitry has been redesigned. No longer can the motor shut down, once the bird is on its way. Destruction is left to the range safety officer if necessary. He can blow it apart miles downrange.

Fortunately, a trend toward simpler design is beginning to appear. Rocket-propelled vehicles always will be complicated, of course; but with simpler components where possible we can expect much better reliability in the future.

It's encouraging to note that, out of the last eight *Discoverer* satellite shots previously described, only one failed to orbit. Perhaps our mishaps are well on the way to becoming memories. ★ ★ ★

QUOTE:

"Nuclear power is a must—especially for deep interplanetary flight. We know now that chemical rocket fuel will be impractical for manned space travel beyond the moon. Our capability of establishing a large base on the moon or conducting interplanetary expeditions in the late 70s and 80s depends on the development of nuclear-propulsion systems and auxiliary-power systems in the 60s and early 70s."

—KRAFFT A. EHRLICH, rocket scientist, Convair (Astronautics) Div., General Dynamics Corp.

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Popular Mechanics, 206 E. Ontario St.
Chicago 11, Illinois



Owners Report on the Comet

(Continued from page 75)

"Squeezing my six-foot-two frame into this car is no problem."—California dentist.

"I carry quite a few people around and the rear seats leave plenty of room for leg stretching."—Michigan pharmacist.

"I am over six feet tall but the Comet is easy to get into and leaves me plenty of headroom besides."—Illinois machinist.

"Economy has been a sore point with me for years but the Comet I bought averages 24.2 miles per gallon at 50 miles per hour."—Nevada retiree.

"My job takes me on day-long trips at 60 to 75 miles per hour and this car averages 19 miles per gallon on regular gas. I travel 50,000 miles per year and it has cut my car costs in half."—Texas factory representative.

These high-mileage boys are the ones who get real dividends from ownership of a compact. Cost per mile goes way way down.

"My new Comet beats all the cars I've owned on gasoline economy."—Virginia government worker.

Detroit has not produced the "perfect" car yet, and Comet is no exception. Here are the five most common complaints in the order of frequency of mention.

"The dealer assured me I'd get 22 to 24 miles per gallon with automatic and the 101-horsepower engine. Despite a complete checkover, I'm still doing no better than 14 miles per gallon."—Ohio drug clerk.

He must be doing all of his driving in stop-and-go traffic, because this is way below average, even for the big-engined model equipped with automatic transmission.

"My only complaint is gas mileage. The dealer checked it out and insists I'm getting 23 miles in city driving. I can't agree."—N. Carolina pressman.

"Terrible gas mileage. I drive mostly in town and get only 10 miles per gallon. It has been in the garage three times and it is still no better."—Iowa editor.

"I just don't like the 13-inch wheels. I think the car would give better mileage and look much better with larger wheels."—Michigan retired fireman.

"I'd much prefer 14 or 15-inch tires."—Vermont government worker.

"Should have wheels one inch larger."—W. Virginia postal worker.

"I don't like the 13-inch wheels since they rotate faster and wear out faster."—New York technician.

The New Yorker is partly right. The smaller circumference of the 13-inch tire will touch the road more often and wear faster. However Comet's lighter weight (compared with full-sized car) reduces wear. On some compacts,

body dimensions do not permit larger wheel housings needed to give clearance to 15-inch wheels.

"Why didn't they equip the gear-position selector with a light? In the dark finding the right gear turns out to be a guessing game."—California personnel director.

"I wish they would put a light on the automatic's shift control so I could tell the difference between low and reverse in the dark."—Washington D. C. telephone operator.

"This is a sweet little car but the 170 hp. motor is too much for the weight of the car. Also, the two-speed transmission should be changed to three."—New York machinist.

He's so right. An intermediate ratio in the Comet's automatic would give better performance and slightly better fuel economy to boot.

"I wish the salesman had informed me about the 101 hp. engine. The one I have is not good enough on hills and could be peepier."—New Jersey office manager.

"The regular engine is not powerful enough, especially with a two-speed transmission."—Maryland employment supervisor.

"Not enough legroom in front seat for tall drivers who like to stretch out their legs."—Alabama engineer.

"Not enough legroom in the back seat."—Illinois engineer.

"The back seat is too cramped for legroom."—Virginia lawyer.

Now, for some more items on the plus side. Here are the best-liked features ranking six through twelve.

"It rides like a large car, yet is small enough to park and handle with ease."—California sales promotion manager.

You don't get a feeling of ungainly size when maneuvering Comet.

"I appreciate its habit of hugging the curves and the ease with which I can park it."—Minnesota engineer.

"Where parking is concerned, this is the best yet."—Ohio plasterer.

"It is small yet still affords enough room for six people."—W. Virginia florist.

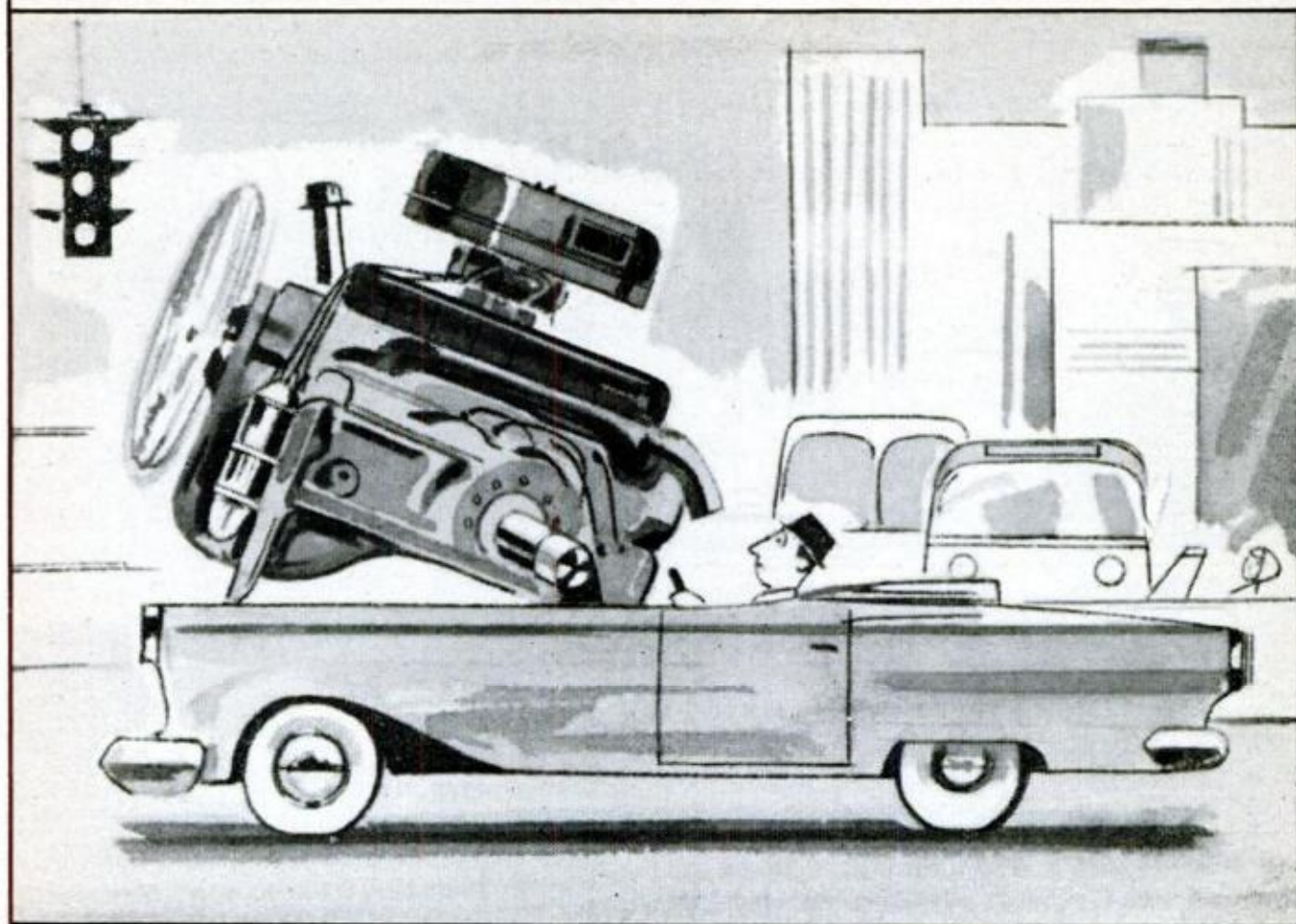
"It is of a perfect size—I would not want one smaller than the Comet—still it gives a big-car ride, has enough room for six people and has a good, large trunk."—Florida stock broker.

"Our new Comet fits our needs beautifully. It is small enough to drive easily, yet large enough for a family with four children. I am very happy with it."—Massachusetts housewife.

"This is an excellent compromise between power and room on one hand and economy and handling ease on the other."—California teacher.

(Continued to page 236)

What to do about excessive driving costs . . .



50% of your driving time

Your engine is too big for your car

“Easy” driving is hard on cars—actually costs you more! In traffic, for instance, you’re using only about 1/10 of your horsepower. That means incomplete combustion and gasoline waste—sludge build-up—excessive engine wear. Result: total driving costs skyrocket!

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"Has plenty of get-up-and-go when you need it."—New Jersey repairman.

"Shifts gears quickly and picks up speed fast."—Ohio machinist.

"Having traded 'up' in horsepower, I particularly noticed the increased pep of this larger (101 hp.) engine."—Michigan banker.

"Don't need to 'rubberneck' to see where I'm going. Visibility is excellent."—Ohio salesman.

"Plenty of good, clear, unobstructed visibility."—Pennsylvania lineman.

This is true up to a point. The stylish rear panels of the roof, a la T-bird, are "blind" and mar an otherwise excellent visibility picture.

"Back-seat passengers can see out of the windows with no difficulty."—N. Carolina conservationist.

"Cheers for the nice big luggage compartment."—Texas dietitian.

"In my line it is necessary to carry a lot of tools and equipment and I appreciate the ample luggage compartment."—Florida vending-machine servicer.

"Just like driving with power steering—only cheaper."—New York housewife.

"My Comet performs very well in heavy snow."—Massachusetts messenger.

"So far it has given me excellent handling in snow—almost as if it had four-wheel drive."—Virginia banker.

None of the people who endorsed Comet's "snow-go" ability mentioned whether or not they were using snow tires or chains. PM's test Comet tended to spin on its standard road tires.

"My wife drives this car to work every day and despite heavy snowfall hasn't been stuck yet. Also, the car hasn't failed to start even at 15 degrees below."—Ohio farmer.

Back to the complaints—here in order of frequency are items six through twelve.

"I suppose I should have expected it in a light car but I still don't like the fact this car skids very easily."—Montana rancher.

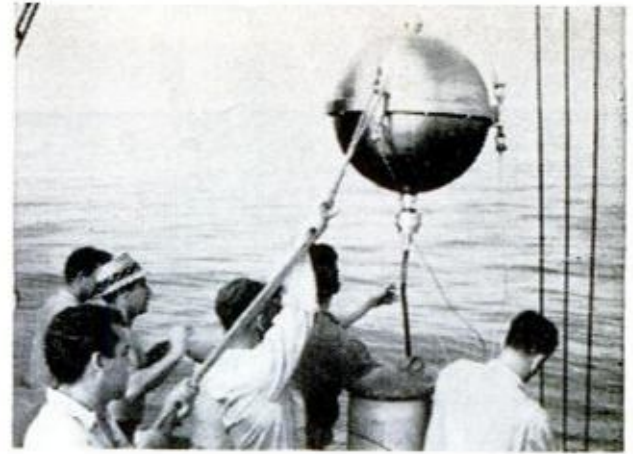
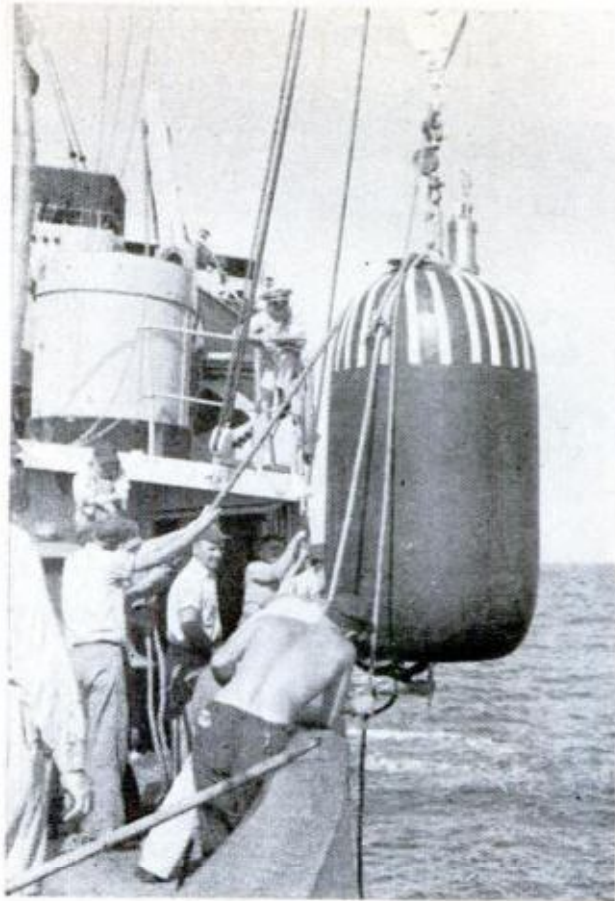
"Why can't they make a small car with a quiet engine? This one is far too noisy."—Ohio clerk.

"The engine runs too fast in first and second to attain necessary speed—sounds like an egg beater."—California machinist.

Here is a car that could use a free-wheeling, temperature-controlled fan which would revolve and make noise only when water temperature was over 185° F.

"With high-speed motor, due to automatic transmission, car reminds me of the old Dyna-Flow Buick. Sounds like it is doing 50 m.p.h. instead of 25."—Minnesota teacher.

(Continued to page 238)



SPHERE and ballast anchor, above, go down first, followed by their gasoline-filled recovery "balloon"

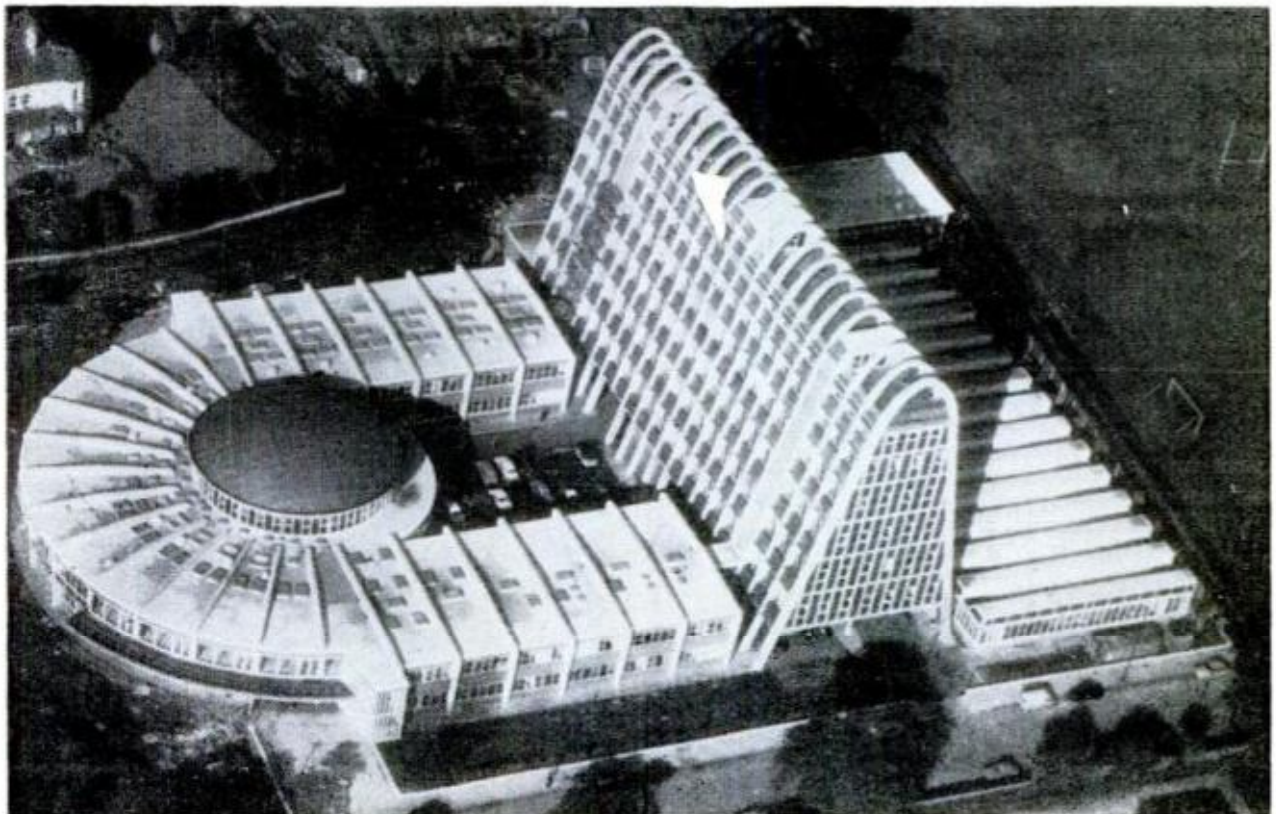
"Sea Satellite"

Working like an unmanned high-altitude research balloon—but in the opposite direction—the Navy's new "sea satellite," Deep Dip, is dropped into the ocean and sinks quickly to the bottom with its load of sensing devices and recorders. At a preset time, the ballast is dropped, and a gasoline-filled flotation bag buoys the sphere to the surface and radios for recovery.

From Baking to Wig-Making Under One Spectacular Roof

Five separate departments of the Domestic and Trades College of Manchester, England, formerly scattered in separate buildings, have been combined under this one

spectacular roof by architect Leonard C. Howitt. Curricula vary from cooking and baking to wig-making; there's even a restaurant to be manned by student chefs.



SAW SHARPENING IS EASY

Super Filer No. 11 joints and sharpens hand and circular saws 6" to 10" with all teeth correct in height, depth, pitch, bevel. When file hits steel roller, teeth are finished. Saw runs true with no side pull. Includes 8" file. **\$9.95** PPD.

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ADJUSTS TO YOUR
WINDOW LENGTH

SIZES	METAL	ALUM.	METAL—5 STAGE BONDERIZED GRAY ALUMINUM—DARK GREEN, CHROMATED
27" to 39"	\$4.95 Pr.	\$7.45 Pr.	
43" to 63"	6.15 Pr.	9.90 Pr.	
48" to 70"	8.55 Pr.	13.20 Pr.	

PLUS PARCEL POST CHARGES. ENCLOSE CHECK OR MONEY ORDER WITH ORDER TO:

ADDINGTON CO., BOX 205 ADRIAN, MICH.

FORGET about COST & BOTHER

of "GREASE JOBS"



... for as little as

\$22.95

NEW WALKER LUBRICATION SYSTEM
"GREASES" YOUR CAR **AUTOMATICALLY**
EVERY TIME YOU START ENGINE!

Now you, too, can enjoy the convenience of full-time, automatic pressure lubrication. Patented Walker Lubricator cuts repairs... keeps your car riding and steering like new *always*. Easy to install, fully guaranteed, pays for itself.

WALKER *PRICE RANGE—\$22.95—\$28.95—\$36.95... for information on your car MAIL COUPON TODAY!

WALKER MFG. CO.
Racine, Wis., Dept. P-571M

Send **FREE** ... installation diagram and estimate on vehicle described here:

Make of vehicle..... Year.....
Automatic Transmission: Yes..... No.....
Power Steering: Yes..... No.....
Engine: 6 Cylinder..... 8 Cylinder.....

NAME.....
ADDRESS.....
CITY..... STATE.....

DEALER INQUIRIES INVITED

"Too much engine noise in the interior."
—New Jersey salesman.

"Manual transmission shift could be smoother and starting easier."—Wyoming sales manager.

"I like a stick shift but this one is a bit too stiff going from 1st to 2nd."—Missouri truck driver.

"Takes muscle going from low to second gear."—California government worker.

Several Comet's that PM has driven had sticky manual shifts. Let's hope that the factory has a hurry-up "fix" on the way.

"This is the only car I've ever driven that demanded double clutching in order to make second gear."—Kentucky electrician.

"Have all kinds of trouble getting into second gear. Dealer claims it was designed that way."—Pennsylvania salesman.

"I own a four-door sedan and have a lot of trouble getting my feet out of the back seat."—Virginia government specialist.

"This car is too hard to get in and out of."—Illinois drill-press operator.

"We long-legged folk have a good deal of trouble getting in and out of a car like this one."—California physician.

This is true, at least in the case of the rear door of sedans. Comet uses same basic door as Falcon although there's space for a wider door due to Comet's longer wheelbase.

"Combination of low floor and high door sill makes problems when it comes to getting in and out of the Comet."—Vermont housewife.

"The Comet is too light for its size—hard to handle on ice and in high winds on the turnpike."—Pennsylvania student.

"Too light for comfortable higher-speed highway driving."—Indiana nurse.

"The driver of this car has his hands full fighting the wind. The car seems to want to 'take off'."—Florida technician.

"Despite 'unit-construction' advertising, the Comet still has its share of squeaks and rattles."—Ohio sales manager.

On PM's test Comet there were minor chirps from the door latches when car was taken over very rough road surfaces. Otherwise the unit body was tight and quiet.

"There's a lot of noise coming from the front suspension of my new Comet."—Tennessee lawyer.

"I can hear the scrape of shoes on the drums every time I apply the brakes."—Michigan scientist.

"Brakes let out with a loud squeal when applied hard."—Tennessee accountant.

This seems to be a problem for some Comets but not the majority. Brakes work well in spite of the squeal.

(Continued to page 240)



**HULL
AUTO COMPASS**

ILLUMINATED BY TINY,
REMOVABLE FLASHLIGHT

THE
BATTERY-LITE

\$6.95 STANDARD COLORS
\$7.50 SILVER OR BRONZE

- A quality compass in your car for SURE directions.
- Lighting unit slips out for use as emergency flashlight.

See Hull Beaconlite, Streamline and new Battery-Lite Models at your dealer's or write for lit.

HULL MFG. CO.

P.O. Box 246-D-5, Warren, Ohio

Works in seconds!



**Loosens Rusted Bolts
nuts, screws, "frozen" parts!**

**LIQUID
WRENCH**
SUPER-PENETRANT

The super-penetrating rust solvent that quickly loosens rust and corrosion.

AT ALL HARDWARE
AND AUTO STORES

RADIATOR SPECIALTY COMPANY
CHARLOTTE, N. C.



World's THRIFTIEST Light Plants

700 Watts, push button start, 115 v. 60 cyc. AC. 2.2 HP, easy starting Briggs eng. No wiring necessary; just plug in and operate. Plenty of current for any oil burner, freezer, brooder, emergency lights, etc. which require up to 700 watts. Ideal for television and radios. Complete with voltmeter and built-in winding to charge auto batteries. (Item 24) Wt. 75 lbs. Easily fits in car trunk. Be prepared if storm knocks out power lines. Reg. \$275... \$149.50
1500 Watt Plant (Item 45) same as Item 24 but larger generator and engine with 50% greater output... \$199.50

ELECTRONIC BRAIN IDLER Now Available On All Our Plants—Write
MASTER MECHANIC MFG. CO., Dept. A-561, Burlington, Wis.
Southern Customers Order from Dept. A-561, Box 65, Sarasota, Florida

Any man will enjoy new

**AIROGRATE
YELLO-BOLE**



1. Smokes sweeter!

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

2. Smokes drier and healthier!

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

3. Smokes cooler!

Air-vented chamber draws in fresh air. Aluminum fins and shank throw off heat, cool the smoke.

Famous honey-lining!

\$295

Extra interchangeable bowls — \$1.50 each

"Icepak" Set—Airowrate Yello-Bole Pipe plus two extra bowls, \$5.95

Other Yello-Bole Pipes, also of imported briar \$1.95 to \$4.95

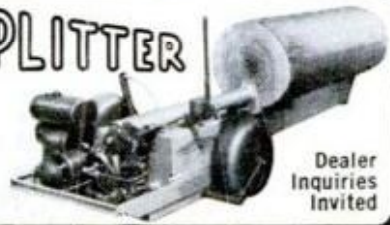
Send for FREE FOLDER, YELLO-BOLE PIPES, Inc., Dept. Y2, N.Y. 22

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 \$29 up. Sold direct from factory only. We furnish everything. Write for free details.
KELSEY PRESSES, Y-37 Meriden, Connecticut

LICKITY LOG SPLITTER

**Ends Wood
Splitting Drudgery**



Dealer
Inquiries
Invited

Smooth 18 ton hydraulic power splits big profits for you from the toughest woods, including American Elm. 7 HP trailer unit squats under own power to receive large logs without "dead" lift. Has 2 speeds, auto-shift and auto-stroke. 26" ram travel splits up to 34" lengths, any diameter—or, with extended frame and adjustable wedge, splits up to 52" lengths, any diameter. Write for details.
THE WACO AIRCRAFT CO., Dept. D, Troy, Ohio



Drill and Countersink Holes for Wood Screws in ONE Operation.

4 Bits 24 Combinations

\$1.70 PER SET

Parker

MANUFACTURING CO.
WORCESTER 1, MASS., U.S.A.

IMPERIAL Brush Cleaner



No mixing, no long soaking of brush. Leaves bristles like new—glossy, springy—never flabby. Effective on hardest caked paint and other finishes.

At paint and hardware stores.

● Send 25c for illustrated Refinishing Manual or write for free folder "Care of Paint Brushes." Wilson-Imperial Co. 118 Chestnut St., Newark 5, N.J.

FREE CATALOG!

TREMENDOUS SAVINGS ON HUNDREDS OF SURPLUS AND NEWLY MANUFACTURED ITEMS!

New 1961 edition contains over 50 pages of tools and equipment for farm, home, workshop, factory. Hydraulic equipment, pumps, motors, construction and diesel equipment and parts! Write for your FREE CATALOG Today.

GROBAN SUPPLY COMPANY
1139 South Wabash Ave., Dept G-5 Chicago 5, Ill., WEbster 9-3793



Sipping Satellite

Ingredients for soda-pop floats take on a refreshing new aspect through a transparent plastic ball which holds the ice cream and attaches to a pop bottle. Fizz-Nik is made by M. C. Glenn Co., Longview, Wash.

"My brakes have been squealing since I first bought the car and I can't keep them adjusted."—California insurance man.

"Front suspension rumbles on rough pavement."—Illinois technician.

Now for more items on the plus side, here are the best-liked features ranking thirteen through sixteen.

"My family and I are quite pleased with the workmanship. It is much better than that of most of the other high-priced cars we have owned."—Ohio mechanic.

"I have no kicks with the quality of the interior finish."—California newspaperman.

"The outside style is fairly pleasing, but its the workmanship and the lack of 'bugs' in this simple mechanical design that I like."—New York sales representative.

Comet's design is straightforward and without tricky items. It's a bit early to say how the car will wear as the years roll by and the miles pile up. But at this time prospects look good for a long happy life at the hands of average owners.

"I have had no trouble starting this car in zero weather."—Michigan printer.

"In below-zero weather this car has started and performed much better than any car I have owned."—Indiana photographer.

"I get quick, easy starts even in the coldest weather."—Washington D. C. nurse.

"Heater has a very good defroster-blower unit for clearing the windshield."—Illinois printer.

"I believe this car is very well constructed. It gives you a sense of rigidity and solidness when you close the doors or hood."—Illinois machinist.

"Seems to be very solid—something other compacts are not, in my opinion."—California executive.

"Very sturdy construction."—Oregon plumbing contractor.

Although the Comet could use some additional sound-deadening materials to make it even quieter and make doors "thud" shut instead of "slam," there's nothing tinny about the car.

"Has better workmanship than most of the other high-priced cars I have owned."—Ohio tool man. ★ ★ ★

Shield for Space Craft

An invisible shield is being developed to protect space craft from radiation by "blowing" dangerous electrons out of the path of the craft. Studies by Boeing scientists involve the use of an electrostatic field generator to repel electrons. The invisible shield, a negatively charged electric current, would repel other negatively charged particles such as electrons.

POPULAR MECHANICS



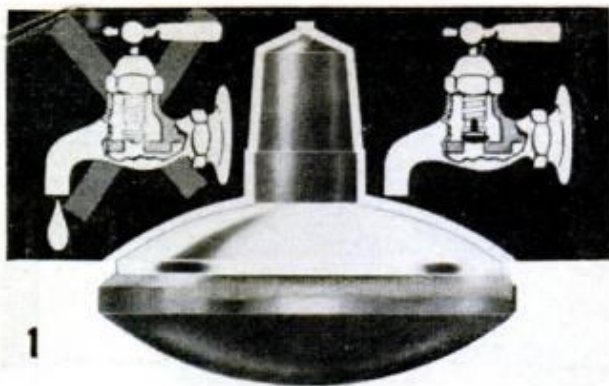
Italian Bathtub Folds Away in the Wall

Designed for installation in new, small apartments, a fold-away bathtub has made an appearance in Italy.

When not in use, the tiled tub is folded up in an attractive container that can be matched to room's color scheme.

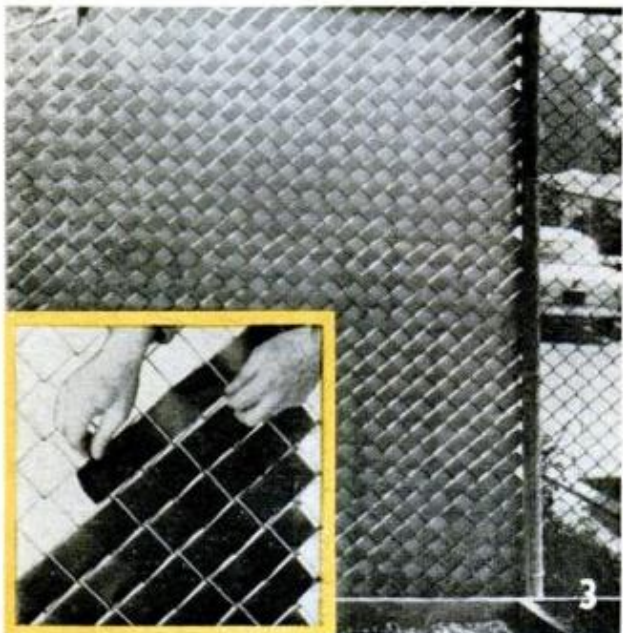


"It all started as an outdoor fireplace!"



1. LONG-LASTING SEAL replaces conventional faucet washer, prevents leaks for a much longer period of time. Seal has a bearing that permits it to turn independent of the washer seat, thus preventing wear on the seal as faucet is turned on and off. Available from Ever-Wear Seal Co., Box 592, Lake Geneva, Wis.

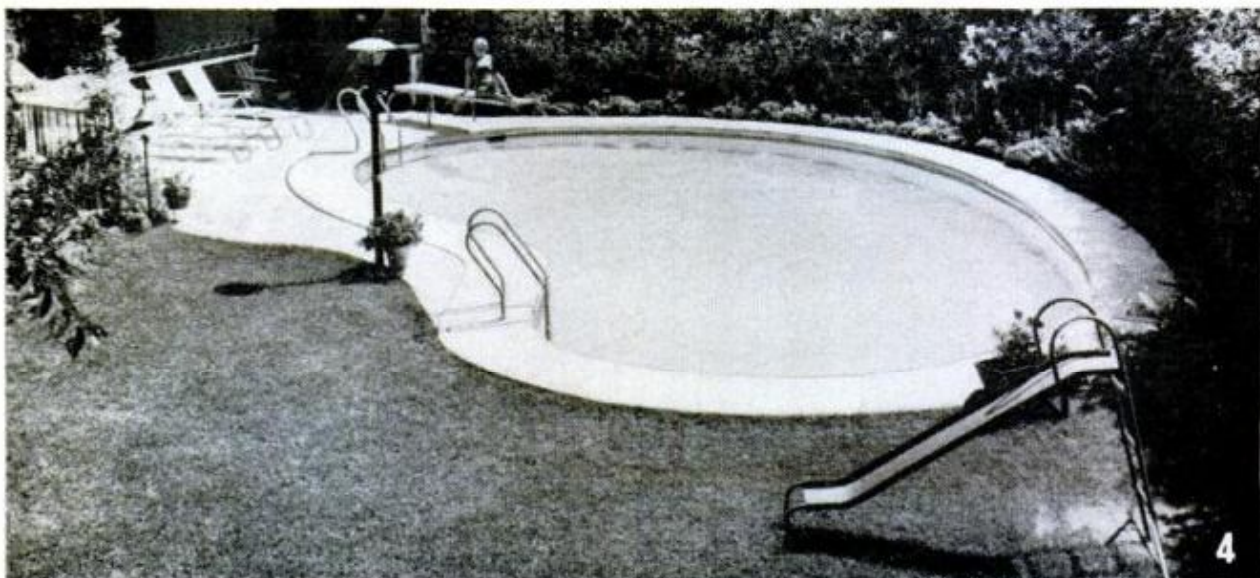
ON THE MARKET



2. RESILIENT FLOOR TILE are easily cut with scissors after soaking in warm water. This feature can be a real timesaver in that it prevents chipping and possible breakage, assures close fitting in rooms that may be slightly out of square. Made by The Mastic Div., Ruberoid Co., 500 Fifth Ave., New York, N. Y.

3. VINYL-COATED FIBERGLAS TAPE woven into the mesh of chain-link fencing gives you the basket-weave pictured. It's most attractive as it comes in just about any color you want. Gives your outdoor living area the privacy of an indoor living room. Comes at 11 cents a yd. from Bolton Industries, Box 502, Arcadia, Calif.

4. IN-THE-GROUND swimming pool has steel side-walls bonded to reinforced concrete bottom. Comes as a kit containing everything needed by do-it-yourselfers or can be installed complete by local contractor. Kit price for 18 x 36-ft. free-form pool is \$1850 plus installation. E. L. Bruce Co., Memphis 1, Tenn.





Don't blindfold him!

THE AWESOME-looking instrument in the picture above is an electron microscope. Through it, a cancer researcher can observe the detail of a cancer cell—magnified 100,000 times.

The microscope costs \$35,000 and was paid for by American Cancer Society funds—which support 1300 scientists, all working to find the cause of cancer, and its prevention.

Don't blindfold cancer research. Give to it. Send your contribution to CANCER, c/o your local post office.

AMERICAN CANCER SOCIETY



Electric Tile Remover

Removing floor tiles is as easy as turning pancakes with an electric remover developed by Roy A. Sutherland of Huntington Beach, Calif. The sheet-metal tool, the exact size of a standard 9 by 9-inch floor tile, heats and softens the tiles uniformly for easy removal with a broad knife.

MAY 1961

LIFT-PULL UP TO 2,000 LBS.

AVOID HERNIA, RUPTURE, BACKACHE

The strength of an elephant
in the palm of your hand...

This is a miracle hoist that lifts up, pulls up to 2,000 pounds—GUARANTEED! Concentrates its great strength on the same principle as a larger block and tackle, yet weighs only 13 oz. (no more than a large tomato). A finely engineered, precision device that provides 100 feet of 550 lb.-per-strand Nylon cord. Ratio is 7 to 1. Pre-lubricated steel axles, high grade tooled lifting slings, heavy duty welded steel rings.



Complete
in
Carrying
Bag, Only

\$12⁹⁵

UP TO
2,000 LBS.

For shop, home, business, vacation
Fits in your palm, pocket, glove compartment or drawer. Handy in a hundred ways, countless times a year. For lifting, hoisting, stretching fence, around boats, cars, etc.

LIFT, PULL, HOIST, FORCE LOAD, STRETCH—
WITH POCKET HOIST!

**SEND NO MONEY WITH ORDER
PAY POSTMAN NOTHING ON DELIVERY**

Try it for 10 days before you buy. If completely satisfied then send \$1.95 and pay balance at rate of \$1.00 per month for 3 months—No interest or Finance Charges Added. If not completely satisfied, return to us, no explanation necessary.

KAPNER, INC.
Dept. A-204, 1924 Washington Ave., New York 57, N.Y.
Please rush one Pocket Hoist. If satisfactory I will pay on terms specified. Otherwise I will return Pocket Hoist.

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

SAVE \$100 OR MORE ON TERMITE CONTROL! DO-IT-YOURSELF with ARAB U-DO-IT

the special Chlordane formulation that gives you long lasting results! (Government Tests Effective for over 12 Years)
one gallon makes 200 gallons—1/2% solution (Less than 9¢ gallon)

SAFE • EFFECTIVE • EASY TO APPLY
THOUSANDS OF SATISFIED CUSTOMERS! LOW COST!
\$10.00 PER AVERAGE 5 ROOM HOUSE: Gallon: \$17.95;
1/2 Gallon: \$9.95; 1 Qt.: \$5.95; 1 Pt. \$3.95.
5 YEAR CHEMICAL REPLACEMENT GUARANTEE!
ASK ABOUT ARAB PROFESSIONAL APPLICATOR!
SEE YOUR LUMBER SUPPLY DEALER TODAY FOR

ARAB-U-DO-IT TERMITE CONTROL
(Over 7,700 lumber dealers stock U-Do-It) or write
Federal Chemical Co., Indianapolis, Ind.
for name of nearest dealer
"The Professional Chemical for the Homeowner!"

CONCRETE BIRD BATHS AND OVER 250 OTHER MONEY MAKING ITEMS



You've seen them all over the country... concrete bird baths, garden seats, flower boxes, appealing statuary, and many other items that add charm around the house and lawn. They're made by enterprising people, just like you, from our COPYRIGHTED ALUMINUM MOLDS. It's easy. It's fun. It's profitable.

Send \$2.00 today for this 82-page "How to" book, 20 pages of clear instructions. Valuable trade secrets. Over 250 items beautifully pictured (with description, dimensions, and prices of molds). Rushed to you by first class mail.

CONCRETE MACHINERY CO., INC.
HICKORY 2, NORTH CAROLINA

Name.....
Address.....

HOW TO
TURN
CONCRETE
INTO
GOLD

NOW! A work shoe that
Wears like a rugged boot,
Feels like a soft glove.

Men who own a pair say it's the greatest work shoe on the market. It's designed, and built, first for **comfort**, yet this shoe retains its rugged good looks under severe tests of wear and weather.

Soft cowhide-lined, with Cushioned Comfort insole, steel arch, in easy-to-care-for black dress leather. Oil resistant, non-conductive, sure-grip Neoprene sole and heel for safety and durability. Compare — comfort and long wear — at ANY price.

Slight as a feather

GEORGIA



No. 300 Moc toe or
 No. 302 Plain toe
Only 9.95



Write today for the name of your nearest dealer.
GEORGIA SHOE MFG. CO., INC., Flowery Branch, Ga.

**\$1,500 IN ORDERS
 FROM 14 WORD CLASSIFIED AD**

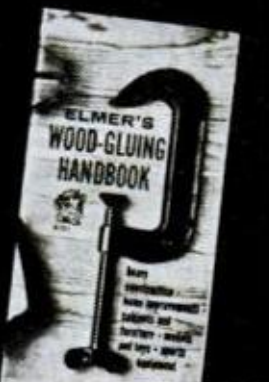
Read this amazing story. Ask for folder "W."

F. W. JOHNSON, CLASSIFIED ADV. MGR.

POPULAR MECHANICS, 200 E. Ontario St., Chicago 11, Ill.

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-51, 350 Madison Ave., New York 17, N. Y. (Available in Canada.)

Can a Compact Save You Money?

(Continued from page 89)

actually costs him to own and drive a car each year.

Traditionally, the depreciation on most models of the once "low-priced" Ford-Plymouth-Chevrolet class is approximately 32 percent for the first year of ownership, 18 percent for the second year and 11 percent for the third. That makes a total of 61 percent for the first three years of a car's life.

Depreciation figures for compacts have been difficult to come by because of the lack of extensive used-car marketing experience on most makes. Recently, however, Yegen Associates, of Teaneck, N. J. (finance consultants specializing in auto costs for banks and dealers), calculated dollar depreciation on three compacts — Corvair, Falcon and Valiant — for the first full year of their existence on the market, following October, 1959. All were four-door sedans.

The Real Truth About When to Change Oil may surprise you. Forget the conflicting claims you may have heard and read the facts about money-saving oil changes in the June issue.

The company also compiled dollar depreciation losses for the Rambler American for the same period and for six-cylinder models of Chevrolet, Ford and Plymouth in the economy-priced series.

Here are the results: Corvair — \$505 (25.9%); Falcon — \$291 (15.4%); Valiant — \$433 (21.5%); American — \$450 (25.2%).

Dollar losses on the standards were: Chevrolet — \$718 (25.6%); Ford — \$810 (33.2%); Plymouth — \$843 (34.5%).

Average first-year loss for the compacts was \$419, or 22 percent of new-car value.

Average first-year dollar loss for the standards was \$790, or 31.1 percent of new-car value.

Thus depreciation savings on a representative compact as compared to a standard car would amount to about \$371 after the first year. Since few drivers trade in their new cars after only one year of ownership however, a realistic appraisal of depreciation costs should be based on at least a three-year ownership period.

Projected depreciation figures for the compacts indicate, on the average, that they may decline as little as 12 percent in value during the second year and 10 percent in the third, although variations will be experienced among individual makes.

(Continued to page 246)

SURPLUS SALE

GOVT SURPLUS
EXCESS INVENTORY
BANKRUPT STOCK

POWER PLANTS GENERATORS

- Deluxe Govt. units 115-v, 60-c. Large selection. Typical values. Write for detailed catalog.
- 1000-watt, 115-v, 60-c plant **\$169.95**
- 1500-watt, 115-v, 60-c plant **189.95**
- 2500-watt, 115-v, 60-c plant **259.95**
- 3000-watt, 115-v, 60-c plant **249.50**
- 5000-watt, 115/230-v, 60-c plant **489.00**
- 10000-watt, 115/230-v, 60-c plant **649.00**
- 750-watt, AC generator, only **59.70**
- 2000-watt, AC generator, only **119.50**
- 5000-watt, AC generator, only **329.00**
- 12500-watt, AC generator **329.00**

BATTERY ELECTRIC WINCH



• **ITEM #318.** New model battery gear winch. Powerful ball bearing motor unit has larger drum capacity to hold up to 150 ft. of 1/4" cable.

• Available in 6 or 12-volt model. Rated capacity 3,000 lbs. Can be run in either direction. Reversing switch mounted on winch. Use on jeeps, trucks, trailers, etc. Size 19"x9"x7". Shipping weight 65 lbs. Specify if for 6 or 12-volt use. Cost Govt. over \$300.00. **SALE.....\$59.95 FOB**

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... **19.95 FOB**
- 2-Way cyl, 2" bore, 9" str... **13.95 FOB**
- Hyd. Press-gauge 1500 lb... **3.49 PPD.**

Many other types, sizes, items.

ELECTRIC CAR MOTOR



• **Item #576.** Powerful gear motor. Hi torque. Build boy's car, golf cart, winch, elevators, etc. Runs on 6 or 12-v battery. Reversible. Gear ratio 33 to 1. Ball bearings. Shaft 3/8" diam. Size 1 1/2" x 3 1/4". Wt. 30 lbs. Govt. cost \$295. **SALE.....\$18.99 FOB**

STANDARD DIAL PHONE

• **Item #716.** Genuine W.E. modern, hi-efficiency dial phone. Use for extension to main line on private system. Use several for complete private system. Work on any system. Shipping weight 8 lbs. Cost gov't. \$29.50. **SALE.....\$8.49 FOB**



FISH-WORM AC SHOCKER

• **ITEM #670.** Harvest worms, clear private ponds of coarse fish. Powerful 110-v AC hand geared generator creates powerful electric field in ground or water. Amazing results.

• Also fascinating for experimental—use for fun at parties. Has Super-Alnico magnets. Govt. cost over \$12. **SALE.....\$3.89 Ppd.**



115-V AC WATER PUMP



• **ITEM #246.** Genuine Surplus. Rupp electric pump. Use for draining, circulating, emptying tubs, fluid transfer. Rustproof housing. Cap. 500 gph. 1" outlet and inlet. 7" x 4" x 4". Wt. 5 lbs. **SALE....\$8.95 Ppd.**

SPECIAL OF THE MONTH!

BRONZE TURBINE-CENTRIFUGAL PUMP

• **ITEM #205.** Brand new, gov't. surplus, capacity over 10,000 g.p.h., total head over 60 ft. Use for irrigation, draining, filling pools and excavations, liquid transfer, marine, etc.



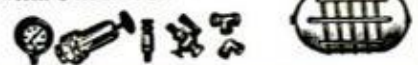
• All bronze case and turbine type impeller. Inlet 1 1/2" p.t., outlet for 1 3/4" I.D. hose. S-steel shaft 1/2" diam. Rotation clockwise. Size 12"x7"x8". Shipping weight 24 lbs. Cost Govt. over \$75.00. **SALE.....\$19.95 FOB**

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.** **FOR**



FREE CATALOG Electronics, Power Tools, Binoculars, Hydraulics, Power Plants, Air Compressors and thousands of other items.

SURPLUS CENTER
LINCOLN, NEBR DEPT 807

*After the city,
Before the state
The ZONE keeps your mail
From being late*



The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

KING MIDGET FOR 1961

WORLD'S MOST EXCITING LOWEST PRICED CAR.



Drive it for 75c a week. Rider Agents Wanted. Send 25c for 32 page book, full details, dealer price. Or send \$1 (refunded first order) for this plus Service and Repair Manual and 16 5x7 photos of car and factory. **MIDGET MOTORS CORPORATION, Athens 1, Ohio**

If it's worth painting
it's worth sanding...
with sandpaper by



CARBORUNDUM®

ARC WELDING PAYS BIG MONEY

NEW AC SHOP TYPE WELDER, the 180 amp. "Hustler" welds, cuts, burns holes, hardsurfaces 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.

HOBART BROTHERS COMPANY, BOX M-51, TROY, OHIO, Ph. FE 2-1223





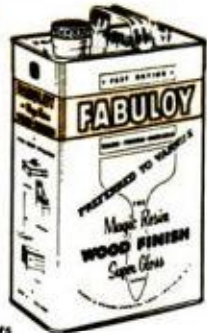
NEW!

MAGIC-RESIN

FABULOY

Super-Gloss Natural Finish for All Wood Surfaces

Applies easily, flows on smoothly without brush marks. Dries fast to a brilliant, crystal-clear, mirror-like finish of exceptional durability. Resists chipping, won't yellow.



At paint, hardware and lumber stores coast-to-coast. For free booklet, write Dept. PM5



PIERCE & STEVENS CHEMICAL CORP.
710 OHIO STREET • BUFFALO 3, N. Y.
IN CANADA LE PAGE'S, TORONTO 18, ONTARIO

"Whis-Purr" Sound and ZOOMING POWER PLUS NEW LONGER LIFE!

QUIET-TONE MUFFLERS

Hi-Efficiency Fiberglass-Packed

Featuring **GARD-KOTE**

Rust-Resistant Alloy-Coated Steel Case and End Caps (Both inside and outside)

"NEW EXTRA" in Quiet-Tone Mufflers — already famous for distinctive deep tone and straight-thru, full-power construction. Long-lasting satisfaction assured with corrosion resisting "Gard-Kote". Exclusive Turbo-Jet Diffuser eliminates back pressure . . . increases power . . . produces low, acceptable "whis-purr" sound. Easily installed on any car.

See "Quiet-Tone" at your favorite dealer — he also has a complete line of duals including all 1961 models

GRAND AUTOMOTIVE PRODUCTS
Dept. PM-5, 2055 N. Ruby St.
Melrose Park, Illinois
World's Largest Producer of Dual Exhaust Systems

This favorable showing is expected on the basis of two considerations:

Anticipated high demand for most used compacts by eager buyers; and both the implied and outspoken promises of manufacturers that annual style changes on these economy cars will be kept to a minimum.

In three years, depreciation on standard cars (based on average percentages already indicated) would amount to \$1475. That on the compacts would amount to only \$837 or \$638 less. Average annual savings in depreciation of the compacts over three years, therefore, would amount to approximately \$213 per year.

How It Adds Up

To determine what total annual savings on a compact would be, turn to the table on page 87.

Note that over a three-year period average annual savings in purchase price amount to \$77 per year. Estimated typical operating and maintenance savings amount to \$85 per year. Savings on insurance amount to another \$23. License cost savings are good for a possible \$5. Including depreciation, annual savings on compacts add up to \$403 per year over the usual six-cylinder car in the Ford-Chevrolet-Plymouth class.

This figure breaks down to savings of \$33.58 per month, or \$7.75 a week—sums which are certainly significant in the budgets of most auto owners.

Do the Owners Hide or Cherish Their New Pontiac Tempests? Read their answers, based on a million miles of in-use driving, in the June issue.

There is, of course, no one spectacular over-all saving associated with buying and driving a compact. Rather, the economies add up bit by bit as the pattern of auto ownership is analyzed.

Even ignoring depreciation (which most drivers are happy to do) savings on such out-of-the-pocket costs as purchase price (payments), operation and maintenance, insurance and license costs amount to more than \$15 per month.

What's more, cost estimates in this article are on the conservative side.

Additional purchase-price savings may easily amount to \$100 or more if, for example, (Rambler's American). If you are willing to buy an even smaller import such as the four-passenger Volkswagen or Renault, your savings on purchase and fuel will be even higher.

Some lesser, but nevertheless measur-

(Continued to page 248)



British Air Transport to Carry 250 Passengers

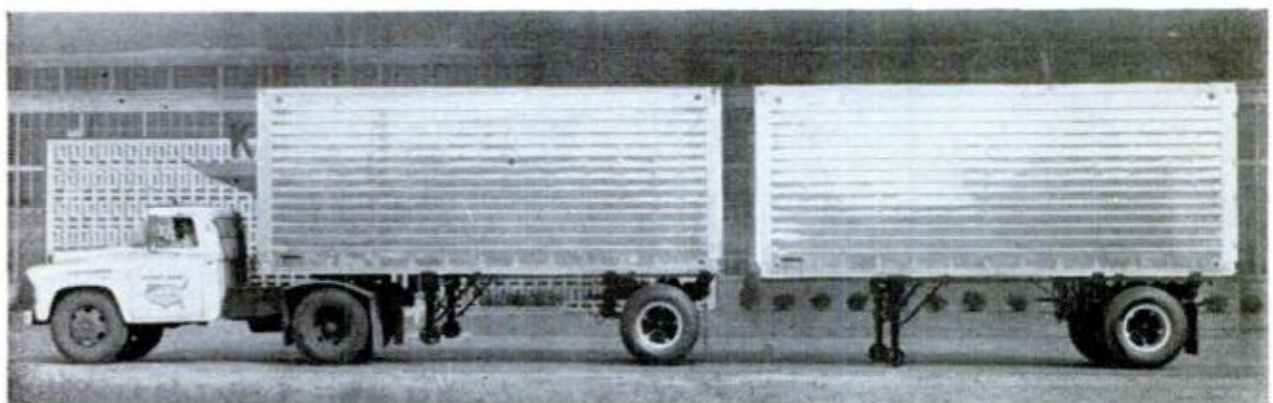
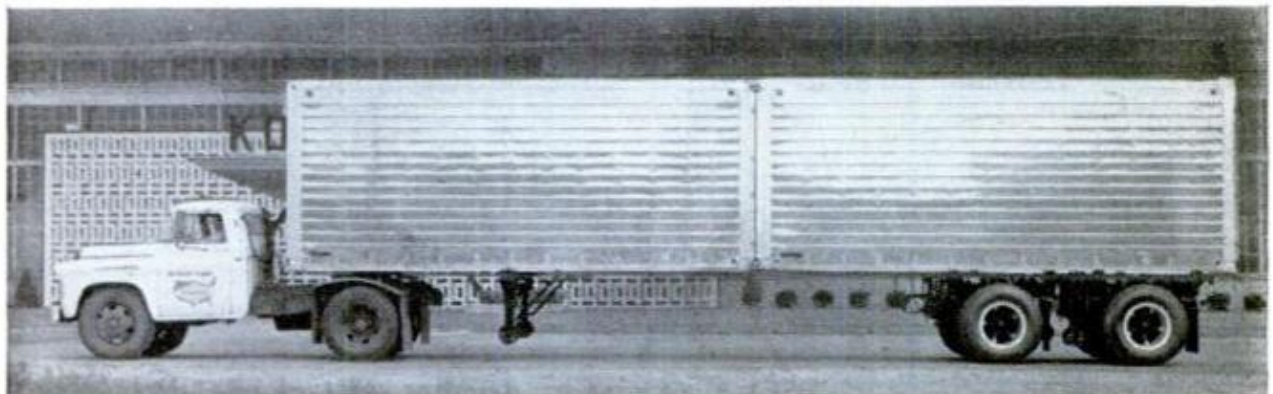
Artist's sketch shows British Belfast, a turboprop air transport ordered by the Royal Air Force, which will be capable of carrying 200 paratroopers or nearly 250

civilians. As a freighter, the plane will carry 85,000 pounds more than 1100 miles at 350 miles an hour. The plane will be made by Short Brothers & Harland in North Ireland.

Semi Splits in Two for Easy Handling

For easier handling in city streets and in loading, a 40-foot Fruehauf trailer splits into two 20-foot sections. Before separation, one wheel unit from the tandem axle of the rear section slides forward on a special

undercarriage and locks in place. This forms the single-axle support for the front trailer. The front section can then be drawn to make pickups and deliveries while the rear trailer is parked or used separately.



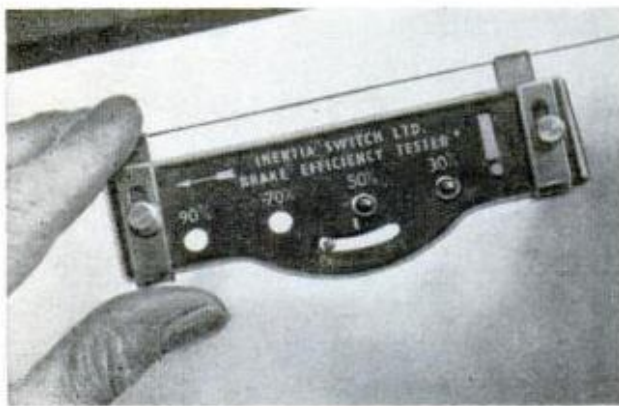
JOHN KENNEDY: A POLITICAL PROFILE

by James MacGregor Burns



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Brake-Efficiency Indicator

Efficiency of car brakes can be measured by a device clipped onto a window. A quick stop at 20 miles an hour causes steel balls to roll up four ramps of varying steepness into circular windows. The highest figure indicated shows the percentage of efficiency. The manufacturer is Inertia Switch Ltd., Surrey, England.

able economies on a compact include lower over-all interest on carrying charges and lower federal, state and local sales taxes. No attempt has been made to account for these extras in the table on page 87.

How much do you really save on gasoline costs? The over-all miles-per-gallon average given for domestic compacts in this article may well be low. Many individual owners would insist so on the basis of firm beliefs that their cars are giving them up to 30 miles per gallon or more.

As one compact owner recently said: "All I know is that I now spend \$2 a week to keep my Comet gassed up to go to work and back. My old DeSoto cost me \$4 for the same driving. Simple arithmetic tells me I save \$104 per year right there."

Repairs on compacts do cost less, in many cases, than on standard cars. For example, estimates are that windshield replacements will be from \$30 to \$100 less on compacts than on standard models; that such jobs as clutch repairs may be as much as \$8 cheaper, though this is not necessarily true in all cases. Where substantial savings are gained in repairs, it is usually a matter of having to pay less for parts and material—labor costs remain about the same.

Despite doubts and criticisms, it is apparent, even with conservative calculations, that compact economies are real enough. When stacked against even the cheapest stripped models in the standard lines, they save the owner money.

They save even more when compared with the more expensive and popular middle and luxury models of the standard (Ford, Chevy, Plymouth) makes which make up the bulk of new-car sales. Add to this savings in purchase price, operation-maintenance and other costs of owning a car and the advantage grows even larger.

If you are satisfied with their size, comfort and performance levels; if you want to relinquish frills for basic automotive value—then a compact will certainly keep many an automotive dollar in your pocket. ★ ★ ★

QUOTE:

"We are in a decade of weapons transition. Early in the decade, the manned bomber will be the primary, the ICBM the secondary threat. Midway in the decade, they will become equal. Later, it will be the ICBM which is the primary danger to our security, the manned bomber secondary. It will not be either one or the other, but both threats we must defend against."

—GENERAL LAURENCE S. KUTER,
Commander-in-Chief
North American Air Defense

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140-1 REDUCTION GEAR For beaching boats, winches, hoists. Ideal motor in golf or boy's electric car. DC motor & 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. \$12.00. Matched splined gear—\$3.00 ea. *225-1 Reduction Gear—\$13.50.

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*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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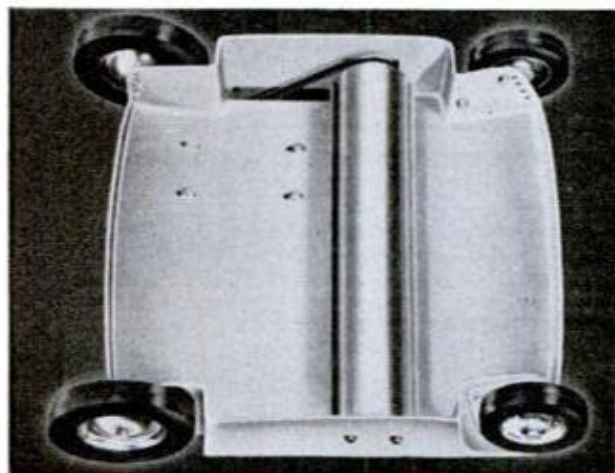
"DELUXE 11" ARC WELDING KIT

Consists of 200 AMP. Gen., voltage reg., ammeter, shunt, adjustable helmet, electrode holder, pr. welder's gloves, 30' welding cable, reactor coil, toggle switch, rheostat. Approx. GOVT. COST \$650. Units guaranteed pre-tested. \$34.95 complete.



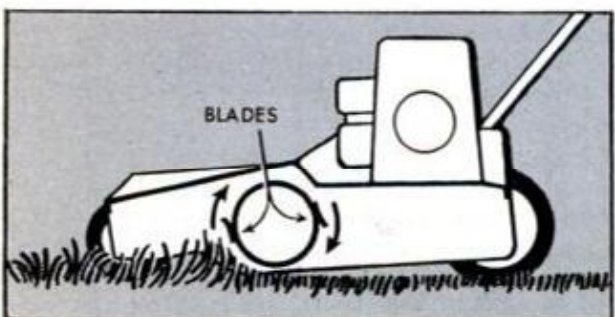
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Fishing With the World's Champ

(Continued from page 83)

spinner-jig in brass with yellow tail feathers; a silver quarter-ounce "Shad Spoon," a fast-sinking flaptail wobbler; and in the center, an Ozark specialty and Ensley's favorite lure for big bass, a "Spider Spin" tandem offset-spinner-jig in casting-rod size. He uses the bigger jigs and the spinner-jig lures with a four or six-inch black pork-rind eel. About the only other lure that rates as a favorite is the Phillips "Crippled Killer," a twin-propeller torpedo type for surface-feeding bass. He prefers either brown or white for surface plugs, but agrees with many experts that color in top-water lures is relatively unimportant.

I asked the old question, "If you could only use one lure for the rest of your life, which would it be?" Ensley thought for a long time, then chose the half-ounce Bass-Buster jig. It was also his choice during the World Series, with its smaller quarter-ounce brother, and he says the lure won the championship for him.

Old-Woman-in-a-Shoe Playhouse? Not only is it practical but the kids will love this fascinating design. See the plans for this unusual "small-fry stopper" in the upcoming June issue.

On his casting reels, the champion uses 12 and 15-pound test Platyl monofilament; 3.8 and 5.8-pound on the spinning reels. He gets it in 1000-foot spools. During the World Series, he changed lines completely every other day, both to make sure he wasn't fishing with a weakened line and to keep from having any knots in it. He uses the spinning tackle in open water, and uses the lightest line possible for that fishing; then goes for the heavier stuff on the casting rods when he's in the timber and weeds after bass.

Out on the water, he fishes along shorelines, weed beds, underwater dropoffs and submerged trees, casting a wide arc around the boat and spending about 15 minutes in each location. If the wind allows, he'll drift along a shoreline very slowly, with an occasional touch of the oars or the electric motor to keep the boat in position. If the wind is too strong for a slow drift, he'll anchor in each location so he can fish it thoroughly.

In covering a section of water, he casts as far as possible each time, and as near the shore or visible snags as possible. The long, accurate casts keep the lure in productive water. Ensley can hit your hat at half a block, a skill that he works hard to

(Continued to page 252)

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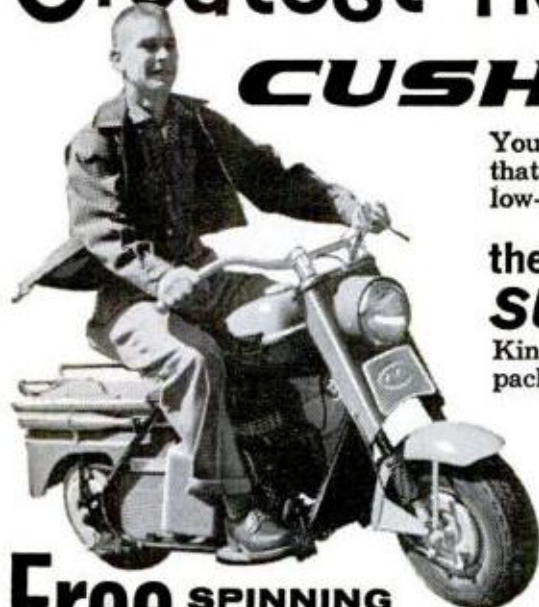
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maintain, practicing in his back yard if he can't go fishing.

With all the water he covers, he doesn't waste a cast or a foot of retrieve; he fishes each one as if it were the last of the day. (At the end of the day, he takes more "last casts" than any fisherman I ever knew; one day he took at least 20.)

Watching the champion work a lure is like watching Segovia play a guitar. He rivets his attention out there on his line, reeling in slowly and carefully, feeling for bottom, for snags, and for fish, and his educated touch knows the difference. Several times he stated matter-of-factly that he had felt a bass (not a fish, but a bass) pick up the lure and taste it, but that the fish only had the trailing pork rind, so he didn't strike.

Ensley doesn't "jig" his jigs, but uses a very slow, steady retrieve. The reeling action and the bounce of the rod impart enough motion to the lure, and the soft marabou plumes and pork eels make the most of it. He reels the lure right through snags, since that's where the fish are. He hangs up a lot, but in that kind of water he's using the heavy casting tackle, and can usually pull out or snap the lure off a limb or rock. He loses a lot of lures, too, but insists that if you aren't hanging up occasionally, you're missing the fish.

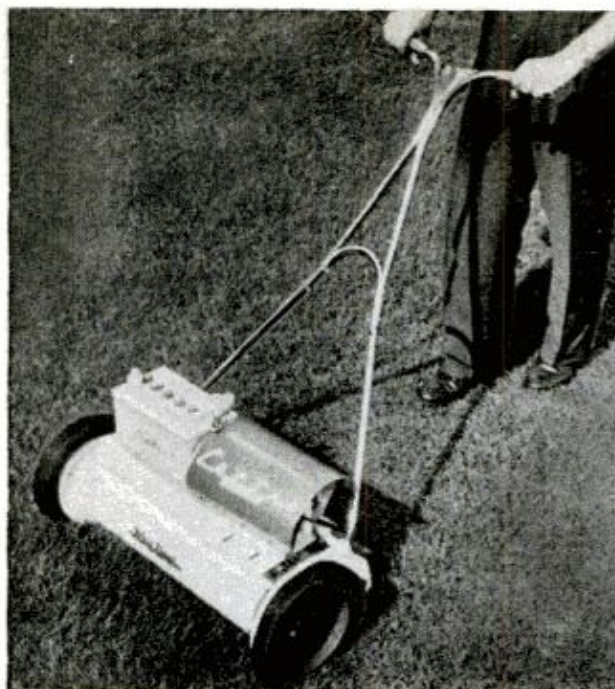
Serene Motoring is yours if you convert the car radio to AM-FM. No more scratchy static or too-frequent commercials if you follow the plans shown in the June issue.

When he feels a strike, he strikes back—hard—at least on those tough-mouthed Ozark bass. He doesn't worry about pulling it away from a fish; he wants that barb in deep. And he loses very few fish; certainly none for lack of setting the hook. Playing a hooked fish, he applies plenty of pressure, but doesn't force the fish to the surface. Fishing with those heavy-headed lures, he doesn't want the fish to jump, because a jumping bass can work them out of his jaw and shake clear. He'd rather land the fish than see it jump; they fight just as hard down deep as they do on the surface.

One of the things the champion does best is study his quarry and its habitat. He maintains correctly, that fish are creatures of predictable habit, and if you can find the spot they call home—or the dining room—you'll catch them.

First thing he does on a piece of strange fishing water is find out everything he can about it. Local fishermen, contrary to popular opinion, are seldom much help. Unless

(Continued to page 254)



Battery Drives Electric Mower

A battery-powered mower cuts about 15,000 square feet of grass on a single charge of its battery. The machine is available as an 18-inch hand-propelled rotary priced at \$149 and a 21-inch self-propelled reel for \$190. The manufacturer is West Point Products Corp., West Point, Pa.

Convert Your Car Radio to AM-FM

There's no need to be annoyed by scratchy static or raucous commercials as you drive along. A few simple steps will adapt your present car radio for use with a soothing FM tuner that can be switched back to AM at will. See how it is done in the

JUNE ISSUE

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H-70E	2-1/2"	30"	40-1/2"	1-1/2"	74.88
H-70G	3-1/2"	8"	19"	2"	17.88

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1500 PSI Double Action CYLINDER - Bore 2", Shaft 7/8", Stroke 9", overall length 14-1/2". Catalog No. H-48... **5.95**

New 1500 PSI Dbl. Action Cylinder. Ideal for clutch or throttle control when used as a master & slave. Has 5/8" bore, 4-1/8" stroke, 7/16" shaft, 9-5/8" closed length. Parts are 1/4" tube (7/16-20 thread). No. H-60 **3.75**

1500 PSI Double Action CYLINDER - Bore 1-1/2", Shaft 9/16", Stroke is adjustable 1-3/16" to 4-3/8", length 14-1/2". No. H-84... **3.95**

1500 PSI, long stroke cylinder - Has Stroke of 15-5/8", Bore 1-3/8", Shaft 1", Length 22". No. H-14 Cost Gov't approx. \$120.00 Palley Catalog Price \$11.75 **7.95**

1500 PSI Double Action Cylinder - Bore is 1-7/8", Shaft 7/8", Length 12", Stroke adjustable from 3-3/4" to 6-1/2". Cat. No. H-10U - USED... **6.75**
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3750 to 4000 RPM, counterclockwise. 3/4" splined shaft. Instructions for Arc Welder conversion FREE! **16.95**

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2. Throttle Control SOLENOID - Use as welder or motor control. Has 5" shaft, 1" travel. **7.95**

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4. "V" BELT PULLEY ADAPTER - For use with R-1 Generator. **12.95**

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you find an unusually good one, you'll do better studying the water yourself, because few fishermen bother to really learn even their home fishing waters. Guides, of course, are necessarily students of fish and fish habitat, and are almost always able to give you tips on where to fish, but if guides are available, it's usually better—and less expensive in the long run—to take one out and let him demonstrate the local hotspots and methods.

With no expert assistance available, Ensley falls back on underwater geography to find the fish. While a good map will show the underwater terrain, and usually will indicate the dropoffs and weed beds he's after, a good look at the surrounding terrain will do about the same thing, certainly along the shoreline. A ridge running into the water means an underwater ridge further out, and that means fish. The same for a creek bed or gully or a patch of timber; they all mean fish just offshore.

Know How to Ride Out a Storm in a Small Boat? You'll find some expert advice on how it is done in the June issue.

The champion also carries a portable electronic depth indicator—for the same reason he often fishes with a guide. In the long run, it saves time, and time saved means more fish caught. The electronic sounder was ruled out of the World Series as an unfair advantage, but that's where his favorite lures come in. Deep-diving jigs and heavyweight hardware gets to the bottom as fast as a sounding lead, so he always starts with them for the very good reason that he can move around, feel out the bottom characteristics, and catch fish at the same time. (Why didn't I ever think of that?) That guy can learn more about a lake in an afternoon than many of the local fishermen learn in a lifetime. And it pays off in fish.

Not all his fishing is done from a boat, of course. If casting toward shore doesn't work, he'll beach the boat and work the shoreline casting out. The lure then parallels the bottom nicely throughout the retrieve, and will often pick up bottom-hugging fish that the boating fishermen miss. He uses much the same technique in streams, bouncing the lure along the bottom of the pools and fishing each pool as thoroughly as possible. If the holes don't produce, he'll go to the riffles and runs, but the big fish he hunts are usually in the bigger, quieter water.

The way Ensley picks a time to fish is interesting. He completely ignores the clock, the calendar, the moon, the sun, the

wind, the weather, and everything else (including lunch time). He insists that the time to fish is as soon as you get to the water and the time to quit is half an hour after you absolutely must. He's out early and in late, and half the fishermen in the Ozarks with frostbitten fingers got them waiting for him to make "one more cast" after sundown on a cold January day when the big bass are hitting. If he notices the temperature he won't admit it, though he's a real believer in insulated foul-weather gear and an extra jacket. And even this pays off in a few more casts and a little more time for fishing—and more fish.

While Ensley is a whale of a fine fisherman, and one of the few outdoor "experts" who really practices what he preaches, even he falls victim to the fisherman's bugaboo, the bad day. We had two of them; we couldn't raise a big bass at all, though he had just taken a 9½ pounder out of Bull Shoals the week before. So we availed ourselves of that Ozark fisherman's ace in the hole, the big crappies that are always there in the timber to keep the wandering angler from going skunked. We caught a couple of dozen, fat, happy panfish up to two pounds. They saved the day and our faces, and made a fine dinner to boot. (Ensley's honest, too. Another fisherman came in with an 8½-pound largemouth. Most outdoor "experts" will beg, borrow or buy a fish for a picture, but he wouldn't hear of it.)

So he doesn't catch all the fish every time. You can try your luck—or skill—against him this year when he defends his title at the '61 World Series. Anyone can enter a local or state contest, and if you win, you'll get an expense-paid crack at the champion. Maybe he'll have a bad day and maybe you'll be the new champ. ★★

Whale of Tale About Swimming

Although they lack the horsepower they need to swim as fast as they do, whales, of course, do swim right along and make good time. A 100-ton whale would require 520 horsepower to make a speed of 20 knots, according to Irving Rehman, consultant at the Naval Ordnance Test Station, China Lake, Calif. Though they seldom exceed 74 horsepower, whales can glide along at 20 knots for hours at a time, he said. He added that research indicates that a network of blood vessels between the whale blubber and skin possibly might be connected with some variations in the surface of the skin that reduce turbulence and add momentum. This may be the secret that lets the whale obtain its "impossible" speeds.



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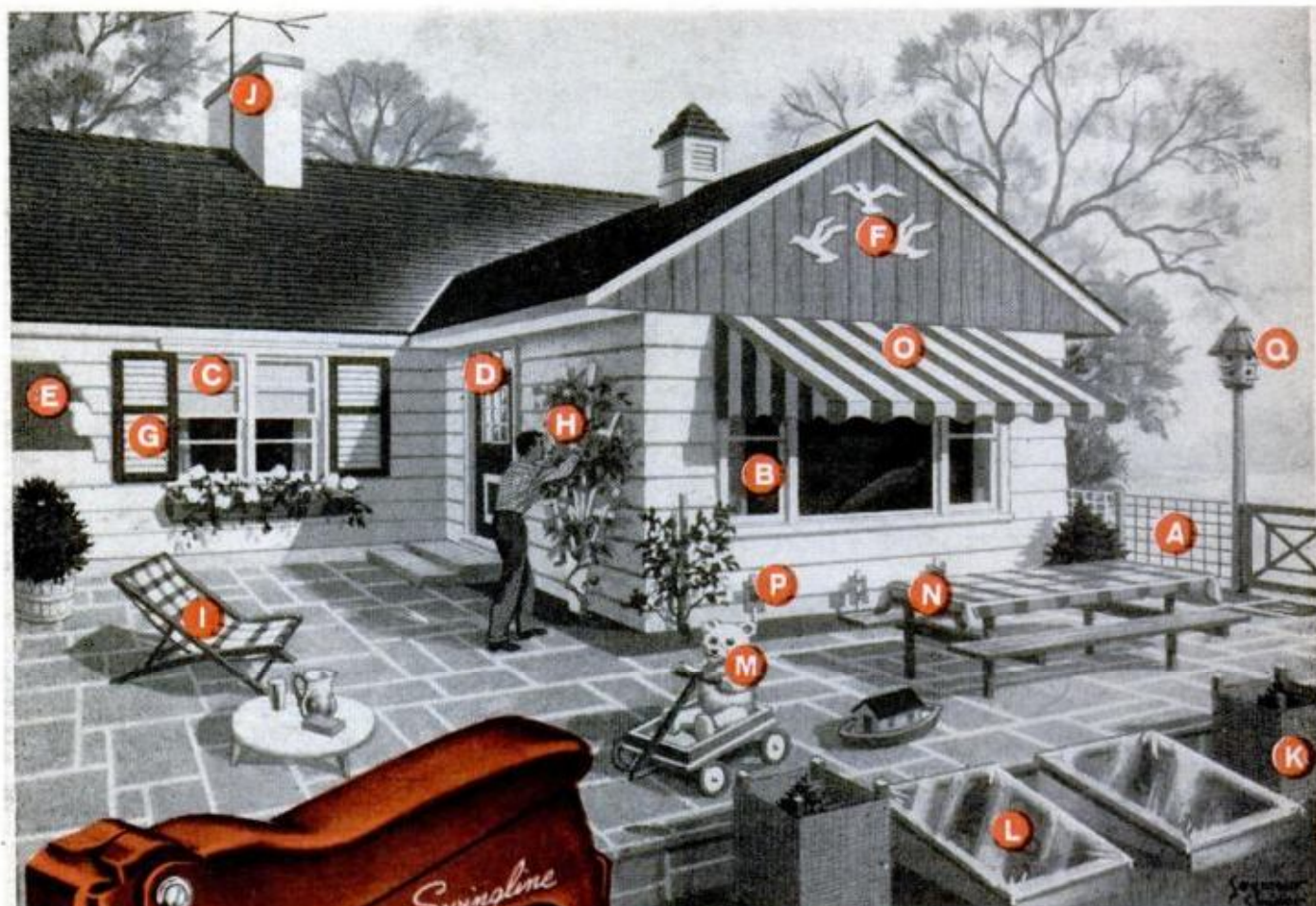
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