

POPULAR SCIENCE

Oct. 1949

25¢



Monthly

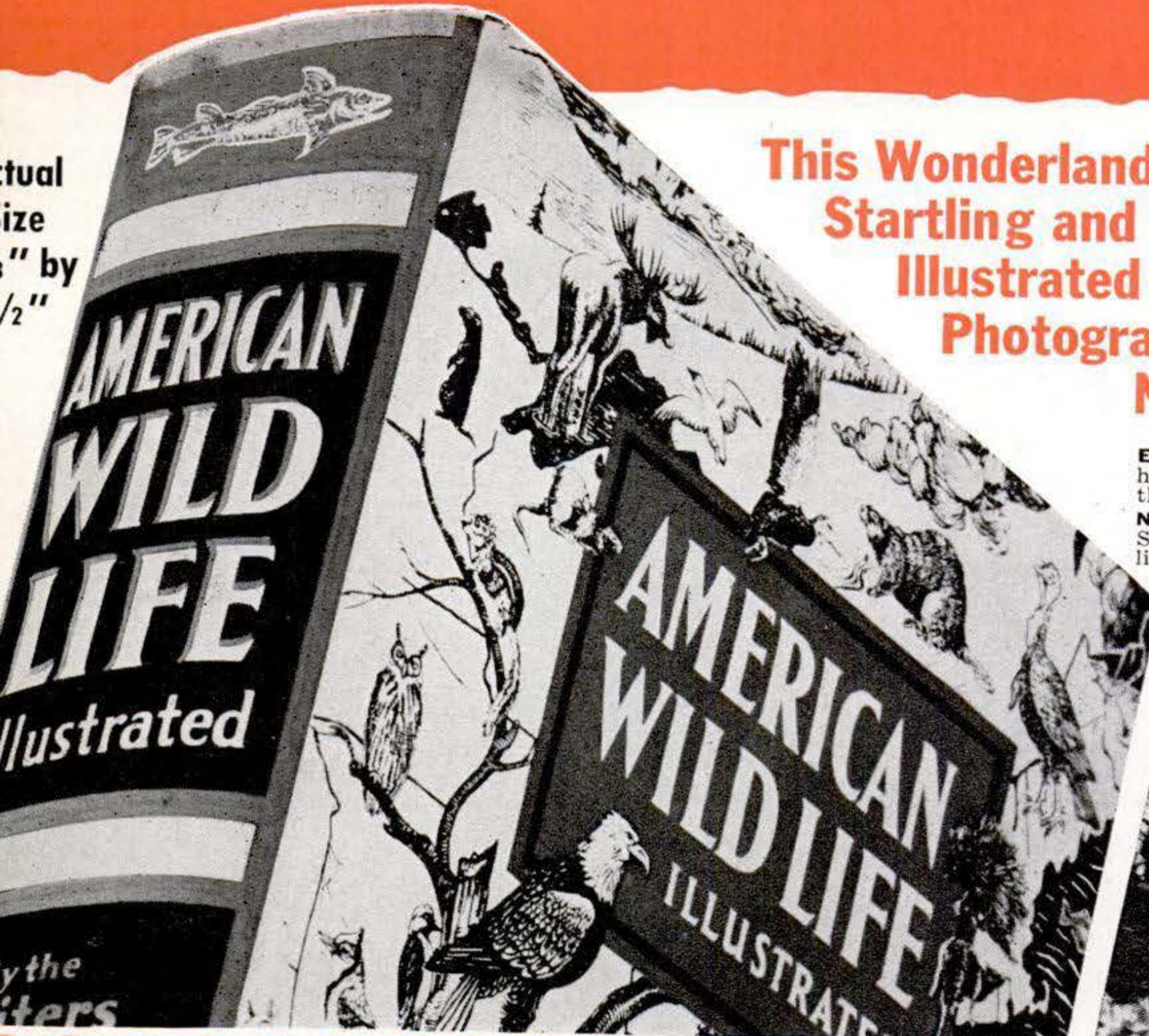


**Scoop-Wing Plane
Leaps Off Lawn**

PAGE 106

Ronald Brown

Thrill to the Wonders of American



This Wonderland of Living Things—Startling and Beautiful—Lavishly Illustrated with Hundreds of Photographs—Some in FULL NATURAL COLORS!

EXTRA LIDS (Top picture). Alligators have extra eyelids—transparent—enabling them to keep their eyes open under water.
NOSE LAMP (below, left). Female Deep Sea Angler lures puny male with beacon-like tentacle. She's 1000 times bigger than he!

In the Partial List of Subjects Below You Get Just a Glimpse of the Wonders in this Superbly Illustrated American Wild Life Book!

AMMALS

- Whales
- Dolphins and Porpoises
- Armadillo
- Mountain Sheep
- Mountain Goat
- Wison
- Rhynchorn
- Antelope
- Caribou
- Goose, Deer
- Beccary
- Sares, Rabbits
- Porcupine
- Jumping Mouse
- Mountain Beaver
- Uskrat
- Beaver
- Socket Gopher
- Woodchuck
- Prairie-Dog
- Chipmunk
- Squirrels
- Co-Lions
- Snx
- Skot
- Guar
- ugar

BIRDS

- Coyote
- Wolf, Fox
- Badger
- Skunk
- Otters
- Weasels
- Raccoon
- Bears
- Bats, Moles
- Opossum
- Thrushes
- Kinglet
- Wren Tit
- Nuthatches
- Wren
- Thrushes
- Warblers
- Shrike
- Swallows
- Tanager
- Starling
- Crows
- Magpie
- Lark, Jay
- Fly-catcher
- Hummingbird

REPTILES

- Swift
- Goatsuckers
- Woodpeckers
- Kingfisher
- Roadrunner
- Parrot, Owl
- Falcons
- Eagles, Hawks
- Doves
- Turkey
- Grouse
- Quails and Bob-Whites
- Cranes, Herons
- Spoonbills
- Swans
- Pelicans
- Cormorants
- Albatross
- Gulls, Geese
- Skimmer
- Auks, Puffins
- Loons
- Alligator
- Crocodile
- Lizards
- Racerunners
- Skinks
- Dwarf Boas
- Turtles
- Terrapins
- Tortoises
- Sun Turtles
- Soft-Shell Turtles

AMPHIBIANS

- Narrow-Mouthed Toads
- Frogs
- Spadefoot Toads
- Bell Toad

- Siren
- Mud Puppy
- Lungless Salamanders
- Congo Eel
- Newts
- Mole Salaman
- Hellbender

FISHES

- Batfish
- Sunfish
- Porcupinefish
- Trunkfish
- Filefish and Triggerfish
- Sharksucker
- Goby
- Demoiselle
- Surgeonfish
- Angelfish
- Pilotfish Snapper
- Sea Bass
- Black Bass
- Perch, Darter
- Dolphin
- Snailfish, Marlin and Swordfish
- Mackerel, Tuna and Albacore
- Barracuda
- Mullet
- Seahorse
- Codfish
- Flyingfish
- Pike and Muskellunge
- Catfish
- Dace, Minnow
- Carp, Sucker
- Eel
- Salmon, Trout
- Sharks, Rays
- Tarpon Sturgeon

FULLY INDEXED

PREHISTORIC MONSTER?
NO! It's the Pacific Horned Lizard, or Horned "Toad" and it's quite real and alive!



"FISHING TRUSTS" Are formed by pelicans who cooperatively hunt fish, scooping up schools of them in their pouched bills!

GROWING UP. This Black Bear Cub, no bigger than a canteloupe at birth, eats ants and wasps while his elders dine on cattle material.

Wild Life

5 Books in One—at the Price of One!

A FEW HOURS—perhaps a few minutes—from your front door, in woods, field, or stream, there is a world of busy life which seldom meets the human eye. Here are unfamiliar four-footed creatures, that swim and fly; here are species of living things whose ways of life are so different from, and again so startlingly similar to, our own human ways.

Multiply such a patch of wild life near your home by the length and breadth of America and you have one of nature's greatest and most varied collections of living wonders on the face of the earth. To witness the daily lives of these wild creatures has been the privilege only of the fortunate few, possessing the time, knowledge and equipment necessary for close observation. Now, however, this fascinating animal world is brought to you within the covers of one wonderful, exciting volume, to be enjoyed comfortably at your leisure. Here at last is a book to open your eyes to the marvels of American Wild Life in brilliantly accurate and profusely illustrated stories!

1001 Extraordinary Stories with Irresistible Pictures—for Enjoyment of the Entire Family!

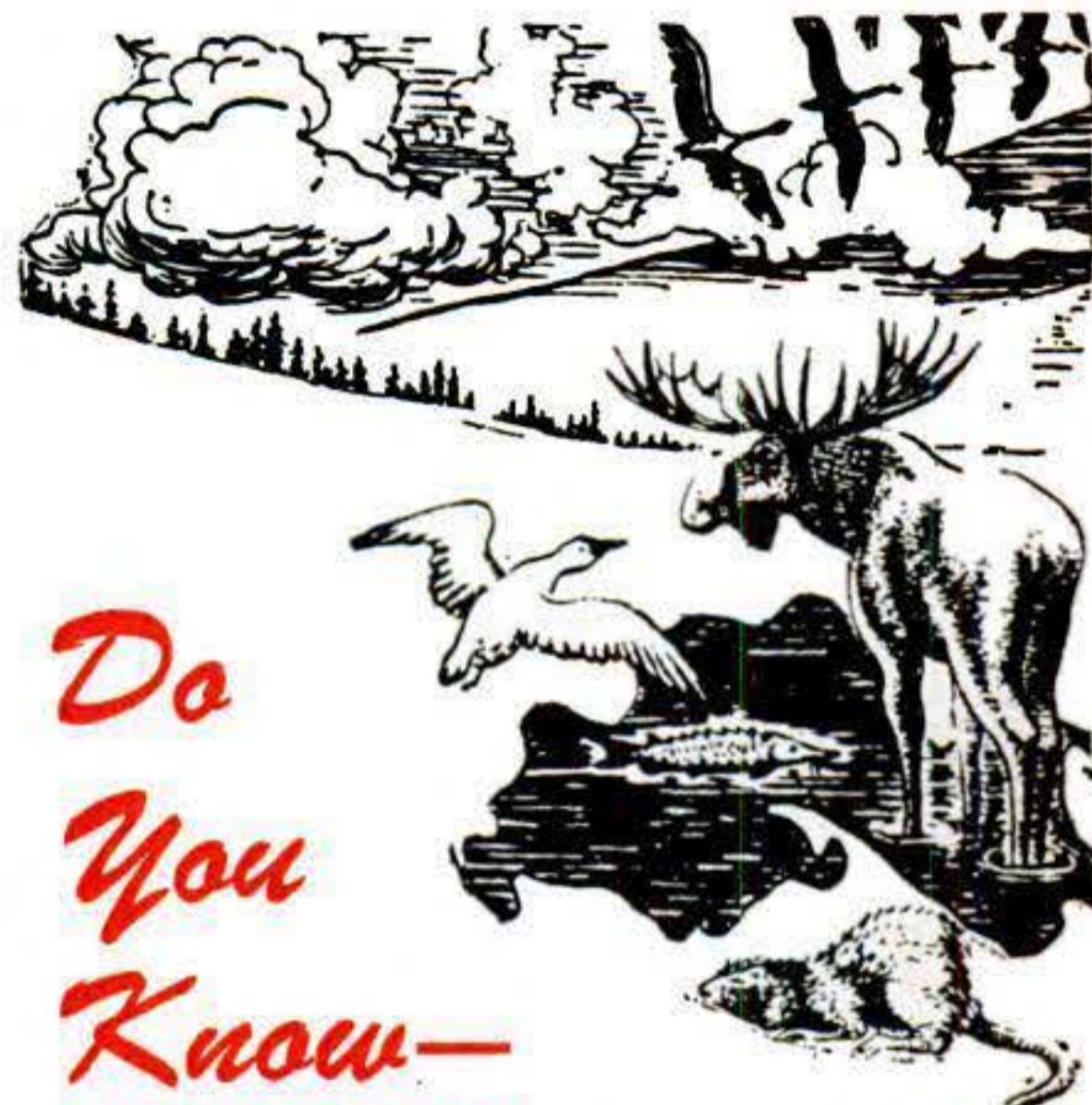
If you spent years and traveled thousands of miles with camera and gun and traps, you could not record a fraction of the interesting photographs and stories that are contained in "American Wild Life." No one man could accomplish the task. 160 specially qualified writers from all 48 states

gathered all available data from the records of regional natural history institutions, government specialists, state naturalist societies, zoological authorities, and every other source of recognized information. From this wealth of material, these 160 writers drew the fascinating stories for "American Wild Life." The result is a five-volume-in-one library of enjoyable reading, prepared in popular narrative style, so that not only grownups but every boy and girl will derive pleasure and information from it. It will also prove of great enjoyment and usefulness to sportsmen, hunters and anglers.

749 Pages—327 Thrilling Pictures Including Full-Page Photos in Natural Color!

The extraordinary collection of wild life pictures in this volume vies with the text for interest. The 327 pictures show an amazing variety of wild creatures in their natural haunts, their everyday attitudes and ways of living. Here is the art of the photographer in its rarest form; to it has been added the art of modern photoengraving, which renders every detail of the originals with marvelous fidelity. The crowning feature of the collection is a series of six full-page plates in NATURAL COLOR, which you may be tempted to remove for framing!

The giant Self-Pronouncing Index lists 1,914 different names of wild creatures! It enables you to find instantly in this book any animal subject in which you are especially interested.



Do You Know—

A PRAIRIE-DOG CITY. Its avenues stretching for many miles, constitutes nothing less than a subterranean housing development on a large scale!

TO RID ITSELF OF FLEAS, the fox, taking a stick in its mouth, slowly submerges in a pool of water. As it sinks, the fleas move upward to drier regions. When only the wood remains above the surface, the fleas desert the sinking fox to take refuge on the raft. Thereupon the fox releases the stick, leaving the fleas to their fate.

THE CLASSIC BELIEF is that the bat becomes entangled in a woman's hair and cannot be removed until every one of the fair victim's locks is clipped to the scalp. Yet there is no record of this ever happening!

THE YOUNG OF THE OPOSSUM are so small at birth that a litter of sixteen easily fits on a tablespoon!

HITCHHIKER OF THE HIGH SEAS is the sharksucker, a fish that attaches itself to the body of a larger fish or sea turtle and rides unmolested on the abdomen of its powerful companion.

... just a few of the thousands of wild life phenomena described in this thrilling book.

"Wouldn't sell it for any price unless I could get another like it." —P. J. T., Newton, Iowa

"Print and paper exceed my expectation. Entertainingly written." —E. C. H., Phoenix, Ariz.

"Perfect for the learning child." —R. H. B., Safety Harbor, Fla.

ONLY \$3.95
If you decide to keep it!

SAVE \$16.00 ENJOY THIS BOOK 7 DAYS FREE!

The material for a five-volume library has been packed into this single big 749-page volume without condensation. Other such libraries sell for \$20.00 or more, but "AMERICAN WILD LIFE" is yours for the unparalleled low price of only \$3.95—so sensational a value that we are offering you a copy for seven days' FREE examination to prove it. After you have seen it, and wish to keep it, you may pay the low price of only \$3.95, plus a few cents postage—in small monthly payments, if you like. Otherwise return book without obligation. Mail the FREE-trial coupon today—give yourself and your family this feast of entertainment and information!

1949, WM. H. WISE & CO., Inc., 50 West 47th St., New York 19, N. Y.

SEND NO MONEY NOW—JUST MAIL THIS COUPON

WM. H. WISE CO., Inc.
50 West 47th Street, New York 19, N. Y.

I wish to examine, without obligation or expense, a copy of AMERICAN WILD LIFE. When it is ready, ship it postage prepaid. After 7 days FREE examination I will either return the book and owe you nothing; or keep it and send you initial payment of only \$1, and then \$1 a month until the low price of only \$3.95, plus a few cents postage, is paid.

SAVE CHARGES ON 4-LB. SHIPMENT
—Mail only \$4.00 with this coupon as full payment and we will pay shipping charges. Immediate refund guaranteed if not more than pleased.

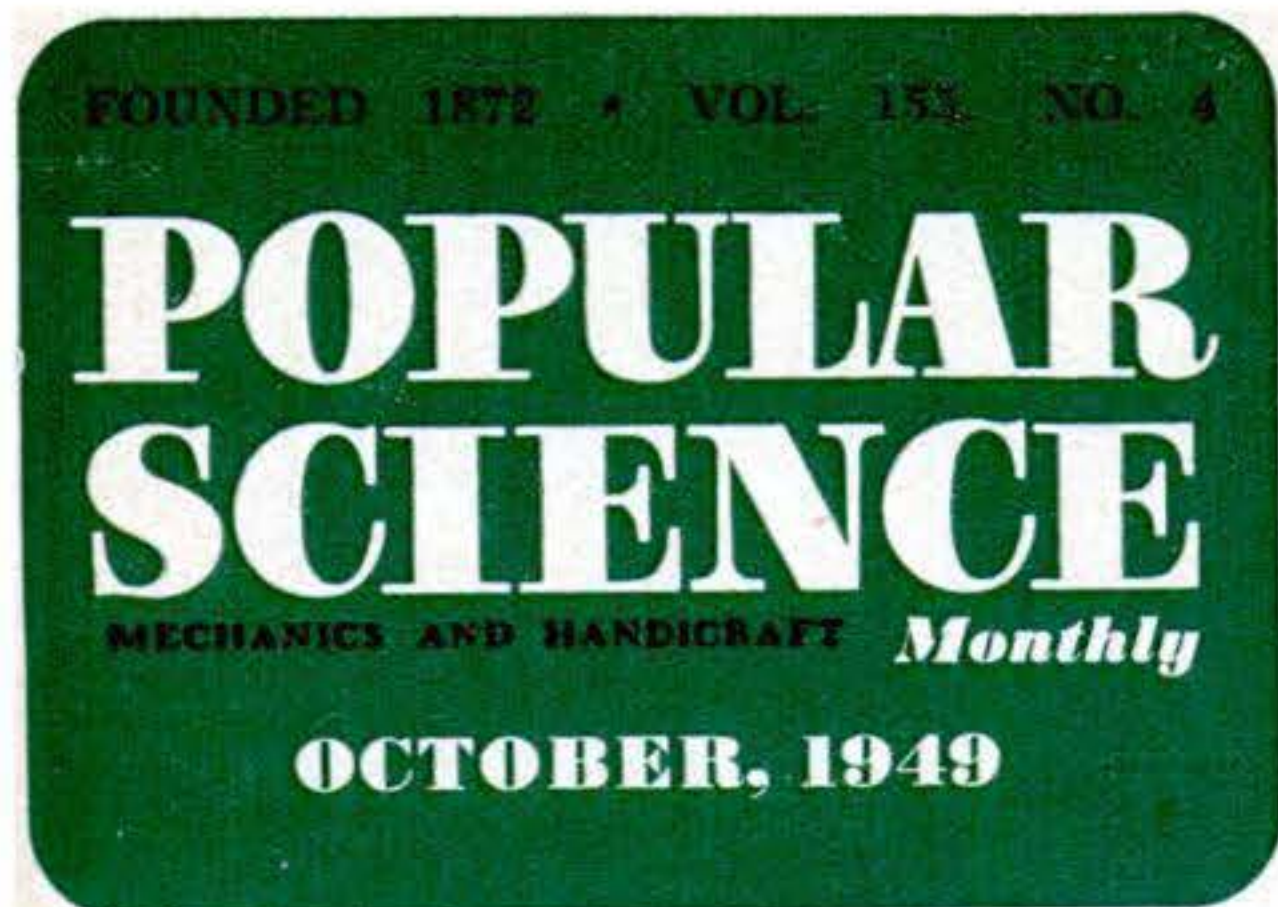
MR. _____ 101
MRS. _____
MISS _____ (Print plainly in block letters)

ADDRESS _____ 8010

CITY & _____ STATE _____
ZONE NO. _____

DeLuxe Edition—Check here to examine DeLuxe Edition in genuine Morocco-Grained Artcraft embossed with hand-tooled design in forest green and bronze. Only \$1 extra. Same terms.

Companion Volume—Check this box if you wish to enter your reservation for the companion volume "Wild Life Around the World" to complete this set and to be sent you as soon as ready. While "American Wild Life" deals with all the living creatures of our country, this second volume covers the fascinating lives of animals, birds, fishes, insects, etc., in all the far jungles, rivers, plains, oceans and skies of the ENTIRE EARTH. Over 640 exciting pages—over 380 thrilling illustrations! Same price and terms.



Perry Githens, EDITOR

Fred O. Newman, Volta Torrey
MANAGING EDITORS

Howard C. Jensen, ART EDITOR

Harry Walton, MECHANICS & HANDICRAFT EDITOR

Hartley E. Howe, Frank Rowsome, Jr.
ASSISTANT MANAGING EDITORS

ASSOCIATE EDITORS: Howard Allaway, Alden P. Armagnac, Devon Francis, Richard Giovine, Robert Gorman, Sheldon Gallager, Herbert Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

ART DIRECTOR: Harry Samuels. ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr., Richard Meyer, Edward Hallstrom, Frances Cooper (Production).

EDITORIAL ASSISTANTS: Julia Charnif, Beatrice El-dridge, Carol Ennis, Georgette Sparks, Ruth Westphal.

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

WASHINGTON CORRESPONDENT: John F. Loosbrock.

EDITORIAL OFFICES: 353 Fourth Avenue, New York 10, N. Y. Manuscripts and illustrations submitted at regular rates should be so marked, addressed to "The Editors" and accompanied by stamped, self-addressed envelope. Popular Science Monthly exercises all possible care but assumes no responsibility for unsolicited material.

TRADE NAMES by which products or materials are commonly known are indicated by the symbol ©. These names may or may not be Registered Trademarks (see PS, Mar. '49, p. 294). This symbol is used only as a service to readers and Popular Science Monthly assumes no responsibility by use or omission.

Godfrey Hammond, PUBLISHER

Stephen P. Glennon, ADVERTISING DIRECTOR

Edward Roeder, Jr., ADVERTISING MANAGER

ADVERTISING OFFICES: NEW YORK—353 Fourth Avenue; CHICAGO—360 North Michigan Avenue; DETROIT—820 Book Building; SAN FRANCISCO—1003 TWA Building; PORTLAND (ORE.)—907 Terminal Sales Building; CLEVELAND—328 Citizens Building; LOS ANGELES—Granada Building.

Popular Science Monthly is published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter July 26, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1949, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, \$3.00 (2 years, \$5.50; 3 years, \$7.50); foreign countries \$1 per year extra. Subscribers must notify us of change of address four weeks before next publication date. Be sure to give both old and new addresses, including zone numbers. Vol. 155: No. 4.

THIS MONTH'S

Highlights

PS Features

New Plane Leaps Off Ground.....106

Astounding lightplane takes off from tennis court. Devon Francis, PS aviation expert, tells how.

Road Cruiser Made From Truck..122

Next time you hit the road you needn't worry about where to sleep or eat—if you have a mobile home.

How Ingenuity Fought Polio.....126

When child-crippling polio hit one town, its mechanics built "iron lungs" in a hurry.

Planes "Type" Messages in Sky....136

A square smoke ring? Don't laugh. This new type of sky writing blows 'em.

Rare Metals in Production.....140

Atomic lab in the corn country turns out by the pound elements once worth dollars per speck.

Cart Explores Ocean Bottom.....166

Read about Otis Barton's Benthoscope, which took him deeper into the sea than man had ever been.

Gus Prescribes for the Doctor...178

Knowing how to listen helps PS's master mech to solve a mechanical mystery.

Homemade Racers Hit the Dirt..186

Stewart Rouse takes you to a jam session of the Rushville Micromidget Racers Club.

Machining a 2-Hp. Engine.....215

For about \$20 you can build this power plant for your lawn mower or pump.

Print Pictures for a Lifetime.....222

Photos will last as long as the paper they're printed on. Ken Swezey shows you how.

Radio Parts from Scrap.....228

Don't throw those old parts away. Here's how to make them do double duty.

Science & Industry

Steel Beaver Chews Out Stumps.....113

Big Hammers Speed Pile Driving.....116

Come-Apart Boat for Arctic Army.....120

Sprayed Plastic Heats Planes.....121

Jet Refuels Like Humming Bird.....131

Nash Boasts Longer-Lasting Engine.....132

Photos of Secret A-Bomb Test.....146

Spinning Camera Covers 360°.....149

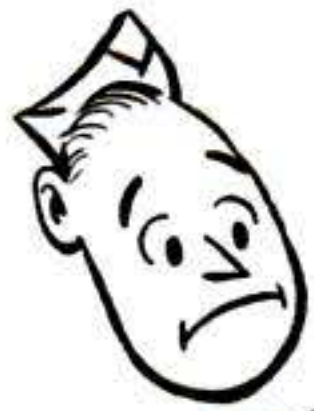
Come-Apart Cars Let Camera In.....153

How's Your Plane IQ?.....158

4-Mile Rails Save Work in Tunnel.....162

Continued on page 6

BETTERIN' the VETERAN —a story about



had three choices back in 1946:



He picked No. 2; came up with a brand-new job. He did well—too well, in fact, got stuck.



He reached a point where he could go no further . . .

WITHOUT ADDITIONAL TRAINING.



was entitled to that training under the **G. I. BILL.**

But he couldn't afford to quit work to go to school. He had to learn and earn at the same time.




SO HERE'S WHAT HE DID:

mailed a coupon. It put him in touch with the largest school in the world,


INTERNATIONAL CORRESPONDENCE SCHOOLS

400

He learned he had some **400** courses to choose from. Each course sound, authoritative, easy to follow. Each course a *gold mine* of practical information.

So  enrolled with I. C. S. and studied.

IN HIS SPARE TIME.

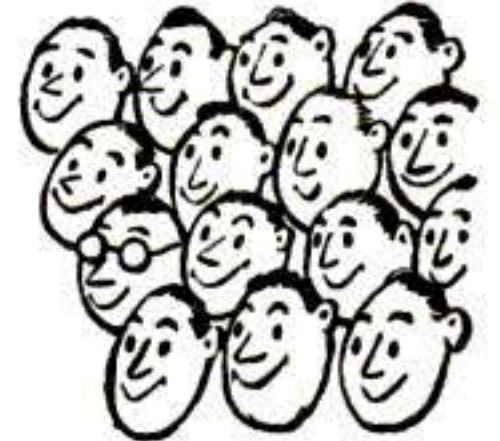
Now  is making good—in his studies and

ON THE JOB.

As a trained man, there will be practically no limit to how far he can go.



is like thousands of veterans who are cashing in on their opportunities through **I. C. S.**



WHAT ABOUT YOU? Do you have enough training to carry you to the top? Here's the coupon that can help open the door to a fuller, brighter, more rewarding future for you. **MAIL IT TODAY!**

INTERNATIONAL CORRESPONDENCE SCHOOLS

APPROVED
under the
G. I. BILL

BOX 7640-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

- | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Business and Academic Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Accounting <input type="checkbox"/> App. Psychology <input type="checkbox"/> Business Administration <input type="checkbox"/> Bus. Correspondence <input type="checkbox"/> Certified Public Accounting <input type="checkbox"/> Commercial <input type="checkbox"/> Commercial Art <input type="checkbox"/> Cost Accounting <input type="checkbox"/> Federal Tax <input type="checkbox"/> First Year College <input type="checkbox"/> Foremanship <input type="checkbox"/> Good English <input type="checkbox"/> Higher Mathematics <input type="checkbox"/> Industrial Supervision <input type="checkbox"/> Motor Traffic <input type="checkbox"/> Retailing <input type="checkbox"/> Salesmanship <input type="checkbox"/> Sign Lettering <input type="checkbox"/> Spanish <input type="checkbox"/> Advertising <input type="checkbox"/> Bookkeeping <input type="checkbox"/> Bus. Law <input type="checkbox"/> French <input type="checkbox"/> High School <input type="checkbox"/> Illustration <input type="checkbox"/> Postal Civil Service <input type="checkbox"/> Retail Bus. Management <input type="checkbox"/> Secretarial <input type="checkbox"/> Stenography <input type="checkbox"/> Traffic Management <input type="checkbox"/> Air Conditioning <input type="checkbox"/> Heating <input type="checkbox"/> Refrigeration | <p>Chemical Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Chemical Engineering <input type="checkbox"/> Chemistry, Analytical <input type="checkbox"/> Chemistry, Industrial <input type="checkbox"/> Chemistry, Mfg. Iron & Steel <input type="checkbox"/> Petroleum Refining <input type="checkbox"/> Pulp and Paper Making <input type="checkbox"/> Civil Engineering, Architectural and Mining Courses <input type="checkbox"/> Architecture <input type="checkbox"/> Building Estimating <input type="checkbox"/> Civil Engineering <input type="checkbox"/> Contracting and Building <input type="checkbox"/> Highway Engineering <input type="checkbox"/> Lumber Dealer <input type="checkbox"/> Reading Structural Blueprints <input type="checkbox"/> Sanitary Engineering <input type="checkbox"/> Structural Drafting <input type="checkbox"/> Structural Engineering <input type="checkbox"/> Surveying and Mapping <input type="checkbox"/> Communications Courses <input type="checkbox"/> Electronics <input type="checkbox"/> Prac. FM and Television <input type="checkbox"/> Prac. Telephony <input type="checkbox"/> Radio, General <input type="checkbox"/> Telegraph Engineering | <p>Electrical Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Electrical Drafting <input type="checkbox"/> Electrical Engineering <input type="checkbox"/> Electric Light and Power <input type="checkbox"/> Lighting Technician <input type="checkbox"/> Practical Electrician <input type="checkbox"/> Power House Electric <input type="checkbox"/> Ship Electrician <input type="checkbox"/> Internal Combustion Engines Courses <input type="checkbox"/> Auto Technician <input type="checkbox"/> Diesel-Electric <input type="checkbox"/> Diesel Engines <input type="checkbox"/> Aeronautical Engineer's, Jr. <input type="checkbox"/> Aircraft Drafting <input type="checkbox"/> Forging <input type="checkbox"/> Heat Treatment of Metals <input type="checkbox"/> Industrial Engineering <input type="checkbox"/> Industrial Instrumentation <input type="checkbox"/> Industrial Metallurgy <input type="checkbox"/> Machine Shop <input type="checkbox"/> Machine Shop Inspection <input type="checkbox"/> Mechanical Drafting <input type="checkbox"/> Mechanical Engineering | <p><input type="checkbox"/> Mold-Loft Work</p> <p><input type="checkbox"/> Patternmaking—Wood, Metal</p> <p><input type="checkbox"/> Reading Shop Blueprints</p> <p><input type="checkbox"/> Sheet-Metal Drafting</p> <p><input type="checkbox"/> Sheet-Metal Worker</p> <p><input type="checkbox"/> Ship Fitting</p> <p><input type="checkbox"/> Tool Designing</p> <p><input type="checkbox"/> Toolmaking</p> <p><input type="checkbox"/> Welding Engineering</p> <p><input type="checkbox"/> Welding—Gas and Electric</p> <p>Railroad Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Air Brake <input type="checkbox"/> Diesel Locomotive <input type="checkbox"/> Locomotive Engineer <input type="checkbox"/> Locomotive Fireman <input type="checkbox"/> Locomotive Machinist <input type="checkbox"/> Railroad Section Foreman <input type="checkbox"/> Steam and Diesel Loco. Eng. <p>Stationary Engineering Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Boilermaking <input type="checkbox"/> Combust. Engrg. <input type="checkbox"/> Marine Engineering <input type="checkbox"/> Power Plant Engrg. <p>Textile Courses</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cotton Manufacturing <input type="checkbox"/> Rayon Weaving <input type="checkbox"/> Woolen Manufacturing |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Length of Service in World War II _____ Enrollment under G.I. Bill approved for World War II Veterans. Special tuition rates to members of the Armed Forces.

Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

TELEVISION INTERFERENCE

In many areas, a car with the motor running can ruin a television program. Ordinary spark plugs broadcast a signal which interferes with television reception. A switch to Auto-Lite Resistor Spark Plugs will check this annoyance.



Checked by

British Bill Would Curb Spark Plug Interference With Television

London—The Government announced tonight that it is enacting legislation making persons subject to \$400 fine and possible jail sentence of three months for causing interference during peak radio and television periods. For example, motorists will be asked to fit suppressors to their motors.

It can happen here!

HERE'S THE PROBLEM

Few people realize that a major cause of faulty television reception, particularly in areas where the television signal is weak, originates not in the set itself but from ordinary spark plugs in nearby automobiles. This poor reception, jumping and wobbling in the image, comes from the radiation of the electrical discharge in passing vehicles—your car, your neighbor's, or delivery cars or traffic on your street. The ordinary automobile spark plug acts as a miniature broadcasting station that frequently spoils what would otherwise be clear, sharp television images.

Read What Television Experts Say:

FRANK STANTON, President, Columbia Broadcasting System: "There is no question in my mind that ignition interference is a contributory cause to poor television reception. The resistor type spark plug appears to be the answer."



J. R. POPPELE, President, Television Broadcasters Association of America: "Interference by automobile ignition systems to television is quite common and is often very severe in outlying areas. I have witnessed tests in which the new Auto-Lite Resistor Spark Plug was very effective in reducing interference to television receivers under such conditions."



W. R. MacDONALD, President, Radio-Television Institute: "The sooner every car and truck in America is equipped with the new Auto-Lite Resistor Spark Plug, the better it will be for the television industry and everyone who owns a television set."



An authoritative article, "Television Brings Change in Car Ignition Behavior," reprinted from the S.A.E. JOURNAL published by the Society of Automotive Engineers, is available without charge.



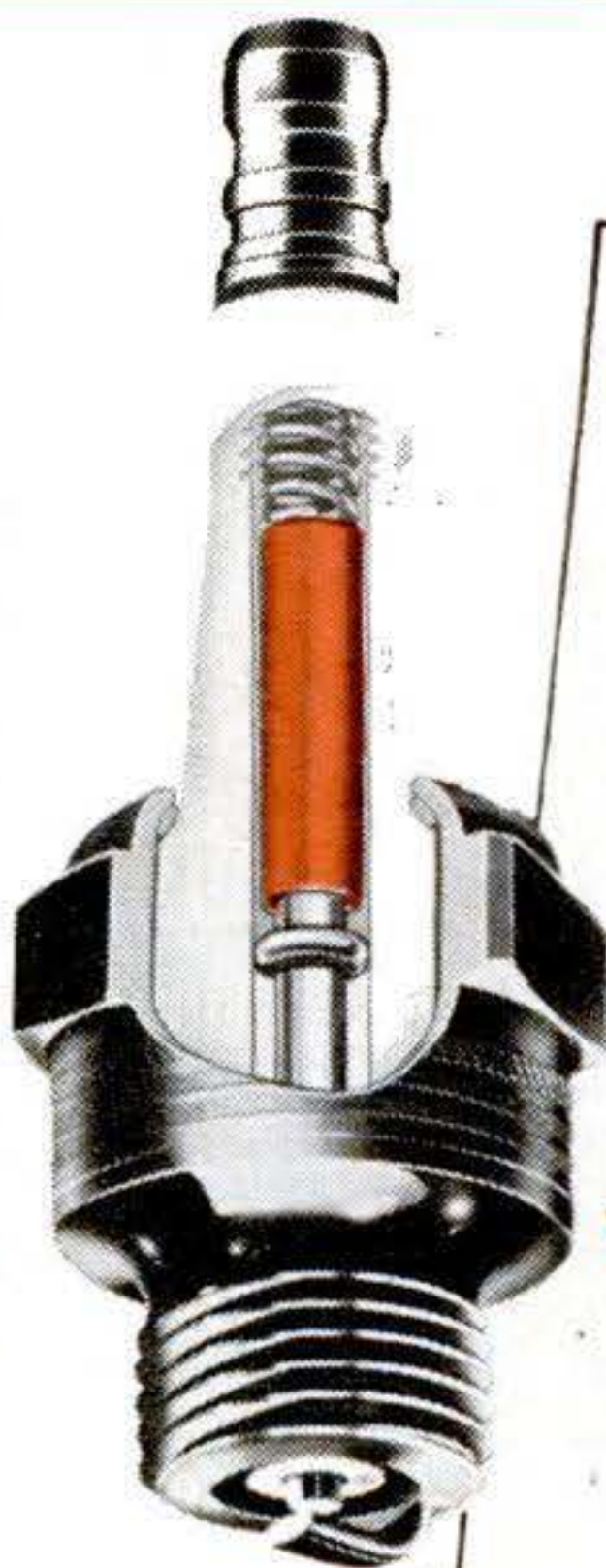
The effect of ordinary spark plugs on the TV image is shown in this scene from Auto-Lite's "Suspense!" show, "The Creeper" starring Bina Foch and Anthony Ross.

BY ORDINARY SPARK PLUGS

AUTO-LITE *Resistor* Spark Plugs

HERE'S THE ANSWER

The new Auto-Lite Resistor Spark Plugs check television interference normally caused by ordinary spark plugs. Blurred, flipping and distorted images, due to this type of interference, become clear pictures like the one at right below. So install Auto-Lite Resistor Spark Plugs in your car—urge your neighbors and neighborhood delivery service to use this better plug too. This "good neighbor" policy will help everyone in your community enjoy television at its best. It's easy to do . . . switch to Auto-Lite Resistor Spark Plugs!



Get these 4 Star Benefits

- ★ **IMPROVED RADIO AND TV RECEPTION**
In addition to its operating benefits, the Resistor reduces plug interference with radio and television within 35 mv/m from 540 kc. to 150 mc. at 50 ft.
 - ★ **A SMOOTHER ENGINE IDLE**
The Auto-Lite Resistor Spark Plug permits wider spark gap to help eliminate occasional missing.
 - ★ **IMPROVED GASOLINE ECONOMY**
Permits burning of leaner mixtures and reduces misfiring.
 - ★ **INCREASED ELECTRODE LIFE**
Because electrode erosion is reduced, electrode life is increased up to 200% and more.
- ★ Cutaway view shows the 10,000 Ohm Resistor which permits wider initial gap settings to make possible the extra benefits obtained from Auto-Lite Resistor Spark Plugs.
- Auto-Lite Spark Plugs—Patented U.S.A.



This clear image shows how better television is possible when Auto-Lite Resistor Spark Plugs check interference. The scene is the same as that shown at the left

Switch to
AUTO-LITE
Resistor
SPARK PLUGS

Now Standard Equipment on Many
Leading Makes of Cars and Trucks

THE ELECTRIC AUTO-LITE COMPANY
Toronto, Ontario Toledo 1, O


EXTRA!

a different name for your old friends:

PROTO TOOLS

-formerly-

PLOMB TOOLS



Here is the biggest news in the tool industry today. The leading hand service tools are now named PROTO tools—formerly Plomb tools. All PROTO tools are of the very finest quality. That's why they have been the favorites of professionals since 1907. Remember the name — PROTO tools—formerly Plomb tools, when you want the best. Buy the ones you need from your dealer today.

Write for catalog to

PLOMB TOOL COMPANY
2257-M Santa Fe Ave., Los Angeles 54, Calif.

4985

PROTO
Professional Quality ®
TOOLS
LOS ANGELES

Leonardo Comes to Life.....	164
Antennas Go into Hiding.....	169
Lenses Promise No-Hands Phone.....	170
Radar Talks Ships into Port.....	172
Radio Toasts Wood for Cars.....	174

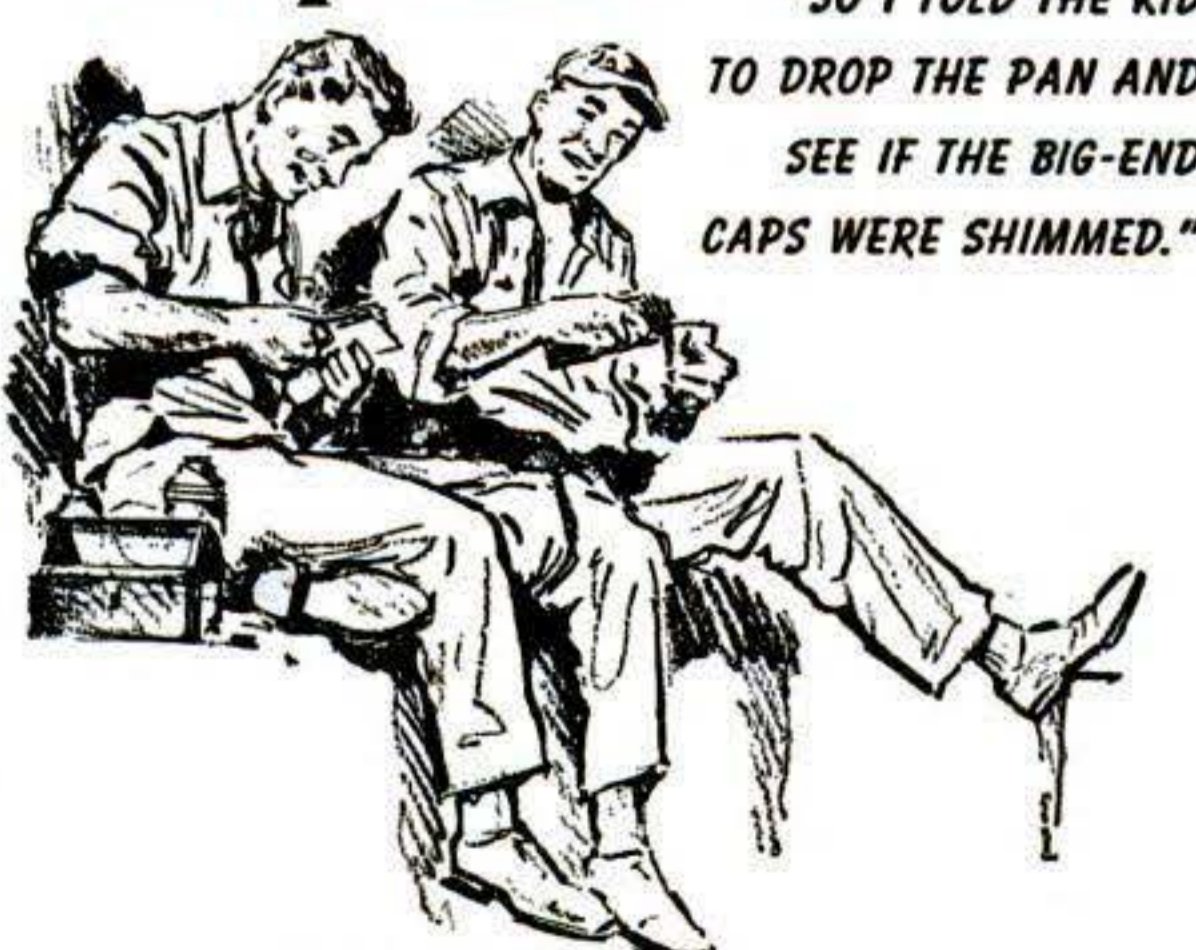
Mechanics & Handicraft

Three Antique Benches.....	192
How to Model Your Contour Map.....	194
How to Drill Curves in Plastic.....	200
Bookcase Includes Desk Shelf.....	202
Floral Basket Lights Table.....	204
Offbeat Jobs for Metal Molding.....	206
Working Wood in the Round.....	210
Amplifier Fits on Headphone.....	232
Cherry Grain Forms Fish.....	235
Magnet Magic.....	240
Concrete Mixer Cooks a Meal.....	242

Departments

Letters	12
I'd Like to See Them Make.....	98
Voice of Science.....	103
New Ideas from the Inventors.....	114
March of Science.....	134
What's New in Aviation.....	150
Hints from the Model Garage.....	208
New Tools	214
New Shop Ideas.....	220
Photo Ideas and Equipment.....	225
News in Electronics.....	227
What's Your Ingenuity Quotient?.....	234
Craftsmen at Work.....	238
What's Wrong?.....	243
Keeping the Home Shipshape.....	244
P.S.—Last Minute News and Notes.....	302

Shoptalk: "SO I TOLD THE KID TO DROP THE PAN AND SEE IF THE BIG-END CAPS WERE SHIMMED."



What are they talking about?
Where do they work? Answer below.

They're auto mechanics. The grease monkey was told to remove the oil pan of an engine to determine if shims (paper-thin spacers) had been placed under the removable caps at the large end of the connecting rods.

Prepare in our
Big Training
Shops for these

GREAT OPPORTUNITY FIELDS!

ELECTRICITY OR RADIO TELEVISION



This big fire-proof building is occupied entirely by Coyne.

FIVE BIG FLOORS PACKED WITH MASSIVE EQUIPMENT

Thousands of men and young men have come to our big training shops where we have floor upon floor packed with massive equipment to train with, to prepare for good jobs and real futures in the opportunity fields of Electricity and Radio-Television. For many years, these fields have offered great opportunities to trained men. With new developments, including Electronics and Television, they will continue to grow and offer even greater opportunities. Why be satisfied with a "no future" job? Many "one operation" jobs that exist today will not last. Prepare for a good job with a real future for steady pay and advancement by training NOW in the great training shops of COYNE in Chicago.

NOT "HOME-STUDY" COURSES

Our famous Radio-Television Practical-Technical method gives you practical experience on a massive outlay of equipment. Not by correspondence, but actual shop work plus necessary technical training. You are trained right here in the great Coyne shops that have been training men and young men for over 50 years.

LARGEST, OLDEST, BEST EQUIPPED SCHOOL OF ITS KIND IN THE U.S.

ELECTRICITY RADIO-TELEVISION

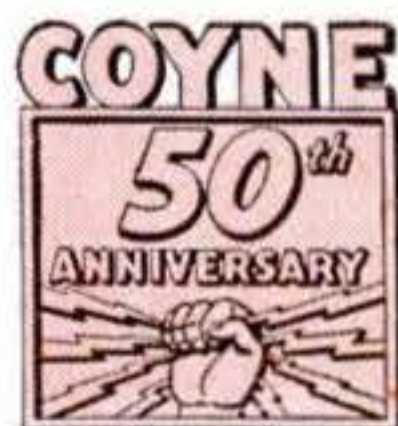
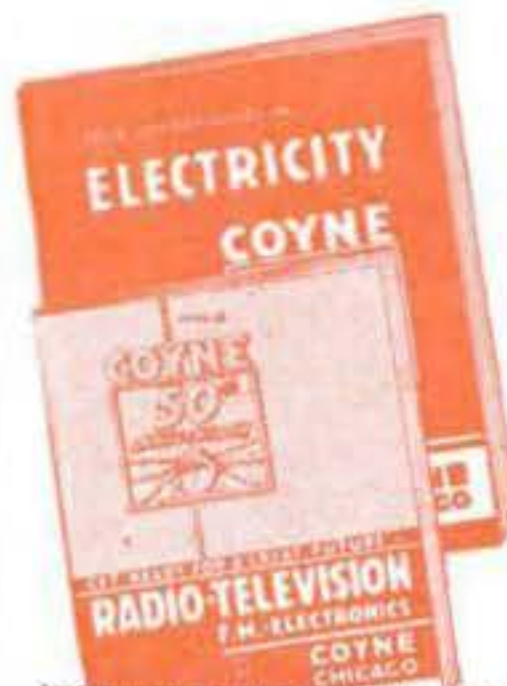
INCLUDING INDUSTRIAL ELECTRONICS

Big future in Power Plant Work, Motors, Armature Winding, Home and Factory Wiring, Appliances, Refrigeration, Maintenance, Illumination, etc. Electricians are in demand everywhere —lifetime job service to Coyne graduates. Send for BIG FREE BOOK.

A great field now, even greater growth ahead. Here at COYNE you're trained for Construction, Testing, Trouble-Shooting on Radio, Public Address, Sound Units. Training includes FM, Television Servicing, etc. Many Coyne trained men in good jobs or own well paying Radio-Television businesses of their own.

Mail Coupon for Big FREE Book!

Whether you prefer Electricity, or Radio-Television, train on actual equipment at Coyne. We have a big, fully illustrated book on each course, and we'll send you the one you want, or both if you want to consider both fields, without obligation. Mail coupon—TODAY.



ELECTRIC REFRIGERATION

This valuable training now included with either course means added opportunities.

G. I. APPROVED

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

B. W. COOKE, President

COYNE ELECTRICAL AND RADIO SCHOOL

500 So. Paulina St., Dept. 79-73H, Chicago 12, ILL.

B. W. Cooke, President
COYNE ELECTRICAL AND RADIO SCHOOL
500 S. Paulina St., Dept. 79-73H, Chicago 12, Ill.

Send me the book, checked below and details of your training offer. This does not obligate me and no salesman will call.

ELECTRICITY RADIO-TELEVISION

NAME.....

ADDRESS.....

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

LOOK!

Here's the best heater money can buy!



Perfection 3155 Oil Heater
55,000 B.T.U. (up to 6 rooms)



See the heater that pays for itself!

BECAUSE

Only Perfection has the "Midget" Pilot

Perfection's exclusive "Multi-Heat" burner is the *ONLY* burner with a pilot like this. It burns for hours on a cup of oil. Alternates with high or low fire. Keeps you cozy on the coldest day, yet never wastes money overheating in mild weather.

BECAUSE

*Only Perfection has the "Floor-Flo" Blower**

A real blower, not merely a fan. Circulates air down low to warm the floor. Gives *better* distribution of heat. (*optional)

BECAUSE

Perfection has a better heat Extractor

This saves dollars from going up the chimney. It traps and uses heat that would otherwise be wasted. You get *more useful heat* from every drop of oil.



AND AUTOMATIC CONTROLS.* Finest available. The thermostat turns the fire from high or low to money-saving pilot as needed, without you having to think about it. (*optional)

Ask your dealer, or let us send you free Perfection booklet.

Be sure YOU get a
PERFECTION
Oil Heater

PERFECTION STOVE COMPANY • 7108-A PLATT AVE. • CLEVELAND 4, O.
Manufacturers of Ranges • Cook Stoves • Home Heaters • Water Heaters • Winter Air-Conditioning Furnaces



LARGE HEAT CAPACITY



LOW OPERATING COST



SMALL DIMENSIONS



BEAUTIFUL FINISH



SIMPLE OPERATION

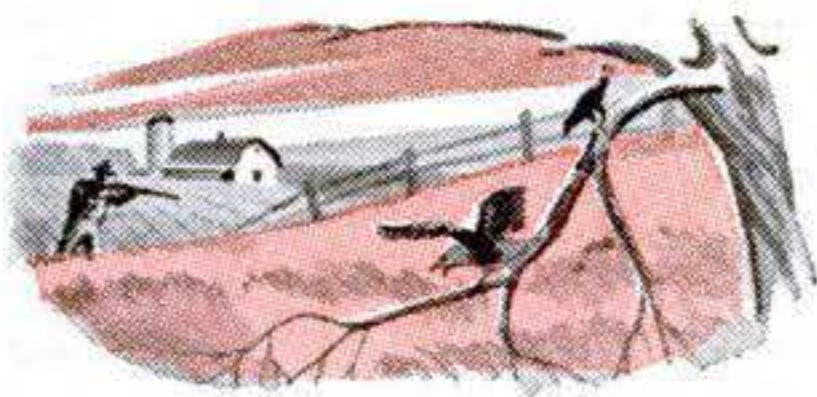
What's Your choice?...

of these sturdy, dependable
Low-Cost
Marlin .22's

TUBULAR MAGAZINE
 18-25 shots on one loading
\$28.90*
**Price slightly higher west of the Rockies.*

MARLIN MODEL 81-DL

Shooting efficiency, with *least* fuss and bother! Magazine holds a load for a full day's hunting. Patented non-jamming feed. Shoots .22 short, long and long rifle cartridges—regular and high speed without adjustment. Quick-release trigger—self-cocking action—side ejection—Off and On safety—American walnut stock. Available with peep sight or open sights; sling strap swivels.



Unbeatable for pests and vermin...owls, rats, hawks and crows, the 81-DL carries up to 25 shots.



CLIP MAGAZINE
 for rapid fire

\$24.15*
**Price slightly higher west of the Rockies.*

MARLIN MODEL 80-DL

Whale of a value—this man-sized .22 repeater! Ready for instant action on vermin or small game. 8 rapid-fire shots to get 'em, no matter how fast they run. Quick-release trigger—self-cocking action—side ejection—Off and On safety—American walnut stock. Available with peep sight or open sights; sling strap swivels. More sport for your money with Marlin's 80-DL!



Marlin's 80-DL is a sure getter of woodchuck, raccoons, rabbits and other fur-bearing game.



THE MARLIN FIREARMS CO. • NEW HAVEN, CONN.

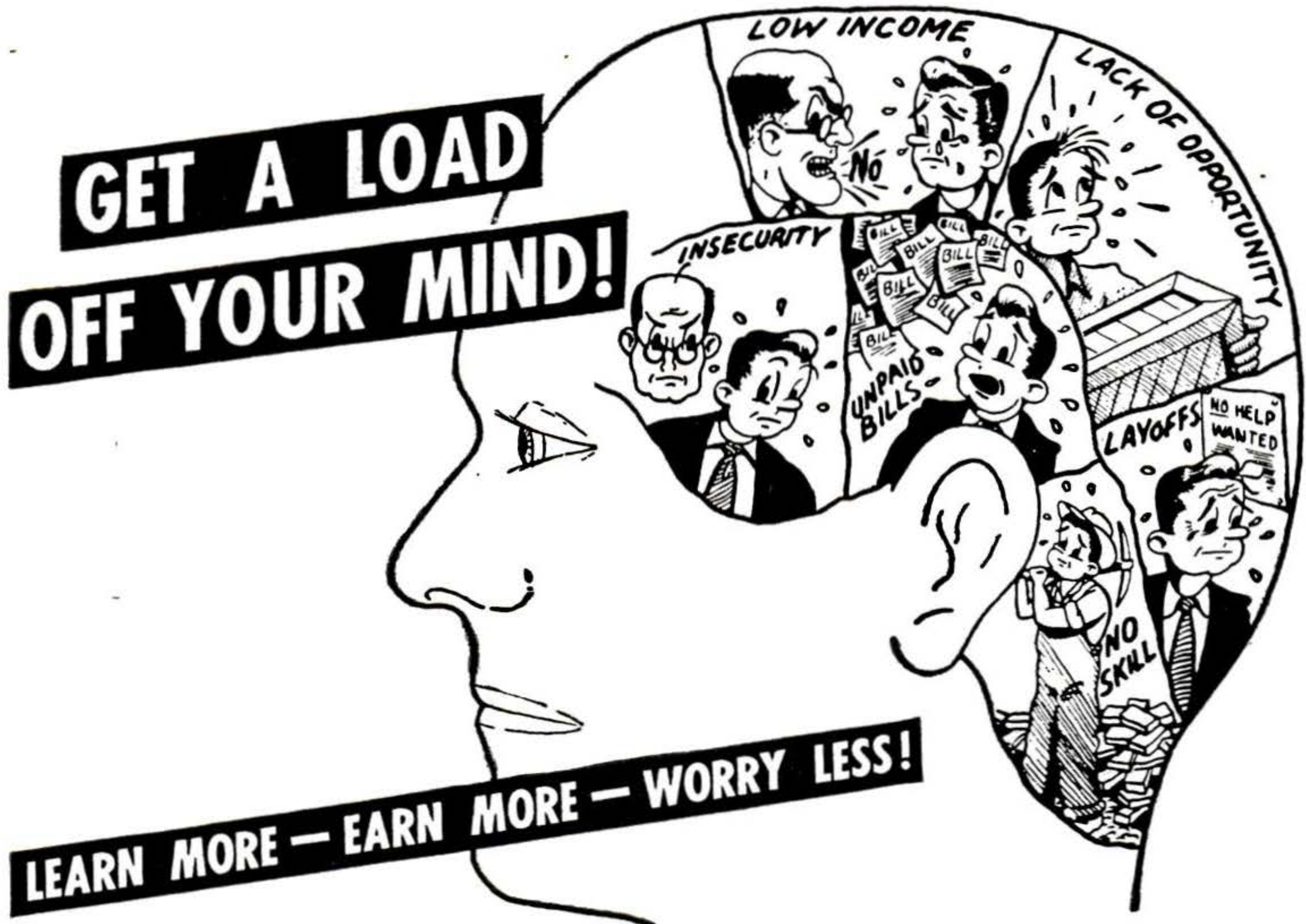


SEND TODAY for new illustrated catalog* with complete specifications! Enclose 10¢ to cover postage and handling. Mail coupon to Marlin, Dept. 7, New Haven, Conn.

*Sample pack of Marlin Blades included, with our compliments

Name

Address



Train at Home through C.T.I.!

Worried because of low wages? Bothered by insecurity? Then read these encouraging words from C.T.I. students and graduates! They tell you how technical knowledge—achieved through C.T.I. in a few months of training—has provided a short cut to high income and independence. Listen:

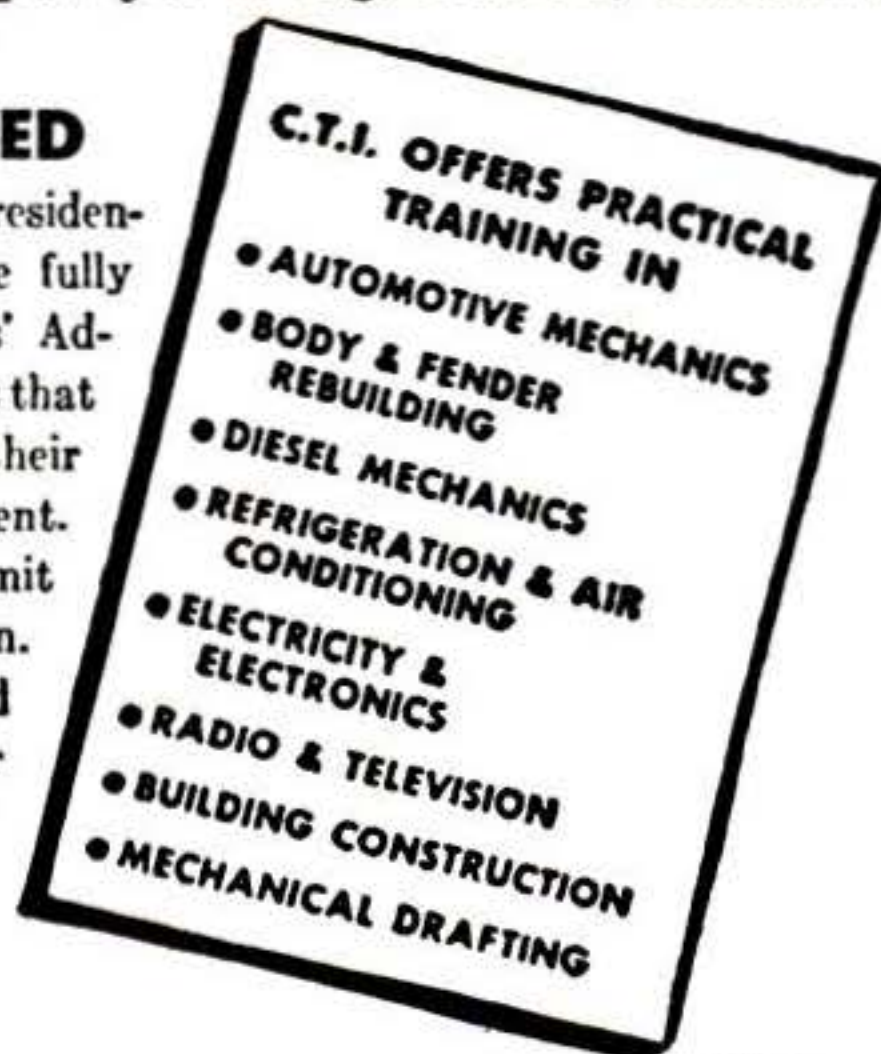
"I enjoy every lesson and am learning more than I ever thought possible by correspondence. I have one man working for me now and I am looking forward to having a bigger and better business soon, thanks to C.T.I." . . . "Since the news got around that I was a student with C.T.I., I have been offered three jobs paying over \$85.00 a week." . . . "When I was on my 34th lesson, I quit my job and started a business of my own, and I'm doing fine." . . . "Thanks to my C.T.I. lessons, I have won the respect of my bosses and the right to hold my head a little higher than

before." . . . "I have almost finished my course and I give all the credit in the world to C.T.I. home study. I never would have been able to have my own business if it had not been for your training." . . . "Another valuable benefit that I received from C.T.I. schooling is the habit of learning. Now I feel there is no limit to what I can accomplish in this life."

Why limit *your* earning potential by lack of training? Better get the facts now—on how you can train for a good future in one of America's leading industries. Find out all about C.T.I. home study training methods, and about the big C.T.I. residential school in Chicago. *Mail coupon for a big, FREE, illustrated booklet. Act today!*

G.I. APPROVED

All C.T.I. courses, both residential and home study, are fully approved by the Veterans' Administration—which means that eligible veterans will have their tuition paid by the government. Remember, there's a time limit on when training must begin. NON-VETERANS — We'd like to tell you about our Easy-Payment Finance Plan and Pay-After-Graduation Plan. Information on request.



COMMERCIAL TRADES INSTITUTE, Dept. E1-10
1400 Greenleaf, Chicago 26



FILL OUT - CUT OUT - MAIL TODAY

Mr. R. C. Anderson, President
COMMERCIAL TRADES INSTITUTE, Dept. E1-10
1400 W. Greenleaf, Chicago 26, Ill.

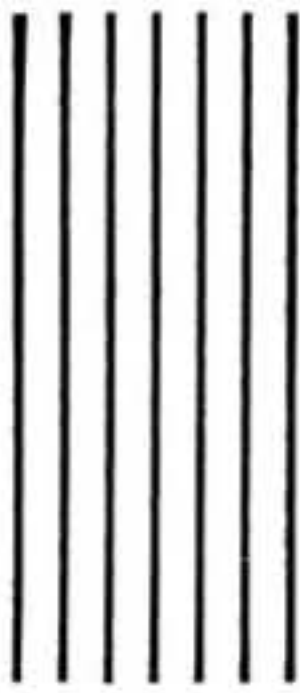
Send free illustrated Brochures and other information about the field I have checked below:

- | | | |
|-----------------------------------------------------------|----------------------------------------------------|--------------------------------------|
| <input type="checkbox"/> Automotive Mechanics | <input type="checkbox"/> Veteran | <input type="checkbox"/> Non-Veteran |
| <input type="checkbox"/> Body & Fender Rebuilding | <input type="checkbox"/> Electricity & Electronics | |
| <input type="checkbox"/> Diesel Mechanics | <input type="checkbox"/> Radio & Television | |
| <input type="checkbox"/> Refrigeration & Air Conditioning | <input type="checkbox"/> Building Construction | |
| | <input type="checkbox"/> Mechanical Drafting | |

Name _____ Age _____

Address _____

City _____ State _____



INVENTORS



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

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

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

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

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

92-K DISTRICT NATIONAL BUILDING • WASHINGTON 5, D. C.

Patents
Trademarks
Copyrights

CLARENCE A. O'BRIEN & HARVEY JACOBSON
 Registered Patent Attorneys
 92-K District National Bldg., Washington 5, D. C.
 Please send me copy of "Patent Guide for the Inventor" and also
 "Record of Invention" form. This request does not obligate me.

Name _____
 Address _____
 City _____ State _____
 (Please write or print plainly.)

FREE!!

HOW TO MAKE

BIG MONEY

AT HOME
FULL OR
SPARE
TIME



WITH
METALIZED

BABY SHOES

A NEW BIG PROFIT
FIELD NOW OPEN TO YOU

Metalize Baby Shoes and other precious keepsakes with Genuine Metal, in beautiful 2-tone BRONZE, SILVER and GOLD and popular PEARL and GLASS Finishes. Even simple dimestore objects, lowly leaves of trees and hundreds of other items become objects of beauty like magic when covered with jewel-like metal.

IF YOU WANT
BIG MONEY

Instead of small weekly pay checks, if you want to add to the family income in your spare time, then you owe it to yourself and family to get the FREE FACTS about this exciting, profitable business.

IF YOU WANT TO
BE YOUR OWN BOSS

and are tired of working for others THIS is what you've been looking for. A chance to be independent and build a secure future without risking your present job.

MILLIONS OF NEW
PROSPECTS YEARLY

Yes, the market is HUGE and growing BIGGER each year. No seasonal slumps — a steady year 'round income. This is ideal for a man and wife who want to work together Right at Home for extra income or a profitable Full Time Business. Quickly learned in a matter of days and without previous experience of any kind. A few cents can bring back many dollars to YOU. Delay may be costly. Write now! NO RISK OR OBLIGATION ON YOUR PART.

ACT NOW AND
CASH IN ON HUGE
XMAS DEMAND!

KIKTAVI COMPANY, Dept. PS-10
2111 W. Manchester, Los Angeles 47
Okay, send me FREE FACTS on How to Make
BIG MONEY At Home.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

TIRED OF
WORKING
FOR OTHERS?

NEED MORE
MONEY?

START YOUR
OWN BUSINESS
ON A
SHOESTRING

\$5 PER HOUR

NO EXPERIENCE
NECESSARY

PAY DAY
EVERY DAY

START EARNING
AT ONCE

FOR
FREE FACTS

on the opportunity
of a lifetime

MAIL COUPON
TODAY!

Letters



Satisfied with Old Moon

Sir:

I should think that the science world would see fit to expend its wisdom on something of more positive potential value than "building a new moon" [PS, May '49, p. 106].

Somehow it seems that this feat, even though inviting, is an impossibility. Let us assume that the earth is a round plate so as to simplify my thesis. We now draw one radial line and extend same into and past the last assumed rarefied circle of the earth's atmosphere. I believe that in this region the gravitational force or attraction on any missile is assumed nil.

Let us now assume our rocket will travel along this radial line beyond gravity. Our rocket now intercepts no resistance. It also moves through space at a constant speed. I can't see any common sense in believing that the rocket can possess some oddity that will enable it to turn of its own volition and travel in a curve around the earth.

R. KLINGBEIL

Woodhaven, N. Y.

You make one too many assumptions. The earth's gravitational attraction does decrease as you go out into space, but it is by no means "nil" at 22,300 miles away—the farthest distance suggested for PS' orbiter. Gravity would keep the orbiter circling the earth in the same way that it keeps the real moon in its path—and that's about 240,000 miles away.

You Can't Please Everybody

Sir:

I am getting disgusted. When I started buying POPULAR SCIENCE I enjoyed it very much. Now my interest is slowly growing dimmer. Why? Because Popular Science now has more mechanics in it than it has science. The greater part of the articles tell about the advancements in the more mechanical fields such as progress in engine design and construction, new inventions in the automotive field and even different construction ideas on building a more roomy

"What's he got that I haven't got?"

LOOK at the successful men you know. "What have they got" that you haven't?

Very little, probably. In most ways these men are no brighter or naturally more capable than average. Many of them probably have no more formal education or better natural aptitudes than you.

But that little extra they have is important. They have the special knowledge and ability for which business is glad to pay well—they know the what, why and how of business. They have also the confidence and aggressiveness which come from knowing that they know and can apply their knowledge.

You may add that extra—may get that same profitable knowledge and ability—that same confidence and aggressiveness—if you are willing to pay the price in earnest, necessary study. For LaSalle has spent over 40 years developing, testing and proving, with over a million student members, spare-time success training in certain specialized business fields. What scores of thousands of men and women—many just like you—have done, you should be able to do.

You need not leave your home or interrupt your job; you need pay comparatively little money. But you must be ambitious and willing to study seriously. And soon after you start training, the results will begin to show up in your own confidence and in your work. For what you learn at home tonight is so practical that often you can apply it on the job tomorrow.

How much do you want success—more money, a promotion or a new job, prestige and responsibility? If you really want it, you will use this coupon to find out what LaSalle training can do for you. It costs only a postage stamp, but a coupon like it has been the starting point to real success for scores of thousands—and can be for you.



LASALLE EXTENSION UNIVERSITY
A Correspondence Institution

Dept. 1083-R • 417 S. Dearborn • Chicago 5, Ill.

I want to know how LaSalle can help me win success in the field I have checked below. Please send me your free 48-page booklet about that field and your success training in it—plus "Ten Years' Promotion in One," a book which has helped many men.

- Higher Accountancy
- C.P.A. Coaching
- Bookkeeping
- Law: LL.B. Degree
- Business Management
- Salesmanship
- Traffic Management
- Foremanship
- Industr'l Management
- Stenotypy (Machine Shorthand)

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

Address.....

City, Zone and State.....

LASALLE EXTENSION UNIVERSITY
A Correspondence Institution

{ Dept. 1083-R 417 So. Dearborn St. }
CHICAGO 5, ILL. }

home. Such articles are all right in their place, but I don't think their correct place is POPULAR SCIENCE. Why don't you live up to the name of POPULAR SCIENCE and insert more articles which will arouse real scientific interest? I think if you would devote more pages to such fascinating subjects as chemistry, astronomy, physiology, biology, atomic energy, and medicine it would raise POPULAR SCIENCE magazine to a greater magazine.

ROBERT E. ZRAIK

Toledo, O.

On the other hand . . .

Sir:

I like your magazine very much, but one thing I don't like is stuff about atoms and things that take high-gear'd brains to read. I'm not that smart. Excuse me if I'm blunt. I like things like making things for the dark-room and cameras.

CHESTER LEWIS

St. Louis, Mo.

What PS tries to do is serve up a "balanced meal" that covers the wide range of science and mechanics. No reader is ex-

pected to like everything in every issue, just as no restaurant patron is expected to like everything on the menu. But that doesn't mean you can't get enough to eat.

Credit Where Due

Sir:

I was particularly interested in the article "Steam Now Cools, Too," appearing in your August issue on page 136. The article states that the Carrier Company has developed a new air-conditioning system whereby waste steam is utilized to produce cooling. This certainly is not anything new—just the old "absorption system," developed years ago.

Servel, Inc. has been manufacturing an air conditioner for the past ten years that cools in the summer and heats in the winter by steam.

RAY D. FREEMAN

Louisville, Ky.

Servel says it was the first to introduce an air-conditioning system of this general type, but that it was designed "for residential and small commercial usage." Carrier's system, for large applications (theaters, department

Continued on Page 18

Country Doctor



Pipe this—for a Hit!

Yes sir, Country Doctor comes through every time at bat with a cool, smooth smoke. TOPS in flavor. Slow-burning, as you like it. Mellowed for Mildness by a rare blend of the World's Finest Tobaccos. Nothing could be more satisfying!

TRY IT TODAY! SMOKE IT FOR GOOD!

**The Pipe Mixture
with the KINDLY disposition**



The Pipe
Smoker's
**ECONOMY
LUXURY**

25
Pleasureful
Pipefuls for
25¢

If your dealer does not have it — write Philip Morris & Co., Ltd., Inc., Dept. S-31, 119 Fifth Avenue, New York 3, N. Y., enclosing 25¢ for full size package

WHAT **AUTO** MECHANIC Every Wants to Know

A motor vehicle is a machine of many parts, each part designed and constructed for its own special function.

All good mechanics, like good doctors, should know the working theory and operation of each part and understand what causes trouble and how to remedy it.

LET AUDELS AUTO GUIDE SOLVE YOUR PROBLEMS

Every auto mechanic, helper, serviceman and operator can use a copy of AUDELS AUTOMOBILE GUIDE. The information it gives saves time, money and worry. Highly indorsed by all users. It presents the whole subject of auto mechanics from A to Z in plain language and simple terms.

This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

A complete Guide of 1800 pages, with over 1500 illustrations showing inside views of the working parts, with instructions for service jobs. Diesel engines, Fluid and Hydra-matic drives fully explained.

IT PAYS TO KNOW HOW TO

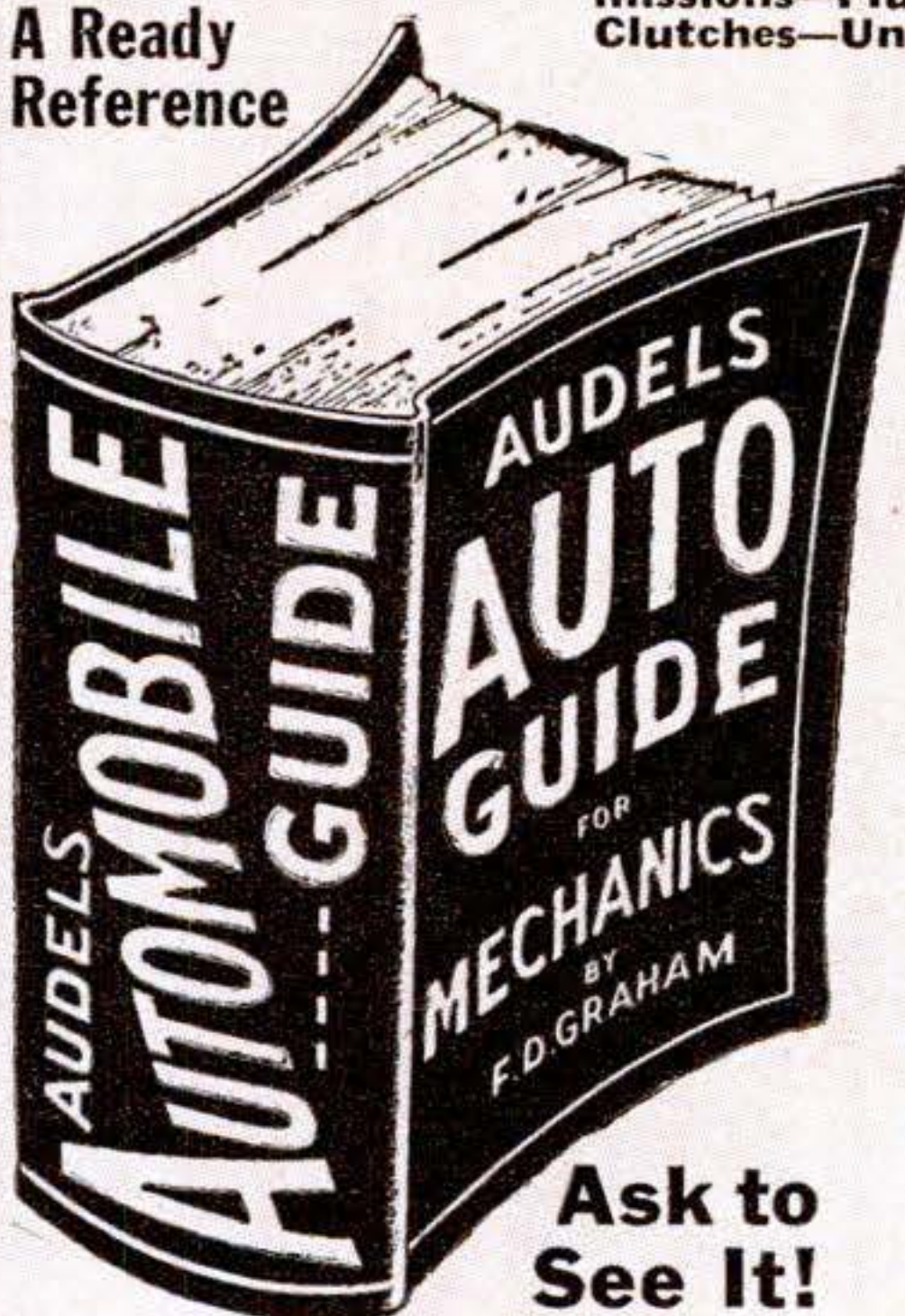
How to fit pistons—How to locate engine knocks—How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors & chokes—How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.

INFORMATION IN A HANDY FORM

73 INTERESTING CHAPTERS—Read this partial list of subjects on which practical information is fully given for quick reference under the headings as shown below. Ready Reference Index.

All Parts of an Automobile—Automotive Physics—The Gas Engine—Gas Engine Principles—Multi-Cylinder Engines—Horse Power—Automobile Engines—Stationary Parts—Moving Parts—Pistons—Piston Rings—Connecting Rods—Crank Shafts—Valves—Valve Gear—Cams and Cam Action—Valve Timing—Cooling Systems—Fuel Feed Systems—Dual Fuel Feed—Mixture—Carburetors—Carburetor Service—Automatic Choke—Super-Chargers—Transmissions—Special Transmissions—Fluid and Hydra-matic Drives—Clutches—Universals and Propeller Shafts

A Ready Reference

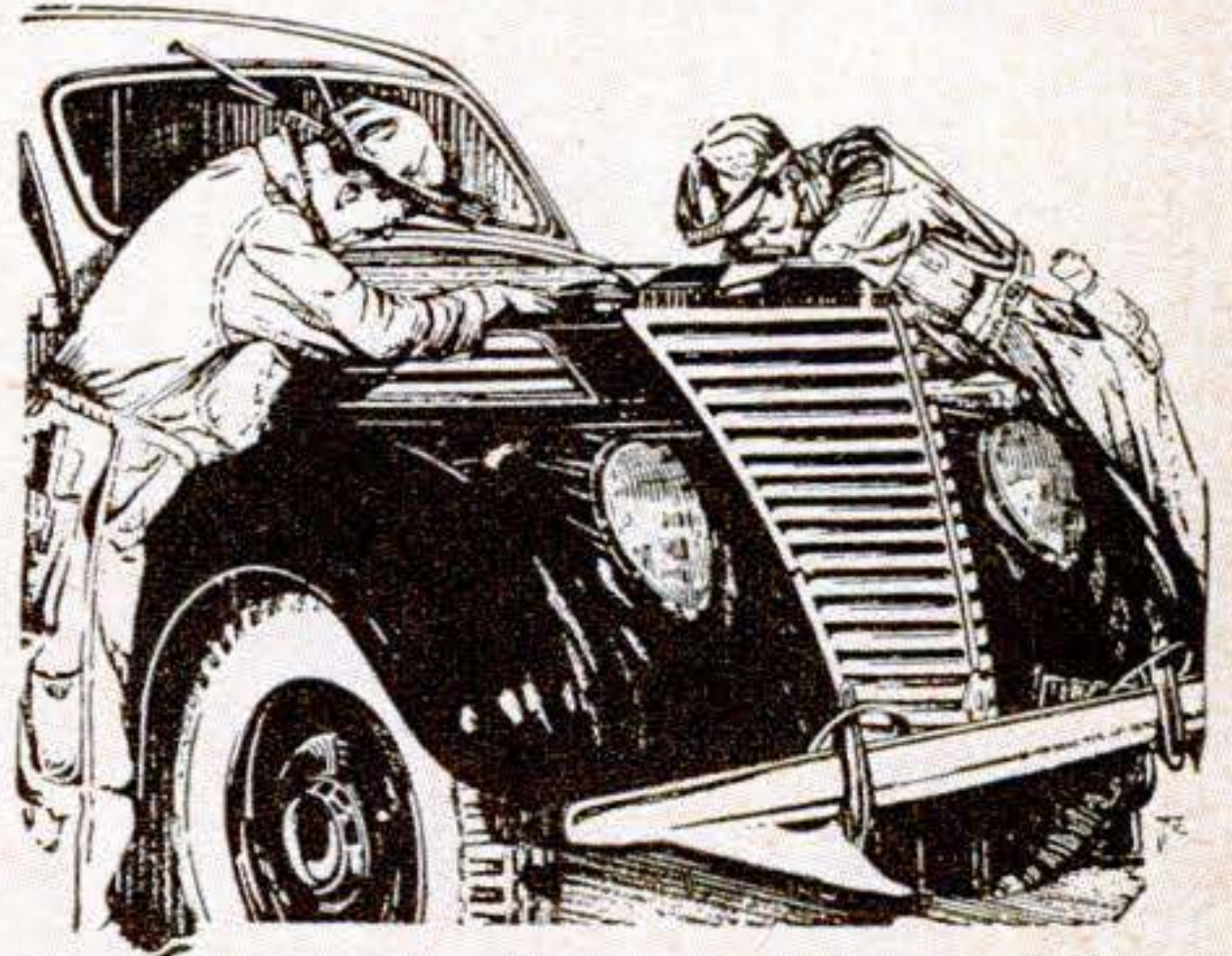


Ask to See It!

—The Differential—Rear Axles—Rear and Front Suspension—Running Gear—Brakes—Wheel Alignment—Knee Action—Steering Gear—Tires—Lubricants and Lubrication—Automotive Electricity—Ignition Systems—Magneto Ignition—Spark Plugs—Ignition Coils—Distributors—Automatic Spark Control—Ignition Timing—Generators—Starters—Generator and Starter Testing—Lighting Systems—Storage Batteries—Charging and Testing—Diesel Engines and Trouble Shooting.

7 DAYS' FREE TRIAL
TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

\$ 4 COMPLETE PAY \$ 1 A ONLY 1 MO.



Sent on 7 Days Approval

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a handy form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for **7 DAYS FREE EXAMINATION.** Send No Money. Nothing to pay postman.

--- CUT HERE --- MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me postpaid for **FREE EXAMINATION** books marked (x) below. If I decide to keep them I agree to mail \$1 in 7 Days on each book or set ordered and further mail \$1 monthly on each book or set until I have paid price, otherwise I will return them.

- AUTO GUIDE**, 1800 Pages . . . \$4
- DIESEL ENGINE MANUAL, 400 Pages . . . 2
- WELDERS GUIDE, 400 Pages . . . 1
- MACHINISTS Handy Book, 1600 Pages . . . 4
- POWER PLANT ENGINEERS Guide, 1500 Pages. . . 4
- ENGINEERS & FIREMANS EXAMS, 528 Pages. . . 1
- PUMPS, Hydraulics & Air Compressors, 1658 Pgs. . . 4
- MARINE ENGINEERS Handy Book, 1280 Pages . . . 4
- ENGINEERS & Mechanics Guides (8 Book Set). . . 12
- Answers on Practical ENGINEERING, 254 Pages . . . 1
- ELECTRIC WIRING DIAGRAMS, 210 Pages . . . 1
- ELECTRICIANS EXAMINATIONS, 250 Pages. . . 1
- ELECTRICAL DICTIONARY, 9000 Terms . . . 2
- ELECTRIC MOTOR GUIDE, 1000 Pages . . . 4
- HANDBOOK OF ELECTRICITY, 1440 Pages . . . 4
- ELECTRICAL POWER CALCULATIONS, 425 Pgs. . . 2
- RADIOMANS GUIDE, 914 Pages . . . 4
- ELECTRONIC DEVICES, 216 Pages . . . 2
- ELECTRIC LIBRARY, 7000 Pages (12 Book Set). . . 18
- Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII \$1.50 Ea. . . 1
- OIL BURNER GUIDE, 384 Pages . . . 4
- HOUSE HEATING GUIDE, 1000 Pages . . . 4
- CARPENTERS & Builders Guides (4 Book Set). . . 6
- PLUMBERS & Steamfitters Guides (4 Book Set). . . 6
- MASONS & Builders Guides (4 Book Set). . . 6
- BLUE PRINT READING, 416 Pages . . . 2
- PAINTERS & DECORATORS MANUAL, 450 Pgs. . . 2
- GARDENERS & GROWERS Guides (4 Book Set). . . 6
- REFRIGERATION & Air Conditioning, 1280 Pgs. . . 4
- SHEET METAL WORKERS Handy Book, 388 Pgs. . . 1
- SHEET METAL PATTERN LAYOUTS, 1100 Pgs. . . 4
- AIRCRAFT WORKER, 240 Pages . . . 1
- MECHANICAL DRAWING GUIDE, 160 Pages. . . 1
- MECHANICAL DRAWING & DESIGN, 480 Pgs. . . 2
- MATHEMATICS & CALCULATIONS, 700 Pgs. . . 2
- MECHANICAL Dictionary, 968 Pages . . . 4
- MILLWRIGHTS & Mechanics Guide, 1200 Pgs. . . 4

Name _____

Address _____

Occupation _____

Employed by _____ PSM

AUDEL, Publishers, 49 W. 23 St., New York 10, N. Y.

YOU Need My PRACTICAL Training to Make Money in

TELEVISION- RADIO and ELECTRONICS!



I'll Send You
8 BIG KITS of
Radio Parts and Equipment

Learn at
HOME
IN YOUR
SPARE TIME

Now is the Time to Get Into This Fast
Growing Industry—Prepare for a Fine
Paying Job or Your Own Business!

I have trained hundreds of men to become technicians—and I'm ready to do the same for you. Whether your goal is a fine paying job in one of Radio's many branches—or a successful Radio and Television business of your own—you need the kind of training I offer! My training is practical and down to earth. YOU NEED NO PREVIOUS EXPERIENCE. I start you with basic fundamentals and give you plenty of practical shop-bench training with many kits of parts I send you. This is the training that sticks with you and makes money for you on the job!

GET PAID FOR SPARE TIME WHILE LEARNING

Soon after you start training I send you my famous BUSINESS BUILDERS that show you how to make money in spare time doing interesting Radio jobs. I send you 8 big kits of Radio parts and equipment and help you build step-by-step a powerful 6-tube superhet radio, a 16-range test meter, plus other mighty useful equipment for Radio and Television servicing. You will perform over 175 fascinating experiments while training. You will learn about Television—so that you will be qualified to step into this fast growing, profitable field. I also send you many valuable service manuals, diagrams, and my book telling exactly how to set up your own Television and Radio shop. Clip and mail the coupon below for my two big FREE Radio books. I employ no salesmen—and nobody will call on you.



HAVE A BUSINESS OF YOUR OWN

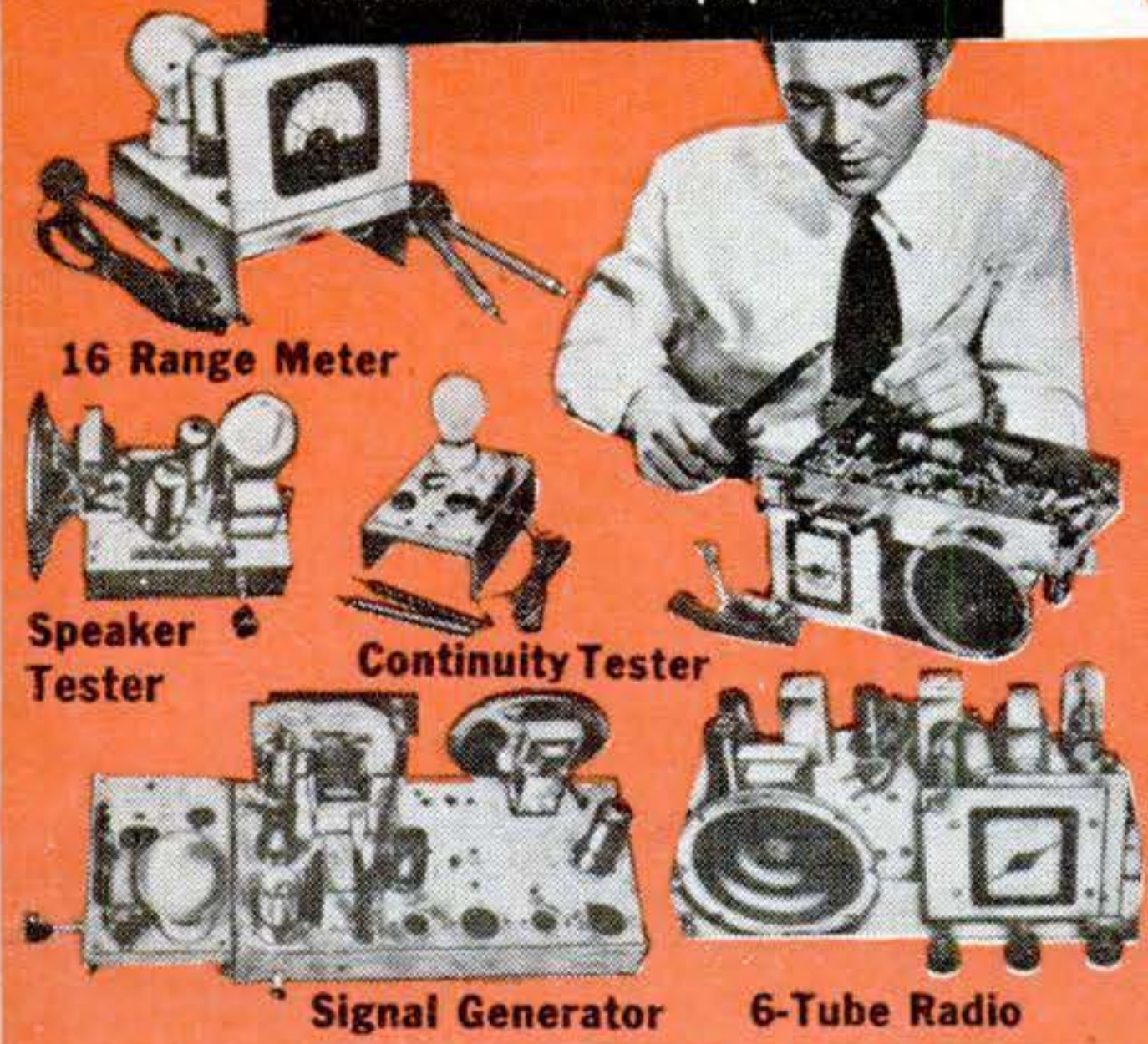
A profitable Radio and Television Service Shop may be started with little capital. I will show you how to get started. At left is pictured one of my graduates, Mr. Merrit C. Sperry, Fairmont, Minn. in his own shop.

Radio and Television Industry Booming

You couldn't pick a better time to get into Radio-Television and Electronics. New Television stations are going on the air to serve every major city—hundreds of new AM and FM Radio broadcasting stations are also on the air. All this creates new and bigger opportunities for the trained man who knows Radio-Television and Electronics.

VETERANS

**THIS
TRAINING
AVAILABLE TO
YOU UNDER
THE G.I. BILL**



All Kits Are YOURS TO KEEP

Each of the hundreds of Radio parts and other items I send my students is theirs "for keeps." You may use this equipment in your Radio and Television service work and save many dollars by not having to buy expensive "ready-made" test equipment.



CALVIN SKINNER of New Orleans, La. tells us he makes \$5 to \$10 in spare time repairing radios. He is now also working with a Television set.



LOREN D. SAUCIER of Coloma, Mich. reports that my training has made it possible for him to repair large numbers of Radio and Television sets.

RUSH COUPON Today!

**SPRAYBERRY ACADEMY of RADIO, Dept. 55-B
111 North Canal Street,
Chicago 6, Illinois**

Please rush my FREE copies of "How To Make Money In Radio-Television and Electronics" and "How To Read Radio Diagrams and Symbols."

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

Address.....

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

() Check here if you are a Veteran

**My Training
Includes . . .
Television,
FM (Frequency
Modulation),
Public
Address
and High
Frequency
Applications**



These Two Big FREE! Radio Books

Just mail coupon for a FREE sample Sprayberry Lesson and my big FREE book, "How To Make Money In Radio-Television and Electronics." Learn why my really practical training is best of all for you. Discover what's ahead for you in Radio-Television and Electronics. No obligation. Don't delay! Mail the coupon now—and count on me for fast action.

SPRAYBERRY ACADEMY OF RADIO
111 N. CANAL, DEPT. 55-B, CHICAGO 6, ILL.

INVENTORS

Patent laws encourage the development of inventions.

We recommend that an inventor employ a registered Patent Attorney or agent, if the inventor is not familiar with patent matters. This is because the value of a patent depends largely upon the skillful preparation of the specification and claims in the patent application.

The firm of McMorrow, Berman and Davidson is registered to practice before the United States Patent Office. Additionally it engages patent attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims.

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

Send for a copy of Patent Booklet entitled "How To Protect Your Invention." This booklet contains information on patent protection and procedure. You will also receive an "Invention Record" blank. This will be promptly forwarded to you upon request—no obligation.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

1424 VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

1424 Victor Building, Washington 1, D. C.

Send me your Patent Booklet, "How To Protect Your Invention", and also "Invention Record" form at once. I understand this request does not obligate me.

Name.....

Address.....

City.....

(WRITE OR PRINT NAME CLEARLY)

This Is How You Can Become a RADIO - TELEVISION TECHNICIAN



Prepare Here
for a career
in America's
fastest grow-
ing industry



TRAIN NOW for opportunities in television—the field which business leaders predict will be among the top ten industries by 1951. You can become a Radio-Television Technician in only 18 months of continuous study at this non-profit, well-equipped Technical Institute and College.

Choose the Course That Interests You Most

SERVICE

- 6 to 12 months
- Electricity
- Welding
- Refrigeration
- Heating

TECHNICIAN

- 12 to 24 months
- Radio and Television
- Electronics
- Electrotechnics (Power)
- Welding
- Refrigeration, Heating, Air Conditioning

PROFESSIONAL

- 36 months
- Electrical Engineering — B.S. Degree. Major in Electronics or Power

EQUIP YOURSELF FOR SPECIFIC POSITIONS

in receiver and transmitter testing, servicing, sales, supervision, and production. Your technician's course will also be credited toward the B.S. degree in Electrical Engineering.

Practical, military or academic training will be evaluated for advanced credit.

Faculty of 85 specialists—over 1500 currently enrolled—35,000 former students.

Write for new 48-page
Pictorial Bulletin . . .
"Your Career"

Terms Begin Jan., April, July, Oct.

MILWAUKEE
SCHOOL OF ENGINEERING
Founded 1903 by Oscar Werwath



MILWAUKEE SCHOOL OF ENGINEERING
Dept. PS-1049, N. Broadway & E. State, Milwaukee, Wis.
Without obligation send free bulletin "Your Career" and more details on course in.....

NAME.....AGE.....

ADDRESS.....

CITY.....ZONE.....STATE.....

() Check if World War II Veteran

stores, buildings), pioneers in another field. All credit to each company for its respective "first."

"Hot Wires" Gets Warm Welcome

Sir:

I found the article entitled "How Linemen Handle Hot Wires and Stay Alive" [PS, July '49, p. 144] by George H. Waltz, Jr. to be most interesting and instructive.

At the last meeting of our local I brought this article to the attention of the members and requested that they read it. It was found that some had read it, and a number of those present were deeply interested.

ROY F. CARAHER

International Brotherhood Electrical
Workers
Utica, N. Y.

Unsung Heroes

Sir:

I would like to take this opportunity to thank the staff of PS and especially Devon Francis for the article "How Motion Pictures Are Projected" in your August 1949 issue [p. 150].

At last a mention has been given to a very important phase of a great industry. Hardly anyone notices the projectionist in the booth at all.

However, we are still there and thousands of projectionists and engineers in theaters and laboratories all over the United States, Canada, and the world are constantly working and striving to achieve even better and greater results for you.

MICHAEL D. HALL

Projectionist, "Metro" Theater
New Westminster, B. C., Canada

Argument for Superbombers

Sir:

I read with interest the article in the August issue "Can Superfighters Stop the Bombers?" [p. 90]. However, I think that you have a good answer to a poor question.

It seems that neither you nor many of our national figures fully realize the importance of the development of the V-2 rocket. Fortunately for us Mr. Hitler had no atomic bomb to put in the nose of his V-2. As a former lead bomber pilot in Europe I had the experience of seeing V-2s going up and hearing them come down. I believe that

SENSATIONAL New Training Offer!

NOW you build and keep a top quality

TELEVISION

RECEIVER

to help you prepare for a real job in

TELEVISION RADIO-ELECTRONICS



Choice of 10, 12 or 16 INCH TELEVISION PICTURE TUBE

Now you can get this amazingly practical aid for learning Television at home, to help you get started toward **FASCINATING WORK...GOOD MONEY...a THRILLING FUTURE** — in a real job, or your own sales and service business. • When you complete our regular home training—described below—you can build and keep a top quality commercial-type **Television Receiver**. Standardized chassis is adaptable for a 10, 12 or 16 inch direct view tube that gives big, bright, sharp, steady pictures. This is an optional training advantage—designed to provide the utmost in practical "learn-by-doing" home training in Television. Mail coupon for complete details. See why you owe it to your "Television Future" to enroll for DeForest's Training, Inc.

Mail Coupon NOW for FREE Information!

See how D.T.I.'s amazingly effective methods help start you toward a **GOOD JOB** or your **OWN BUSINESS** in one of America's most promising fields — including Television, F. M. Radio, Aviation, Train, and Taxi Radio, Broadcast Radio, Industrial Electronics. Get modern lessons... **plus 16 shipments** of Radio-Electronic parts. Work over 300 experiments and projects—including building of (1) commercial-type **OSCILLOSCOPE** for practical T-V circuit training, (2) double-range **R-F SIGNAL GENERATOR**, (3) jewel-bearing **MULTIMETER**, (4) quality **6-tube SUPERHET. RADIO**. Then build and keep that big new Television Receiver. Here's **EVERYTHING YOU NEED** for real laboratory-type training...**AT HOME!**

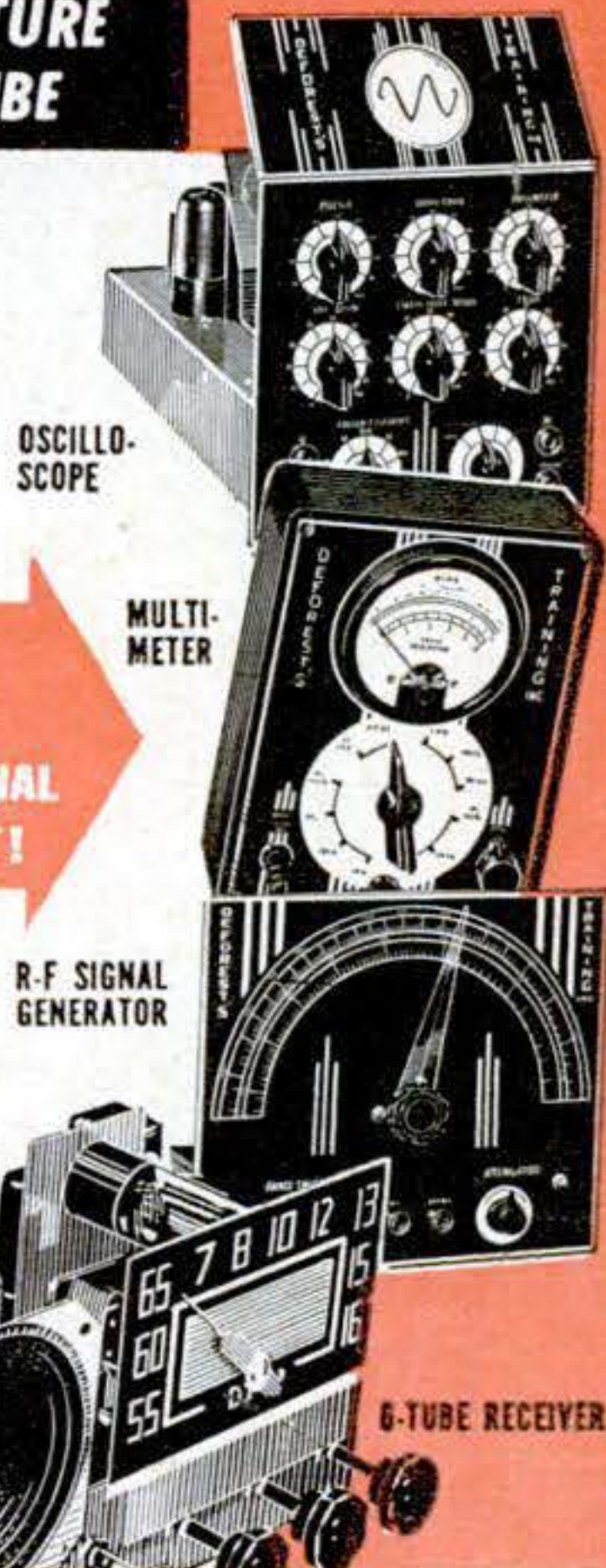
Modern Chicago Laboratories

★ If you prefer, you can get ALL your preparation in our new, Chicago training laboratories... one of the finest of its kind. Ample instructors... modern equipment. Write for details!

Employment Service

★ When you complete your training, our effective Employment Service helps you get started toward a real future in Television — Radio — Electronics.

YOU ALSO BUILD AND KEEP THIS PROFESSIONAL TYPE EQUIPMENT!



You also use HOME MOVIES! a D. T. I. Exclusive!

D. T. I. alone includes the modern, visual training aid... **MOVIES**... to help you learn faster, easier at home. See electrons on the march and other fascinating "hidden action"—a remarkable home training advantage that speeds your progress.

MAIL THIS COUPON TODAY!

DeFOREST'S TRAINING, INC.
2533 North Ashland Avenue, Dept. PS-F-10
Chicago 14, Illinois

Without obligation, give me complete facts showing how I may make my start in Television-Radio-Electronics.

Name _____ Age _____
Street _____ Apt _____
City _____ Zone _____ State _____

De FOREST'S TRAINING, INC.
CHICAGO 14, ILLINOIS
A DE VRY Institution

And to think they used to call me SKINNY!

Give Me 15 Minutes a Day and I'll Give You a NEW BODY

PEOPLE used to laugh at my skinny 97 lb. body. I was ashamed to strip for sports or for a swim. Girls made fun of me behind my back. THEN I discovered my muscle-building system—"Dynamic Tension." It turned me into such a complete specimen of MANHOOD that today I hold the title "The World's Most Perfectly Developed Man."

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

What's My Secret?

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

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

FREE BOOK

Mail coupon right now for my illustrated book, "Everlasting Health and Strength." Tells all about my "Dynamic Tension" method. Shows actual photos of men I've made into Atlas Champions. It's a valuable book—and it's FREE. Mail coupon to me personally. CHARLES ATLAS, Dept. 1Y, 115 East 23rd St., New York 10, N. Y.

CHARLES ATLAS, DEPT. 1Y,
115 East 23rd Street, New York 10, N. Y.

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

Name Age
(Please print or write plainly)

Address

City State



there is no way for a rocket of this type to be shot down except by sheerest chance.

Let us forget for a moment the B-36s and F-90s and look at the "superbomber" we should have in production.

It will be armed with an atomic bomb or equivalent. It will have acceleration in excess of that of any jet fighter. It will have no service ceiling. It will be guided to its target by techniques already in use. A human pilot would not be able to ride it, let alone out-manuever it in an interceptor.

This machine is not only possible but practical now. Why waste time and money building piloted bombers and fighters?

VICTOR F. PFENDLER

Cleveland Heights, O.

You Pays Your Money . . .

Sir:

Having been a projectionist for about 15 years, I feel your article "How Motion Pictures Are Projected" [Aug. '49, p. 150] could stand some revising. First: "The first dots warn that it is almost time to switch reels." It is no warning whatsoever, it is a clue to start the motor.

Second: "In a moment he switches on the current to start the second machine rolling." This sounds as if he just starts it at random; actually he starts it when he sees the first clue as previously stated.

Third: "Practice tells him when his 20 feet of 'leader' will have run past the film gate." He does not rely on practice; he relies on a pair of signals. Furthermore there is not 20 feet of leader. Most operators "thread" on a figure 8, which means there are 8 feet (not 20) to run past the film gate.

Fourth: "An ingenious variable-speed motor feeds the positive carbon into the arc at just the rate that the carbon is burned." What about the negative carbon? It would be hard to keep a good light on the screen if the motor feeds only the positive carbon. The fact is the motor feeds both the positive and the negative carbons, keeping the arc equidistant from the film.

JAMES SCHOLL

Jamestown, Ky.

PS is grateful to Reader Scholl for the additional information on motion-picture projection. Before publishing the article, we checked it for factual accuracy with the chief engineer of the largest manufacturer of commercial projection machines.

GET INTO

DIESEL-AUTO MECHANICS

Master All Phases

JOBS LIKE THESE ARE AVAILABLE TO TRAINED MECHANICS. CHOOSE THE FIELD YOU LIKE BEST

Get Complete Training

Diesel Fuel Injection
 Automotive Motor Tune-up
 Diesel Engine Rebuilding
 General Garage Mechanic
 Agricultural Implements
 Auto Engine Rebuilding
 Auto Elec. Service
 Public Utilities
 Parts Dealers
 Bus & Truck Lines
 Industrial Maintenance
 Contracting & Excavating
 Business of Your Own
 AND MANY other similar openings.

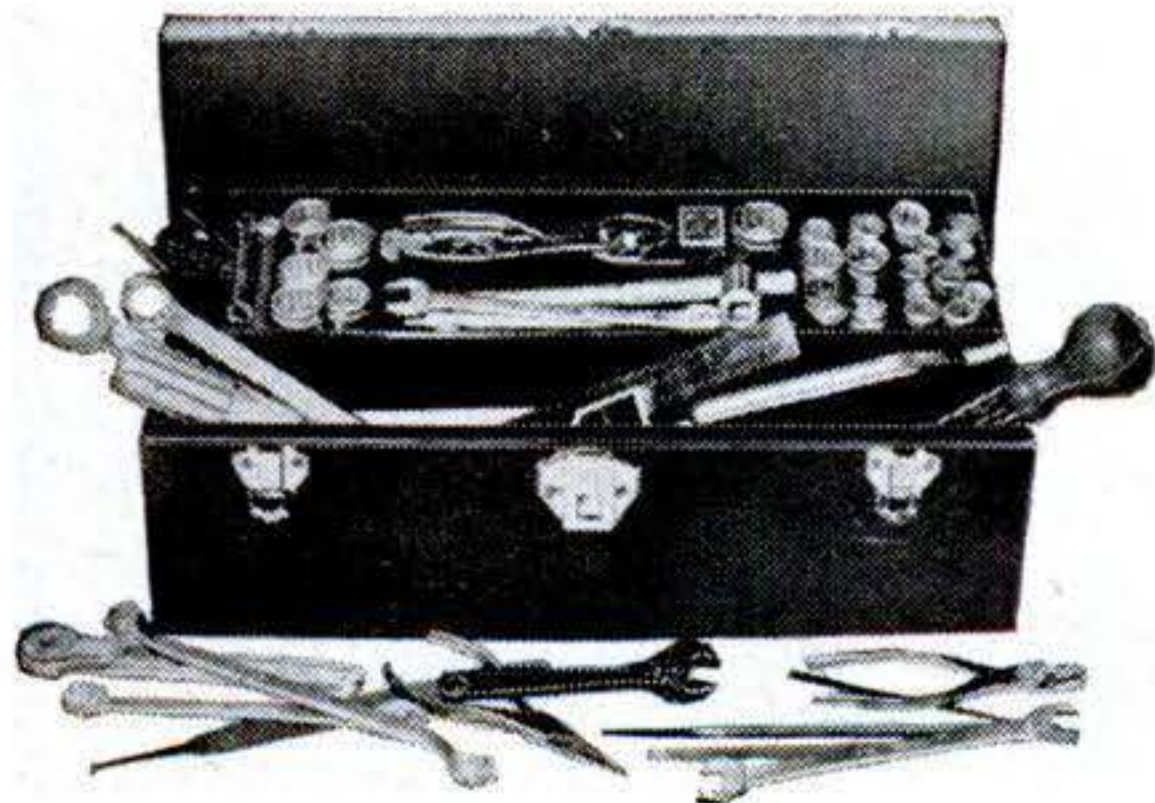
As a National Schools graduate, you are trained for ALL opportunities in the Diesel & Auto Industries.

EARN WHILE YOU LEARN

With our practical Master Shop-Method Home Training, you study at home in your spare time. You receive Spare Time Work Lessons, which show you how to earn while you Learn... for extra money and experience. You Learn by DOING.

TOOLS AND EQUIPMENT

To make your training complete, we give you selected mechanic's tools and equipment, illustrated below, including all-metal tool-box—as a regular part of your instruction.



Shop-Method Home Training by an Established Resident School Prepares you for Many Good Jobs

Opportunity is everywhere for the trained Diesel - Auto Mechanic. Highways throng with cars, busses, trucks tractors. Garages and Service Stations are kept busy. Factories, ships, farms, railroads, general industry, are dependent upon engine power. Here's a dynamic, fast - growing field that needs trained men who know ALL phases: installation, operation, maintenance and repair. Now—National Schools offers you a practical, all-embracing Diesel-Auto Mechanic's Course, including all of these advantages:

Complete training, covering—Diesels, High Speed and Heavy Duty; Semi-Diesels, Gasoline and Special Fuel Engines AND Allied Mechanics.

- Basic Lesson Texts
- Diesel Installation
- Operation—Maintenance
- Diesel Chart Manual
- Spare Time Lessons
- Engine Service Manuals
- Engine Repair
- Drive Systems
- Diesel Electric Power
- Thermodynamics

TOOLS AND EQUIPMENT INVESTIGATE

Secure Full Information

NEW, ILLUSTRATED BOOK & SAMPLE LESSON SHOW HOW WE TRAIN YOU... SEND FOR THEM TODAY!

NO COST NO OBLIGATION

APPROVED FOR VETERANS

Check coupon below

WE GIVE YOU TOOLS OF YOUR TRADE

NATIONAL SCHOOLS

LOS ANGELES 37, CALIF. • EST. 1905



FIND OUT NOW... MAIL COUPON TODAY

NATIONAL SCHOOLS, Dept. 10—PSD
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or paste on penny postcard)

Mail me FREE the book, YOUR FUTURE IN DIESEL-AUTO MECHANICS, together with the Sample Lesson. I understand I may keep and use the information with no obligation.

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

Address.....

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

Check here if Veteran of World War II

INVENTORS

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

Unless an inventor is thoroughly familiar with such matters, he is advised to employ a competent registered patent attorney or registered patent agent, as the value of patents depends largely upon the skillful preparation of the specification and claims.

This firm is registered to practice before the U. S. Patent Office and is available to assist inventors in the preparation and prosecution of their cases. Detailed information and the preliminary steps to take to obtain patent protection will be furnished upon request.

Form below for mailing convenience

VICTOR J. EVANS & Co. *Merlin M. Evans*
 REGISTERED PATENT ATTORNEY
 440-L MERLIN BUILDING, WASHINGTON 6, D. C.

- • • • •
- VICTOR J. EVANS & CO. •
- 440-L Merlin Building, Washington 6, D. C. •
- Please send me without obligation a copy of your •
- booklet "Patent Protection For Inventors" together •
- with your convenient "Evidence of Invention" form. •
-
- Name..... •
-
- Address..... •
-
- City and State..... •
- • • • •

PATENTS TRADEMARKS COPYRIGHTS

STUDY AT HOME

With An Educational Institution

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

ARTS and SCIENCES

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

ENGINEERING

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

LAW

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

McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd., Chicago 40, Ill.

LEARN IN SPARE TIME— by Easy PICTURE CARTOONING CHART METHOD!

Same Simplified Method that has helped train creators of "Steve Canyon," "Winnie Winkle," "Out Our Way," "Secret Agent X-9," "The Neighbors," "Reg'lar Fellers," "Strange As It Seems," and many others. Send 10c for Picture Chart (to test your ability), and full details. (State age.)
LONDON SCHOOL OF CARTOONING
 4930 Cleve. Transit Bldg., Cleveland 14, Ohio



Learn BAKING at home

Baking is one of America's high industries in wages. Not seasonal, but year 'round good field for trained and experienced men. Thorough basic spare time home study course lays solid foundation. If you have the aptitude for this type of work, send for FREE Booklet, "Opportunities in Commercial Baking."

NATIONAL BAKING SCHOOL
 1315 S. Michigan Ave., Dept. 1367, Chicago 5, Ill.



LEARN TO HYPNOTIZE



Yes, anyone. Modern speed hypnotism. Methods revealed. You are told exactly what to say & do. Many interesting experiments. Self-hypnosis fully explained. Personal instruction also available.

Send for Hypnotism Revealed \$2
 12" Hypnotism record including Group-Hypnotism & Self-Hypnosis \$5

MELVIN POWERS, Professional Hypnotist, 1324 Wilshire, Dept. 60, Hollywood 14, Calif.

Famous BAILEY TECHNICAL SCHOOLS

OFFER THE FOLLOWING COURSES:

COMMERCIAL ELECTRICITY PRACTICAL DIESEL ENGINEERING

Your future success depends largely on the reputation of the school you attend. Don't take chances! Train at America's foremost school of mechanical specialization. Bailey is recognized and approved by industry. Bailey graduates get the top pay jobs! Send for FREE Catalog.

Check course in which you are most interested:
 Diesel Electricity

BAILEY TECHNICAL SCHOOLS

1655 So. Grand Blvd., St. Louis 4, Mo.

I. C. S. STUDENT JUDGED BEST APPRENTICE IN THE NATION



Ex-G.I. Took Course in Electrical Engineering

I. C. S. Training proves its worth. Recently, Robert M. Hutchison of Evansville, Ind., was picked as "the best electrical apprentice in the nation." He had studied Electrical Engineering with the International Correspondence Schools.

The award was made by the National Electrical Contractors Association. Hundreds of apprentices from every section of the country figured in the competition.

The same training that brought "Bob" Hutchison national recognition is available

"Here's why I consider I. C. S.

Courses exceptional:

- 1 I. C. S. texts are easy to understand; explanations are very clear.
- 2 The student determines his own progress; gets a real sense of achievement.
- 3 Textbooks and lesson material make a valuable set of reference books."

ROBERT M. HUTCHISON

to you. If you want the security and rewards that come with sound, practical training, mark and mail the coupon *today*. Find out what I. C. S. can do for you.

INTERNATIONAL CORRESPONDENCE SCHOOLS

APPROVED
under the
G.I. BILL

BOX 7639-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

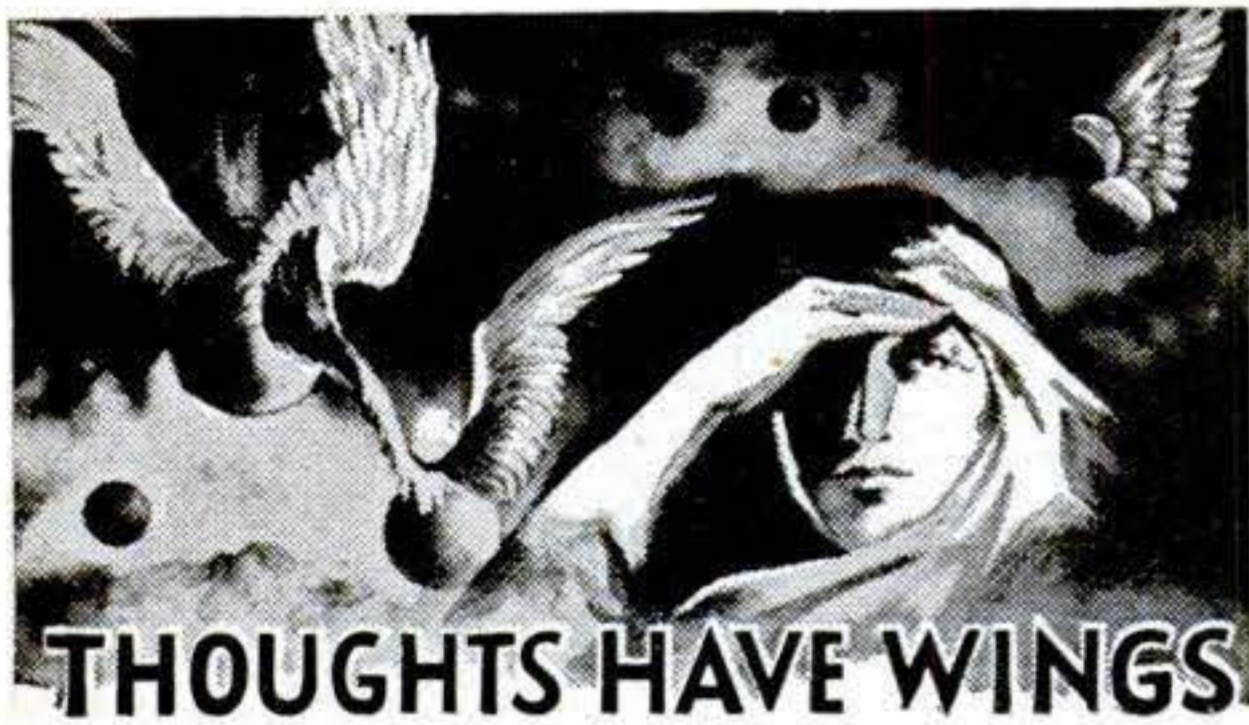
- | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Air Conditioning and Plumbing Courses</p> <p><input type="checkbox"/> Air Conditioning <input type="checkbox"/> Plumbing</p> <p><input type="checkbox"/> Heating <input type="checkbox"/> Steam Fitting</p> <p><input type="checkbox"/> Refrigeration <input type="checkbox"/> Steam Fitting</p> <p>Chemical Courses</p> <p><input type="checkbox"/> Chemical Engineering</p> <p><input type="checkbox"/> Chemistry, Analytical</p> <p><input type="checkbox"/> Chemistry, Industrial</p> <p><input type="checkbox"/> Chemistry, Mfg. Iron & Steel</p> <p><input type="checkbox"/> Petroleum Refining <input type="checkbox"/> Plastics</p> <p><input type="checkbox"/> Pulp and Paper Making</p> <p>Civil Engineering, Architectural and Mining Courses</p> <p><input type="checkbox"/> Architecture</p> <p><input type="checkbox"/> Architectural Drafting</p> <p><input type="checkbox"/> Bridge and Building Foreman</p> <p><input type="checkbox"/> Building Estimating</p> <p><input type="checkbox"/> Civil Engineering</p> <p><input type="checkbox"/> Coal Mining</p> <p><input type="checkbox"/> Contracting and Building</p> <p><input type="checkbox"/> Highway Engineering</p> <p><input type="checkbox"/> Lumber Dealer</p> <p><input type="checkbox"/> Reading Structural Blueprints</p> <p><input type="checkbox"/> Sanitary Engineering</p> <p><input type="checkbox"/> Structural Drafting</p> | <p><input type="checkbox"/> Structural Engineering</p> <p><input type="checkbox"/> Surveying and Mapping</p> <p>Communications Courses</p> <p><input type="checkbox"/> Electronics</p> <p><input type="checkbox"/> Practical Telephony</p> <p><input type="checkbox"/> Radio, General <input type="checkbox"/> Radio Operating</p> <p><input type="checkbox"/> Radio Servicing <input type="checkbox"/> Television</p> <p><input type="checkbox"/> Telegraph Engineering</p> <p>Electrical Courses</p> <p><input type="checkbox"/> Electrical Drafting</p> <p><input type="checkbox"/> Electrical Engineering</p> <p><input type="checkbox"/> Electric Light and Power</p> <p><input type="checkbox"/> Lighting Technician</p> <p><input type="checkbox"/> Practical Electrician</p> <p>Internal Combustion Engines Courses</p> <p><input type="checkbox"/> Auto Technician <input type="checkbox"/> Aviation</p> <p><input type="checkbox"/> Diesel-Electric</p> <p><input type="checkbox"/> Diesel Engines <input type="checkbox"/> Gas Engines</p> <p>Mechanical Courses</p> <p><input type="checkbox"/> Aeronautical Engineer's, Jr.</p> <p><input type="checkbox"/> Aircraft Drafting <input type="checkbox"/> Flight Engineer</p> <p><input type="checkbox"/> Forging <input type="checkbox"/> Foundry Work</p> <p><input type="checkbox"/> Heat Treatment of Metals</p> <p><input type="checkbox"/> Industrial Engineering</p> <p><input type="checkbox"/> Industrial Instrumentation</p> | <p><input type="checkbox"/> Industrial Metallurgy</p> <p><input type="checkbox"/> Machine Shop <input type="checkbox"/> Mech. Drafting</p> <p><input type="checkbox"/> Mechanical Engineering</p> <p><input type="checkbox"/> Mold-Loft Work</p> <p><input type="checkbox"/> Patternmaking—Wood, Metal</p> <p><input type="checkbox"/> Reading Shop Blueprints</p> <p><input type="checkbox"/> Sheet-Metal Drafting</p> <p><input type="checkbox"/> Sheet-Metal Worker</p> <p><input type="checkbox"/> Ship Drafting <input type="checkbox"/> Ship Fitting</p> <p><input type="checkbox"/> Tool Designing <input type="checkbox"/> Toolmaking</p> <p><input type="checkbox"/> Welding Engineering</p> <p><input type="checkbox"/> Welding—Gas and Electric</p> <p>Railroad Courses</p> <p><input type="checkbox"/> Air Brake <input type="checkbox"/> Car Inspector</p> <p><input type="checkbox"/> Diesel Locomotive</p> <p><input type="checkbox"/> Locomotive Engineer</p> <p><input type="checkbox"/> Locomotive Fireman</p> <p><input type="checkbox"/> Locomotive Machinist</p> <p><input type="checkbox"/> Railroad Section Foreman</p> <p><input type="checkbox"/> Steam-Diesel Loco. Eng.</p> <p>Stationary Eng'r'g Courses</p> <p><input type="checkbox"/> Boilermaking</p> <p><input type="checkbox"/> Combustion Engineering</p> <p><input type="checkbox"/> Engine Running</p> <p><input type="checkbox"/> Marine Engineering</p> <p><input type="checkbox"/> Power Plant Eng'r'g <input type="checkbox"/> Steam Engr.</p> | <p>Textile Courses</p> <p><input type="checkbox"/> Cotton Manufacturing</p> <p><input type="checkbox"/> Loom Fixing <input type="checkbox"/> Rayon Weaving</p> <p><input type="checkbox"/> Textile Designing</p> <p><input type="checkbox"/> Woolen Manufacturing</p> <p>Business and Academic Courses</p> <p><input type="checkbox"/> Accounting <input type="checkbox"/> Advertising</p> <p><input type="checkbox"/> App. Psychology <input type="checkbox"/> Bookkeeping</p> <p><input type="checkbox"/> Business Administration</p> <p><input type="checkbox"/> Bus. Correspondence <input type="checkbox"/> Bus. Law</p> <p><input type="checkbox"/> Certified Public Accounting</p> <p><input type="checkbox"/> Commercial <input type="checkbox"/> Commercial Art</p> <p><input type="checkbox"/> Cost Accounting</p> <p><input type="checkbox"/> Federal Tax <input type="checkbox"/> First Year College</p> <p><input type="checkbox"/> Foremanship <input type="checkbox"/> French</p> <p><input type="checkbox"/> Good English <input type="checkbox"/> High School</p> <p><input type="checkbox"/> Higher Mathematics <input type="checkbox"/> Illustration</p> <p><input type="checkbox"/> Industrial Supervision</p> <p><input type="checkbox"/> Motor Traffic <input type="checkbox"/> Postal Civil Service</p> <p><input type="checkbox"/> Retailing <input type="checkbox"/> Retail Bus. Management</p> <p><input type="checkbox"/> Salesmanship <input type="checkbox"/> Secretarial</p> <p><input type="checkbox"/> Sign Lettering</p> <p><input type="checkbox"/> Spanish <input type="checkbox"/> Stenography</p> <p><input type="checkbox"/> Traffic Management</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Name _____ Age _____ Home Address _____

City _____ State _____ Working Hours _____ A.M. to _____ P.M.

Present Position _____ Employed by _____

Length of Service in World War II _____ Enrollment under G.I. Bill approved for World War II Veterans. Special tuition rates to members of the Armed Forces. Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.



THOUGHTS HAVE WINGS

**You Can Influence Others
With Your Thinking**

TRY IT SOME TIME. Concentrate intently upon another person seated in a room with you, without his noticing it. Observe him gradually become restless and finally turn and look in your direction. Simple—yet it is a *positive demonstration* that thought generates a mental energy which can be projected from your mind to the consciousness of another. Do you realize how much of your success and happiness in life depend upon your influencing others? Is it not important to you to have others understand your point of view—to be receptive to your proposals?

How many times have you wished there were some way you could impress another favorably—*get across to him or her your ideas?* That thoughts can be transmitted, received, and understood by others is *now* scientifically demonstrable.

This FREE Book Points the Way

The tales of miraculous accomplishments of mind by the ancients are now known to be fact—not fable. The method whereby these things can be **INTENTIONALLY**, not accidentally, accomplished has been a secret long cherished by the Rosicrucians—one of the schools of ancient wisdom existing throughout the world. Write for the free copy of the fascinating sealed book, **"THE MASTERY OF LIFE,"** which explains how you may receive this unique wisdom and benefit by its application. Address: Scribe LXH.

The ROSICRUCIANS

San Jose, (AMORC) California

USE THIS COUPON

Scribe LXH
The Rosicrucians
San Jose, California

I am sincerely interested in an intelligent method of attaining a mastership of life. Send me without obligation, your **FREE** Book which explains how I may receive and use your age-old method.

Name.....
Address.....
City.....

**All weather protection for
your convertible top . . .**



**The Robbins
TOPPER**

TOUGH, TIGHT-FITTING, HEAVY VINYL

Here's what you need this winter to protect your expensive convertible top. Get a Robbins "TOPPER". It's a tough vinyl plastic top cover that's *tailored to fit!* No universal models—there's a beautiful "TOPPER" for your convertible.

KEEPS TOP CLEAN IN ALL WEATHER

"TOPPER" is easy to install, and fits like a glove. No more weather stains, grease stains, and quick top deterioration to spoil your convertible's looks. Get your "TOPPER" now (order direct if your dealer can't supply) and be ready for bad weather. Be sure to specify make and year of your convertible.

**ONLY
\$25⁰⁰**

ORDER YOUR "TOPPER" TODAY!

Postpaid

JIM ROBBINS CO.

21724 Woodward Avenue, Detroit 20, Mich.

GIANT ASTRONOMICAL TELESCOPE



Ready for use. 6 ft. tripod. 100 diameters magnification. (10,000 area magnification). Extra eyepiece especially suited to observing Milky Way, Nebulae, Comets, Double Stars and Star Clusters. Sun projector lens for watching sun spots. Full power and clear vision guaranteed. \$15.00. 25% deposit on C.O.D. orders.

Shipped via Express F.O.B. Manorville

**SUFFOLK SCIENCE SERVICE
DEPT. CT. MANORVILLE, N. Y.**

CHROME CUSTOM STYLED

All Metal Automobile Monogram

5" long
1 1/4" wide
Fits All
Cars



Specify
Initials
Wanted

EMBOSSSED, HAND FINISHED, ROMAN BLOCK INITIALS

This gleaming **TRIPLE CHROME BEAUTY** quickly installed on door, hood, trunk or any part of any car. Satisfaction or refund.

Price \$1.95 Each, Complete with 3 Initials.

SEND CHECK OR MONEY ORDER. WE PAY POSTAGE U.S.A. ONLY
AUTOGRAM, INC., Dept. PS 3242 N. Pulaski Rd., Chicago 41, Ill.



AN EASY WAY TO MAKE BIG MONEY

Be the first to sell sensational luminous house numbers, light switch plates, wall protectors, cord pulls, novelties, etc. Also luminous pictures, statues, decals, and a host of religious, nursery and other objects **THAT GLOW IN THE DARK.** Sell on sight. *Get into this new and growing industry.* ENORMOUS DEMAND . . . NO COMPETITION . . . BIG PROFITS. Represent a large manufacturer, established over 35 years. Write **AT ONCE** for liberal **MONEY-MAKING** offer and **free sample** to show you how they **GLOW IN THE DARK.**

Madison Mills, 303 Fourth Ave., Dept. B-5, New York 10, N.Y.

THOUSANDS NOW PLAY

who never thought they could!



Thrilled by Playing

I've had my lessons just a week. I think your course is super. I was more thrilled than words can express when I found I could actually play America. The Merry Widow Waltz and the others.
*J. T., Mancelona, Mich.



Wouldn't Take \$1000 for Course

The lessons are so simple that anyone can understand them. I have learned to play by note in a little more than a month. I wouldn't take a thousand dollars for my course.
*S. E. A., Kansas City, Mo.



Shares Course With Sister

The teaching is so interesting and the pieces so beautiful I couldn't ask for anything better. I recommend your course highly. My sister shares it with me and feels the same way.
*D. E. G., Wausau, Wis.



Finding New Joy

I am finding a new joy that I never experienced before. for I have always wanted to play, but had given up hope until I heard of your course.
*C. S., Lucien, Okla.



Plays After 2 Months

I hesitated before sending for your course because of an earlier experience I had with a course by ear from another company. I am playing pieces now I never dreamed I would play after only two months.
*E. T., Prichard, Ala.
*Actual pupils' names on request. Pictures by professional models.

You, too, can play any instrument By this EASY A-B-C Method

YOU think it's difficult to learn music? That's what thousands of others have thought! Just like you, they long to play some instrument—the piano, violin, guitar, saxophone or other favorites. But they denied themselves the pleasure—because they thought it took months and years of tedious study to learn.

Learn in Spare Time at Home

And then they made an amazing discovery! They learned about a wonderful way to learn music at home—without a private teacher—without tedious study—and in a surprisingly short time. They wrote to the U. S. School of Music for the facts about this remarkable short-cut method. And the facts opened their eyes! They were amazed to find how easy it was to learn.

The result? Over 850,000 men and women have studied music at home this simple, A-B-C way. Now, all over the world, enthusiastic music-lovers are enjoying the thrilling satisfaction of creating their own music. They have found the key to good time, popularity and profit.

Costs Only a Few Cents a Day

And that's what you can do, right now. Get the proof that you, too, can learn to play your favorite instrument—quickly, easily, in spare

time at home for only a few cents a day. Never mind if you have no musical knowledge, training or talent. Just read the fascinating booklet and Print and Picture sample that fully explain all about the famous U. S. School method. If interested tear out the coupon now, before you turn the page. U. S. School of Music, 810 Brunswick Bldg., New York 10, N. Y. Largest school of its kind in the world. (51st year).

FREE!

Print and Picture Sample



NOTICE

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

**U. S. SCHOOL OF MUSIC,
810 Brunswick Bldg., New York 10, N. Y.**

I am interested in music study, particularly in the instrument checked below. Please send me your free illustrated booklet "How to Learn Music at Home," and your free Print and Picture Sample. (Instrument supplied when needed, cash or credit.)

<input type="checkbox"/> Piano	<input type="checkbox"/> Saxophone	<input type="checkbox"/> Clarinet	<input type="checkbox"/> Practical
<input type="checkbox"/> Guitar	<input type="checkbox"/> Trumpet, Cornet	<input type="checkbox"/> Trombone	<input type="checkbox"/> Finger
<input type="checkbox"/> Hawaiian	<input type="checkbox"/> Reed Organ	<input type="checkbox"/> Flute	<input type="checkbox"/> Control
<input type="checkbox"/> Guitar	<input type="checkbox"/> Tenor Banjo	<input type="checkbox"/> Modern	<input type="checkbox"/> Piccolo
<input type="checkbox"/> Violin	<input type="checkbox"/> Ukulele	<input type="checkbox"/> Elementary	<input type="checkbox"/> Mandolin
<input type="checkbox"/> Piano Accordion		<input type="checkbox"/> Harmony	

Mr. _____ Have you _____
Miss _____ Instrument? _____
Mrs. _____ (Please print)

Address _____

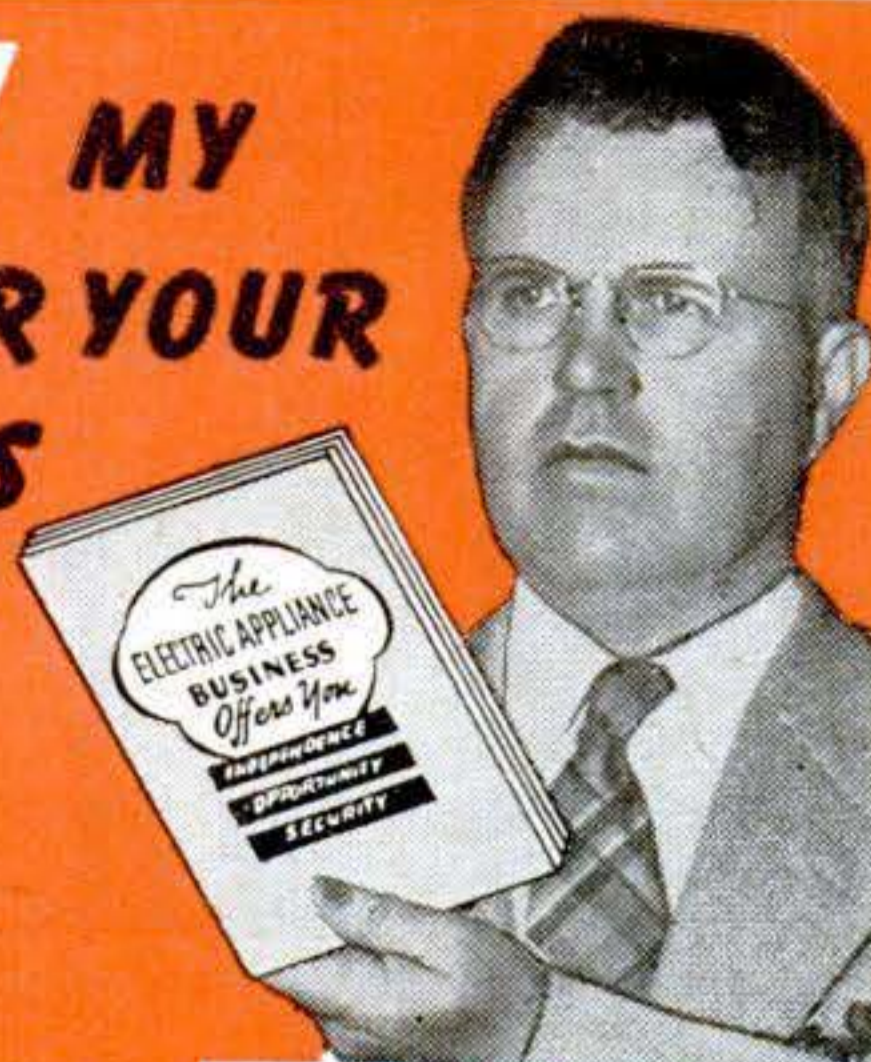
City _____ State _____

NOTE: If you are under 16 years of age, parent must sign coupon.

SAVE 2c—STICK COUPON ON PENNY POSTCARD

FREE! MY PLAN FOR YOUR SUCCESS

Learn
ELECTRICAL
APPLIANCE
REPAIR
and
SERVICING



OPEN YOUR OWN SHOP

PTS training is more than a home study course in electric appliance repair and service. It gives you the know-how on the operation of your shop from a business standpoint—what to charge — how to get customers. Everything possible is done to assist you to start on the road to your success.

EARN WHILE YOU LEARN

You can actually start earning before your course is finished. I send you your first lesson showing you easy jobs that can be done in your SPARE TIME AT HOME. Remember, one good repair job will pay for the cost of your course. NO BIG OVERHEAD needed. Start in your garage, basement, attic or spare room. When you are ready to expand, I will give you the benefit of my advice and experience.

Yours! AT NO EXTRA COST
Big kit of tools and ELECTRICAL APPLIANCE TESTER

Free!
Big book containing all of the details of my plan for your success.
WRITE NOW!

USE
THIS COUPON

PACIFIC TRAINING SCHOOL — Dept. 5 910
7217 So. Broadway, Los Angeles 3, Calif.
Please send me your FREE BOOK.

NAME _____ AGE _____

ADDRESS _____ ZONE _____

CITY _____ STATE _____

SPARE OR FULL TIME

Want a good-paying business — a job in a fast-growing industry? Learn electrical appliance repair and service. I will teach you this interesting, good-paying business. The EASY step-by-step home study method, taught by PTS, prepares you NOW to reap lush profits to be made in this unlimited field. Have YOUR OWN BUSINESS — spare or full time — prepare for one of the many openings for trained men.

ACT NOW

Millions of new appliances in homes — millions of new homes being wired for electricity assures hundreds of customers in nearly every neighborhood.

EASY TO LEARN!

Men of all ages, yes, even the man of 60 can get into this ever expanding field—a business well suited to men who like to use their hands—a REAL OPPORTUNITY for the practical man who is not happy in his present job. Get started NOW—send for FREE BOOK giving all details.

YOU LEARN TO REPAIR

Vacuum cleaners,
Washing machines,
Lamps, Motors, Irons,
Ranges (gas and electric),
Auto electricity, Garbage
disposal units, Fluorescent
lights, Electric shavers,
Refrigeration, House Wiring.



BRONZED Baby Shoe MOUNTINGS

NEW!

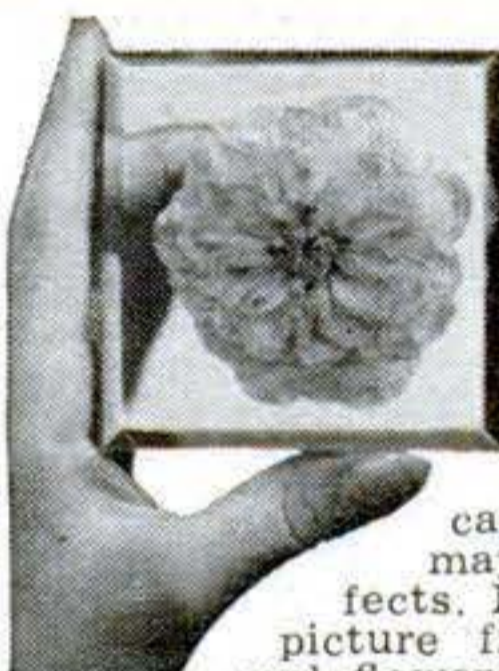
ORIGINAL DESIGNS to boost your baby shoe business. Completely new presentation of beautifully styled, superbly finished and heavily weighted bases.

BOOKENDS • ASHTRAYS • PHOTOFRAMES
"THEY SELL ON SIGHT"

These are just what you need to enhance the beauty of the shoes you bronze and to build your volume.

WRITE TODAY FOR
ILLUSTRATIONS AND PRICE LIST

Dorothy Lane, Inc.
VALLEY STREAM, N. Y.



PRESERVE REAL FLOWERS in Crystal Clear Plastic

Now create many lovely and unusual things like the distinctive coaster shown—made by embedding real flowers in Castolite—the "magic" liquid casting plastic. Comes crystal clear, or may be dyed to produce gorgeous color effects. Make really different jewelry, book ends, picture frames, candle sticks, figurines. Embed real flowers, butterflies, coins, medals, photos, for novel plaques, paper weights, tiles, other art objects. Use only home utensils. Follow simple step by step method. New pleasure, fine profits are possible. Send 25c for exciting picture-packed new Home Project Manual showing how to get started. Write today.

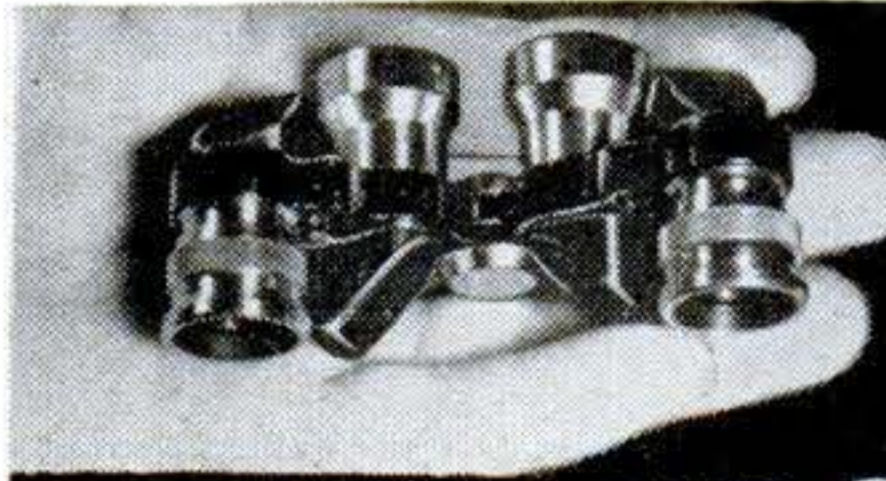
The Castolite Company Dept. L-4 Woodstock, Illinois

New SENSATIONAL WRIST CAMERA

America's First Magazine Load Still Camera
INSTANT switch COLOR to Black and White!
Amazing new PIXIE Camera, so tiny you can wear it on your wrist, loads films in 15 seconds like expensive movie cameras! America's smallest precision camera gives you big sharp pictures . . . with INSTANT switch from COLOR to Black and White . . . at sensationally low cost! No other still camera in America has this feature. SEND NO MONEY!
Order PIXIE Camera C.O.D. today. Pay postman only \$4.95 plus postage. Or send \$4.95 and we pay postage. COLOR or B&W Film, 14-exposure magazines, \$1.29 each, includes processing of color film —or 14 2 1/4x3 1/4 prints of B&W film. Guaranteed. FREE Folder.
CALIFORNIA TECHNICAL PRODUCTS 448 So. Hill St., Dept. T-10 Los Angeles 13, Calif.



\$4.95 POST PAID



6 POWER PRISM

BINOCULARS

VEST
POCKET
IN SIZE

COATED LENSES! Dynamic in power and range. At 1,100 yards has sharp, clear field of 370 feet! Made to military specifications. Moisture-proofed —Dust proofed! All metal construction. Individual eye focussing. Adjustable for all eye widths! A compact, durable, all-purpose, achromatic prism binocular. NOT a field glass. Economy priced at fraction of what similar glasses sell at retail! Complete with quality leather, plush-lined case and straps only \$19.95 plus 20% Federal tax. Cash orders sent postpaid. On C.O.D.'s include \$2.00 deposit. GUARANTEED. Try for 20 days at our risk and expense.

7941 S. Halsted Dept. ARF-1916 Chicago 20
Reference Duna & Bradstreet

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

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

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

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

THINK! LOOK FORWARD!

Business is making big, new plans

Men and Women are preparing for the future

WHAT ARE YOU DOING ABOUT YOUR TOMORROWS?

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

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

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

HOME - STUDY TRAINING SINCE 1897

Take This First Easy Step

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G-746, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subject checked.

- | | | |
|----------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------|
| <input type="checkbox"/> PLASTICS ENG'R | <input type="checkbox"/> Accounting | <input type="checkbox"/> Drafting and Design for Men and Women |
| <input type="checkbox"/> Refrigeration | <input type="checkbox"/> Electrical Engr. | <input type="checkbox"/> Radio |
| <input type="checkbox"/> Architecture and Building | <input type="checkbox"/> Electricity-Pract. | <input type="checkbox"/> High School |
| <input type="checkbox"/> Contracting | <input type="checkbox"/> Electronics, Industr. | <input type="checkbox"/> Air Conditioning |
| <input type="checkbox"/> Practical Plumbing | <input type="checkbox"/> Bookkeeping | <input type="checkbox"/> Mechanical Eng. |
| <input type="checkbox"/> Automotive Engineering | <input type="checkbox"/> Private Secretary | <input type="checkbox"/> Shop Management |
| <input type="checkbox"/> Aviation Drafting | <input type="checkbox"/> Diesel Engineering | <input type="checkbox"/> Tool Making |
| <input type="checkbox"/> Aviation | <input type="checkbox"/> Sheet Metal Pattern Drafting | <input type="checkbox"/> Better Foremanship |
| <input type="checkbox"/> Business Mgmt | | <input type="checkbox"/> Machine Shop Operations |
| <input type="checkbox"/> Railway Training | | |

PRACTICAL, EFFECTIVE HOME

Name..... Occupation.....
Address..... Age.....
City..... State.....

AMERICAN SCHOOL

Dept. G-746 Drexel at 58th Street, Chicago 37

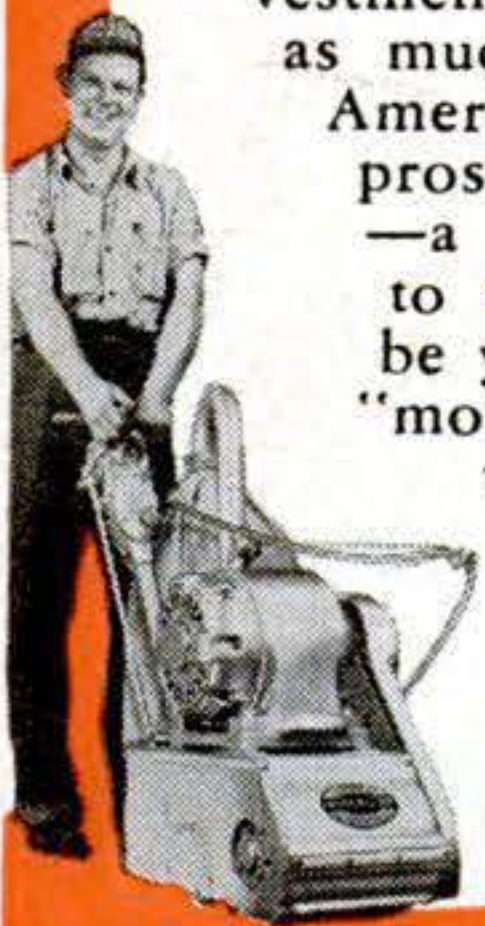


Here's your future

- ★ \$35 TO \$50 A DAY
- ★ STEADY WORK ★ LIFETIME SECURITY ★ PLEASANT INDOOR WORK ★ SMALL INVESTMENT
- ★ NO SPECIAL SCHOOLING
- ★ NO TIME CLOCK TO PUNCH
- ★ YOU ARE BOSS!

with American

This wonderful future can be yours—as a floor surfacing contractor with an American Machine! We have the "formula" that has brought success to thousands—it can do the same for YOU. Floor sanding is a down-to-earth service that's needed every day. No big overhead...no large investment (a new car costs 3 times as much). Easy to operate an American Sander. Plenty of prospects—new or old homes—a year 'round opportunity to make **BIG MONEY** and be your own boss! Send for "money-making" booklet entitled "Opportunities in Floor Surfacing"—use coupon and enclose 25c in coin or stamps to cover handling.



AMERICAN FLOOR MACHINES

The American Floor Surfacing Machine Co.
532 So. St. Clair St., Toledo 3, Ohio

Enclosed find 25c in stamps or coin for booklet "Opportunities in Floor Surfacing," telling me how I can start my own floor sanding business.

Name

Street

City State



*

YOU'LL NEVER HAVE BUT ONE HEAD OF HAIR

*Will You Give 3 Minutes a Day To Take Care of It?

Take advantage of this opportunity to learn more about the new electric-automatic Vita-brush that turns 20 minutes of tedious, tiresome hand brushing into just 3 minutes of restful, stimulating fun. Handy as an electric razor, Vita-brushing does these things well:

- Gets your scalp refreshingly clean, removing itching dandruff scale, accumulations, dust.
- Distributes the natural oils, "polishing" the hair . . . making it softer, glossier and easier to manage.
- And, in addition, stimulates the circulation of the blood supply in your scalp.

Don't delay. Send for full information on how Vitabrush can help you in caring for your scalp and hair. Just say, "Tell me about Vitabrush."

Hershey Mfg. Co., 3740 Field Bldg., Chicago 3



MOTOR TUNE-UP GAUGE

new—Simple to Use

• Aluminum case cast bronze movement—Guaranteed. Checks entire motor—Plugs, Points, Rings—Valves—Muffler—Fuel Pump—Carburetor, etc.

Dial in 4 colors—Instruct. chart included—4" — \$6.50; 8" — \$11.75; 12" — \$18.75 Postpaid. Works on vacuum. Attach to windshield wiper. Over 1,000,000 in use. Tune your own motor.

GALE HALL ENGINEERING
BOSTON 18, MASS.

WORLD'S LARGEST MFR. OF AUTO GAUGES



WORLD'S LOWEST PRICED ADDING MACHINE

Vest Pocket Size
FREE TRIAL

IDEAL XMAS GIFT!
GUARANTEED ACCURATE. Not a toy. Operates with only a finger flick. Adds, subtracts, multiplies, divides. Counts up to one billion. Pays for itself over and over. Ideal Gift—for Business, Income Tax and School use. **MONEY BACK GUARANTEE.** Send name and address. Pay postman only \$2.95 plus postage. (Send full cash if outside U.S.) Beautiful rich-looking Leatherette Case included at no extra cost. Money back in 10 days if not delighted. **AGENTS WANTED.**
CALCULATOR MACHINE CO., (Mfrs.)
 Dept. 517, P. O. Box 248 Glenview, Illinois

\$295

only **TOTAL COST SEND NO MONEY**

NEW!

FOR PROFIT & PLEASURE

IN COPPER TOOLING AND ETCHING

No Experience Needed

DO IT AT HOME

At last a way to get in on the **Big Money** made every day in Copper Art. You make plaques—Bowls—Trays—Gifts—Souvenirs of all kinds. Art talent not necessary. Our New Method makes it easy to learn. **Big Markets waiting.** Anyone can learn quickly—you start **making money** right from the start. Don't miss this opportunity to cash in at once on this big-paying easy to operate business. Be your own boss. **SEND NO MONEY. Act Now** to get all the free details—just send your name on a penny postcard today—**Do it Now!**

Write Today. Money-Back Guarantee.

HOLLYWOOD COPPER ART STUDIOS Dept. PS-10
4257 Beverly Blvd. Los Angeles 4, Calif.

**YOU BUILD THIS
23-TUBE
TELEVISION
RECEIVER**

NOW!

**FOR THE FIRST TIME YOU CAN GET
Real Practical HOME TRAINING In**

TELEVISION

RADIO AND ELECTRONICS

**PREPARE YOURSELF FOR A
PROFITABLE Fascinating FUTURE**

**RTS GIVES YOU
11 BIG KITS
of TELEVISION and RADIO PARTS**

**YOU BUILD A TRF RADIO
RECEIVER PLUS MANY OTHER
PRACTICAL JOBS & EXPERIMENTS**

**YOU WORK AND LEARN
WITH REAL TELEVISION
AND RADIO EQUIPMENT**

RADIO-TELEVISION TRAINING SCHOOL'S master Technicians guide you. Located in the very heart of America's Television, Broadcasting, Radio and Sound Industries, RTS is right "on-the-spot" where new technical improvements are first introduced; is in the best possible position to bring students ACTUAL METHODS and practices developed by the RADIO-TELEVISION industry, leading to real money making opportunities. The 11 BIG KITS RTS GIVES YOU enable you to do many practical jobs, build the equipment illustrated; perform more than 100 other fascinating, valuable experiments. These jobs you do give you ACTUAL SHOP experience so vitally necessary to your future success. Thus RTS methods assure you BALANCED TRAINING—Theory PLUS Real Experience.

**OPPORTUNITIES NOW
WIDE OPEN FOR
Properly Trained Men**

Latest reports estimate 400 MILLION new television and radio sets will be built in the next 10 years . . . more than 72 million dollars is being spent RIGHT NOW just for radio repairs ALONE! When you are thoroughly trained by RTS Experts—who have their fingers on the pulse of the Radio-Television industry—a field of unlimited opportunities will open up for you in Your Own Radio-Television Sales & Service Business, F.M., Equipment Manufacturing, Communications and allied fields.

**EARN EXTRA MONEY
while learning at HOME**

Under the RTS amazingly easy, practical home-training plan there is no need for you to quit your present job. You study in SPARE TIME ONLY! RTS Experts show you how

to earn WELCOME EXTRA CASH, even BEFORE FINISHING YOUR TRAINING! In fact, when friends and neighbors know you are studying Radio-Television you may—like many RTS students—actually get MORE REPAIR WORK THAN YOU CAN HANDLE.

**27 YEAR
SUCCESS RECORD**

Backed by over a quarter-century of experience in home training, RTS (formerly Radio Training Association of America) offers practical "Learn-by-doing" methods, assuring you quick step-by-step progress. Begin preparing for your future in Radio-Television now while the time is ripe. If you are at all mechanically inclined—and have a grammar school education, RTS can teach you how to MAKE GOOD in Radio-Television.

GET THE FACTS

Send for FREE BOOK which tells you all about the RTS "time-tested" home-training plan, developed by technicians in the heart of the Radio-Television field. Fill out the coupon now—TODAY! and your FREE BOOK entitled "How To Make Good in Radio-Television" will go out to you AT ONCE. No Obligation. No salesman will call. Act now!

**YOU BUILD THIS
6-TUBE STANDARD
SUPER HETERODYNE
RADIO SET with
SHORT WAVE
CONVERTER**

**YOU
KEEP ALL
EQUIPMENT
—it's Yours!**

**★
SEND
FOR THIS
30-PAGE
FREE
BOOK
★**



RADIO-TELEVISION TRAINING SCHOOL
5100 SO. VERMONT AVE., LOS ANGELES 37, CALIF., U.S.A.
ESTABLISHED 1922 — 27 YEARS AGO
formerly RADIO TRAINING ASSOCIATION of AMERICA

**RADIO-TELEVISION TRAINING SCHOOL, DEPT. 10-PS
5100 South Vermont Avenue, Los Angeles 37, Calif., U.S.A.**

Send FREE Illustrated Book showing how I can make good in TELEVISION and Radio through training under the guidance of expert RTS Technicians. No obligation. (No Salesman will call).

NAME _____ AGE _____
St. & No. _____
CITY _____ ZONE _____
STATE _____

Learn A Trade NOW! PRACTICAL SHOP TRAINING!

In Our Chicago Shops

- AUTO MECHANICS
- DIESEL MECHANICS
- REFRIGERATION
- BODY-FENDER
- WELDING—ARC and GAS
- MACHINIST
- PIANO TUNING

Above Approved For G. I.'s and Civilians
One of America's Leading Practical Schools
7 Floors of Fully Equipped Shops
Over 48,000 Successful Graduates
Expert Individual Instruction
Learn by Doing—Low Living Expense
Established 1902—Day and Evening Classes

Also the following Home Study Courses

- PLASTIC
 - REFRIGERATION
 - DIESEL
- CALL IN PERSON OR MAIL THIS AD TO —

GREER SHOP TRAINING

(Desk 12) 460 South State St., Chicago 5, Ill.

Please send without obligation free information regarding trade checked above. (Specify whether you are a Veteran or Civilian)

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

EARN MORE MONEY!



Personal Attendance Courses

Be your own boss! Earn more money! Learn photography quickly through our unique LEARN-BY-DOING methods taught by famous photo "aces" at our Resident School. Resident Training is available with subsistence under the G. I. Bill to serious workers.

Home Study Course

You can train yourself for an action-packed, thrilling, profitable career in photography! N. Y. I.'s INDIVIDUALIZED Home Study Course is a spare time short cut to success. Invest your time in your future—don't waste it!

— Don't delay! Write today for FREE literature. —

New York Institute of Photography
Dept. "5", 10 West 33 Street
New York 1, New York

Please send me complete information regarding
 Resident Training Home Study Course

Name.....
(Please Print)
Address.....
City.....Zone.....State.....



**NEW YORK INSTITUTE
OF PHOTOGRAPHY**
10 West 33 Street, New York 1



WORK SHIRT BARGAIN

**SURPLUS STOCK
FROM MID-WEST
SUPPLY FIRM!**

69¢

What a buy! These sturdy, serviceable work shirts, though used, have been washed, sterilized and put in perfect condition. Every shirt is cut from durable wash materials, choice of blue or tan. Well made with reinforced stitching at strain points. Order today at our risk! Money-back guarantee!

3 for \$1.79

SEND NO MONEY! Just send name, address, neck size and color choice. Pay postman plus postage or send cash and we ship prepaid. Inspect 10 days. Return for refund if not delighted!

WORK PANTS TO MATCH 99c
Send waist measure and leg length

COVERALLS \$1.49
Send chest measurement

MILCO SALES, Dept. B-262 9350 Roselawn, Detroit 4, Mich.

**SAVE UP TO 50% THE WORLD'S
Greatest VALUES
in BINOCULARS**

GERMAN TYPE, BRAND NEW, DELUXE LEATHER CASE INCLUDED. Built to rigid military specifications. Never before at these prices! Free Catalog. Fully Guaranteed. OFFER IS LIMITED.

6 x 15	\$18.00	with Coated Optics	\$19.50
8 x 30	33.00	with Coated Optics	39.50
7 x 50	42.50	with Coated Optics	49.50
10 x 50	52.00	with Coated Optics	62.00

Many other models. Largest Stock in the West. ORDER TODAY! Send check or money order; \$2.00 Deposit on COD's. MONEY-BACK GUARANTEE!
"HOW TO SELECT BINOCULARS" Add 20% Fed. Tax, Postage Included

BUSHNELL IMPORTERS Dept.-P10, 43 E. Green, Pasadena 1, Cal.

TRI-STATE COLLEGE

B. S. ENGINEERING—Courses in Civil, Elec., Mech., Chem., Aeronautical and Radio, Television. Also Bus. Admin., Acc't. and Sec. Science. Visitors welcome. See beautiful campus, well equipped laboratories. Graduates successful. Enter Sept., Jan., March, June. Write for Catalog.
5109 College Avenue, Angola, Indiana

DEGREE IN 27 MONTHS
66th Year.
Students from all over the world.

MONEY BACK GUARANTEE

<p>OFFICER'S TROUSERS Pinks & Greens Brand new. Fine quality officer's elastique trousers. Sizes 29 thru 42. Add 25c for mailing. 1.95</p> <p>• GABARDINE • OFFICER'S SHIRTS Brand new pinks and greens. Made of finest quality gabardine. Shoulder epaulets. Sizes 14 1/2 thru 17. Sleeve sizes 32 thru 34. Add 25c for mailing. 6.95</p>	<p>AIR CORPS TYPE B-15 JACKET Brand new. Extra warm and lightweight. Mouton fur collar. Zipper front. Knit wristlets and waist. Sizes 36 thru 46. 9.88 Add 25c for mailing.</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

SEND FOR FREE CATALOG

NATIONAL JOBBING CO.
Box 1485 Dept. S-10 Omaha, Nebr.

Now YOU-TOO-Can Be a "WHIZ" on ANY AUTO REPAIR JOB!

Free
7-DAY OFFER!



"MoToR's Manual paid for itself on the first two jobs and saved me valuable time by eliminating 'guess work.'"
—WILSON J. SCHROP, Akron, Ohio



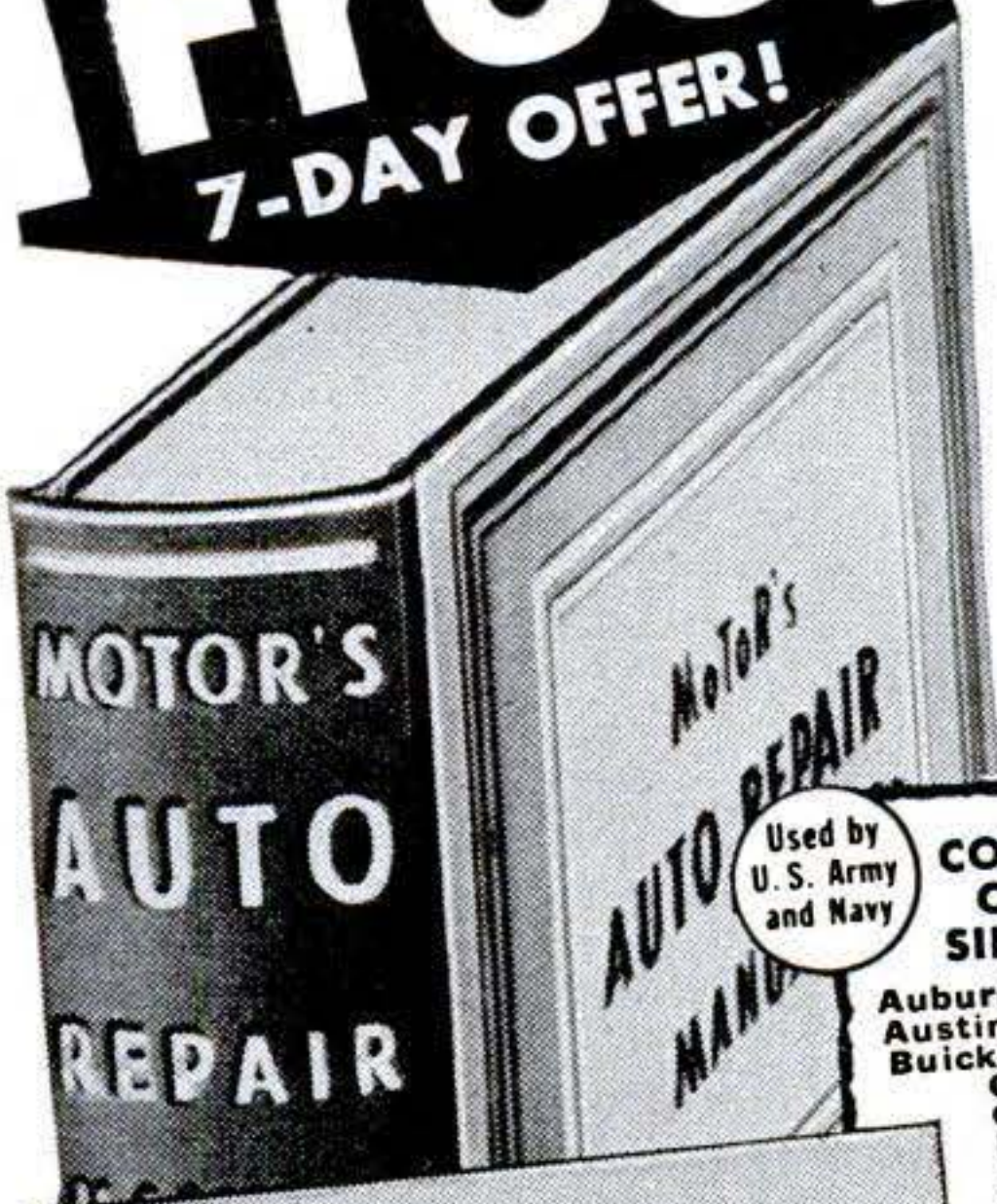
"Fixed motor another mechanic had worked on half a day. With your Manual I did it in 30 minutes."
—CURTIS AUBERRY, Murfreesboro, Tenn.



"I have done jobs with this Manual that I would not have attempted without it."
—C. L. V A N E R - STROM, Hazel Park, Mich.

HERE'S the book YOU need to "whiz through" any repair job on any car built from 1935 thru 1949—including those "ornery" extra-hard jobs that give other mechanics such a headache.

THOUSANDS of men like the three above are letting MoToR's brand-new **AUTO REPAIR MANUAL** help them "lick" even the toughest repair problems—in LESS TIME, with LESS work and MORE profits!



- Used by U. S. Army and Navy
- COVERS ANY CAR BUILT SINCE 1935!**
- Auburn
 - Austin
 - Buick
 - Cadillac
 - Chevrolet
 - Chrysler
 - Cord
 - Crosley
 - De Soto
 - Dodge
 - Ford
 - Frazier
 - Graham
 - Hudson
 - Hupmobile
 - Kaiser
 - Lafayette
 - La Salle
 - Lincoln
 - Mercury
 - Oldsmobile
 - Nash
 - Packard
 - Pierce
 - Arrow
 - Plymouth
 - Pontiac
 - Reo
 - Studebaker
 - Terraplane
 - Willys

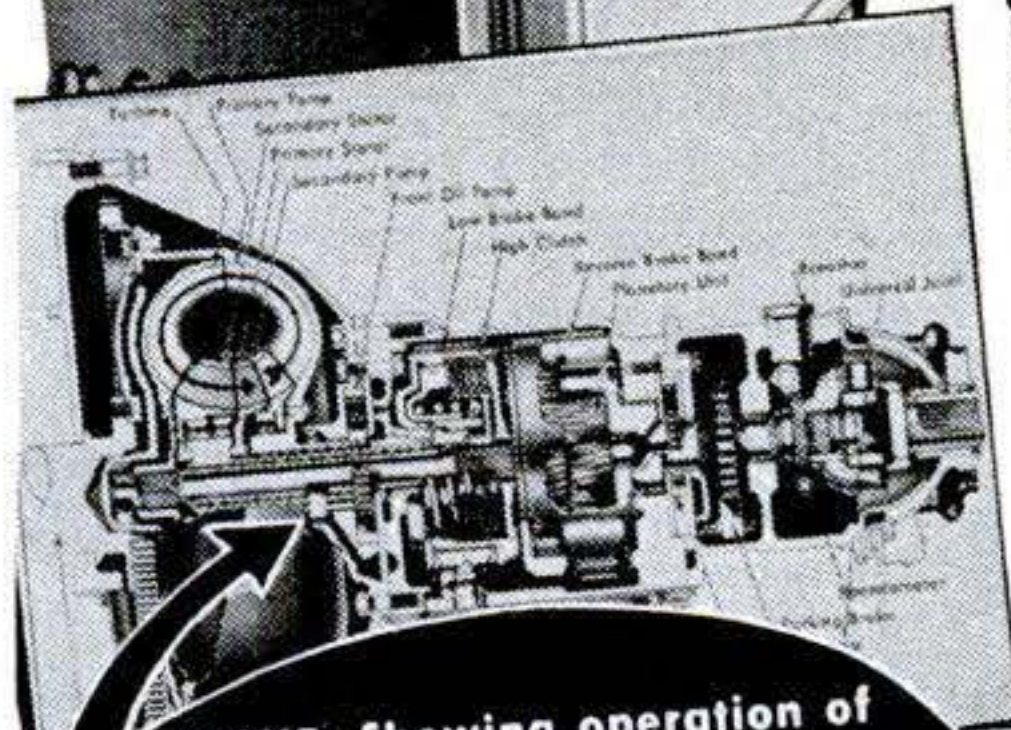
Complete "How-To-Do-It"

Now let these 200,000 factory-correct instructions and facts, 2100 "how-to-do-it" pictures, 200 "quick-check" charts and tables, go to work for YOU! With them you can repair anything from carburetor to rear end, Ford or Cadillac, shaky '35 model to shining '49—quickly, easily, right!

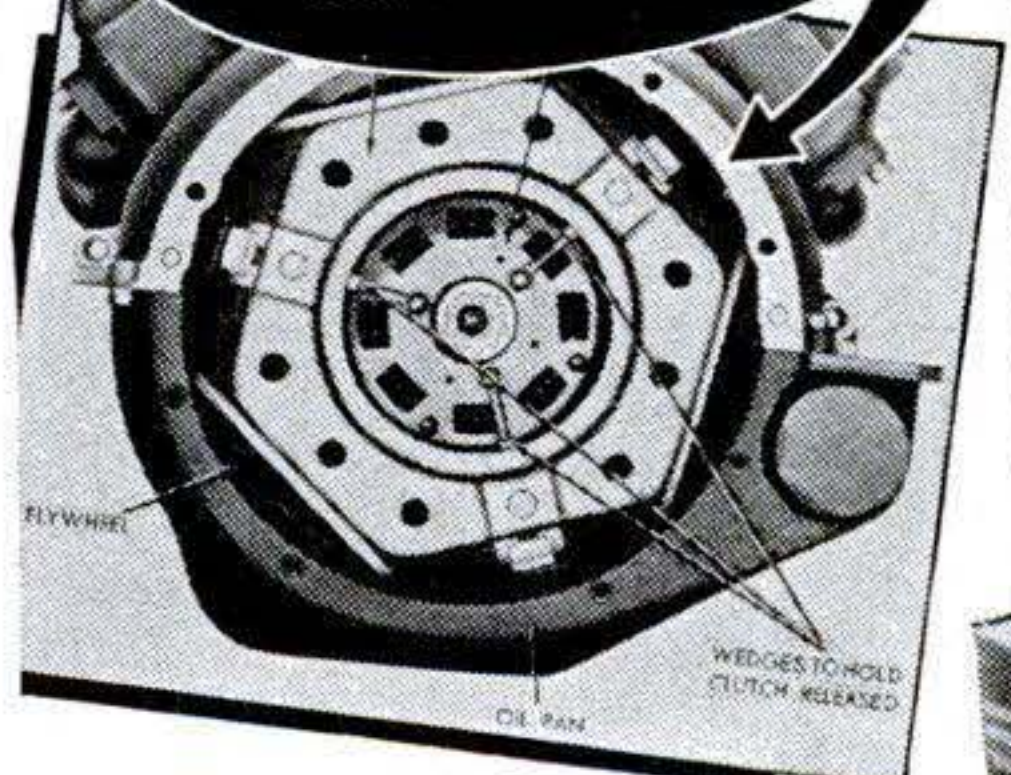
Just look up make, model, job in quick index; then let official step-by-step instructions, "boiled down" from 150 auto manufacturers' factory shop manuals, show you how! Sturdy binding, 8½ x 11 inches, 795 big pages.

SEND NO MONEY

Find out for yourself how this book can pay for itself first few days you use it. Try it FREE 7 days! Just mail coupon. Pay postman nothing. Put Manual to actual test. Then if not entirely satisfied with it, return book in 7 days, pay nothing. Mail coupon today! MoToR Book Dept., Desk 210, 250 West 55th Street, New York 19, N. Y.



ABOVE: Showing operation of Buick Dyna-Flow—and, BELOW: How to adjust Ford Clutch. Every moving part is covered in simple words and BIG, CLEAR Pictures.



Same FREE Offer on MoToR's TRUCK MANUAL

Covers EVERY job on EVERY truck made from 1936 thru 1946! 1400 pictures, 952 pages, 300,000 facts. All types Gasoline Engines, Truck Diesels, Hesselmanns, Fuel Systems, Governors, Lubrication, Ignition, Starters, Clutches, Axles, Brakes, etc., etc.

ALSO covers many buses, tractors, contractor and road building equipment, stationary power machinery. Check box in coupon.



MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR BOOK DEPT.
Desk 210, 250 W. 55th St., New York 19, N.Y.

Rush to me at once (check box opposite book you want):
 MoToR's New **AUTO REPAIR MANUAL**. If O.K., I will remit \$1 in 7 days (plus 35c delivery charges), \$2 monthly for 2 months and a final payment of 95c one month after that. Otherwise I will return the book postpaid in 7 days. (Foreign price, remit \$8 cash with order.)
 MoToR's **TRUCK REPAIR MANUAL**. (Described at left.) If O.K., I will remit \$2 in 7 days, and \$2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. (Foreign price, remit \$10 cash with order.)

Print Name..... Age.....

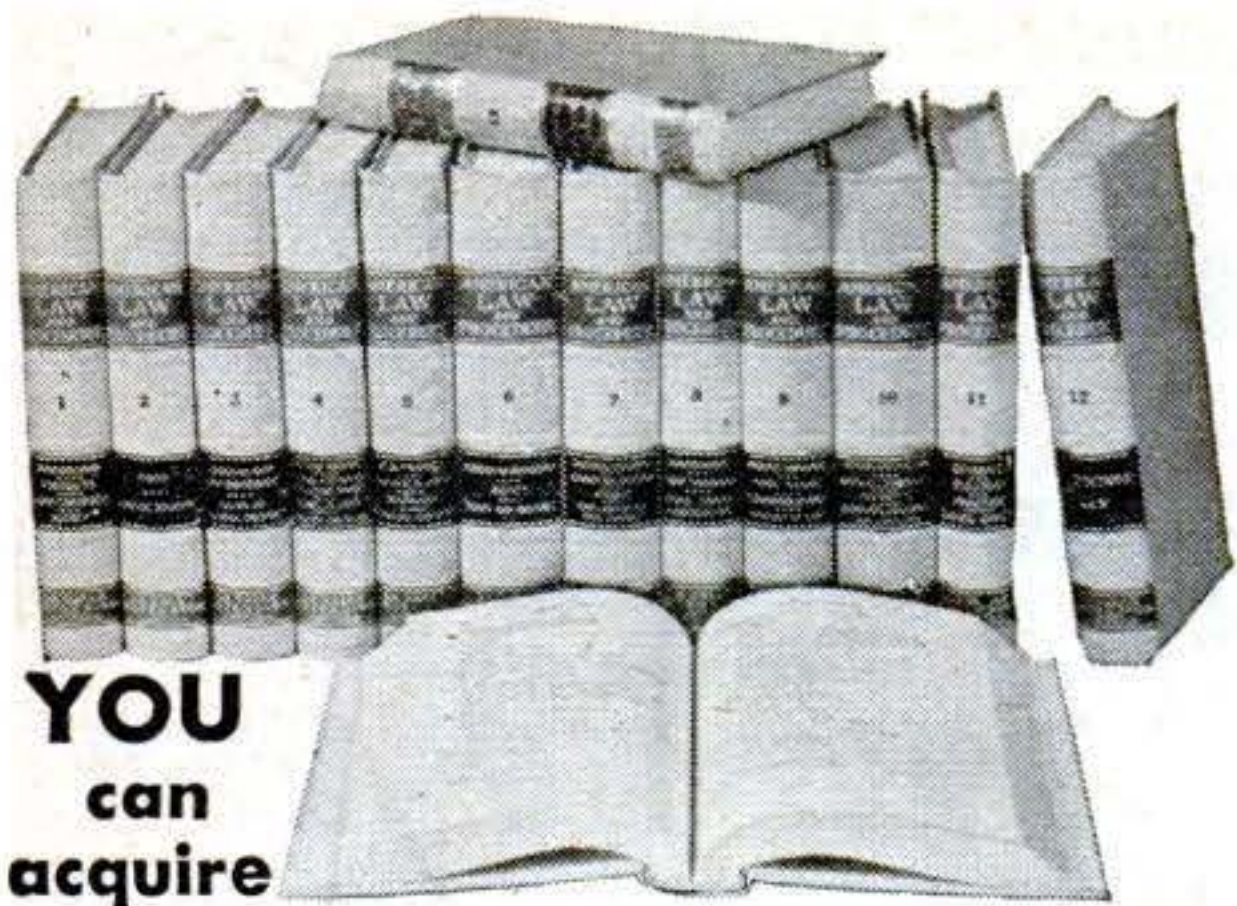
Print Address

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

Check box and save 35c delivery charge by enclosing WITH coupon entire payment of \$5.95 for Auto Repair Manual (or \$8 for Truck Repair Manual). Same 7-day return-refund privilege applies.



Published by MoToR, The Leading Automotive Business Magazine



**YOU
can
acquire**

**LAW NIGHTS AT HOME!
L L.B. DEGREE**

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

**LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution**

417 S. Dearborn St. Dept. 1083-L Chicago 5, Ill.

Send me your two FREE booklets described above; without obligation.

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

Street.....

City, Zone & State.....

**ENGINEERING DEGREE IN
27 MONTHS**

Big Demand for Graduates

AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and RADIO ENGINEERING (including Television).

Hundreds of young men are earning engineering degrees in this recognized institution each year—continuous operation. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center.

Low tuition. Competent instruction. Thorough intense practical program. Modern laboratory facilities including new physics lab. and modernized wind tunnel. Individualized instruction emphasized.

Approved for Veterans. Engineering preparatory courses. Students from 48 states and 21 foreign countries. Enter December, March, June, September. Send coupon for free catalog and full information. Enroll now.

SEND COUPON TODAY

INDIANA TECHNICAL COLLEGE

6109 E. Washington Boulevard
Fort Wayne 2, Indiana

Please send me free information on B. S. Engineering. Degree in 27 months as checked.

- Aeronautical, Chemical, Civil,
- Electrical, Mechanical, Radio-Television.

Name.....

Address.....



**MAKES YOUR
PLAYING**

*Easier!
Better!*

First and only seamless bell, of superior new metal, made by electro-mechanical process. Impossible to overblow or crack a note! Gives amazingly greater flexibility, richer tone quality, easier response. Exclusive on Conn trumpets, cornets and trombones. Most important development in years. Preferred by the leading artists. See your Conn dealer or write us. Please mention instrument. Conn Band Instrument Div., C. G. Conn Ltd., 1032 Conn Bldg., Elkhart, Ind.



*Write
FOR FREE
FOLDER*



FOR BUSINESS AND SOCIAL SUCCESS!

Improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: **New Free Book**, "How to Become a Good Penman", or check books wanted, \$1.00 each. Business Writing Artistic Writing Card Writing Engrossing Alphabets Bird and Design Flourishing Complete Set \$4.50 Enclose 10c for your name beautifully written and shading penpoint. S. A. Ziller, President, **TAMBLYN SCHOOL OF PENMANSHIP** 439 Ridge Bldg. In Business Over 52 Years Kansas City, Mo., U.S.A.

**ENORMOUS PROFITS CASTING
AT HOME**

Write today for **NEW FREE CATALOG**

Learn to cast thousands of perfect figurines, plaques, book ends, ash trays, etc. Start **NOW—NO EXPERIENCE, LITTLE CAPITAL** needed. Earn **GREAT PROFITS** with **X.L. RUBBER MOLDS**. X.L. Rubber. Pts. \$2.00; Qts. \$3.50; Gallons \$8.95; Models and enough rubber for 3 molds . . . \$1.30 postpaid.



PLASTIC ARTS STUDIO

Route 5, Dept. 3
MUNCIE, IND.

**Trained Men Get the Better Jobs
PRACTICAL SHOP TRAINING
in AUTOMOTIVE MECHANICS
BODY and FENDER REBUILDING**

If interested write or wire

ATLANTA MOTIVE TRADES INSTITUTE

Dept. C 254 IVY St., N.E. Atlanta, Georgia

Member of the Southern Association of Private Trade Schools

Veterans ask about G I Training

SPEED & MILEAGE MANUAL



**EASILY OBTAIN GREATER SPEED, MILEAGE,
RACING PERFORMANCE FROM ANY AUTOMOBILE!**

Famous new book shows simplified soup up methods—Speed Tuning—Mileage Secrets—Economy Tips! Tells how to build your own speed equipment! Fast Conversions! "Hot Rods"! Sports Cars! Complete instructions on building inexpensive superchargers. Hi-Speed Heads, Dual Mufflers, Manifolds, "Water Injectors!" All about engines, "Economy Tuning," Restyling, "Racing Tricks"—Fuels! Reveals Track Proven Methods that will give your car thrilling new getaway—with up to 40% more speed and mileage!

Also shows latest "Hollywood Custom Styling" methods! Streamlining! Sport Changes! Money-Saving Speed Conversions! California Roadsters Plans! Racer Diagrams! Working Drawings! Speed Catalogues! Photographs! Complete Data—Plus "Beautiful Custom Car and Hot Rod Pictorial Supplement!"

SATISFACTION GUARANTEED—ONLY COMPLETE BOOK OF ITS KIND . . . ONLY \$1.98 Post-paid

ALMQUIST ENGINEERING, Milford 25, Pennsylvania



Get
Into

RADIO, TELEVISION and ELECTRONICS

Master ALL Phases

Get Complete Training. You Receive and Keep All Equipment, Parts and Lessons. No Extra Charges.

**GOOD PAY
and Unlimited Opportunities
in JOBS LIKE THESE:**

Business of Your Own
Radio Manufacturing, Sales, Service
Broadcasting, Telecasting
Television Manufacturing,
Sales, Service
Laboratories: Installation, Maintenance of Electronic Equipment, Electrolysis, Call Systems
Garages: Auto Radio Sales, Service Sound Systems and Telephone Companies; Oil Well and Drilling Companies; Engineering Firms
Theatre Sound Systems Police Radio
And scores of other good jobs in many related fields

**YOU CONDUCT MANY
EXPERIMENTS LIKE THESE!**

Checking action of condensers
Experiments with cathode-ray principles
Experiments with resonance
Producing beat frequencies
Calibrating oscillators
Experiments with diode, grid-bias, grid-leak and infinite impedance detectors
Practical experience in receiver trouble shooting
Application of visual tester in checking parts and circuits
Experiments with inverse feed-back
Advanced trouble-shooting
... and many, many others

Complete Training by Practical Resident Trade School, Est. 1905

The same highly trained faculty, instruction materials and methods used here in our large, modern resident school, are adapted to your training in *your own home*. Shop Method Home Training has been proved by hundreds of successful graduates.

Both Resident and Home Study Courses Offered

**YOU
LEARN BY
DOING**

You receive special laboratory experiment lessons to show you how to build with your own hands various experimental units such as those shown at left, and how to conduct many tests.

**YOU
Build This
Superheterodyne**

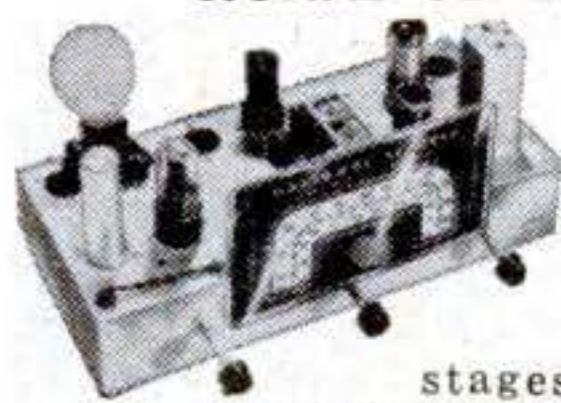
You receive complete standard equipment, including latest type High-Mu Tubes, for building various experimental and test units. You progress step by step until you build a complete Superheterodyne Receiver. It is yours to use and keep.



**YOU RECEIVE THIS
PROFESSIONAL MULTITESTER!**

You will use this professional instrument to locate trouble or make delicate adjustments—at home—on service calls. You will be proud to own this valuable equipment. Complete with test leads.

SIGNAL GENERATOR



You construct the Transatron Signal Generator shown here, demonstrating Transatron principles in both R.F. and A.F.

stages. You study negative type oscillators at firsthand.

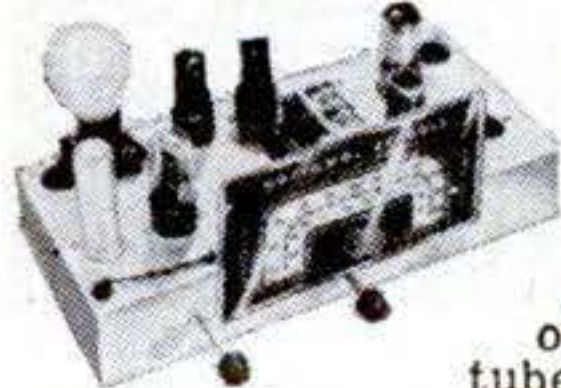
AUDIO OSCILLATOR:

An electronic device, which produces audio-frequency signals for modulating R.F. (radio frequency) carrier waves, testing A.F. (audio frequency) amplifiers, speakers, etc.



**T.R.F.
RECEIVER**

You build several T.R.F. Receivers, one of which, a 4-tube set, is shown here. You learn construction, alignment, make receiver tests, and do trouble shooting.



You will find all lessons easy to understand because they are illustrated throughout with clear diagrams and step-by-step examples that you work out yourself. Every piece of the equipment and complete lesson material we send you is yours to keep and enjoy, including the multitester, experimental equipment, all parts of the Superheterodyne, tube manual, radio dictionary, and complete, modern Television texts. All parts are standard equipment.

**Shop Method Home Training . . .
Earn While You Learn**

With our practical resident Shop Method Home Training, you study in your spare time. You receive Spare Time Work Lessons, which show you how to earn while you learn. Service neighbors' radios and TV receivers, appliances, etc., for extra money and experience. Many National students pay all or part of their training with spare time earnings!

DON'T DELAY! The Radio-Television Industry needs trained men NOW!

**APPROVED
FOR
VETERANS!**
Check coupon below!

For quick action, mail coupon today and we'll rush you full information.

Free!

NEW, ILLUSTRATED OPPORTUNITY BOOK AND SAMPLE LESSON SHOW YOU HOW WE TRAIN YOU . . . SEND FOR THEM TODAY! NO COST. NO OBLIGATION.



NATIONAL SCHOOLS

LOS ANGELES 37, CALIF. • EST. 1905



FIND OUT NOW . . . MAIL COUPON TODAY

National Schools, Dept. 10-PS
4000 South Figueroa Street
Los Angeles 37, California

Send me your FREE book "Your Future in Radio" and the sample lesson of your course. I understand no salesman will call on me.

NAME.....AGE.....

ADDRESS.....

CITY.....ZONE.....STATE.....

Check here if Veteran of World War II

Mail in envelope or paste on penny postal.

Do you want

- ➔ .. to go to College?
- ➔ .. or to enter a Profession?
- ➔ .. or get an Office Position?

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

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

High School Course at Home

Many Finish in 2 Years

American School, Dept. H-746, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me **FREE** information covering special training in subjects checked below. No obligation on my part.

- | | |
|------------------------------------------------------|----------------------------------------------------------------|
| <input type="checkbox"/> High School Course | <input type="checkbox"/> Diesel Engineering |
| <input type="checkbox"/> Electronics, Industrial | <input type="checkbox"/> Drafting and Design for Men and Women |
| <input type="checkbox"/> Architecture and Building | <input type="checkbox"/> Plastics |
| <input type="checkbox"/> Automotive Engineering | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Business Management | <input type="checkbox"/> Mechanical Engineering |
| <input type="checkbox"/> Electrical Engineering | <input type="checkbox"/> Aviation |
| <input type="checkbox"/> Elec. and Gas Refrigeration | <input type="checkbox"/> Salesmanship |
| <input type="checkbox"/> Air Conditioning | <input type="checkbox"/> Radio |
| <input type="checkbox"/> Railway Training | |

Name.....
Address.....



HIGH PAY • SECURITY When You LEARN A TRADE

Get ready for a well-paid, lifetime job or a business of your own in one of these **FIVE ESSENTIAL TRADES**. Complete training under expert instructors with practical experience prepares you to step into a good paying job with a future and security.

ELECTRICITY: Basic electricity, Residential and Industrial Wiring and Appliance Repair

PLUMBING: Every phase—pipe cutting and threading to complete installations, blue print reading.

AUTOMOTIVE & TRACTOR: Engine overhaul, Transmissions, Carburetion Generator-Ignition Systems, Tune Up

DRAFTING: College level training in general Machine and Architectural Drafting.

SHOE REPAIRING: Complete practical training includes reconditioning and rebuilding.

Approved For Veteran's Training

NATIONAL TRADE SCHOOL

DEPT. C • 2610 Grand • Kansas City 8, Mo.

Without obligation to me please send full information on the course checked.

.....Automotive and Tractor Technician Drafting
.....PlumbingElectricityShoe Repairing

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

Address.....

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

Veteran?.....

SURPLUS BARGAINS

LINEMAN'S TOOL & SAFETY BELT

Brand new web type belts in the original package. Only..... **\$3.95**



POLE AND TREE CLIMBERS

Without straps. Used, good. Per Pair, only..... **\$1.50**

BRAND NEW!

HAYDEN TIMING UNIT



Excellent as an automatic timing device for turning off electric signs, store lights, etc. Hundreds of other uses. **\$2.95**
110 V.—60 cycle—2 watts 1/10th rev. per hour

Send 10c for our jam-packed Catalog!
Enclose full amount with order. All Equipment F.O.B.

C & H SALES COMPANY

2176 S-10 E. Colorado St. • Pasadena 8, Calif.

WELDING SHOP TRAINING



G.I. APPROVED—GAS AND ARC
Classes start on Monday each week. Payment Plan for Non-Vets. Welders needed in practically every industry—train for a field where you have greater assurance of Steady Work, Good Pay. Write for Free Information.

A & S VOCATIONAL WELDING SCHOOL

1212 E. 63rd Street, Dpt. PS-10, Chicago, Illinois

MASTER COURSE IN

HYPNOTISM

SECRETS REVEALED!

Actual methods, techniques of master hypnotists... how to hypnotize suitable subjects at a glance—a command—by phone! How to control subjects after they awaken—help break tobacco, other habits. Self-hypnosis. Group hypnosis. Entertain with amazing hypnotic stunts for fun or profit. Get this easy-to-understand, how-to-do-it course now! Money-back guarantee. Fully photo-illustrated... **\$2 (complete)**. **EXTRA!** Unique "ALARM-CLOCK MIND" instruction folio and catalog of unusual Power Books included. Order "Hypnotism Course" today!



POWER PUBLISHERS, Dept. M3, 790 Broad St., Newark, N. J.



BARBELLS

Finest Quality..... **\$8.98 up**

FREE CATALOG

Send today for big new 4 color fully illustrated free catalog of **BARBELLS**, Dumbbells and Health equipment. Free—world famous \$15.00 Dan Lurie Barbell and Dumbbell training courses with every purchase.

DAN LURIE BARBELL CO.

Dept. 170-K, 1729-S9 Rockaway Parkway, Brooklyn 12, N.Y.

Get a MURRAY Electro-Stylus for FUN and Profit!

Turn spare time into real enjoyment—and perhaps big profit! Make Christmas cards by etching plastic or film for contact printing or enlarging. Engrave leather bill-folds, plastic plaques, glass, do silk screen, retouch photographs, make plastic edge-lighted signs—cut beautiful mimeograph or rexograph stencils. Hobby or business instrument.

Delivers 7200 strokes per minute. Learn in 10 minutes. No radio interference. For all ages—wonderful gift.

Send No Money!

Send name and address. We ship C.O.D. Pay postman \$9.95 plus postal charges. Or, send check or money order and we pay postage! Includes Electro-Stylus, 2 sharp points, 1 small ball point, 1 large ball point, 1 plastic-cutting point, Diamond point for glass cutting... \$5.95 additional.



\$9.95

MONEY-BACK GUARANTEE

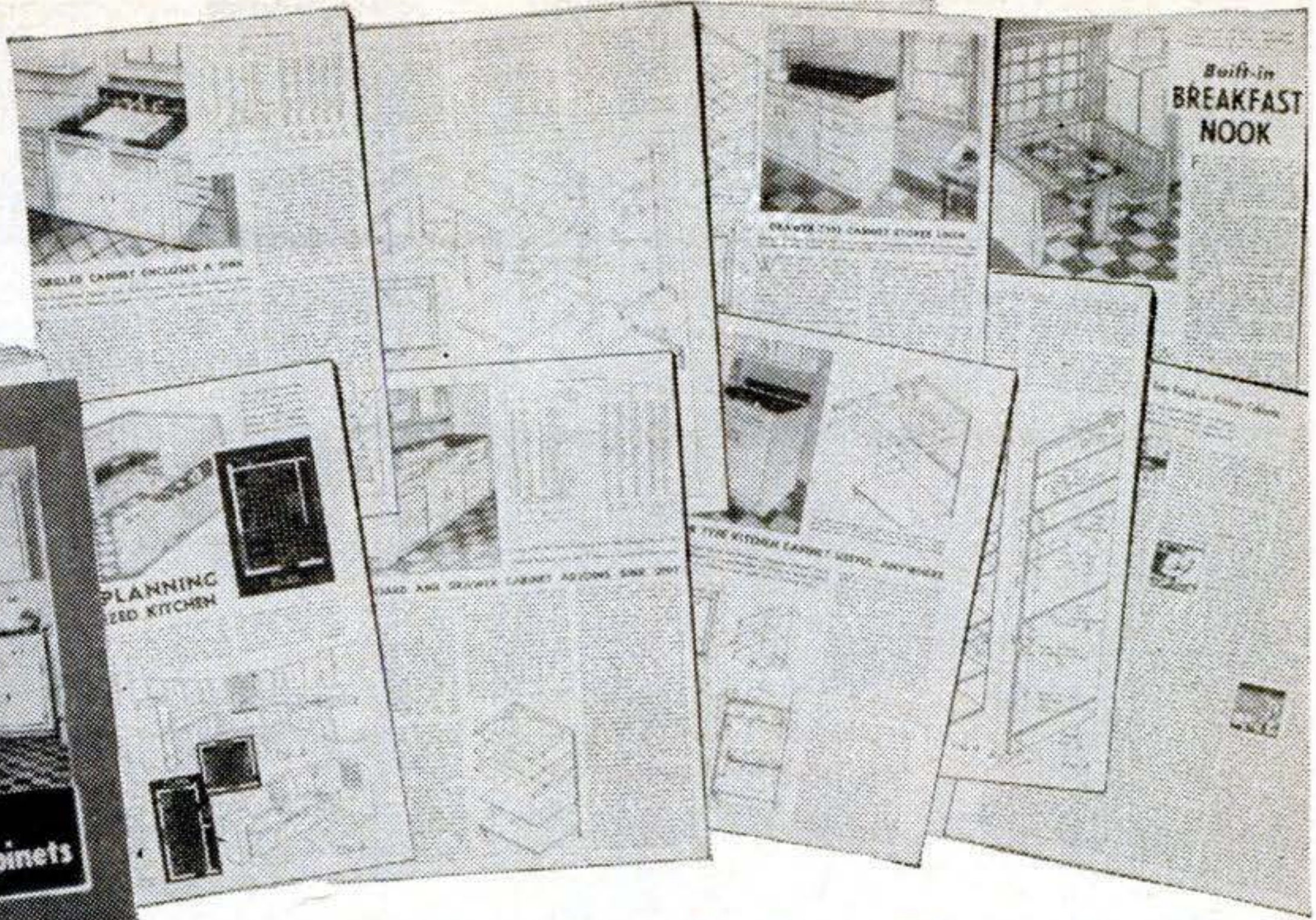
MURRAY INDUSTRIES INC.

502 West Colo. Ave. Colo. Springs, Colo.

Free!

7-Day Trial

Just Mail Coupon NOW



How Thousands Are Now Getting NEW KITCHENS This Easy Way!

Amazing New Book Shows How to Plan the Space—Build the Cabinets, Install and Finish Like a Professional

"How to Build Modern Kitchen Cabinets" can also make your dream kitchen come true! Thousands have ordered this wonderful book on FREE TRIAL. Hundreds have written of amazing results. And no wonder! For it guides you every step. Helps you pick best cabinets for special needs. Then shows how to install, finish for a perfect job. Now let "Modern Kitchen Cabinets" give you, too, the kitchen cabinets you need. Send for it now on free trial.

Then select the RIGHT CABINETS and locate them to save steps. You'll pick the best combination to fit your space. Be sure of work counters where needed!

To save time and error, the designer has prepared a cutting list in chart form. There's a chart for each cabinet, complete for whatever size you choose. This alone cuts work in HALF. All you do is cut single pieces of wood to sizes given. When all are ready, assemble into a finished cabinet!

Save Money Building Your Own!

Shows you how to build one cabinet, at a time, or combination. A style for every purpose, a size for every kitchen.

When you're ready, simply measure space, refer to "Modern Kitchen Cabinets" complete lumber list of sizes. Easy as that! Simplified—all the help you need. Units designed to be assembled in workshop and brought to kitchen ready to install.

Gives You the Answer to Every Problem

Every step, every operation fully described. Every detail clearly shown. How to cut joints, what size to cut every piece in every style. Nothing missing! Plywood or solid wood; plastic or metal moulding. Reveals types, how to install hardware. How to hang cabinet. How to cement linoleum to tops. How to insert grilles. How to ventilate. Special drawer-runner construction. Beautiful, lifetime hard-cover binding.

Secrets of Planning Revealed

Should cabinets be near door? Sink? Work counters? Where should dishes be kept? Answers are in your copy of "Modern Kitchen Cabinets." An architect works with the same facts you find here. Read chapter on "Secret of Planning a Modernized Kitchen" and you, too, will learn fundamentals.

Mail Free Examination Coupon Now

Will be sent for 7 days' free trial. Now you, too, can build the kitchen cabinets you need. You, too, can plan your own kitchen. Why delay? Why be old-fashioned? Get started now.

Which of these MODERN KITCHENS do YOU want?



TYPICAL kitchen schemes shown here are but a few of many—many combinations you can have by selecting cabinets for your own special needs and in widths that fit your available space.



PLAN A is a suggested arrangement if you have two adjacent walls for cabinets. PLAN B gets a wide variety of cabinets into compact space along one wall. PLAN C has broom closet.



PLAN D has cabinets along one wall and utilizes corner for convenient dinette. PLAN E is laid out on the efficient U principle around three walls. Built-in breakfast nook included.

SEND NO MONEY JUST MAIL COUPON

Pay postman only \$1.50 plus postage, or send \$1.50 (check or money order) and WE pay postage. Read and study it for 7 days at our risk. If not delighted—if not worth every penny of \$1.50 to you, send it back at our expense. We will refund your \$1.50 by AIR MAIL. "HOW TO BUILD MODERN KITCHEN CABINETS" was compiled by the Editors of CRAFTSMAN PUBLISHING.

CRAFTSMAN PUBLISHING CO.
115 Worth Street, Dept. PS10,
New York 13, N. Y.

What Two Out of Hundreds say:

"I have made quite a few from plans. I received 15 more orders."
—M. F., New Jersey.

"I am in the midst of making a complete set using the plans which I find excellent. You have set them forth in such complete detail—greatly appreciated."
—W. J. R., Abscon, N. J.

Craftsman Publishing Co., Dept. PS10,
115 Worth St. New York 13, N. Y.

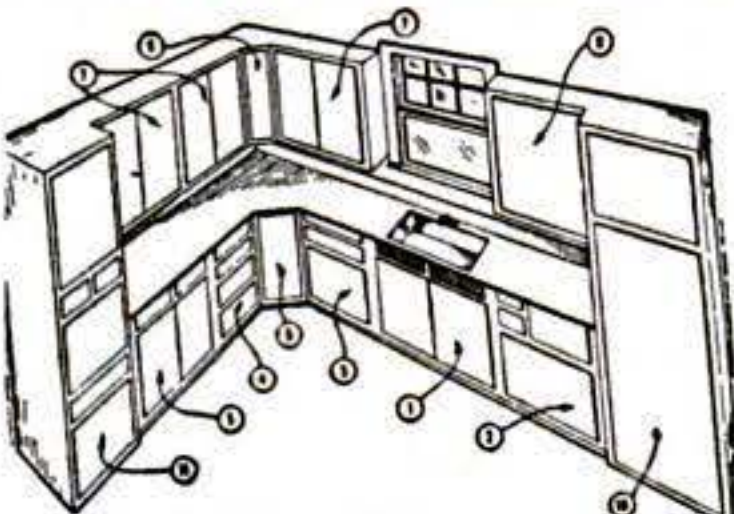
Send me, too, "How to Build Modern Kitchen Cabinets" on 7 days' Free Trial. If I am not delighted, you will refund my \$1.50 at once.

Name _____

Address _____

City _____ Zone _____ State _____

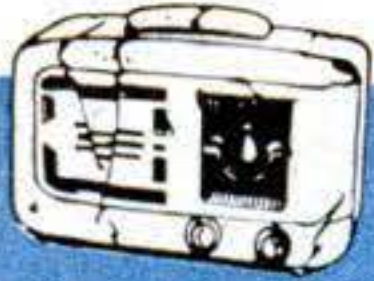
I enclose \$1.50 Send postpaid.
 Send C.O.D. I will pay postman \$1.50 plus postage.



Wide Variety of Floor and Wall Models

- 1—Sink. 2—Drawer and cupboard.
- 3—Single door. 4—All drawer.
- 5—Double door. 6 & 9—Corner.
- 7—Double door wall unit. 8—Single-door wall. 10—Broom closet or storage. 11—Desk and storage.

EVERY STYLE CABINET!



Blue Print for PROFIT

Here's *Your* Success Plan



a few cents worth
of materials
BRINGS YOU DOLLARS!!

Have Your Own Lasting,
Successful Business—Be Your
Own Boss—Help Fill Huge Demand
... No Experience Is Necessary

Rich profits are waiting to be tapped in this new field. New MIRACLE finish gives a velvety, luxurious surface to radios, lamps, toys, signs, store displays, figurines, auto dashboards, and hundreds of other items. Make old objects beautiful and saleable — make new things worth much more with this soft, rich covering that can be applied to any surface, even if old and worn.

START RIGHT AWAY

Yes, you can learn in a few days to start MAKING MONEY! Everything you need is furnished, including fully detailed, illustrated instructions that are complete and easy to understand. Every point is explained, to show you how to start on the road to big money, full or spare time, right in your own home.

EVERYTHING COMPLETE

In addition to full instructions, you get all materials that will enable you to start at once. A few cents worth of materials can mean many dollars in return. You can earn up to \$5.00 per hour and more spare or full time. Boost your present income or start your own profitable business. Our Business is Booming. Help us fill HUGE DEMAND.

ACT NOW

Grasp this opportunity TODAY — start your own business. It's too good to miss! SEND NO MONEY — fill out the coupon and stick it on a post card or in an envelope and mail today for full details, FREE sample of FLOK-KRAFT covered material, and hundreds of useful and profitable IDEAS. Do it NOW — be first!

SEND NO MONEY

**FREE SAMPLE!
MAIL COUPON
NOW!**

Covers
Wood,
Fabric,
Metal,
Glass,
Plaster,
or any
Surface

It covers



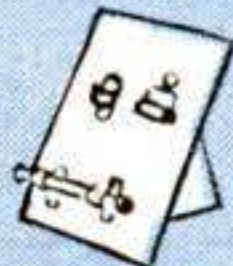
TOYS
old or new



LAMPS
take on a new
distinctive
beauty



JEWELRY
BOXES
give perfect
protection



DISPLAY
PIECES
become
unusually
eye-appealing



CAR
DASHBOARDS
made soft
as velvet



COAST INDUSTRIES

Dept. 1A
1004 So. Los Angeles St.,
Los Angeles 15, Calif.

Please rush me all the details!

NAME

STREET

CITY STATE

BE A GOVERNMENT LICENSED AIRPLANE AND ENGINE MECHANIC



EARN BIG PAY IN
AVIATION

Start your aviation career by enrolling in our **MASTER AVIATION MECHANICS**, CAA Approved 1 Year Course, a complete course in both airplanes and airplane engines. Our **REFRESHER AIRPLANE & ENGINE MECHANICS COURSE** is designed for veterans or others with aviation mechanics experience. Either course is available to veterans under the **G.I. Bill of Rights**. Write today for complete information.

LINCOLN AVIATION INSTITUTE
UNION AIR TERMINAL DEPT. A-10 LINCOLN, NEBRASKA

Be A MASTER PLUMBER

Earn \$15 To \$50 A Day

DON'T ENVY THE PLUMBER—BE ONE

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

LEARN IN 32 WEEKS WITHOUT PREVIOUS EXPERIENCE

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

UNIVERSAL PLUMBING SCHOOL
819 HOLMES STREET KANSAS CITY, MO.

Learn PHOTOGRAPHY at Home

Splendid Hobby or Vocation

Prepare in spare time. Practical basic training. Long-established school. Send for free booklet, "Opportunities in Modern Photography" and particulars. Sent postage prepaid. No obligation.

AMERICAN SCHOOL OF PHOTOGRAPHY
1315 S. Michigan Avenue, Dept. 1367 Chicago 5, Illinois

ELECTRICAL TRAINING

Intensive 32 weeks residence course in fundamentals of industrial electrical engineering, including radio, electronics. Prepares for technician, engineering aides. Approved for veteran training. 56th year. Enter January 9. Catalog.

BLISS ELECTRICAL SCHOOL
7618 Takoma Ave., Wash. 12, D.C.

World Famous EASY TO ASSEMBLE PACKAGED BOAT KITS



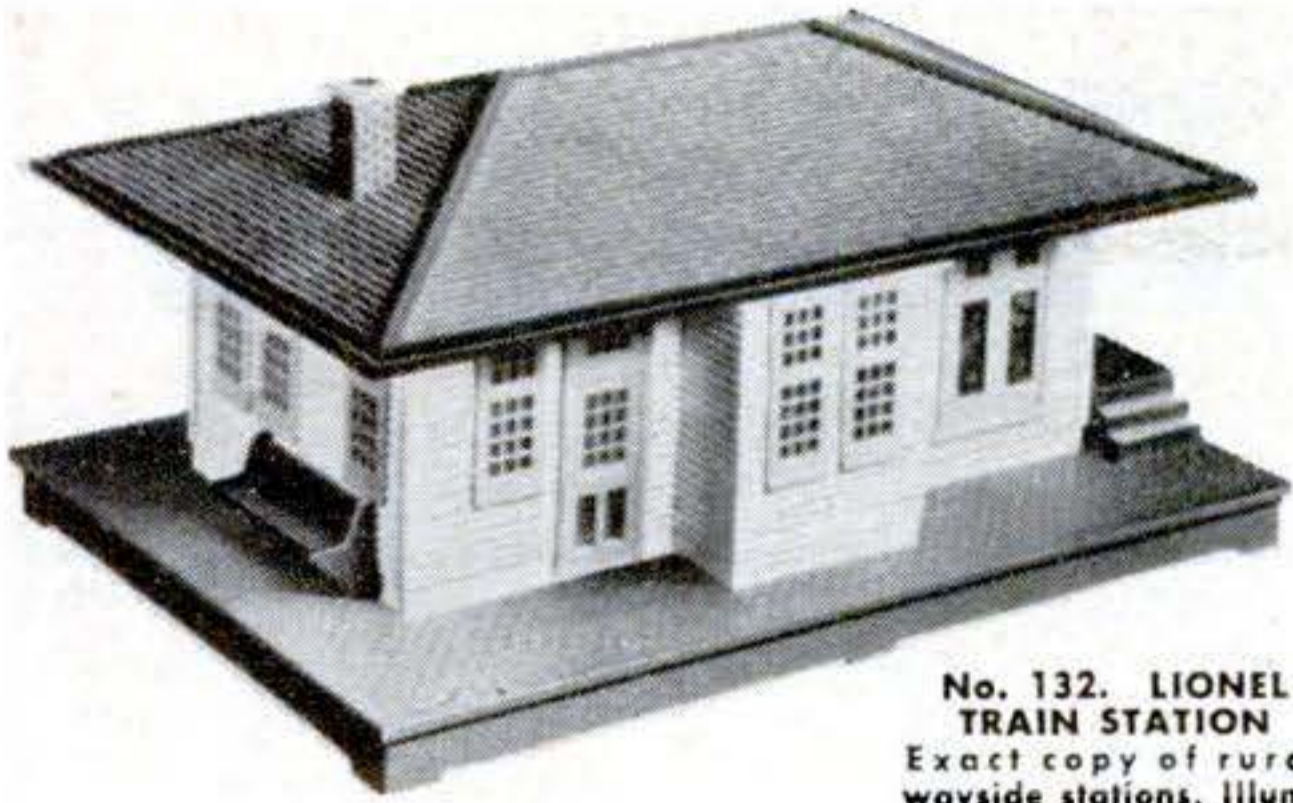
18 models—8 to 18 Ft.
1949 line—many new models—increased performance—simplified assembly. All parts pre-cut, frames pre-assembled. Send 25c (coin) for literature. Literature plus booklet "Plywood Boats," \$1.00.



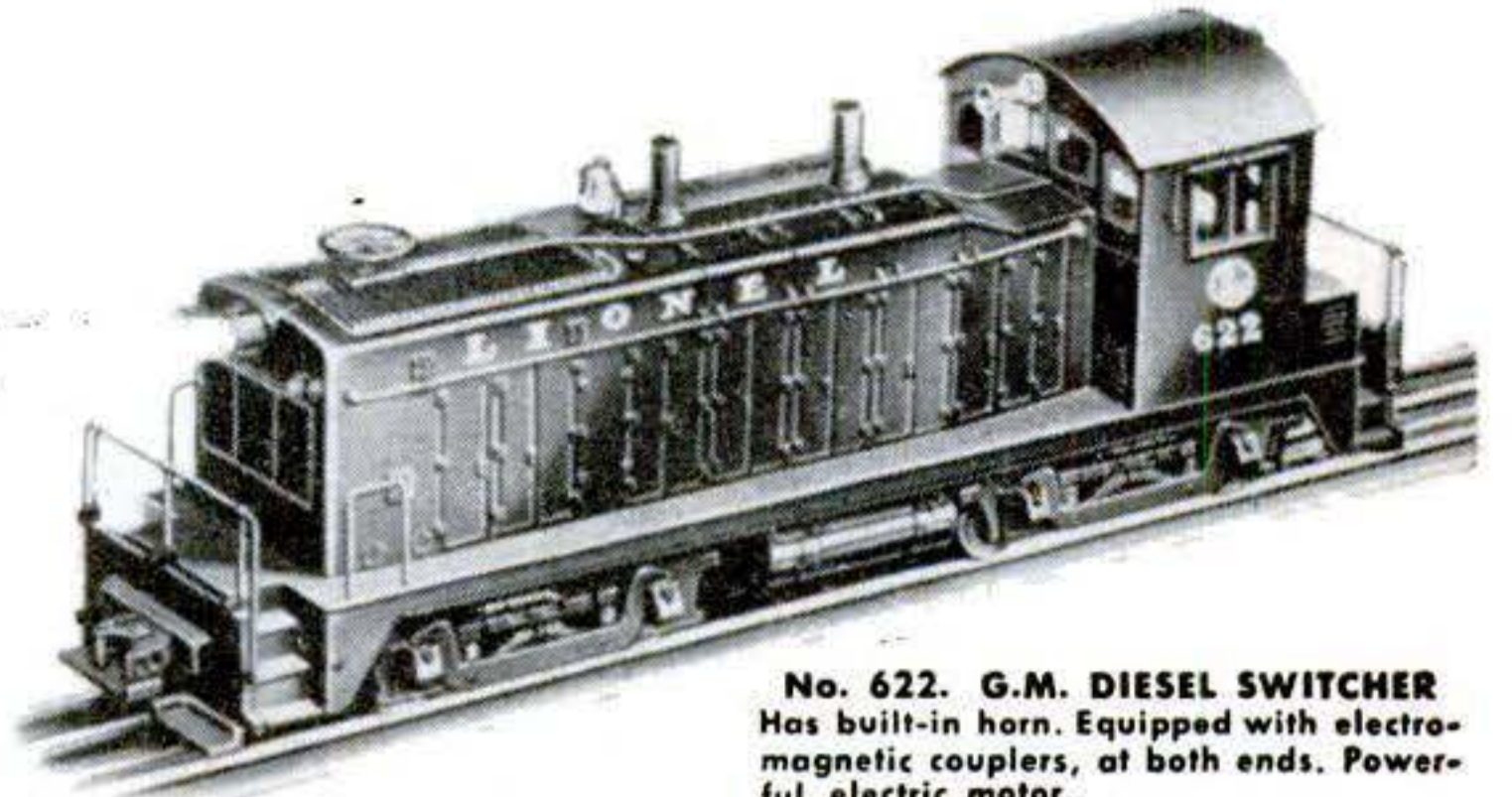
BOAT PATTERNS—BLUE PRINTS

100 designs by Deed, Lord, Crandall, etc., plank, steel, and plywood types 6-35 ft. Detailed blueprints, full-size paper patterns. Catalog 35c (coin). Catalog and booklet "Boat Building" \$1.00.

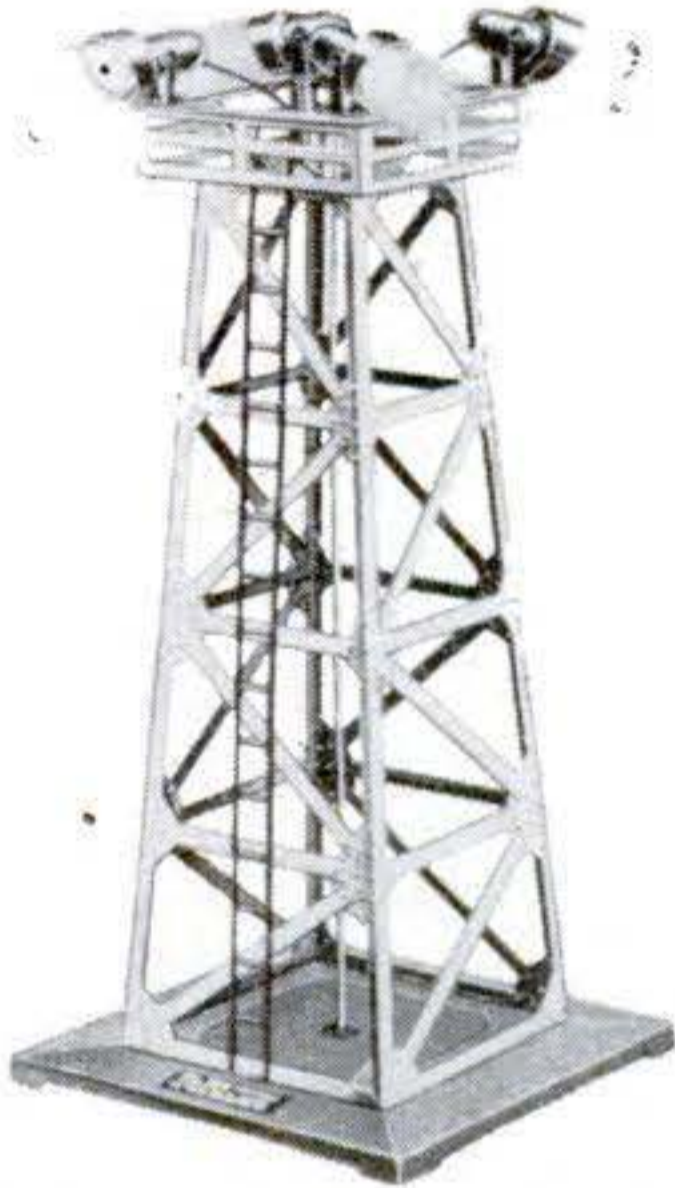
MARINE MART—DEPT. 23—BUFFALO 7, N. Y.



No. 132. LIONEL TRAIN STATION
Exact copy of rural wayside stations. Illuminated windows. Colorful, Realistic.



No. 622. G.M. DIESEL SWITCHER
Has built-in horn. Equipped with electromagnetic couplers, at both ends. Powerful electric motor.

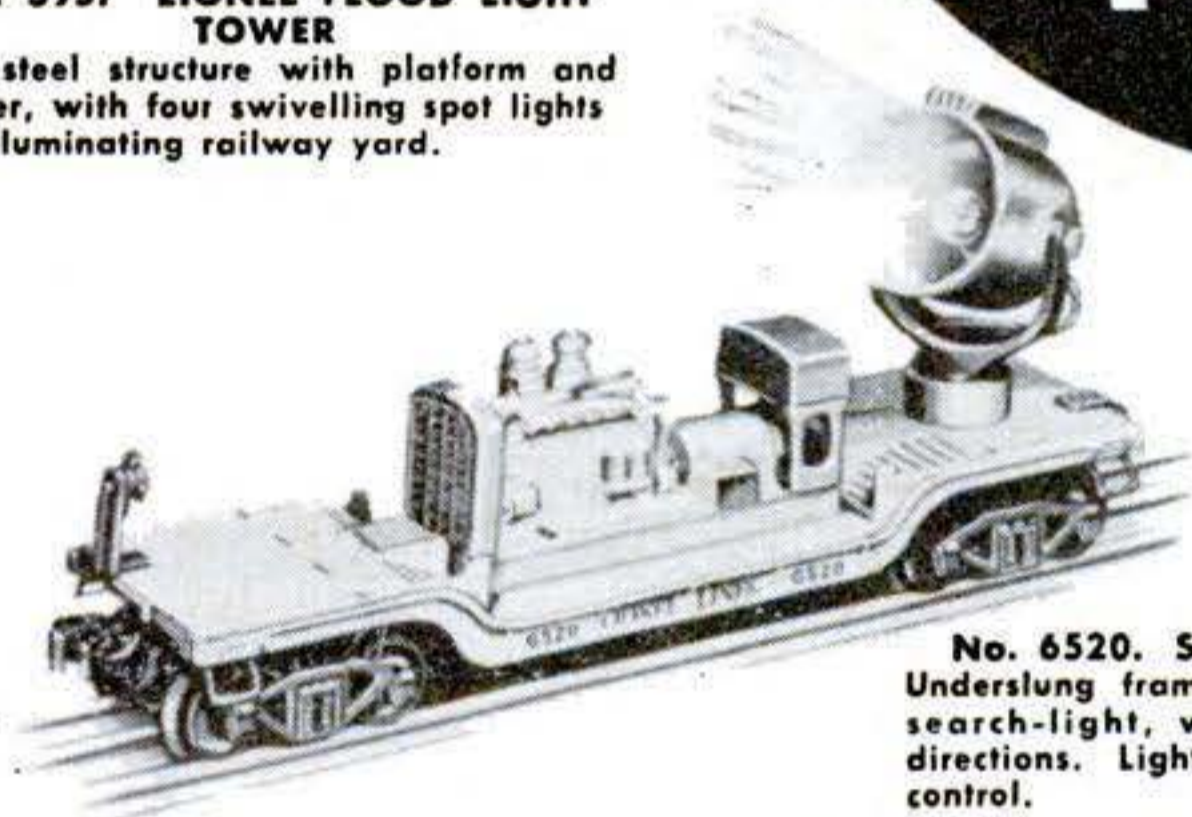


No. 395. LIONEL FLOOD LIGHT TOWER
Tall steel structure with platform and ladder, with four swivelling spot lights for illuminating railway yard.

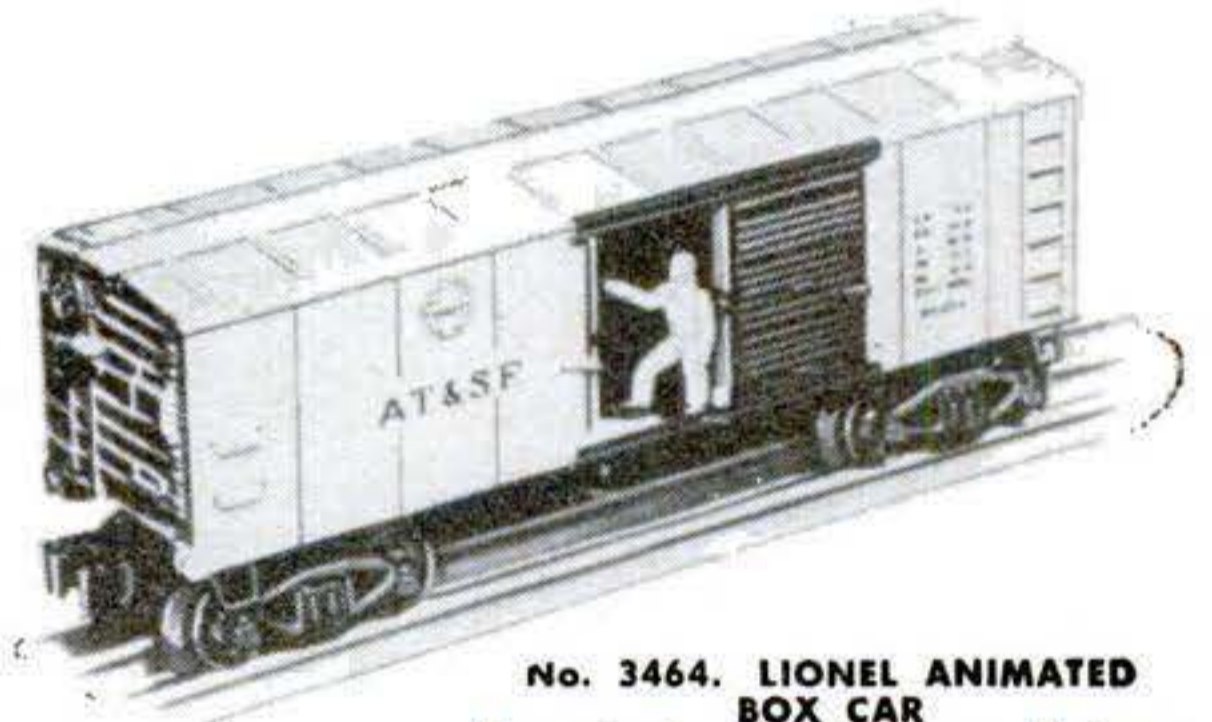
New
LIONEL
Items for
1949



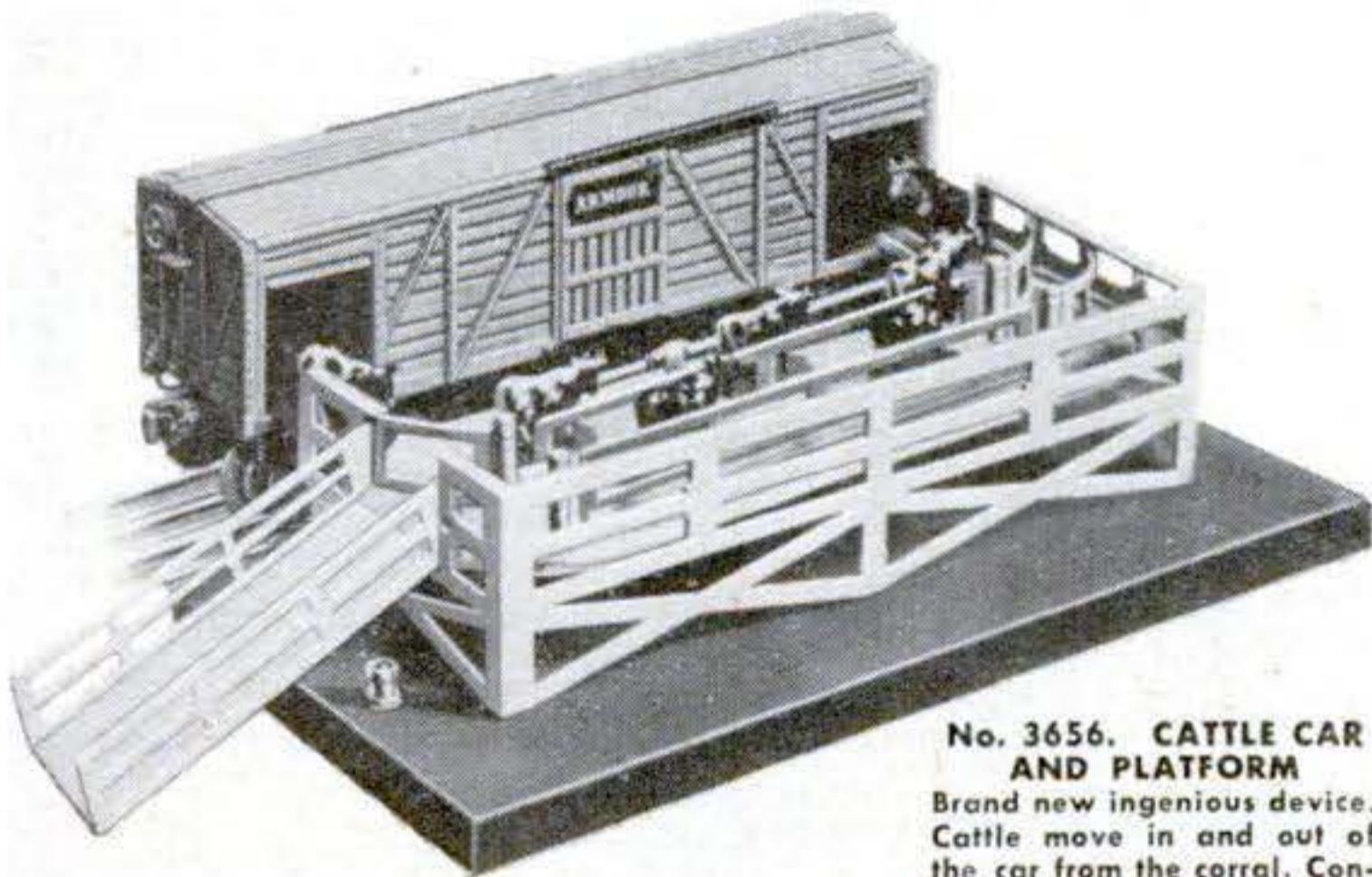
No. 394. LIONEL ROTARY BEACON
A miniature rotary beacon used to define air lanes, with revolving search light.



No. 6520. SEARCH LIGHT CAR
Underslung frame. Mounts a powerful search-light, which swivels in two directions. Light operated by remote control.



No. 3464. LIONEL ANIMATED BOX CAR
A semi-automatic accessory. A figure within the car pushes open the sliding door and appears at the entrance. Controlled by press button.



No. 3656. CATTLE CAR AND PLATFORM
Brand new ingenious device. Cattle move in and out of the car from the corral. Controlled by push button.

See Lionel trains at your favorite store.

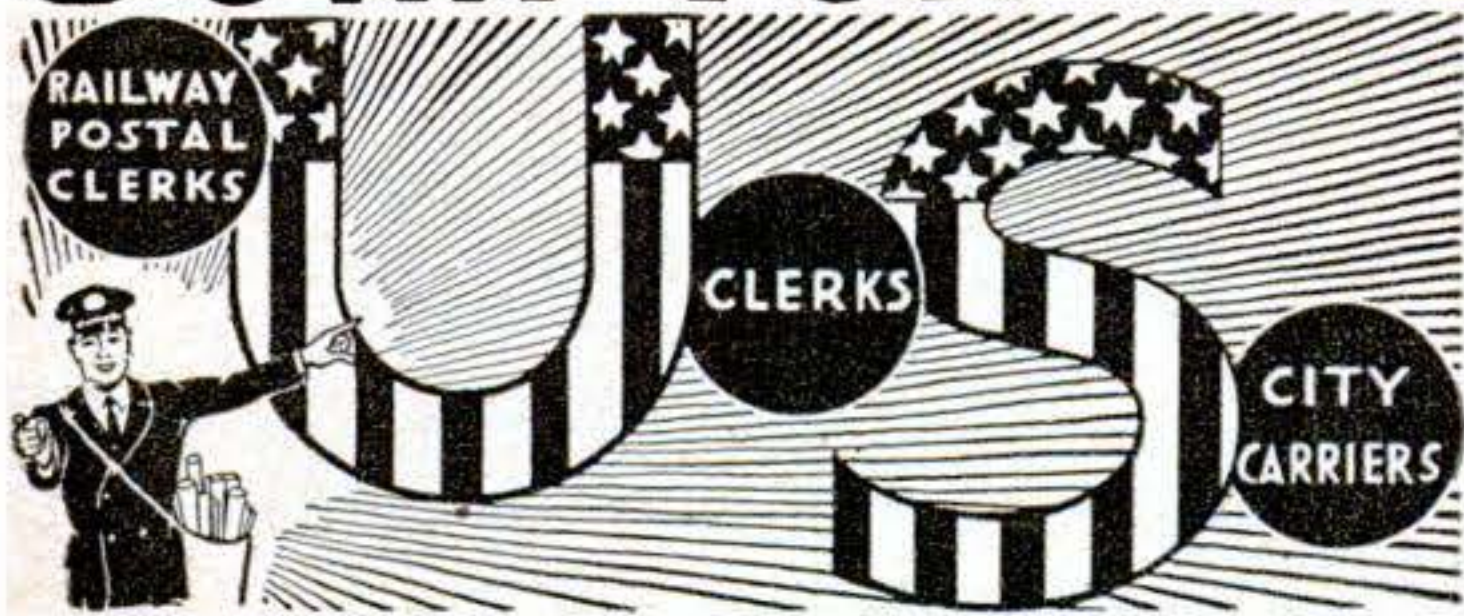
Write for the Catalog Today!

LIONEL TRAINS, P. O. BOX 242
Madison Square Station, New York 10, New York

I enclose 10c. Please send me the new 40-page, full-color Lionel Train Catalog for 1949.

Name _____
Address _____
City _____ Zone _____ State _____

WORK FOR THE GOVERNMENT START AS HIGH AS \$3,351 YEAR



Veterans Get Special Preference

MEN—WOMEN

Railway Mail Clerks
Postoffice Clerks, Carriers
Storekeeper-Gaugers
Stenographers-Typists
Meat Inspectors
Many Other Jobs

PREPARE
IMMEDIATELY
FOR NEXT EXAMS
Common Educa-
tion Often
Sufficient

Mail
Coupon
TODAY



COUPON

Franklin Institute
Dept. W-81
Rochester 4, N. Y.
(Not Government Controlled)

Gentlemen: Rush to me,
FREE of charge, list of U. S.
Government big pay jobs.
Send FREE 40-page book de-
scribing salaries, vacations,
hours, work. Tell me how to
qualify for one of these jobs.

Name.....

Address..... Vet?.....

The New MOTOR TUNE-UP MANUAL

Gives you ALL the informa-
tion you need in order to
understand THOROUGHLY
the modern automobile en-
gine and how to keep it in
top running order.



ALL principles as well as
detailed practical instruction

ONLY \$5.50

Explains all electrical and engine prin-
ciples; the function of EVERY part in
batteries, ignition system, distributor,
spark plugs, fuel and accelerator pumps,
carburetor, choke system, valves, power
jet, bearings, manifold, cooling system,
starter motor, generator, voltage regu-
lator, etc. Shows step by step how to
test each part, make sure meter readings
are accurate, locate all types of trouble,
make all adjustments. Full information
on fuels included.

Handy lists of
trouble symptoms
and all possible
causes.

Complete summa-
ries of each step
in all tune-up jobs.

190 diag., il.

SEE IT ON APPROVAL

The Macmillan Co., 60 Fifth Ave., New York 11

Please send me Motor Tune-Up Manual on approval. I
will either remit \$5.50 or return the book in 10 days.

Signed.....

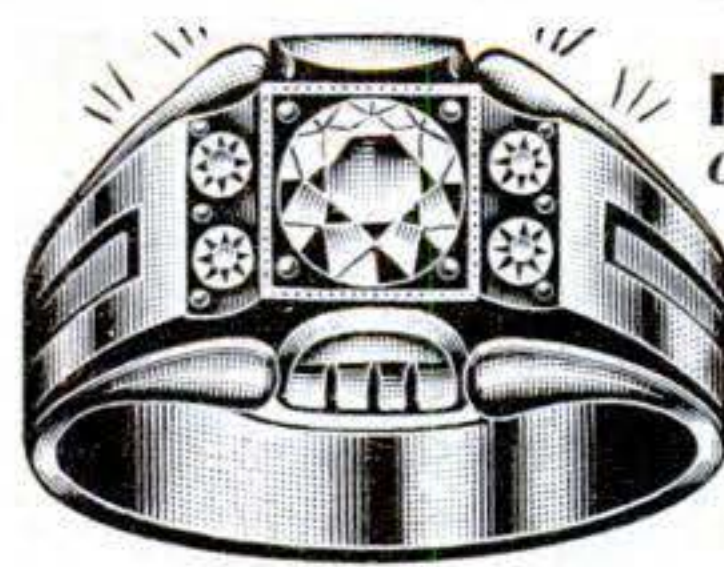
Address.....

P

Command Bigger Money! STUDY LAW

STUDY AT HOME for BUSINESS SUCCESS and
LARGER PERSONAL EARNINGS. 40 years expert
instruction—over 114,000 students enrolled. LL.B
Degree awarded. All text material furnished. Easy
payment plan. Send now for FREE BOOK—"Law and
Executive Guidance." It explains the course—how
you may enroll and the many ways you may profit
from Law Study. Write TODAY to: (G I Approved)

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 19-PS, 646 N. Michigan Ave., Chicago 11, Ill.



Imported Simulated
MEN'S DIAMOND
COPY OF \$500 ORIGINAL
WEAR 10 DAYS **\$265**
AT OUR RISK PLUS TAX
SEND NO MONEY

Pay postman \$2.65 plus 20% Tax
and a few cents postage.

Send string or paper for size.
Your Choice of Massive 14K or
12K Yellow Gold Finish Mounting
Center & White Sides or Flashy solitaire with no side stones. 10 Day
Money Back Guarantee.

GRAND JEWELRY COMPANY
1135 — 24th Street Dept. P Des Moines 11, Iowa

MONEY for MEN ALL FREE

THE PLASTEX Industry needs manufacturers on small
scale and for big production of Lamp and Clock Stands.
Art Goods and Novelties in Plastex and Marble imita-
tion. Experience unnecessary. 1/2c material makes regu-
lar 10c store sellers. Rubber moulds furnished for
speed production. Small investment brings good re-
turns. Big chain store orders now being placed. Ambit-
ious men have chance for real prosperity. Our Free
booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 50, N. Y.

COMMERCIAL TRADES' GRADUATES GET

THE BETTER JOBS because they are PROPERLY TRAINED!

Practical Shop Training in
Air Conditioning—Refrigeration
and/or
Electricity Major Appliances
Service, Maintenance & Installation
Write for Catalog PS4

COMMERCIAL TRADES INSTITUTE

200 South 20th St. Birmingham, Ala.
Member: Southern Association of Private Trade Schools
An approved school to TRAIN Veterans & Non-Veterans

LEARN TO WRITE

The Magazine Institute, a private school owned, operated, and
staffed by successful writers and editors, offers an up-to-the-
minute course in writing for magazines which makes it easy for
beginners to get started in this rich field. You work in spare time
at home. You may concentrate on either fiction or non-fiction.
Send today for the FREE CATALOG describing the Magazine
Institute method. VETERANS: THIS COURSE APPROVED FOR
VETERANS' TRAINING.

The Magazine Institute, Inc.
Dept. 4610-A, 50 Rockefeller Plaza,
Rockefeller Center, New York 20, N. Y.

Please send free catalog, without obligation, to:

Name.....

Address.....

Check here if eligible under G. I. Bill
(Inquiries confidential. No salesman will call)

NEW for 1950

MIDWEST

Celebrates its 30th YEAR of FACTORY-TO-YOU Selling with a Sensationally NEW 1950 LINE of

TELEVISION

CONSOLES and Complete CHASSIS

New GIANT 16" PICTURE TUBE

Here is Television at its finest! . . . brought to you by Midwest, for 30 years a leader in the field of radio and electronics. Immense 151-square-inch screen on new 16" metal-glass tube . . . clear, steady, bright pictures . . . Synchronized sound and picture that a child can tune in perfectly . . . Highest quality FM sound . . . Big 12" Electro-Dynamic Panasonic Speaker. Available in beautiful Consoles or in complete chassis as illustrated (not a kit, but a complete Television receiver ready to plug in and play) to place in your own cabinet. And you can buy Midwest Television at Low Factory Prices, with Low Down Payment and Long Easy Terms — and on 30 Days Trial!



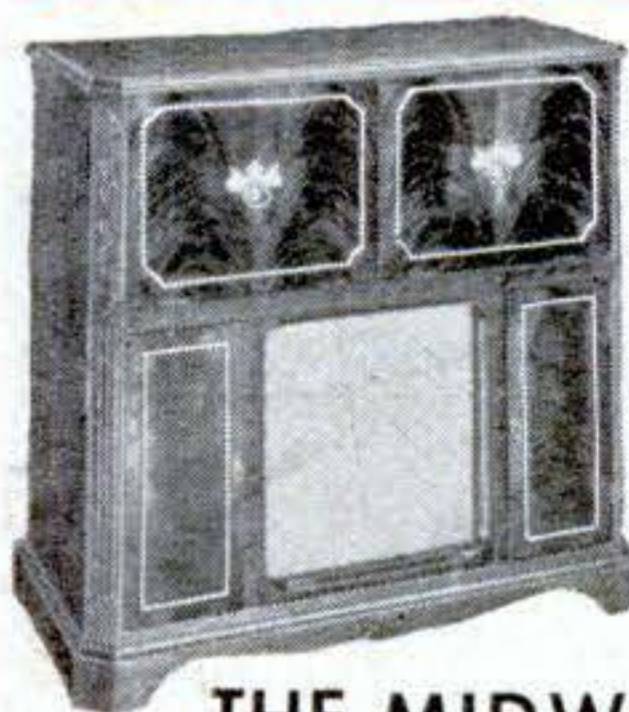
NEW LOW
Down Payment
Long EASY TERMS



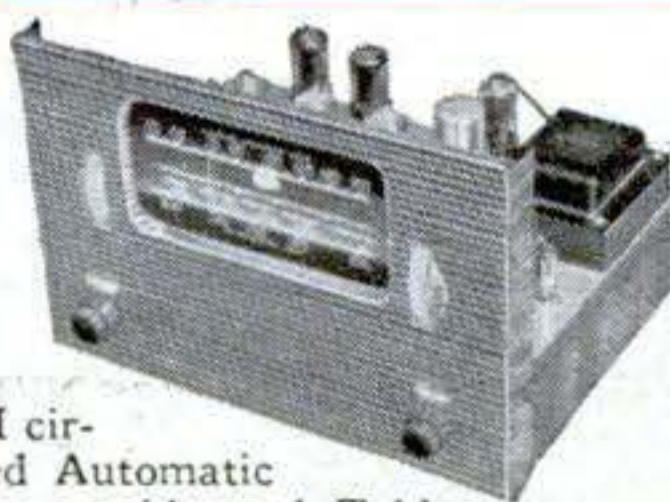
LOW
FACTORY-TO-YOU PRICE
30 DAYS TRIAL

Not a KIT... This is a Completely assembled Receiver

... also a Magnificent Line of NEW 1950 **MIDWEST RADIOS** featuring the latest Improved FM Circuit and the New 3-SPEED RECORD PLAYER



Powerful new 1950 Series 16 and Series 12 AM-FM Radio in complete chassis. Also beautiful new Console models including the magnificent Symphony Grand Radio-Phonograph with latest FM circuit and new 3-Speed Automatic Record Player. New portable and Table Models also available.



BUY DIRECT FROM THE MIDWEST FACTORY and SAVE!

MIDWEST RADIO & TELEVISION CORP.

Dept. X243, 909 Broadway, Cincinnati 2, Ohio

SEND FOR **FREE** 32-Page Full Color CATALOG



Write in Name and Address (Please Print) on Coupon or 1c Postcard.

MIDWEST RADIO & TELEVISION CORP.
Dept. X243, 909 Broadway, Cincinnati 2, Ohio

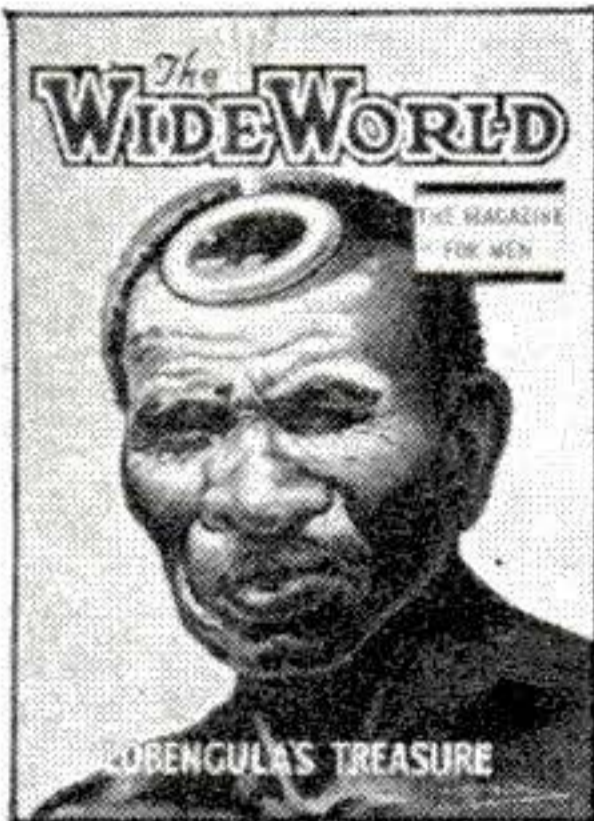
Please send me your new FREE 1950 Catalog.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

PASSPORT TO ADVENTURE

Let the **WIDE WORLD MAGAZINE** take you every month on a voyage of breathtaking adventure to many strange ports. This unique British publication is famous for its presentation of the world's most exciting experiences from true life. Men who live dangerously in far-off corners of the earth relate their own spellbinding stories, packed with action and vividly illustrated. Every narrative told as it actually happened; every page a thrill.

Join the World-wide Brotherhood of the **WIDE WORLD**. Send Coupon below **NOW!**

CLIP AND MAIL

Send only \$3 (reduced rate) to George Newnes Ltd., U.S. Subscription Office (W.W.67), 342 Madison Avenue, New York 17, N.Y. for 12 consecutive monthly issues sent direct to your address from London. Two Years \$5.75 (normal rate \$7).

Name

Address

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

INVENTORS

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

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

PATRICK D. BEAVERS
(Formerly **RANDOLPH & BEAVERS**)
Registered Patent Attorney

937 Columbian Building, Washington 1, D. C.

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

Please send me full information on how to secure Patents & Trademark Registration.

Name.....

Street.....

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

NATION'S LARGEST EXCLUSIVE ELECTRICAL SCHOOL

"LEARN-BY-DOING" ELECTRICITY

PRACTICAL TRAINING NOT "HOME STUDY"

G.I. APPROVED Get actual experience in great shops of M.T.I. Learn all phases Practical Electricity; Housewiring, Motors, Const., Maintenance, etc. Living arrangements, Part-time jobs, etc. A post card brings the story.
MICHIGAN TECHNICAL INSTITUTE, Dept. PS-10
2281 W. Fort St., Detroit 16, Michigan

PATENTS PATENT LAWYER

TRADE MARKS
GUSTAVE MILLER
69-PS WARNER BLDG.
WASHINGTON 4, D. C.

ASSOCIATE EXAMINER
U. S. PATENT OFFICE 1922-1929
REGISTERED PATENT ATTORNEY
Send for Form
"INVENTOR'S RECORD"

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH

Registered Patent Attorney

205 Columbian Building Washington 1, D. C.

HIGHEST ROYALTIES and CASH

FOR YOUR INVENTIONS

Write for FREE booklet without obligation

UNIVERSAL MARKETING CO.

354 S. Spring St. (Suite C)

Los Angeles 13, Calif.

HELP FOR INVENTORS

Hundreds of manufacturers have requested our assistance in locating marketable new products.

Complete information, free.

INSTITUTE of AMERICAN INVENTORS

Dept. 3, 1926 Eye St. N.W., Washington 6, D. C.



PATENTS AND TRADE MARKS

C.A. SNOW & CO.

REGISTERED PATENT ATTORNEYS

WRITE FOR INFORMATION TO

246 SNOW BUILDING, WASHINGTON 1, D. C.



INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION, You should take steps to protect it by a U. S. Patent. Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

Woolworth Bldg., 35th Floor, Dept. 109-C, New York City
Please send me "Record of Invention" form.

NAME.....

ADDRESS.....

MAKE YOUR OWN!

WITH

Griffin READCUT LEATHER PROJECTS

Over 100 KITS in every kind of Tooling and Carving Leather, accurately cut, all parts included. Only Top Grade Leathers used. You do the choosing. You do the tooling, carving, stamping, the punching and assembling.



SEND FOR COMPLETE CATALOG Please send 10c to cover mailing.

SINCE 1924

OUT OF THE WEST, THE HOME OF LEATHER CARVING

Griffin Craft Supplies

5515-B GROVE STREET OAKLAND 9, CALIFORNIA

EVERYTHING FOR THE LEATHER WORKER

Largest, most complete stock of *Leathercraft Tools and Accessories* in U.S.A.



HIDES AND SKINS of Craft Leathers of every kind if you prefer to cut your own.



FREE TO HOME PLANNERS

"Little Blue Booklet" of 29 popular plans sent FREE to acquaint you with our MONEY SAVING home planning service which includes 1200 Tested Designs; beautifully illustrated plan books; working drawings; material lists; specifications—all at LOW COST. Write today for FREE BLUE BOOKLET and complete information. America's pioneer residential plan service.

Small Homes Plan Book—68 beautiful designs. **\$1.00**
Budget Homes Plan Book—78 economy plans for 1 and 2 story homes. **BOTH BOOKS FOR \$1.00**

L. F. GARLINGHOUSE CO., Inc. Box PS, Topeka, Kans.

FIX HOLES, Rusted SECTIONS on CAR and FENDERS with Amazing FABRIC-METAL PATCH



Easy, quick, inexpensive. Simply dip patch in solvent, apply to any metal—quickly hardens into toughness of steel. Cover with Auto Solder, then sand smooth. No skill, heat or tools needed. Satisfaction guaranteed. Large, complete Crosby Kit—enough to repair car, and other metal articles. Directions included. Postpaid only..... **\$4.95**

CROSBY PRODUCTS CO., 1531 Hamilton, Cleveland 14, Ohio

LAW FREE BOOK



Your FREE copy of "The Law-Trained Man" shows how to gain prestige and greater earnings through Blackstone home law study. All instruction material furnished including 18-volume Law Library written by 65 well-known law authorities. Lawyers, judges among our graduates. LL.B. degree. Low cost; easy terms. Write today.

BLACKSTONE COLLEGE OF LAW 225 N. Michigan Ave. Dept. 127, Chicago 1, Ill.

A Correspondence Institution Founded in 1890



FREE parts catalog

Build Better Trailers with Safety-Engineered

- ★ Torq-less Axles
- ★ Bull Dog Hitches
- ★ Parking Jacks

... Send for your copy TODAY!



HAMMER BLOW TOOL CO.

Dept. D-36 Wausau, Wisconsin

PLASTICS

EVERYTHING YOU NEED UNDER ONE ROOF!

SPEEDEE-BUFF

A liquid hand compound—contains abrasives.
4 oz. . . . \$0.60 1 pt. . . . \$1.75

PL-1 PLEXIGLAS—LUCITE CEMENT

Apply with brush, eye dropper or hypodermic needle. 30-second action. Permanent bond, no discoloration.
2 oz. \$0.35
1 pt. 1.50
1 gal. 5.10

CLARO-CAST

A clear liquid casting plastic for imbedding insects, flowers, coins, etc. Tops for casting novelties.



1 pt. \$1.95
1 qt. . . . \$3.75 1 gal. . . \$16.00
Instruction book—\$0.20

PLIA-FLEX

A flexible liquid, air-dry mold material. Ideal for plastic molds. Price, 4 oz. \$.75; pt. \$1.95; qt. \$3.60; gal. \$8.50.

INTERNAL PLASTICS CARVING DRILLS

Special precision, machine made, tapered drills ground to perfect points, sharp cutting edges.

DIAMETER	EACH	DOZEN
1/16"	\$0.95	\$10.45
3/32"95	10.45
1/8"	1.00	11.00

CUTTERS Selected small cutters, precision made for detailed carving.

SHANK	EACH	DOZEN
3/32" Round. Plain	\$0.30	\$3.00
3/32" Flame60	6.00

HANDEE TOOL
Our best recommendation for a carving tool. 25,000 rpm—Easy to handle, built to withstand carving usage. Complete with 7 accessories (not drills) **\$20.50**

CRYST-L-CRAZE
Newest decorative coating. Easily applied by brush. Gives beautiful crystallized pattern—White or colors—to plastics, glass, copper and ceramics. Tops for "Jack Frost" Christmas decorations.
2 oz. \$0.45
1 pt. 1.75
1 qt. 3.10
1 gal. 10.90



DYE Deep, rich colors blend beautifully, drop-per cap. Red, Old Rose, Fuchsia, Yellow, Green, Blue, Orchid, Black, Brown, Fluorescent Red. 1 oz. 30c; 4 oz. \$1.00; pt. \$2.75; gal. \$8.75.



BACKING MATERIAL FOR CARVED PIECES

Jet black and solid or translucent white. Plexiglas or Lucite 1/16" thick.

3" x 6" each \$0.22
12" x 12" each 1.69

FILL-IN POWDER
Fills cavity before coloring. Seals cavity before backing. 2 oz. . . . \$0.50 8 oz. . . \$1.75

"Internal Carving in Plastics" Complete course of instructions by an expert, H. A. Zoback. **Only \$1.50**

PRACTICE BLOCKS
Plexiglas and Lucite. Special price—\$1.00 lb.
5 lb. . . \$4.75 10 lb. . . \$9.00

PROJECT BLOCKS
Lucite and Plexiglas, polished 2 sides only.

THICKNESS	SIZE	PRICE
3/8"	1" x 1"	\$0.08
1/2"	2" x 2"	.26
1"	1" x 1"	.14
1 1/2"	1 1/2" x 1 1/2"	.45
2"	2" x 2"	.80
3"	3" x 3"	2.15

JEWELRY FINDINGS

LAR WIRE
Dozen \$0.35
Gross \$3.75

FIN BACK SAFETY CATCH
Safety catch—with holes or prongs. Size 3/4" and 1".
Dozen \$0.35
Gross 3.75

SCREW EYE
Dozen \$0.30
Gross 3.10

FORNELL SWIVEL
(For Desk Set)
Funnel-Swivel
Each \$0.60
Dozen 6.00
Pen
Each \$0.55
Dozen 5.50

METALLIC ACETATE

Colors: gold, silver, red, blue, green, fuchsia, lime.

aquamarine, chartreuse, iris, orchid, black, rose pink, pink, purple, white, bronze, ice blue, multi-color.

Newest thing in plastics craft material. Make costume jewelry, flowers, book covers, etc.

Sheets 10" x 25" \$0.85
20" x 50" \$3.00

POP PLASTIC KNOW-HOW

Latest book by Cherry. Recommended for all-round "how-to-do-it." **\$1.50**

PLASTIC JEWELRY BOX

Size 3 1/2" x 3 3/4" x 1 1/4". Modern style jewelry boxes add richness, charm to any merchandise. Each . . . \$0.15 Dozen . . . \$1.50



COMPLETE CATALOG FREE! A catalog of plastics supplies for the hobbyist. Everything in plastics under one roof—at prices you can afford. GET YOURS NOW!

Send check or money order. Add 15% of order to cover postage. (Any postage overpayment will be refunded.) Send 25¢ deposit with C.O.D. orders.

FRY PLASTICS CO.—Dept. 20
7612 So. Vermont—Los Angeles 44, Calif.

INTERESTING ARTICLE ON INTERNAL PLASTICS CARVING—SEE PAGES 185, 186 & 187 SEPT. '49 POPULAR SCIENCE



AUTO

BOOKS ON APPROVAL



CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES
Over 2700 pages, 2000 illustrations, wiring diagrams, etc. Beautiful modernistic, washable cloth binding.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

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

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Publishers Since 1898

AMERICAN TECHNICAL SOCIETY, Dept. A 7-20
Drexel Ave. at 58th St., Chicago 37, Ill.

I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you \$2 and pay the balance at the rate of only \$3 a month until \$24.80 has been paid. Include consulting service as offered above.

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

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

MEN! WOMEN!

There's a Well Paying Job Awaiting You in Aviation

Assure your future with a well paying job. Prepare yourself for a well paying career in the rapidly expanding Aviation Industry through training at Brayton—specialists in co-educational aviation training. The aviation industry recognizes the superiority of Brayton graduates. The demand for trained men and women exceeds the supply.

FOUR COURSES AT BRAYTON TO FIT YOUR NEEDS

Airplane & Engine Mechanics Course... 54-week course. Prepares you for your A & E certificate and qualifies you as a mechanic in the constantly expanding field of Aviation.

Base Operators & Maintenance Course... Prepares you for a career as a flying mechanic—trouble shooter—a flying salesman for a manufacturer of parts—or to operate a base. Flight training begins immediately.

Aeronautical Engineering... Upon successful completion of this course, you will be fully prepared to begin a promising and eventful career in Aeronautical Engineering. Flight training begins immediately.

Comprehensive Flight Courses... Practically any type of flight training is available—Private Pilot; Commercial Pilot; Instrument Flight; Multi-Engine; Flight Instructor; Airline Transport Pilot.

Aeronautical Training Division... Co-Educational

BRAYTON FLYING SERVICE, Inc.

10P Lambert-St. Louis Airport, St. Louis 21, Missouri

START NOW! The Aviation Industry Needs You

Send for FREE Catalog

AERONAUTICAL TRAINING DIVISION
Brayton Flying Service, Inc., Dept. xx
10P Lambert-St. Louis Airport, St. Louis 21, Missouri

Yes, I am interested in Aviation as a career. Send me your illustrated catalog of available courses. I am particularly interested in:

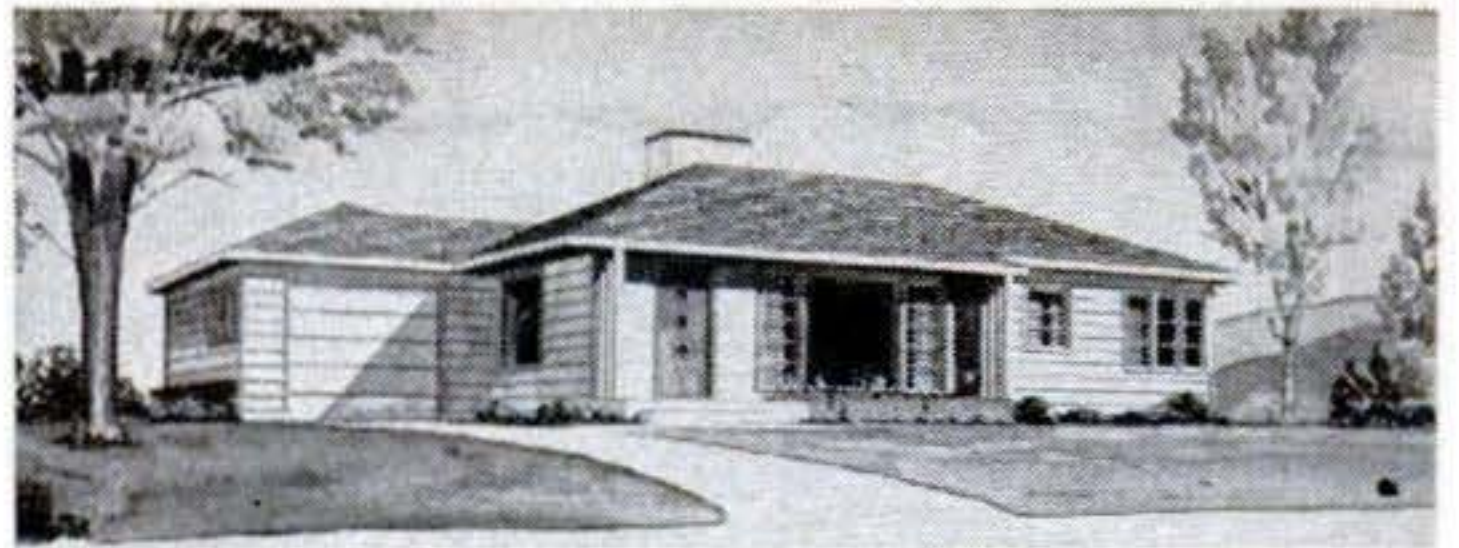
- A & E Mechanics Course Aeronautical Engineering
 Base Operators & Maintenance Course Flight Training

Name.....

Address.....

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

My Age..... Male..... Female..... I am..... am not..... a veteran.



SEND FOR NEW HOME PLAN BOOKS Concrete Block Homes \$1, Wood Frame \$1

Two brand new editions, one of frame homes, one of concrete block homes. Both chock-full of the latest plans for modern living, including starter and garage homes, small homes, three bedroom homes, western ranch homes, modern designs, Cape Cods. Best of all you can order complete blue prints and specifications at low additional cost for any plan in either book. Order frame book \$1 or block book \$1 or both \$2. No C.O.D.

HOME BUILDING PLAN SERVICE

2454-P N. E. SANDY

PORTLAND 12, OREGON



Save Fingers

with

Steel-Grip Finger Guards

Hundreds of factories save time and injuries and speed production by protecting workers with Steel-Grip Finger Guards. Used for handling rough or sharp articles, for buffing, grinding, sanding, polishing, punch press work and hundreds of other jobs. Protect fingers or thumb, front or back, from cuts, abrasions or blisters. Made of durable leather with elastic web back for snug, cool, comfortable fit. Easy on and off. One size fits all, men or women. Send 10c each for samples or trial order box of 50 at \$4.50 less 10%.

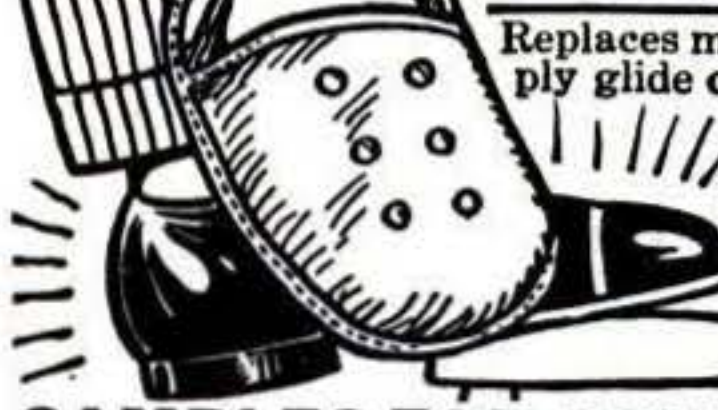
Catalog of Steel-Grip Safety Apparel free on request

INDUSTRIAL GLOVES CO.
1427 Garfield, Danville, Illinois
(In Canada: Safety Supply Co., Toronto)

Famous Industrial Safeguards Since 1910

SHINE WITHOUT 'POLISH'

New Invention! • Sells Like Wild

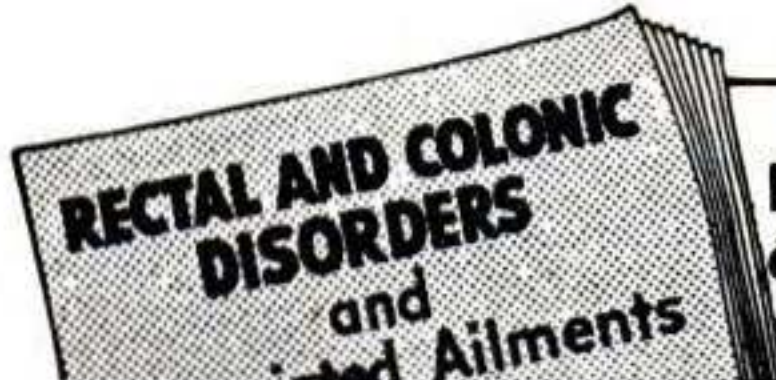


Replaces messy pastes, liquids. Simply glide over shoes—and PRESTO!—you have a lustrous, long-lasting shine. No mess. No muss. No soiled hands. Clean. Handy. WORKS LIKE MAGIC! For Men's, Women's and Children's Shoes. Low priced. Lightning seller!

SAMPLES FOR AGENTS Sample offer sent immediately to all who send name at once. A penny postal will do. SEND NO MONEY—just your name. KRISTEE CO., 729 Bar Street, AKRON, OHIO.

Don't Neglect Piles and Colon Troubles

**FREE BOOK—Explains Dangers of
Associated Ailments**



**Avoid
Dangers
of Delay**

Neglected piles, fistula and colon troubles often spread infection. Learn about rheumatic and other associated chronic conditions. Write today for 160-page FREE BOOK. McCleary Clinic & Hospital, 1071 Elms Blvd., Excelsior Springs, Mo.

locksmithing and key making

Practical Up-To-Date Course
Only \$3.95 Complete
 Teaches you **PROFESSIONAL** "secrets." How to pick locks, de-code, make master-keys, install and service key systems, etc. Step-by-step detailed instructions explain and illustrate every operation. **53 EASY ILLUSTRATED LESSONS**
 Plain easy-to-follow self-instruction course. Money-making information for carpenters, mechanics, hardware dealers, gunsmiths, cycle shops, fix-it shops, service stations, maintenance men, every home owner and handyman. **Satisfaction Guaranteed or Your Money Back**
 Fill in the No-Risk Coupon at bottom of this page. Check "Locksmithing Course" and mail coupon right away. You'll be mighty glad you did!

watch and clock repairing

LEARN AT HOME—
IN YOUR SPARE TIME
 Prepare NOW for a happy future of prosperity, security. Fascinating, high-grade occupation for men of almost any age or physical condition. You can earn while you learn. Very practical course in horology.
FULL PRICE—ONLY \$4.95
 How-to-do-it lessons for beginners as well as those already in the trade. Thorough self-instruction training in the fundamentals of American and Swiss watches, clocks. Contains wealth of helpful photos, drawings, diagrams, charts, etc. Only \$4.95 for everything complete. Satisfaction or refund guaranteed. Check "Watch & Clock Repairing" in coupon at bottom of page and mail coupon today.

practical RADIO servicing

SELF-INSTRUCTION COURSE
ONLY \$3.95 POSTPAID
 Complete series of lessons in one big volume... teaches you the practical side of radio: repair, adjustment, operation, alteration, troubleshooting. No previous knowledge necessary to master these fundamentals.
STEP-BY-STEP ILLUSTRATIONS
 Prepare to set up a shop of your own or train for the big industrial electronic field. Simplified lessons including mathematics, review questions, problems, answers. Up-to-date! Only \$3.95 complete. Money-back guarantee. Check "Practical Radio Servicing" in coupon at bottom of page and mail at once.

REAL ESTATE BUSINESS

The foundation of all wealth is land! Train yourself for a career in this booming profession. Here is the basic information you need on how to get started and how to get ahead in real estate.
FULL PRICE, ONLY \$6.95 Postpaid
 (Money-making information) Includes instructions in appraisals, valuations, management, investments, practical real estate operating, etc., salesmanship, and many other subjects a successful real estate man must know. Strictly up-to-date. Complete, only \$6.95. Money-back guarantee. Use No-Risk Coupon below.

REFRIGERATION

Just out! Non-technical instructions, up-to-date and authoritative. Latest information on servicing and engineering covering the whole field of PRACTICAL refrigeration, both electrical and absorption. Teaches you the newest methods of repair and servicing of household and commercial cooling units. Explains by means of specially drawn illustrations and easy step-by-step detailed descriptions.
ONLY \$4.95 COMPLETE
 Includes fundamentals for beginners, plus advanced tricks-of-the-trade for experienced servicemen. Every man who uses refrigeration in his work—every family man who has a refrigerator in his kitchen should get these lessons now to make money, to save money and to increase his satisfaction or refund guaranteed. Only \$4.95, postpaid. Check "Refrigeration" in the coupon below.

INSURANCE BUSINESS

How to make money selling life insurance. Virtually a self-training course on how to get started in this profitable profession, how to get prospects to buy NOW, plus practical instructions on nearly every other important phase of life insurance business! Actual examples given throughout—no generalized discussions. All business-tack money-making facts you can turn into quick cash. Full price only \$6.95. Mail No-Risk Coupon below.

APARTMENT HOUSE MANAGEMENT

Wonderful field for ambitious men and women, especially those over 40. Experienced managers have steady work, good pay and SECURITY. Satisfaction or money-back guarantee. Complete, only \$3.95. Mail coupon below today.

WRITING FOR MONEY COURSE

Specific, practical instruction on how to get frequent checks for \$5, \$10 and more writing short stories, fillers, etc., for magazines, newspapers. Complete in 7 volumes, including Where and How to Sell Manuscripts. Full price only \$5.95.

Better English

Daily YOU are being judged by the language you use. Your other abilities, however great, are generally discounted if your English is faulty. So don't let your shaky English hold you back in business or social life. Improve your speech and writing by studying these interesting, PRACTICAL lessons. Teaches you how to increase your vocabulary—learn new words and use them right. How to spell and pronounce correctly. Secrets of good letter writing and entertaining conversation. **FULL PRICE ONLY \$2.95**. Simply check "BETTER ENGLISH" in the coupon below. Satisfaction or refund guaranteed.

FREE! "HOW TO GET ALONG IN THIS WORLD"

Boiled-down tips on SUCCESS! Here, gathered together for the first time, are 5,000 gems of worldly wisdom on how to live joyously, successfully... how to handle people, make money, be happy. Written out of actual experience by the best brains of mankind... during the past four thousand years! To-the-point, workable instructions on the practical art of getting ahead. Included are lessons on HOW TO USE these quotations in your daily life.

10 DAY TRIAL OFFER

PICK YOUR OPPORTUNITY

How to Order. In coupon to the right check the courses you want us to send you. Print your name and full address clearly, then mail coupon right away. Send full payment with your order and we'll pay all postage charges—on C.O.D. shipments you pay charges.

BE A SUCCESS

THE AMAZING volume briefly described above (How to Get Along in This World) will be included in your shipment without any charge if your order calls for two or more of the items listed on this page. This wonderful text is yours to keep permanently, even should you send back for refund the courses you order. We reserve the right to withdraw this offer when our present limited stock is gone. Don't lose out—mail coupon today!

Satisfaction Guaranteed or Your Money Back
NELSON-HALL COMPANY (Established 1909)
 1139 South Wabash Ave., Dept. K-1, Chicago 5, Ill.

Short-Cut Mathematics

COMBINED WITH
Practical Mechanics Simplified
COMPLETE COURSE—ONLY \$1.49
 Be a "master mind." Learn how to juggle figures, do balling tricks with numbers. Add long columns of figures this lightning-quick short-cut way. Multiply 4 figures by 4 figures without using old-fashioned multiplication. Here are, speedily, simplified systems used by stage "wizards," expert accountants, engineers, etc. This amazing course includes illustrations, worked-out problems, answers, etc.
SEND NO MONEY. Just send name and address on coupon at bottom of this page. When course arrives pay postman only \$1.49, plus C.O.D. postage. Or send \$1.49 with your order and we ship postpaid. If not amazed with this sensational course just return it for full immediate refund. Mail coupon below today! "Short-Cut Mathematics."

BUILD IT YOURSELF

Be a practical handyman. Save time and money using these professional Tricks-of-the-Trade. Carpentry now made easy! NEW self-instruction course in one handy volume, complete with full-page photographs, diagrams, etc. Teaches practical wood-working, painting & decorating, upholstering, power tools, cabinet making, etc., etc. **COMPLETE PRICE ONLY \$1.98**. Money-back guarantee. Check "Build It Yourself" in the coupon below and mail today!

COMPLETE PRACTICAL BLUEPRINT READING COURSE

Interesting, simplified self-instruction lessons for builders, mechanics, electricians, plumbers, welders, carpenters, automotive & aviation workers, etc.
FULL PRICE ONLY \$6.95
 24 volumes, complete. Includes over 600 actual blueprints, diagrams, and other instructive step-by-step pictures. Unusual bargain. Satisfaction or refund guaranteed. In coupon below check "Blueprint Reading Course."

PHYSICAL THERAPY

COMPLETE PRICE ONLY \$4.95
 Up-to-date illustrated instructions on the new methods in drugless healing. Surveys the broad field including sections on massage, hydrotherapy, electrotherapy, light and heat treatments, mechanotherapy, etc. Additional material covers the Kenny system on poliomyelitis. This one-volume treatise is entitled "The Practice of Physical Medicine." Check "Physical Therapy" in coupon at bottom of this page and mail at once for prompt shipment. Satisfaction or refund guaranteed!

Artie McGovern's GYMNASIUM COURSE IN PHYSICAL CULTURE

You've got to keep fit to get the most out of life. You can't get ahead dragging around a half-dead, listless body. Success DEMANDS energy! And McGovern knows how to bring it to you.
 1. HE-MAN BUILD!
 2. SMASHING STRENGTH!
 3. PEP AND ENERGY!
 No gadgets required—no equipment of any kind. All natural methods in this revolutionary self-instruction course. These lively lessons are designed to strengthen vital organs, the author claims, and increase personal efficiency and muscular development. If you achieve glowing good health, he says, it may bring you a NEW POWER to resist some diseases: colds, indigestion, headache, fatigue, nervousness, worry, irritability, insomnia, constipation and many other common ailments. Consists of 12 complete weekly lessons, each with a working chart, guide to health, etc. Thoroughly illustrated for home study.
COMPLETE PRICE ONLY \$4.95, includes everything. Satisfaction guaranteed or your money back! Check "Physical Culture Course" in coupon below and mail coupon today, while limited stock lasts.

HOW TO RUN A FARM

Of course you can learn from experience but why wear yourself down and squander several years finding out the hard way. Illustrated instructions on "Fundamentals of Farming and Farm Life" cover: poultry, livestock, soil, implements, crops, gardens, trees, milk products, etc. Only \$2.69.

COMPLETE SHORTHAND COURSE

Full 12-lesson self-study course in standard system used by thousands of lightning-quick male court reporters and expert stenographers. 5 times faster than writing longhand! Complete outfit for self-instruction only \$4.95.

PRACTICAL ACCOUNTING

For men who want to follow accountancy as a profession and for managers and owners who want to increase their business profits. "Principles of Accounting" covers whole subject and includes hundreds of sample forms, problems, solutions, etc. Full price, only \$4.95, complete.

HOW TO SING FOR MONEY

Teaches you the art and business of singing popular songs professionally. Written by ASCAP-member Charles Henderson, one of Hollywood's top-flight vocal coaches—who works with such stars as Bing Crosby, Deanna Durbin, Dinah Shore, etc.

SHORT-CUT TO SINGING SUCCESS!

Learn how to make the most of what you've got. Revealed for you here are the trade secrets of effective auditioning, successful applause endings, developing your voice, diction, tempo, microphone technique, publicity for the beginner, singing with dance bands, etc. Recommended by Kenny Baker, Frances Langford, Deanna Taylor, Fred Waring and scores of others. Now is your chance to make room for yourself at the top!
EVERYTHING COMPLETE, ONLY \$5.95. Satisfaction guaranteed or your deposit refunded in full. Mark coupon below: "Sing For Money."

Eugene Feuchtinger's Hints on VOICE DEVELOPMENT

Basic exercises designed to STRENGTHEN your vocal organs and IMPROVE your voice. These new self-instruction lessons include the most important parts from the world-famed voice course put out by the Perfect Voice Institute. **FULL PRICE, ONLY \$1.49**. In coupon below simply check "Voice Development" and mail coupon at once. Money-back guarantee!

Learn HYPNOTIZE!

Develop your personal POWER
 Now... revealed for you... are the secrets of practical hypnotism... that strange, compelling force by which an expert operator can bring others under his power. He can sway people at will—issue commands and be obeyed—virtually cast a spell over his subjects. This sensational knowledge may make YOU a more dominant, more masterful personality. Get this

Illustrated SELF-Instruction COURSE in Useful Hypnotism

Amazing lessons in simple, easy-to-understand language. How to select a subject—how to hypnotize by telephone—how to make money from hypnotism—mental telepathy—stage hypnotism—self hypnosis—conquer inferiority complex, timidity, etc. Clear helpful pictures show operating positions, movements. A startling low price. Satisfaction guaranteed or your money back. Simply **Send No Money!** pay postman \$1.95 plus COD postage—or send \$1.95 and we pay postage; same money-back guarantee. Order "Hypnotism Course" today! Use order blank at bottom of this page right away.

Awaken Your Hidden Powers!

YOU are a sleeping giant... learn how to release your unused forces. Now ready—PRACTICAL READING COURSE IN EVERYDAY PSYCHOLOGY. Teaches you self-mastery, influencing others, getting ahead, etc. Written by 34 renowned psychologists. Low price. **COMPLETE ONLY \$6.95**. Satisfaction or refund. Check "Mental Science" in coupon below.

SUPER JU JITSU

Now get tough double quick!
 Step up YOUR fighting power—learn lightning-quick AMERICAN SUPER JU JITSU. Develop your body... be dangerous! Big illustrated home-study course, reveals secrets on how to make deadly weapons of just your bare hands. Easy to learn; quick. Get these sensational lessons right away—you owe it to yourself and loved ones. **COMPLETE PRICE ONLY \$4.95**, nothing more to pay. Your money back if not amazed! Check "Super Ju Jitsu" in coupon at bottom of this page and complete course will be rushed out to you AT ONCE.

SWEDISH BODY MASSAGE

A Dignified Profitable Profession
 At home, at low cost, you can learn the elements of Swedish Massage and Hydrotherapy. Many qualified men and women earn fine salaries in private clubs, institutions, hospitals, sanatoriums, etc. Some go into business for themselves practicing either full time or spare time and make good money. These easy-to-understand instructions are strictly practical and up-to-date. Teaches anatomy, physiology, detailed procedure for a complete body massage, approved exercises, etc. Also includes business information on how to build a steady practice of your own. Excellently illustrated throughout; step-by-step explanations with diagrams. Complete, only \$6.95 postpaid. Money-back guarantee. Check "Swedish Body Massage" and mail coupon at bottom of this page TODAY!

JEWELERS & WATCHMAKERS CYCLOPEDIA

Packed with trade secrets, manufacturing processes, little-known formulas, etc., for opticians, stone setters, engravers, case makers, horologists, photographers and others. 1001 money-making ideas for the practical man!
 Only \$1.69.
HOW TO BUY & SELL OLD GOLD, ETC.
 A new-to-the-point Technical Bulletin to teach you how to make money dealing in precious metals—broken jewelry, old gold, silver, platinum, etc. Enormous opportunities for those with experience. Only \$1.00.

CIVIL SERVICE GOV'T JOBS

Looking for a government job? (Federal, State, City). Or a job with some big industrial or business organization? Or work in an institution? Then you NEED this complete "Practice Tests for All Jobs." Explains in detail how intelligence tests and aptitude tests are given—how they are used for hiring, classifying, assigning and promoting—and how they should be handled for best results. Shows you what the tests are like, gives you a very definite idea of the kind of questions you will be asked, tells you what you have to know, how to get a top mark. Contains practice materials, study outlines, sample tests, etc. For anyone interested in mental self-improvement! Full price only \$3.95. Check "Civil Service" on No-Risk Coupon below. Satisfaction or refund guaranteed.

How to be a BARTENDER

Professional information for the liquor trade and man-about-town. Details on mixing and serving 300 most popular drinks. Practical instruction for working behind the bar. How to handle and use spirits, wines, beers. Trade secrets on the care of bottles, glassware, mirrors, utensils. How to make syrups, bottle in bulk, prepare fruit. Excellent illustrations. Also includes appropriate toasts for good fellows. **COMPLETE, ONLY \$1.49**. Satisfaction guaranteed or refund. Check "Bartender" in coupon below.

MAIL THIS NO-RISK COUPON TODAY!

NELSON-HALL CO., 1139 S. Wabash Ave., Dept. K-1, Chicago 5, Ill.

Please rush me the practical courses I am checking below. I understand each is complete and this is the full price. I have the right to examine everything you send me for 10 full days. Then if I am not more than satisfied I will return the material and you guarantee to make complete immediate refund, without question or quibble.

- | | | |
|----------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| <input type="checkbox"/> Locksmithing Course.....\$3.95 | <input type="checkbox"/> Better English..... 2.95 | <input type="checkbox"/> Sing For Money..... 3.85 |
| <input type="checkbox"/> Watch & Clock Repairing..... 4.95 | <input type="checkbox"/> Short-Cut Mathematics..... 1.49 | <input type="checkbox"/> Voice Development... 1.49 |
| <input type="checkbox"/> Practical Radio Servicing..... 3.95 | <input type="checkbox"/> Build It Yourself... 1.98 | <input type="checkbox"/> Hypnotism Course... 1.95 |
| <input type="checkbox"/> Real Estate Business..... 6.95 | <input type="checkbox"/> Blueprint Reading Course..... 6.95 | <input type="checkbox"/> Mental Science... 6.95 |
| <input type="checkbox"/> Refrigeration..... 4.95 | <input type="checkbox"/> Physical Therapy... 4.95 | <input type="checkbox"/> Super Ju Jitsu..... 4.95 |
| <input type="checkbox"/> Insurance Business..... 6.95 | <input type="checkbox"/> Physical Culture..... 4.95 | <input type="checkbox"/> Swedish Body Massage..... 6.95 |
| <input type="checkbox"/> Apartment House Management..... 3.95 | <input type="checkbox"/> How to Run a Farm Course..... 4.98 | <input type="checkbox"/> Jewelers' Cyclopedia..... 1.69 |
| <input type="checkbox"/> Writing For Money Course..... 3.95 | <input type="checkbox"/> Complete Shorthand Course..... 4.95 | <input type="checkbox"/> Buy & Sell Old Gold, etc..... 1.00 |
| <input type="checkbox"/> Ship C.O.D. for \$..... plus postage. | <input type="checkbox"/> Practical Accounting..... 4.95 | <input type="checkbox"/> Civil Service..... 3.95 |

I enclose \$..... in full payment. Ship entirely postpaid.

NAME.....

ADDRESS.....

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

Check here if above order is for two or more items. In this case we send you, without extra charge, a copy of HOW TO GET ALONG IN THIS WORLD—big 160-page volume. This most unusual text is yours to keep, even if you return the courses after inspection. Mail this coupon NOW—this offer subject to cancellation when our present limited stock runs out.

YOU ARE IN DEMAND IF YOU CAN DRAW!



If you like to sketch, write for **FREE TALENT TEST**. Splendid opportunities for *trained* artists. Find out if you have talent worth developing.



ART INSTRUCTION, INC.
Dept. 10149-C Minneapolis 15, Minnesota

Send me your **FREE** Talent Test.

Name _____ Age _____
Address _____
City _____ Zone _____
County _____ State _____
Occupation _____ Phone _____

SURPLUS BARGAINS ASSEMBLE YOUR OWN BINOCULARS!

Complete Optics! Complete Metal Parts!
WE SUPPLY FULL INSTRUCTIONS

GOVERNMENT'S 7x50 BINOCULARS

Save More Than 1/2 Regular Cost

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock #842-N \$39.40
Postpaid, plus \$4.80 for Case,
Total \$44.20

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.

Stock #5102-N \$25.00 Postpaid
(These are standard American-made parts . . . not Japanese, French or German.)

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.
ARMY'S 6x30 BINOCULARS—We have complete Optics and Metal Parts. Write for Catalog N.

SLIDE PROJECTOR SETS—Consist of all unmounted lenses you need to make the following size projectors:

Stock #4038-N—2 1/4" x 2 1/4" \$3.35 Postpaid
Stock #4039-N—2 1/2" x 3 1/2" \$3.35 Postpaid
Stock #4035-N—35 mm. \$4.85 Postpaid

SIMPLE LENS KITS!—THE LENS CRAFTERS DELIGHT! Fun for adults! Fun for children! Kits include plainly written, illustrated booklet showing how you can build lots of optical items. Use these lenses in photography for copying, **ULTRA CLOSE-UP SHOTS**, Microphotography, for "Dummy Camera", Kodachrome Viewer, Detachable Reflex View Finder for 35 mm. cameras, Stereoscopic Viewer, ground glass and enlarging focusing aids. And for dozens of other uses in experimental optics, building **TELESCOPES**, low power Microscopes, etc.

Stock #2-N—10 lenses \$1.00 Postpaid
Stock #5-N—45 lenses \$5.00 Postpaid
Stock #10-N—80 lenses \$10.00 Postpaid

Order by Stock No. Satisfaction Guaranteed
Edmund Salvage Company BARRINGTON, NEW JERSEY

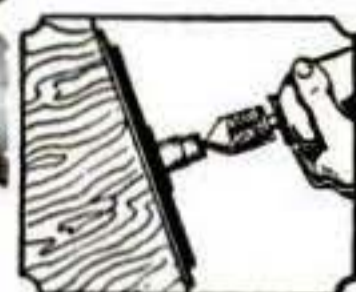
NOW! USE YOUR ELECTRIC DRILL for POLISHING! GRINDING! SANDING!

Work on curved
or flat
surfaces

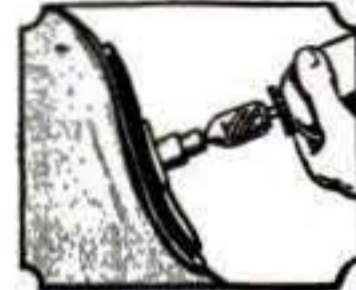
You can use it to
fix bodies, fenders;
wax; polish cars,
floors, linoleum;
refinish furniture,
wood, metal sur-
faces; smooth, re-
duce welds, etc.



Bends
To Take
Curved
Surfaces



On Flat Surface



On Curved Surface



Polishes

**FITS ANY 1/4 IN. CHUCK or DRILL,
FLEXIBLE SHAFT, MOTOR, etc.**

Designed and engineered for high speed sanding, polishing, finishing, etc. Full 6 1/2 inch rubber face plate bends into curved surface. New clamp arrangement mounts sanding discs instantly—no cementing. Draw-string lamb's wool bonnet slips on for high speed polishing, finishing, etc. Outfit includes 6 1/2" flexible rubber disc with 1/4" metal shank, fibre backed sanding disc and heavy lamb's wool polisher. Equals \$75.00 outfits in performance. You'll find hundreds of time saving uses for it. Fully guaranteed. Shp. wgt. 2 lbs. F.O.B. Chicago. Shipment in U.S.A. only.
6 1/2 in. heavy \$4.95 5 in. size for light \$2.49
duty type. Each hand drills. Each

At your favorite hardware store or direct.
PREHLER PROVED PRODUCTS

Division Norbert Prehler & Co.
1623-25 Milwaukee Ave. Dept. PS10 Chicago 47, Illinois

Free for Asthma

If you suffer with attacks of Asthma and choke and gasp for breath, if restful sleep is difficult because of the struggle to breathe, don't fail to send at once to the Frontier Asthma Company for a **FREE** trial of the **FRONTIER ASTHMA MEDICINE**, a preparation for temporary symptomatic relief of paroxysms of Bronchial Asthma. No matter where you live or whether you have faith in any medicine under the sun, send today for this free trial. It will cost you nothing.

FRONTIER ASTHMA Co.
462 NIAGARA ST.

23-D FRONTIER BLDG.
BUFFALO 1, N. Y.

\$10,000 REWARD

Earn the government bonus by locating
Radio-Active Ores with a

P.R.I. GEIGER COUNTER

Weight only 2 lbs.* Priced from \$49.50 complete.*
The most sensitive portable Geiger counters made.
*Battery lasts a year. *Prospecting book included.

PRECISION RADIATION INSTRUMENTS, INC.
1101-F N. Paulina St. Chicago 22, Ill.
DEALER INQUIRIES INVITED

Watch Repairing Pays Big Money Learn at home

Free Literature Tells How

Watchmakers in big demand. You train step-by-step under experts. You learn to take a watch apart—repair and put in perfect working order. 10 easy lessons. We furnish all tools, and a 15 jeweled watch. Practicemovement with first lesson.



Turn spare time into cash—perhaps a business of your own. A licensed school. Students 18 to 65 have profited by our training. Low cost.

Write Today for All the Facts—No Obligation

WATCH REPAIRING Dept. PS-10 2870 Elston Ave.
Chicago 18, Ill.

TUBE GIVEN WITH EVERY TIRE



Why Pay More?

NEEDLESS TO PAY MORE
—RISKY TO PAY LESS

VETS—GARAGES
Service Stations
Take 10% **DISCOUNT**
ON 1 TO 100 TIRES

OUR GUARANTEE
OUR TIRES must make good or WE WILL
If You Want **SAFE TIRES**
Be Wise—See Us Before You Buy
Our Experience Insures Your Safety
You get what we advertise

ORIGINAL TREAD—USED TIRES

BUY IN CONFIDENCE safe dependable
selected **POPULAR BRANDS**—Guaranteed
to give **A-1 SERVICE**. These tires are
absolutely **NOT** Re-caps or Re-molds.

REMEMBER: Tube SENT with EVERY tire regardless of **QUALITY—PRICE** or **GRADE**

SELECTED for TOUGHEST JOBS Not just good . . .
THE BEST. These are genuine Values! One Trial will
CONVINCE YOU

TOPS IN VALUE—TOPS IN SAFETY	
6.00-16 .. \$5.02	6.50-16 \$4.72
6.50-15 .. 4.72	7.00-16 \$6.02
7.00-15 .. 4.72	7.50-16 7.62

**WORLD'S BEST TRUCK TIRE VALUES, TOP SERVICE,
MINIMUM PRICES**

6.00-20(6) \$9.22	8.25-20(10) 15.52	11.00-20(12) \$16.42
6.50-20(6) 9.22	9.00-20(10) 15.52	11.00-22(12) 18.42
7.00-20(8) 10.52	10.00-20(12) 16.22	32x6 (8) 10.02
7.50-20(8) 10.52	10.00-20(12) 16.22	32x6 (10) 12.82

7.50-20 **MILITARY 8 PLY REGULAR \$9.62—SUPER \$12.92**
9.00-16 **MILITARY 8 PLY REGULAR \$8.72—SUPER \$10.92**
ONE QUALITY THE BEST AVAILABLE

**HERE'S MAXIMUM QUALITY IN THESE O.K.
SAFE TIRES**

6.00-16 .. \$3.42	6.50-16 \$3.62	7.00-16 \$4.42
6.50-15 .. 3.62	7.00-15 3.72	7.50-16 5.62

Thousands of Tires Shipped to Satisfied Customers Through-
out United States and Many Distant Points. Please Note:
We've made Thousands of Friends by giving a Tube with
Passenger and Truck Tires. **MAIL ORDERS** given Personal
Attention—Send This Ad with Check or Money Order. Dep't. 5

STANDARD 834 N. Broad St., Phila. 30, Pa.

MAKE MONEY IN LANDSCAPING

Thorough training by Internationally known
Landscape Architect to start your own
business, improve your home or advance in
this well paid field. Many Opportunities.
Approved for Veterans. Send for **FREE**
BOOK.



NATIONAL LANDSCAPE INSTITUTE

310 So. Robertson Dept. PS-10 Los Angeles 36, Calif.

EARN \$50 UP A WEEK... ON THE SIDE!

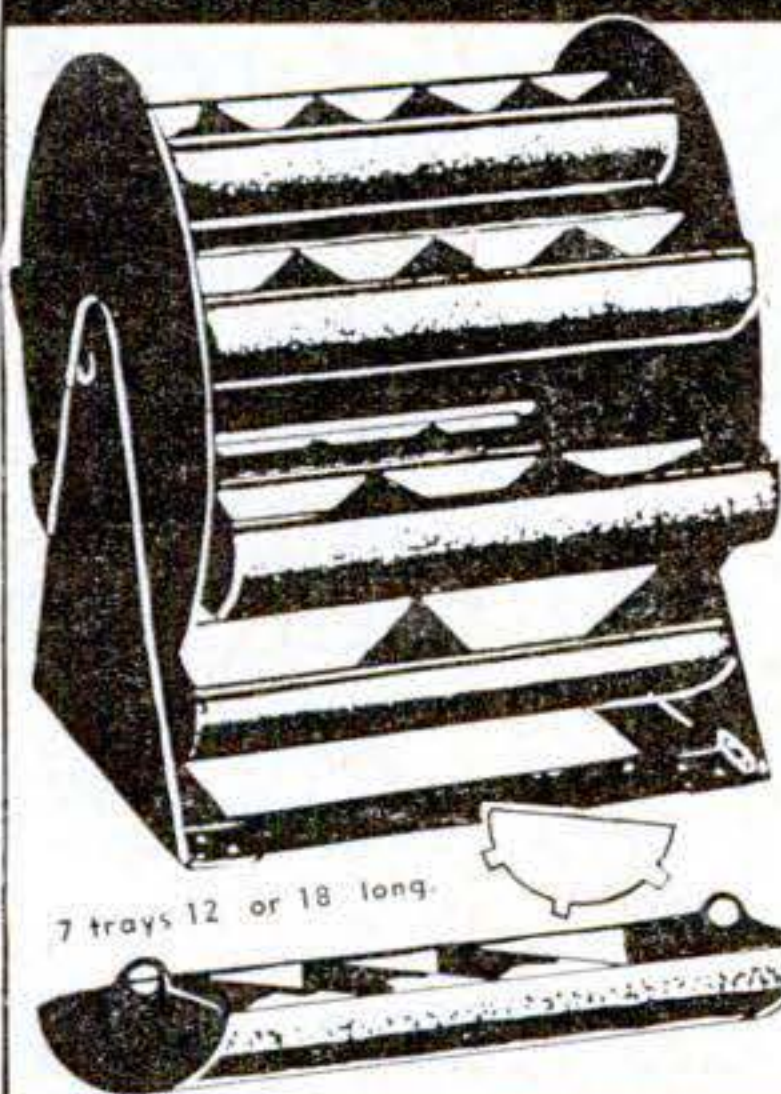
While You Learn Watch & Clock Repairing At Home

WITH OUR NEW 15 ITEM SELF TRAINING KIT
Containing: **AMERICAN JEWELED WATCH MOVEMENT** for
practicing; **PROFESSIONAL TOOLS:** Loupe; 6 Watch Screw
Drivers; Clock Screw Driver; Tweezers; Clock Tweezers; Mate-
rial Tray; Case Opener & Knife; Movement Gauge; *plus*
COMPLETE, EASY TO UNDERSTAND, ILLUSTRATED COURSE
IN MODERN WATCH & CLOCK REPAIRING incl. use of tools
and materials. (If C.O.D., plus charges!) **\$14.95** Post Paid
MONEY BACK GUARANTEE.....

MODERN TECHNICAL SUPPLY CO.

Dept. 10 MPS 55 W. 42nd St. New York 18, N. Y.
Tool Catalog **FREE** with **KIT** or send \$.50 credited to 1st order.

AMAZING NEW LOW PRICE



REVOLVING GADGET TRAY

For Carpenters, Machinists,
Mechanics, Cobblers, and
Hobbyists.

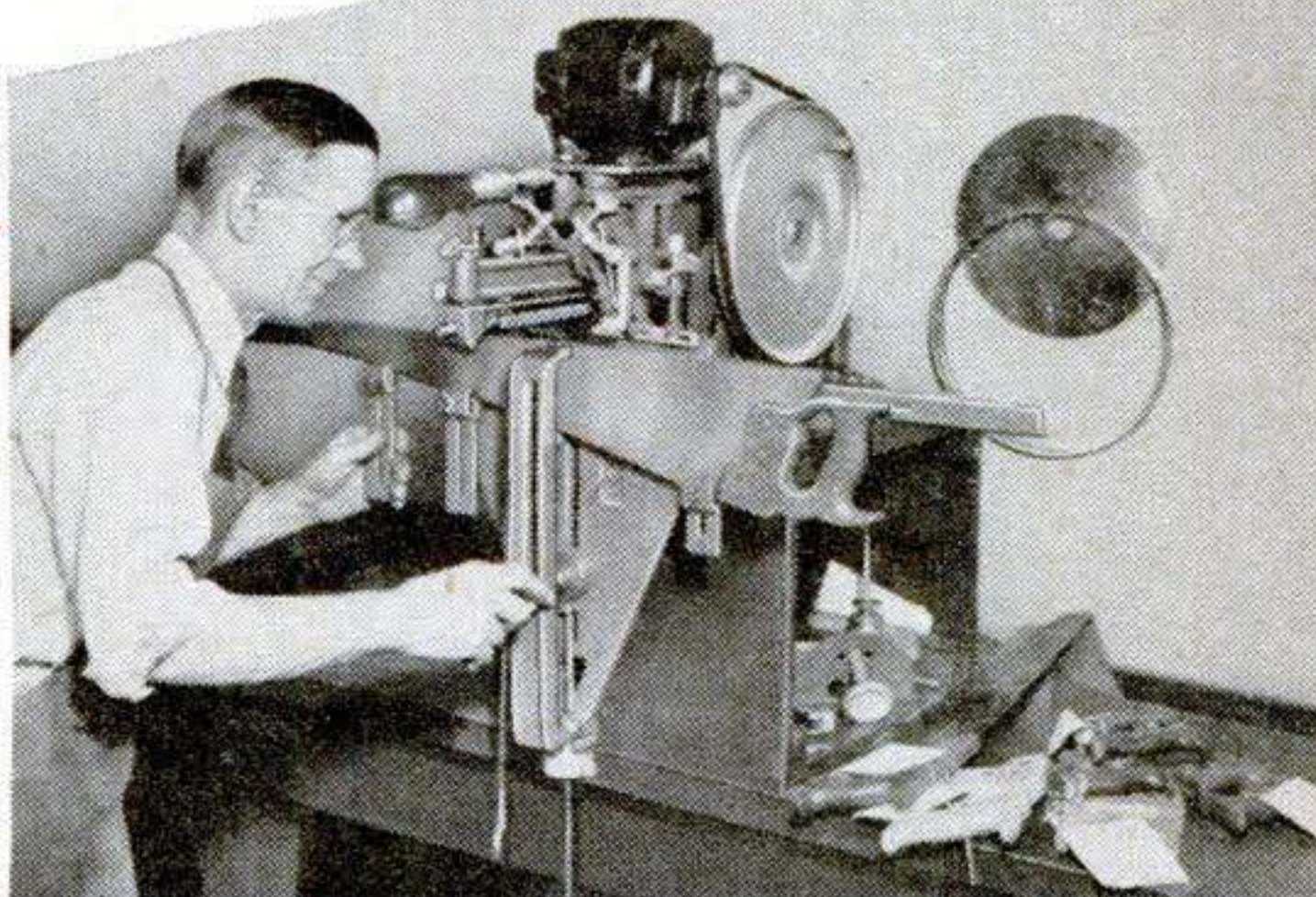
Keeps bolts, nuts, screws, nails and
small parts at your finger tips for
easy picking. Comes in two sizes,
each having 7 trays 12 or 18 long.
Built of durable lifetime steel with
adjustable, removable tray separa-
tors. Can be set on workbench or
hung from wall. Sold on money back
guarantee.

12 SIZE 18 SIZE
\$3.88 \$5.88

HOMERY INDUSTRIES
P.O. BOX 981 WARREN, OHIO



**YOU'RE
ALWAYS
SURE OF
A JOB...**



**.. if you have your own
SAW FILING BUSINESS**

Make up to \$2 or \$3 an hour with the FOLEY SAW FILER

Be your own boss! There's nothing like the satisfac-
tion of seeing pleased customers come back time after
time. Then you won't worry about your present job
or future income. Start in spare time with a Foley
Saw Filer—set it up in your garage or basement. No
canvassing necessary—"I advertised in our local
paper and got in 93 saws"—says M. L. Thompson. "I
made \$765 last year filing saws—I do this work in
spare time," writes J. B. Williams. And listen to this
from Chas. C. Hough, a full-time
operator: "Last year's profit
amounted to \$3,000—not so bad
for a one-man outfit!"

Get this book

"INDEPENDENCE AFTER 40"

You can file hand, band and cross-cut
circular saws with a Foley Saw Filer.
This book shows how you can get busi-
ness from home owners, farmers, car-
penters, schools, factories, etc. With
a small investment, no overhead, no
stock of goods to carry, you can get
right into a cash business—and pos-
sibly later on develop into a full-time
repair shop. Send coupon today for
Free Book. No salesmen will call.

**FOLEY MFG. CO., 1019-9 Foley Bldg.,
Minneapolis 18, Minnesota**

Send **FREE BOOK**—"Independence
After 40"

Name.....

Address.....

**FREE
BOOK
shows How
to Start**

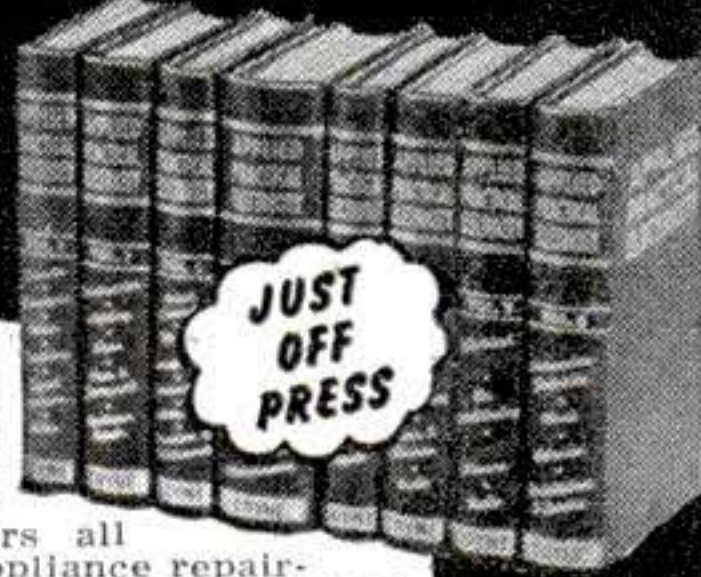


MAIL COUPON FOR FREE BOOK

EARN MORE MONEY IN ELECTRICITY!

with APPLIED PRACTICAL ELECTRICITY

Coyne's new set helps men get ahead in Electricity. 8 great books give you complete A to Z knowhow, explained in easy-to-follow language with hundreds of charts, examples, pictures. Covers all branches of electricity including appliance repair-ing; AC and DC equipment; electrical refrigeration; industrial electronics and much more. Brings you 10,500 electrical facts; 3,400 subjects; hundreds of wiring diagrams, tables, formulae, short-cut methods. Backed by 50 years of Coyne experience in training that has put hundreds of men on the road to top earnings.



JUST OFF PRESS

Sent on FREE TRIAL

USE SET FREE FOR 7 DAYS!

You have to SEE these books to know how much they'll help you. See them FREE! Just fill out coupon below and mail it in. SEND NO MONEY. Examine the set for 7 days AT OUR RISK!

HANDBOOK OF RESIDENTIAL WIRING FREE FOR PROMPT ACTION



Act promptly and we will include FREE, the valuable new booklet, "Handbook of Residential Wiring Design." If you return the Set at our expense in 7 days, you owe nothing. To keep Set, send either \$23.75 in cash or \$3.00 after 7 days and \$3.00 per month until \$25.50 is paid. *Either way, you keep the Residential Wiring Book FREE!* Coupon below is just a request to see APPLIED ELECTRICITY Set and to get FREE Wiring Book for doing so. Mail coupon AT ONCE!

FREE TRIAL COUPON—MAIL NOW!

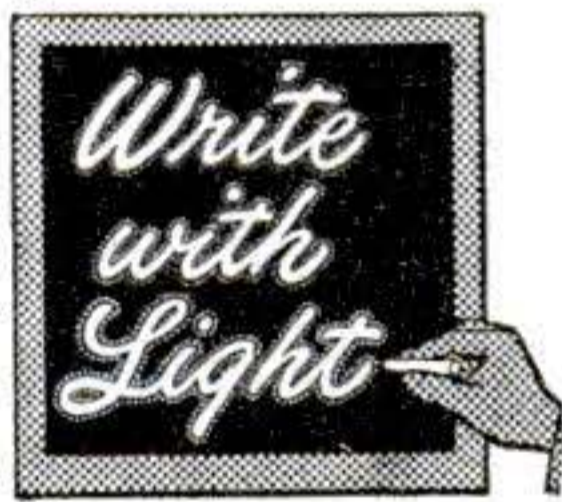
Educational Book Publishing Division,
COYNE ELECTRICAL & RADIO SCHOOL,
500 S. Paulina St., Dept. 79-R8, Chicago 12, Ill.
YES! Send Coyne's new, 8 volume set, "Applied Practical Electricity" to me, postpaid, for 7 days FREE TRIAL per your offer. Include "Handbook of Residential Wiring" FREE.

Name.....Age.....
Address.....
Town.....Zone.....State.....

\$100.00 A DAY

Yes! \$100⁰⁰ a day!

Sensational "walk-in, walk-out" 10-second demonstration makes possible 30 to 50 calls a day. Sell 1 out of 3 for a daily profit of \$100 or more.



Spectacular Invention

You write on glass in 5 colors with "Magic Crayon." Then watch letters "catch fire" and burn like brilliant Neon! Merchants amazed...snatch crayon out of your hand...start writing themselves! NOTHING BEFORE LIKE LITEWRITER PROFITS ever thrilled salesmen.

Rush Coupon for FREE Offer on the most Breath-taking Money Maker of the Day!

Salesmen, Distributors, Crew Managers try out Litewriter for one day — then drop everything for this astounding money-maker. It's patented — hence exclusive with Maxilume men. No competition. Quick sales come easy. Many merchants buy three or four. Many salesmen close 1 out of 3 demonstrations. **Don't waste time.** Wire, phone or airmail name for facts. ALL FREE. If you have crew, ask for Exclusive Territory information. This is the biggest thing of the year. Don't miss it!

L. B. Patterson, MAXILUME CO., Dept. L-910,
125 W. Hubbard St., Chicago 10, Illinois

Rush complete information on Litewriter, Free Selling Kit, Free offer of Demonstrator and instructions for making "walk-in, walk-out" demonstration. No charge now or at any other time.

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

REMEMBER THIS

You can't buy a \$20 Goldpiece for \$10. So it's Dangerous to Pay Less—if You Want Safe, Balanced, Matched Tires.

We Repeat, Consider Your Family's Safety—Not Just Price! You See Our Reliable Adv. Month After Month. Take 10% . Not Recaps



GOODYEAR Goodrich, Firestone, U. S. & Others. Original High Tread, Slightly Worn. Pass. & Truck 30,000 Miles Golden Rule Guar. Genuine Factory Adjusted "All-Purpose" "AAA" Tires Read That Top Line Again! You'll Save More Than \$

600-16	\$5.50	650-16	\$5.75	700-15	\$6.00
600-16(6)	6.50	650-16(6)	6.75	650-15	5.75
700-16	6.50	750-16	7.75	550-17	7.75
700-16(6)	7.50	475-19	5.50	525-18	6.75

WE ARE TRUCK-TIRE EXPERTS. Matched Tires

600-20	\$9.00	32x6(8)	\$9.95	900-20	\$15.95
650-20	9.50	32x6(10)	10.95	1000-20	16.95
700-20	10.50	825-20	14.95	1100-20	17.95
34x7(10)	13.50	1000-22	17.95	1100-22	18.95

MILITARY TREAD "SUPER" GUAR. 12 Mos. Top Grade Guar. 30 Mbs.

750-16	900-16	750-20
Super \$ 8.75	Super \$ 6.96	Super \$ 8.48
Top Grade 12.00	Top Grade 10.75	Top Grade 13.00

GOOD USED TIRES Any Car \$3.25. 12,000 Miles Guarantee

Send ck. or money order for rush shipment, And this ad. We won't ship a tire we wouldn't use ourselves. Instant shipment down South, Far West, and the world over. The Name to trust in Rubber.

BLATT GIRARD & LANCASTER AVE. DEPT. PS
BLATT BLDG., PHILADELPHIA 31, PA.

The Signal that Softly Whistles "TAKE OFF THE BRAKE"

195

Send \$2.00 and we prepay postage.

You'll never again drive with the hand brake on, because when you start the engine you hear a melodious whistle unless the brake is OFF. Put on with screwdriver. Operates off hose to windshield wiper.



Guaranteed for life of car—Saves you cost of new hand-brake lining.

No letter necessary—just print name, address, year and make of car. Enclose check, M.O. or cash. Gladly sent C.O.D. plus charges. Money back in 10 days if not satisfied.

MONARCH GOVERNOR COMPANY
DEPT. A 2 • 1832 WEST BETHUNE • DETROIT 6, MICH.

A MAN'S BEST FRIEND IS HIS POCKET KNIFE

Blades hand honed, hand stopped. Many styles, at your dealer's. \$1.50 up.

CAMILLUS has the edge!

No. 22
2 13/16" closed

CAMILLUS CUTLERY COMPANY, N. Y. 17, N. Y.

Save UP TO 25% ON QUALITY BALL-BEARING WHEELS



Bilt-Rite Guarantee No better wheels are made regardless of price; 10 day return privilege.

Bilt-Rite wheels roll smoothly and easily, are semi-pneumatic, ball-bearing, painted red; guaranteed top quality—and you save up to 25%! Compare Bilt-Rite's quality and price; then get your order in today! Dealer inquiries invited.

Ball-Bearing Wheels at Bargain Prices

(For 1/2" axles)			
6 x 1.00	\$1.30	10 x 1.25	\$1.95
8 x 1.25	1.65	10 x 1.75	2.15
8 x 1.75	1.80	10 x 2.00	2.45
6 x 1.50 \$1.50			
(For 5/8" axles)			
6 x 2.00	\$3.95	8 x 2.50	\$4.45
10 x 2.75 Only \$4.65!			

If size you need isn't listed, write for Folio A. Order Today—Send cash, check, or M. O.—Pay postage on arrival.

BILT-RITE WHEEL COMPANY

520 East Missouri Ave. Dept. 65 Kansas City 6, Missouri

FAST PUSH-BUTTON POWER CAR!

ALL ELECTRIC REMOTE CONTROL

1951 AUTO SENSATION!

- Driven By Powerful Remote Control
- Powered with Electric Mini-Motor
- Latest All Electric Marvel
- Balloon-type Rubber Tires



Push the Button!

IT STARTS! REVERSES! STOPS! STEERS!

The greatest new electrical toy since the electric trains. REMOTE CAR is a thrillingly realistic scale model, made of colorful shining plastic. It runs and steers by remote control—no wind-up or friction motor, but an ALL-ELECTRIC PRECISION-MADE MOTOR, powered by 2 long lasting flashlight batteries. Push the magic rheostat button, and you really make things happen. Here's real action to fascinate every child, and daddy too. RUSH YOUR ORDER TODAY! SEND NO MONEY! Remit with order and we pay postage, or C.O.D. plus postage.

Imagine only **\$3.49** COMPLETE!

NOVELTY MART • 59 East 8th Street, Dept. 331, New York 3 N.Y.

THERE'S MONEY IN CARTOONS!

DON'T COPY—LEARN TO ORIGINATE!

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS at home that you may SELL! Course contains 26 lessons and over 600 illustrations. All for only **\$2.85**

Send name and address for free details.

RAYE BURNS SCHOOL, Dept. S, Box 3583, Cleveland, Ohio

Learn MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy terms. Write for FREE BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL of Mechanical Dentistry
207 N. Broad St. Dept. 891 Philadelphia, Pa.

FOR GREATER ACCURACY • DEPENDABILITY YOU WILL WANT THIS PRECISION MADE 17 JEWEL SWISS WATCH

CHECK ALL THESE FEATURES:

- Waterproof
- Shockproof
- Anti-Magnetic
- Radium Dial
- Sweep Second Hand
- Chrome Case with Stainless Steel Back

SPECIAL! A sturdy stainless steel expansion band furnished with every watch. Order this smart, dependable watch today! One year guarantee. Send no money. Pay postman or save C.O.D. charges—send check or money order. Satisfaction guaranteed or your money promptly refunded!

Registered Jewelers, Dept. PS10
545 Fifth Ave. New York 17, N. Y.

ONLY **\$23.75**
(Includes Fed. Tax)

Now CHEAP OIL BURNER FOR HEATING AND COOKING STOVES • FURNACES

HEAT YOUR HOME, COOK YOUR MEALS WITH CHEAP FURNACE OIL

NO MORE SHOVELING COAL OR ASHES. Sensational Fuelizer Starter Vaporizing System turns Cheap No. 1 Furnace Oil, also Range, Heater, Tractor Distillate, Kerosene and like oils into oil heat—one of the quickest, hottest fires known. LIFETIME GUARANTEE. \$1.00 Bonus Offer for Testing. We will let you try it in your own stove or furnace for one month. Get yours for introducing. Big profits QUICK. Be first. Send in your name today for details and cash in on the tremendous demand for this Amazing Invention.

NORTHWEST MFG. CO. 703-M Mitchell, S. Dak.

Artists! Art Students! Art Lovers!

LIFE STUDIES FROM HOLLYWOOD

that help you learn to draw the human figure

GOOD FIGURE ARTISTS always are in demand, make big money. Develop your talents. Enjoy pleasant, fascinating work. Meet more attractive people, in glamorous surroundings.

THESE 3 BOOKS, by nationally known artists, can be the key to an exciting new career.

only \$2.50

24 ACTUAL PHOTOGRAPHS

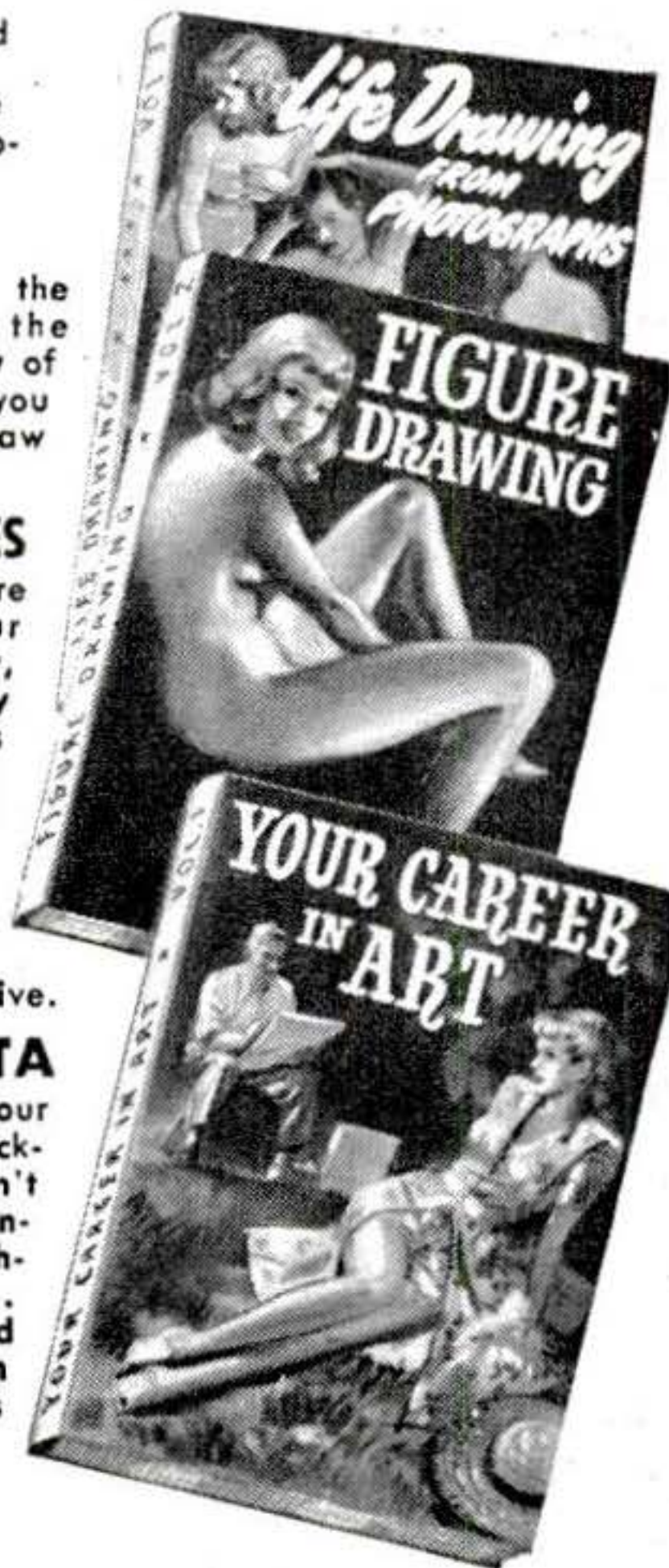
of beautiful live Hollywood models, in glamorous poses, illustrate the volume of "Life Drawing from Photographs." From these photographs, and interesting supplementary sketches, you learn the intimate structure of the human body, the interplay of bone and muscle, which you must understand to draw figures successfully.

CHARMING SKETCHES

in the volume on "Figure Drawing" develop your knowledge of anatomy, with emphasis on the body in action. These studies clearly show basic anatomical differences in various types of figures—the manikin, the "stick figure," etc.—and introduce you to the study of figure groups in perspective.

ABSORBING DATA

in the volume on "Your Career in Art" provides background material you won't want to miss. Artistic principles, materials and methods. Selecting models. Relation with models and clients. A frank discussion of "Bohemian or business man?"



Special Offer

For a limited time only, you can get ALL THREE of these beautifully illustrated books for just **\$2.50** POSTPAID

Or, any one book for \$1.00. The supply of these helpful, fascinating books is limited. ORDER TODAY!

MAIL THIS COUPON TODAY!

HOLLYWOOD ART ASSOCIATES
Markham Bldg., Hollywood Blvd., Hollywood 28, Calif.

Please send, at once, in accordance with your special offer, the following lavishly illustrated books:

_____ All 3 volumes, "Life Drawing from Photographs," "Figure Drawing," and "Your Career in Art"—\$2.50

The individual volumes checked below:

_____ "Life Drawing from Photographs"—\$1.00

_____ "Figure Drawing"—\$1.00

_____ "Your Career in Art"—\$1.00

_____ Send postpaid; payment of \$_____ is enclosed. (Cash, check or M. O.) (In Calif. add sales tax)

_____ Send C.O.D.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

NOW! Build Your Future On



DIESEL Opportunities

LOOK around you. See the way tractors, trucks, buses, railroads, ships, power plants and equipment of many kinds are "going Diesel." Every day new opportunities are opening—in industrial and farming communities—for trained men who can install, maintain, operate and repair Diesel engines. Plan now to build your future in this growing field.

Diesel Knowledge is Earning Power

You don't have to give up your present job. Now, you can begin learning DIESEL in spare time at home. UEI practical training teaches you, step by step, how Diesel engines operate, how fuel systems work, repairs, accessories and auxiliary equipment; a world of Diesel "know how." Includes actual practice on Diesel equipment in our shop under expert guidance. UEI training methods are successful. For 20 years they have helped mechanically inclined men better themselves.

NOW IT'S UP TO YOU!

Coupon below brings you all the facts without cost or obligation. Get going today! MAIL COUPON NOW

UTILITIES ENGINEERING INSTITUTE Diesel Division
Founded 1927

2521 Sheffield Ave., Dept. DM-4
Chicago 14, Ill.



Send Coupon for FREE FACTS

UTILITIES ENGINEERING INSTITUTE, Diesel Division
2521 Sheffield Ave., Dept. DM-4, Chicago 14, Ill.
Please send me Free Facts about Diesel opportunities and training.

NAME _____ Age _____

ADDRESS _____

CITY _____ Zone or County _____ STATE _____

Check here for special information if you are under 17.

Learn this Profitable Profession



IN 90 DAYS AT HOME

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

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

Anatomy Charts & Booklet FREE

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



THE COLLEGE OF SWEDISH MASSAGE
Dept. 970-M, 41 E. Pearson, Chicago 11

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

Name _____ Age _____

Address _____

City _____ State _____

Chronograph Wrist Watch

LOWEST MARKET PRICE \$7.25



Sweep Second Hand: Precision Workmanship; Rugged Shock-resistant case; Radium hands and numerals; Leather strap. It measures distance, speed of cars, planes, horses and other moving objects. It's a time keeper, stop watch, telemeter, tachometer. ONE YEAR WRITTEN GUARANTEE and full operating instructions enclosed with each watch. SEND NO MONEY. Mail your order today. Pay postman \$7.25 plus 10% Federal tax. Total \$8.00 plus postage. Or send cash (money order or check) with your order and save postage charge.

MARDO SALES CO., Dept. 1803
480 Lexington Ave., Rm. 1115 N. Y. 17, N. Y.

HANDI-SCOPE

POWERFUL MICROSCOPE

For Machinists, Hobbyists, Photographers, Doctors, Engineers, Students, etc.

- Sharp Fine-Focus Adjustment
- 20-Power, Compound System
- Wide Undistorted Field
- No Special Light Source Needed

ORDER NOW!

BUHL OPTICAL COMPANY



Hundreds of practical uses in home, school, office, shop, farm, etc. Easy to use—handy to carry. Sold on money-back guarantee. Send check or money order TODAY! \$4.95 POSTPAID

Box C-117 1009 Beech Avenue, Pittsburgh 12, Pa.

Send for this FREE BOOK on RHEUMATISM



Arthritis • Neuritis • Sciatica

If you suffer the aches, pains and discomforts of these diseases, learn about a proven specialized system for treating them. Find out why drugs and medicines give only temporary relief and fail to remove the causes of the trouble. Fully explained in the Ball Clinic's FREE BOOK. No Obligation. Write Today. BALL CLINIC Dept. 36 Excelsior Springs, Mo.



YOU can draw!

AMAZING NEW HOLLYWOOD PLAN

• Yes, YOU can draw GIRLS, CARS, FRIENDS, even MAGAZINE COVERS. Our plan is EASY—especially designed to help the beginner and advanced student. Many artists make more than \$150.00 per week in advertising and cartoons. Be your own boss, draw for money anywhere. Our Commercial Artists will teach you the secrets from HOLLYWOOD. Drawing materials furnished. Be a success. Write NOW for details and FREE 32-page book.

APPROVED FOR G. I. TRAINING

HOLLYWOOD SCHOOL OF ART

Under direction of Frank Axelson
6533 Hollywood Blvd. Hollywood 28, Calif.

Dept. 1A Name _____ Age _____ G.I.

Address _____

City _____ Zone _____ State _____

O.D. WOOL SHIRTS
13 to 15
244

PANTS
28 to 32
266

Used, reg. re-issue perfect condition. 100% wool serge Cleaned & pressed by Q.M. Corp Add 12c ea. post.

GEN. NYLON 50 FT
59¢

PARACHUTE CORD
3/16" dia White or khaki 550 lb. ten. strength For clotheslines, venetian blind and drapery cords and other uses Add 4c post

50% WOOL HOSE
NEW Medium weight, rugged and warm Post 3c.
39¢

CUSHION SOLES
NEW 63% wool, double sole These are known as the desert sox Khaki and white Add 4c postage per pr.
49¢

WAR SURPLUS
AND OTHER **ORDER FROM THIS AD PLEASE**

BARGAINS

WATCH CAPS
77¢

NEW Navy watch caps. Color, blue 100% pure wool knit Please add 5c postage each.

all wool WRISTLETS
13¢ 8 PAIR \$1.00

NEW 100% O D wool knit Ideal for glove and mitt inserts. wristlet replacements etc Worth 75c per pair Add 3c postage per pair.

1299

B-15 Style FLIGHT JACKET

NEW Renders greatest warmth per oz. of weight. Mountain cloth outside, pile lined body and sleeves Genuine mouton Collar, 4 pockets—2 outside 2 inside Wool knit cuffs and waistband. Add 27c postage.

BRAND NEW KHAKI SHIRTS-PANTS
14 to 17 **25.9**
28 to 42 **33.3**

Genuine 8.2 chino khaki suntan material. Pants with cuffs. Add 11c post. per garment.

NAVY T-SHIRTS
WHITE 59¢

NEW Combed yarn, full cut, small, medium, and large. 5c postage.

SIZZLING SPECIALS

ARMY STYLE 6-88 COMBAT BOOTS

NEW For sportsmen and outdoor wear. 10" high. Reversed uppers, full oak leather sole, with composition outer sole Add 27c post

6 TO 12

DUST MASKS
33¢

New \$1.50 value Ideal for millers farmers paint and insecticide spraying Add 6c postage for each.

GREATEST WATCH VALUE IN U.S.A.

17 JEWEL Military Style WRIST WATCH

BRAND NEW GEN. INCABLOC WATERPROOF SHOCKPROOF

Non-magnetic, radium dial, sweepsecond hand St steel case Complete with leather strap. Guaranteed Swiss 17-Jewel movement A truly remarkable value Add 15c post.

1995 PLUS 10% FED. TAX

WAR SURPLUS CIRCULAR **SEND FOR FREE**

Over 200 War Surplus and other outstanding bargains

SIoux FALLS SURPLUS STORE
113 NO. PHILLIPS **SIoux FALLS, S. DAK.**

NAVY SUN GLASSES

Navy Issue Ground & polished lenses, plastic frame wire center. \$4.00 value Add 6c post

AVIATORS 24K Style GOLD PLATED RIMS

Large size 52mm lenses Shuts out max. violet & infra red ray Pearl sweatband Comp with handsome case Add 7c post

133

OUR BETTER QUALITY2.55

HOW I STEPPED into a Big Pay HOTEL JOB!



Don E. Ulmer Becomes Hotel Manager With Substantial Increase in Salary Although He Previously Knew Nothing About Hotel Work

"Immediately after I received my Lewis diploma, I gave up my job in an office and accepted a position obtained for me by the Lewis Placement Service at a resort hotel. At the end of the season I was appointed Manager of another hotel. Later I came to this hotel. Each time that I made a change meant an increase in salary. I give credit to the Lewis Course."

HOTELS NEED TRAINED MEN AND WOMEN

Thousands of Lewis-trained men and women winning success and a sound, substantial future in the colorful hotel, club and institutional field. They are making good as Managers, Assistant Managers, Stewards, Hostesses, Executive Housekeepers and in 55 other types of well-paid positions. Not only has this fascinating business been breaking records, but authorities agree the greatest travel boom in history is now under way. The demand for trained men and women, therefore, is greater than ever.

Previous experience proved unnecessary in this business where you are not dropped because you are over 40. Good grade school education, plus Lewis Training qualifies you at home, in spare time. Write your name and address in the margin and mail this ad TODAY for Free Book which tells how you are registered free of extra cost in Lewis National Placement Service.

Course approved for Veterans' Training

Check here if you are a veteran.

Lewis Hotel Training School
Room PR-2785 Washington 7, D. C. **34th SUCCESSFUL YEAR**

NEW Edition

AUTOMOTIVE BODY AND FENDER REPAIRS
= **C.E. PACKER**

NOW HAS 325 PAGES 232 ILLUS. \$3.50 Total Cost

Famous Guide To Best Pay Auto Repair Work

This practical book will put you right into the most profitable business in the auto field. Shows you how to get a good job or start a business of your own with little or no capital. Easy to use and understand. Covers use of tools and equipment, gives approved methods, describes materials and shows you how to actually do a professional job, operate a shop, etc. The very latest information and pictures on all interior and exterior body work and fender repairs—the kind of work people everywhere want and will pay big for when you can do it. Mail coupon now. Use book 5 days and if not O.K. return it and we will refund your money.

Goodheart-Willcox Co., Dept. 37
1321 S. Michigan Avenue, Chicago 5 **MAIL ORDER COUPON**

Send Auto Body and Fender Repairs () C.O.D. I will pay postman plus charges. (C.O.D. in U.S. only.) () Remittance for \$3.50 enclosed, send postage paid. If not O.K. I will return in 5 days and you will refund purchase price.

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

Are You a "One-Date Dick" or a KING OF MUSCLE?



YES!—and in just 5 Minutes every other day, YOU, too, can have a new physique, added height, glowing health and vigor, with world-famous Paramount Bar Bells. At any age, you can gain new popularity, and probably boost your own paycheck through the sheer vitality of a powerful new build. Send now for FREE Paramount "Self-Check Chart." Learn sensational new low prices of Paramount Bar Bells, sold at direct-from-factory savings. Get started NOW to be a King of Muscle! Act TODAY!

GIFT CHART—FREE!

Paramount Bar Bells, Dept. 12
2416 E. 23rd St., Los Angeles 11, Calif.

Rush Info and "Self-Check Chart," FREE!

Name _____
Address _____
City _____ Zone _____ State _____

AS LOW AS
\$8.95

GOOD WEAR FOR WORK GOOD LOOKS FOR PLAY



REEVES Army Twill is a double duty fabric that's right for work and play. It's highly resistant to wear and tear, and its wide variety of vat dyed colors are fast to sun, water and perspiration. Being Sanforized*, it can take repeated washings and still come up fresh and new. For better looks and longer wear—demand Reeves Army Twill.

*Residual shrinkage less than 1%

REEVES BROTHERS, INC.
54 Worth Street, New York 13, N. Y.



TRAIN NOW FOR AN AVIATION CAREER

IN SUNNY SOUTHERN CALIFORNIA

MAXIMUM TRAINING IN MINIMUM TIME

Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929... America's Finest Aeronautical Institute... 7000 successful graduates... MAKE MORE MONEY... MAIL COUPON TODAY. APPROVED FOR VETERANS. Board and Room now available.

Without obligation, send free catalogue with full information.

NAME _____ AGE _____ PS-10
ADDRESS _____
CITY _____ ZONE _____ STATE _____

CAL-AERO TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL • GLENDALE 1, CALIFORNIA

THE TONE YOU LOVE TO HEAR

REG. U.S. PAT. OFF.

HOLLYWOOD MUFFLER

GREATER SPEED, POWER, MILEAGE are yours with a Wilkinson Hollywood Muffler... plus a tone you'll love to hear. Improved design, precision made, electrically welded... outlasts ordinary mufflers 3 to 1. Low priced. Manufacturer's central location saves you freight.

DEALERS WRITE All Ford, Chevrolet, Plymouth... \$5.00
All other cars... \$6.00
(FOB Fort Wayne)

Order direct, or thru your dealer. Also Fender Skirts, \$10.95; Chrome Air Horns, Low as \$49.00; 3" Barker Tips, \$3.25.

TOM WILKINSON MUFFLER CO. 811 Wilt St. Ft. Wayne, Ind.



DUST-O-VAC FOR ALL MACHINES

For Home Workshops & Industry. DUST-O-VAC collects & bags wood & plastic chips, wood & metal dust, wood shavings. Free Bag. Attaches to circular saw, planer, band saw, grinder, belt or disc sander, shaper, drill press with shaper or sander attachment, spindle shaper, wood lathe, jig saw. 110 A.C., D.C. Send for mounting instr. for all machines.

\$19.95

Free Ship. east of Miss. West of Miss., add \$1. Check, M.O.

HEAVY CAST ALUMINUM BLOWER—ONLY \$9.75
110V, AC 50-60 cycles, cont. duty motor, deliver app. 100 C.F.M. For workshop, lab, kitchen, cellar, etc. Install yourself. Send for circular.

UNIVERSAL YONKERS CORP., 137 Alexander St., P-10, Yonkers 2, N. Y.

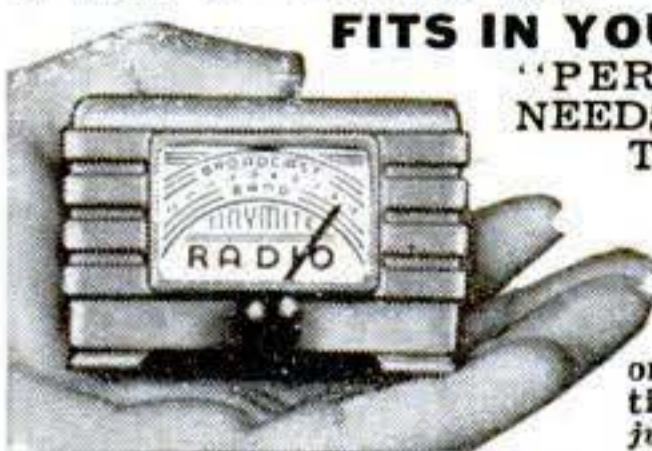
Earn \$280 to \$340 a Month

3,000 R. R. Station Agents Needed Now

APPROVED FOR VETERANS

Be a R.R. station agent in 4 to 6 months. Important, responsible work—that's why the salary is high, \$280 to \$340 per month or more. Ask your local R.R. agent about this opportunity. Our placement record of qualified men is nearly 100%. We've placed hundreds; railroads want our trainees. A dependable school since 1897; located downtown. Start any Monday. Part-time work available. Get the facts free—write today. **BOYLES COLLEGE**—Dept. 110—18th at Harney—Omaha, Nebr.

TINY RADIO—REALLY WORKS



FITS IN YOUR HAND! Works on new "PERMA-CRYSTAL" so it NEVER NEEDS TROUBLESOME TUBES, BATTERIES OR ELECTRIC "PLUG-INS"! Easy to use—Plays for nothing—Should last for years. Beautiful Red Plastic Case.

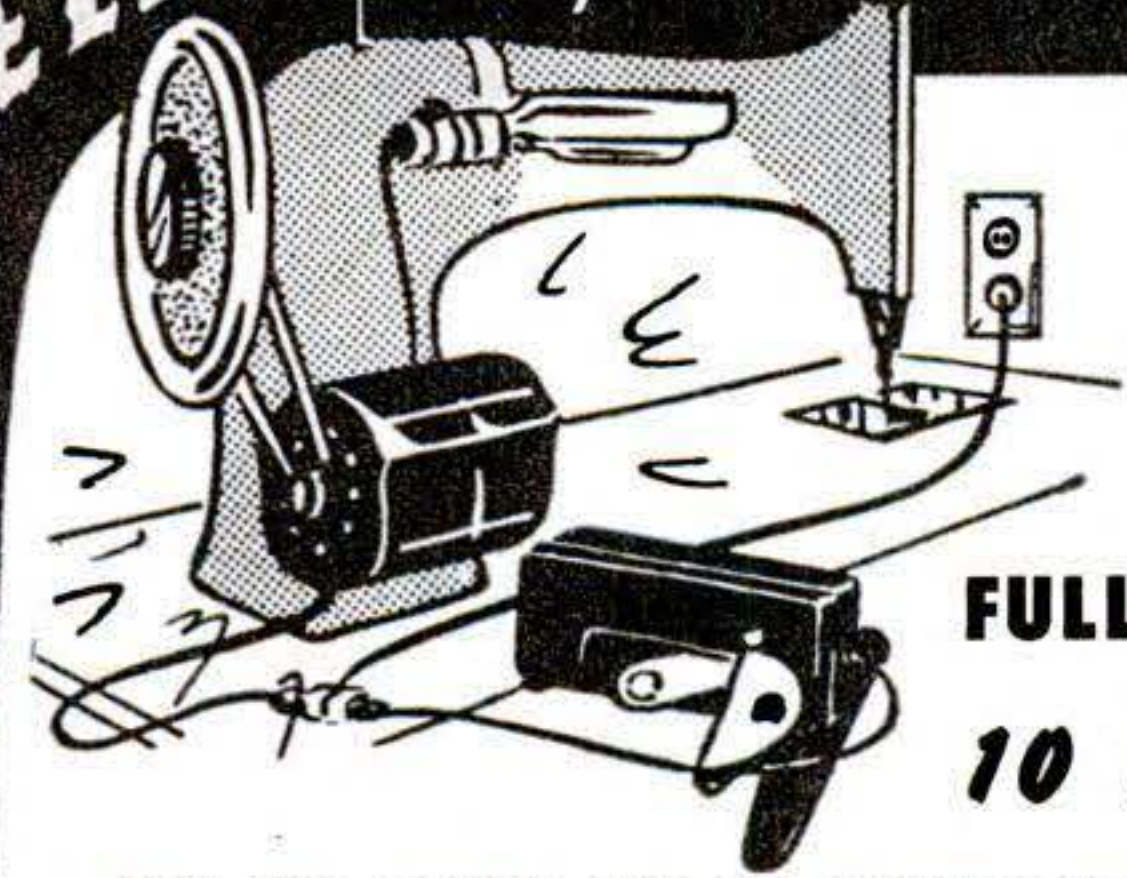
GUARANTEED TO WORK

on local programs by following instructions. C.B. of Ala. says "Tiny Radio is just Wonderful!"

SEND ONLY \$1.00 (bill, ck, mo) and pay postman \$2.99 COD plus postage or send \$3.99 for postpaid delivery. SENT COMPLETE READY TO PLAY on simple attachment. Has personal phone. WONDERFUL GIFTS FOR BOYS & GIRLS. Low priced. Order YOUR Tiny Radio Now!

MIDWAY COMPANY DEPT. TPS-10 KEARNEY, NEBR.

ELECTRIFY your SEWING MACHINE NOW!



OUR LOWEST PRICE

\$12.95

FULL 1 YEAR GUARANTEE

10 DAY FREE TRIAL

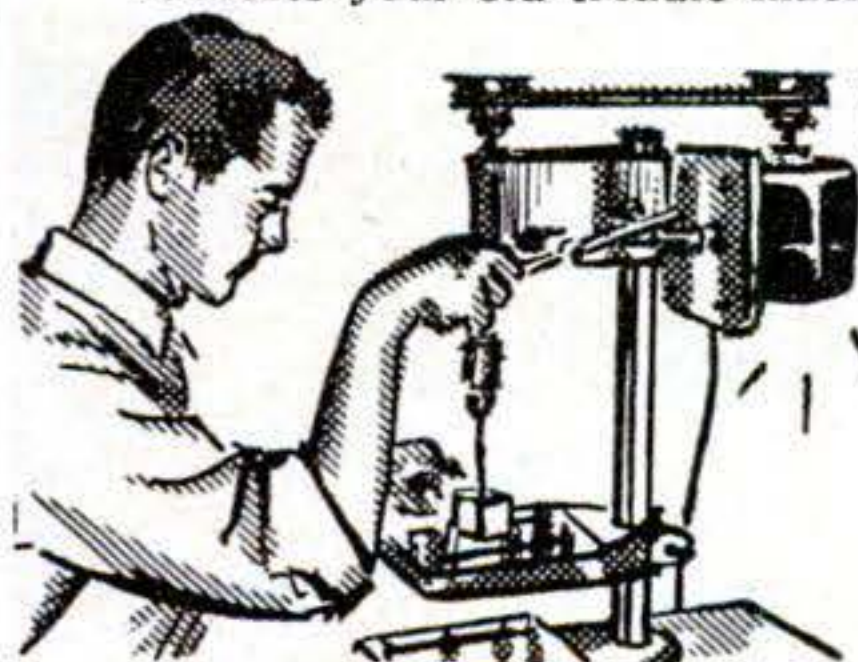
KIT INCLUDES:

- All brand new parts
- AC-DC 115v. 60c
- Air cooled motor
- Multi-speed foot control
- Pulley, belt & cord set
- Fully illustrated instructions

Now give mother, wife the workfree new thrill of electric sewing. The new low-priced Continental Sewing Machine Electrification Kit quickly and easily converts your old treadle machine to a modern, elec-

tric model . . . saves time, work and money!

Kit comes fully wired with everything you need to install it in a jiffy . . . fits any make or model machine.



EXCELLENT UTILITY KIT

Powerful AC-DC motor, pulley & bracket set makes a perfect power tool attachment . . . excellent workshop utility kit. A natural for experimental uses.

FREE: Handy new Chrome Plated SEWLITE

(As illus.) given free with each kit

2-TONE LUGGAGE CARRYING CASE!

Handsome 2-tone alligator leather case . . . lasts a lifetime, fits all machines. State base width, length and make of machine when ordering. **\$9.95**



SEND NO MONEY . . . 10 DAY FREE TRIAL!

Pay postman plus C.O.D. or send check, money order and we'll pay postage. Your money back in 10 days if you are not completely satisfied. State whether wheel on your machine turns TOWARD you or AWAY from you when ordering kit. Shipping Wt. 6 lbs.

CONTINENTAL SALES CO.

Dept. PS-6

83 Graham Avenue

Brooklyn 6, N. Y.

Start Your Own Money-Making Business

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

Von Schrader Mfg. Co., Dpt. 3M, Racine, Wis.

ENGINEERING

BUILDING, DRAFTING, ETC.



Write for catalog

N-88 TECH BLDG., 2000 SO. MICHIGAN AVE., CHICAGO 16

Degree in 27 mos. Approved for G.I. Training. Prepare in Chicago, the Industrial Hub. Earn part living expenses. 45th year. Other shorter courses in Air Conditioning, Refrigeration, Radio, Electricity. Enter Jan., March, July, Sept.

SET THE PACE WITH THE



Dealer Inquiries Invited

- Cruises at 45 MPH—with faster pickup than car
- 39" high, 71" long overall, wt., 190 lbs.
- 8 HP motorcycle engine

- 50 miles to the gallon
- Automatic clutch
- Internal expanding brakes—handle-grip throttle controls

POWELL MANUFACTURING COMPANY

DEPT. PS-1049 • COMPTON, CALIF.

Powell P-81!

ONLY \$247³⁴
AT COMPTON, CALIF.
EXCISE TAX INC.

Write for FREE folder and name of nearest dealer

DRAW for MONEY . . . Be an ARTIST!



Trained Artists are Capable of Earning **\$65, \$80 and MORE a WEEK!**

YOU CAN learn to draw at home in your spare time the well-known WSA way. **COMMERCIAL ART, DESIGNING, CARTOONING** all in ONE complete course. No previous Art experience necessary—we teach you step-by-step. Prepare for a fascinating hobby or profitable career. For 35 years WSA graduates have been making good—WHY NOT YOU?



VETERANS! WSA Approved for Training Under G.I. Bill. Write for FREE BOOK, "Art for Pleasure & Profit," fully describes course, our method of instruction and commercial opportunities for you. TWO ART OUTFITS included with training. Low cost—only \$5 monthly.

MAIL COUPON TODAY FOR DETAILS.

Washington School of Art, Studio 1310 R
1115—15th St., N.W., Washington 5, D.C.

Please send me full information and your Free Book, "Art for Pleasure and Profit." (please print)

Name.....AGE.....

Street.....

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


Don't Risk LAY-OFFS!

LEARN

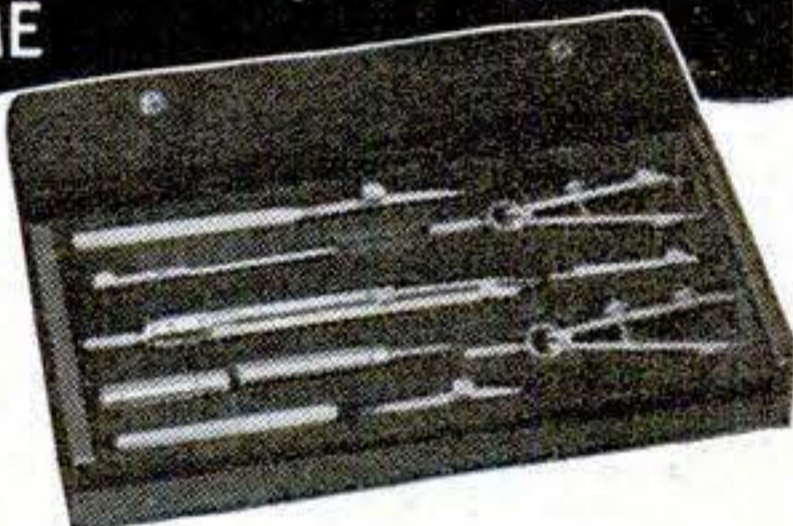
DRAFTING

FOR YEAR 'ROUND Security!

IT'S EASY TO LEARN AT HOME
- IN SPARE TIME



LEARN DRAFTING
in a few short weeks with
CEI SIMPLIFIED
TRAINING AND COACHING
Draftsmen are being hired... not fired! Because their work is vital to industry they're not laid off when times get tough. Don't risk lay-offs that can mean piled up bills, foreclosed mortgages, used up savings. Send for our **Free Success Book** today showing how we train you for a good pay Drafting job, and how our **Job-Finding Service** helps you get that job. You get professional instruments and drafting equipment at no extra cost. Act now!



MONEY MAKING DRAFTING INFORMATION

MAIL COUPON NOW

CLEVELAND ENGINEERING INSTITUTE
Extension Division, PS-10-A
2325 Chester Ave., Cleveland 14, Ohio
Rush your FREE 28 page Success Book showing how Drafting means year 'round security for me.
 Veterans check here

NAME

ADDRESS

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

No obligation—No salesman

APPROVED FOR VETERAN TRAINING UNDER THE "G. I. BILL OF RIGHTS"

THE "BUY" ALL AMERICAS TALKING ABOUT

GADGET GRAB BAG!

NEW! EXCITING! FUN! NOTHING LIKE IT ANYWHERE!

\$1.00

Gadget Grab Bag is the gadget lover's dream of years come true! It's a surprise package, "a pig in a poke," containing five new, exciting, different, practical, useful gadgets! Sent direct to you by U.S. Mail from Los Angeles, the gadget capital of the world.

Every member of the family will enjoy Gadget Grab Bag. With five distinctly different gadgets, everyone will discover one he has always wanted. Fascinating new gadgets you've never seen before—but always wanted! Playing Gadget Grab Bag is thrilling! It's like buying an ole tyme grab bag at a country fair! Most important—all the gadgets are practical, exclusive, new and useful!

UNCONDITIONAL MONEY-BACK GUARANTEE

We unconditionally guarantee that the total retail price of the five gadgets in Gadget Grab Bag will exceed the price of the Grab Bag, or your money will be refunded at once. And here's the best news—GADGET GRAB BAG costs you only ONE DOLLAR. No more! Just fold a dollar bill, with attached coupon, into an envelope and drop into any mailbox tonight. No limit on the number of GADGET GRAB BAGS you may buy. Send them as gifts too! Order Today! Get in on this terrific new fun—and own the newest gadgets NOW! For a Buck, what can you lose!

GADGET GUILD of AMERICA, Dept. PS-10G
P. O. Box 2711, Hollywood 28, Calif.

Rush me the amazing new Gadget Grab Bag—five exciting new gadgets in one big grab bag. Am enclosing cash.....check.....money order.....

Attached is a list of friends to whom I want Gadget Grab Bags sent. Please enclose my name as donor. Enclosed is.....to cover cost.

Name

Street

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

(Foreign orders—add 25% extra for each Gadget Grab Bag)

SPEED AND POWER HANDBOOK



Build fast Stock Cars! California Roadsters! 150 MPH Rods! Covers Fords to Cadillacs—all makes! Breathtaking methods—Authentic—Direct from California!

SAVE MANY DOLLARS

Build your own Dual Manifolds! Superchargers! Hot Cams! Water Injectors! Hi-Compression Heads! Mileage Devices! Get racing speed, lightning acceleration, dynamic power increases from any make passenger automobile! Get construction drawings! Tuning techniques! Speed tricks! Picture catalogues! Economy secrets! Ingenious formulas! Including—"Racing Frames"—"Reciprocating Masses"—"Jet Engines"—"Braking Characteristics"—"Dynamometers." Dual Pipes, Gears, Fuels, Manifolds, Porting, Relieving, Lowering! Balancing.

Includes "CALIFORNIA AUTOMOBILE CUSTOMIZING"—Glossy photographs! Diagrams! Newest Ideas! Conversions! Re-Styling all makes! Streamlining! Chopping! Channeling! Customizing!

50 CHAPTER LIBRARY EDITION—complete—\$1.98 Postpaid.
NEWHOUSE AUTOMOTIVE INDUSTRIES
5805-A4 EAST BEVERLY LOS ANGELES 22, CALIF.

RUPTURE-EASER

A strong, form fitting, washable support. Back lacing adjustable. Snaps up in front. Adjustable leg strap. Soft, flat groin pad. No steel or leather bands. Unexcelled for comfort. Also used as after operation support. For men, women and children. Mail orders give measure around the lowest part of the abdomen. Specify right or left side or double. We prepay postage except on C.O.D.'s.



308 E. 12th Dept. PS-10 Kansas City 6, Mo.

ARMY BUNK BEDS

DOUBLE DECK

Used, but in excellent condition. Like new. They cost the government 4 times our price. Use as twin beds or double deckers... built for and used by the Army... sturdy hardwood frame, green or brown finish, steel springs... 30" wide, 84" long, complete with springs. BUY NOW! These bunk beds soon may not be available anywhere. New Sterilized Cotton Mattresses to fit Army Bunk Beds, each \$7.95 Buy Bunk Beds complete with TWO MATTRESSES \$25.85



SHACKELFORD'S, Dept. 50, 332 E. 31st St., Kansas City 8, Mo.



TALK—SING—PLAY OVER YOUR RADIO

with the real Radio Mike! Attaches in a jiffy—full instructions given! Swell for "parties"—"cut in" on or "kid" regular network programs or put on your own broadcasts! Amaze your friends—real fun. Beautiful Metallic Plastic 6 in. high. 12 RADIO SHOW LESSONS GIVEN with each mike. SEND NO MONEY Just pay postman \$2.99 COD plus postage or send \$2.99 and we pay postage! Radio Mike is available only from us by mail—guaranteed. Midway Co., Dept. MPS-10, Kearney, Nebr.

EVERYTHING YOU NEED FOR INTERNAL CARVING OF PLASTICS

Plastic hobbyists, attention. Here under one roof you can get everything you need for carving plastics. Plexiglas plaques, cubes, and other shapes—cut to sizes you want, and expertly polished on all sides—various shaped blanks for shellcraft and engraving, tools, drills, dyes, filler, etc. Lowest prices. Rush 10¢ today for brochure.

Get 6 page brochure packed with pictures, descriptions, prices of complete line, including ready-to-carve gift items.

SEND TODAY FOR YOUR COPY! Only 10¢

D. W. COPE—Plastics 7401-P Marillac Drive St. Louis 21, Mo.

WHEELS — WHEELS

- 5" Disc Wheel 5/8" Tire 5/16" or 3/8" Sleeve..... 30c ea.
 - 6" Disc Wheel 5/8" Tire 5/16" or 3/8" Sleeve..... 35c ea.
 - 7" Disc Wheel 3/4" Tire 3/8" Sleeve..... 45c ea.
 - 8" Disc Wheel 1 1/8" Tire 1/2" Sleeve..... 70c ea.
 - 7" Disc Wheel 1" Tire 1/2" ball bearing..... 80c ea.
 - 8" Disc Wheel 1 1/8" Tire 1/2" ball bearing..... \$1.00 ea.
 - 8" Disc Wheel 2" semi-pneum. T. 1/2" B.B..... \$1.35 ea.
 - 10" Disc Wheel 1.75 semi-pneum. T. 1/2" B.B..... \$1.50 ea.
- Above wheel prices include hub cap.
- 10" Aluminum Wheel 2 3/4" semi-pneum. T. 1/2" B.B..... \$4.50 ea. Plus Postage. 20¢—C.O.D.'s accepted.

UNITED WHEEL STAMPING CO., PS-10
2756 W. 115th STREET CHICAGO 43, ILLINOIS

JEWELER'S SCREW DRIVERS



8 Jeweler's Screw Drivers. A must for every hobbyist and model builder.

Ideal for precision work, camera and fine instrument repairs. In 8 sizes—from the smallest size 9 up to size 2. Finest tempered steel blades. Lowest price!

MONEY BACK GUARANTEE IF NOT SATISFIED

ONLY \$2.00 C.O.D. \$2 plus postage, or send \$2 and we pay postage.

SET OF 8

PINE WATCH CO. 29 ELDRIDGE STREET Room 40 N. Y. 2, N. Y.

PARTS FOR MILITARY TRUCKS

4 or 6 Wheel Drive at a SAVINGS
1/4 ton to 20 ton

Parts List Available on Most
Military Trucks and Jeep Models.



JEEP TOP and SIDE CURTAINS, Complete, O.D. Color..... **\$39.50**

TRAILER AXLES 12,000 lb. capacity, Duals..... **\$69.50**

WINCH CABLE—1/2", 200 ft. **\$25.00** 250 ft. **\$30.00**

Hundreds of Other Truck & Jeep Parts and Supplies

All prices quoted good 30 days FOB, Kansas City, 25% Deposit Required on All Orders.



UNITED AUTO PARTS CO. INC
1901 TROOST-GR.1800-KANSAS CITY, MO.

ARTISTS MAKE MONEY

DO YOU LIKE TO DRAW?

Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, INC.

10149 Art Instruction Bldg., Minneapolis 15, Minn.



BUILD YOUR OWN ENLARGER

Enjoy Photography's most fascinating hobby at a fraction of usual cost. With simple step-by-step instructions and diagrams plus a screwdriver and pliers you assemble your own Enlarger and Save! Get all features of more expensive Enlargers: precision machined aluminum alloy castings, 90° tilt for wall projection of prints, spherical aluminum lamp-house, helical rack and pinion focusing with extra large knobs, unconditional guarantee. For 35mm to 2 1/4 x 3 1/4 negatives. Time payment plan.

Write Today for Free Illustrated Folder

CALIFORNIA TECHNICAL PRODUCTS CO.
448 So. Hill, Dept. K-10, Los Angeles 13, Calif.

WHAM-O SPORTSMAN*

HITS LIKE A .22 RIFLE—
KILLS RABBITS, SQUIRRELS,
For Hunting, Target,
Routing Posts.

\$1.00
postpaid

Dealers
Write



A man's sport!

Powerful, silent, accurate.

Complete with 40 pellets and extra
rubber straps. Send \$1.00 today to—

Wham-O Mfg. Co., Box 135, South Pasadena, Calif.

*PROFESSIONAL MODEL USED BY MEMBERS OF NAT'L SLINGSHOT ASSN

ARC WELDING FOR PROFIT OR PLEASURE

60 LBS. OF READY MADE PARTS

Only
\$24.95

**BUILD YOUR OWN
HEAVY DUTY WELDER**

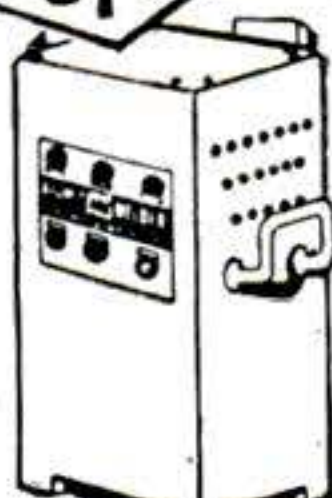
SAVE
BUY ONLY
NECESSARY
PARTS

All parts Ready-Made and easy to assemble. You can do all around welding on steel, cast iron and other metals after only a few hours practice. Illustrated instruction manual included. Sold on 30 Day Money-Back Guarantee!

FREE: Write today for fully illustrated Pamphlet S-9.

ATOMIC ARC WELDER CO.
1039 So. 39th St., OMAHA, NEBR.

Gives
100%
penetration. Welds are
stronger than original
metal. Operates on 110
or 220 AC.



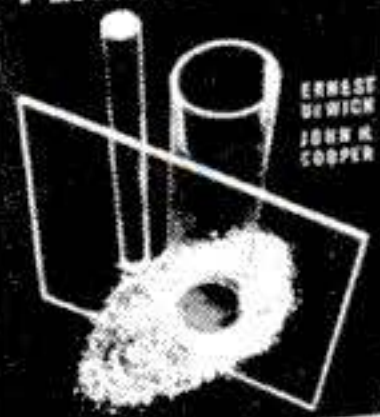
THIS IS YOUR SEASON — CASH IN ON IT!

Any man with a tool can do wonders for his pocketbook before Christmas with . . .

PLASTIC CRAFT

This book gives you hundreds of dollars worth of ideas, designs, and complete, illustrated directions for making readily saleable Christmas gifts.

PLASTIC CRAFT



With the tools you have and inexpensive materials you will get beautiful results.

Get a copy of this book today and see how easily you can make all kinds of gifts for all ages and tastes — useful, beautiful, colorful. When most people are spending money, you can be making it—and contribute to your own Christmas as well.

SEE IT ON APPROVAL

The Macmillan Co., 60 Fifth Ave., New York 11

Please send me a copy of PLASTIC CRAFT. I will either remit the price—\$5. or return the book within 10 days.

Signed.....

Address.....

S

THE PICKWICK "SPRING-BOOSTER" WILL MAKE YOUR 1935-48 FORD OR MERCURY

Ride easier and quieter with a Pickwick "Spring-Booster" on your Ford or Mercury. Install it yourself. Adds pep to tired springs—smooths the ride—equals new springs plus shock absorbers. Send money order or check for your "Spring-Booster" today. Immediate shipment!

RIDE EASIER,
MINIMIZE RATTLES

\$9.97

Including Excise Tax

WE PAY SHIPPING CHARGES IN CONTINENTAL U.S.A.



10 DAY TRIAL
MONEY REFUNDED
IF NOT SATISFIED!

The PICKWICK Company

221 THIRD ST. N. E.

CEDAR RAPIDS, IOWA

OVER 500 WAR SURPLUS BARGAINS!

WAR SURPLUS CATALOG

NEW! GOVT. SURPLUS CATALOG FREE!

FLYING JACKETS



TYPE B-3
Fine seal brown leather. Adjustable waist and collar straps. Sheep lined. Zipper closure. Reconditioned. Sizes 36 to 46.

\$15⁹⁵

TYPE D-1 FLYING JACKET
Similar to above but lighter in weight. Reconditioned. Small, medium, large. **\$8⁸⁸**



New U. S. NAVY 2 pc. STORM SUITS
2 pc. suit with parka hooded jacket and cover-all bib-style pants. OD color. Waterproof, windproof, -lightweight, plastic resin-coated fabric. Pants have zipper fly, button flap, pocket. Sizes, Med., Lge., Ex. Lge. For sportsmen, hunters, fishermen. **2 pc. suit \$6.88**
Parka only 3.88. Pants only 3.49

Mail orders add 10% for packing and shipping. Send deposit or check with order. Every item guaranteed as advertised.

HONEY OF THE TANK CORPS TANKER JACKET



36-46.

Poplin outer shell. 100% wool OD lining, wool knit semi-turtle neck, wristlets and bottom. Zip front, slash pockets. **\$8⁸⁸**

ORDER NOW!

GENUINE ARMY BLANKETS

Finest 100% wool blankets issued! Soft, soil resistant nap. Olive drab, cleaned, guaranteed perfect. This quality in civilian colors sells for \$12.50. Wgt. 4 lbs. **\$3.88** 2 for \$7.50

BRAND NEW O. D. ARMY BLANKETS
Right out of orig. govt. cases. Size 68"x86". 4 lbs. **\$5.88** 2 for 11.50

FISLER SALES CO. 723 Walnut St. Kansas City 6, Mo.

BE AN AUTO MACHINIST



Draw Top Pay • No Job Worries

Earn more money in auto mechanics—Specialize! New FREE booklet tells how to prepare for good jobs with high pay and job security. Our modern equipment and practical instructions make it easy to learn—get experience in:

ENGINE REBUILDING or GENERAL AUTO MECHANICS

VETERANS American is a G.I. approved school.

Job Placement Service FREE

PLANNING YOUR FUTURE IN AUTO MECHANICS

WRITE TODAY FOR FREE BOOKLET

AMERICAN TRADE SCHOOL 2407 McGee Kansas City, Mo.

Learn ACCOUNTING BOOKKEEPING

This nationally renowned school has demand for graduates in good salary positions thru Nationwide recognition and placement service. Write Department PSE today for Big 32 page Success Book to be sent to you **FREE**

Hills BUSINESS UNIVERSITY AND EXTENSION SCHOOL 619 W. MAIN ST. OKLAHOMA CITY 2, OKLAHOMA

HOW TO MAKE MONEY IN PLASTICS

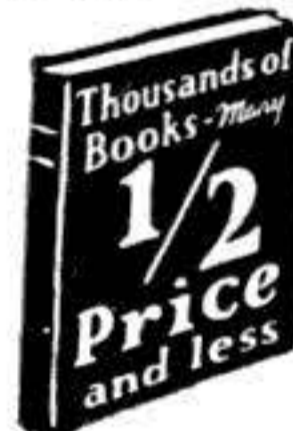
Learn Plastics at home, in spare time.

You get 7 Big Plastic Material KITS with training course. Make useful, valuable articles as you learn. Send for free illustrated catalog today.

PLASTICS INDUSTRIES TECHNICAL INSTITUTE

Dept. of West Coast University 1601 S. Western Ave., Dept. PS-109, Los Angeles 6, Calif.

ANY BOOK IN PRINT



Delivered at your door. We pay postage. Standard authors, new books, popular editions, fiction, reference, medical, mechanical, children's books, etc. Guaranteed savings. Send for Clarkson's 1950 catalog.

Write for our great illustrated book catalog. **FREE** A short course in literature. The buying guide of 300,000 book lovers. The answer to your Christmas gift problem. Free if you write now—today!

CLARKSON PUBLISHING COMPANY Dept. PS-8, 1257 So. Wabash Ave., Chicago, Ill.

BE A NOTARY PUBLIC

Get paid for life for signing your name. Old legal-supply house, 22 cities. helps you get your appointment by governor if you qualify. No training needed, no course to study. As a public notary your signature is important; you certify legal papers by signing, get paid. Money intake grows as you become known. Like compound interest. Income steady for life. We equip you completely. Pay us after you are appointed—2 payments \$12.50 each. That's all. Details free.

STATIONERS EXCHANGE Boerne 30, Texas

500 Pages, 7000 Novelties

Send 10c for mammoth, amazing catalog of 7000 novelties. 1-inch thick, roto picture section, 6-color cover. Carnival, circus, world's fair & science exhibit rolled into one! Includes live animals & pets, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, telegraph sets, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, experimental sets, auto & bike accessories, Western wear, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, money makers, swimming helps. 1000 fascinating books, games, locks, live chameleons, rings, exercisers, curious plants, etc., etc., etc. (DeLuxe Hard Bound Library Edition 25c Postpaid.) Regular paper covered edition 10c. (Stamps accepted.) Sent Air Mail, \$1.00. JOHNSON SMITH & COMPANY, Dept. 163, DETROIT 7, MICHIGAN

FIND OUT FREE!

HAVE YOU GOT WHAT IT TAKES?



SUCCESS
HOME STUDY
WILL TO WIN
CHARACTER
HEALTH

to be a FINGER PRINT EXPERT or TRAINED INVESTIGATOR?

Send for free IAS Qualification Questionnaire. If in our opinion your answers indicate that you "have what it takes," then you will receive absolutely free the famous "Blue Book of Crime" . . . plus full details on how to train at home in Crime Detection and Finger Printing! IAS graduates are key men in over 800 Police Bureaus. See if YOU can train for this exciting, steady, "good pay" work! No obligation. No salesman will call. Write today, stating age.

INSTITUTE OF APPLIED SCIENCE 1920 Sunnyside Ave., Dept. 1367, Chicago 40, Ill.

INSTITUTE OF APPLIED SCIENCE 1920 Sunnyside Ave., Dept. 1367, Chicago 40, Ill. *

Gentlemen: Without obligation or expense on my part, send me your qualification questionnaire. I understand that upon receipt of my answers you will immediately advise me if you think they indicate that I have a chance to succeed in criminal investigation or finger print work. Then I will receive FREE the "Blue Book of Crime," and information on your course and the 800 American Identification Bureaus employing your students or graduates.

Name _____
Address _____ RFD or Zone _____
City _____ State _____ Age _____

LEARN MEAT CUTTING EASILY - QUICKLY

At Home-In Spare Time



The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, selling—a complete meat education. For beginner or men with ex-

perience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. 0-83, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Merchandising. No obligation. No Salesman will call.

Name.....

Street.....

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

TODAY'S BIGGEST PREFAB BOAT BUY

Build a better boat than you can buy! Save up to 55%. See OZARKA's Model 12-A—a trim, top-quality 12-footer with laminated rib construction, all oak frame, for years of boating pleasure with motors up to 16 H.P. A cinch to assemble, a joy to own. Send 10c for descriptive literature. OZARKA . . .

\$73.50
COMPLETE

7129 Borden St. Woodstock, Illinois



SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs; no symbols; no machines; uses ABC's. Easy to learn; easy to write and transcribe. Low cost. 100,000 taught by mail. For business and Civil Service. Also typing. 26th year. Write for free booklet to:

Speedwriting
Dept. 2610-9, 55 W. 42 St., New York 18 (R)

HYPNOTIZE

ANY ONE!



BE THE LIFE OF THE PARTY!!!

Make your friends do all sorts of funny things. Have them under your control. Learn modern speed hypnotism. SECRETS REVEALED! EXCITING EXPERIMENTS. Also helps you to overcome inferiority complexes, smoking, alcoholism, stuttering, nail biting, phobias, insomnia, stage fright. Improves your memory. HELP OTHERS. Anyone can learn this fascinating subject.

Complete Home— \$195 12" Hypnotism record (2 sides) inducing mass hypnotism and self-hypnosis. \$495
Study Course Outside U.S.A. add 20%

MAJOR SYSTEM, 5225 Hollywood Blvd., Dept. 15, Hollywood 27, Calif.

U. S. GOVERNMENT JOBS!

AS HIGH AS \$3,351 FIRST YEAR
RAILWAY POSTAL CLERKS



Veterans Get Special Preference

Many other Government Jobs. City and Rural Carriers
—Postoffice Clerks—
Meat Inspectors—Accountants—Stenographers
—Typists—etc. Prepare now for next Examinations.

FRANKLIN INSTITUTE
DEPT. W80, Rochester 4, N. Y.
(Not Government Controlled.)

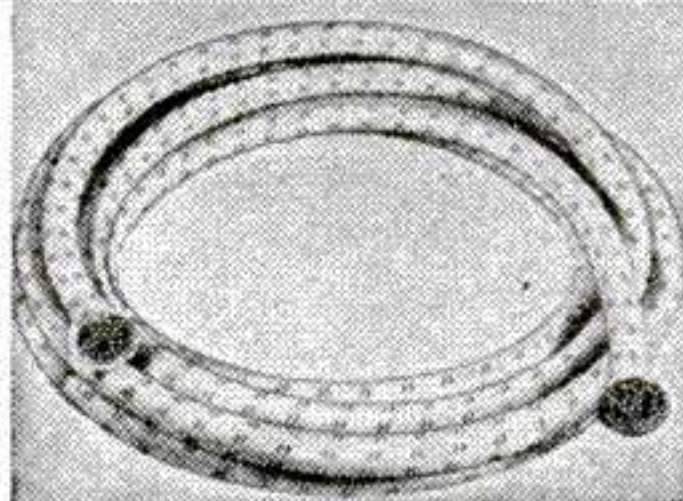
Sirs: Rush to me, without charge, copy of 40-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

Name

Address Vet?.....

UP TO 80% SAVINGS ON WAR SURPLUS

LT. WT. ALUMINUM PIANO HINGE
 Length 72 inches, thickness .040—width 1 1/4"—Operating radius 275 degrees. Made of aluminum alloy, sold in 6 feet lengths only—\$1.14 per length....



LIVE RUBBER SHOCK CORD
 Made in accordance with rigid army specification. Clean fresh stock. 5/8" contains approx. 500 strands of live rubber, 3/8" approx. 100 strands, 1/4" approx. 40 strands. Sold in 25 ft. lengths or more. At about 20% of original cost.

DIA.	PRICE (per 25')	Ship. Wt.
1/4"	\$1.00	2 lbs.
3/8"	\$1.25	2 lbs.
5/8"	\$1.75	3 lbs.

HEAVY DUTY STEEL PIANO HINGE

Length 56"—Thickness 3/32"—Width (open) 3-5/16"—Operating radius 330 degrees—Made of heavy duty steel—Drilled ready for use. Ideal for drop tables, heavy tool boxes, heavy doors, and many other uses where heavy hinges are required. Sold in 56" lengths only. Ship. Wt. 7 lbs. At a fraction of original cost.... **\$1.45**

HEATING ELEMENTS
 For home made photo print dryers, chicken brooders, etc. Wiring diagram for use on 110-volt; 50 watts each. Each element 1 1/2" x 2 1/4" x 3/16". Set of four.... **96c**

NEW 10 1/2 x 4 WHEEL ASSEMBLY

6 ply tire 10" high, 4" wide plus new tube plus 4" ball bearing wheel with grease fitting. Uses 5/8" axle. Ideal for midget soap-box racers, wheel-barrows, trailers, etc. Ship. wt. **\$9.95**
 8 1/2 lb. ONLY....

6 VOLT DOUBLE SHAFT MOTOR

1/30 horse-power motor made by Delco. This is a 6 volt D.C. motor with two 1/4" shafts, used on Auto Heaters, Auto Fans, etc. Ideal for use in the shop, garage, and wherever 6 volt D.C. is available. RPM 3700. Ship. wt. 3 lbs. List price is \$4.20, our price is a real money saving buy. Our price, only **\$2.95**

Prices F.O.B. Chicago. Include approx. postage on orders paid for in advance. C.O.D. orders enclose 25%, balance sent C.O.D. WRITE FOR FREE ILLUSTRATED CIRCULAR.

U. A. S. Corp. Dept. PS-10 5637 W. 63rd Pl. Chicago, Illinois

Train for BIGGER PAY in REFRIGERATION AIR CONDITIONING

GET FREE BOOK! Prepare yourself for a fine paying job. Trained men find opportunities installing and servicing Refrigeration and Air Conditioning. Get practical training in spare hours at home—plus four full weeks in the great ITI shops. Job Placement Help. FREE BOOK. Write Industrial Training Institute 2130 Lawrence Avenue Dept. B-2 Chicago 25, Ill.

NOW HE HAS

WHAT LOOKS ALMOST LIKE

A NEW SKIN

He Got It Quickly At Home This New Simple Way

Read FREE Offer

Thousands like him, including girls and older men and women, who suffered humiliation and lack of success in business and affairs of the heart, because of a bad looking skin, can now rejoice over this good news. A new way has been found anyone can do at home, for removing that blemished or old looking external layer on the skin called the epidermis, easily, and often in a few days time. And now, a new TREATISE is being sent to all readers of this paper who need it, in plain wrapper, prepaid. Just send post card or letter requesting the FREE TREATISE. Address WILLIAM WITOL, Dept. B-18, Valley Stream, N. Y. If pleased, tell friends.

How to get BETTER FINISHES

Do Like Professionals. Use "TACK CLOTH" Before you PAINT or VARNISH

If you paint, varnish or lacquer woodwork, furniture, etc. at home, "TACK CLOTH" is the professional's secret of a slick, smooth, glistening finish every time. Used by all large industrial finishers. Just wipe over surface and remove every trace of lint, dust, sand, or dirt. No more specks, spots or rough places to mar your finishes. To introduce to Home Users, send only **4 \$1** for 4 large 18" x 36" "TACK CLOTHS". **BAUGHN CHEMICAL PRODUCTS CO.** 7025 N. Ravenswood, Dept. 310, Chicago 26, Ill.

LEARN LEATHER CARVING EASILY AT HOME—FOR PROFIT AND FUN

The age-old secrets of the leather-carver's art have been handed down for generations in only a few skilled families. But now the craft is taught by F. O. Baird, nationally-known authority. Mr. Baird supervises every lesson in the complete course. His Carv-A-Plate comes with the course, makes it easy for you to learn to carve beautiful work on belts, handbags, wallets, etc.—for yourself, for gifts, or to sell for BIG PROFITS!

NO ARTISTIC ABILITY NEEDED

The Baird Course shows you how to develop designs, gives you dozens of beautiful patterns to work on. Short cuts, practical tips, how to select leather, etc.—all combined in step-by-step instruction that makes it easy for you to learn this fascinating, highly profitable art.

WRITE NOW FOR COMPLETE INFORMATION

BAIRD School of Leather Carving 221 Manitou Avenue, Dept. S-10 Manitou Springs 3, Colorado

<p>10 different size HIGH SPEED STEEL Morse Taper Shank Drills (used surplus) up to 1', with one 2 to 3 Morse Taper Drill Sleeve. Over \$40 worth of drills for only \$6.25</p>	<p>BLACKSMITHS TONGS 18" heavy duty. Price.... \$1.59</p>	<p>10 ASSORTED PUNCHES Drift, center, etc. Also one 6" diamond point punch. All in handy canvas bag. Price.... \$1.00</p>
<p>SOCKET ACCESSORIES 1/2" drive speed handle, "L" handle, sliding "T" handle and breaker. New and used. Price.... \$1.75</p>	<p>AUTO ACCESSORIES One Schrader tire gauge, one carbon scraper, two spark plug wrenches (fits four sizes) and one clean-out brush. Mixed new and used. Price.... \$1.00</p>	<p>RAWHIDE MALLET 1 1/4 x 5" leather head bound in metal collar. Price.... \$1.00</p>
<p>SCHRADER HYDRAULIC PRESSURE GAUGE #8315, 20 to 120 lb., new, \$5.00 value for only \$1.69. Over 5000 other new gauges of all popular makes and pressures. Write for catalog.</p>		
<p>MAKE YOUR JACOBS CHUCK LIKE NEW with a new set of jaws and nuts. #7 or 7B for 1/4" chuck—\$1.00. #3 for 17/32" chuck—\$2.00. #36-36B for 3/16 to 3/4" chuck—\$2.75. These are offered at approximately 1/2 price and are brand new in original factory carton. Full instructions enclosed.</p>		
<p>All merchandise here listed whether brand new or used surplus is offered with a money-back guarantee of satisfaction and is shipped POST PAID. Send us your requirements for drills, taps, milling cutters, dies, etc. priced at a fraction of their original cost.</p>		
<p>T & T TOOL CO. 101 W. Archer TULSA, OKLA.</p>		

NO SHOP
NEEDED

Operate YOUR OWN Business



Clean and Mothproof Rugs and Upholstery

SEE OUR COLUMN SERVICE "AD" IN OCTOBER LIBERTY

Can you qualify? . . . If you are dependable, honest and willing to work, send for FREE Booklet explaining how you can become "your own boss" in a growing business of your own. You'll use proven successful methods of established DURACLEAN Dealers. Service rendered "in the home," offices and public buildings. Easy to learn. No experience necessary.

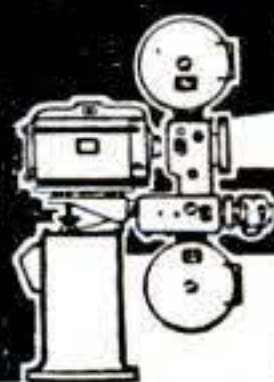
DURACLEAN cleans by absorption! No scrubbing. No soaking or shrinkage. Fabrics dry in just a few hours. Dirt, grease and many unsightly spots vanish as if by magic . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF kills moths and carpet beetles. Makes material resistant to both! Another year 'round service. DURAPROOF, to our knowledge, is the only moth proof service backed by a National Money Back, 4 YEAR WARRANTY of protection. Also rendered "In the Home," at your customer's convenience.

These services are Nationally Advertised! Leading furniture and department stores recommend DURACLEAN Dealer's service. Almost every building in your territory houses a potential customer. Even auto dealers buy your service to revive upholstery in used cars. You get many voluntary and repeat orders.

Some dealers establish a shop or an office after business has grown. Others continue to operate from their own home. Profits up to \$15 and \$20 for a day's service on EACH of your service men. Territories are limited! Write now for FREE Booklet explaining details of these Nationally Advertised services.

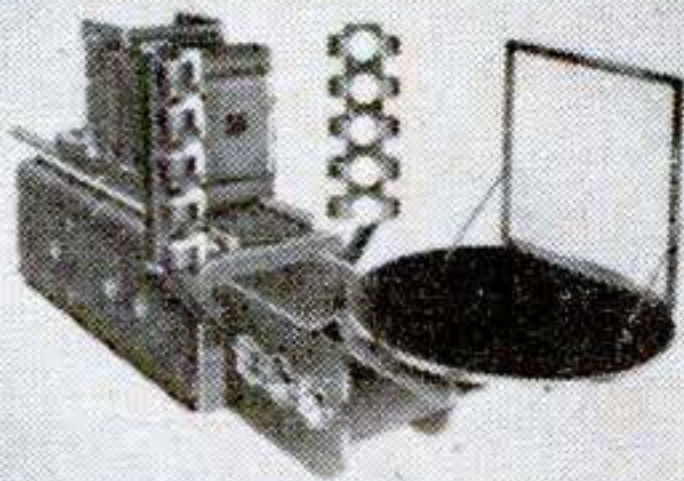
Duraclean Co., 9-180 Duraclean Bldg., Deerfield, Ill.



LEARN MOVIE PROJECTION THEATRE MANAGEMENT

The Motion Picture Theatre Business offers big opportunities for trained men. Get into a fascinating field with a promising future. Train at home in spare time. Free Catalog. Established 22 years.

THEATRE INSTITUTE, 385 Washington St., Elmira, New York



BE A PHOTO-ENGRAVER

We furnish complete equipment and supplies. Learn at home or in our modern, friendly APPROVED school in MISSOURI. Get into this big demand, high profit, high wage field. You can start your own profitable, full time or part time PHOTO-ENGRAVING business right in your own home.

THE AURORA SCHOOL OF PHOTO-ENGRAVING, DEPT. PS-10, TASOPÉ BLDG., AURORA, MO.

Be independent, be your own boss or pave the way to a high pay job with experience gained in your own shop.

TASOPÉ TRAINING and TASOPÉ EQUIPMENT has enjoyed world wide recognition since 1931. Write for descriptive literature today. No obligation.

Shoe Repairing Hat Cleaning & Blocking

Prepare quickly in one of the finest and best equipped schools. Practical shop work and shop management taught by experts. Widespread need for trained men in this good pay field. Get the facts. Write today.

Practical Shop Training

COMPLETE YOUR TRAINING IN ONLY 12 WEEKS in Hat Cleaning and Blocking. As a trained man you can start your own business with very little investment. Pay in this field is good, fine opportunities for steady jobs. "Learn-By-Doing."

Prepare for Good Job or Own Business in One of These Big Fields



Help in finding part time work while a student, employment service to graduates. No minimum educational requirements since these are practical courses. Training in large, modern brick building.

Largest and Best equipped School of its kind in U. S.
G.I APPROVED PAYMENT PLAN FOR NON-VETERANS

Mail Coupon Today for Free Information

CHICAGO SCHOOL OF SHOE REBUILDING, 124 E. 26th St., Dept. PS-10, Chicago, Ill.

CHICAGO SCHOOL OF SHOE REBUILDING
124 E. 26th St., Dept. PS-10, Chicago, Ill.

Please send me information and free facts about the course I have checked.

() Shoe Repairing () Hat Cleaning & Blocking

Name

Address

City State

EARN MORE IN DRAFTING



STEADY
EMPLOYMENT
●
MORE OPPORTUNITIES
FOR PROMOTION

"Here I am at work making good money as a draftsman. I'm glad I sent the coupon to Chicago Tech for that Free Trial Lesson and found out how easy it is to learn Drafting in spare time at home. Today I feel secure in my job because the draftsman's work comes first on any new project. And, in addition, draftsmen can't be replaced with machines. What's more, I feel I'm slated for promotion and more pay, because I see so many draftsmen advancing to high-pay jobs."

LEARN IN SPARE TIME—AT HOME!

(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. No interference with your present job. All the tools you need; drawing outfit included. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 45 years of C.T.C. progress—prepares men quickly for good positions in industry.



FREE INFORMATION—SEND COUPON

To prove to you how easy it is to learn Drafting at home by the Chicago Tech method, we will send you this FREE TRIAL LESSON. No charge for this lesson, now or later. Fill out and mail coupon, or send post card today.

CHICAGO TECHNICAL COLLEGE

N-226 Tech Bldg., 2000 So. Michigan Ave.,
Chicago 16, Illinois

Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name Age

Address

City Zone ... State

Lafayette

RADIO ELECTRO NEWS

★ 29th YEAR SERVING AND SAVING YOU MONEY

NEW YORK: 100 Sixth Avenue and 542 E. Fordham Road
 CHICAGO: 901 W. Jackson Blvd. and 229 W. Madison St.
 BOSTON: 110 Federal Street NEWARK: 24 Central Avenue
 ATLANTA: 265 Peachtree Street

Best Buys You Can Get—Now Yours From Lafayette CATHODE RAY TUBE



Brand new 5BP1 cathode ray tubes, perfect for oscilloscope use. Green fluorescence with medium persistence. Large five-inch screen, medium shell magnal 11 pin base. 6.3 volt heater, anode No. 2 voltage 2500 volts. Each tube is

individually boxed. Weight 3 lbs.

No. 99N9559.....Lafayette's Price Only **\$2.95**

AMAZING INSTANT-HOT SOLDERING IRON



(a real hot tip!)

Flick the switch and it's *soldering-hot in split seconds*. Heat is concentrated in flat non-corrosive nickel alloy tip. No filing or tinning necessary. Weighs only 6 ozs.; fine for hard-to-get-at places. ON-OFF switch in easy-grip plastic handle. Pays for itself over and over in time saved. AC-DC.

No. 18H15189—List Price \$7.95 Lafayette's Price Only **\$5.30**

"SELF-POWERED" PHONE SYSTEM

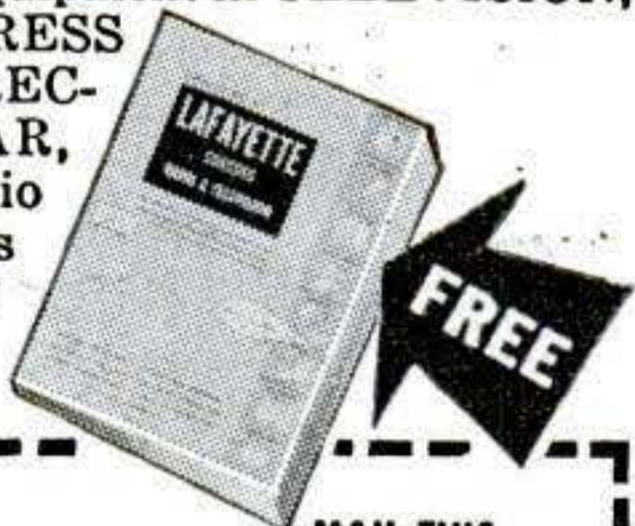


No batteries or current needed! The power for this phone system is generated by your voice alone! You can have perfectly clear 2-way conversations as far as 25 miles apart! Ideal where you need a portable communications system that can be quickly set up. Especially useful when installing TV antennas, because you can use the antenna wire as the phone line! Also practical for intercom use around the home, shop, farm, or office. They're being snapped up at Lafayette's bargain price.

No. 32H14015 (Weight 1½ lbs.) **\$8.75** per phone

FREE! 164 PAGE BARGAIN CATALOG NEW 1950 EDITION

Why pay more when you can buy for less from Lafayette's New 1950 Bargain Catalog, just off press. 164 pages packed with latest model, famous-make equipment in TELEVISION, RADIO, TOOLS, PUBLIC ADDRESS SYSTEMS, HIGH FIDELITY, RECORD CHANGERS, HAM GEAR, PARTS, etc. Thousands of radio men will save millions of dollars buying from Lafayette this year—as in the past 29 years! A letter or penny postcard brings yours.



MAIL THIS FOR FREE CATALOG AND TO ORDER

- Check here for FREE Catalog. (Please don't check if already on our mail list.)
- Please fill my order for items checked above for which I enclose \$..... in postal note, money order or check. Please enclose shipping charge based on weight and zone.

NAME.....
 ADDRESS.....
 CITY..... ZONE..... STATE.....

BE STRONG USE BARBELLS

95 POUND SET
 Only \$10.80
 Extra Plates 10c. pound

Send for our **FREE** Barbell Catalog.

We have been selling the finest barbell equipment since 1928. We operate our own foundry and sell direct to you at a very low profit. No other company can match our low prices.

BUR BARBELL CO.
 LYNDBURST 10,
 NEW JERSEY

Repeating Slingshot

ACCURATE! • POWERFUL!

Engineered to shoot BB shot, same as an air rifle. Shoots through 100-page magazine. Easy to carry in your pocket. Holds 150 BB's. Precision-made for accuracy. Target practice and small game hunting. Send \$1.00 and we will include 100 BB's. No C.O.D.'s.

THE SLINGO CO.
 Dept. V-10 Alexandria, Va.

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! No obligation. Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in our classrooms in big cities. Diploma awarded. G.I. approved. Nationally known.

WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
 15 E. Pershing Road Dept. PS Kansas City, Mo.

FREE BOOK TELLS HOW

SUIT YOURS AS A BONUS

And Big Money in Spare Time, Too

We want you to wear this fine made-to-measure suit! Make it yours by sending a few orders, and earn BIG CASH PROFITS in spare time. Your suit will help you get more orders with over 100 rich, quality fabrics, tailored-to-measure to newest styles. Also Ladies' Tailored Suits—complete line. Write today for FREE SAMPLES. No experience, no money needed. For quick action tell us about yourself.

J. C. FIELD & SON, Inc.
 Harrison and Throop Sts., Dept. X-1721, Chicago 7, Ill.

TIGHT SHIRT COLLAR LET-OUT RELAX NOW

NO MORE TIGHT COLLARS COMFORT WEARING SHIRTS THAT SHRINK


Button flexible loop to shirt collar button, then button let-out to collar button hole. Silk with opal white plastic, 15 cents each; two for 25 cents; 9 for \$1.00. With elastic loop, 20 cents each; 3 for 50 cents; 7 for \$1.00. Postpaid. Money refunded if not pleased. Dept. 4, COY CRAFT CO., 103 Main Street, Peoria, Ill. Save shrunken shirts. **CARD JOBBER SALESMEN WRITE.** COPR. C.C.C.

Locksmithing & Keymaking

PRACTICAL HOME TRAINING OUTFIT INCLUDES EVERYTHING NECESSARY TO GET STARTED IN YOUR OWN BUSINESS

Excellent full or part time earning opportunities. Professional outfit includes supplies, tools, key cutting machine. Get practical training from Master Locksmiths on house locks, auto locks, padlocks, etc. Learn to cut keys by code, master locks, change combinations, quickly identify key blanks, many profitable "tricks of the trade." Booklet of Information FREE. Write today.

UNITED SUPPLY & SERVICE
 3327 Madison St., Dept. PS-10 Chicago, Illinois



ELECTRIC APPLIANCES REPAIRED YOUR NAME

Start YOUR OWN BUSINESS!

Repair electrical appliances of friends and neighbors. Service electrical equipment in factories, stores, etc. Work full or part time! New Shop Method home-training system. Rush name today for **FREE BOOK** and special form for getting Electronic Kit, Special Service Kits, Armature Growler, Illustrated Instructions on new easy-payment plan. Pay us later with your **EARNINGS WHILE LEARNING**. Rush name.

CHRISTY TRADES SCHOOL
4432 N. Kedzie, Dept. D-8201, Chicago 25

BE A BROADCASTER

Learn at Home A.M., F.M., Television. Train with America's foremost school of Broadcasting. Training includes instruction on announcing, producing, directing, newscasting, commercials, script writing. We want to help you get started now. **Send only \$1.00 for first lessons and free information**. If not satisfied, return within 10 days and your money will be refunded.

BROADCAST PRODUCTIONS 25 East Jackson Blvd. Dpt. PS-10 Chicago, Ill.



GENUINE BRAND NEW GOV'T SURPLUS

Excellent for Ice Fishing, Outdoor Wear, Hunting and Sportswear

ORDER BY MAIL

A-8 Down-filled Flight Pants, size 40. Fits 34 to 40 waist.	\$8.95
A-11 Alpaca-lined Flight Pants, size 30-32. Fits 34 to 40 waist.	5.95
N-1 Blanket-lined Bib Pants. Small, medium or large size.	4.95

Write for **FREE** Surplus List

Shipped Postpaid Except C.O.D. *These items cost Gov. over twice these prices.*

BEN'S SURPLUS 138 Michigan St., Dept. A-1 Grand Rapids, Mich.

"How to Make Money with Simple Cartoons"

A book everyone who likes to draw should have. It is free; no obligation. Simply address **FREE BOOK**

CARTOONISTS' EXCHANGE
Dept. 1910F Pleasant Hill, Ohio

NEW 1949 Plastics Supplies Catalog

Just off press. Full details on Plexiglas, Lucite, rods, sheets, tubes. Acetates, cements, dyes, buffs, molding sets, tools, carving kits, accessories. Everything in plastics. Gives prices, sizes, colors, etc. Price 10c, stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP.
Dept. PS-10 4707 Euclid Ave. Cleveland 3, Ohio

"IDEAL" PRECISION RANGE FINDER

Get professional, sharp, clear pictures from your movie or still camera with the beautiful precision built "IDEAL Range-Finder." Easy to use—guarantees perfect focusing. Works the same as \$15.00 models. Highest quality optical system. **Only \$2.95** Incl. Tax

Three year guarantee with each instrument. At your dealer or send \$3 postpaid to:

FEDERAL INSTRUMENT CORP.
14-02 Broadway, Dept. 10, L. I. C. 6, N. Y.



WAR SURPLUS


BIGGEST BARGAINS IN YEARS

ELECTRIC MOTOR. 1/2 H.P. 27V D.C. R.P.M. 4000, No. 750 for intermittent or continuous duty 5/8" shaft. **VARIABLE SPEED MOTOR.** Can be adapted to 110 Volt A.C. or R.E.A. line by re-arranging armature brush leads. **UNUSED.** Instructions incl. **\$5.50**


HAND HYDRAULIC PUMP BRAND NEW. Use it for hydraulic jacks, presses, hoist, etc. For operating hydraulic cylinders, to pump oil or hydraulic fluid under pressure. Ruggedly constructed, built by WEAVER. The handle is telescoping, length variable from 12" to 20". Has built in check valve and is capable of delivering 1000 lbs. of pressure. Dimensions, 8" long x 6" high x 4" wide. Wt. 10 1/2 lbs. **\$8.50**
A \$50 value, directions incl. Now..



VICKERS CONSTANT DISPLACEMENT HIGH PRESSURE PUMP. Use it for any type liquid pumping job. 375 gal. per hr. at 3750 R.P.M. 1000 pounds pressure per sq. in. Can be used as hydraulic motor. O. Acq. cost \$100 **\$8.95 post paid**
Brand New. Wt. 7 lbs. Directions incl.
Brand new check & Relief valve adjustable **\$2.50 post paid** for any pressure.
VICKERS UNLOADING VALVE. Brand New—By passes full amount output of the pump while the cylinder is not in operation. Takes starting load off of electric motor driving the pump. Price. **\$4.95 post paid**



BRAND NEW HYDRAULIC CONTROL VALVE. This is a **TWO CYLINDER DOUBLE ACTION VALVE** with unique arrangement allowing the operator to raise both cylinders simultaneously, to lower them simultaneously, or to raise one and lower the other at any predetermined rate and speed. **BRAND NEW.** **\$9.95 post paid**
A \$75.00 value.



SPEED REDUCERS. G.E. 10 to 1 ratio, or 5 to 1. Shaft Driven 1/2" spline Shaft. 3 mounting holes 5/16". Unused Ea. **\$3.95**

LUBE PUMP. Brand new precision Gear Impeller pump. Pumps liquid up to 3 G.P.M. Pressure up to 200 lbs. per sq. in. For high vacuum, air pressure, operating Hydraulic units, etc. St'd. 1/2" threaded and keyed. Shaft Instructions incl. **\$4.50 post paid**


Dynamotor New Model PE-73-CM. Input 28 Volts A 19 Output 1000 V. D.C. 350 MA G.E. Wt. 38 lbs. **\$4.95**

Dyn Type S-3416 Input 9 V. Output 400 V. .7 Amps and .08 Amps wt. 6 lbs. Ea. **\$2.50 plus postage**

Dyn. New Model 23350. Input 27 V. D.C. Output 285 V. D.C. Ea. **\$1.75 postpaid**

Sensational Fascinating Mysterious SELSYN. Two or more connected together work perfectly on 110V A.C. For weather vanes, rotating directional antennas or controlling distance operations. Complete with diagram and instructions. (wt. 3 1/2 lbs.) **PER PAIR \$3.50 Plus Postage**

NEW PUROLATOR GASOLINE FILTER Aircraft type for all cars, trucks, tractors and boats. Install in a few minutes. Permanent, needs no replacements. Instructions incl. Ea. **\$4.95**



NEW CUNO OIL FILTER aircraft type. Filters oil without cartridge replacements. For Autos, Trucks, etc. Install at home in a few minutes. **STOP CHANGING MOTOR OIL.** Instructions incl. **\$4.95**
Ea.

Send check or money order. No c.o.d's. Prices f.o.b. K.C.
Write for hydraulic listing.

GENERAL SALVAGE COMPANY
Dept. 27, 2922 E. 27th St. Kansas City, Mo.



SANDEE

Mufflers—All Ford, Chev., Ply. **\$4.45**
All Buick, Pont., Olds., Chrys.,
Dodge, Hudson, K.F., Pack., etc. **\$5.45**
V-8 and Merc. Duals
(32-49 incl.)
\$15.95

SPORTONE MUFFLERS
(Pats. Pend.)

DURABILITY **SPORTONE TONE** **DEALERS WANTED**

Beautiful **SANDEE** Fender Skirts **\$16.95**

A **SANDEE Sportone** will outlast two ordinary mufflers and give More Power! More Speed! More Mileage!—plus a tone quality unsurpassed.

Please ship (item): _____ Price: _____
Car and Year _____ Name: _____
Address: _____

SANDEE MUFFLER CO. 5643 Corryne Pl. Culver City, Calif.

NOW...SPRAY WAX

your CAR in 5 MINUTES



New
**PUSH-BUTTON
SPRAY WAX!**

**NO RUBBING!
NO POLISHING!**

Save time—save money! A touch of your finger and **PRESTO...MARLEY SPRAY-GLOSS AUTO WAX** releases a pure protective **SPRAY** of real hard wax—applied to the entire car in a jiffy! **MARLEY SPRAY-GLOSS** is a first grade Carnauba wax that never chips, peels or water spots... dries to a brilliant finish without rubbing. Gives your car the same long-

\$1.49
ea.

lasting professional wax job that usually costs \$15. Twelve ounce dispenser, sufficient for three complete car waxings.

ORDER TODAY... MONEY BACK GUARANTEE!

Send check or money order **\$1.49 NOW** and we'll pay the postage...or, sent C.O.D. plus postage charge. Money back in five days if not fully satisfied.

Distributor Inquiries Invited

MARLEY INDUSTRIES CORP.

Dept. P, 10-42 47th Road, Long Island City 1, N. Y.



ARMY FIELD Telephones & WIRE



**Compact . . Rugged . . Portable
Anyone can install and operate**

Just hook up terminals of two or more phones to any 2-conductor wire and you are ready to talk up to 17 miles! Powered by standard flashlight batteries. **HUNDREDS OF USES** for quick, dependable communication in **HOME, SHOP, FARM, INDUSTRY**. Complete with self-contained hand-operated ringer. **Checked for perfect operation and guaranteed.**

USED, excellent condition, Each . . . \$9.95, Two for \$18.50

LIKE NEW, each phone undergoes thorough performance check in our reconditioning shop to assure peak operating efficiency. Best appearance of handsets and chassis units is restored **LIKE NEW**. . . . Each \$12.95, Two for \$24.50

6 phones on one line makes excellent intercom.

TELEPHONE WIRE

Weatherproof, durable, 2-conductor, twisted, communication wire, insulated, stranded 7X.013, reinforced with steel strands for extra tensile strength (3 copper & 4 steel).

W-110B. Unused, new, stored in open. Half-mile reels (2500 to 2750 feet). Wt. 85 lbs. Each. . . . \$14.25

ONE-MILE REEL. . . . \$27.50

500 ft. coil (14 lbs.) . . \$3.95 1000 ft. coil (28 lbs.) . . \$7.25

NEW W-130 Lightweight. Half-mile. (16 lbs.) . . . \$15.00

Telephone parts available. **WRITE for Free Folder**

All prices FOB Sacramento. No COD. California residents add 3% for sales tax. Small orders sent postage collect plus small handling charge.

SEND CHECK OR MONEY ORDER **LORIS SALES**

P. O. Box 1896-A9-10

Sacramento, California

Ball-Bearing SPEED WHEELS



Juvenile Wheels (No bearing, solid tires)
5"45c 6"65c
7"75c

(Semi-pneumatic tire, ball bearing)
8 x 1.251.85 10 x 1.252.20
8 x 1.751.95 10 x 1.752.30
8 x 22.20 12 x 1.753.45

Industrial Wheels for Heavy Loads
5 x 1.75 Bolted3.65 10 x 2.75 Pneu. 6.80
6 x 2 Welded3.45 10 x 3.50 2-ply 10.55
6 x 2 Bolted4.00 12 x 2.00 Bolted6.90
8 x 1 Alum5.25 12 x 3.00 Bolted9.20
8 x 2.00 Bolted5.20 4.00 x 8 2-ply13.10
8 x 2.50 Bolted5.40 4.00 x 8 4-ply13.90
8 x 3.00 2-ply 11.00 16 x 4.0015.15
10 x 2.00 Bolted 6.10
10 x 2.75 H.C.5.15

Dealers, Jobbers, and Manufacturers! Our new prices will interest you.

Available Now—CASTERS

Write for circulars on all wheels.

No. c.o.d. orders. Prices F.O.B. our plant.

JIM BROWN TOY COMPANY

1093 Home Ave.

Akron 10, Ohio



100% PROTECTION

TEAR GAS

**A REAL SURE-FIRE SELLER!
THUGS AND THIEVES BEWARE!**

Here is a tear gas pencil gun which discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast. A safe and effective substitute for dangerous firearms. No permanent injury. Needed in Stores, Banks, Autos and Homes, everywhere to protect Life and Property. No skill required. Handle our tear gas as a side line and you'll soon give it full time. For a quick start send \$3.60 for complete demonstrator outfit consisting of an Automatic Pencil Gun with 10 demonstrators and 3 powerful Tear Gas cartridges fully guaranteed. Many thousands now in use. Order your outfit today. Not sold to minors.

Hagen Supply Corp.

Dept. D-510

St. Paul 4, Minn.

NEW! MINIATURE DUST MASK



Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against dusts, lint, coal, cement, grain dust. Has 9 sq. in. filter.

Order today.

Order Today \$1.00 POST PAID

JERRY BRYANT, Dept. PS, 919 N. Michigan Ave., Chicago 11, Ill.

Learn THE SCIENCE OF SALESMANSHIP

This nationally renowned school has demand for graduates in good salary positions thru Nationwide recognition and placement service. Write Department PSF today for Big 32 page Success Book to be sent to you **FREE**



Hills BUSINESS UNIVERSITY AND EXTENSION SCHOOL

619 W. MAIN ST. OKLAHOMA CITY 2, OKLAHOMA

DRAINS CELLARS, WASH TRAYS CIRCULATES OIL



Pumps 1800 GPH 300 gal. 30' high, uses 1/8 to 1/2 HP motor. Will not clog. **\$6.50**

Postpaid if cash with order. (Add 50c for west of the Mississippi.)

Thousands in use since 1936

LABAWCO PUMPS, BELLE MEAD 3, N. J.



ENJOY MAKING YOUR OWN TOOLS

Machine your own lathe attachments from semi-finished castings of proven design. Faceplates, Carriage Stops, Boring Bar Holders, Tailstock Drill Pads, etc. All can be completed on your own lathe. Complete drawings and details. Save over 50%. Write for information. Give size, make and model of lathe.

THE VESTA ENGINEERING CO.

5226 N. Hollywood Ave., Milwaukee 11, Wis.



**How TIP-TOP
LIQUID SOLDER
Saved My
Hunting Trip**

Last Fall, on my first day of deer hunting in the Rockies, I broke the mount of my telescopic rifle sight. No repairs were available for several hundred miles, so I fixed the break with Tip-Top Liquid Solder. Despite the terrific recoil from my 30-30 rifle, the joint held throughout the hunt.
Mr. T. M. — Iowa

Sportsmen, keep a tube of Tip-Top handy in your kit. It's perfect for emergency repairs on all kinds of sports equipment. This amazing Liquid Solder forms a perfect joint in metal, wood, glass and fabric. Tip-Top is water and gasoline proof . . . sticks where others fail.

Keep Tip-Top handy at home, too. It licks hundreds of home mending problems. Buy Tip-Top at your hardware dealer's today, or write Tip-Top Products, Omaha, Nebraska. Insist on Tip-Top, the original and superior Liquid Solder.



**LEARN
MEAT CUTTING**



through actual practice. Profitable Meat Cutting and Self Service Meats taught easily, quickly. LEARN BY DOING at Toledo in just eight short weeks under actual market conditions. For beginners or men with experience. All subjects taught thoroughly and completely. Diploma. Job help. Get store of own. People must eat. School in operation over 25 years. Approved for GI training. Send today for FREE illustrated catalog. No obligation. NATIONAL SCHOOL OF MEAT CUTTING, Dept. 51-N, Toledo 4, Ohio

**Learn MASONRY
CARPENTRY**



Big money in the building trades. Learn now while opportunities are greatest. Train in our completely equipped shops under expert instructors, or by Home Study. Vets attending school entitled to G.I. Benefits.
MIDWEST SCHOOL OF BUILDING TRADES, Dept. PS-10
411 N. Center St., Bloomington, Ill.

Build your own JET ENGINE!



Order these plans today

1. JET PROPELLED BICYCLE. Assemble your own. Photo and instructions \$1.00.
2. HOW TO MAKE EXPERIMENTAL JET ENGINES. Seven sheets drawings with information and instructions \$2.95.
3. BOTH OF ABOVE in one order \$3.75.

SEND NO MONEY. Order both at once \$3.75 C.O.D. in USA plus c.o.d. postage. Send check or Money Order and we pay postage. Get other information too. Rush Order.

J. HOUSTON MAUPIN, Dept. 66, Tipp City, Ohio

**NEW! BELTLESS
GEARLESS
NON-HYDRAULIC**



Zero-Max
TORQUE CONVERTER

**Infinitely Variable Speeds
for Single Speed Motors!**

Infinite speeds zero to max. (4:1 ratio). High torque for start, low & high speeds. Instant speed change running or stopped. Cap. 160 inch ounces output torque. Write for details or ORDER YOURS TODAY!

ONLY \$16⁹⁵
Complete with case

\$12⁹⁵ Internal mechanism only.
Post Paid, Cash with order.

REVCO INCORPORATED 405 Thorpe Building
Minneapolis, Minn.

PEARL

FINISHING OFFERS YOU
BIG MONEY
RIGHT AT HOME

AMAZING NEW PEARL FINISH can be instantly applied to any article—leather—wood—plastic—glass—metal, etc.

BABY SHOES preserved for life in beautiful Baby Pink, Blue, and Ivory thrill mothers and bring immediate sales.

Nothing else like it! Costume jewelry, buttons, earrings, treasured mementos, etc., etc., take on new splendor and beauty at once.

TREMENDOUS DEMAND—Help us fill it—Fantastic profits await those who act NOW. Be First! Scoop the market. Never before has such an opportunity been offered. Never before such Big Profits made so quickly.

DON'T PASS THIS UP—It costs Absolutely Nothing to get the FREE FACTS that show you the EASY WAY to QUICK, BIG MONEY overnight. Mail Coupon TODAY!

PEARL-KOTE CO. Dept. 3
2111 W. Manchester Ave., Los Angeles 47, Calif.
Okay! RUSH me FREE FACTS at once.

Name _____

Address _____

City _____ Zone _____ State _____

DELIVERED TO YOUR DOOR POSTAGE PREPAID!

**MAIL ORDERS
WE PAY POSTAGE ON ALL ARTICLES**

**ARMY SURPLUS
\$8.95 VALUE!**

BOOTS

IDEAL ALL WEATHER BOOT FOR WORK — SPORTS

LEATHER UPPERS—RUBBER BOTTOM

- Flexible double chrome, tanned, tough wearing leather uppers!
- Leak-proof gusset tongue!
- Non-skid heavy duty rubber soles.

\$345 WE PAY POSTAGE

SIZES 6-7-8-9-10 11-12-13

10" 12" Tops

Reconditioned and LOOK LIKE NEW!

**NEW POLISHED STEEL
ALL PURPOSE HOUSEHOLD
MEAT CLEAVERS
IDEAL KITCHEN SIZE**



\$2.95 Value

Fine quality cutlery steel-riveted hardwood handle. Polished blade 11-inches long, 1/4-inch thick!—For meat, fish, fowl — every kitchen use.

COMPLETE WITH ALL LEATHER SAFETY SHEATH \$1¹⁵

Delivered to You
We Pay Postage

**Genuine ACTIVATED CARBON
KILLS ODORS!**

In Refrigerators, Ice Boxes, Coolers, Freezers We Pay Postage

29¢ 97¢ VALUE



Absorbs unpleasant odors of fish, meat, onions, garlic, etc. Made to rigid U.S. specifications! Absolutely harmless. Just place it inside the refrigerator and it goes to work. GUARANTEED ONE YEAR!

**NEW—100% WOOL
BLANKETS**

62" x 82"

\$7.95 VALUE!

\$5²⁵ WE PAY POSTAGE

Soft, fleecy, warm. Closely woven nap, whipped ends. Ideal for every purpose.

Choice of GREY or KHAKI
(30% Pure Wool—70% Pure Processed Wool)

SEND FOR FREE CATALOG — AMAZING VALUES!
UNIVERSAL ENTERPRISES
DEPT. 5 P.S., 946 S. MAIN ST. LOS ANGELES 15, CALIF.
WE PAY POSTAGE, TAXES, INSURANCE ON ALL ARTICLES.



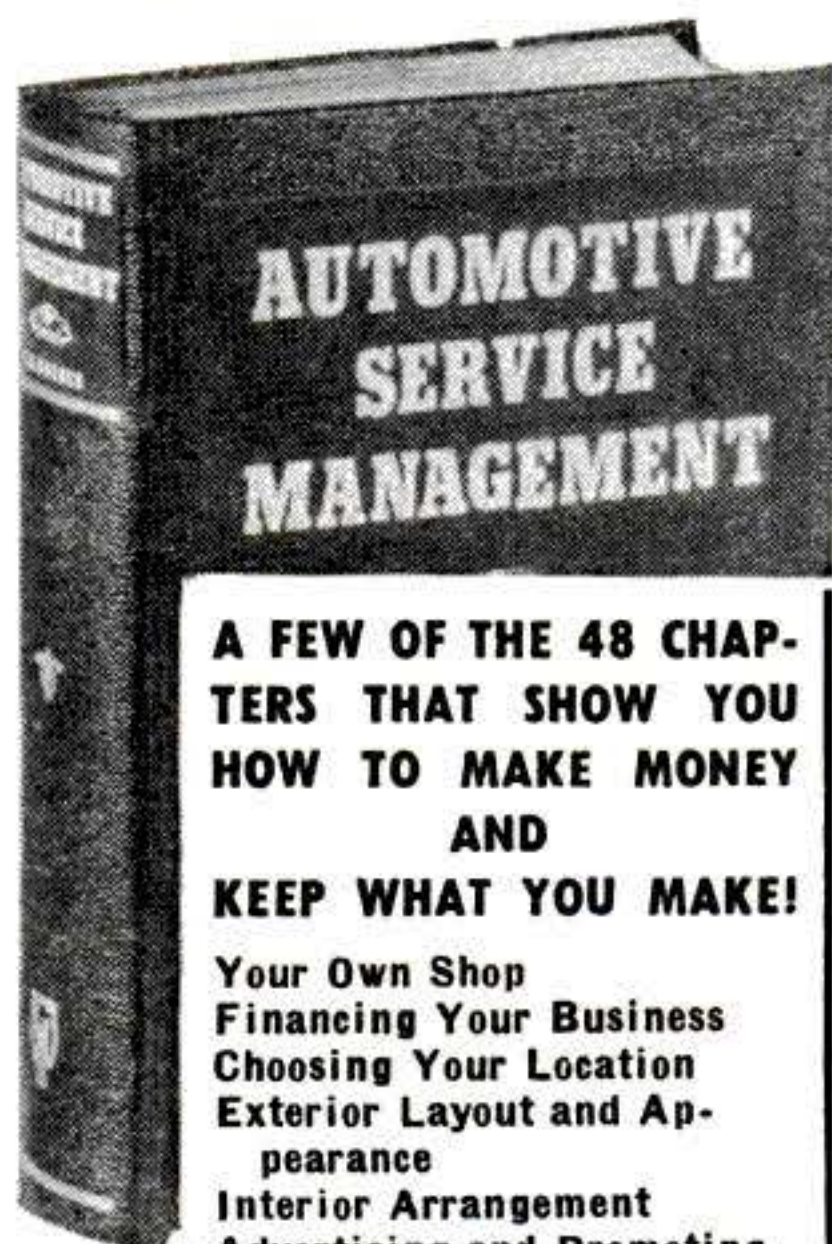
Step Up to
TOP PAY in

AUTO SERVICE Management

AUTO MECHANICS! STATION OWNERS!

Get This Sensational Book—Learn How to Make More Money in Service Work

Here it is! A big 478 page book of vital facts! This is the book that will put you right out in front in the business end of auto service station operation. It tells how to organize a business—how to get the necessary capital—what equipment you need and how to get it—how to get business and hold customers. It tells you what to do—when to do it—how to do it—how to make money as a service shop, garage or station owner or as a manager in charge for others.



A FEW OF THE 48 CHAPTERS THAT SHOW YOU HOW TO MAKE MONEY AND KEEP WHAT YOU MAKE!

- Your Own Shop
- Financing Your Business
- Choosing Your Location
- Exterior Layout and Appearance
- Interior Arrangement
- Advertising and Promoting Your Shop
- Services to Feature
- Sources of Business
- Where to Buy Tools and Equipment
- Building Goodwill
- Meeting the Customer
- Selling Service
- Figuring Service Prices
- Increasing the Average Sale
- Follow-Up on Jobs
- More Profitable Buying
- Managing Your Stockroom
- Employing Helpers
- Expense Control

5 DAY TRIAL—MONEY BACK IF NOT SATISFIED

Mail the coupon. Send no money if you prefer for we will send C.O.D. anywhere in U.S.A. Use book 5 days and if not delighted, return by mail and we will promptly refund purchase price. Goodheart-Willcox Co., Inc. (Publishers of Dyke's Famous Auto Book) 1321 S. Michigan Ave., Chicago.

Mail Coupon for Examination

Goodheart-Willcox Co., Dept. 537
1321 S. Michigan Ave., Chicago 5

Send Automobile Service Management subject to 5 day approval. If not satisfactory I will return book and you are to refund my money.

- I enclose \$5.00 for postpaid delivery
 Send C.O.D. I will pay postman.

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

BE AN EXPERT REPAIRMAN OF MUSICAL INSTRUMENTS



MANY JOBS NOW OPEN FOR TRAINED MEN... BIG OPPORTUNITIES!

Over 3,000,000 amateur and professional musicians are potential customers. You can make good money twelve months of the year... even start your own business. We'll train you. *Course approved by U. S. Veterans Administration.* Get complete information NOW, without obligation.

SEND FOR FREE SCHOOL CATALOG F-31

CONN VOCATIONAL SCHOOL

S-32 S. Main St., Elkhart, Indiana, Div. of C. G. Conn Ltd.

EYE-GLASSES BY MAIL



16 Days Trial

Write Today for Free Catalog. Send no Money
ADVANCE SPECTACLE COMPANY
537 South Dearborn Street, Dept.SP-10, Chicago, Illinois

See The Wonders of the Heavens!

Amazing value! Wonderful 192-page cloth-bound book, *Astronomy for Amateurs*, now yours for only \$1.00! Contains star charts, tables, telescope-making instructions, how-to-do-it ideas for astronomical equipment you can build, etc. *Supply limited!* Order today! Write.

POPULAR SCIENCE

Dept. 109, 353 4th Ave.

New York 10, N. Y.

WATCH REPAIRING

be a master watchmaker!

- Graduates earn big money—many in business for themselves. The famous Sweazey System of Instruction teaches you quickly and easily. Our 42nd year. Write today for free book about watchmaking, gem setting and engraving.

CHICAGO SCHOOL OF WATCHMAKING
Dept. 1409, 1608 Milwaukee Avenue, Chicago 47, Illinois



Bar Bells

COMPLETE 53 PAGE TRAINING COURSE

- Get fast results with these six scientific body-building courses. 4 barbell and 2 dumbbell courses. Illustrated charts make training easy. Postage prepaid. Regular price \$1.98. Send \$1.00 to

\$1.00

PARAMOUNT BARBELLS

2438 East 23rd Street, Los Angeles 11, Calif.

NOW! More Shooting Fun



with
Crosman's New \$14.95
"Town & Country Jr." RIFLE

Expert or beginner—you'll like this rifle for year 'round shooting indoors and out. Accurate, hard hitting, yet safe to use anywhere thanks to Crosman's "controllable power" feature. Has rifled barrel; standard sights. Weighs only 4 lbs. 7 ozs. Available in .177 and .22 cal. single shot models at your dealer. Write for literature.

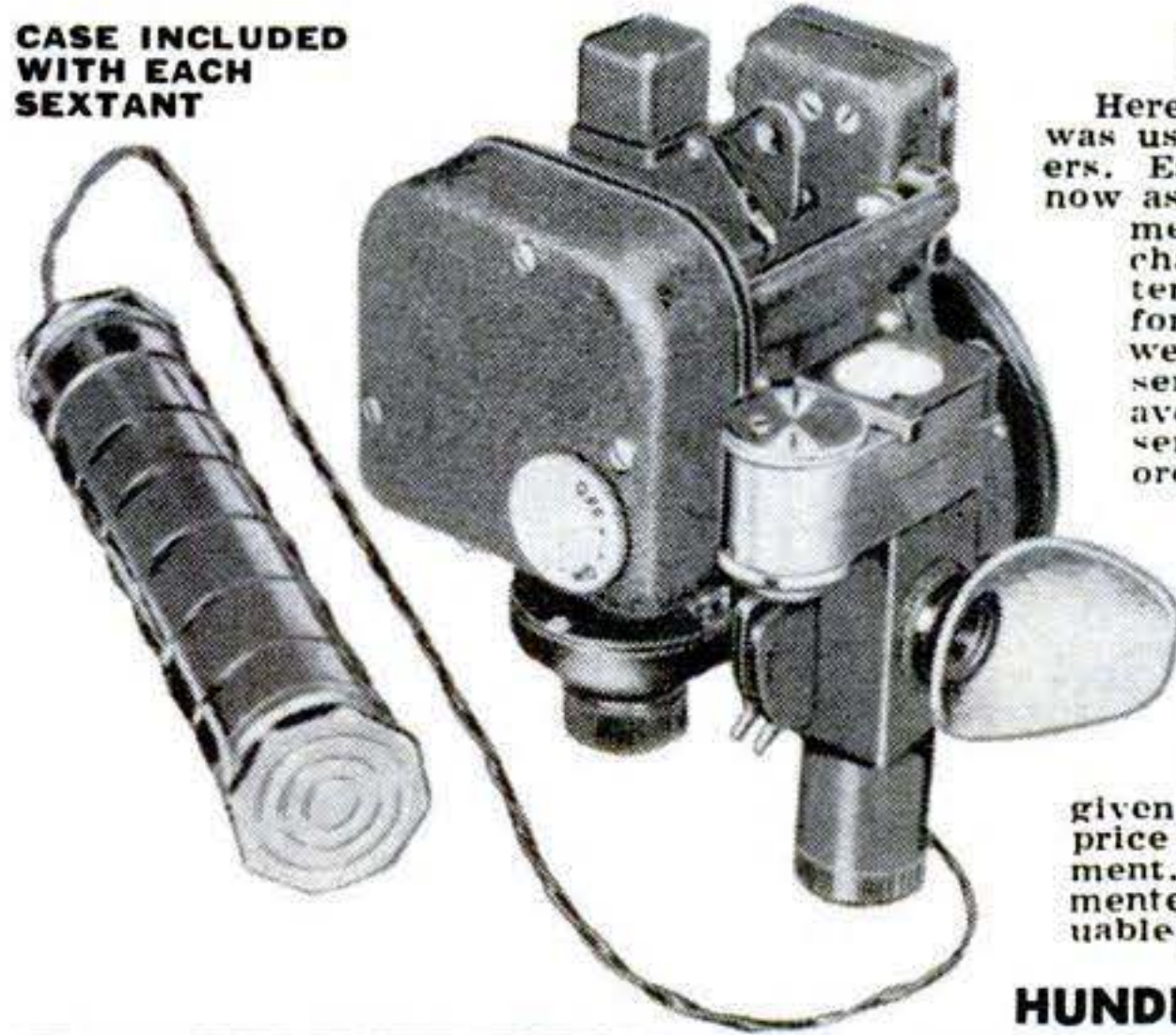
Crosman Arms Co., Inc. 9 HENRIETTA STREET
ROCHESTER 7, N. Y.

\$200.00 CELESTIAL NAVIGATION SEXTANT \$7.95

NEVER BEFORE AT A PRICE LIKE THIS—ONLY 3000 TO SELL.

***** GENUINE AIR FORCE SURPLUS! HURRY!**

CASE INCLUDED WITH EACH SEXTANT

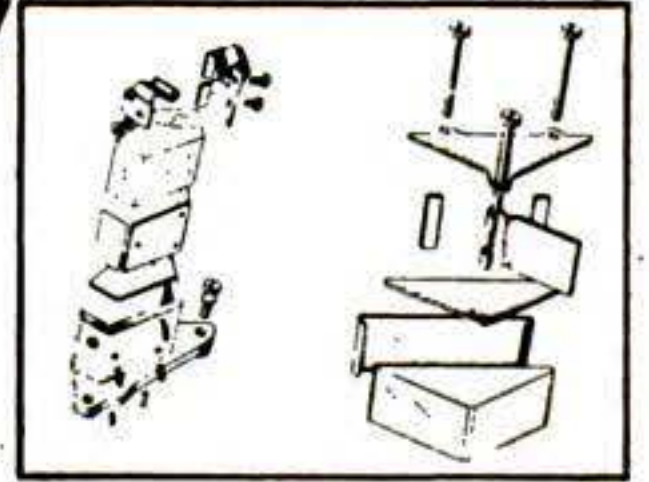


FINE PRECISION CONSTRUCTION

Here is a masterpiece in fine precision engineering that was used by the AAF for globe wide navigation of bombers. Estimated original cost was around \$200.00—and now as surplus it brings a wonderful opportunity to boatmen, airmen, experimenters, inventors and other mechanically inclined hobbyists to delve into the mysteries of celestial navigation at a price anyone can afford—actually less than 4% of original cost. Because we have only 3000 of them, its first come—first served. Only by fast action now, will you avoid possible disappointment—and we reserve the right to return your check if your order arrives after our stock is depleted.

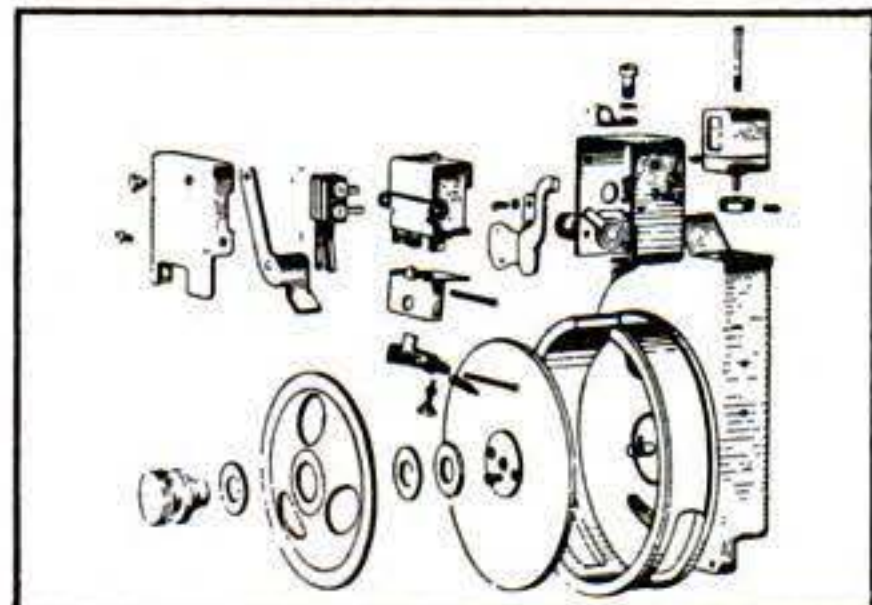
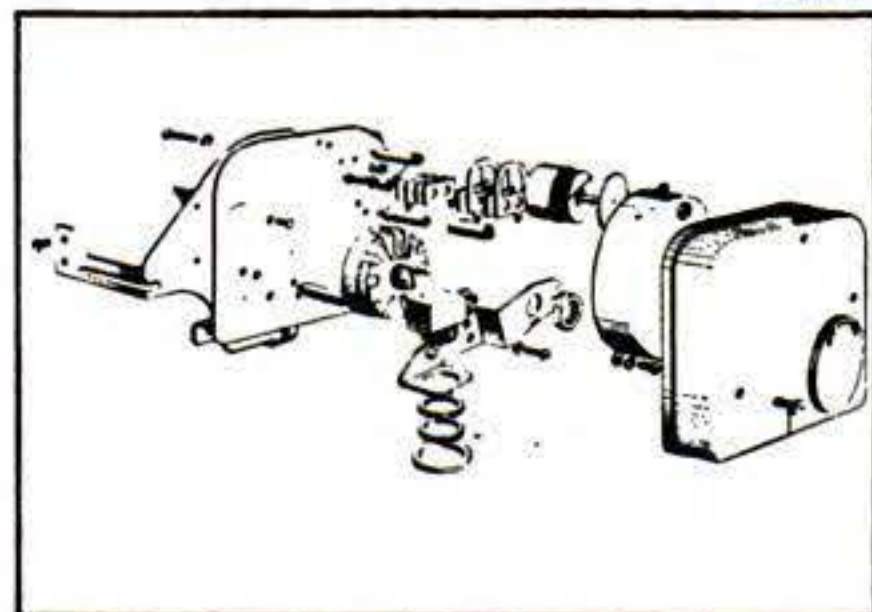
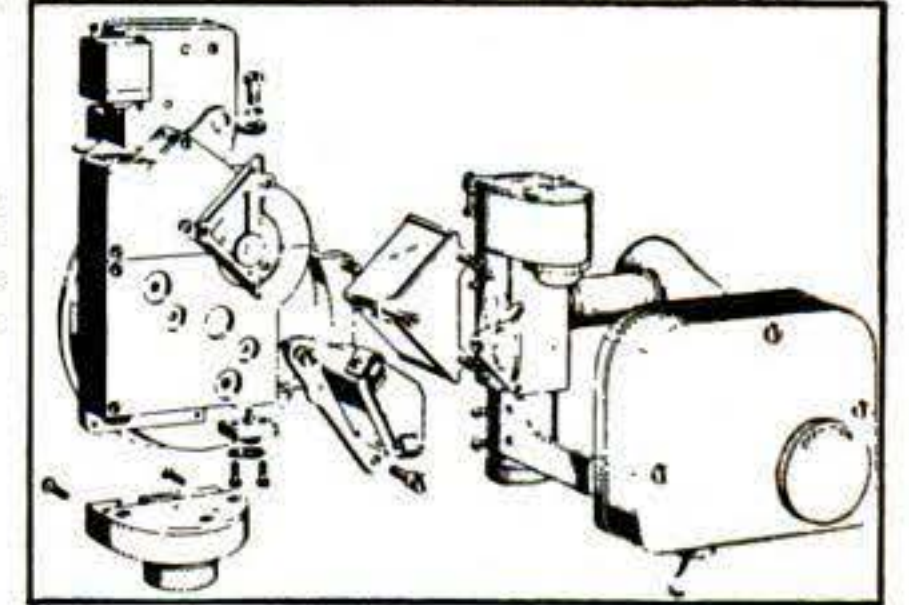
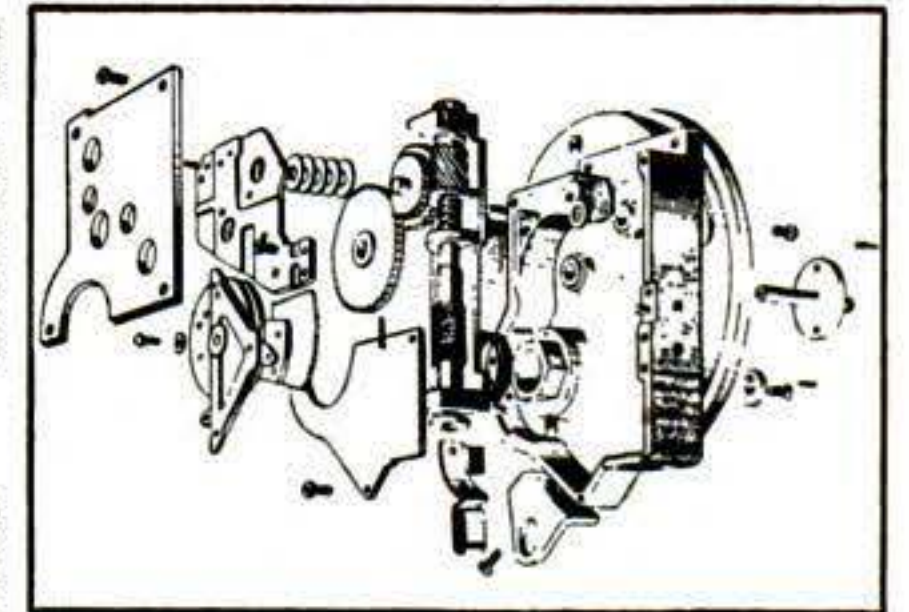
USE ON AIR, SEA or LAND

For the boatman or student of navigation the Sextant or Octant is used to determine their position on the earth's surface by means of astronomical observations of the stars, planets, etc. In the air or on the sea the navigator uses it to set his course—to accurately steer for any given point. Never before at anywhere near this price could you secure so fine a precision instrument. And it is of tremendous value to experimenters, inventors and others for the many valuable parts that make up the complete assembly.



HUNDREDS OF VALUABLE PARTS

In the illustrations shown at both right and left you gain an idea of the hundreds of parts that are included. It's a veritable treasure trove of fine lenses, prisms and other optical systems, gears, rheostats, relay, switches, timer, flash battery motor, V/R counter, bubble chamber, worm drives, solenoid, lights and light system, optical eye-piece, battery case, filters, controls, etc., not to mention a great array of fine small screws, pins, nuts, washers, springs, etc. These parts and sub-assemblies may be adapted to hundreds of other uses. The optical equipments alone are worth many times the price we are now asking for the complete outfit.



DON'T MISS THIS BARGAIN VALUE! ACT NOW

These Sextants are used. We are selling them just as we received them. Some show use more than others. They have all seen actual service in the AAF. We have not checked or "collimated" them—that is why they are being offered at this low price. There are only 3000 to sell—and they are offered strictly subject to prior sale. They won't last long at this low price.

TWO MODELS TO SELECT FROM

FAIRCHILD A10-A

Automatic timing Sextant. Includes battery case and holder, plus fine mahogany colored hardwood case, 9 1/2 x 9 5/8 ins. Case alone is worth this price. Each as illustrated

\$7.95

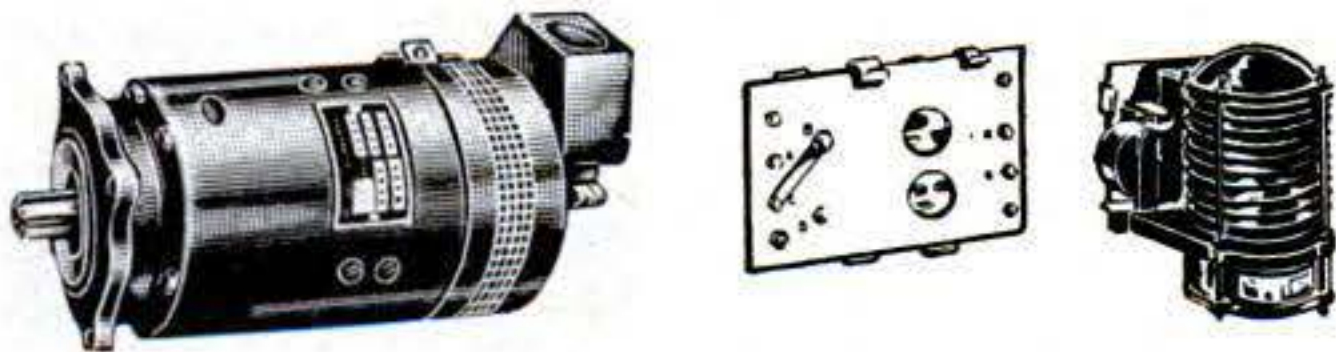
FAIRCHILD A10

Same as model A10-A but without automatic timing system. Carrying case and battery holder included. Each only

\$5.95

We will ship prepaid if you include 70c to cover postage and handling. Shp. wgt. 10 Lbs.

\$200.00 Generator Set \$19.95



WE SOLD GENERATOR ALONE FOR UP TO \$50.00

Drastically reduced for quick sale. Original procurement cost was approximately \$200.00. We sold many for as high as \$50.00, hundreds more at around half that price—and now you have the opportunity to acquire one at an even lower price.

VOLTAGE REGULATOR AND MOUNTING BASE

The fine set includes the Aviation Type generator, Luce Nevell L3, 28 volts, 25 amps., rotation CW, 2500 rpm. Measure 12 by 5 inches. Net weight 24 lbs. Outfit includes the famous Carbon Pile type voltage regulator (AN3080-1) also a convenient mounting base that is readily adaptable for most any use. The special regulator functions to hold the voltage within a given operating range (may be set up to 200 amps.) at varied generator speeds. Quantity is limited and at this low price they won't last long. Order today. Shipping weight 30 lbs.

\$19.95

\$100.00 Breathing Oxygen Set \$7.95

Brand new surplus
*
Ready to use
*
Portable
with Automatic "Demand" Type Value



A find for airmen, mountaineers, firemen, paint shop workers and others who on occasion demand extra oxygen. This popular "demand" type oxygen outfit requires no technical knowledge for use—just breathe into the mask provided and the regulator automatically delivers such oxygen as you demand. Set consists of D2 type shatter-proof steel bottle 6 x 24 inches; demand type regulator AN6022-1; 0-500 lb. oxygen gauge and type A10 demand oxygen mask with hose. Net weight 7 lbs. Condition, NEW war surplus. Shipping weight 10 Lbs.

OXYGEN FILLED
Complete as described above with oxygen loaded tank. By express only—not available. Each complete . . . **\$9.95**

LESS OXYGEN
Complete outfit as described but with empty tank. Can be shipped parcel post. Each complete . . . **\$7.95**

Refiller hose, orifice and valve for charging tank with oxygen. Set only **\$2.00**

ALL F. O. B. HOUSTON
SEND CHECK
OR MONEY-ORDER

AERO PARTS SUPPLY

Dept. PS10, Municipal Airport
HOUSTON 17, TEXAS

OCTOBER 1949 63

Learn to MOUNT Birds and Animals FUN • PROFITS



Send Today for Free Book

Old reliable school (250,000 students) will teach you **AT HOME** to Mount **BIRDS, ANIMAL HEADS, FISH** and **TAN SKINS** and **FURS**. Write now—at once.

SPORTSMEN: Save your trophies. Game is growing scarcer—every **Specimen** is valuable. Keep them—save them—mount them. Decorate your den. Fun and fascination. Profits, too.

TAN heavy and light skins and furs. Make real **HARNESSE LEATHER, BUCK SOLE LACE, ETC.** Best method known, but easy and simple. Don't sell those hides cheap. Tan them for your own use. Make leather vests, belts, gloves, etc. **TAN FOR OTHERS.**

FUR-WORK for men and women. Tan and make up scarfs, capes, coats, muffs, mitts, trimmings. Quickly, easily learned.

EXTRA MONEY \$40 to \$80 a month, even more some students report. Big demand for **TAXIDERM, TANNING AND FUR-WORK.** A real spare-time business—good in every community. If you need extra money, **WRITE!**

FREE BOOK

48 pages, 100 beautiful pictures, tells **ALL** about Taxidermy, Tanning, Fur-Work. Write **Today**—this minute for this **STRANGE, MARVELOUS FREE BOOK.** A postal will do. State **AGE.**

N. W. School of Taxidermy, 2610 Elwood Bldg., Omaha, Neb.



Build your own SMITH Compressor

Operates spray guns, rock drills, tampers, paving breakers, sandblasting . . . Uses only 1 gallon of gas an hour!



Save Money—build your own Smith Air Compressor! Famous the world over! Capacity 60 cu. ft.; pressure up to 100 lbs. per sq. inch. Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Head equipped with high speed compressor valves; automatic unloading and idling.

Write for complete information!

GORDON SMITH & COMPANY, Inc.
405 College Street • Bowling Green, Ky.



SUCCESS • SECURITY • RESPECT
as a Master Watchmaker!

APPROVED FOR VETERAN TRAINING

Learn today's top mechanical profession at the world's largest, best-equipped school of its kind. Individual instruction, day or evening classes. You graduate with complete watchmakers' tools, ready to start your own business or work for established jewelers.

SEND FOR FREE 116-PAGE INFORMATION PACKET

WESTERN PENNSYLVANIA
HOROLOGICAL INSTITUTE
WORLD'S LARGEST WATCHMAKING SCHOOL

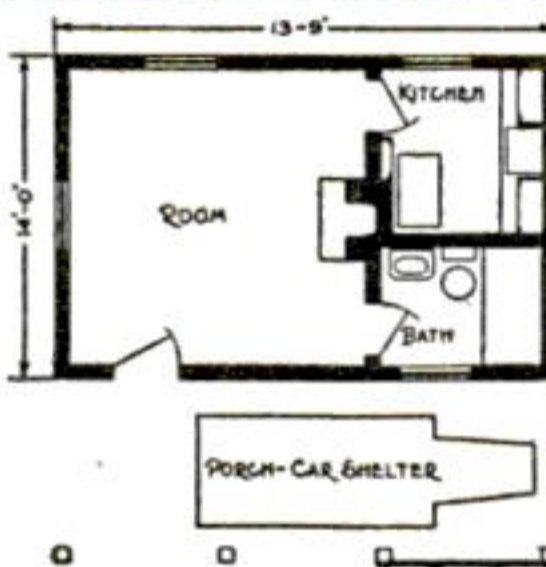


Desk 39, 808 Ridge Ave., Pittsburgh, Pa.

64 POPULAR SCIENCE



HOW TO BUILD YOUR OWN LOG CABIN LODGE OR BUNGALOW!



COMPLETE INSTRUCTIONS IN ONE GREAT BOOK!

Countless thousands say this great volume brings them *complete detailed plans* for building their own log cabins and bungalows!

180 PICTURES - 250 PAGES - ONLY \$1.98!

Just take your pick from the scores of cabins, lodges, tourist homes, wayside stands and bungalows jam-packed into this big book, "How to Build Cabins"! You'll learn how to lay a foundation . . . how to build walls . . . how to lay floor boards and roofs. Yes, you'll discover step-by-step details for building porches and garages . . . for cutting doors, windows, and attaching shutters . . . for building fireplaces and chimneys . . . and even for installing plumbing and lighting!

SAVES YOU HUNDREDS OF DOLLARS!

Now you can have a vacation spot of your own—a place where you won't be gouged by sky-high summer rentals—one that you can build yourself and *save hundreds of dollars* on the construction costs! And don't imagine that it's hard for you to build—for you'll find this great how-to-do-it book makes it as easy as pie—shows you every move!

SEND NO MONEY - 7-DAY FREE TRIAL!

Imagine! This big book with 180 pictures and 250 pages costs *only* \$1.98! So fill out the order form below right now! When book arrives pay postman only \$1.98 plus a few cents mailing charge as payment in full. If after 7 days' free trial you aren't delighted, return it for a full refund!



MAIL COUPON TODAY!

POPULAR SCIENCE Publishing Co., Dept. 109
353 Fourth Avenue, New York 10, N. Y.

Send me "How to Build Cabins" in edition checked below. I will pay postman price plus postage. If not delighted I may return it within 7 days for full refund.

- DeLuxe Edition in handsome Buckram binding, only \$2.48
 Regular cloth-bound Edition, only \$1.98

Name.....

Address.....

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

Check here if you send payment with order, and we will pay shipping costs. Same return privilege.

AMAZING INVENTION

SOLDER-MATIC

AUTOMATIC SOLDERING IRON

AUTOMATICALLY FEEDS SOLDER TO THE TIP OF THE IRON

• LEAVES ONE HAND FREE TO HOLD WORK

• HOLDS OVER 6 FEET OF SOLDER 1/16" TO 3/16" DIA.

FEED ATTACHMENT REMOVABLE IN A MATTER OF SECONDS, FOR USE ON OTHER IRONS FROM 75 TO 250 WATT-SIZES. Slight pressure on trigger brings solder to the tip of the iron in the exact quantity needed. Speeds production in workshop or factory. Comes complete with instructions, Underwriter Approved 85 watt precision electric iron and six feet of solder. Fully guaranteed—money back in five days if not satisfied.

C. O. D. add postage—prepaid, we pay postage.

ONLY \$5.95 COMPLETE

ACT TODAY
THE STERN CORP., 219 BI Investment Bldg., Pittsburgh 22, Pa.

DEALER INQUIRIES INVITED

"PLASTICS"

FABRICATING MANUAL AND CATALOGUE

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Tenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20c today for 1949 Catalogue and Handbook.

HOUSE OF PLASTICS
 8648 Linwood Avenue Dept. MO 10 Detroit 6, Michigan

TRAIN

Your VOICE!

Results GUARANTEED

STRENGTHEN your voice this tested, scientific way. Yes—you can now build yourself a POWERFUL speaking or singing voice in the privacy of your own room. Silent self-training lessons; no music or piano required. Just send your name for sensational details of this amazing course. I'll send you FREE a vocal mechanism chart. State your age.

Perfect Voice Institute, 1141 S. Wabash Ave., Studio K-1, Chicago 5, Ill.



GEIGER COUNTERS TREASURE DETECTORS

Sensational new low cost detectors. Light weight, portable, highly sensitive. Low operating cost. None finer REGARDLESS OF COST.

Write TODAY for FREE literature.
The DETECTRON Company
 5637 Cahuenga Drive, North Hollywood, Calif.

Earn High School Diploma at Home

Guided study permits you to complete High School education in shortest possible time. Modern methods make it interesting, easier. Prepare for better jobs, pre-professional, college entrance exams. Recognition for H.S. credits already earned. Books supplied. Low tuition, easy terms. Write for Free information.

HOME STUDY INSTITUTE
 209 Vine Avenue Dept. PS-10 Park Ridge, Ill.



GET INTO THE PAINT BUSINESS!

Permanent! Profitable! Sell direct to factories, offices, homes, farms. Top quality paints, varnishes, polishes; competitive prices. Advance commissions, no investment, no deliveries; full or part time. Write today!

STANDARD INDUSTRIAL PRODUCTS
 Dept. PS-10 — Evansville 4, Indiana



MAKE MONEY!

RAISE CHIN-CHIN CHINCHILLA RABBITS

VALUABLE BREEDERS! PEDIGREED! PROFITABLE! EASY! PLEASANT!

Extra Profits from gorgeous Furs, Delicious meat, etc.

Free illustrated Booklet—Write Today!
WILLOW BROOK FARM, SELLERSVILLE 41 PA.

World's Largest Breeder of Chinchilla Rabbits

Get into BUSINESS for Yourself!

METALIZING BABY SHOES AT HOME IN SPARE TIME



Get facts about amazing money-making *Warner Success Plan* that shows you every easy step in completely charted path to personal independence—with your home as your headquarters... This proved and tested Plan is working like magic. It's backed by an old, reliable company... And we send it to you on a No-Risk Trial Money Back Guarantee.

QUICK CASH WAITING

Demand for METALIZED Baby Shoes and other keepsakes is growing bigger daily. Our Tested Plan Shows How to Do the Work, How to Bring in the Business, How to Make as much as \$5 an Hour. Spare or full time, big steady profits are waiting for you. Send penny postcard or mail coupon for FREE Facts. Act! Time is precious.

FREE offer of COMPLETE MONEY MAKING PLAN

SEND NO MONEY Just Mail COUPON

Ray Brandell, Mgr., Warner Electric Co.,
 1512 JARVIS AVE., DEPT. 210, CHICAGO 26, ILL.

Please rush complete details about your No-Risk Trial Money Back Plan for Metalizing Baby Shoes. Everything you send is FREE and costs me nothing—now or ever.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Write today for Complete details

GEIGER COUNTERS

FOR PROSPECTING RADIOACTIVE MINERALS

OMAHA SCIENTIFIC SUPPLY CO.
 DEPT 10, 3601 N 24th St, OMAHA 10, NEBR



SAVE MORE THAN 1/2 PRICE

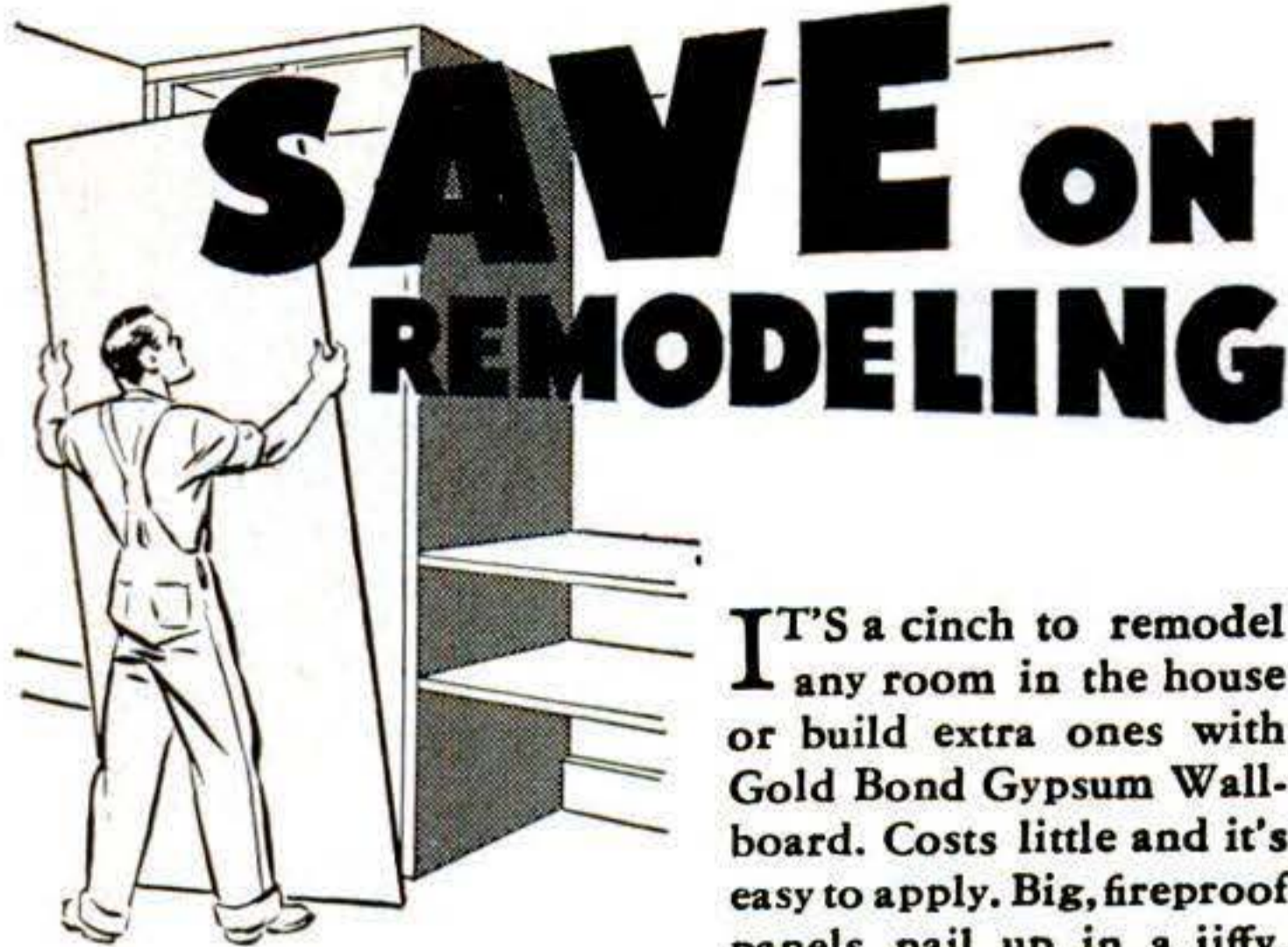
for only
10 FT. PRE-BILT ROW BOAT \$59.50
 (Reinforced for Outboard Use)



STRONG ONE-PIECE BOTTOM, ALL PARTS PERFECTLY CUT FOR EASY ASSEMBLY WITH SIMPLE TOOLS IN A SINGLE DAY.

Also 12 and 14 ft. deluxe, decked V-Bottom Models

Write **BAY STATE BOAT CO.**
28 Main St., Cambridge, Mass.
 for name of nearest dealer.



SAVE ON REMODELING

IT'S a cinch to remodel any room in the house or build extra ones with Gold Bond Gypsum Wall-board. Costs little and it's easy to apply. Big, fireproof panels nail up in a jiffy.

Can be papered or painted. Use Gold Bond Sunflex paint... dries in one hour! See your local Gold Bond Lumber and Building Supply Dealer today!

FREE BOOK OF SUGGESTIONS



NATIONAL GYPSUM COMPANY
Dept. J-6, Buffalo 2, New York

Gentlemen: Send free copy of new Booklet, "Modernizing Magic" showing remodeling ideas and methods:

Name

Street

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

(Please print name and address)

EARN MORE

\$\$\$

FREE 118 PAGES

SEND FOR THIS FREE BOOK NOW!

● Increase your earning power. Become thoroughly trained in a well-paid profession. Without obligation, find out about the opportunities in Electrical, Mechanical, Plastics, Civil, Mining and other engineering fields. Our free 118-page handbook, lists details of home study courses, compiled by world authorities. See for yourself how you can soon earn more dollars. Write today, to: Canadian Institute of Science and Technology, Ltd., 486 Century Building, 412, 5th Street, N.W., Washington, D.C.

Special discounts for Servicemen

MAIL THIS COUPON NOW

Canadian Institute of Science & Technology, Ltd.,
486 Century Building, 412, 5th Street N.W.,
Washington, D.C.

Please forward free of cost or obligation of any kind your 118-page handbook "Engineering Opportunities".

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

Address

CANADIAN ENQUIRIES: 263 Adelaide St. West, Toronto

YOU NEED ALLEN HEAD HEX KEYS

for the many socket screws used in shop equipment, tools, cars, appliances, farm machinery, radio and hobbies. Get the tested best in Allen marked kits made by the originators of Allen Head Screws. Have the right key when you need it. Allen key sets cost as little as 75¢ at your hardware store.

75¢

Buy ALLEN Key Sets at your hardware store

ANALYZE Handwriting

Try it FREE, use it—to understand yourself and others in business and social life—more clearly than you ever thought possible. Many use their knowledge of handwriting to make more money full or part time. Simply send your name today for FREE ILLUSTRATED lesson. No obligation. Must be over 21.

INTERNATIONAL GRAPHO ANALYSIS SOCIETY, INC.
204 Wilhoit Building Springfield 4, Mo.

Save Money-Make Money with LARSON Leathercraft

For gifts or for sale—make easy-to-assemble leather items. Complete stock leathers, tools, accessories. Send ten cents for new catalog of 101 money-making ideas.

J. C. LARSON CO. 826 S. Tripp Ave. Chicago 24, Illinois

MEN'S WRIST WATCH

Ideal Xmas Gift ONLY \$5.95

...with gleaming, stainless steel Expansion Band. Amazing Value -1 year guarantee. Jeweled, smart chrome case, radium dial-hands; sweep second hand; shock-resistant. Wear with pride or give as a gift. Send \$5.95, plus 10% Federal Tax, postpaid. Or order C.O.D. plus postage. Satisfaction guaranteed.

Leather or stainless steel expansion free of extra cost

FREE Extra BAND

MUDIAL WATCH HOUSE 330 South Wells Street Dept. B, Chicago 6, Ill.

LEARN AERONAUTICAL ENGINEERING

Aircraft and Engine Mechanics (A&E)

Train at the Flying Wing school—New classes starting soon. Write for illustrated catalog.

Northrop Aeronautical Institute
APPROVED FOR VETERANS DIVISION OF NORTHROP AIRCRAFT, INC.
1525 E. Broadway, Hawthorne, Los Angeles County, California

Performance that excels ● Stamina that endures

DOUGLASS Steel-Pack MUFFLERS

FOR ALL MAKES AND MODELS

Rugged construction. Steel tubing. Straight-thru-design. Solid tube with steel packing. "Throbbing Deep Tone." Complete for Easy Installation

32-40 FORD V-8	\$5.95	29-49 CHEVROLET	\$5.96
41-49 FORD V-8	6.85	31-41 PLYMOUTH	5.96
39-49 MERCURY	6.85	42-49 PLYMOUTH	6.85
35-48 FORD & MERCURY DUAL SETS			\$23.00
49 FORD & MERCURY DUAL SETS			25.00

Specify Year and model ● Satisfaction Guaranteed

Enclose Full Amount With Order All Equipment F.O.B.

1949 COMPLETE RACING EQUIPMENT CATALOG 25c

DOUGLASS MUFFLER MANUFACTURING COMPANY
1916 W. Valley Blvd. Alhambra, Calif.

New Advertising Machine



PRINTS and ILLUSTRATES

1¢ Post Cards

FREE

Learn how thousands of business men, in every line, are boosting sales in spite of conditions—with 1¢ messages—printed and illustrated in a few minutes on gov't post cards—with amazing new patented **CARDMASTER**. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine, built to last for years. Low price, sold direct. Guaranteed for five years. Send name today.

We'll send **FREE** illustrated book of money-making **IDEAS** for your business and complete, unique advertising plans. **RUSH YOUR NAME TODAY.**

CARDMASTER COMPANY
1920 SUNNYSIDE, Dept. 1610, CHICAGO 40, ILL.

Always Mention Popular Science when writing

ELECTRIFY YOUR OLD SEWING MACHINE

in 3 minutes



AMAZING NEW LOW PRICED INVENTION MAKES SEWING EASIER, FASTER, BETTER

- COMES FULLY WIRED AND CONNECTED!
- EASILY ATTACHED! • 1 YEAR GUARANTEE ON ALL PARTS!

At last an invention that ends tiresome foot pedaling. Electrifies your sewing machine—regardless of age, make or type—in 3 minutes! Just snap the **BROWNELL MOTOR KIT** in place, plug it into any standard 110-volt AC or DC outlet and presto!—a modern electric sewing machine! Handy foot control regulates machine speed to your needs. Kit is complete—nothing else to buy. Only \$16.75 for everything! **FREE**—a useful \$2.75 value **SEW LIGHT**, if you order today!

Send No Money
Mail coupon at once
for prompt delivery.
Money back
if not delighted.

REPLACEMENT OR REFUND OF MONEY
Guaranteed by Good Housekeeping
IF NOT AS ADVERTISED THEREIN

AGENTS—MAKE UP TO \$25 A DAY

BROWNELL DISTRIBUTORS, INC., Dept. EM14
308 Canal St., New York 13, N. Y.

Rush me your sewing machine motor kit at \$16.75 complete with gift lamp. Make of my machine is

- Handwheel turns toward me away from me
- Send postpaid. I enclose \$.....
- Send C.O.D. I'll pay postman \$16.75 plus C.O.D. If not fully satisfied, I may return kit within 10 days for full refund.

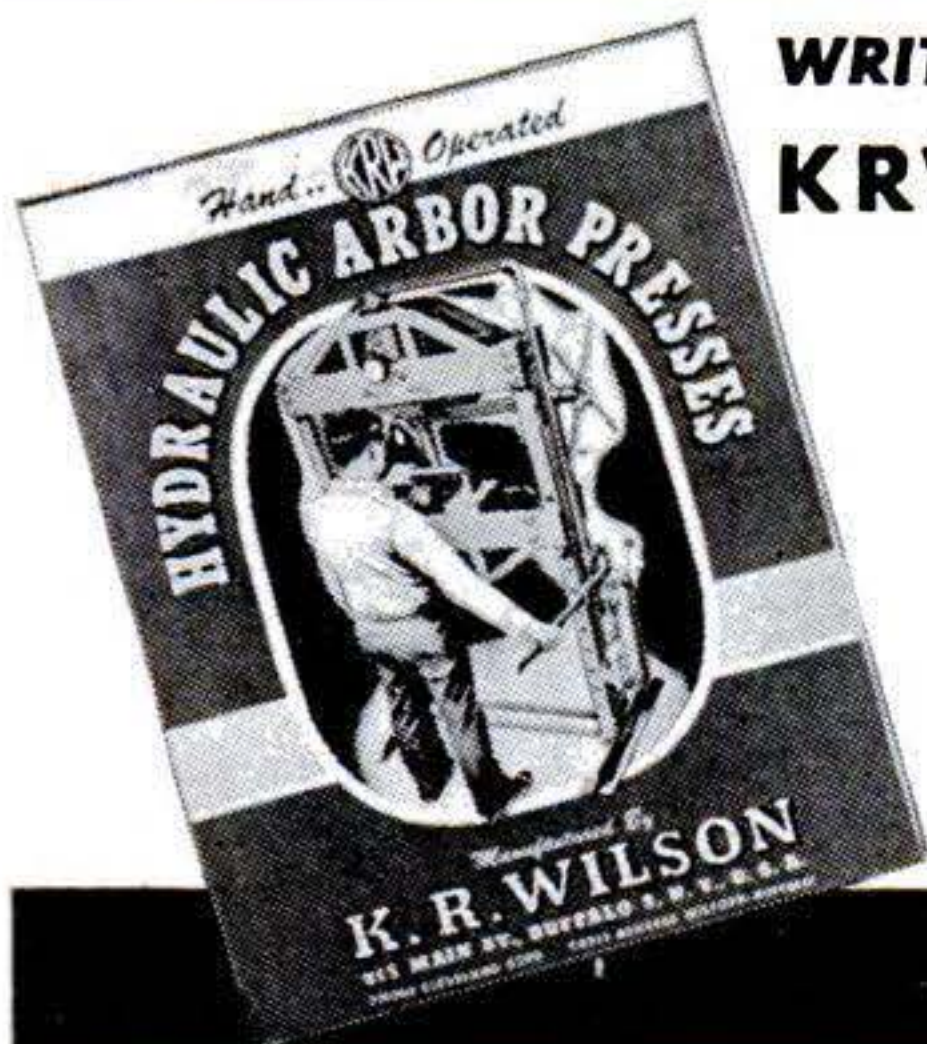
Name

Address

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

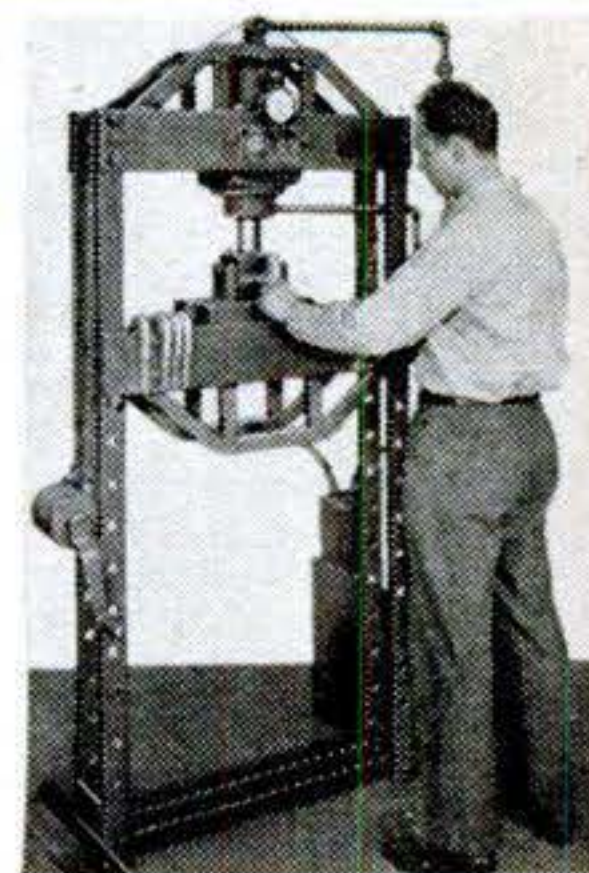
Send details of agent selling plan.

WRITE FOR YOUR **FREE** COPY OF THE NEW KRW HYDRAULIC PRESS BOOK



Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Presses. Illustrates the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses. 25 to 100-ton capacities.

Write for your copy today.



K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

SHOE REPAIR OFFERS BIG INCOME • Learn in 12 Short Weeks!

Own your own shop. Earn big income. Get into business in this depression-proof work. Hard times only make shoe repairing thrive. 12 short weeks. Packed with practical training on actual shoes and professional machinery. No book studies. No educational or age requirements. Anyone can be a successful shoe repairman—from 18 to 80. Our fast "Learn By Doing Method" is easy, complete. Three modern schools. Chicago, Los Angeles, Oakland. 150 million customers for shoe repairs in U.S. alone. **Get the facts** on this big paying skilled trade today. Write for free booklet.

MODERN SHOE REBUILDING SCHOOL, Dept. PS-109
2937 Belmont Ave., Chicago; 361-12th St., Oakland, Calif.
Established 1927 806 So. Figueroa St., Los Angeles 14, Calif.

FREE! Big 20-page Illustrated Book tells how you can get into this big paying skilled trade Today! Complete details. No obligation. Fill in coupon Now!

Gentlemen: Please rush me the facts on how I can learn shoe repairing and get into my own business. Non-vets check here.... Vets check here....

Name.....

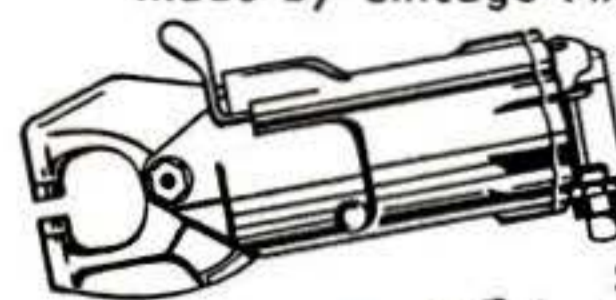
Street.....

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

WAR SURPLUS AND OTHER BARGAINS

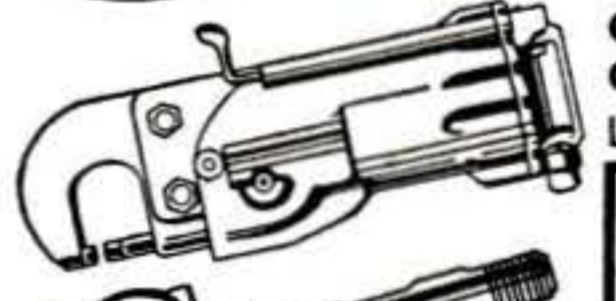
PNEUMATIC AIR TOOLS

Made by Chicago Pneumatic and other Manufacturers



Squeeze Riveter with Alligator Yoke

For all types of metal and auto body work. Purchased from an active gov't. tool crib. Original cost about \$80. Like new. Wgt. 4 lbs. Ea. **\$12.95.**



C-Type Yoke Riveter

Compression Squeeze Type Like new. Wgt. 5 lbs. . . Each **\$12.95.**



Pistol Grip Riveter & Chipping Hammer

Mf'd by Ingersoll-Rand, Chicago Pneumatic and Thor

Ideal for fender, brake lining, concrete breaking work. Like new. Six rivet sets and bucking bar included, making a complete combination. Wgt. 9 lbs. . . Each **\$6.95.**

HIGH SPEED DRILL BITS
ALL NEW! Fractional and numbered. Original value \$15. 30 assorted sizes and lengths . . . **\$3.50**

MICROMETERS
Chrome plated, precision engineered and carefully tooled to give long life. All new.
0-1" capacity . . . each **\$2.25**
1-2" capacity . . . each **3.50**
2-3" capacity . . . each **5.50**
3-4" capacity . . . each **6.50**

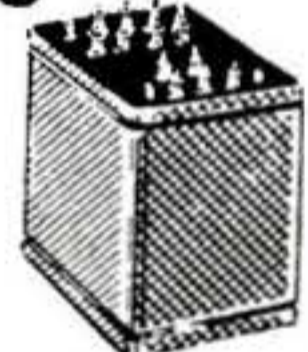
EXPANSION REAMERS



Spiral Flute. Mfd by Alvord Polk Tool Co. All New, original pack. 1/4"-3/8"-7/16" Recommended expansion limit, .006". Original value \$12. Set of 3 . . . **\$4.95**

TRANSFORMERS

Jefferson Electric step-up or step-down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 pounds. New! Each . . . **\$7.95**



Stolle Engineering Co. Transformer. Primary Input, 115 Volts. 60 Cycles. Flexible color-coated leads. Output, 6-12-24 Volts. Will work aircraft gadgets, heater relays, signal systems, radio test filaments, home chimes, etc., off house current. A good item for the home gadgeteer. Weight 7 pounds . . . New. Each **\$7.95**

Stolle Engineering Co. Transformer. Output 12-24-32 V. Otherwise same as above. Weight 15 pounds . . . **\$14.95**

SEND 10c FOR ILLUSTRATED CATALOG

Send check, money order or cash. 25% deposit required on C. O. D. orders. All prices F. O. B. Culver City, Calif.

AIRBORNE SALES CO., INC. DEPT. PSM 10-9 CULVER CITY, CALIF.

One Swipe of NEW PLASTIC Makes these LEATHER and LEATHERETTE Items LIKE NEW

Get Into A Money Making Business

Make like new, worn, scuffed or faded leather and artificial leather equipment. Either your own to renew, recolor and beautify, or cafe, restaurant and hotel equipment as a business. Single stroke with a brush renews. Does not crack, peel or scuff. Resists acid, alcohol, caustics and weather. All colors. Mail coupon for free sample.



FREE Sample SHOWS EFFECT

\$50 to \$500 Profit On One Job Possible

Let me show you how, as I have shown others. Get your own exclusive territory while available. Mail coupon today, I'll do the rest. — Jack Edwards, Sales Mgr.

LEATHER-NEW PRODUCTS,
6082 Suney Slope, Kansas City, Mo.
Send me without obligation a sample of Leather-New coated material so I can inspect it.

Name _____
Address _____
City _____ State _____

A TOOL... NOT A BRUSH

\$1.00 POST PAID

NOW! PAINT STRIPING MADE EASY!

PAINTERS' STRIPING TOOL

Easy to use as a pencil! Draws parallel lines, straights, curves, circles with paint, enamel, lacquer, etc. Do your own striping on autos, furniture, toys, bikes, model planes, signs, linoleum... make wall board look like tile. Painters—craftsmen, order today! Type "M" Master Painters' Striping Tool complete with tip for 1/16" stripe, \$1.00. Tool with choice of 1/64", 1/32", 3/64", 5/64", 3/32", 1/8" tip—\$1.50 . . . all tips 75c ea. Tool with complete set of 7 tips \$5.00 (COD's postage collect) Dealers write!

WENDELL MFG. CO.
4234-A Lincoln Ave., Chicago 18, Illinois

EASY TO LEARN CODE

Learn or increase speed with an Instructograph—the Radio-Telegraph Code Teacher that takes the place of an operator-instructor and enables anyone to master code without further assistance. Available tapes from beginners alphabet to typical messages on all subjects. Speed range 5 to 40 WPM. Always ready—no QRM. Thousands have "acquired the code" with the Instructograph System. Write today for convenient rental and purchase plans.

INSTRUCTOGRAPH COMPANY
4701-P Sheridan Road, Chicago 40, Illinois

LINEAR ACTUATOR UNIT

50# Push or Pull 2 3/4"
AC-DC 15 Volts up—Auto. Shut-Off
Complete with 2-way Switch for 110 volts. Weighs only 1 1/2 lbs. Fine for operating valves, shutters, windows, switches, etc., at any distance.

GOVT. COST \$160.
Our Price **\$9.95**

GADGET SHOP, Box 2497, Tulsa, Okla.

FALSE TEETH KLUTCH holds them tighter

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

KLUTCH CO., Box 4994-J, ELMIRA, N. Y.

LOTS \$300 LOW TERMS

In California's loveliest Garden Spot, on scenic shores of beautiful Morro Bay. Enjoy future independence with excellent soil, soft water, wonderful fishing, hunting, boating, bathing, etc. Grow fruits, vegetables, poultry. Perfect temperate climate. Congenial community. Finest investment. Free literature.

RICHARD S. OTTO
Dept. PS San Luis Obispo, California

BOYS-IT'S FREE!

This exciting book "THE WONDERS OF CHEMISTRY" Shows how to amaze your friends with chemical magic, describes many fascinating home experiments, tells of fun, thrills, adventure and big future opportunities for boys who know chemistry. Send today!

THE PORTER CHEMICAL COMPANY
21 Prospect Avenue Hagerstown, Md.

**HIGH INCOME
TRAVEL ABROAD**

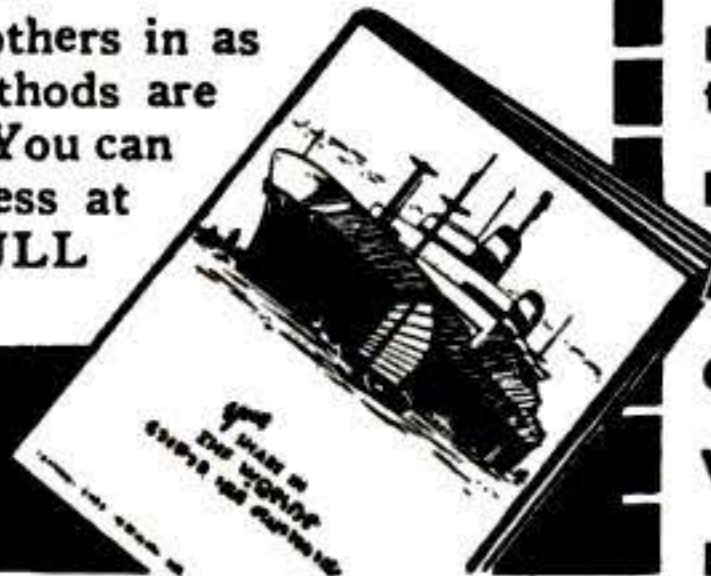
LEARN EXPORT

Tired of humdrum, low-paid, overcrowded vocations? U. S. A. Export-Import volume was over \$19 Billion during the year ending last July. Compare the few listings of World Traders in your phone book against the hundreds in struggle-to-live lines. Men and women have room to prosper and opportunities to travel abroad in World Trade.

EXPORT MANAGERS MAKE UP TO \$12,000 A YEAR... and even more. But the sky's the limit in your own business. Commissions of \$10,000 to \$20,000 or more a year are possible. Customers in other lands tell you what they want. You buy FOR them—ship at their expense at handsome profits. Big profits in Imports too.

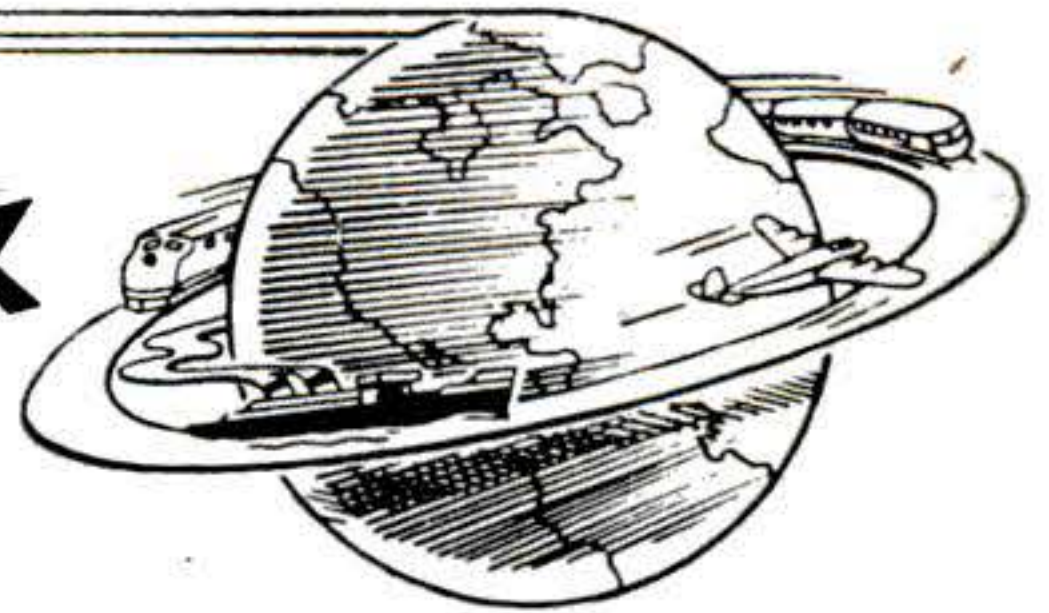
PAST EXPERIENCE UNIMPORTANT. No previous experience or special education is necessary when you learn by simple methods based on my 25 years' practical experience.

I TEACH YOU AT HOME. I have trained others in as little time as one month because my methods are direct, free of non-essentials and red tape. You can start your own mail order Export business at home on practically no investment — **FULL OR SPARE TIME!**



Write for FREE BOOK

NEW QUICK WAY



PRACTICAL—NO THEORY. Twenty clear, fascinating lessons, full year's consultation service included, also full year membership in International Traders' Guild which puts you in contact with traders the World over. **WORLD TRADE CERTIFICATE AWARDED.** Money-Back Agreement.

START TODAY—GET FREE BOOK!

Rush coupon today for illustrated FREE book. No obligation. No salesman will call. Airmail reaches us overnight.

**B. L. Mellinger, Director, The Mellinger Co.
1422-IT Westwood Blvd., Los Angeles 24, Calif.**

MAIL COUPON NOW

**B. L. Mellinger, Director, The Mellinger Co.
1422-IT Westwood Blvd., Los Angeles 24, Calif.**

Please send **FREE BOOK** showing how I may enter the profitable career of World Trade.

Name _____
 Address _____
 City _____ State _____
 Veteran? _____ Occupation? _____ Age? _____
 Location preferred? _____



BIG MEN

Send For

FREE CATALOG showing smart

Clothing & Haberdashery in sizes 48 to 60. Low Prices.

BURNS MARTIN, 147 Summer, Dept. 33, Boston, Mass.



1 H.P. ELECTRIC MOTORS

for less than 1/2 price!

Heavy duty. Single phase 110-220 volts. Capacitor type 60 cycle AC. 1750 RPM. Sleeve bearing. Standard 3/4" shaft. Standard Nemco frame. Nationally known, mfd. by Elcorn for Corenet Corp. List price \$81.00. Our price... **\$40.25**

3/4 HP same as above... **\$36.95**

All new and in original crates.

Check or money order—25% req. on C.O.D.

C & H ELECTRIC CO., 434 W. Juneau St., Milwaukee 3, Wis.

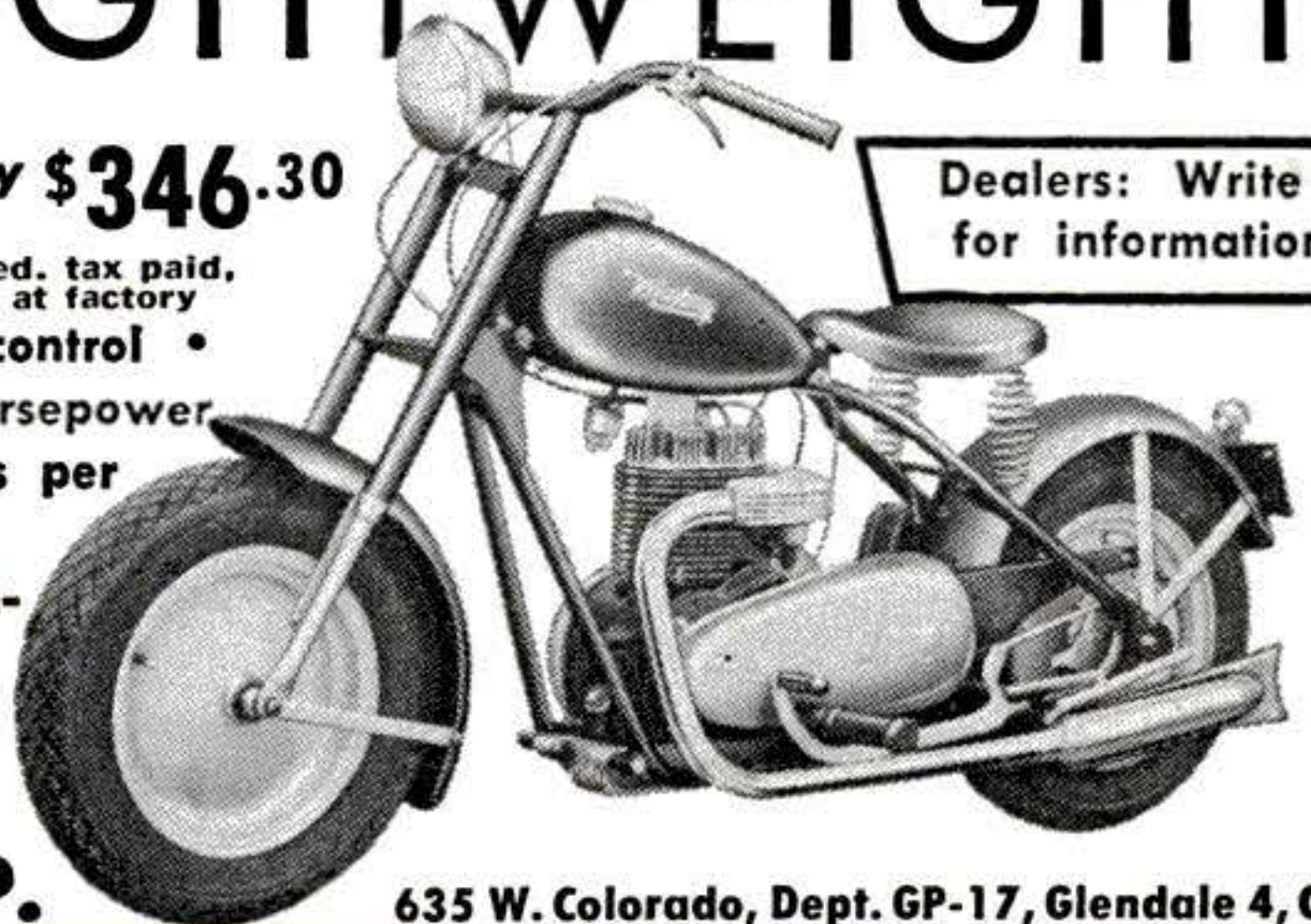


LIGHTWEIGHT

now only **\$346.30**

Fed. tax paid, at factory

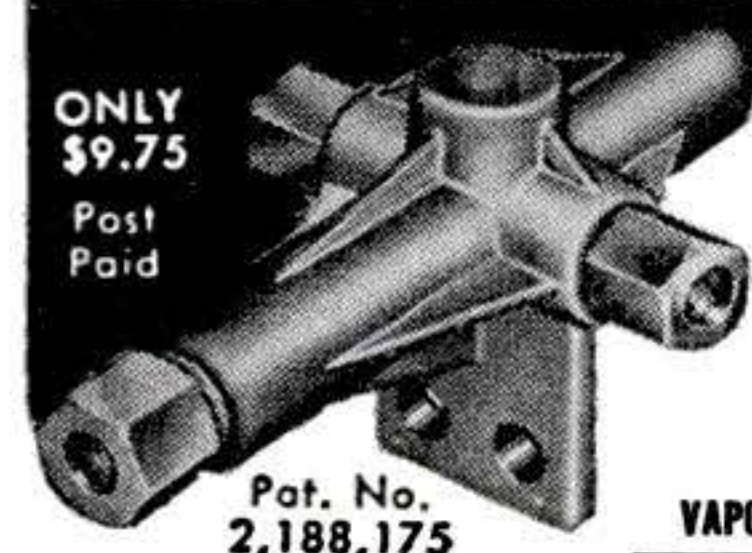
3 speeds • FOOT GEAR SHIFT • Handlebar clutch control • Telescopic front fork • Weight only 230 lbs. • 9.5 horsepower at 5000 rpm • 70 miles per gallon • Over 60 miles per hour • Low center of gravity • Rugged • Safe • Compare Mustang performance with that of popular imported lightweights costing \$200 to \$400 more. Ask your dealer for full details and demonstration or write for free literature.



Dealers: Write for information

MUSTANG MOTORCYCLE CORP.

635 W. Colorado, Dept. GP-17, Glendale 4, Calif.



ONLY \$9.75

Post Paid

Pat. No. 2,188,175

JET PERFORMANCE FOR YOUR CAR WITH VAPOJET

This aircraft developed water-oil vapor injector is designed to give faster pick-up, smoother running power, and tends to eliminate carbon, vapor lock and overheating. Users of the new Vapojet report up to 25% more mileage per gallon of regular gas. Complete, easily installed kit fits all car, tractor, boat or stationary engines. Agents Wanted.

MONEY BACK SATISFACTION GUARANTEE

(If returned within 30 days)

Order today. Only **\$9.75** ppd. Send check or money order & save postage. \$1 deposit on C.O.D.

VAPOJET MFG. CO., 11424 Biona Dr., Dept. PS-10, Los Angeles 34, Calif.

MAIL COUPON TODAY

Rush me.....Vapo-Jet Kits including carburetor adaptor, copper tubing, fittings, etc. and illustrated instructions. Enclosed is my check or money order for \$.....

Car.....No. of cyl.....Year.....

Name.....

Street.....

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

Famous CASCO ELECTR-O-TOOL



In New
**PLASTIC
CHEST**
at Same
Low Price!

25-PIECES ... Only **\$14⁹⁵**

Most terrific value ever! Electr-O-Tool now comes in a smart, jade-green plastic chest that lasts a lifetime! And at *no increase in price!* Full assortment of most popular accessories! Genuine Casco Power-Head that works wonders at vibrationless *super-speed*. Precision-built! Fractional HP, AC-DC motor. Pencil-grip. On-off switch. Unbreakable plastic Tenite case. Special safety-sleeve. Non-slip chuck. (Free 36-page Project Book with every Kit!)



Drills! Carves!
Sands! Saws!
Sharpens!
Polishes!
Etches!
Grinds!
Buffs! Cuts!
For Wood, Metal,
Plastics, Fibre,
Glass, Leather.

CASCO 40-pc. TOOL 'N' RAK Only \$17.95

40 pieces, and Power-Head in handy, solid hardwood wall rack.

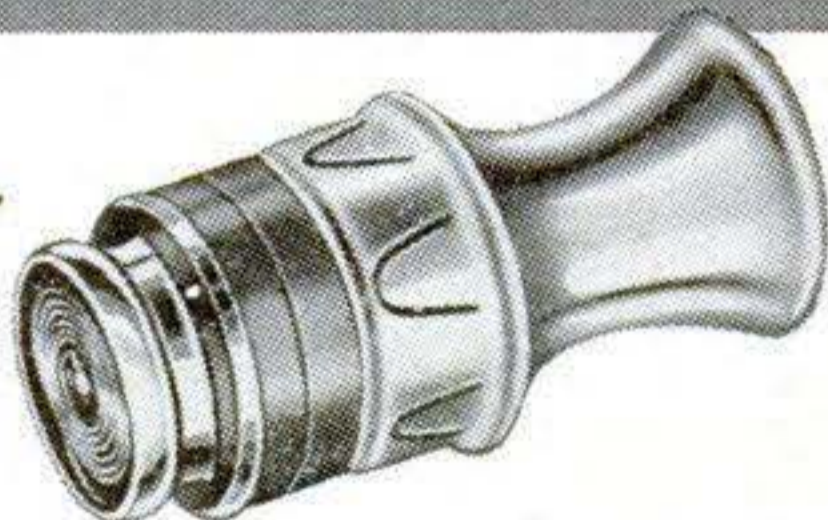
CASCO 50-pc. ELECTROMATIC Only \$19.95

50 accessories, and Power-Head in serviceable, burgundy plastic chest.

Now at Dept., Hardware, Auto Supply, Appliance, Jewelry Stores.

CAR LIGHTER ON THE BLINK? REPLACE IT IN A WINK!

CASCO
"Pop-Out"
CIGARETTE
LIGHTER UNIT



Why do without your lost or broken lighter? It's easy and inexpensive to replace it with a new, chrome-plated Casco "Pop-Out" ... original equipment in 9 out of 10 cars. Pops out *automatically* in 10 seconds with a nice, even glow. Blends beautifully with any dashboard. Now at Car Dealers, Auto Supply Stores, Garages, Service Stations..... **\$1.50**

VIS-O-LITE ... Amazing new car lighter with illuminated well for safer lighting-up at night..... **\$2.75**

CASCO

CASCO Products Corp.
Bridgeport 2, Conn.

MODERN LAWN MOWER SHARPENER

FOR LAWN MOWER SHOPS
FIX-IT SHOPS

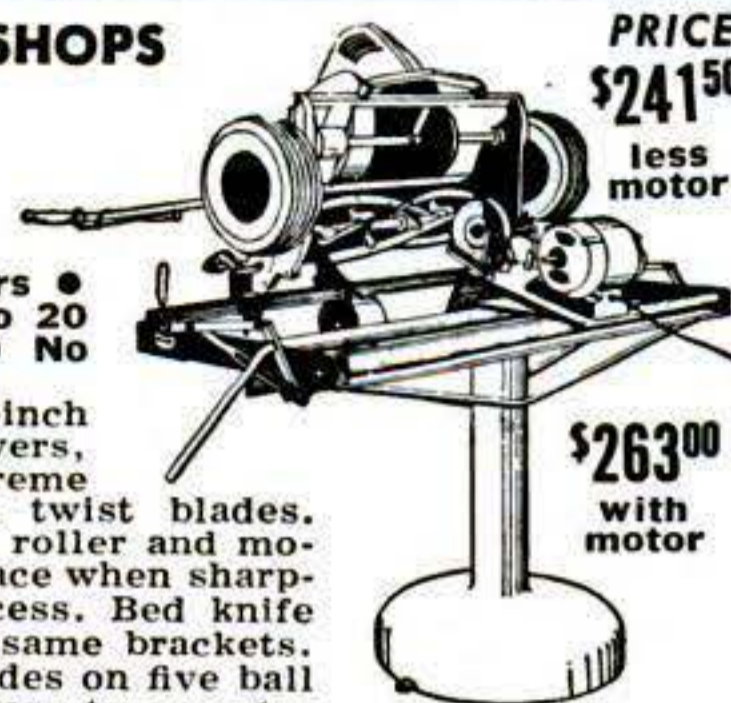
GOLF COURSES • PARKS
101 OTHER JOBS

Sharpens All Reel Type Mowers • Hand, Power or Gang • 10 to 20 Minutes • No Dismantling • No Extra Attachments Needed.

All reel type mowers, from 5-inch edgers to 36-inch power mowers, are quickly sharpened to extreme ends of both left and right twist blades.

Handle, wheels, roller and motor remain in place when sharpening is in process. Bed knife is sharpened in same brackets. Grinding head rides on five ball bearing races. Easy to operate.

Also sharpens chisels, joiner knives, planer blades. Big profit maker. Own your own business. Send Today for **FREE Illustrated Bulletin No. 11-C1**



PRICE
\$241⁵⁰
less
motor

\$263⁰⁰
with
motor

**ORDER
NOW**
Immediate
Delivery

MODERN MFG. CO. 160 N. FAIR OAKS AVE
PASADENA 1, CALIFORNIA

REPAIR PARTS

START YOUR OWN WASHING MACHINE REPAIR BUSINESS

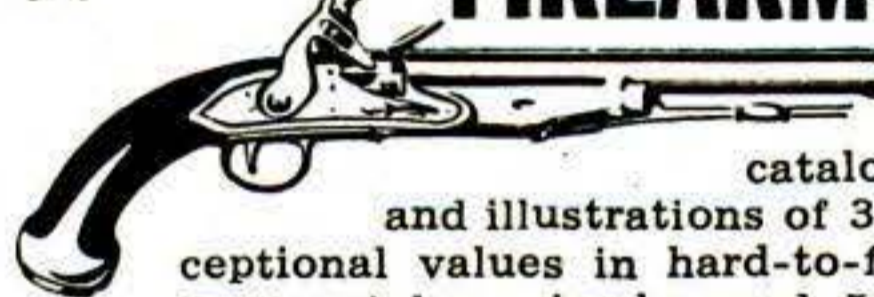
Tremendous field, excellent profits! Get our large complete wholesale catalogue showing thousands of repair parts illustrations: wringer rolls, V-belts, motors, gears, etc. Price \$1.75 per copy postpaid in U. S. Send check or money order today—price of catalogue refunded on first order.

Established 20 Years

WESTERN APPLIANCE CO., Inc.
5650 Grand River Ave., Detroit 8, Mich.



FIREARMS & SWORDS



You don't want to miss our new thrill-packed catalog. Fascinating background and illustrations of 3300 authentic pieces. Exceptional values in hard-to-find items. For your 190 page catalog, simply send 50c to cover postage and handling, with your name and address.

ROBERT ABELS, Box PS, 860 Lexington Ave., New York 21, N. Y.

ITALIAN ACCORDIONS



All types, all models, Very best. Hand Made, Lowest prices. Buy direct from Factory representative and Save Money. Also Button Accordions, Chromatic Accordions and Concertinas. Send name and Address for **FREE** catalog.

ITALIAN ACCORDION MFG. CO.

7600 Cottage Grove Ave., Dept. PS-10, Chicago 19, Ill.

**Always Mention Popular Science
when writing**

MAINTAIN YOUR CAR INVESTMENT



WITH

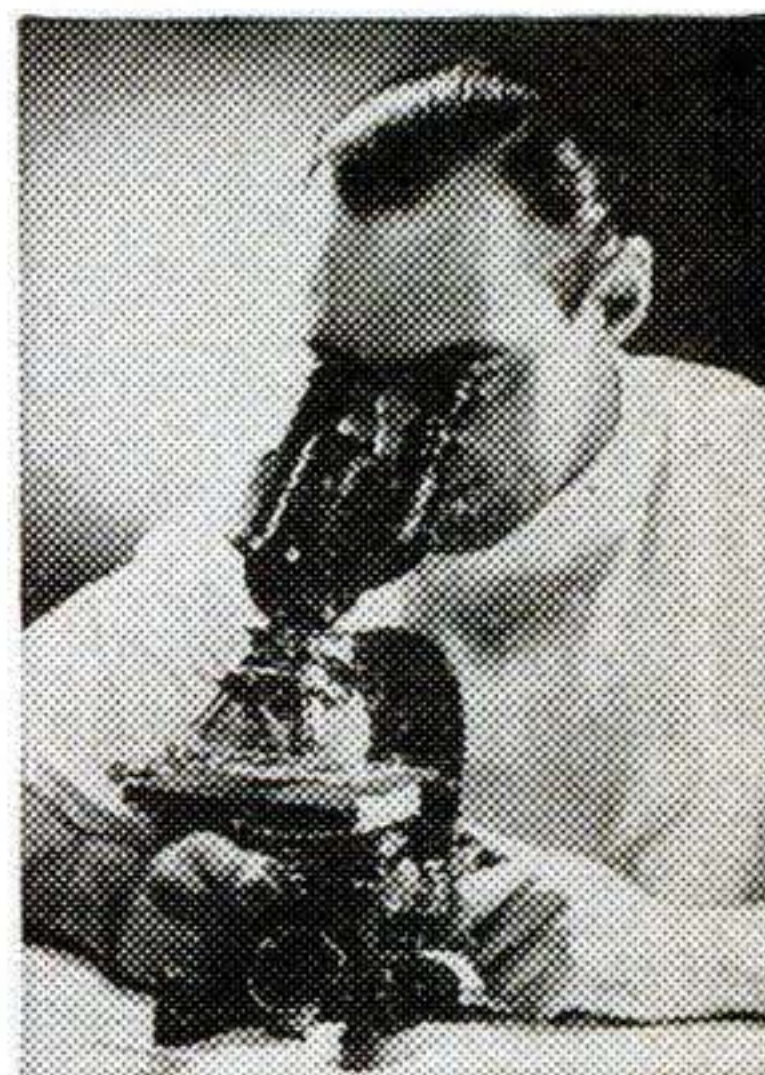
NEW FULL FLOOR RUBBER MAT PROTECTION

Here's the handiest investment saving accessory ever offered to car owners. Here for the first time is full floor mat protection to keep your car's interior like new—to end tell-tale floor and carpet wear—to protect your car investment. Made of long lived, quality black rubber for years of service—fits all cars front and back. Easy to sweep—easy to wash. Lays perfectly flat. Send for yours today at this new low price—only **\$2.59** postpaid or a set of 2 for **\$5.00** postpaid. Nothing else to buy—full money back guarantee. Send cash, check or money order to—

LEES' SALES CO. • EUCLID 23, OHIO

WHAT YOU CAN DO ABOUT PIMPLES

Acne, Blackheads, and other externally caused Skin Blemishes



WHEN pimply skin is your problem, the first thing to get straight is that you *can* and *should* do something about it. To develop the attractiveness of your face is not mere vanity. It is an "open sesame" towards bringing the real YOU closer to other people and giving your personality the poise and confidence it needs. Your good qualities — intelligence, character, dignity — all go to naught... are completely cancelled out by a skin that "nobody loves to touch." Remember, the YOU that people see first is your face.

SKIN PROBLEMS

DEMAND IMMEDIATE CARE

Medical statistics tell us that blemished skin usually occurs from adolescence on through adult life. The problem at the adolescent stage is serious enough to deserve attentive care as a family matter. In adulthood, when life's responsibilities are so much weightier, it is doubly important to exert great effort to eliminate these blemishes. And, there is no better time to get pimples under control than *now*.

DON'T ABUSE SKIN

The first instinctive reaction to pimples and blackheads is to squeeze them out with your fingers.

A bit of experimentation along these lines soon provides convincing proof that this succeeds only in inflaming your skin and spreading the infection. Under no circumstances should pimples and blackheads ever be squeezed.



Copyright 1949 by Dornol Products, Inc.

MICROSCOPE SHOWS IMPORTANT BASIS FOR EXTERNALLY CAUSED PIMPLES AND BLACKHEADS

Let's take a look through the microscope to see what's behind those unsightly pimples. The high-powered lenses show your skin coated with a covering which originated from two sources—one, internally and the other, externally.

The internal substances on your skin include dead cells, residue from the sweat glands, and a high quantity of oil excreted by the sebaceous glands. A most important factor in skin disorders occurs when thousands of these tiny sebaceous glands discharge more oil than the skin can use for lubrication. Unless special care is given, the oil forms a heavy film which attracts foreign matter to your skin much as any oil mop picks up dust. These infectious external substances may be classified into three general groups:

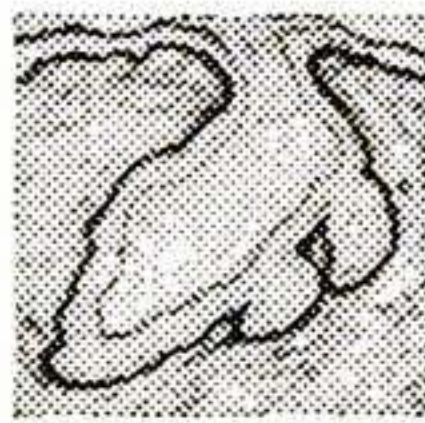
1. Airborne materials such as dust, pollens, condensation products of smoke, vapors, etc.
2. Materials brought in contact with the skin, such as tiny fragments of clothing, bedding, cosmetics.
3. Micro-organisms such as bacteria and fungi.

See the difference between a healthy skin and a pimply skin in the microscopic reproductions below.



A.

Normal skin



B.

Sick, pimply skin

Diagram A shows a normal-size, smoothly functioning sebaceous gland. Diagram B pictures sick, pimply skin. Notice that the sebaceous gland is a swollen mass of trapped oil, waste and infectious bacteria.

TRY THIS SENSIBLE WAY

Two sensible aims to achieve in controlling this skin condition are: to clear the pores of clogging matter, and to inhibit the excessive oiliness of the skin. Toward these ends, Dornol Products' research makes available two formulas. One is to aid in thorough cleansing by highly detergent penetration which simplifies the removal of waste and foreign matter. The other is to discourage oiliness with clinically-proved ingredients, and to kill infec-

tious bacteria often associated with externally caused pimples and blackheads.

BLEMISHES COVERED UP

To remove the distressing embarrassment of these skin blemishes, the second Dornol formula exerts a "cover-up" action on your broken out skin while the medication does its work. This, plus its pleasant odor, will spare you the mental distress which is associated with unsightly, malodorous, medicated preparations. Imagine! You can apply this Dornol formula to your skin by day and face the immediate present with greater confidence in your appearance, while secure in the knowledge that medication is acting to remove old blemishes and keep away new ones. What this "cover-up" action alone is worth in peace of mind is beyond calculation. No longer need prying eyes make you wince with humiliation and misery. Now because of this wonderful feature of the Dornol treatment, you can put your best foot forward... at once!

SATISFACTION GUARANTEED

OR

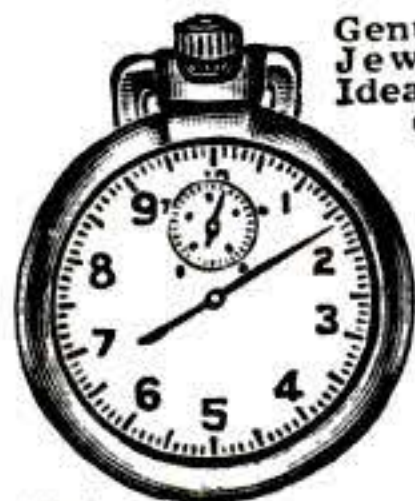
DOUBLE YOUR MONEY BACK

We know what the Dornol treatment has done for others, so we want you to try it at *our risk*. A few minutes a day invested in our treatment can yield more gratifying results than you ever dared hope for. This is what we say to you: If you are not delighted in every way by the improved condition and general appearance of your skin in just 10 days, simply return the unused portion and we will refund not only the price you paid — but **DOUBLE YOUR MONEY BACK!** Can anything be fairer than that? You have everything to gain... and we take all the risk!

How to get the Dornol Treatment immediately:

Just send your name and address to DORNOL PRODUCTS, INC., Dept. 4510-C, 4257 Katonah Ave. New York 66, N. Y. Be sure to print clearly. By return mail we will ship the Dornol treatment to you in a plain package. When postman delivers the package, pay only \$1.98 plus postage. Or, if you wish to save postal fee, send \$2 now and we will pay postage. Which ever way you order, the **DOUBLE REFUND GUARANTEE** still prevails. Don't delay another minute, send for the Dornol Medicated Skin treatment with "cover-up" feature... at once! Sorry, no Canadian C.O.D.'s.

15 JEWEL STOP WATCH
U. S. AIR CORPS SURPLUS



Genuine Elgin 15 Jewel movement. Ideal for split second timing in racing, sports, time study, etc. Full sweep split second hand graduated in 1/10th seconds. Stem wind, start, stop and reset. Used but guaranteed perfect.

Wgt. 1 lb.
No. 200—Each..... **\$9.95**

MESS HALL BENCHES



WAR SURPLUS

For picnics, social gatherings, clubs, lodges, etc. Used but perfect. Hardwood top 9 x 72 inches, seats 4 or 5 people. Folding type angle iron legs with metal brace and lock. Best and cheapest seating you ever bought for this money. Weight each 25 lbs. Stock **\$2.48**

No. 440. Each.....
10 or more, Each..... **\$2.00**

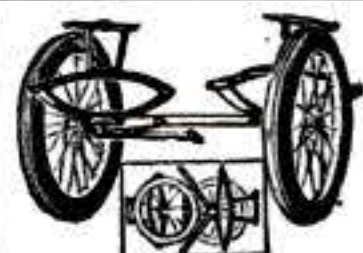
RUBBER OVERBOARD SUIT



Here is a buy! Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves.

Heavy gum rubber over fabric. Fine for commercial fishermen, sewer diggers, etc. Use it as is or cut it up for waders. All brand new! Wgt. 14 lbs. **\$4.95**

No. 183, Each.....
Please include 75c for postage.



TRAILER UNDER-CARRIAGE

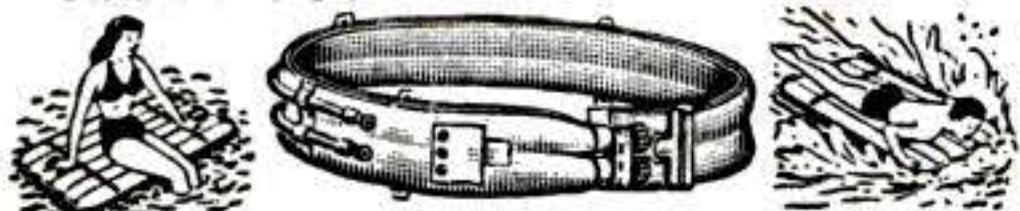


OVERSIZE TIRES

Build your own trailer for boat, camping gear or delivery service. Fitted with 26 x 2.125 U. S. Royal Tires. Motorcycle type wheels. Solid steel axle, leaf type springs and body mounting brackets. All brand new! Hitch not included. Folds to fit trunk of car. Shipped express collect only. **\$18.95**

No. 199, Ea.....

ALL PURPOSE LIFE PRESERVER BELTS



Brand new! Guaranteed water tight. Use them at the beach on the shore or in the water. Tie together for rafts. Use as canoe stabilizer. Belt consists of two air chambers. Inflate automatically with Sparklet cartridges or manually with attached hose. A real bargain at this price. No. 1261. Each..... **\$1.00**

NUCLEAR "GEMER COUNTER" SNIFTER

For locating radioactive minerals. A scientifically designed, highly sensitive instrument incorporating a Geiger counter. Detects most radiation, no matter how deep the deposit may be. Government rewards available now for locating uranium deposits. Simple to use. Audible clicks indicate presence of radioactive substances. Headphones and batteries included. Weight only 2 lbs. Brand new and guaranteed. Stock No. 527. Ea. complete **\$54.50**



7 LB. EXPERIMENTER PARTS ASSORT. KIT



Valuable radio and electronic parts by weight—resistors, trimmers, condensers, capacitors, etc., plus stamped out metal chassis. Shipped in chassis form with parts ready to demount as needed. A real bargain surprise package. No. 130R—7 lbs. **\$1.79**
No. 130Y—
12 lbs. **\$2.95**

VEEDER COUNTER

Counts to 999 and repeats—reset any time. Use for all counting operations. Has 1/8 in. shaft 3/4 in. long. Top measures 1 1/4 x 2 1/2 ins. Shp. wgt. 1 lb.

No. 436.
Each..... **\$1.95**

AVIATION CABLE



Flexible 133 strand wire cable, 5/32 in. diam., 3300 lb. break test. Lengths up to 450 ft. Use for tow rope, guy wire, clothes line, etc. Wgt. per 100 ft. 4 lbs. Specify length wanted. No. 421—
Per Ft. **4c**

U.S. Govt. BOLO KNIFE



Extra heavy. For farm, home or jungle use. Blade of Govt. formula cutlery steel. Walnut riveted handle. 3 1/2 inch hilt. 10 1/2 inch blade. You'll find hundreds of uses for a Bolo knife. Blade will take and hold a keen cutting edge. Wt. 2 lbs. A112—
with Army Sheath **\$2.95**

WIRE CUTTER

Heavy duty, compound leverage. Cuts up to 1/4 inch wire. Upper jaw acts as feeder to cutting edges. Insulated handles. Ideal for farm fence work and shop use. Shp. wgt. 2 lbs. Stock No. 392—Each **\$1.95**



Heavy Duty RUBBER GLOVES BRAND NEW

Extra heavy—extra long. Brand new, high quality gum rubber for softness and ease in use. Designed for heavy duty industrial service—protection in handling chemicals, acids, etc. A real bargain at this low price. Stock No. 295—Per Pair, Only **79c**



MEDICAL STERILIZER



Consists of alcohol burner and sterilizing tray in hinged metal case 1 7/8 x 1 1/8 x 2 5/8 inches. Burner may be used separately. Bright nickel finish. All brand new. **98c**
A125—Ea.....

CAVALRY SPURS



Genuine Wishbone type cavalry spurs. Nicked brass. A102, Pair... **98c**
A103 Spur straps per set of four..... **50c**

ELECTRIC MOTOR

Small but powerful. Shaded pole type, designed for fan application. 115 V 60 cycle. Has 1/4 inch shaft, one inch long. Operates at 3150 RPM under no load, 2000 RPM under 2.33 oz. inches load. Full load current .6 amp. Ideal for use on toys, window displays, etc. Shp. wgt. 1 1/2 lb. Stock No. 555—Each **\$1.95** only.....



McCLELLAN SADDLE



Brand new! Top grade cowhide, 12 inch seat. Hair girth. Has straps for blanket roll and knapsack. Gun boot and sabre loops. Shipping weight 15 lbs. Stock No. A145. Each..... **\$16.95**

BAYONET BLADE

Fine forged steel. Ground but not polished. May be made into throwing or hunting knife or spear. Blade 6 3/4 x 7 3/8 inches, 1 3/4 inches overall. Will take and hold a fine edge. Shp. wt. 1 lb. No. 664-R—Each..... **49c**



POPULAR RECORD ASSORTMENT



No. A300—25 Records. All Dance. Wgt. 14 lbs. **\$4.88**

Fifty records of modern dance, race, blues and hillbilly selections. No two alike. Famous name bands and artists included. Used in juke boxes, but guar. perfect. Shipped exp. collect only—no exchanges or refunds. Wgt. 28 lbs. No. A303—50 records **\$9.64**

No. A301—25 Records. Hillbilly, Race and Blues. Wgt. 14 lbs. Set... **\$4.88**

No. 302—25 Records. All Hillbilly numbers. Wgt. 14 lbs. Set... **\$4.88**

ASTRO COMPASS



A precision navigation instrument for accurately determining direction of travel and for securing a true bearing on distant objects. Ideal for classroom work—on boats, planes, etc. Wgt. 4 1/2 lbs. All brand new. No. R324. Each... **\$9.95**

SURVEYOR'S COMPASS

A precision compass with 3 inch accurately balanced, jewel mounted needle. Spirit level. Folding sights. Silvered dial accurately calibrated in degrees. Folding sights. In hand sewn leather case. Shp. wgt. 4 lbs. No. R315. Each. **\$9.95**



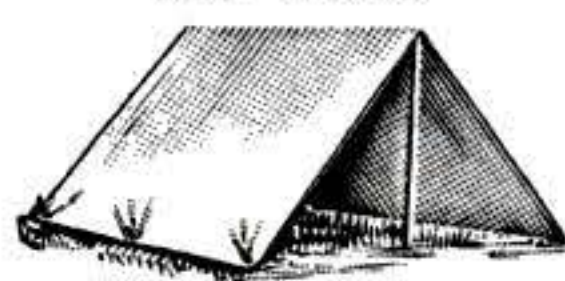
ORDER DIRECT FROM THIS AD

Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than \$5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago. Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

NEW CATALOG Now Ready—Send **10c** To Cover Postage and Mailing

STARK'S Dept. PS10
509 So. State St.
CHICAGO 5, ILL.

PUP TENTS



Regulation Army Pup Tents of durable, brown canvas. Used, but in good condition. Fine for campers, outdoorsmen, boy scouts, etc. Wgt. 8 lbs. A100 Tent only **\$3.95**
A110—Tent, new..... **\$7.95**
A101—Ropes, wooden poles and stakes for above. Per set **\$1.00**



CLASSIFIED ADVERTISING DEPT.

Popular Science Monthly • 353 Fourth Avenue, New York 10, N. Y.

Classified Ads only 80c per word per insertion, payable in advance. Minimum ad 10 words. To be included in December issue, copy should be in our office by October 25th. December issue on sale December 1st.

1 AUTOMOBILES

"SPEED & Mileage" Manual!—140 Illustrations! Most Authoritative and widely read book of its kind!! Easily gain up to 40% more speed, power, mileage, from any automobile! Complete instructions on building inexpensive speed equipment! Fast Sports Cars! "California Hot Rods"! 155 M.P.H. conversions! Superchargers! Dual Manifolds! Twin Mufflers! "Water Injectors"! Heads! Economizers! All about fast engines—Speed Tuning—Restyling—"Customizing"—Gas Saving—"Racing Tricks"—Cams—Fuels—Ratios—"Stock Car Speed Secrets"! Latest California Methods! "Custom Styling Information"! Streamlining! Sport Changes! Lowering! Working Diagrams! "Hollywood Roadster Plans"! Speed Conversions! Drawings! Charts! Photographs! All Cars! "Complete Manual" plus "Hot Rod Handbook" and Equipment Catalog—All three \$1.98 (Satisfaction Guaranteed), Almquist Engineering, Milford 24, Pennsylvania.

RACING Car Equipment for all cars. Engines, Racing Heads, Manifolds, Carburetors, Mufflers, etc. Speed instructions and literature \$1.00—refunded first order. Lee Motorcraft Co., 1412-B Great Northern Bldg., Chicago 4, Ill.

FROM Speedway to Roadway! Track-proved Hi-speed Heads and Manifolds now available for your passenger car! No special tools needed! Increase horsepower 25%! Astounding getaway! Free illustrated catalog. Speedsport, 6215AB Diversey, Chicago 39.

BUICK Parts. Enjoy new-car pep and power in your old Buick. Same day service from World's largest stock of new (not rebuilt) Buick parts and engines. Ship anywhere. Write today. Robertson Buick Co., 1002 S. Wabash Ave., Chicago 5, Ill.

"HOW To Be An Expert Car Buyer." Special report for every car buyer and owner, written by mechanical engineer. Exposes 36 tricks used to defraud new and used car buyers. Shows how to spot a "lemon." Its 98 pages crammed full of valuable information will save you many, many times the book's low cost. Sent for only \$2.00 postpaid. Act now. Stamford Supply House, 175 Toms Rd., Stamford, Conn.

"WATER Injection." Free descriptive illustrated information. Neher Industries, La Verne 6, Calif.

NEW Catalog every American Car. 120 photographs, specifications. All G-M, Ford, Chrysler and independents including Del Mar, Playboy, Gregory, Tucker, Davis, Keller. Compare all cars in one book. \$2.00 Postpaid. Clymer, Dept. 10B, 1268 S. Alvarado, Los Angeles 6, California.

SEE our ad under motorscooters for Midget Car Bargains. Midget Motors Directory, Athens, Ohio.

CALIFORNIA Speed Equipment. Doll'em up chrome accessories. Hollywood mufflers, skirts, lowering kits. Illustrated Fall Catalog 25c. Von Esser's, 2840 North Kedzie Ave., Chicago 18, Ill.

AUTOMOBILE Racing. Sixth Edition. 100 illustrations. Drawings, building instructions Ford-60 midget, California Roadster, Offenhauser racer, World's record 158.5 m.p.h. car. \$2.00 postpaid. \$2.40 C.O.D. Ray Kuns, Dept. 63, Cincinnati 27, Ohio.

1949 INDIANAPOLIS Race Yearbook. Just Out. Complete information, articles, photographs. Postpaid \$1.50. Clymer, Dept. 10B, 1268 S. Alvarado, Los Angeles 6, Calif.

"SPEED & Power" Handbook—50 chapter Library Edition! Breathtaking methods—Authentic—Direct from California! Covers Fords to Cadillacs—all makes! Build your own Dual Manifolds! Superchargers! Hot Cams! Water Injectors! Hi-Compression Heads! Mileage Devices! Save many dollars! Get racing speed, lightning acceleration, dynamic power increases from any make automobile! Build fast Stock Cars! California Roadsters! 150 MPH Rods! Get construction drawings! Tuning Techniques! Speed Tricks! Picture Catalogues! Ingenious formulas! Economy secrets! Including—"Racing Frames"—"Reciprocating Masses"—"Jet Engines"—"Braking Characteristics"—"Dynamometers." Also—Dual Pipes—Gears—Fuels—Porting—Relieving—Lowering—Balancing! Includes "California Automobile Customizing"—Glossy photographs! Diagrams! Very newest ideas! Conversions! Re-styling all makes! Streamlining! Chopping! Channeling! Customizing!—Complete—\$1.98 postpaid. Newhouse Automotive Industries, 5805-A2 East Beverly, Los Angeles 22.

LIFE of Ted Horn, American Automobile Racing Champion \$2.00—Hot Rod Pictorial \$1.50—How To Build Racing Automobile \$2.00—Indianapolis Race History Book since 1909. 360 large pages, 1100 Illustrations \$3.50—Power and Speed \$2.50—Postpaid. Clymer, Dept. 10B, 1268 S. Alvarado, Los Angeles 6, Calif.

"VAPO-Steamatic" Water Injector. Easily built! Finest automatic "Moist-Humidity" system! Engineering triumph—Gets up to ten extra miles per gallon! Tremendously increases horsepower! Eliminates ping, carbon, overheating! Reduces wear—Lengthens engine life! Copyrighted "Water Injection Handbook"—with working drawings covering automobiles, motorcycles, airplanes, tractors! Includes Plans, Catalogues, Diagrams, Instructions—\$1.00 complete. Newhouse Automotive Industries, 5805-A1 East Beverly, Los Angeles 22.

CALIFORNIA custom accessory headquarters. Buy direct from original designers and save. Solid hood sides, grille panels, lowering kits, fender skirts, dual pipes, chrome motor accessories, speed equipment. 32 page illustrated catalog, jam-packed with California accessories—25c. Eastern Auto Supply, 3319-D South Grand, Los Angeles 7, California.

"BARGAINS"—California Mufflers \$4.50. V-8 Duals \$15.90. Chrome Carburetor Stacks 98c. Dual Manifolds \$9.95. Chrome Tailpipe Cans \$1.65. Racing Camshafts \$29.95 Exchange. Hi-Compression Heads \$45.00. Many others! Illustrated Speed Equipment Catalog 25c. Almquist Automotive Engineering, Milford 71, Pennsylvania.

CLYMER'S Steam Traction Engine & Threshing Machine Book \$2.50—No. 5 Scrapbook Antique Cars \$2.00—Steam Automobile Scrapbook \$2.00—Motor History of America Book \$3.00—Life of Henry Ford \$3.00—All Postpaid. Clymer, Dept. 10B, 1268 S. Alvarado, Los Angeles 6, California.

AUTOMOBILE Racing Book, fifth edition, well illustrated. Building bodies, frames, engines, Ford conversions, Plans, Roadsters, Indianapolis cars. \$1.00 postpaid. Ray Kuns, Dept. 47, Cincinnati 27, Ohio.

FORD Owners Handbook. Service information all 1932-1949 Models \$1.50—Model "A" Handbook \$1.00—Model "T" Handbook \$1.50—Motor's Automobile Repair Manual \$7.00—Motor's Flat Rate \$7.50—Chevrolet Car, Truck Book 1930-1940 \$3.50—Outboard Handbook \$3.50—all Postpaid. Clymer, Dept. 10B, 1268 S. Alvarado, Los Angeles 6, California.

NEW Ford Speed Manual. 128 pages chock full of cutaway construction drawings, photos, and valuable easy to read and understandable technical data. Neatly bound with colorful eye-catching cover. Includes complete data on installing V-8 motor in Model A chassis, hydraulic brakes for any Ford, roadster and fast car info. How to rework these engines for speed: V-8, Merc., Ford 6, Zephyr, Model A. Guaranteed finest manual of its type published to date. Sent postpaid for \$2.00. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

NEW Chevrolet Speed Manual! 90 pages of accurate information you can really use! How to increase speed and acceleration of any 1937 thru 1949 Chevrolet. How to install late engines in pre-1937 chassis. Full data on cams, high compression, multiple carburetion, supercharging, ignition, etc. We guarantee this to be the finest manual of its type! Prove that your Chevrolet can have power and speed formerly associated with other cars. Sent postpaid for only \$2.00. California Bill, Box L-2, Eaglerock, Los Angeles 41, California.

"HOLLYWOOD" Deeptohe Mufflers. Powerful "Straight-thru" design increases efficiency, speed, acceleration, mileage! Singles, All cars \$4.85. V-8 Duals \$15.90—(Satisfaction Guaranteed). Speed equipment catalog 25c. Dealers wanted. Almquist Engineering, Milford 24, Pennsylvania.

"HOT Rod" Handbook plus "California Speed Manual" and "Racing Equipment" Catalog—all three only \$2.00. Speed Publications, Drawer 716, Port Jervis 98, N. Y.

CUSTOM-Restyling. Super Handbook. Brand new! 200 graphic photographs, sketches, Medley cutaways. Thousands ideas. Guaranteed: Biggest, Best Buyable! \$2 pp, including catalog. Post Publications, Box 723-KC, Arcadia, California.

2 AUTO SUPPLIES & EQUIPMENT

"AIR-SCOOPS" — Air-Condition your car!! Clamp to your front small windows. Made of highly polished stainless steel, they give your car a smart look. \$1.60 pair. Send to New Canaan Engineering, Box 216, New Canaan, Conn.

POPULAR SCIENCE OPPORTUNITIES

BRUSH Plating Outfits connect to a battery. No tanks or shop required. Free particulars. Gunmetal Co., Avenue K, Decatur, Illinois.

AUTO parts. Buy direct. Get dealers' prices. Represent us in your territory. Write requirements. Specify car make. Mechanics Auto Parts, Factory Warehouse, 3807-PS N. Ashland, Chicago 13.

"SMITHY Mufflers" for all cars. Free list. Buck's Auto Parts, 1629T, Merced 5, California.

WELDING Pays good profits. Bodies, blocks, frames, fenders—easy with Hobart Welders. Low cost. Easy Terms. Free Catalog. Write Hobartweld, Box P-1092, Troy, Ohio.

SAVE Gasoline! Quick Starting! "Air-flow Needles." \$1.50. Free Trial! Specify Car, Carburetor, Neher Industries, La Verne 6, California.

DIRECTION Signal will flash present parking, tail lights. Install yourself. Arm signals unnecessary. \$8.95 Postpaid in U.S.A. for 1942-1949 cars. Some earlier cars slightly higher. Specify make, year. Money back guarantee. The Lester Co., Box SC-10, 820 W. Jackson Blvd., Chicago 7, Ill.

NEW Car Lustre! Catron's Miracle Auto Wax, cleans, polishes—one operation. Removes rust from paint, metal. Amazing results. Long life. Send \$1.00. Peters, Box 308, Hemet, Calif.

LIFE Charge keeps battery charged automatically. One package lasts life of battery. \$1.50 postpaid. Guaranteed. R. N. Clark, Distributor, 205 Whitehall Street, S.W., Atlanta 3, Georgia.

HEAT your car seconds after starting with Super Heater, booster for all water heaters. Fits around exhaust pipe, water runs from motor through Super Heater into car heater. Quicker, hotter heat. Easy to install. \$7.50 postpaid. Dealers wanted. Caughron Engineering Co., 219 Merchandise Mart., Oklahoma City, Oklahoma.

OVERDRIVE—"Sig-Na-Lite" for cars with Overdrive. Write for Free "Overdrive Hints". Sig-Na-Lite, 5227c Parker, Chicago, Ill.

VAPOR Injector gives super performance more power, smoother running and saves gas. Send car year and number of cylinders. \$9.75 postpaid. Money back guarantee if returned 30 days. Vapojet, 14424 Biona, Los Angeles 34.

SNAP-On Convertible Top Covers. Plastic fabric. \$19.50. Vassar, Cleveland 5, O.

CHEVROLET Parts. Scarce motor, body, sheet metal parts. Grossman Chevrolet, Minneapolis, Minnesota.

SHATTERPROOF Glass! Direct factory savings! Write Requirements. Cooper's, 3124W, Chicago 25.

TILLOTSON carburetors, parts, manuals. Wholesale and retail. Free list. Agencies available. 600 LaPrairie, Ferndale 20, Mich.

"LEKTRON" atomic coil booster saves gas! Instant starting, smoother power. Easily installed. \$2.00. Money-back guarantee. Specify car. Electronic Industries, Cleveland 11, Ohio.

NEW Sensational Automatic Thief Chaser Burglar Alarm. A Life Guarantee electrical unit installed on any car or building. Once installed it works automatically. Only \$4.98. Easily Installed. Free Literature. Novak Manufacturing Company, 1358 Chase, Gary 2, Indiana.

AUTO Bells: Sensational new warning signal! \$8.50. Details free. Write: Bermuda Auto Bells, D-20, 16 Concord St., West Hartford 7, Conn.

PISTONS—American, Foreign, and Racing Any Model, Merryman Co., Lawndale PS 6, California.

CHEVROLET Parts. Any part for any year, any model Chevrolet. Don Allen, Buffalo, New York.

NEW Sensational Seat Covers. Mono, 6545 Santa Monica Blvd., Hollywood 38, Calif.

3 AUTO TRAILERS

TRAILER plans—house, utility, boat, etc. Axles, chassis, hitches, windows, etc. Catalog with booklet, "Trailer Hints." \$1.00. Catalog only, 50c. Marine Mart, Buffalo 7-A, N. Y.

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

TRAILER Coaches. Save Money. Buying? Building? Sound engineering construction, chassis, bodies, furnishings. Travel, dwelling, trailer plans. \$1.50 postpaid. Ray Kuns, Cincinnati 27, Ohio.

4 MOTORCYCLES BICYCLES, SUPPLIES

MOTORSCOOTERS. New Design, 6 big features. Literature 10c. Rollaway Motors, Lancaster, N. H.

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages. 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31, Kansas City, Mo.

RECONDITIONED motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 1, Mo.

MOTORCYCLE pistons and parts, new, used. Harley, Indian, Henderson, Super-X. List 10c. Ballak, 811 N. 9th, St. Louis 1, Missouri.

MIDGET car \$5, motorbike conversions \$5 brand new Regal motorscooters \$37.50 less motors, Indian motorcycle \$25, midget car \$20, Custer motorscooter \$25, all complete. Gasoline engines \$2 up. Super-cycles, Cushman's, Salsburys. Plenty new motorscooters, midget cars, homebuilders parts, automatic clutches, transmissions, engines, tires, etc. at factory prices. Special sale: Four balloon tires for \$3. Over 5500 tires in stock. Mailorder only. Send 25c for Big War-Bargain Catalogue just out listing these and hundreds of other bargains. (35c by First Class Mail.) Midget Motors Directory, Athens, Ohio.

MOTORCYCLE Journal—Worldwide Coverage. Illustrated. Year's Subscription \$1.00. Sample 15c. Motorcycle News, 5424-H Sawyer, Chicago 25.

CUSHMAN motorscooter (4 H.P. motor) \$19.98 complete; Midget car (leather seat) \$25.00; Motoscot \$15.00; 1946 Whizzer \$35.00; Motorbike outfit \$5.00; Indian motorcycle \$30.00. Other motorscooters \$8.00 up, motors \$3.00 up. Send 25c for new Summer catalog listing many other sensational bargains in used motors, motorscooters, motorcycles, parts, etc. Associated, Box 1764-CS, Toledo, Ohio.

WHIZZER Bike-motor \$25.00; Cushman motorscooter \$15.00; Midget Racer \$40.00; Shaw Bicycle-motor \$15.00; Harley-Davidson Motorcycle \$15.00; Smith Motor-wheel \$25.00; Good motorscooter (twist grip) \$22.50. Rush 25c for new catalog #14 listing many other amazing bargains in motorscooters, used motors, midget cars, parts, wheels, etc. Gail, 538 Erie, Toledo, O.

POWERCYCLES—New—Factory overstock—Latest Models—\$98.50 up plus tax and freight—Regular \$179.50 to \$267.50 values—Amazing Buy—Regular Factory Warranty—Send For Free Catalog. R. C. Cheney Co. Mfg. Division, La Crosse, Wis.

MOTORSCOOTER Clutches \$6.45. Engines \$5.00. List 15c. Donz, Mount Ephraim, N. J.

5 AVIATION

JET Engine \$3.00; Plans \$1.00; Literature 10c; M.E.W., 387 University, St. Paul, Minn.

PROPELLERS—2-3 Blade, for sleds, air-drive boats. Catalog. Standard Aero Craft, Box 387, Ft. Worth, Texas.

PROPELLERS, plans for snow sleighs & air boats. Catalog 10c. Banks-Maxwell, R.F.D. 12, Ft. Worth.

6 AVIATION INSTRUCTION

ROSS Guaranteed questionnaires for all C.A.A. ratings. Free folder. Ross Aero Publishers, Department 3-P, Administration Building, Commercial Airport, Tulsa, Oklahoma.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Pencil; Engraves all Metals \$1.25. Beyer Mfg., 10511-C Springfield, Chicago 43.

BUY Lamp Parts Wholesale. Parts you need for building, repairing, or assembling. Save money on large or small orders. New catalog for 10c. Gearon Company, Dept. 300-A10, 27 South Desplaines, Chicago, Illinois.

OIL Lamps—Electrify them in ½ minute. Catalog all lamp parts and instructions 10c. Gyro Lamps, 5402B Clark, Chicago 40.

MAKE your own variable transformer from low cost practically ready made easily obtainable surplus. Data \$1.00. PeJay Engineering, Box 1172, Oakland 4, Calif.

ELECTRONIC door lock! Sensational! Invisible! Positive protection! Inexpensive! Tremendous profits! Free details! Aynesworth, 17544 Raymer, Northridge, California.

LAMPS—Build own Originals. Parts Wholesale, any amounts. Catalogue 10c. Brown Lamp Co., No. 501, Wellston, St. Louis 12, Mo.

8 WELDING, SOLDERING, PLATING

"BANTAM-Champ" Welder starts you in profitable welding business. Pay only \$16 monthly. Write for information on this new, low-cost 200 Amp. Welder and free "Guide to Better Welds." Hobartweld, Box P-1093, Troy, Ohio.

SOLDERING Iron Stove—burns kerosene. No pumping—no noise—use anywhere. Send for descriptive folder. Patton and Patton, 1900 W. Fulton, Chicago.

WELDERS 110V. Welds ½" steel, \$29.50. Morris Welding Service, 1850B State, Schenectady 4, New York.

WELDERS for all requirements. Free catalog. Write Hobartweld, Box P-1094, Troy, Ohio.

ELECTROPLATING Units—Complete \$2.00 and up. Free Literature. Regency Sales, 5316 S. Justine, Chicago 9, Illinois.

RADIATOR Repairing Books, Supplies, Equipment, Gasoline Torch. Write for circular. Curfman Mfg. Co., Maryville, Mo.

WELDING—a profitable trade. Learn quickly at best equipped school in U. S. Low Cost. G.I. Approved. Free Catalog. Write Hobartweld, Box P-1095, Troy, Ohio.

10 MACHINERY, TOOLS, SUPPLIES

"BUILD-UR-OWN" Welder—AC Power Combination. Portable—welding plus AC Power anywhere. Your engine plus Hobart Generator saves \$350. Free instruction book. Write Hobartweld, Box P-1096, Troy, Ohio.

CONCRETE Mixers—New low prices, \$49.00 up. Write for literature and price sheet. Muller Machinery Company, Inc., Dept PS, Metuchen, New Jersey.

POWER tools, equipment wholesale prices. Free Bulletin. Homecrafters Cooperative, Grand Rapids 6, Michigan.

13 BATTERIES, GENERATORS, ETC.

EDISON Non-Acid lifetime storage batteries for home lighting, motors, industrial uses, radio, etc. Free interesting literature. Hawley Smith Co., Croton Falls 2, N. Y.

14 BOATS, OUTBOARD MOTORS, ETC.

STEERING Wheels, windshield brackets, from \$6.95. Modern fittings at lowest prices. Complete pre-cut plywood boats. Bargains galore. Folder 10c. Marine, Box 681, Mendota, Minnesota.

FULL size, cut to shape boat patterns, blueprints, 7½-38 feet. Illustrated "Build a Boat" catalog, 25c (coin). "How to Build Boats" book, \$1.00. PolyWog Houseboat Plans \$10. Marine Catalog \$1.00. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland 13, Ohio.

PACKAGED Lumber—Marine plywood, seasoned oak and cedar, sized, selected. Send \$1.00 for booklet, "Plywood Boats," with quotation form and literature. Forms and literature, 25c. Marine Mart, Buffalo 7-A, N. Y.

YOUR Shop Needs Our Machines. Lathes, Drills, Millers, Shapers. Accurate, low prices, immediate delivery. Money Back Guarantee. Conversion Parts Co., 277 Adams Street, Boston 22, Mass., U.S.A.

POPULAR SCIENCE OPPORTUNITIES

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

MARINE Specialties and motor conversions catalog. Sixty pages of struts, finishes, hardware, plexiglass windshield kits, electric tachometers, inboard and outboard air cooled motors, etc. Immediate delivery. Catalog with booklet, "Conversion Hints," \$1.00. Catalog only, 50c. Marine Mart, Buffalo 7-A, N. Y.

BOAT Builders' guide—250 pages—15,000 items pictured, priced, deliverable. Send \$1.00. Marine Mart, Buffalo 7-A, N. Y.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company, Department A, Newark 2, New Jersey.

P38 BELLY Tanks \$9.95. Steel. Unused. Ten foot. Anzio Boat Company, 1627 "T." Merced, Calif.

SAVE 2/3 cost. Assemble your own boat. Complete plans and boat parts machined ready for assembly. No experience necessary. Rowboats to cruisers. Illustrated catalog 25c. Midwest Boat Company, Menomonee Falls, Wisconsin.

15 ENGINES, MOTORS, ETC.

NEW Electric Motors, 1725 R.P.M. 110 volt. A.C. 60 cycle 1/3 H.P. General Electric \$12.50. 1/3 H.P. Jack & Heintz Heavy Duty Capacitor type, rubber mounted only \$12.50. 1/2 H.P. General Electric, capacitor type, ball-bearing \$23.50. 3/4 H.P. Repulsion Induction 110-220 Volt A.C. 60 cycle 1725 P.P.M. \$30.95. New Electric Drills—110 volt. A.C. or D.C. 1/4" \$9.95; 1/2" with Jacobs geared key chuck \$26.50. No C.O.D. orders. Satisfaction guaranteed or money refunded. Prices F.O.B. E. W. Peters, 2139 West Fifty-Ninth St., Cleveland 2, Ohio.

WINDING Data, listing 225 motors, single and three phase. \$1.00. Motor Data, Box 7631, Kansas City 3, Mo.

"Build-ur-Own" Welder, Hobart Generator plus auto engine saves \$350. Free instruction book. Write Hobartweld, Box P-1097, Troy, Ohio.

SURPLUS Engines, Factory Cartons, 2-H.P., \$39.50. Box 262, Route 3, Orlando, Florida.

MAKE it Yourself at Zelf! The rental machine shop. Lathes, Millers, Grinders, etc. Accessories. Hourly rates start at 25c. Call Zelf Tool, Or 5-3675, New York City.

HOTTEST surplus list in the country. Electronics, Hydraulics, Aircraft, Gadgets. Dick Rose, Everett, Washington.

DIKE Pumps Custom Built. Circular Free. Langholz Machine Works, Oak Harbor, Ohio.

GASOLINE Motors, Surplus, new rated 3/4 to 1 H.P. 2700, 3800 R.P.M. 2 cycle. Wico or Phelon Magneto, Tillotson Carburetor, instructions, rope in original package, \$29.95 with order we pay shipping. Jedway Company, Acton, Indiana.

16 AMERICAN POLICE JIU JITSU

DEADLY Judo—Fiercest fighting technique, Trick knockouts. (Over 200 illustrated pictures.) Expert instructions—Three volumes Complete \$2.25. Variety House, Box 46-A, Wall Station, New York 5.

18 BODY-BUILDING COURSES

BARBELLS—finest quality \$8.98 up. Catalog Free. Lurie Barbell Co., 1729-S10 Rockaway Parkway, Brooklyn, New York.

HANDBALANCING and Acrobatics easily learned. Write, Power, 923-A, W. Vine, Kalamazoo, Michigan.

6 BODYBUILDING Courses, four Barbell, two dumbbell, in 53-page muscle-building book with six illustrated Wallcharts, \$1. Paramount, 2418 E. 23rd, Los Angeles 11, California.

BARBELLS, Dumbbells, Exercise equipment, Courses, Free booklet. Good Barbell Co., Reading, Penna.

NOW! The Way to develop your muscles quickly. Details, Sports Centre, 204 East 81, New York 28, N. Y.

19 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

SEND 10c for list 100 used guns, Frayseths, Willmar, Minn.

"SHOTGUNS"—"Rifles"—"Handarms"—"Ammunition"—"Rods"—"Reels"—List 10c. PS-Rudolph's, Atchison, Kansas.

BOWS—Arrows—Quality Archery Equipment, Popular prices. Catalog 10c. Illustrated Archery Instruction Book 50c. Archery, 617-J So. State, Chicago 5.

190 PROFUSELY illustrated pages antique and modern pistol, sword, etc. values, 50c. Robert Abels, PS860 Lexington Ave., New York 21.

AMMUNITION Prices Slashed, American and Foreign Loads below retail, Dime for List, Central Sports, Delphos 11, Ohio.

ENFIELDS, 30/06, Excellent Condition \$39.50. Pre-war Short Mauser '98 actions \$28.50. Std. Model '98, \$28.50. All orders F.O.B. L.A. Western Arms, Dept. 3, 1206 Maple, Los Angeles 15, Calif. Dealer inquiries invited.

SPORTSMEN! Send for big money-saving catalog; guns, sporting goods. Enclose 10c. Woodland Sports, Woodland Hills 1, California.

FREE Catalog (New Fall Edition) of Guns, Fishing Tackle, Athletic Goods, Camping Equipment, Cameras, Western Goods. Write Andy Anderson's Sporting Goods Co., 120-B W. Grand Ave., Oklahoma City, Okla.

NATIONALLY known Shotgun or Rifle Recoil Pads, slightly imperfect. While they last \$1.25. Also seconds but very top quality, while they last, \$1.00. Merston Company, Inc., 511 East Broadway, Glendale 5, California.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemed, N. J.

ANTIQUA and Modern Guns, Bargain List 10c. Rywell, Harriman, Tennessee.

SHOTGUNS, Rifles, Revolvers, Over 500 Modern, Obsolete, Also Cartridges, List 10 coin, Ed Howe, 26 Main Street, Coopers Mills, Maine.

20 FIELD GLASSES, TELESCOPES, ETC.

TELESCOPES, Binoculars, Microscopes, —big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

"TERRIFIC" Bargains — Government Surplus Telescopes, Binoculars. Send \$1.00 for 10 piece Hobbyst Lens Set. Contains magnifying and reducing lenses. Send stamp for "Bargain" list. H. Jaegers, 93-08 95th Ave., Ozone Park 16, N. Y.

WAR Surplus Bargains, Binoculars, Telescopes, Sextants, Millions of Lenses, Prisms, Reticles, Eyepieces, Objectives, etc. Request Free "Catalog CN." Edmund Salvage Co., Audubon, N. J.

REFLECTING Telescopes, completely assembled, 60X, \$25.00. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

ASTRONOMICAL telescopes, binoculars, microscopes; Bought, sold, repaired. Books. Lists 10c. Rasmussen-Reece, Amsterdam, New York.

SAVE 50% On New Binoculars! Free catalog and booklet, "How To Select Binoculars." Write Today! Bushnell Importers, 43-P10 East Green, Pasadena 1, Cal.

POWERFUL astronomical telescope easily made. Perfect lenses and instructions; 100X \$3.00; 100X and 200X \$4.00; 100X, 200X and 400X \$6.00. Full power, clear vision guaranteed. Instructions alone 10c. Suffolk Science Service, Box 308, Manorville, N. Y.

24 DOGS, BIRDS, PETS, RABBITS

RAISE Guinea Pigs. Make extra money. Booklet free, Taylor, Box 426B, Hapeville, Georgia.

MAKE Money! Raise Chinchilla Rabbits. Experience unnecessary. Valuable Breeders. Extra profits from meat, furs, laboratories. Pleasant hobby. Write today! Willow Farm, Sellersville 16, Pa.

ANGORAS, Giant Chinchillas, White Giants—World's most profitable rabbits. Finest pedigree, heavy-producing, prize-winners. Literature free. Grinstead's, Edwardsville, Illinois.

HOHL'S Hamsters, A million laughs, hours of fun. Literature free, "Ideas For Markets" 10c. Pets, quality breeding stock available. Box 695, Newark, Ohio.

SEE Gulf Hamstery ad page 91. Shows picture of Hamster.

\$50 WEEKLY Raising Angoras, Free Illustrated Booklet tells How, Wilson's, Stanton, Calif.

\$400 MONTHLY Raising Angora Rabbits, No experience required. Details free, White's Rabbitry, Newark, Ohio.

GOLDEN Hamsters—Novel Pets, \$5 brings breeding age pair including two metal cages, instructions, Hathaway Hamstery, 609 Deerfield, Silver Spring, Md.

RABBITS! For tasty Food and Profits. Write for information and Free Illustrated Booklet, Dr. Frank Baddour, Lebanon 8, Tenn.

HAMSTERS \$2.75 pair, Mice \$2.50 dozen, Alligator \$2.50, Chameleon 35c, Mealworms 50c hundred, Hobby Catalog 10c, Reptile List 5c, Quivira Specialties, Topeka, Kans.

RAISE Mink, Amazingly profitable. Free booklet gives inside "secrets." Molgard, Brigham City, Utah.

25 FROG RAISING

"RAISE Frogs!"—Pleasure and profit. New book explains everything. Marlboro-B, Box 7002, New Orleans 19, Louisiana.

30 FARMS, OTHER REAL ESTATE

GOOD FARMS—Ranches, Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state, J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minn.

OZARK Lands for All purposes, Actual river frontages, 5 acres \$90.00 and upwards. Free list and literature, Hubbard, 424-H, Minnesota Ave., Kansas City 4, Kans.

STROUT'S Farm Catalog! Time and Money-Saver—Free! Describes 2790 Bargain Properties—35 States Coast-to-Coast. Write Today for your Free Copy! Strout Realty, 255-ZB—4th Avenue, New York 10, New York.

BIG Free Fall Catalog! Farm and country real estate bargains, good pictures, many states, easy terms, many equipped, crops included. For Special Service, state requirements, desired location, United Farm Agency, 428-P4S BMA Bldg., Kansas City 8, Mo.

FARMS, Ranches, lodges, resorts, Big selection, Milwaukee Road territory, Washington, Idaho, Montana, Dakotas, Minnesota, Iowa, Missouri, Michigan, Wisconsin, Illinois, Indiana. Free colorful descriptive folders, price lists, L. H. Robbins, 738P Union Station, Chicago 6, Ill.

FLORIDA Campsites — \$75.00 at \$5.00 monthly buys nice, high dry lot in Lake County (world's best bass fishing) near Ocala National Forest, St. Johns River, beautiful lakes, pavement, Safe from bombs, Folder Free, Wintree Vernor, DeLand, Florida.

32 PROFITABLE OCCUPATIONS

\$40.00 WEEKLY, Made growing mushrooms, Fresh, Dried, Dominion Patent 331.583, free spawn, North American, 169Y Yonge, Toronto, Canada.

NO selling, operate coin machines, amazing profits, details Free, Parkway Corporation, Dept. 12, 623 W. North Avenue, Baltimore 17, Maryland.

\$5000 FROM half acre growing Ginseng, crop bought, Particulars 10c, Associated Growers, 1169 Corydon, Winnipeg, Canada.

DETECTIVES Earn Big Money, Excellent opportunity, Detective Particulars free, Write, Wagoner, P-125 West 86th, N. Y. 24.

RAISE Ginseng; roots bring \$10.00 pound, Seeds for fall planting; circular free, Fezler Seed Company, Patchogue, N.Y.

BE Independent, Be Secure, have your own profitable business—earn \$10.00 and more a day making beautiful, fast-selling lamps at home, No equipment needed, Illustrated course teaches you quickly, Course, parts catalog, wholesale price list—only \$2.00, Gearon Company, Dept. 200-A10, 27 South Desplaines, Chicago 6, Ill.

TOM Burt's salesmanship course affords great opportunity—see Educational Classification.

POPULAR SCIENCE OPPORTUNITIES

MAKE Beautiful Holiday Flowers, Novelties. Wonderful home business pays excellent profits. Literature free. Velva Art-crafts, 324-X East 14, New York 3, N. Y.

\$50.00 A Day. Part or full time. De-tails \$1.00. P. O. Box 381, Fort Dodge, Ia.

RAISE Fishworms. Easy. Profitable. Send 25c in coin for complete instructions. Huffman's Worm Ranch, Rives Junction, Michigan.

MAKE money with hamsters. New Tiny animal. Easily raised at home. Write for details. Hudson Hamstery, Newfoundland 2, N. J.

\$400 MONTHLY Raising Angora Rabbits. No experience required. Details free. White's Rabbitry, Newark, Ohio.

EARN extra money tying artificial silk roses for houses and millinery. Large roses—80c a dozen; small roses—60c a dozen. Large leaves—25c a dozen; small leaves—18c a dozen. Complete sample kit for \$2.00. Money back guarantee. Artificial Flowers, 786 East 51st Street, Brooklyn 3, New York.

LOCKSMITHING secrets! Key fitting, lock repairing, opening; prices, sources. Illustrated book \$1.00. Wexler, 7 West 36, New York City.

33 BOOKS, PERIODICALS, ETC.

MAGAZINES (back dated)—foreign, domestic, arts, books, booklets, subscriptions, pin-ups, etc. Catalog 10c. (refund-ed). Cicerone's, 863 First Ave., New York 17, New York.

USED Correspondence Courses and Books bought, sold, rented and exchanged. Catalog Free. Lee Mountain, Pisgah, Alabama.

ADULT Stories, 25c. Eight—\$1.00! Free catalogs! Hirsch, Spring Valley 3, N. Y.

HYPNOTISM. Mental phenomena students—adults only. Send 10c for unique Hypnotic Catalog. Power Publishers (Un-usual-Book Specialists), PS9, 790 Broad Street, Newark 2, N. J.

QUICK profits taking magazine sub-scriptions, handling greeting cards. Cas-sell Publishers Service, Westfield, N. J.

BOOKHUNTERS! All Subjects. Send Wants! Jaher Book Service, 620-K East 178 Street, New York 57.

SELF-Hypnosis. Amazing new book—guaranteed!! \$2.00. Psyche, 542-BH 5th Ave., N. Y. 19.

CARTOON Booklets—50 pages 20c. West-erns—Boxing—Wrestling—Real Action Stories in Picture. Cartoon Books, Box 77, Mexico, Missouri.

FIVE Big Mail Order Magazines 25c. Grover Porter, Hartsville, Tennessee.

ADULT Books—Unusual—Revealing—il-lustrated. Five \$1.00. Catalogs 10c. Kogan, 1032-DP, Church Annex, New York 8.

10c CARTOON. Joke, Gag Magazine. Okay laughs! Fun! Humor! Sample copy, Dime and Stamp. K. O. Harris, Box 1567, Portland 7, Oregon.

ADULTS—Intimate Books, Booklets. Particulars! Justco, 326 Park Row Build-ing, New York 7.

REAL Girl Photos 24 different and wholesale price list \$1.00. Max Kleeman, 2433 North Mascher, Philadelphia, Penna.

NATIONAL Geographic Magazines 1888-1949. any issue. Periodical Service, Box 327-PS, Swarthmore, Pa.

BACK number magazines reasonable. Reedmor, 240 East 9th, New York, N. Y.

ADULTS Only "Daring Books." Free lit-erature. Home Pix, 1674 Broadway, N. Y. 19.

IMPORTANT! Hobbyists, have you seen leading British technical monthly. "Prac-tical Mechanics?" Invaluable Home Work-shop and model-making sections; new British and European inventions; features by experts on television, aeronautics, etc. Profusely illustrated. Annual subscription (12 consecutive issues direct to your ad-dress from London) only \$2.00 from George Newnes Ltd., U. S. Subscription Office (P.M. 18), 342 Madison Avenue, New York 17. Two Years \$3.75. Three Years \$5.50.

NEW book, "How To Live Without Money," ends your money worries. How-ard, 1778-S Hamburg St., Schenectady 4, New York.

BACK-date Magazines. Specific issues: years. Arkell's, Tarzana 2, Calif.

35 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS' Gamblers' secrets ex-posed. Cards, Dice, Punchboards, Slot Ma-chine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo.

FREE Dollar Magic Set with Profes-sional Catalog 25c! "Mysto," 4462-PS Germantown, Philadelphia.

ITCHING, Sneezing Powders, Eighteen Other Tricks and Joker's Catalog 25c. 2404N15, Philadelphia.

WE supply every noted magician. Large professional catalog 50c. Holden's, P220 West 42nd Street, New York.

500 TRICKS Catalog and book "84 Card Tricks", Both only 50c. Robbins Co., 152-P West 42nd St., New York.

MAGIC, novelties, money-makers. Cat-alog, 10c. Newton Company, Bonham, Texas.

BOUTENNIER Flower mystically ap-pears and disappears on coat lapel at your command. 50c. Free illustrated catalog of trick items. Bow Lite Tie Co., 4348 Po-tomac, Chicago 51, Ill.

500 TRICKS you can do! Send 10c for Douglas famous Catalog, best in magic at lowest prices. Unequaled service to mag-icians for 30 years. Douglas Magicland, Dept. 2, Dallas, Texas.

VENTRILOQUISM Taught. 3c stamp brings particulars. Smith, 801 Bigelow, Peoria 5, Ill.

"GENUINE Hypnotism", Complete il-lustrated course including instantaneous method and self-hypnosis \$1.00. Money back guarantee. Henry Fowler, 650 Pros-pect Place, Brooklyn 16, New York.

TRICK that won first prize at magicians convention. Guaranteed dollar value. 25c with our catalog. Steiner's, 316-D East 61, New York 21.

400-PAGE Catalogue of 2000 Tricks, pocket, parlor, stage. World's Finest Magic. Send \$1.00 for Catalogue (refund-ed first \$5.00 order). Kanter's, S-1311 Wal-nut, Philadelphia 7.

LARGE 160 Page Magic Catalog 35c for Beginners and Professionals. Chicago Magic Company, 2300-B No. Mason Ave-nue, Chicago 39.

BE a Magician. Large professional magic catalog of latest tricks, 35c. Ireland, F-109 North Dearborn, Chicago.

LEARN magic, Ventriloquism, Mind-reading. Write for particulars. Quacken-buch, Big Flats, N. Y.

VENTRILOQUISM Free Literature. State Age, Maher, Box 36-S109 Kensington Sta-tion, Detroit 24, Mich.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak, Mich.

PROFESSIONAL Magic Hats, Canes, and Wands at Amateur Prices. Catalog Free. Aim Magic Co., 143 Verona Avenue, New-ark 4, N. J.

12 LATEST Tricks, Puzzles, and Cata-logue 25c. Laramie Sales, 4800 So. Laramie Ave., Chicago, Ill.

36 GAMES, ENTERTAINMENT

RULES for arithmetic card game, Ci-pherex, \$1.00 postpaid. Convert old decks. Landau, 225 East 74 Street, New York City 21.

37 COIN COLLECTING

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to ap-proval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

GET profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Bldg., Ft. Worth, Texas. Largest rare coin estab-lishment in U. S. Established 48 years.

FREE Foreign Coin and Banknote with giant Bargain List 10c; 4 Whitman Coin Albums \$1.00; 1949 U. S. Guidebook (256 Pages) \$1.50. Nolson, 5800 Lake, Chicago 44.

FOREIGN Coin Bargains. List free. Lyle Andrews, Box 677, Sumner, Washington.

COINS Wanted: Itemized list 20c. Elsholz, Box 9014-S, Pittsburgh 24, Pennsylvania.

OLD Money Wanted. Will pay Fifty Dol-lars for nickel of 1913 with Liberty Head (no Buffalo). We pay cash premiums for all rare coins. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Texas.

U.S. coins lowest prices. Send stamp for lists. Hutchinson, 3463 I Street, Philadel-phia 34, Penna.

BARGAINS. All different—3 Large Cents \$1.00, 20 Indian Cents \$1.00, 4 Copper-Nickel Cents \$1.00, 4-2c Pieces \$1.00, 20 Foreign Coins \$1.00, 1932-D Quarter \$1.00, 1932-S Quarter \$1.00, Giant Guidebook \$1.50, Handbook 75c, 4 Albums \$1.00, Cata-logue 15c. Bebee Coin Company, 1180 East 63rd, Chicago 37, Illinois.

43 MIXED Indian Pennies \$1.00, 33 Dif-ferent Foreign Coins \$1.00. Chelsea, 40 West 18, N. Y. C. 11.

COMMEMORATIVE \$1/2 — Columbus, Washington, Cleveland, Stone Mountain, \$1.50 ea. Illustrated Catalogue 25c. Norman Schultz, Salt Lake 9, Utah.

40 STAMP COLLECTING

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Abso-lutely unpicked and unsorted, just as re-ceived from church missions. Many varie-ties, including large commemoratives, air-mails, high denominations up to \$5.00! Stampdom's biggest package of fun, and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co., Dept. 55, Camden, New York.

FREE! Crystal-Mount Sample. Harrisco, 204 Transit Bldg., Boston, Mass.

DEALER'S Wholesale Catalog. Postage 3c. Franksco, 5031 Queensbury, Baltimore, Maryland.

128-PAGE United States Catalog, 1,000 illustrations, 25c. Harris & Co., 204 Tran-sit Bldg., Boston.

WORLD'S Largest Stamp (7 1/2 x 14 inches). A real curiosity! Retail for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. A-Valon Stamp Co., Springfield, Mass.

POUND stamps containing thousands \$1.00. Longacre Shop, 100c West 42nd, New York City 18.

WOW! \$10.00 Worth Of Fun 10c! What a treasure hunt! Big package 500 Foreign Stamps, including airmails, pictorials and others from the world over; stamps worth up to 25c each. This offer sent for 10c to Approval Applicants Only. Jamestown Stamp Co., Dept. 5, Jamestown, New York.

FREE! Illustrated United States Cata-log. Low Prices! Americo, Bristol, Conn.

UNITED STATES approvals complete coverage fine quality, attractive prices. Seminole Stamps, Box 1138-S, Coral Gables, Florida.

CASH For Your Duplicates. Particulars free. Goliath, Bethlehem 8, N. H.

FREE—Famous Americans Set, Flag Set, National Parks Set, and Presidential Set to \$5.00. A total of 90 Stamps Free to Customers for our unsurpassed U. S. and foreign selections. Send 3c for 15 of the above Stamps and full particulars. Tri-boro Stamp Co., 145 Nassau St., Dept. 210, N. Y.

POSITIVELY Greatest Free Offer! Lat-est Scott's International \$6.00 stamp al-bum—covering entire world, contains 36,000 illustrated descriptive spaces; Scott's 1950 Standard \$7.00 catalogues "Philately's Encyclopedia"—absolutely Free to appli-cants for foreign approvals becoming cus-tomers. Approval Service, P. O. Box 1700, San Francisco.

FREE! Powerful magnifying Glass—to approval applicants; also big bargain lists. Jamestown Stamp Co., Dept. 202, James-town, New York.

TOPS! Our book "How to Collect Stamps." Send for your free copy today! Littleton Stampco, Littleton 29, N. H.

POPULAR SCIENCE OPPORTUNITIES

YOU Need These! All six for 10c! To introduce our Exceptional Approval Service, we'll send you: 1. Pocket Stock Book. 2. Watermark Detector. 3. Stamp Tongs. 4. Perforation Gauge. 5. Book for Duplicates. 6. Package of Stamp Hinges. All only 10c to approval applicants! Free! Big list other bargains. Jamestown Stamp Co., Dept. D, Jamestown, New York.

UNITED States Commemorative Collection. Thirty-three different unused. Columbians to 1943 issues only. Price \$1. Request approvals. "Stamps," Albany 5, New York.

WORTHWHILE New Zealand Semipostals (1943 Princesses Triangulars) only 10c with approvals. George Richie, 840 Oak, Alameda, California.

FREE "Round the World" packet to approval applicants. Lange, Box 21, Hub Station, New York 55.

543 BARGAIN Offers—Free!! Kenmore Stamps, Arlington 74-D4, Mass.

FREE—Illustrated Catalog! Kenmore Stamps, Arlington 74-C8, Mass.

FREE—Canadian Sets Royal Visit, George VI, George V, Coronation, Jubilee, others to approval applicants. Ensign, Box 118-P, So. Orange, N. J.

EXCHANGE Stamps Universe. Particulars free. "Exchangers," Bry 118 (Seine), France.

FREE. Absolutely free. \$22.50 catalogue value in better grade stamps, including Airmails, Pictorials, Commemoratives. Also free. International albums and Scott catalogues. Free hinges. Free mystery sets to \$1.00 value. Free \$5.00 Presidential. All free to approval applicants buying under colossal Raymax plan. Raymax, 123-X William St., N. Y. C. 7.

200 BRITISH Empire Stamps! Norfolk, Tokelau Islands, Grahamsland, Pakistan, Nepal, big stamp of murdered Mahatma Gandhi; many others! Stamps cataloging up to 20c each! Only 10c!! Kenmore Stamps, Arlington 74-A9, Mass.

750 FRANCE and Colonies stamps 10c. Littleton Stamp Co., Littleton 26, New Hampshire.

MONACO Nudes Set—10c!! Approvals. Atlas, 3210 Republic, Racine, Wisconsin.

AIRMAILS on approval. Excellent quality. References required. Gerspacher, 159 Irving, Kenmore, New York.

RARE Bargain 300 world—25 Vatican City—all different, only 10c to Approval applicants. Stamp Mart, 1412 Great Northern Bldg., Chicago 4.

FREE! United States Allied Occupation Block, Russia Airmails Packet, approvals. Greenwood, 263 Meridian, Miami Beach, Florida.

UNITED States stamps nearly 100 years old, Roosevelt set, others, 40c value—only 5c to applicants United States approvals. Wakonda, 140F Nassau, New York 7.

\$1—\$2—\$5 UNITED States, commemoratives, airmail, high values in large collection United States stamps only 5c to applicants United States approvals. Metropolitan, 140A Nassau, New York 7.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

FREE—\$1 Wilson used to approval applicants. H. W. Litten, 318A North Fifth Avenue, Maywood, Ill.

FREE! Rare Polish Roosevelt Set complete. Economical, quality approvals included. Riedell, Greensburg 11, Penna.

CASH Paid For Stamps. Send yours. Miller Stamp, Malden 48, Massachusetts.

BOLIVIA "Torch of Knowledge" triangle, Britain Silver Jubilee Set, Costa Rica bi-color diamond, FDR, Stalin, Churchill, Venezia Giulia Air, Georgia, Fezzan, others. All 5c. Approvals. Colonial, Box 326B, Passaic, New Jersey.

25c EACH U.S., Switzerland, Netherlands, Denmark, Canada. All 10c. Approvals included. Aletalo, Maynard, Mass.

MAGNIFIER, Big Stamp Magazine; First U.S. Commemorative; plus unused \$5000.00 Foreign Legion, diamond, Giant, and other worthwhile stamps. Everything free to approval buyers. Capital Stamp Company, Little Rock 10, Arkansas.

LIBERIAN Triangulars, 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Illinois.

U. S. Price catalogue free. S. Stone, 618 Washington, Dorchester 24, Mass.

SELECTED U. S. Mint Roosevelt and Flag sets. Both. Only \$1.00. Approvals. Equin, 570 Madison, Wisconsin.

MINT France—1949 Scientists issue at face—5c with approvals. Lawrence, Box 1616B, Hartford 1, Conn.

500 MIXTURE Stamps with prize 10c to approval applicants. Morrell, 203P Fenimore St., Brooklyn 25, New York.

25 DIFFERENT Norway, 3c to approval applicants. R. Thompson, Rt. 3, Box 19, Vienna, Va.

CANADA Peace set 10c with attractive approvals. Rheume, 8949 Routhier, Montreal, Canada.

BARGAINS! 2,000 Foreign Stamps \$1.00, 5,000 \$2.00, 2,000 U. S., \$1.00, 5,000 \$2.00. Post-All, 930-F Street, Washington 100, D. C.

LARGEST Diamond, Smallest Triangle, Others, 3c. Pettibone, 411-A South Washington, Moorestown, N. J.

TURKEY 15 different 5c with approvals. Parks, 97-08-125 Street, Richmond Hill, N. Y.

FREE! Asia, Africa, Europe Packet, Approvals. Standard Stamp, Barneveld, N. Y.

1862 PRINCE Edward Islands—Just 3c with approvals. Viking, 130-P Clinton St., Brooklyn, New York.

EXOTIC Collection; Fezzan Ghadames, Togoland, Camerouns, Andorra, Reunion, Miquelon, Algeria, Somalis, Guadelope, Guiana.—Natives, Maps, Ships, Idols, Snakes, Rhinoceros, others, 5c. Imperial Stampco, Tampa, Florida.

AIRMAILS—worldwide variety, Bargain. With approvals 5c. Arthur Wirth, Norwichtown 2, Conn.

307 ALL Different Free, Commemoratives, Triangles, Bicolored Beauties, High Values, Strange Countries, New Varieties Galore. Free to Approval Buyers. Garcelon, Box 518, Calais, Maine.

WORLDWIDE Stamps, All Different. 200—25c; 500—50c; 1000—\$1.25; 2000—\$3.00; 5000—\$15.00. Beacon Sales, Maynard 3, Mass.

FREE "Stamp Finder." Tells instantly country to which any stamp belongs. 36 pages profusely illustrated. Approvals, Garcelon, Calais 18, Maine.

50 DIFFERENT U. S. 10c. No approvals. Price list free. Seidenberg, Cassopolis, Michigan.

50,000 STAMP Grabbags 25c each. Anderson, 630 Bingaman, Reading 2, Pa.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 333—86th St., Brooklyn, N. Y.

PENNY Approvals by Country. M. H. Hoerning, 102 Farmington, Arkansas.

1c EACH and Less! Thousands of Bargains! Cole, 43-G Rinewalt, Buffalo 21, N. Y.

25 DIFF. 19th Century given to approval applicants. Rossom, 218 West 59th St., Chicago 21, Ill.

GENUINE "Goya Nude" set 15c (Catalogs 55c). Approvals. Royal Stamp Company, Tamaqua 2, Pa.

10 U. S. Over 40 years Old 5c Approvals. Scott, Middle St., Lexington, Mass., 73.

FREE—Mint Set with Approvals. Department PSM, 1267 Tutwiler, Memphis 7, Tennessee.

APPROVALS—Many 40% Catalog References Please. H. K. Bardsley, Roslyn, Pa.

\$5.00 CATALOG Price For 10c. (1) Big collection 112 all different stamps from Africa, South America, South Sea Islands. (2) Four desirable unused U. S. cataloging 40c. (3) Fine packet 25 British Colonies—Burma, Solomon Islands, etc. (4) U. S. \$5.00 high value. Everything (all four items) only 10c with approvals. Crystal, Littleton 41, N. H.

FLAG Stamp Free, if you request my U. S. approvals. E. Wenigman, 1933 Patterson, Chicago.

25 DIFFERENT stamps 10c. F. Tunis, Wakeman Ave., Newark 4, N. J.

OLD, scarce U. S. seconds on approval. Slightly defective, bargain prices. Hearnfeld, Clintonhill Station, Newark 8, N. J.

ALL-Aboard! The Philatelic Special, 12 Train Stamps and packet of 100 different stamps for 10c with approvals. Reich Stamp Co., 4647 Kenmore, Dept. S19, Chicago 40, Ill.

FREE: China Navigation Issue with foreign approvals. Modern Stampco, Box 12A, Wakefield Station, New York.

HAVE Fun, add thousands of stamps to your collection at 1c each. Write for my Economy 1c Approvals. Joe Goldman, (PSM), Lynbrook, New York.

75 STAMPS from 75 countries 10c to approval applicants only. Bjorn Nielsen, Monmouth 1, Maine.

FREE with approvals: Beautiful large reproductions of first U.S. Stamps. Decorate your album. Mull, Randolph, Mass.

WORLDWIDE Mission Mixture, 500 Stamps 25c. Garrow, Montevista, Chula Vista 2, Calif.

FREE! 100 Worldwide different stamps to approval buyers. Big U.S. and illustrated bargain lists sent with approvals. Bookman, Maplewood 1, N.J.

NEWFOUNDLAND, most popular country, now a province of Canada. Many Newfoundland stamps becoming scarce. 25 different, 50c; 50 different, \$1.50; 75 different, \$3.75. Ask for free price list—many attractive offers. Russell, 224 West 17th St., New York City.

100 STAMPS, hinges, gauge—15c. Box 6618, Northeast, Kansas City, Mo.

FREE United States Price List. Mark Hanna, 335 Fifth Avenue, Pittsburgh 22, Pa.

118 WORTHWHILE Stamps, including Chinese hunger stamps, strange countries, pictorials aplenty. Only 10c with surprise-packed approvals. Atlas Stamps, 4220 West 16th, Little Rock 16, Arkansas.

STAMPS available—unsorted and sorted. (Mostly on bits of papers.) Of different countries—China, Japan, Europe, Russia, England, Germany, India, France, etc. Ten dollars for (300) three hundred only unsorted. Please write to:—Nativity Viegas, Marine Lines, P. O. Box 1085, Bombay, India.

42 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 2926-Eye St., N. W., Washington 6, D. C.

UNUSED matchbook covers—100 different \$1.00—Catalog 10c—Charles Edelman, 1311P East 84, Cleveland 3, Ohio.

UNPAINTED plaster ornaments. Loxite for moulds. Free literature. Midwest Novelty Manufacturers, Box 788-B, Anaconda, Montana.

44 ANTIQUES, RELICS, INDIAN GOODS

10 ANCIENT Indian Arrowheads \$1.00. Tomahawk \$1.00. List Free. Lear's, Kirby, Arkansas.

1950 CATALOG:—Selling 400 Antique Firearms, 20,000 Indian Relics, Coins, Gold Dollars, Kentucky Rifles, Flintlocks, Percussion caps, Tomahawks, Gempoints, Powderhorns, Steerhorns, Rifles, Pistols, Blunderbusses, Ammunition, Swords. 1950 illustrated catalog 25c. Heike, Wenona 31, Illinois.

SPECIAL:—8 Arrowheads, \$1.30—Civil war Musket \$12.50, Sword \$7.50, Bayonet \$1.68, Tomahawk \$3.88. Heike, Wenona 31, Ill.

46 MINERALS & PRECIOUS STONES

ZIRCONS, diamond-like white, blue, or golden, carat Gem plus 2 sparkling Zircon side stones \$3.85. C.O.D.'s accepted, \$1.00 deposit. Imhusex, Armonk, New York. Agents Wanted.

GEMSTONES, Mineral specimens. Every variety. Lowest prices. Postcard brings free list. Plummer's, 2177D Bacon, San Diego 7, Calif.

GEMS, precious and semi-precious, all genuine from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7-K, Salem, Oregon.

POPULAR SCIENCE OPPORTUNITIES

47 CAMERAS, PHOTO SUPPLIES

BASS Says: Bargaingram 257 ready and waiting for you. The book which tells all the finest in new and used camera equipment, a veritable encyclopedia. Write, phone or call the sign of the old "Horse Trader". 39th year of satisfaction or your money back dealing. Bass buys, sells and trades. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for booklet. American School of Photography, 1315 Michigan, Dept. 174C, Chicago 5.

DEVELOP and Print your own snaps. Complete kit including tank, trays, chemicals and paper. Full instructions \$7.95. Home Photo Service, 450 Main Street, Wakefield, Mass.

KODACHROME 2x2 Slides—Join the West-View Color Slide Club and receive monthly approval selections. Club membership is Free. Write today for first approval slides. No obligation. West-View, Dept. K, 1518 Montana Ave., Santa Monica, Calif.

ENLARGERS, all sizes, lowest price. Booklet "B" Free. J. B. Photo, 41-09-19th Ave., L. I. City, New York.

COLOR Slides, Cameras, Supplies. Catalog 10c. Heald-Robinson, 112S Lemon, Monrovia, California.

BUY photographic supplies wholesale. Free catalog. Expert camera repairing. Capitol Photo Supplies, 2428 Guadalupe, Austin, Texas.

KODACHROMES on approval—Grand Canyon, Yellowstone, Rockies, etc. Douglas Whiteside, Yosemite, Calif.

NEW Photocraft Kit includes Camera, complete darkroom equipment: enlarger, easel, paper, chemicals, tank, trays, etc. only \$12.95. Write Tam Products S10, 3814 Wrightwood, Chicago 47.

48 PHOTO FINISHING

16 ENLARGED, Jumbo, oversize deckled prints from any 6-8-12-16-20 or 36 exposure roll film developed only 35c and this ad. Electronically exposed. Enlargement coupon free. Skrudland, 6444-W Diversey, Chicago.

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School, 1315 Michigan, Dept. 1726, Chicago 5, Ill.

ROLL developed and 8 prints 25c. Smart Photo, Winona, Minnesota.

8 BEAUTIFUL Double Size pictures and roll developed 30c. 8 hour service. Free Mailers. Pacific Photo Service, Box 666, San Francisco, Calif.

18 CHRISTMAS Cards and envelopes \$1.00, 60—\$3.00, send negative. Your 8 exp. roll with 3 prints each good negative 45c. 2 each good negative 35c. One each good negative 25c. Reprints 3c. L. A. Eastman, Bode, Iowa.

GREAT News! Price reduction on our famous Century Jumbo Oversize finishing. Our new Chicago plant makes these reductions possible, and new improved equipment, exclusive with Century, produces sensationally magnificent quality work. Any 8-exposure roll finished deluxe style only 30c. 12-exp. 45c. 16-exp. 55c. 36-exp. \$1.25. All oversize reprints 4c each. Free Mailers. Send us your next order, you will be delighted with results. Century Photo Service, Box 5208, Chicago 80, Ill.

2 BEAUTIFUL Hi-Gloss prints each good negative and enlarging coupon with each 6 or 8 exposure roll developed 28c. Owl-photo Co., Weatherford, Oklahoma.

WALLET photos and cards sealed in plastic are moisture-proof and soilproof. Three for \$1. Mankato Plastic Seal, Mankato, Minnesota.

FINEST quality double weight bromide enlargement. 5x7 20c; 8x10 25c; 11x14 50c. Satisfaction guaranteed. Minimum order \$1. Foto Portrait Co., 1172-S Ogden Avenue, New York City 52.

50 PHOTOPRINTS, PHOTOCOPIES

ENLARGEMENTS 5x7 15c. 2 for 25c. 8x10 25c. Photoservice, 4698 Beaconsfield, Detroit 24, Mich.

PHOTOCOPY anything yourself. Papers, books. No darkroom. 8 1/2 x 11" complete. \$6.95. Fotoflek, 4801 Yarmouth Place, Cincinnati 29, Ohio.

KODACHROME Slides. Beautiful Coast Scenes. Free Lists. MainePhotos, Box 1622A, Portland, Maine.

51 MOTION PICTURES, SOUND EQUIPMENT

NEW unusual thrilling Slam-Bang action 16mm. movie of fighting girls, called "Battling Babes" 100 feet \$15.00—complete 200 feet \$28.00. Free Catalog. Irving Klaw, Dept. 8-B, 212 East 14 St., New York 3, New York.

GUARANTEED fresh anti-halo outdoor movie film! Weston 12! Daylight loading! Processing free! Three spools double 8mm. \$3.45! Six single 8mm for Univex. \$4.60! Postpaid! Catalog. Filmcraft, 47th Holly, Kansas City 2, Missouri.

BASS Says: 39 years of leadership guarantees satisfaction. Finest Cine equipment. 8mm., 16mm., and 35mm., silent and sound. Write the old "Horse Trader". Satisfaction or your money back always! Bass Camera Company, Dept. A., 179 W. Madison St., Chicago 2.

85 KODACHROME movies! War, Atom Bomb, Travel, Air, National Parks, Beautiful Models. Catalog. 4c stamps. 2 scene "Waikiki" sample. \$1.00. Specify 8mm. or 16mm. World In Color Productions, Elmira, N. Y.

BETTER 8mm and 16mm Movie Camera Film. Lower prices. Better Films, 742 New Lots, Brooklyn 7, N. Y.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film, 317 West 50th, New York 19.

ORIGINAL Party Films and Records. Adult Entertainment. Details, interesting offers dime. Alberts, Dept. P, 6369 De Longpre Ave., Hollywood 28, Calif.

WANTED. We'll pay hard cash for silent or sound 8mm or 16mm. new or used movie film. Write and tell us what films you have, and how much you want for them. Camera Shop, 760 Broad St., Providence, R. I.

COLOR Film 50' 8MM \$3.95. F-a-s-t Panchromatic \$1.65. MK Photo, 451 Continental, Detroit 14, Mich.

BEAUTIFUL Artist Models in action movies. Sample reel. 50 Ft. 8mm. \$3; 100 Ft. 16mm. \$6. Color slides (2x2) sample 40c. Shipped Ppd. Send cash. M.O. Free Catalog. Joy Studios, Dept. S-20, Box #150 Main P. O., Jersey City 3, N. J.

UNUSUAL 8-16mm Film Subjects. Kodachrome projection length sample "Allure." \$1.00. "Strip Polka" 100-ft. 16mm sound. \$6.50. Art slides in color. sample 50c. 5 for \$2.00. Films exchanged. Bargains! Big catalog. 25c; refunded first order. National Film Supply, Broadway Sta. (E), Toledo 9, Ohio.

NEW 8 mm full color fine grain movie film (not surplus or re-spooled seconds) 25 ft. double roll, including processing, tax and postage, only \$3! Guaranteed. Send cash, check or money order. Dynacolor, Dept. S-4, Rochester 3, N. Y.

LEARN movie projection, management. Free Catalog. Theatre School, Elmira, N. Y.

ONE cent home movie film sale. Send 10c for 1949 photographic catalogue. Sterling's, 679 Northampton, Easton, Pa.

MOVIES for your gay gatherings. 8mm-16mm, color, black and white. Send self addressed stamped envelope. Cornell Enterprises, 7070B Hollywood Blvd., Hollywood 28, California.

BARGAINS in 16mm sound films. Big new list out each month. Blackhawk Films, Davenport, Iowa.

RENT 16mm sound films. Complete programs features—shorts low as \$4.95. Write our nearest office for complete list. Dept. PSB, Eastin Pictures, Davenport, Iowa; Colorado Springs, Colo.; Chattanooga, Tennessee.

RENT 16 mm, sound films 50c reel. Large selection; free catalog. U. C. Film Service, 128 Chestnut St., Roselle Park, N. J.

"LADY Eve" Glamour Movies. Equipment. Free catalog. Home Pix, 1674 Broadway, New York 19.

FREE Processed Film Weston 10 100 ft. 16mm \$3.25. 25 ft. double 8mm \$1.50 without processing. 100 ft. double 8mm \$2.35. 16mm \$2.25. Free Circulars. Fromaders, Davenport 5, Iowa.

ART model films 16mm rentals exclusively. adults list. Enclose stamp. Revere Films, Box 1051, Detroit 31, Mich.

FREE movies. Hundreds of subjects. Interesting. Entertaining. Fascinating. New directory—only 50c. International Cine Society, Dept. 102-D, 1300 Taylor, N.W., Washington 11, D.C.

WANT a real buy in 16mm Sound Films? Take advantage of the I.C.S. 1949 Clearance Sale of 16mm sound films—features, comedies, educational, cartoons, novelties, etc. Send for our giant list "A" today stating machine you own (make and model). Institutional Cinema Service, 1560-PS Broadway, New York 10, N. Y.

DIFERENT. Unusual. 16mm of Damsels in Distress called "Juliet Learns The Ropes" 100 Feet \$15.00—Complete 200 feet \$28.00. Illustrated Catalog free. Irving Klaw, Dept. 7-B, 212 East 14 St., New York 3, N. Y.

SUPER-Special Hollywood Movies for the connoisseur of the unusual. Two-color brochure of unique 8-16mm silent-sound subjects, plus sample film strip. 10c. Camera Corner, 391 Bridge Street, Room 134, Brooklyn 1, New York.

52 MUSIC, MUSICAL INSTRUMENTS

HILLBILLY, Polka Records—Late. Old—29c. Catalog 3c. F-L Shop, Box 19-S, New York City 35, New York.

SWISS Musical Units \$2.75. Music Boxes, 131 West 42nd, New York 18.

PHONOGRAPH Records 15c. Catalogue. Paramount, TF-313 East Market, Wilkes-Barre, Pa.

VOICE! "Effortless-Control!" 15 lessons \$10.00. Cor Studio, 14356 Jersey Ave., Norwalk, California.

SWISS Music Box Movements suitable for novelties. 400 Tune Selection. \$1.00 to \$3.50. Send for Catalog. Bell Music Box Company, Box 49, Planetarium Station, New York 24, New York.

A MUSIC Store at your door. All the Old Songs and the new. Send 50c & postage each. West Phila. Music Centre, 5214 Chestnut St., Phila. 39, Pa.

GUARANTEED Band Instruments. Accordions, Guitars, Pianos, Drums, Equipment. Lower Prices by Mail. Send 10c for catalog. Harden's Music, Marion P, Ohio.

MUSIC Printing. \$5-100. Composing—Arranging—Publishing. Auto-Litho, Jensen 3, Florida.

53 SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil, Master of Music, 510-PS, S. Alexandria, Los Angeles, California.

SONGWRITERS. Songs Published Monthly. Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunemasters, Dept. 10F-C, 1537 N. Vine, Hollywood 28, Calif.

POEMS Wanted For Musical Setting. Send poem for free examination. Five Star Music Masters, 646 Beacon Bldg., Boston, Mass.

YOUR poems set to music, recorded. Free booklet, attractive offer. Write, Songland, 331 West 46th, New York.

POEMS Wanted. Percentage basis collaboration. Terry Tune Master, 709 1/2 PS North Broadway, Oklahoma City 2.

SONGWRITERS! Outstanding, ethical offer. Hibbeler, C15, 2157 N. Avers, Chicago 47.

POEMS Wanted. Splendid offer! Rush! Radio Composers, WPSJ, Clinton, N. C.

"SONGWRITER'S Review". 1650-PS Broadway, N.Y.C. Songsharks exposed. Contests. Sample: 20c. Year \$2.00.

54 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple. Tubeless. Batteryless. Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen, 427-S, Clinton, Mo.

POPULAR SCIENCE OPPORTUNITIES

FIX any radio. Amazing new instrument locates radio troubles double quick. Simple instructions show you how. Thousands now in use. Free—Write today for 28-page illustrated technical manual. "The Inside Story". Feiler Engineering Co., Dept. 10PS9, 945 George Street, Chicago, Ill.

FREE—Money Saving Bargain Catalogs in radio and television sets, record changers, tubes, parts, amplifiers, speakers, etc. Write today. Radionic Equip't Co., Dept. 1510, 170 Nassau St., New York 7, N. Y.

HEADPHONES, Guaranteed U. S. Signal Corps used headsets with adjustable leather headbands and Black Bakelite Earphones. Special now \$1.99. Allen Radio, Dept. HPS, Clinton, Missouri.

BUY everything at wholesale prices! Radio parts, equipment for the amateur, serviceman and experimenter. Lowest prices anywhere; fast delivery! Write Mid-America, Dept. S-109, 2412 S. Michigan, Chicago 16, Ill.

SNOOPERSCOPE Tube. Permits night-time vision. Tube and complete instructions \$14.95. Quantities limited. Filters 15c. Voltmeter, Oscillator, kit \$2.95. Precise, 942 Kings Highway, Brooklyn 23, New York.

NOT selling radio courses! But if planning to study radio, don't fail to write for free information. Valley Radio Service, Pharr, Texas.

TELEVISION Wiring Diagrams—Set of ten—Only \$1.00 Postpaid. Melpro Co., P. O. Box 40, Bay Ridge Station, Brooklyn 20, N. Y.

15 TESTED one-tube circuits, including "Radiobuilder". Catalog—25c. Laboratories, 578-T, San Carlos, Calif.

56 BUSINESS OPPORTUNITIES

\$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke, Box 2471, Cleveland 12, Ohio.

ENVELOPES addressed accurately, reasonably. Fast Service. We have capable addressers in your city. Glenway System, 5713-Z Euclid, Cleveland 3, Ohio.

137 PLANS to make money local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur, Illinois.

A FACTORY in your home garage! Mfg. and sales rights, mechanics' waterless hand cleaner. \$500-\$800 monthly. No special equipment necessary. Formula free. Western Aircraft Mfg., Dept. G, Los Angeles 6, Calif.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

MAKE money addressing envelopes. Our instructions reveal how. Glen Glenway, 5713 Euclid, Cleveland 3, Ohio.

VENDING machines earn big money! An investment as low as \$10.50 will start you in this fascinating, profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our Free catalog illustrating our nut, candy, gum and stamp vendors; also pin ball machines, music boxes, etc. Write immediately to Parkway Machine Corporation, Dept. 9, 623 W. North Avenue, Baltimore 17, Maryland.

POPCORN Machines, Potato Chip outfits. Long Eakins Co., 4963 Hi St., Springfield, Ohio.

I MAKE big money in the mail-order business. You can do the same at home with copyrighted system. Write me. I'll tell you how. F. Little, RD # 1, Glenshaw, Pa.

RECAST old batteries into new. Latest achievements. Battery Laboratories, Minneapolis.

MAIL Order Offers Increased Income, Independence, Unlimited Possibilities; free literature. Manhattan House, 126 Lexington, New York 16.

START Mailorder Bookshop—Everything furnished. 25c binders booklet, samples, exciting ideas. General Publications, Ossining 1, New York.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

EARN \$50.00 or more weekly operating vending machine route in your spare time. As small an investment as \$13.95 will get you started. Details free. Danco Coin Machine Co., Dept. PS., 1302 E. Baltimore St., Baltimore 31, Md.

"SPECIALTY Manufacturing". Big money business. Start on small capital with dependable formulas. Send for Free interesting booklet. Howard Robinson, Ph. G., 1300-B South Ohio Street, Sedalia, Mo.

UNPAINTED figurines—Wholesale—Retail. Illustrated list free! Oman, 642M Broadway, St. Paul 1, Minnesota.

BIG Money—Spare or full time. Hand painting fabrics, ties, blouses, leathers, etc. is big business. New easy method. Help us fill demand. Free samples and complete plan. Hollywood Artlabs, 333-A E. 2nd, Los Angeles 12.

MAKE money making new greaseless doughnuts at home on electric machine. Wholesale to grocers, drug stores, cafes, hamburger shops. Send for free recipes and plans. S. Ray Company, 3605 South 15 Ave., Minneapolis 7, Minnesota.

MAKE Money spare or full time, casting Metal Toys and Novelties. Big wholesale and chain store demand for cast Metal Autos, Soldiers, Ashtrays, Banks, etc. keeps manufacturers busy. Production moulds furnished for up to 100 and more castings per hour. No experience or special place necessary. "Cash-in" on holiday orders now being placed. Write for full information and illustrations of patterns needed. Mast Cast Products Co., Dept. E, 1696 Boston Road, New York 60, N. Y.

BIG money. Spare or full time in your home. No Selling! Spray New Miracle Finishes. Plush and Suede, on signs, radios, automobiles, figurines, lamps, toys, etc. Our business is booming. Help us fill huge demand. New easy Flok-Kraft methods. Material costs few pennies. You get dollars. Free samples, complete powerful money making plan free. Write now! Coast, 1008 S. Los Angeles St., Los Angeles 15.

EARN Extra Cash Selling Personalized Stationery, Cards, Napkins, Particulars free. Stampco, South Whitley 2, Indiana.

EXTRA Money—No selling—operate vendors. Amazing profits, details Free. Silver King, Suite 282, 622 Diversey, Chicago 14.

START mailorder business. Get details concerning beginners booklet guide. Wayne Burger, Baltic, Ohio.

USE Your Home as magazine subscription station. Represent all magazines. Liberal Commissions. Supplies furnished. Big Christmas Gift business now. Catalog, full details, free. McGregor Magazine Agency, Dept. 519B, Mount Morris, Ill.

LIKE to Make \$20-\$40 Weekly at home? Proven mailorder Plan does it. Free Details. Perry Publications, 906-B North Wenatchee, Wenatchee, Washington.

WATCHES, Elgin, Waltham, other outstanding brands. Expertly reconditioned, priced low for quick, great profits! Send for Free catalog. Plymouth Jewelry, 163 Canal St., New York 13, N. Y.

NUSILVER Plating Liquid. Apply with cloth. Renews Silverware, Silverplates brass, copper. Easy seller. NuSilver, 508-9PSB New York St., Aurora, Illinois.

"THEY Smiled When I Went Out To Sell! My family humored me—thought me too old to work. I earned \$50.00 my first week." Free Selling Outfit. Consolidated Shoe System, Dept. S-433, Chippewa Falls, Wisconsin.

MAKE Rubber Stamps, Feather Pictures, Metallize Baby Shoes, Repair Dolls, Make plaster Novelties. Catalogue of "30 Ideas" Free. Universal, Box 1076-B, Peoria, Ill.

SELL our Wooden Ware. Big Profit. Helen Cloutier, Escanaba, Michigan.

CLEAN rugs and upholstery. No expensive equipment. Start business with \$5. Instructions \$1. Bernfeld, 419 E. 5th St., N. Y. C. 3.

TRADE Magazines—Current copies. Business, professions, dogs, firearms, travel, sports, hobbies—All fields. Free price-list. Commercial Engraving Publishing Co., 34S North Ritter, Indianapolis 19, Indiana.

DISTRIBUTE nationally advertised Sahara Waterless Hand Soap. Full or part time. Excellent profit. Steady Income. Sahara Waterless Soap Co., Grand Rapids, Michigan.

LIQUID Marble—Colorful, glossy! Molded. Brushed, sprayed! Cast Novelties, Statuary, Colored Tiles, Flexible Molds, Composition Floors, Particulars Free. Marbelizing Service, Edwardsville, Ill.

ELECTROPLATING Instructions, and formulas for Brass, Copper, Cadmium, Chromium, Nickel, Gold and Silver plating. Instructions for Baby Shoe Bronzing and Gun Blueing. All for \$1.00. S. Hyde, Box 2099, Station V, Los Angeles 3, Calif.

GET Into the paint business! Permanent. Profitable. Sell direct to factories, offices, homes, farms. Top quality paints, varnishes, polishes; competitive prices. Advance commission, no investment, no deliveries; full or part time. Send 50c for sales kit or write for free details. Dept. JPS, Standard Industrial Products, Evansville 4, Indiana.

HOW To Set Up and Run a Mirror Shop! Resilver Mirrors. Make chipped glass nameplates. Electroplating Salts and Rectifiers. John Sprinkle, V 90, Marion, Indiana.

START a Christmas card imprinting business. Write Dunbar, Sanford, Florida.

FOR an extremely profitable lifetime business, operate a Collection Agency-Credit Bureau. Easily learned. Free folder. Cole & Associates, Syracuse 2, New York.

BABY shoes electroplating rectifiers, supplies, chemicals, mountings. Foster's, 1520 Ardmore, Chicago 26.

NATURAL molding latex. Extra thick. Free Sample. W. Wooley, 115-B Donald, Peoria, Illinois.

FREE Book "372 Unusual Worldwide Businesses." Successful! Australia, South America. Work home (U.S.A.)! "Different" plans. Get surprise! Publishers—7W, Carlsbad, California.

AUTOMATIC saw setter used with Foley filer. Write to Stadick Manufacturing Co., Searles, Minn.

MAKE Big Money in Home Mail Business! Few dollars starts you—interesting, profitable! Write: Smith, Box 2592-B, Hines, Illinois.

SELL Merchandise By Mail. Big Profit business! Everything furnished—orders filled for you! Easy, pleasant. Write: National, Box 88, Dorchester 22, Mass.

HAVE Home Mail Business Of Your Own—Run Ads, Mail Literature. Very profitable! Write: Ted Gordon, 711-L East 40th, Chicago 15.

WHOLESALE Sources 1,000,000 Items—25c. Siegel, Box 183, New York 2.

PEARL Finishing—New, Amazing—Huge Profits. Start Making Big Money first day. Free Facts show easy way to \$25 to \$50 per day at home. Absolutely no experience. Be first—scoop the market. Write Pearl-Kote, 2111A W. Manchester, Los Angeles 47, Calif.

PROFITABLE Sparetime. Easy-Made attractive Christmas items. Complete manufacturing instructions, selling suggestions. Community warranty. \$5.00 refundable. C-B Products, P. O. Box 164, San Diego 4, Calif.

WOULD you pay 3%—first \$350 made? Book "505 Odd, Successful Enterprises" free! Work home. Expect something odd! Pacific, Oceanside, Calif.

"LIFETIME Repeat Orders!" Sell Business Cards by mail. "Starter" Plan. Lynn, 5710-12 Bankfield, Culver City, Calif.

MAKE flexible molds! Cast plaques, novelties, bookends! Free sample! H. Tooker, Hamilton 7, Ohio.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, Minnesota.

POPULAR SCIENCE OPPORTUNITIES

MAKE Perfume—Learn Profitable Business—Free—Men—Women—Write "International", 6347 Parnell—PS-10, Chicago 21, Illinois.

LIQUID Rubber, make flexible molds. Free Sample. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

"EVERYBODY Likes Candy"—Learn to make professionally. (Our 39th year.) Ragsdale Candles, D7, East Orange, New Jersey.

YOUR own profitable home business. Preserve live flowers to last forever. Spare or full time. New discovery—simple—fascinating. No experience necessary. Send \$2.00 for working equipment, instructions and valuable sales plans. Satisfaction guaranteed or money refunded. Hermandsen, 210 Fifth Ave., Suite 1102, New York 10, N. Y.

IMPORT-Export! Represent manufacturers. Conduct barter exchange, without capital. Two bulletins supplying hundreds overseas connections \$1. Money refunded if unsatisfied. International Trade, 246-S, Fifth Ave., New York 1.

OPERATE Profitable Mail Order Business. Write: Doremi Company, 8-S Mawney, Providence 7, Rhode Island.

ELECTROPLATE on non-metals. Instructions \$1.00. Four ampere plater \$19.95. Eight ampere \$29.95. 30 ampere \$85.00. Kissel Electric Products, 431 Sherman, Galion, Ohio.

HOW and where to obtain Capital? Free details. Star Service, Wapakoneta, Ohio.

LEARN Piano Tuning, repairing at home. Tremendous field! Piano parts, tools furnished. Established 1935. Empire School of Piano Tuning, 606-A East University Ave., Champaign, Illinois.

BRONZED Baby Shoe Mountings. Equipment and Supplies. We manufacture world's largest assortment of all metal mountings. Wholesale only. Ramyr Selenium Platers \$39.95. Gold and Silver Plating Assemblies low as \$97.50. Write for Free copy of Electroplating Instructions. Sales Division, Hollywood Bronze Supply, 1770 N. Vermont Ave., Hollywood 27, Calif.

SELL \$2 Fire Extinguishers. Locally mailorder. Lorrac Products, Albany 1, N. Y.

100 BUSINESS Ideas—10,000 Formulas. Mail Order, Farm-Workshop, Particulars Free. Flasco Sales, 2505PT 150 Street, Flushing, New York.

PLANNING a small mail order business? Booklet shows How. 36 pages full of opportunities. Copy only 10c. Special. Clarence Woodfall, Publ., Route 3, Charleston, Illinois.

SAWDUST. Turn it into cash. Six methods. Instructions 25c. Charles, 12-FM, Norwood, Ohio.

GOLDEN Opportunity to start profitable business of your own with Rite-N-Raise Home embossing Sets. Surprise Specialties, 749-A Broadway, New York 3, N. Y.

BIG Money Regraining-Refinishing Automobile Dashboards-Garnish Mouldings for Automobile Owners, Dealers, Body Shops. Profitable-Fascinating-Undeveloped Field. Full details. Write Outman, 4323 So. 38th, St. Louis 16.

FREE! "How to Make Money from Bronzing." Free! "Sales Guide." Free! Jar bronze. Free! "Bronzing Process." instructions, consultation. Send \$5.00 deposit, refunded first order. Jones, Wholesaler, Box 7283, Ft. Worth, Texas.

CHRISTMAS Lycopodium Wreath Makers Course. Supplies, Samples 25c. Lycopodium Foundation, St. Paul 8, Minn.

NEW Industrial Hand Cleaner. Free manufacturing-distributing plans. Unusual money-making proposition. "Acro-Sol-Ex," 623-D West 14th Ave., Denver 4, Colorado.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

FORGE ahead financially! Start big Profit Business; Mail order or locally. Amazing invention. Free sample offer. Consolidated Equipment, 782 Guardian Bldg., Cleveland 14, Ohio.

MILLION Articles wholesale. "Supply Source Directory" 25c. Publisher's, Box 1302-A10, Detroit 31.

METALLIZE Baby Shoes. Excellent profits. New system assures success. Free details. Treasures Forever, 89 Henry Ave., Lynn, Mass.

"RECESSION Blues?" Sensational new money-making plan, 33 other profitable ideas. \$1.00. Halley Service, 11037-S Estepa, Oakland 3, California.

BUILD your own depression proof business. Sales-rentals-service equipment for homes and small business places. Operate from your own home. Fine opportunity for man mechanically inclined, selling ability and some capital. Write Kent Electric, Rome, New York.

MAKE Rich profits selling by mail—the "Natural" way. Hundreds successful! Interesting details free. Edward Lay, 3819 North Kenmore, Chicago 13.

EARN At home, casting novelties. Free course using latex molds. Major Chemical Co., 164 Portland St., Cambridge 39, Mass.

REAL money making opportunity making Interlocking Concrete building blocks. Rex Products Co., Dept. 21, Piqua, Ohio.

QUICK Money! "Repairing Car Batteries"! At home! Easy too! Batteryman, Grand Junction, Colorado.

BABY Shoe Metallizing. Simplified modern practical system. Schoettle, Friendship 4, Ohio.

"INDUSTRIAL Hand Cleaner." (Without Ammonia—Kerosene!) 400% Profit. manufacturing—distributing. Sample \$1. Refunded, first order. Information Free. "Rythmo-H-Ex," Kingsport, Tennessee.

\$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart, Bridgewater, Massachusetts.

HOSIERY, Sheets, Print Cloths, Etc! Wholesalers write for prices. Spartan Hosiery Company, Spartanburg, South Carolina.

MAKE Rubber Stamps, metallize baby shoes, repair dolls, silver mirrors, make plaster novelties. Catalogue of "30 ideas" Free! Universal, Box 1076B, Peoria, Ill.

57 MONEY MAKING OPPORTUNITIES

NO selling, operate coin machines, amazing profits, details Free. Parkway Corporation, Dept. 18, 623 W. North Avenue, Baltimore 17, Maryland.

PROFIT with Larson Leathercraft. Belts, purses, 100 other ideas. Largest supply in U. S. Catalog 10c. Larson, Dept. C, 826 S. Tripp, Chicago 24.

LEARN Sewing Machine Repairing at home. Install our wholesale motor kits. Make \$125 to \$300 a week. Free particulars. Taylor Service Co., Hamilton PS, Ohio.

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Waggoner, P-125, West 86th, N. Y., N. Y.

MAKE Money At Home—Cut grinding costs. Belsaw Powered Saw Gummung Machine precision Joints, Gums, Sharpens circular saws 8 to 48-in. diameter. Portable, fast, accurate. Catalog. Belsaw, 315-G Westport Rd., Kansas City, Missouri.

MAKE Money At Home as renewal headquarters for all magazines. Big profit in Christmas gift sales. Liberal commissions. Supplies furnished. Catalog Free. Write McGregor Magazine Agency, Dept. 519C, Mount Morris, Illinois.

SCHOOL Seniors—Earn 40% commission selling classmates America's Most Beautiful Graduation Name Cards. Largest selection. Outsell all others. Free sample kit. Printcraft, Dept. M, 1425 E. Elm Street, Scranton 5, Pa.

MAKE money with imprints. Complete instruction book and Big Mail only 25c. J. P. Stenger, 500—20th St., Rock Island, Illinois.

WIN Contest Money. General Contest Bulletin gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

WOULD You pay 3%—first \$350 made? Book "505 Odd, Successful Enterprises" free. Expect something odd! Pacific, Oceanside, Calif.

EARN—Extra money sharpening Hair Clippers of all kinds on the Heimerdinger Clipper Grinder. Write for details. W. C. Heimerdinger Co., 116 West Market St., Louisville 2, Kentucky.

"CAN You Wrap Packages?" Be popular during Christmas. Valuable throughout lifetime. Interesting gift, selling item. Copy, profitable offer, \$1.00. Holbrook Books, Box 1802, Milwaukee, Wisconsin.

ADDRESS, Mail circulars for advertisers. Full information and list of firms—25c. Write for other offers. Imperial, Dept. PS10, 902 South 9th, Wilmington, N. Car.

HOW To Make Money In Plastics. Learn Plastics at home, in spare time. You get 7 Big Plastics Material Kits with training course. Make useful, valuable articles as you learn. Send today for free illustrated catalog. Plastics Industries Technical Institute, Dept. of West Coast University, 1601 S. Western Ave., Dept. CPS-109, Los Angeles 6, California.

SELL merchandise by mail. Easy and profitable. Everything furnished. Home City Services, Box 1062S, Springfield, Mass.

HAVE Your Own Big-Money Business! Others are making up to \$500 monthly in waterproofing and cement painting. Let me prove you may do as well! Few dollars starts you. Interesting facts, free. Write today! Edgar W. Thomas, Barnesville 1, Ohio.

MAKE extra money at home in spare time. Raise Golden Hamsters. Small investment. Literature free. Golden Gate Hamstery, 631-G Richmond St., El Cerrito, California.

FREE California land. Information 25c. Cowan, Box 561, Berkeley, California.

CASH for simple Ideas. Household & Shop Hints. E. W. Moses, Jr., Blacksburg, Va.

15 MINUTES masters advertising and sign lettering, complete system; sign painters' secrets; cartooning book; all three, \$1; free circular. Abenterprizes, Box 875-A, Peoria, Illinois.

EARN Money Evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle (2), Wisconsin.

\$50 WEEKLY while learning Watch-Clock Repairing. See ad page 45.

58 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Illinois.

10,000 FORMULAS and trade secrets. Free Literature. Stillmans, 555 Kingston Ave., Brooklyn 3, N. Y.

PRODUCTS analyzed. Duplicated. Improved. Formulas. Consulting Scientific Company, Swarthmore, Pennsylvania.

SNOWBOUND? SnowCar detailed working drawings—Parts list—\$10.00. Callair, Afton, Wyoming.

50 SINGLE Ingredient Formulas 25c. Siegel, Box 183, New York 2.

LABORATORY tested formulas. Lists free. Pont, Box 635-PS, Terre Haute, Ind.

59 PLASTICS

PLASTIC supplies, materials, instructions for hobby or business. Send for free catalog. Tells about internal carving. Hays Plastics, 2333 Lincoln Avenue, Alameda, California.

LUCITE, Plexiglas. Any size sheets, masked. Square foot (12 x 12) cost, 1/16", 96c; 1/8", \$1.25; 3/16", \$1.52; 1/4", \$1.80. Colors add 10%. Include 10% postage. Almac Plastics, 230 Fifth Avenue, New York 1, N. Y.

INTERNAL carved roses, orchids, swans, goldfish, butterflies, etc. Jewelry and gifts. Crystal Floral Novelty Co., Bound Brook, New Jersey.

WHOLESALE Plastics supply catalog. 10c. Lucite, clear, colored, Metallic Acetate. Complete Castolite line, Phosphorescent, pearling pigments, dyes. Metal findings. Tools. Ideas—bargains galore. Fast delivery from stock. Gem-O'-Lite, Box 686K, North Hollywood, Calif.

CASTING Plastics: Cold Curing Transparent and Colors. Information 10c. Alan Plastics, Dept. S1, Box 3564, Cleveland 18, Ohio.

POPULAR SCIENCE OPPORTUNITIES

PLASTIC, Sheets, Rods, Tubes, etc. Free List. Plastic Supply Co., 2901 N. Grand Blvd., St. Louis 7, Mo.

PLEXIGLAS—Write for Free Price List. The Unique Glass Shop, 309 Cowardin Ave., Richmond, Virginia.

SPECIAL 1/4" 12"x12" Prime Plexiglas \$1.75 include 10% Postage. Free Catalogue. Craft Plastics, Somerville, New Jersey.

NEW plastic fabricating manual and catalog, 32 illustrated pages. "How to Work Plastics." Complete list of plastic supplies and accessories. Send 20c. House of Plastics, Dept. CP, 8648 Linwood, Detroit, Michigan.

60 CHEMICALS AND APPARATUS

NEW Idea Chemical and Apparatus Outfits for Home Experimenting. Photo-Scales, Microscopes, Chemicals, Biological and Laboratory Supplies in Small Quantities. Catalog 15c. Established 1931. John H. Winn, 124-B West 23rd Street, New York, N. Y.

NEW Laboratory supply catalog of Chemicals and Apparatus. Contains many thousands of items with illustrations. Send 25c. Standard Science Supply Company, 1232 N. Paulina St., Chicago 22.

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

NEW catalog: Chemistry, mineralogy, biology, physics 10c. Tracey Laboratories, Evanston, Ill.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Catalog 15c. Dept. M-26. Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

NEW, used. Catalog 10c. Atlantic Laboratory Supply, 21 Wenham, Boston, Mass.

61 HELP WANTED

BOYS Wanted. Over \$2.00 hour! Sell name plates for front doors. Free Sample. Write Dept. 71. National Engravers, 214 Summer, Boston, Mass.

ALASKA. The Last Frontier offers unlimited opportunities. \$1 brings government map and Directory listing firms in Fishing, Construction, Mining, Aviation, Fish & Game rules, Homestead data. Alaska Opportunist, Box 883-S, Hollywood 28, Calif.

\$1,000,000 CONSTRUCTION Job Project Report. \$1.00 brings Monthly News Bulletin giving authentic projects starting "world wide." U.S.A., Alaska, Canada, Pacific, Arabia, Latin America, India, Mexico, Africa, Europe. Tells How-When-Where to apply. Global Reports, P. O. Box 883-PX, Hollywood 28, Calif.

INTERESTED In Latin American And Foreign Employment??? \$1.00 brings copy-righted "Foreign Service Directory" with complete listing of firms in Oil, Mining, Aviation, Construction, Steamship, Manufacturers, Importers and Exporters with Hot Tips for immediate application. Published since 1944. Global Reports, P. O. Box 883-S, Hollywood 28, Calif.

IMMEDIATE opening for reliable man with car to call on farmers. No experience necessary. \$15 to \$20 in a day. Permanent. McNess Company, Dept. 179, Freeport, Ill.

FOREIGN Employment. Construction men, building trades mechanics, helpers, office men. Good workers needed for oil projects, mining, pipe lines, dams, power plants, roadways, shipping, etc. Transportation and quarters furnished; high wages. Listings of firms actively working and hiring on projects in South America, Arabia, Asia, Africa, Alaska, Central America, etc. Send \$1.00 for foreign construction compendium and application forms. Foreign Service Bureau, Dept. P.S. 10 (Employment), P. O. Box 295, Metuchen, New Jersey.

CALIFORNIA Job Opportunities. Job openings. Industries presently hiring. wages, housing, rentals, living costs, etc. Send \$1 for Complete Information to: California Opportunities, 749-3 No. Broadway, Los Angeles 12, California.

MEN-Women mail circulars spare time at home. Good pay. Mail 25c for samples. Instructions. P.S.-2441 N. Patton, Philadelphia 32, Pa.

FOREIGN Employment?? List of Overseas projects with application form. \$1.00 Cash (C.O.D. \$1.32). Foreign Service Institute, Box 3980, Miami 24-A, Florida.

62 AGENTS WANTED

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. G, Decatur, Illinois.

EXCELLENT Sideline for printing and advertising salesmen. Decalomania name plates in small quantities. Great demand. Also, make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco", XL-Roxbury, Boston 19, Mass.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

FREE water and our concentrates make flavors, lotions, shampoos, 125 products. Labels, bottles supplied. Qualco, F-20030 Russell, Detroit.

PHOTO-Salesmen-Agents. Sell beautiful hand-colored plastic enlargements. Collect deposit, we deliver. Profitable sideline. Send card for free sample kit. Novel Portrait Co., 3343-A North Ave., Chicago, Ill.

SEWING Machine electrification kit. Nationally advertised. Has Good Housekeeping Guaranty Seal. Can be demonstrated and sold in 5 minutes. Make at least \$5 per sale. For complete details write today to Brownell Distributors, Inc., Dept. PS, 308 Canal St., New York 13, N. Y.

LOOK! Make money all year round selling personal initialed individualized belts, buckles, cap badges, western buckles, tie holders, name plates. 2000 emblems to choose. Big profits, whole or part time. Please write today special outfit offer. Hook-Fast Specialties, Box 1425, Dept. 7, Providence, R. I. Established 1926.

WOULD you pay 3%—first \$350? Book "505 Odd, Successful Enterprises" free! Work Home. Expect something odd! Pacific, Oceanside, Calif.

BIG Money—Fast! Sell Plastic Tablecloths (From \$3.50 Doz.), Drapes, Aprons, over 300 other items. Cash advanced Daily. Lowest Factory Prices; Highest Quality Plastics! Huge Selling Kit Free! The Dur-Ever Co., 2781-N Atlantic Ave., Brooklyn 7, New York.

FREE Folio. Wholesale Supply Sources. Business deals. Plans. Ideas. Formulas. Kolamite Co., Box 572 C, Dayton, Ohio.

SELL Slot Machines, Games, Home Bars. Send for wholesale deal. Webb Distributing Co., 4966 West Chicago Ave., Chicago 51, Ill.

AGENTS! 100 Brand New Products. Confidential Bulletin Monthly. Publishers, Gardenville 4, N. Y.

SELL!! Balloons, Combs, Specialty Merchandise. Carleton House Distributors, Texas City, Texas.

PAINTS—Enamels, Roofing 65c gallon up. Also outdoor toilet cleaners. Certified Products, 812f 38th, Louisville, Ky.

BE first! Clean up selling brilliant new, metal Christmas cards featured in America's greatest box assortment line. Special metal, plastic, foil and novelty assortments. Five portfolios of personal cards. Fast imprint service. Free samples. Elmcraft Chicago, 5930 South Western, Chicago 36, Ill.

POPULAR-Priced Sportswear. Shirts, Jackets, Pajamas, Nylons, Housedresses. Tremendous Commissions. Free Outfit. Jarod Manufacturing, Rockville Centre 6, New York.

AGENTS—make \$100 easy! Sell only 100 extra-profit Xmas card deals. Cost 75c—profit \$1 per deal! Complete line Free imprint samples; also approvals. Make more with Creative Art, 45 Warburton, Yonkers, New York.

\$1.00 STARTS you in business. Sell top quality \$1.00 ties. Now only \$7.20 dozen, your profit \$4.80 dozen. Regular \$1.50 up values. Send one dollar for introductory offer two ties. Catalog complete line free. Philip's Neckwear, 20 West 22nd Street, Department P-37, New York 10.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 28 E. Jackson, Dept. 18, Chicago 4, Ill.

START Your Own Business On Credit. Always your own boss. 1554 Dealers, sold \$5,000 to \$26,500 in 1948; their average \$6,742. We supply stocks, equipment on credit. 200 home necessities. Sales experience not needed to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh Co., Dept. J-U-PSC, Freeport, Ill.

ABSOLUTELY Free! Big package actual sample fabrics and style presentation of dresses, lingerie, hosiery, etc. Take orders. Commissions big. Send no money. Melville Co., Dept. 5104, Cincinnati 3, Ohio.

A DRESS Yours with every 3 you order for yourself and family. Amazing new bonus plan. Everything Free. Harford Frocks, Dept. A-535, Cincinnati, Ohio.

FREE Samples. Big profits showing amazing Glow-In-The-Dark specialties. House numbers, pictures, plastic novelties, religious and nursery objects, etc. Large manufacturer. Madison Plastics, 303 Fourth Ave., New York 10, N. Y.

1949 CHRISTMAS Card Catalog Now Ready! Earn more Money! Be a wholesale Jobber! A large selection of Box Assortments, Imprint Lines, Religious, Personalized Cards and Christmas Novelties. Three sample boxes, retailing for \$2.60, only \$1.00 postpaid. Catalog Free! Elfko, 440 North Wells, Chicago 10.

STOP! Want to make money all year round selling a complete line, Wool and Cotton Embroidered Uniforms for summer and winter wear, shirts, caps, ties, badges, 2000 emblems, personal initialed buckles, belts, and hundreds of other easy-to-sell items. Sales Kit furnished. Please write today. Hook-Fast Company, Box 480 PS, Roanoke, Va.

EARN Big Money Fast! Sell finest-quality advertising work uniforms to garages, factories, filling stations, etc. Free selling kit. Topps, Dept. PS-109, Rochester, Indiana.

\$100.00 WEEKLY selling 6 pair Paragon Cushion shoes daily. No investment. Experience unnecessary. Free outfit. Samples, Advance commissions, bonus. Paragon Shoes, 738 Columbus, Boston.

BE Renewal Headquarters for all magazines. Big profit in Christmas gift sales now. No experience—No capital needed. Free Catalog tells how. Write: McGregor Magazine Agency, Dept. 519A, Mount Morris, Illinois.

\$5—\$25 DAILY. Full, Sparetime or Sideline. Pocket Samples Free. Centson Cards, 3333 Neenah, Chicago 34.

FAST profits—No investment. Send for big, free catalog. Plastic aprons, tablecloths, etc. 150 sure-fire items. We guarantee sales. Write The Halliday Company, Dept. P-10, 347 Broadway, Passaic, N. J.

WHOLESALE Vitamins, Minerals, Concentrates, National Products, 2510 S.E. Clinton, Portland 2, Oregon.

WANTED! Direct from factory to customer salesmen for guaranteed shoe line. Unusual factory fitting service. \$1.00-\$3.00 advance commissions. Bonuses. Experience unnecessary. Free starting outfit. Mench Shoes, 14B Brockton, Mass.

SELL New-Used clothing from home, auto, store. Men's suits \$1.25; Leather Jackets 85c; Overcoats 56c; Dresses 18c; Ladies' coats 38c. Other Bargains. Catalog Free. National Mail Order, 1219T So. Jefferson, Chicago 7.

SELL Calendars Now. Be the first in your district. Good sideline or full time. Every business wants them. Few calendar salesmen are on the road now which means more sales for you. Fleming Calendar Co., 6539 Cottage Grove, Chicago 37.

NUSILVER Plating Liquid. Apply with cloth. Renews Silverware. Silverplates brass, copper. Easy seller. NuSilver, 508-10PSA New York St., Aurora, Illinois.

"CLEAN Dry" Clothes Brush. Chemically treated. Cleans clothes while brushing. Lightning seller. Samples sent on trial. Kristee 135, Akron, Ohio.

ADVERTISING book matches—Cash in on big demand—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-109, 7530 Greenwood, Chicago.

POPULAR SCIENCE OPPORTUNITIES

GOLD lacquered Window Sign Letters. Large Sizes Penny Each. New Foils. Absolutely Beautiful. Free Samples. Atlas. 544 W. 79th. Chicago 20.

AMAZING offer—\$40 is yours for selling only 50 boxes Christmas cards. Also 50 and 25 for \$1.00 with or without name. Free samples. Other boxes on approval, including entirely new, different deluxe assortment with feature television card. Cute plastic assortments. Write today. It costs nothing to try. Cheerful Card Co., 982 White Plains, New York.

AT last! Something new and sensational in Christmas Cards. Show Gorgeous Satins, Velours and Plastics never before offered. Gets Easy orders Fast! Pays Big Profits. Free Samples of Christmas Cards With Name 50 for \$1. Imprinted Stationery. Floral Charmettes. Napkins. 50 other assortments 60c to \$1.25. Samples on approval. Write. Puro Co., 2801 Locust. Dept. 941-M. St. Louis. Mo.

MAKE money easily. New spare time plan. Up to 100% profit. No experience. Show unusual Christmas. Everyday card assortments. Plastics. Gleam and Glo. Kiddies Cards. Wrappings. Attractive Gift items. Bonus. Special offers. Send today for free samples 30 different Christmas cards with name. 50 for \$1.00 up. Stationery. Coasters. Thomas Terry Studios. 102 Union Ave., Westfield, Mass.

FREE Nylons given if Kendex hosiery runs or snags. World's only women's hosiery sold with written guarantee amazing everybody. Mere words could not express unbelievable money making opportunity. Fantastic earnings become reality. Armstrong earned \$202 in 9 days. Watkins sent 92 orders in one day. Imagine replacing hosiery free regardless of cause—whether use or abuse! Truly sales dynamite for terrific profits. Even if you never sold before, three magic words: "Guaranteed Against Everything" will open doors for you—make women listen and pour money in your pocket. Nationally advertised in Life, Ladies Home Journal, Saturday Evening Post, McCall's and Woman's Home Companion. Awarded Seal of Approval by Good Housekeeping. 75 million readers will see Kendex advertising to help you make quick sales and big money. Complete line from sheerest 15 denier 51 gauge to heavy 70 denier service. Sizes 8½ to 11½; lengths 28 to 35 inches; latest fashion colors plus white; full fashioned seamed and seamless. No competition because Kendex nylons are not sold in stores. Also complete line men's hosiery actually guaranteed for one full year or replaced free. Nothing like this anywhere. Includes rayon, nylon, lisle, wool, cotton, mixtures, etc. All styles, patterns, colors, prices to please everybody. 200,000 pairs constantly in stock for fast delivery. Thousands shipped daily. Over 30 years in business. You need no money or experience. Nothing to pay now or later. Just show free outfits. Write orders. We deliver and collect. Big advance cash plus huge bonus. Earn money spare or full time—exclusively or as side line. No restrictions. Become manager—appoint others to sell for you—earn steady income on their sales. Man or woman, young or old, experienced or beginner, you can make money and friends writing orders. Everything you need is furnished free, including sales books in color, samples of hosiery materials etc. Simply write your name and address on postcard and make money next week with money-making outfits sent free and prepaid. No obligation. Kendex Company, Babylon 14, New York.

NYLON. Poplin, Rayon Uniforms, white and colors. Immediate Delivery. Immediate Profits. Sell to Doctors, Dentists, Nurses, Waitresses, Beauticians, Housewives. Free Sales Kit. Superior Fabrics, Dept. A10, 3936 Market St., Phila. 4, Pa.

BIG Bargains for Big profits. Over 100 sensational values. Men's used suits \$2, pants 35c, topcoats \$1.25, overcoats \$2, shoes 20c. Experience unnecessary. Free wholesale catalog. Superior, 1250-B Jefferson, Chicago 7.

NEW "Sponge" Dish Cloth. Replaces messy dishrags. Banishes dishwashing drudgery. Lightning seller. Samples sent on trial. Kristee 136, Akron, Ohio.

SELL Big Money-Maker to men and Women. Easy handwork makes fast-selling useful articles. Sample free. Sunmade Company, Brockton 64, Mass.

BIG extra income! Sell friends nylon hosiery, lingerie, blouses. Values supreme! Free sample displays. Christmas. Everyday greeting cards, gift wraps. Christmas samples on approval. Special outfit offers. Wear Wright, 1709 Arch St., Dept. B, Philadelphia, Pennsylvania.

OWN Your Own Business. Sell Men's Neckwear full or spare-time. Low investment, big profits. Send \$1.00, receive two Sample ties plus free catalogue, color portfolio, selling plan. Radio City Neckwear, Dept. P.S. 2, 112 W. 50th, N. Y. C.

SELL ultra-blue stock signs to stores. 1000 slogans, comedy, general, religious. "7x11" cost 6c—Sells 35c—Make money. 15 samples Ultra-blue signs "7x11"—\$1.00 postpaid. L. Lowy, 8 West Broadway, Dept. 499, New York City 7.

BUY thousands of nationally advertised products direct from manufacturers and distributors. Write for "Buy Direct and Save". Service Publishing, 218-B Investment Bldg., Pittsburgh 22, Pa.

HOTTEST 39c item on the market. National Sales & Service, Greenville, Pa.

SCHOOL Seniors!!! Your postal will bring our wonder, Kwick-Sell Cardalog of popular Graduation Name Cards. Biggest profits!!! Only firm giving free souvenir chest and Card Case. Don't miss out! Hurry that postal!!! Craftcards, Box 235 (M), Pittsburgh 30, Pennsylvania.

WHERE To Buy 800,000 Articles Wholesale! Details Free. Schibani, Box 1576-S, Birmingham 1, Ala.

SPARE Minutes bring dollars selling this new burn ointment. Free details. Clover Products, 11860S Mississippi, Los Angeles 25.

63 HIGHGRADE SALESMEN

BIG Money Taking Orders: Shirts, Ties, Sox, Pants, Jackets, Sweaters, Shoes, Uniforms, etc. Sales equipment free. Experience unnecessary. Nimrod, 4922-AV Lincoln, Chicago.

LOOK Here! Wanted—Men and women to start in business on credit. Sell some 200 farm-home Products. Thousands our Dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. J-192-PSC, Freeport, Ill.

SALESMEN. Earn \$100.00 weekly, selling only six pair shoes daily. Commission and bonus. Wide variety for men, women, children. No investment. Experience unnecessary. Free catalog. Tanners Shoes, 515 Boston, Mass.

SALESMEN—Put yourself in line for big money, real future. Keep stores supplied with 5c-10c to \$1 counter goods. Nationally advertised. Top profits for you and merchants. Liberal deals boost sales. Side-line or full time. World's Products, Dept. 83-Y, Spencer, Ind.

DIGNIFIED Selling . . . Commissions in Advance! Perfo—the leader in its field—has full line of custom-built rubber mats with inlaid names, numbers and trademarks. Big commissions paid in advance to hundreds of successful representatives. Write for details on this year 'round business today. Perfo Mat & Rubber Company Inc., PS-1, 281 Fifth Avenue, New York 16, New York.

UP to \$12.00 in a day and tailored suit for yourself without paying one cent. Write for plan. W. Z. Gibson, Dept. X-521, 500 S. Throop, Chicago 7, Illinois.

67 EDUCATIONAL AND INSTRUCTION

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or Spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

EXPORT! Learn at home from established World Trader. Big paying positions. Your own profitable world-wide business by mail order without capital; or travel abroad. Experience unnecessary. Free booklet. Mellinger, 210 W. Los Angeles 24, California.

MATHEMATICS. Individualized instruction. NCS, Box 27, St. Johns Station, Brooklyn 13, New York.

DO you want Success—Self-Confidence—More Money? You have the ability—Home Study Course develops your mental powers quickly, easily. Results proven. Write for "Free Personality Chart" and full details. Self-Help Foundation, 746-P South Lake St., Los Angeles 5, Calif.

BE A real estate broker through home study or classroom instruction. Write for free book. Approved for veterans. Weaver School of Real Estate, 15 E. Pershing Rd., Box CP-8, Kansas City 8, Mo.

PREPARE Now for permanent, big pay Diesel jobs. Write for Free information about our approved, easy-to-understand Diesel Training Course. Covers all phases. Learn as you earn. Placement advisory service Free. Write today! Interstate Training Service, Dept. 2 K, Portland 13, Oregon.

STUTTERING or Stammering Corrected at Home. Amazingly successful method. Send for free literature showing how you, too, may overcome stuttering at home. The Atheneum, PS-102, 1714 Chestnut, St. Louis 3, Mo.

HOW You Can Get A Better Job. Send for free information. Stanley Research, P. O. Box 2151, San Francisco, California.

PIANO Tuning Pays. Learn this profitable profession at home. Our Tonometer and mechanical aids make learning easy. No knowledge music necessary. Diploma granted. Largest and oldest school—51st year. G. I. Approved. Write for booklet. Niles Bryant School, 77 Bryant Bldg., Washington 16, D. C.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment, happiness. Win degree of PsD, or MsD. Solve mental worries. Free book. College of Universal Truth, 5153-K N. Clark, Chicago.

LEARN Auctioneering. Col. Nelson can teach you by mail or resident classes. Sample lesson Free. Nelson Auction School, Renville, Minnesota.

INEXPENSIVE Manual teaches air conditioning. Write Don Nelson, Warner Robins 3, Georgia.

USED Correspondence courses bought, sold, rented. Literature free. Baker, 5509-A Winthrop, Chicago 40.

GOOD salesmen command good pay. To learn the "know how", send for Tom Burt's course in salesmanship. Only \$5.00 for six weekly lessons. Invaluable to any one entering sales field and to salesmen in a rut. The information, counsel and constructive ideas contained in this course make it worth many times its cost. Place \$5.00 in envelope now with your name and address and send to Mead Publishing Co., 404 Halliburton Bldg., 1709 West 8th, Los Angeles 14, Calif. First lesson "You and the Field" sent immediately.

BETTER Jobs—More Pay. Learn Beautiful Handwriting. 100% improvement few days. Easy method complete \$1.00. Bradley, Box 559-B, Linwood, Pa.

MAKE Up To \$35-\$45 Week as a Trained Practical Nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-10, Chicago.

USED Correspondence Courses and Educational Books Bought, Sold, Rented; Catalog Free. Educational Exchange, Summerville, Ga.

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

FALL Classes in Air Conditioning, Refrigeration Heating and Heat Pump Engineering are forming Now. Write for free information. Detroit Air Conditioning Institute, Dept. A, 4125 Grand River, Detroit, Michigan.

PHOTOGRAPHIC mind with Super-memory, write Thor Books, S-10 Box 1210, Chicago.

HOME Study Courses, Chiro-Deo-Therapy, Drugless Healing Certificates, Diplomas, Degrees, Western University, 911-13 West University Ave, San Diego 3, Calif.

69 CONTESTS

WIN Cash, Cars In Prize Contests! Write for copy filled with current contests, winning hints and tips. Send only 25c. Wright Contest Digest, Dept. 20-K, P. O. Box 2266, St. Louis 9, Missouri.

POPULAR SCIENCE OPPORTUNITIES

HITCH Your Wagon to a ConteStar! Send 3c stamp. National Contest Bulletin, Box 2685-C. Miami 31, Fla.

70 LANGUAGE OUTFITS

LINGUAPHONE Makes Languages Easy. At home learn to speak Spanish, Portuguese, Italian, French, German, Russian, by quick, easy Linguaphone conversational method. Save time, work, money. Linguaphone Correspondence Courses are available to veterans under G.I. Bill of Rights. Send for free book. State if G.I. Linguaphone Institute, 54 RCA Bldg., New York 20, N. Y.

72 AUTHORS SERVICE

I WANT New Writers to cash checks of \$1 to \$100 offered daily. The easiest way to write for pay. No previous experience necessary. Free Details. Saunders M. Cummings, 468-15 Independence Bldg., Colorado Springs, Colo.

73 BUSINESS SERVICE

SUCCESSFUL letters developed which pull results. P.O. Box 1067, San Francisco.

74 CARTOONING, SIGN PAINTING, DRAWING AIDS

"HOW to make money with simple cartoons". A book everyone who likes to draw should have. It is free; no obligation. Simply address Cartoonists' Exchange, Dept. 1910-C, Pleasant Hill, Ohio.

INTERESTED in Cartooning? Write Cartoons D3, Box 3291 San Francisco 19, Calif.

CARTOON Your Way To Success! Internationally known instructor, Raye Burns, will personally teach you to create salable, original cartoons at home. Course of 26 lessons only \$2.85. Send remittance with order or write for Free Details and addresses of successful students. Raye Burns School, Box 3583-S, Cleveland 18, Ohio.

RAISED Wood letters for signs. Send 10c for catalog. Sign Letter Distributors, 273 Starke Ave., East Meadow, New York.

CARTOONING—Complete 35 Lesson Course, \$1.00. Cartoonland Schools, 2019A Emerald, Grand Rapids 5, Michigan.

LIFE Figure Drawing. Learn our quick exclusive method and earn money for drawings. Male and Female Anatomy, \$1.00 each. Free cartoon and caricature lessons included if you order both. Waller Art Studios, Dept. 13, 1000 N. Charles St., Baltimore 1, Md.

75 CHALK TALK-STUNTS

CHALK Talks. Laugh Producing Program, \$1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

76 TYPEWRITERS AND OFFICE MACHINES

ADVERTISE. Increase business. "Printomatic" selffeeding "Mimeograph" Post Card Duplicator prints, reproduces, thousands anything typewritten, handwritten, \$13.50. Literature. Pittsburgh Typewriter Company, 336-2 Fourth Avenue, Pittsburgh 22, Pennsylvania.

77 OFFICE SUPPLIES & EQUIPMENT

TYPEWRITERS \$17.50. Adders \$12.50. Duplicators \$9.75. Burglar alarms \$2.95; Typewriters, 118 Spruce, Wichita, Kansas.

78 RUBBER STAMPS

3 LINES 45c; Indexed 55c; Pads 35c. Print-Right, Wauwatosa, Wisconsin.

RUBBER Stamps—Marking devices. Service Stamps, Box 445-A, Winona, Minn.

79 PRINTING OUTFITS, SUPPLIES

PRINTING Presses, type, supplies. Send stamp for details or dime for complete illustrated printer's supply book and samples. Kelsey Corp., J-8, Meriden, Conn.

1000 ENVELOPES Printed. Five lines, 6 $\frac{3}{4}$ size, white wove, \$5.00 prepaid. Hatch Press, Meriden 2, Connecticut.

MAKE Your Own rubber printing cuts. Self-molding process. Flexirubber, Argyle 2, Wisconsin.

80 PRINTING, MULTIGRAPHING, ETC.

BUSINESS. Personal Stationery. State Requirements. Samples. Prices Free. How Printing Company, 717-23 Eunice, Webster Groves 19, Missouri.

LETTERHEADS, drawings, photographs, printed matter, reproduced without cuts. Folder free. Pengad Offset Printing, Bayonne 5, New Jersey.

SAVE Money On Printing—Stationery, Checks, Cards, Samples, Prices Free. Stumpprint, South Whitley 2, Indiana.

"HOW to Save on Printing and Office Supplies" New illustrated catalog 10c; refunded first order. Eddy Company, Southington 3, Conn.

UNCOSTLY varotyping; multi-page work estimated. U-Tel-M, 252 8th S.E., Washington, D.C.

250 QUALITY 8 $\frac{1}{2}$ x11 letterheads and 6 $\frac{3}{4}$ envelopes \$3.50 Postpaid. Advance, Starke, Florida.

BUSINESS. Personal stationery. State requirements. Samples. Mero Products, 99 Morrison, Punxsutawney, Pa.

500 $\frac{3}{4}$ x 2 $\frac{1}{4}$ PRINTED stickers 50c. General printing, Willis Myers Company, Owosso, Michigan.

MIMEOGRAPHING. Letterheads, letters, envelopes. Martin Service, 3212 Harper, Saint Louis 7, Missouri.

2000 BUSINESS Cards \$3.75 Postpaid. Colors—White, Buff, Blue. Samples Free. George Mather, 606 Milford Mill Rd., Pikesville 8, Md.

MIMEOGRAPHING. 8 $\frac{1}{2}$ x11. Quality Work less than 1c a copy. Photo Offset. Multigraphing. Send 10c (refundable) for Price List. Mimic Reproductions, 383P N. Corona, Valley Stream 9, New York.

1000 BUSINESS Cards \$2.50 Prepaid. Samples free. Reliable Print Shop, 905 East Jefferson, Louisville 6, Ky.

1000 BUSINESS Cards \$1.85. Prepaid. CPR, 914 E. 217 Street, Bronx 67, N. Y.

82 PATENT ATTORNEYS

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

PATENT practice before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys, Suite 413, 815-15th St. N.W., Washington 5, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7.

PATENTS—Trade Marks. Patent Lawyer. Gustave Miller, 109-B Warner Building, Washington 4, D. C.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skilful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow: Berman & Davidson, Registered Patent Attorneys, 143-C Victor Bldg., Washington 1, D. C.

INVENTORS—If you have a valuable invention, the usual procedure is to authorize a preliminary search through appropriate classes of U. S. patents. This firm is registered to practice before the Patent Office.—is available to make such a search and report to you concerning the probable patentability of your invention. Booklet and convenient "Evidence of Invention" form sent upon request. Victor J. Evans & Co., 441-L Merlin Bldg., Washington 6, D. C.

PATENTS. "Proof of Invention" folder mailed without obligation. E. E. Vrooman, Registered Patent Attorney, 512 McKim Bld., Washington 5, D. C.

INVENTORS: Learn how to protect your invention. "Patent Guide" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be forwarded upon request—without obligation. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 92B-K District National Building, Washington, D. C.

PATENTS—Trade marks. Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

83 FOR INVENTORS

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS: If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 1926 Eye St. N.W., Washington 6, D. C.

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7.

INVENTORS: The usual First Step is to have a search of the U.S. Patents conducted, so I can report on Patentability. Write, without obligation, Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 939 Columbian Bldg., Washington (1), D. C.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

INVENTIONS Wanted. Prominent manufacturers and national distributors look to us for new products. You can also benefit by having us assist you with your invention from the idea stage through to the developed product, fully protected. Ask for Booklet "P", Elo Development Co., Chatham Phenix Bldg., L.I. City 1, New York.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U. S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skilful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorow: Berman & Davidson, Registered Patent Attorneys, 143-D Victor Bldg., Washington 1, D. C.

INVENTORS—If you consider your invention to be something of importance, you may take steps to protect it with a U. S. Patent which gives you the right to exclude others from making, using and selling your invention as claimed. "Patent Protection for Inventors" booklet outlining steps to take to secure patent protection will be mailed promptly without obligation. Victor J. Evans & Co., Merlin M. Evans, Registered Patent Attorney, 442-L Merlin Bldg., Washington 6, D. C.

PATENT search, analysis your invention, \$6.00. Includes patent copies, Patent Applications prepared. Inventions marketed. Protection forms free. Industrial Patent Reports, Box 1081, Massachusetts Avenue and North Capitol, Washington 13, D. C.

POPULAR SCIENCE OPPORTUNITIES

CONSULTING service on mechanical, structural and patent developments. Submit problems for cost estimate. Strict confidence. Lloyd and Becker, Technical Consultants, Box 403, Barberton, Ohio.

INVENTORS: Learn how to protect your invention. "Patent Guide" containing detailed information concerning patent protection and procedure together with "Record of Invention" form will be forwarded upon request—without obligation. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 92A-K, District National Building, Washington, D. C.

PATENT Searches \$5.00. Includes patent copies, 48 hour service. Free protection forms. Patent Service Institute, 945-B Pennsylvania Ave., Washington 4, D. C.

INVENTORS: Obtain patents without assistance. Details free. International Patent Library, 1420 New York Avenue, Washington 5, D. C.

IDEA Men! Let's get together and get some money out of our ideas, instead of promises. James Corubia, 126 Lexington Avenue, New York City 16.

PATENT Searches \$5.00. Includes nearest patent copies, 48 hour service. Free protection forms. Patent Research Engineering, 318 Evans Building, Washington 5, D. C.

84 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 1926 Eye St., N.W., Washington 6, D. C.

INVENTIONS Promoted, Patented or Unpatented. Write Adam Fisher Company, 183-A Enright, St. Louis, Mo.

CASH For your idea. 280 manufacturers need inventions, patented or unpatented. List free. Invention Bureau, 208-S Clinton, Oak Park, Illinois.

INVENTORS—Charges from royalties only. Inventors-Manufacturers Associates, 5 Beekman St., New York.

HIGHEST Royalties—Cash. Request free Booklet "C." Universal Marketing Co., 354 South Spring St., Los Angeles 13, Calif.

INVENTIONS Wanted. Patented or Pending only. Inventors Exchange-D, Hartford 1, Conn.

ATTENTION Photographic Inventors—Engineers. We can help you design, develop, and market your invention. Our experience assures you maximum return. All correspondence in strictest confidence. Photo Research Corp., 127-129 West Alameda Ave., Burbank California.

85 PATENTS

INVENTORS: Test the commercial value of your patented or unpatented inventions, quickly and inexpensively. Write for free information, Institute of American Inventors, Dept. 30-B, 1926 Eye St., N. W., Washington 6, D. C.

86 PATENTS FOR SALE

AMERICAN & Canadian airless tire patents for sale or Royalty. Reasonable. Joseph T. Murphy, 761 Hazel Street, Akron 5, Ohio.

88 MANUFACTURING

MODELS. Experimental work; designing; manufacturing. Henry, Engineer, 2815-PS Hudson Blvd., Jersey City 6, N. J.

89 MODELS, MODEL SUPPLIES

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 24—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

SHIP Models—most complete line in New England. Kits, parts, plans, books. Steam and electric power plants. Illustrated catalog 25c. James Bliss & Co., Inc., 220 State St., Boston, Mass.

BUILD Historic Ship Models, complete kits 39c to \$9.00. Catalog 10c. Ideal Models, 21 West 18th, New York 11, N. Y.

STEAM Marine Engines, Boilers, Casting Kits, Box 326, Evanston, Illinois.

READY! Our 1950 catalog of ship model kits and fittings; sail, steam, diesel. Send 25c for catalog. Model Shipways Folio, 476 Main St., Fort Lee 41, N. J.

HO RAILROAD. Airplanes, Boats, Cars, Craft Supplies. List 5c. Pete's Hobby Shop, 5743 1/2 Prospect, Kansas City 4, Mo.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

FIRE Engines, Famous Will-O-Line 1/2" scale kits, Ladder, Chemical, Steamer, Others, Conestoga Wagon, Stamp for circular, Bay Models, 1013 Braintree 84, Mass.

DOWMETAL Magnesium for all model makers. Rod, Bar, Sheet and Scale Structural Shapes, Craftsmith, 15427 Robson, Detroit 27, Michigan.

STEAM engines, boilers, castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

90 MOLDS AND MOLDING MATERIALS

METAL forming molds for Lucite, Plexiglas, Candy dish and mold list one Dollar, 128 Adams St., Wellington, Ohio.

91 HOME CRAFTSMEN

PROFIT with Larson Leathercraft, Belts, purses, 100 other ideas. Largest supply in U. S. Catalog 10c. Larson, Dept. C, 826 S. Tripp, Chicago 24.

JUST Off The Press—8-page folder illustrated 6 beautiful, popular lamps you can make—for yourself, for Xmas gifts, or to sell others. It's fun, highly profitable—as hobby, or part or full time basis. 8-page folder, 32-page parts catalog, wholesale price list only 25c—refundable first order. Gearon Company, Dept. 400-A10, 27 South Desplaines, Chicago 6, Ill.

JIGSAWED Money-maker! Sells itself. Plan 25c. Box 56, Braintree 84, Mass.

LEATHERCRAFTERS: Complete supplies and leather. Free Catalog. Arts Leather, 411 Joseph Ave., Rochester 5, New York.

SLIPPERY Steps made safe! Basement, kitchen, wood, metal, concrete or any steps. Do it yourself. Easy. Tested materials, instructions \$2.00. Barcanic, 7655-B Farragut, Chicago, Ill.

SPECIAL Offer: 80 Full Size Toy, Novelty, and lawn ornament patterns only \$1.00 Postpaid. Lynds, Box 193E, Medway, Mass.

LAWN chairs, garden figures, furniture, novelties, toys, etc. 68 popular plans with full size patterns, \$1.00. Mastercraft 10S1, 7041 Olcott, Chicago 31, Ill.

LEATHERCRAFT. Copper tooling. Textile painting. Materials, tools, supplies. Free illustrated catalog. Kit Kraft, Dept. BC10, 7377 Melrose, Los Angeles 46, Calif.

8 BEAUTIFUL Full Size Whatnot patterns only 25c. Joanness, P. O. Box 141-S, Omaha 7, Nebraska.

BRAND New Idea—Make beautiful fluorescent desk lamp from old furniture, odds and ends of lumber, with simple tools. Something different. Jigsaw necessary. For pattern and instructions, Send \$1.00 to James Good, Oley, Pa.

COMPLETE line of supplies. Lucite, plexiglas, Shells, Jewelry findings, Royal Plastic Specialties, 1209 Spruce Street, Box PSH, Philadelphia, Pa. Catalog 10c.

ALUMINUM—Bulletin APS Free, Rounds, Squares, Sheets, Etc. Kale Crafts, 2252 Milwaukee, Chicago 47.

BOOKLET, Hobbycraft Hints, and Catalog 10c. Leisure Hour Products, 416 Rose, West Hazleton 20, Pa.

KNOCKDOWN Cedar Chest, Lumber and Veneers, Free Price List, Giles Co., Brownsboro, Alabama.

LEATHERCRAFT Supplies, Leather & Tools, low prices. Send 10c for catalog. Jonas Handicraft Co., (Dept. S-10), 32 Frankfort St., N. Y. 7.

MEXICAN Novelties in Big Demand! 20 Patterns 25c. Mexican Arts, 202 Adams St., San Antonio, Tex.

SPECIAL 80 Full Sized Patterns Lawn Ornaments, Toys and Novelties, One dollar. Modern Woodcraft, Saginaw, Mich.

93 BUILD IT YOURSELF

BUILD Your Own "Tractor". Plans, walking, riding. Send postcard. Free information. Ellsworth Tractor Co., D-5, Camptonville, California.

BUILD Concrete Blockmaker, Motor or hand operated. Easy. Inexpensive. Practical. Literature—dime. Clyde Lee, Mountain View 1, Okla.

BUILD block, brick, tile machine. Sell 15 items. Good profit. Build low cost home. Two blocks per minute—simple, inexpensive. Write U-Build-it, P.O. Box 7026, Tampa 3, Fla.

FREE Handbook, Build sawmills, block machines, freezers, tractors, scooters, 250 shop, farm, home machines. Nichols Co., Dept. C-102, Purvis, Mass.

"CONCRETE Block Homes." 32 page booklet on how to build. \$1.00. Other Home Building booklets, \$1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

BUILD your own home for half the price. Details 25c. P. O. Box 381, Fort Dodge, Iowa.

MODERNIZE! Kitchen cabinets of plywood. Simple tools and our \$1.00 plan does it. Ace-Hi Plan Service, Box 111, Burbank, Calif.

94 WATCH REPAIRING

WATCHMAKERS Tools, Supplies. Sold—Bought. Catalogue! Bengale Company, Culver City, Calif.

WATCHMAKERS' Journal contains instructive articles for watchmakers. Send 20c for new copy. Dean Co., 116-B Nassau St., New York 7, N. Y.

ENTRUST your watch to experts. One year guarantee. Modern Technical Supply, 55 West 42 Street, New York 18.

95 OLD GOLD, WATCHES, ETC.

HIGHEST Cash for Old, Broken Jewelry, Gold Teeth, Watches, Silverware, Diamonds, Spectacles. Free Information. Satisfaction Guaranteed. Government Licensed, Rose Smelting Company, 29-Y East Madison, Chicago.

NEW and Rebuilt Watches, all makes, styles, \$9.95 up; guaranteed. Brookins, B-1975CK, Little Rock, Arkansas.

HIGHEST Prices Paid for old gold, silver, platinum, diamonds, watches, gold teeth, old jewelry. Send now. Cash Immediately. Goods returned if offer is not satisfactory. Government License TGL12, United Smelting Works. (The Old Reliable), 39-A South State, Chicago 3.

96 JEWELRY

JEWELRY Making. Illustrated catalog 20c. George Sassen, 35 Maiden Lane, N. Y. C. 7.

BROKEN Jewelry Bought—Everything. Best cash prices paid for gold teeth, rings, jewelry, spectacles, diamonds, bracelets, watches, etc. Cash mailed promptly. Send for Free shipping container today. Lewis', Dept. SP, International Building, St. Louis, Missouri.

MAKE Your Own Jewelry! All types of findings, plastic and metal; cameos, beads, shellkits, illustr. catalog, 20c. Hobby Art, Dept. 6, POB 276, New York 18, N. Y.

LOST Wax Casting Instructions plus three jewelry waxes \$2.50. Adelbert Jones, Box 882, West Los Angeles 25, California.

97 TOBACCO & PIPES

CIGARETTES—Popular brands \$1.51 per carton postpaid. West of Mississippi add 7c per carton. Min. order 3 cartons. Send check or money order. King Co., Box 1713-E, Baltimore, Maryland.

FREE literature. Finest imported briar pipes (unfinished) \$1.00 postpaid. Carvape, 2829F Dixie, Hamilton, Ohio.

MAKE smoking pipes, briar pipe blocks and stems. Send for circular. Michelson & Sternberg, 23 West 47 Street, New York 19, N. Y.

POPULAR SCIENCE OPPORTUNITIES

100 MISCELLANEOUS

BOOKFINDERS! (Scarce, out-of-print, unusual books) Quickly supplied. Send wants. Clifton, Box 1377-PSM, Beverly Hills, Calif.

GEIGER Counters! New, lightweight, super sensitive uranium detectors. Sensational low price. Write today. The Detector Co., 5637 Cahuenga Avenue, North Hollywood, California.

GRAVITY. If you are interested in Gravity—Write us. No expense to you. Gravity Research Foundation, New Boston, N. H.

NEW Invention; Adjustable Paint Can Handle. Fits quarts, pints, smaller cans. 25c postpaid. Doty, Box 448, Port Richmond, S.I., N. Y.

SEND 25c for Hand Blown Glass Lapel Flower Vase, complete with pin. Glastube Products, Hawthorne, California.

LEATHER Jackets renovated, cleaned, dyed, repaired, relined, expertly, reasonably. Send for itemized price list No. 7. Berlew Mfg. Co., Freeport, N. Y.

MEN! Large size shoes, large size socks! We specialize in large sizes 10 to 16, widths AAA-EEE. Dress, sport, work shoes. Guaranteed. Write for Free catalog. King-Size, Inc., 198, Brockton, Mass.

ELECTRIC Testing Made Easy. All Purpose Electric Tester 50c Postpaid. Hahco, 1760 Hill View Rd., Cleveland 12, Ohio.

TROUSERS for Big Men—Rochester-tailored to your measure. From \$11.00. Send for catalog. The Large Sizes Company, 118 Shepard Street, Rochester 7, New York.

BUY Best English Suitings Direct. Send for Free Patterns. Mullen, 117 Watchfield, Chiswick, London, England.

"INTERESTING Mails"—25c will keep your mail box full three months. Bentz, Jr., Desk-A/21, Chatawa, Mississippi.

BIG Mails Three Months. Name Listed Directory 25c. Harvey Teeple, Decatur, Indiana.

PANNING Gold—Free instructions. Catalog mining books—supplies. Old Prospector, B-275, Dutch Flat, Calif.

URANIUM! Exploration, detection, recognition methods understandably explained. Particulars free. Woodwid Industries, 5217-B Hollywood Boulevard, Hollywood 27, Calif.

MILLION Articles wholesale. "Supply Source Directory" 25c. Publisher's, Box 1302-A10, Detroit 31.

GEIGER Counters \$48.50 and \$70.00. Complete. Prepaid. Guaranteed. Uranium Spinthariscopes (Scintilliscopes) with Samples \$6.00. Western Radiation Laboratory, 1107 West 24th St., Los Angeles 7, Calif.

TREASURE Locators, Mineral Detectors, Geiger Counters for Uranium ores. Free literature. Fisher Research Laboratory, Inc., Palo Alto, California.

BEAUTIFUL Bird Houses—knockdown 75c. \$1.00. \$1.25. Knockdown Feeders \$1.50. Yonghaus, Box 395-P, Pompton Plains, New Jersey.

101 FOR SALE—MISCELLANEOUS

WAR Surplus. Aircraft items. Shop Equipment. Machinery and a million other items. Free Catalog. Atlas Equipment, 229 Southwest Blvd., PS., Kansas City 8, Mo.

PLASTICATED "GI" Cloths. Waterproof, lightweight, 8 x 10 foot, 1001 uses as painter's dropcloth, lawn, furniture, machinery, merchandise cover, beach blanket, or shelter. Many uses camping, fishing, or picnic trips. Send \$1.25, and we will ship one cloth prepaid. Sax-on, Dept. N-1, 3840 Fullerton, Chicago 47, Ill.

RECEIVE Beautiful Box Christmas Cards. Send \$1.00. Justian's Service, 133 Dewey Ave., Syracuse, New York.

NEW Air Corps Flying Helmets. Small, Medium, Large—3 for only \$1.00 Postpaid. EE-8 Army Field Telephones, \$9.00 each. F.O.B. Fortune, 2250 McKinley, Fresno, Calif.

TOY Pistols and Holsters. Wholesale & Retail. C. C. Groff, 116 Broad St., Lancaster, Pa.

FREE Catalog! War surplus clothing. Men's, women's. Amazing bargains. N. Y. Clothing Co., N. Y. 29.

USED Vending Machines. Largest selection. Satisfaction guaranteed. Vassar, Cleveland 5, Ohio.

SURPLUS Bargains Save \$\$\$\$. Light Plants 800 Watt \$145.50, 1000 Watt \$165.50 and up, 110 Volt A.C. Gasoline Engine Driven, New Custom Built and Guaranteed. Many other Reduced Price Items. Send for listing today! Mdse. & Equipment Mart, 51 E. 99 St., Cleveland, Ohio.

102 WANTED MISCELLANEOUS

USED fur coats wanted. Only mink, weasel, ermine. 133 Kearny, Room 306, San Francisco, California.

103 FOR THE HOME

SKID proof your rugs. Dollar buys five safety fabrics. Drewsen, Northampton, Mass.

104 PERSONAL

GERIATRICS. Fountain of Youth. Free literature. Health-Center, Columbia City, Indiana.

BORROW by mail. Loans \$50.00 to \$300.00 to employed men and women. Easy, quick. Completely private, confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Write State Finance Co., 210 State Finance Bldg., Dept. A-14K, Des Moines 9, Iowa.

MEDICAL Prescriptions filled at guaranteed lowest cost. Ask for prices on all your drug, hormone, and vitamin requirements. Ace Mail Order Co., E. East Orange, N. J.

"HOW Can I Find Out?" You Can! Information discreetly developed. Any matter, person, problem, anywhere. Worldwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 170 Broadway, New York.

DETECTIVE'S Opportunities. Particulars free. Write. Wagoner, P-125 West 86th, New York 24.

DEVELOP magnetic "Faith-Power"! Attract! Free booklet, "Mountains of Gold," tells how you win bigger income, happiness, love, through "Naturlaw Secrets." Write Institute of Naturlaw, Dept. P44S09, 2208 Main, Dallas, Texas.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

STUTTERING or Stammering Corrected at Home. Amazingly successful method. Send for free literature showing how you, too, may overcome stuttering at home. The Atheneum, PS-101, 1714 Chestnut, St. Louis 3, Mo.

LETTERS remailed from Paris (France). \$1.00. Airmail \$2.00. Box 4066, San Francisco 1.

"1,000 ITEMS Free", latest edition, plus 500 Big Mails (you count 'em) \$1.00. Particulars, with supermails, 25c. Dealership. Wright Publications, 2276 Hubbard, Memphis 8, Tenn.

PSORIASIS Sufferers: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for Free important information. You needn't invest one cent! Pixacol Company, Dept. S, Box 3583, Cleveland, Ohio.

NEW Formula For Athlete's Foot, Dermo-Ring. Sure Remedy with one application, send \$1.00, includes postage, money-back guarantee. Candido Pharmacy, P.O. Box 1256, Albany, New York.

SLEEPLESS? Stop noise 90%! Sleep soundly with Sleep-Rite Waxen Earstoppers. Users say—"Wonderful"—"Great". Set 10c. Guaranteed. Raymond Dow, 2922-164th, Flushing 20, New York.

I'LL Tell You how to make money doing what you like best to do. Fee \$1. Cyrus Clover, 11860 Mississippi, Los Angeles 25.

HAIR falling stopped!!! Dandruff, itching stopped. Enjoy healthier, stronger hair. Money back guarantee. Michael's, 1049CPS, 3027 Atlantic Ave., Atlantic City, N. J.

LETTERS Retailed, 25c coin. M. Victor, 93 Hart Street, Brooklyn 6, New York.

MEXICAN Law. General Practice Attorney. 1203 Arizona Street, El Paso, Texas.

COMPLETE Letter Writing Service. Detailed Information 25c. Brown, Seaview, Swansea, Mass.

INFORMATION for single people by Human Relations Consultant, University Graduate, Dr. B. Long, Box 375, Los Angeles 53, Calif.

YOUR Name in Lights! Micalite Sign Letters 50c. Sample 25c. Harwell's, Byrds-town, Tenn.

"KNOW the truth!" 1/2 page handwriting analyzed. \$1.00. Analyst, 11037-S Estepa, Oakland 3, Calif.

106 ADVERTISING

ADVERTISE: 24 words. 40 Newspapers, \$3.50. Lists free. Advertising Bureau, 10511-P Springfield, Chicago 43.

AVOID costly advertising mistakes. Get enlightening Ad-Guide and Ratebook leading newspapers, magazines, mailing lists, 10c. Chicago Advertising Agency (Established 1900), Chicago 4.

EVERYTHING you need in Advertising Sales Aids for the Bronzed Baby Shoe Business. Write for Free booklet "3 Ways to Successful Selling." National Ad-Aid Service, 4646 Melbourne Avenue, Los Angeles 27.

24 WORDS in 50 Weeklies. \$4.96. J. Darnell, 730 Hays, Jackson, Tennessee.

114 DRAFTING INSTRUMENTS

BEAM Compass. Adjustable. Diameters to 32 inches. Steel Beam, Brass Posts, Nickel plated. \$4.20 Postpaid. Grew Products, 664 East 126 Street, Cleveland, Ohio.

115 DRAWING & ART SUPPLIES

DRAFTING and artists' materials catalog—thousands of items—25c (deductible first \$2 order). Gordon's, 187 Madison, Chicago.

117 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies. Illustrated List Free. Zeiss, 728 Lesley, Rockford, Illinois.

120 CANDY MAKING

MEN—Women—"Everybody Likes Candy." Learn to make professionally at home. (Our 39th year.) Ragsdale Candies, East Orange, New Jersey.

125 WOODS

WOOD cards. Business, Christmas, Announcement. Cards of Wood, Manlius 2, N. Y.

131 TREASURE FINDERS

METAL Detectors. The very latest circuit. Send 25c for literature. Hedden Metal Detectors, 3329 Liberty Ave., Pittsburgh 1, Pa.

GEIGER Counters for locating Uranium; Metal Detectors for Gold, Silver and minerals. Lightweight, low cost, ultra-sensitive. None finer at any price. Free information. Detector Co., 5637 Cahuenga Avenue, North Hollywood, Calif.

SEEK Buried treasure; Methods, mysteries, devices explained. Circulars free. Century Press, Box 151-D, Glen Ellyn, Ill.

TREASURE—Mineral Locators, M-Scope. Low Priced, lightweight, unsurpassed in efficiency. Revolutionizes locating of minerals and precious metals. Geiger Counters for Uranium ores. Time payment plan. Factory guaranteed. Free 16-page booklet upon request. Fisher Research Laboratory, Inc., Palo Alto, California.

137 DETECTIVES

DETECTIVE Training. Phillips Secret Service System, 1917C North Kenneth, Chicago 39, Illinois.

DETECTIVES—Work home—Travel. Experience unnecessary. Write Wagoner P-125 West 86th, N. Y., N. Y.

145 SOUVENIRS

THREE Military Emblems and price list 10c. Hobbyguild, 57X Sumner Ave., Brooklyn, N. Y.

SAVE UP TO 85% IN WAR SURPLUS

Palley Clothing BARGAINS ★

B-15 Style BOMBER JACKET Sturdy, water repellent O.D. Oxford Cloth. Body & sleeves fully lined with 100% Alpaca Wool. Mouton Fur Collar. Zipper Front and rib-knit cuffs & bottom. 2 outside & 2 inside pockets. Sleeve pencil pocket. Air Corps insignia.

SIZE 36 to 46 in O.D. color only **1495**
Same as above, but with sheepskin lining & choice of Green or Brown **1695**



Motorcycle Jacket



Like the best "custom made" jackets. Top grade Horsehide, zipper opening on sleeves & 3 pockets, 1 snap pocket. Snaps on collar & shoulder straps. Waist belt with large buckles. Body & sleeves fully lined with Rayon-tex. Flannel inner lining. Form fitting waist & action back.

Full length zipper closure. Rich Black. Sizes thru 46 . . . **\$2645**

NAVY MELTON COSSACK STYLE JACKET



BRAND NEW!! ALL WOOL!! Extra warm & durable. Has 2 slash pockets. Full zipper front closing. Tailored to fit snug for added warmth. Ideal work jacket for farm,

factory or outdoor wear. Sizes 42 thru 46. . . . **\$569**

16 POCKET VEST



Sturdy, Yet Light Wt. Satin Lined with Tie Straps, 14 Outside Pockets, Plus Knife, gun, or Tool, Leather Holder, 2 large 11" x 8" Pockets

Inside, Wonderful Hunting, Fishing, or Mechanic. A Steal at **\$2.79**

FLYING HELMET



Winter type with fleece or chamois lining. In good condition though used. Lots of good service left for \$1.95 pilots, cycle drivers, sportsmen, etc. . .

NEW!! Chamois lined with chin cup on strap. Intermediate weight for summer wear. **1.59**



Aviators (AN-6530) Windproof & Dustproof GENUINE GOGGLES

Sponge and leather protected frame with ground lens in clear, amber and green. Clear set in replaceable metal frame with hinged nose bars. Ideal for Motorcycling, etc. **Go-65 \$1.69 ea.**

PALLEY SUPPLY COMPANY
6321 SAN FERNANDO RD.

DEPT. P.S.10 GLENDALE 1, CALIF

A-2 Type Jacket

Smart & stylish. Top grade Horsehide with furry Mouton collar. Has 3 roomy pockets & zipper slash pockets. Knitted wrist & waist band. Fully lined, body & sleeves, with blanket stitched Rayon-tex. Flannel inner lining. Full length zipper closure. Cordovan Brown. Sizes thru 46



\$23.65

MACKINAW



Here's a real outdoor, rough weather garment. Heavy Poplin cover - water repellent, wool blanket lined, thigh length. Sleeve flap adjustment. Full belt, 2 roomy pockets. Just right for the outdoor man, truck & tractor driver, hunter, farmer, etc.

Sizes 34 thru 38 . . **\$7.95**

FLYING SUIT or Blue Bunny SUIT



For hunting, winter sports, skiing or "bundling". As coveralls for cold outdoor, or farm work, 100% woven wool with extra flannel inner lining for double warmth & utility. Wiring so fine, flexible it does not interfere with movement. Can be used with or without heating or can be plugged into car, tractor, or truck battery. Sizes 36 thru 44. . **\$3.49**

Genuine ARMY AIR FORCES SUNGLASSES



THE REAL McCOY! AAF 6 Base, Precision Polished and Ground, Glare-Free lens with leather case that can be attached to belt. Gold plated adjustable frame. Pearlloid sweat bar and pads. A real Palley \$17.50 Value for Only **\$3.95**

KLEER-VUE NIGHT DRIVING GLASSES



With 57mm yellow amber - 6 base lenses. PRECISION GRND. & POLISHED to reduce Glare of oncoming headlights. Sharpens 'object focus' more clearly during night driving. In Men's size or Ladies Harlequin style. A \$16.00 VALUE **\$5.89**
SAME GLASSES but clip-ons. **\$4.59**
Fit-over style without temple bars.

THE LARGEST FIRM OF ITS TYPE IN THE WORLD

HUNTING KNIFE 6" chrome vanadium blade, handle, leather grip. In leather sheath.



\$5.98 Value for ONLY **\$1.89**

(Like Above) 5 in. polished blade **\$1.69**
With Parkerized black Finish **\$1.49**

BOLO KNIFE



10" x 2" Parkerized blade, 5" Grippled Handle. Weight 1 1/2 lbs. Ideal for Hunting, Clearing Brush or Trails. **\$1.19 ea.**
With Case.

COMPASSES

#151 - MARCHING - Lensite, with Luminous Dial . . **\$1.59**

#152 - MATCHBOX - both jewel & liquid floating dial . **39c**

#153 - NEW!!! JEWEL Watch Pocket Compass **1.59**

#154 - WRIST STRAP Compass **69c**



MESS TRAY



6 Compartment - Stainless Steel - Rustproof. Wonderful for Outdoor Serving, Barbecue etc. Saves dishwashing. Ideal for use in the home, hospital, 'roughing'. NEW **83c ea.**

311A - Used but in excellent, Servicable Condition. **59c ea.**

SLEEPING BAG



KAPOK BAG Heavy duty, water repellent with wind breaker hood and cover. 1/2 zipper Has air mattress pocket.

Size 32" x 77". 7 lbs. **\$14.95**
Like above with wool filler **\$14.95**

DOUBLE BAG Like above. Wool filler. Full zipper. Size 34" x 77". 8 lbs. **\$15.95**
2 of these bags may be zipped together to hold two people.

LARGE SIZE BAG Wool filled. Full zipper. Air mattress pocket. 36" x 80", 11 lbs. **\$25.95**

MUMMY TYPE BAG Feather and Down filled. 3/4 length zipper. Water repellent cover. 6 3/4 lbs **\$14.95**

New SUN VISOR



17 1/2" x 6" Stop That Glaring Sun!! Here is a Visor made of clear Green Plastic. Has swivel lead and adjustable arm. Can be swung in any direction. Made for the USAAF. SPECIAL **\$1.29**

WATER KEG



5 gal capacity. Metal bound staves. Brass plug & spigot. Handle for easy carrying. This real Oak Keg makes an ideal container for water, beer, etc. For boats, trailers, camping, picnics, etc. **\$2.39**

PLASTIC PARALLEL STRAIGHT EDGE

with knobs and rubber pads for non slippage on each section. A must for navigators, mechanics, draftsmen, and engineers . . . You've never seen em at **97c ea.**

ORDER BY MAIL from GADGETEERS HEAVEN



CLAMP-ON LAMP

WITH ADJUSTABLE BALL AND SOCKET SWIVEL HEAD, LONG RUBBER COVERED CORD AND WALL PLUG. The All Purpose Lamp. Wonderful for indoor Photography, Floodlights, Baby Spot or Large Spot, Personal Bed Reading, Workbench, Garage, etc. Lamp Alone. 99c
Highly Polished 9" diameter Parabolic Reflector or 5" diameter Spot Reflector at ONLY 85c ea.



DUCK DECOY

The most "life-like" decoy you've ever seen. Colored to match the real thing. Made of sturdy lightweight waterproof fibre. You duck hunters will enjoy this one. 99c ea



Plexiglas Window
12 1/2" x 9" - 3/8" thick with aluminum piano hinge **\$1.69**



NAVY BATTLE LANTERN

This powerful battle tested lantern complete with 2 standard 1 1/2 volt dry cell batteries. Size 6" x 7" x 4" with a 4" dia. reflector. **\$3.29**



PALLEY OCTOBER SPECIALS!!

STOP WATCH

15 Jewel
Elgin - Full face, 60 sec. dial, 1/5 sec. timing with sweep hand. Stop & reset control on stem wind button. Just the watch for Sportsmen for timing all types of races. **\$12.95**

Chronograph WRIST WATCH

17 Jewel - One of the finest made anywhere. Cased in Switzerland. Sweep sec. hand, stop & re-set buttons. Measures distance, airspeed, groundspeed. Ideal for the sportsman.



Oct. Only... \$22.50

FOAM RUBBER CUSHIONS

Genuine Goodyear AIRFOAM Molded & pre-shaped. Cement or cut to fit. For Chair, Boat, Auto, and Truck seats.
25" x 62" x 1 1/2" **\$6.45**
25" x 65" x 2" **\$8.45**
FOAM RUBBER ADHESIVE
Specially prepared to permanently cement above foam rubber. PER QT. . . **\$1.55**



NAVIGATORS LAMP

A handy light for desk, work bench, chart table, engine room, etc. Can be used on 6-12-24-110 V by changing bulb. 3 ft. shaft has 4 joints to adjust position... ONLY. **\$2.95**



DELTA "BUDDY" LANTERN

With 3" square reflector. Handiest lantern on the market, small but powerful. **1.39**

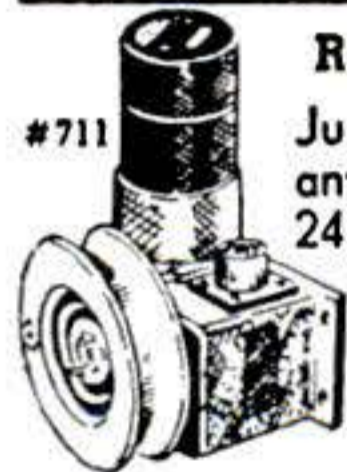


HS 33 NEW LOW IMPEDENCE RADIO HEADSET

Latest & most improved style. Currently in use in aircraft. Packed in original boxes. Leather hd. band, sponge rubber ear pads. Includes Cord & Jack High-Low Impedence Adapter . . 35c ea. **\$3.25**



Hand Mike Highly Sensitive with thumb control button on handle. Ideal for home recorders, public address systems, etc. Comp. with 2 ft. rub.cd. & phone plug. **\$1.19**



Radio ANTENNA Reel

#711 Just the thing for tuning beam antenna. Powered by 1/8 h.p. 24 V G.E. Motor. Removable 6" Reel-limit Switch - Cam Worm gears, Bevel gear, Solenoid clutch. Motor engaged to gear reduction only when electrical contact made. Operates in either direction Ideal for auxillary power take-off, opening and closing doors, etc. **\$4.29**



PLASTIC KITS

HERE ARE UN-SURPASSED VALUES for ARTISTICALLY INCLINED HOME HOBBYIST! Start Planning Novel Xmas Gifts Now! Kit #1 contains 2 lbs. plexiglass & Lucite sheet in various shapes, 1 oz. bottle of clearset cement, and 5 bottles of colors in Orchid, Red, Yellow, Peach, etc. Also a Plastic Handbook of uses & instructions. This set easily worth \$5.50. Our Price . . **\$2.19**
Kit #2 contains 1 1/2 lbs. of plastic sheet, a 1 oz. bottle of clearset cement, and the Plastic Handbook. A \$2.50 Value for ONLY **99c**

Plexiglass & Nascolite clear plastic shts.
NASCOLITE - Full sheets app. 1/8" x 37 1/2" x 49 1/2", app. 10 1/2 lbs. each **\$12.50**

PLEXIGLASS - Full Sheet
5/16" x 36" x 24" . . . Per Sheet.. **\$13.00**
5/16" x 36" x 48" . . . Per Sheet.. **\$25.00**

Fabricators write in for our special quantity prices, all above are new & masked. Also inquire about other large stocks of Plastics.

MAKE YOUR OWN TELEVISION FILTER

Plastic CALABAR FILTER

Highly translucent Green Calabar Plastic: 3/16" thick in sheets 16" x 43" - Enough for 2 or 3 television filters (average size screen) Cuts down eye strain yet permits sharp, clear picture. . . . **750**



PLASTIC POLISH

Made for Army to polish & brighten plastic surfaces. Can be applied by hand. Removes scratches, blemishes, etc. In 1/2 pt. cans **39c**



Loose Leaf BINDER

3 metal post. Cylindrical locking heavy duty 3/16" fabricated hinged cover. End identification window Ideal for price books, salesmen catalogues, photo albums, students, publications, Reference books, etc. Will hold 500 sheets, 8" x 11". **59c ea.**



Genuine LEATHERETTE

to cover Chairs, Patio Furniture, Nooks, Auto Seats, etc. 10 colors at a BARGAIN PRICE.

WIDTH	COLORS	PRICE (per run. yd.)
36"	Grey, Brown, Black	\$1.19
36"	Lt. Green, Dark Green, Blue	1.65
54"	Red, Grey, Lt. Blue, Ivory, Yellow	1.89

DURAN - Plastic Covering Cloth - 54" wide - in Yellow only, \$1.89 per running yard



CHEMISTRY SET

Made for Chemical Warfare Division for testing water, etc. A handy addition to the chemistry lab. or an exciting experiment for the amateur. Set includes test tubes, complete instructions, 15 different items. Packed in attractive lucite box with cover & dividers. Set **\$1.39**

NEW TARPS - HEAVY CANVAS

Mildew & Flame Resistant 9' x 16' **\$11.95 ea.**
Cheap outside storage!!
They are really moving at these prices. **\$3.95**
5 ft. x 7 ft. size
16' x 22' **\$20.95** 16' x 32' **\$29.95**
NEW Rubberized Linen Tarp - 7' x 11' Waterproof, weighs only 3 lbs. **\$5.95**
Ideal for outside car storage.



Rope

AT REAL VALUES!

1/4" Cotton Clothesline	.01 ft.
1/4" dia. 3 strand, treated jute	.02 ft.
5/8" dia. 3 strand, jute	.06 ft.
1" dia. 3 strand, sisal	.12 ft.
3/4" dia. 3 strand Manila	.08 ft.



COTTON THREAD

New spools of 6,000 yds - #20, 4 strand, left twist cotton for extra strength. 3 colors Grey - White and Brown. Per Spool **\$1.95**

NEW CATALOG

10,000 Bargains in War Surplus. 92 Page, Illustrated with valuable information tables, charts & data. Send 25c to cover handling & postage.



ARMY Field Telephone #338

A private phone or intercom system. Easy to operate. Reception up to 20 miles. Uses 2 standard flashlight batteries. Several phones can be used on same line. Set contains generator for ringing, leather carrying case & receiver. 1000s used daily in factories, farms, stores, mines, etc. A Real Palley Special. **795**

Order from this Ad. All sales final. All Prices F.O.B. Los Angeles. Pay by M.O. or Check. P.O.'s Acptd. from D & B firms. 1/2 deposit with C.O.D's.

Here's How CREI Prepares You for a Professional Career with Industry-Recognized Training in a Minimum of Time

RADIO — ELECTRONICS TELEVISION ENGINEERING

Graduates of CREI residence school are preferred by industry because of their *training* and *ability*. This recognition is the reason that CREI men quickly find good jobs. With 22 years of practical teaching experience in these highly technical fields, CREI offers an outstanding faculty, modern and complete laboratories, shops and equipment. New students are accepted twice monthly and each may advance as rapidly as he is capable. The basic course with one specialized course requires an average of 20 months to complete. CREI is recognized as one of the country's leading technical institutes. Its work is of college level. It prepares the young man for a good job in industry in a minimum of time.



Approved for Veteran's Training

CAPITOL RADIO ENGINEERING INSTITUTE

An Accredited Technical Institute Founded in 1927

Mail coupon for Free Catalog

Capitol Radio Engineering Institute, Dept. 1810A
16th & Park Road, N.W., Washington 10, D. C.

Please send me your residence school catalog and complete details.
(If interested in Home Study check below)

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

Street.....

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

I am entitled to training under G.I. Bill Send information on Home Study Courses

Now! A Tested and Proven Way to Win PROMOTION and SUCCESS!

HERE at last—the Famous Wetherill Training Courses—in Book Form! Complete, Practical and Easy to Understand these Three Brand-new Volumes Give You the Scientific, Step-by-step Methods that Bring Faster Advancement and Greater Earnings.

- Vol. 1 HOW TO SUCCEED WITH PEOPLE
- Vol. 11 HOW TO PUT YOUR IDEAS ACROSS
- Vol. 111 HOW TO GET LEADERSHIP AND INFLUENCE

These three great new books put at your instant command the essential knowledge that leads to success and security. They bring you the entire contents of the famous Wetherill adult training courses in public speaking, salesmanship, business administration, executive techniques, and other equally important subjects.

Mr. Richard R. Wetherill, author of the three great books that make up this practical success library, has spent twenty years as an educator, writer, public speaker, training executive and management consultant. He has helped hundreds of ambitious men and women.

As you read and make use of Mr. Wetherill's proven methods and procedures you will find that you are beginning to overcome all feeling of reserve and self-consciousness. You will glory in your new-found feeling of competence and power, and in the realization that at last you, too, are on the sure road to financial success.

EXAMINE THESE GREAT BOOKS FREE

Just fill in and mail the coupon below. It will bring you all three volumes for 10-days' free examination. Unless you are convinced that these books are just what you want, you may return them and owe NOTHING, or you may keep them by making a down payment of only \$2.95, plus a few cents postage, and the balance in two monthly payments of \$2.00 each.

Mail This Coupon.....

D. Van Nostrand Company, Inc. Pop. Sci. 10-49
250 Fourth Avenue, New York 3, N. Y.

Please send me Mr. Wetherill's success library in three volumes. Within 10 days I will either return the books or send you \$2.95 as first payment and \$2.00 per month for two months until the total price of \$6.95, plus postage, is paid.
(If you send remittance of \$6.95 with this coupon, we will pay the postage. Same return privilege, refund guaranteed.)

Name.....

(please print)

Address.....

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

IF IT SLIPS...IF IT CHAFES...IF IT GRIPES...THEN THROW AWAY THAT TRUSS!



Where other trusses have failed, we have often had our greatest success. The Brooks Appliance actually helps Nature support weakened muscles gently but securely, day and night. It has been ordered or recommended by more than 18,000 doctors. Thousands have written us their thanks for relief from pain and worry—for results beyond their expectations. Sanitary, comfortable, low-priced... never sold in stores or by agents, but specially made to fit you. Sent on Trial! Satisfaction guaranteed or money back. Learn what the genuine Brooks may mean to you. Write for Free Booklet and Proof of Results. Ready Now! All correspondence confidential.

Brooks Appliance Co., 163F State St., Marshall, Mich.

We'll Pay You

\$1000.

for 3 gallons of "worn out" motor oil from your own auto, truck or tractor engine. Details, page 30 in our FREE BOOK "Oil Facts."

RECLAIMO MFG. CO., 5083 Elston Ave., Dept. 13, Chicago, 30, Ill.

Inventors! Let This Giant Book Help You!

Don't waste time and money! Here's a big 264-page cloth-bound book that shows you 2100 ideas for new inventions that will bring fame and fortune to someone. Covers electrical, chemical, aviation, automobile, mechanical, radio, instruments, textiles, metals, food and many other fields. Only \$1.98! Write Popular Science, Dept. 109, 353 Fourth Ave., New York 10, N. Y.

BULLETIP

(Reg. U.S. Pat. Off.) by

SANDEE

Exclusively



2 1/2" diam. \$1.95

3" diam. \$2.95

Heavy Western Chrome Plate

SANDEE MUFFLER CO., 5643 Corryne Place, Culver City, Calif.

MAKE EXTRA CASH FAST!

Show Housewives How To Iron Faster, Easier Big cash profits for you introducing amazing new COPPER COTE Ironing Pad. Cuts ironing up to 20% — presses both sides at once—saves money, work. Sells fast at \$3.95 with up to 100% profit! Guaranteed. Also sensational CLEEN COTE Fabric Tablecloth. Wipes clean. No experience needed. FREE Sample Offer. Write.

THE SHELDON CO., 1223 S. 23rd St., Dept. P-10, Milwaukee 4, Wis.



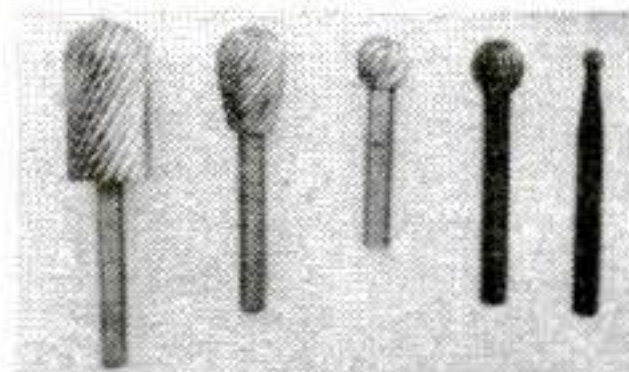
GET FREE SAMPLE OFFER PLAN

BARGAIN!

HIGH SPEED ROTARY FILES

Set of 5 Assorted.....	\$ 2.00
" " 10 ".....	3.75
" " 20 ".....	7.25
" " 30 ".....	10.00

1/4" shank



WE BUY SURPLUS TOOLS

SID TOOL CO., 183 Grand St., N. Y., N. Y.

Big value!
MARKSMAN
AIR PISTOL

with all **\$5**
ammunition

WE PAY POSTAGE

- Easy to open
- Easy to load
- Easy to cock
- Safety catch
- Strong velocity



Shoots BB's, pellets or darts from a single barrel. A whizz!

Has the looks, feel, heft and accuracy of a real gun. Can shoot a steel dart into a solid wood board at 50 feet. Has the power to kill small game. Slick for indoor or outdoor target practice.

EXTRA AMMUNITION { Lead pellets, 500 for... \$1.50
Steel darts, dozen... 50c
BB shot, 1/2 pound... 50c

J. J. ANTHONY BOX 402
MILWAUKEE, WIS.

SELL NYLONS GUARANTEED AGAINST RUNS!

Amazing guarantee gives FREE nylons if hose runs or snags within guarantee period to 3 months! All weights, sizes etc. including sheerest 15 denier. Not sold in stores. Nationally advertised in Life, Ladies Home Journal, Saturday Evening Post, McCall's, Woman's Home Companion. Awarded Seal of Approval by Good Housekeeping. Also complete line of men's fine hosiery guaranteed ONE FULL YEAR or replaced FREE! No money or experience needed to earn big, steady income writing orders spare or full time. We deliver and collect. Advance cash plus huge bonus. Complete money-making sales outfits FREE and prepaid. No obligation. Rush name to:



KENDEX COMPANY, BABYLON, 349 N. Y.



AMAZING NEW MAGIC CATALOG

350 pages of mystifying, easy-to-do tricks and illusions. 600 illustrations. Send \$1.00 now for catalog, credited on your first \$5.00 purchase.

NATIONAL MAGIC CO.

119 S. State St. Dept. M-9 Chicago 3, Ill.

MANUFACTURE BUILDING BLOCKS

Easy to start your own profitable business. General high speed, low cost Concrete Vibrator Block Machine produces 1000 blocks in 8-hour day. All sizes and shapes. Complete details FREE. Mail \$1 for wonderful book, "How to Build Your Own Concrete Block Home."

Only \$199



GENERAL ENGINES CO.
(EASTERN DIVISION) DEPT. S1-DREXEL BLDG., PHILA. 6, PA.

NEW LOW PRICE!

Imported Swiss Stop **CHRONOGRAPH** with 2 push buttons

WRIST WATCH \$6.90

Plus 69c Fed. Tax
WRITTEN GUARANTEE



GIVEN STAINLESS STEEL EXPANSION BAND
Tells Time • Stop Watch • measures SPEED • measures DISTANCE

7-Day Money Back Guarantee

"Wonder" Watch. Used to time autos, airplanes, horse races, athletic events. FREE instructions included.

PLUS 8 BIG FEATURES

• Telemeter • Chrome Plate Case • Attractive Dial • Tachometer • Unbreakable Crystal • Precision Made • Large Red Sweep Hand • Hands & Numbers Glow in Dark. Used by Engineers, Sportsmen, Doctors, Army, Navy, Airforce Officers, Navigators, Photographers. SENT ON APPROVAL. Deposit \$6.90 plus tax and postage with postman or send money order, save postage. (Same money back privilege.)

THE JEWELBOX, Dept. ET, 1674 Broadway, N. Y. 19, N. Y.

she's some SMOOTHIE!
(YOUR CAR, THAT IS)

when equipped with

ADVANCE "ULTRA DEEP-TONE" MUFFLERS
DUAL OR SINGLE STRAIGHT-THRU

Rich, low, mellow tone. Also greater power, speed, and economy result from reduced back pressure. Rugged steel tube, blow-out proof. Simple to install. No welding. Dual set comes complete with rubber mounted clamps, fittings.

ADVANCE FENDER SKIRTS

These heavy duty steel skirts will beautify and streamline your car. Tight fit, no rattle, easy to install, prime painted. Real top quality, not to be confused with cheaper, light weight makes.

ADVANCE KI-YI AND RAZZ HORNS

Get these novelty horns for laughs.

MAIL COUPON BELOW DEALER INQUIRIES INVITED

ADVANCE MUFFLER CO. of Los Angeles, Dept. PS-109
1458 EAST COMPTON BLVD., COMPTON 3, CALIF..

Send check, money order, or we will mail C.O.D. You pay postage upon receipt.

<input type="checkbox"/> Dual Muffler Set (Ford, Mercury only) ... \$19.95	<input type="checkbox"/> Single Muffler (other makes) ... \$5.50	<input type="checkbox"/> Fender skirts, pr. \$12.95
<input type="checkbox"/> Single Muffler (Ford, Chev., Plym.) ... 4.86	<input type="checkbox"/> 2 1/2" Chrome tail pipe tips . ea. ... 1.75	<input type="checkbox"/> Ki-Yi Horn, each 3.25
<input type="checkbox"/> Send free catalog showing complete line.		

Car make _____ Year _____ Model _____
Name _____
Address _____ City _____ State _____

HERE IT IS
THE AMAZING NEW

Man-from-Mars
RADIO HAT

COMPLETE 2-TUBE RADIO BUILT INTO A HAT

Here's the famous two-tube topper you've read about in LIFE, TIME, POPULAR SCIENCE, BUSINESS WEEK, and many other magazines and newspapers, coast-to-coast. Now, you too can own this wonderful "dream-come-true" radio hat. A perfect gift idea! Study these amazing features

At your local dealer, or fill out and mail coupon below:



\$7.95
plus fed. tax
Complete with Battery Pack

- Covers entire broadcast band within 20 mile radius
- Set weighs 5 ozs., hat 7 ozs.
- Conceals in lining 1/4" thick
- Absolutely mobile... no extra aerial needed
- Volume and tone equal to many portables
- Regulation water-proof sun helmet... adjustable size, comes in many colors

AMERICAN MERRILEI • 918 Halsey St., B'klyn 33, N.Y.

Please send me **RADIO HATS**

I'm enclosing \$8.65 (check or money order) for each hat. (\$7.95, plus 48c fed. tax, plus 22c postage)

Please send me more information about this new scientific marvel.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

P.S. 10-49

WhiskER®

THE ELECTRIC SHAVER THAT'S
SOLD BY BARBERS



ONLY
\$12.95
RETAIL

NOW! SMOOTH, CLOSE SHAVES... FOR THE MAN WHO SHAVES ONCE A DAY—OR, ONCE A WEEK

Barbers know a good shave when they see one. That's why they recommend and sell WhiskER. WhiskER whisks away any length beard, clean as a whistle, without pulling or stalling. It uses a time-tested hair clipping principle, with an extremely, close-shaving blade. Operates quietly on 110 v, 60 cycle AC; no radio interference. The next time you visit your barber or beautician, ask to see the WhiskER. If he does not have WhiskER, he can order it for you on a 5 day trial.

MADE BY WELL KNOWN MANUFACTURER OF QUALITY BARBER AND BEAUTY TOOLS . . . that's your guarantee of a precision product and long, satisfactory performance. Ladies: Buy WhiskERs at your favorite beauty shop for gifts or for personal depilatory use.

ELECTRO TOOL CORPORATION
Dept. W529-J RACINE, WISCONSIN

Always Handy AT NITE

Carry this BUDDY lantern anywhere—in glove compartment, tool chest, drawer, pocket or purse. Compact, sturdy, lots of light! Switch glows in dark. At hardware, sport, electric stores. Uses 2 standard 1 1/4" flash-light cells. Less bat. **\$1.75**



DELTA ELECTRIC CO., MARION, IND.

Delta BUDDY ELECTRIC LANTERN

Make Money Writing

SHORT STORIES, MYSTERIES, ARTICLES

Free Lesson Shows How You Learn at Home

The demand for writers is creating great new opportunities for people with an urge to write. It's not as hard to succeed as you may imagine. Most famous authors come from ordinary walks of life. At home, you too may learn fiction writing, the best basis for all fields—short stories, features, articles, technical, mechanical and business items. Palmer Institute's Home Study Training (Established 1917) is endorsed by Rupert Hughes, Gertrude Atherton, Keith Monroe, and other famous authors and by scores of successful graduates. Complete instruction material and professional coaching to develop your own style. FREE book tells how you may enjoy an ideal part time or full time career. Write today (no salesman will call). Veterans: advise us if you are eligible for G.I. Training.

APPROVED
FOR
VETERANS

PALMER INSTITUTE OF AUTHORSHIP • Desk U-109
1680 N. Sycamore • Hollywood 28, Calif.

MEN: KEEP TRIM—Wear the original SPORTFLEX for Comfort and Support!

Says Mr. A. P.—Before I started wearing my special SPORTFLEX support I looked and felt like an old man. Today, with this wonderful figure aid, I look 10 years younger and feel like a million!

Sportflex

Reg Appd

to dig into soft flesh! The wide 2-way stretch band of quality lastex can't roll, bunch or bind. Soft, smooth detachable crotch gives sanitary super-support. Here's a sturdy, resilient figure aid for porous non-chafe control that launders like magic! Please specify waist & height size.

Send check or money order. C.O.D.'s accepted. Sizes over 48 made to your order, \$5. Extra crotch 75c. **\$3.00** Post Paid

Sportex Foundations 14 W. 17 St. Dept. PS-10
NEW YORK 11, N. Y.



FOAM RUBBER

Do your own upholstery with soft durable Foam Rubber. Ideal for Furniture, Auto Seats and many other uses. Write Dept. K for information and prices.

IOWA FIBRE PRODUCTS, INC.
316 Court Ave. • Des Moines, Iowa

DEPENDABLE CRAFT SUPPLIES

LEATHER CRAFT • PLASTICS • POTTERY CRAFT
BLOCK PRINTING • BELT CRAFT
TEXTILE COLORS • POWER TOOLS • WOOD BURNING
INSTRUCTION BOOKS • WRITE FOR CATALOG

DWINNELL CRAFT SHOP

Dept. PS-910 • Elm Grove, Wheeling, W. Va.

2 SURPLUS VALUES!



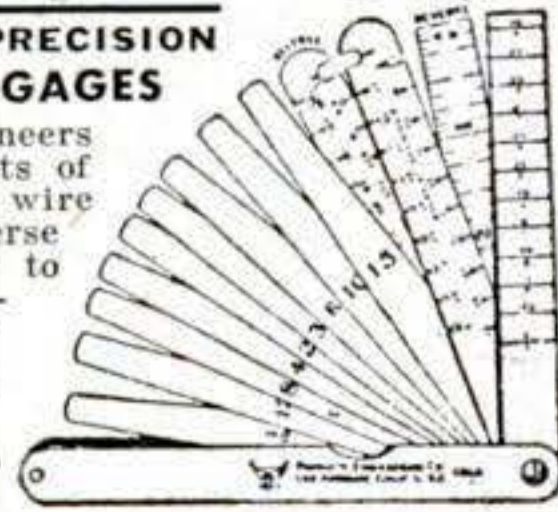
SET OF 3 OFFSET SCREWDRIVER SETS
SIMPLE—LIGHT—STRONG

Quickest, easiest way to start, tighten, or remove screws in close quarters. Adaptable to both finger and lever turning. Knurled head for finger turning to engage or remove free screws, hex-wrench handle engages bit in 6 positions for leverage in security setting or removing stubborn screws. Just what you need for those hard-to-get-at screws. Each set **\$1.00** Post-paid in handy holder package. Set of 3

NEW U. S. NAVY PRECISION ENGINEERS GAGES

Specially designed for machinists and engineers who want a compact set of gages. Consists of taper gage—with 3" rule on reverse side, wire gage with decimal equivalents on reverse side, 9 thickness gage leaves from .002 to 1/16". Overall length is only **\$2.00** Post-paid 4 3/4". List price \$5.00. Send check, money order or cash. No COD's. Satisfaction guaranteed.

HARDWARE SUPPLY CO. Dept. P.
495 Atlantic Ave. Boston, Mass.



PRINT YOUR OWN POST CARDS

COMPLETE OUTFIT
only
\$7.50

Amazing results in sales, inquiries and contacts... saves time and money... very easy to use GEM STENCIL DUPLICATOR is ideal for Advertising, Announcements, Notices, Labels, Forms, Price Lists—hundreds of uses for every type of business and organization. Comes complete with all supplies, instructions and 60-page Book of Ideas.

FREE TRIAL OFFER: Try it before you buy it! Write and a GEM OUTFIT will be sent you postpaid. After 10 days, send only \$7.50 or return the GEM, no questions asked. The GEM must sell itself; you be the judge.

BOND EQUIPMENT CO. • Dept. 151
6633 Enright • St. Louis 5, Mo.

SEND NO MONEY • FREE TRIAL OFFER

Free Book



RAISE HAMSTERS

The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories need thousands. Clean, odorless. Raise anywhere. A profitable and interesting hobby or business. We furnish breeders and instructions. Write today for free book.

GULF HAMSTERY, 1540 BASIL ST., MOBILE, ALA.

IMPROVE YOUR PLAYING

PIANISTS—Send for FREE Booklet showing how you may greatly improve your technique, accuracy, memorizing, sight-reading and playing thru Mental-Muscular Coordination. Quick results. Practice effort minimized. Used by famous pianists, organists, teachers and students. No obligation.



BROADWELL STUDIOS, Dept. 249-K, COVINA, CALIF.

BUY DIAMONDS WHOLESALE

Save
50%

Learn how to benefit from Estate Liquidations and Loan Foreclosures. Values from \$25.00 to \$25,000.00. Est. for over 35 years.

WRITE For FREE VALUABLE CATALOG

CITIZENS Diamond Brokers • Dept. F
195 MITCHELL ST. • ATLANTA, GA.



How Red

should a red rose be?

Only as red as *correct exposure* can make it; not darkened by too little, or washed out by too much. The WESTON Exposure Meter assures you of color-true pictures every time. Instantly gives correct exposure for any picture in or out-of-doors. See the WESTON at leading photo dealers everywhere.

WESTON Exposure Meters



Master II

The meter most photographers use!

4 SPEED MOTOR

WITH 1000 USES!

The built in integral gear box has four 1/4" drive shafts turning simultaneously at the following speeds:

- 4000 RPM for grinders, buffers, small drills, flex shaft tools, etc.
- 150 RPM for wrapping fishing rods, driving pumps, slow speed tools, fans.
- 25 RPM—rocker for photo developing tray, cabinet makers glue wheel, erector sets, film puller for 16 mm. developer, operating laboratory equipment, etc.
- 5 RPM for turning barbecue spits, advertising displays and antennas.

A THOUSAND OTHER USES AROUND THE WORKSHOP

This 1/20th HP, 115 V., 50/60 cycle, AC motor is precision built throughout.

Fully guaranteed—Money refunded if not satisfied

Pulleys, belts, shaft couplings, Mandrels and other equipment at 15c to 60c. List sent with motors. SPECIAL—while they last.....

Californians please add 25c sales tax

- For amateur beam & television antenna
- Drives working models, toys and gadgets
- For action displays, miniature fountains
- For doctors, dentists, jewelers, technicians

TROUP ENGINEERING CO., 2223-G Grand Ave., Long Beach, Calif.

\$9.95
SENT POSTPAID

OCTOBER 1949 91

PLASTICAST

THE GREATEST THING IN PLASTICS!



A NEW HOME INDUSTRY AND HOBBY!

We have combined two of our most popular Kits into one **GIANT COMBINATION PLASTICS OUTFIT** as described:

PLASTICAST . . . a transparent liquid plastic; can be poured into ANY kind of mold or container. Hardens in a few minutes into a beautiful transparent solid, clear-as-glass, tough-as-steel plastic! No tools, equipment or skill required. *Our casting plastics are as easy to use as pouring water out of a glass!* Ideal for imbedding pretty flowers, butterflies, photos, souvenirs, biological specimens, etc. Makes a **PERMANENT** and **ATTRACTIVE** display! Make beautiful jewelry, novelties, etc. Casts easily into any shape or form.

HERCULOX . . . liquid plastic; works same as above but hardens in 5 minutes into a very attractive white opaque solid. A *general all-purpose plastic*. Can easily be made to imitate Ivory, Onyx or Marble. May be dyed any color, cast into ANY shape, used for ANY purpose. Extremely hard and durable. Ideal for statuary, figurines, novelties, gadgets, models, tools . . . a million useful things! In addition, **COMBINATION OUTFIT** contains 3 attractive molds for making about \$100.00 worth of novelties, dye, pipette, hardeners, measure, imbedding material, jewelry accessories and instruction manual.

COMBINATION PLASTICS OUTFIT, Cat. No. 636, postpaid . . . \$4.95
PLASTICAST OUTFIT ONLY, complete with 3 molds . . . \$3.50
HERCULOX OUTFIT ONLY, complete with 3 molds . . . 3.50

FREE!

Let us show you how extremely easy it is to make beautiful and useful things out of **LIQUID PLASTICS, LIQUID MARBLE, LIQUID IVORY, LIQUID GLASS, CERAMICS, ETC.** . . . as easy as pouring water out of a glass! Make novelties, jewelry, gifts, artware, gadgets, toys, ceramics . . . a million useful things! We supply everything—**MATERIALS, INSTRUCTIONS AND BUYERS!** Send only 25c for 1. Big catalog of 300 casting materials, molds, and accessories, 2. A beautiful **CAMEO** free (to show you what you can do), and 3. Actual **INSTRUCTIONS** on how to cast and start in the **CASTING BUSINESS!** Send 25c today—this may be the lucky coin that will start the most fascinating and profitable phase of your life! (Catalog only—10c)

TERMS: We pay the postage (U.S.A. only) if full cash accompanies order. C.O.D. accepted (U.S.A. only) if \$1.00 deposit included for each item ordered.

DEALERS: WRITE FOR CATALOG, DISCOUNTS & PROMOTIONAL MATERIAL.

PLASTICAST COMPANY (DEPT. A)
 4637 N. Kedzie Ave. (Write to nearest address) P. O. Box 987
 Chicago 25, Ill. Palo Alto, Calif.
CANADIAN CUSTOMERS, please order directly from: **CANADIAN INDUSTRIAL PLASTICS, LTD.,** 1056 1/2 Pender West, Vancouver, B. C.



Always Mention Popular Science when writing

Genuine
HIDE GLUE
 is best for all **WOOD** WORK

FRANKLIN LIQUID HIDE GLUE

NO ODOR
 NO MIXING
 NO HEATING
 NO CHILLED JOINTS

at most hardware stores

Used by furniture mfgs., craftsmen, schools. If dealer cannot supply, send 20c (postage and wrapping) to THE FRANKLIN GLUE CO., Columbus 15, O.

15c extra-large TUBE

75 POWER MICROSCOPE

\$20 INCLUDES KIT

Postpaid in U.S.A. Leading microscopist says: "Best on the market under \$59."

ENJOY the thrill of exploring new worlds. Precision lens, achromatic objective, standard optical threads, 45° tilting stand and hairline adjustment. KIT includes Pliofilm Cover, Slides, Specimens, Balsam, Tweezers and Dissecting Tool. With 150 power objective, \$24.50. Send check or money order today!

MONEY BACK GUARANTEE
 Money refunded if microscope returned prepaid within 10 days' trial.

W. E. ROWE CO., Dept. P. S.
 P. O. Box 1, Brighton Station, Rochester 10, N. Y.

EARN BIG MONEY Growing Out-of-Season Vegetables and Flowers FOR PROFIT!

Easy - No experience or equipment needed for top results. Start in your own home or yard. Grow *any* plant quickly "without soil." Giant yields. Order "Success Without Soil," practical, fact-filled. Money making plans, diagrams, photos. Clear instructions—start at once. Only \$2.95 postpaid anywhere. Money-back guarantee. Send check or money order today and learn the big new opportunity methods of "Hydroponics."

Or Send Postcard for FREE Illustrated 16-page Booklet on This Money Making Plan

CHARLES C. GILBERT & CO., 840 W. IVY ST. SAN DIEGO 1, CALIF.

FOR MEN!

BOYS! Here's the real thing! Just what you're looking for . . . You'll have the time of your life! 10 small different booklets with chockfull funniest cartoons (and other THRILLING offers). You'll be missing plenty—if you don't buy'em NOW. Don't delay! Send a BUCK and we'll ship this fun-packed package prepaid. No C.O.D.

NUDKI, Dept. 244 Box 126-BO., New York, 1, N. Y.

PROFIT and PLEASURE in WRITING SHORT STORIES

Your name and address on a postal card brings you a complimentary copy of "HOW TO MARKET YOUR SHORT STORY". Approved and praised by amateurs and professionals. Get your copy today!

WRITE FOR FREE BOOKLET! CROYDON INSTITUTE, INC. 1545 N. Larrabee, Chicago 10

REAL DIESEL ENGINE

\$2.95

WE'RE CRAZY, they tell us, giving away a real diesel engine, complete with cylinder and piston, carburetor, crankshaft and connecting rod. All parts completely machined, ready for easy assembly. ONLY \$2.95. How do we do it? We're selling thousands of DEEZILS. So production's up; costs tumble down. DEEZIL is a precision engine. Actually runs at 7500 RPM. Produces 1/7 HP. Ideal for planes, boats, midget cars. Send \$2.95 plus 25c postage today.

GOTHAM HOBBY CORP.
 107 East 126th Street New York 35, N. Y. Dept. "S"

PIPE EXPERTS SAY:

"Best Pipe I've Ever Smoked—Regardless of Make or Price!"



Here is Mr. Gentle's personal offer to you! He says, "Smoke my pipe for one week. I guarantee you that it is the coolest, cleanest, driest, and most *satisfying* smoke you've ever had! If, after one week's time, you think it isn't all I claim, return it and we'll refund your money, including postage! Patented ceramic lined bowls come in Brown, Tan or Two-Tone. Superior to any briar, they are *guaranteed for life* against burning out!"

GENTLE, Jr.—Chrome Plated.....\$3.50 ea. 2 for \$6.00
 GENTLE, Jr.—Gold Plated.....\$6.00 ea. 2 for \$11.00

— ORDER BY MAIL —

COMPLETE SATISFACTION—OR YOUR MONEY BACK!

Enclose money order or check with order. We pay postage. If not fully satisfied, return pipe and we refund your money . . . including postage!

NO STAMPS OR C.O.D.'s PLEASE

Dept. SP-1 **GENTLE SALES CO.**
 2222 MYRTLE • DETROIT 8, MICH.

Electrical Meter Engineering
 "The Profession With a Future"

Utilities pay good money to trained Meter Engineers. Increased demands regularly bring new opportunities.

HOME STUDY COURSE

Practical, up-to-date home training covers all types of meters, demand meters, instruments, relays, installation, testing, calibration, repair. Enthusiastic graduates throughout U. S. & abroad.

Low Cost—Easy Terms—Diploma Granted
 Write Today for Free Booklet
 In Business Since 1909

FORT WAYNE CORRESPONDENCE SCHOOL
 Dept. 510 Fort Wayne 2, Indiana



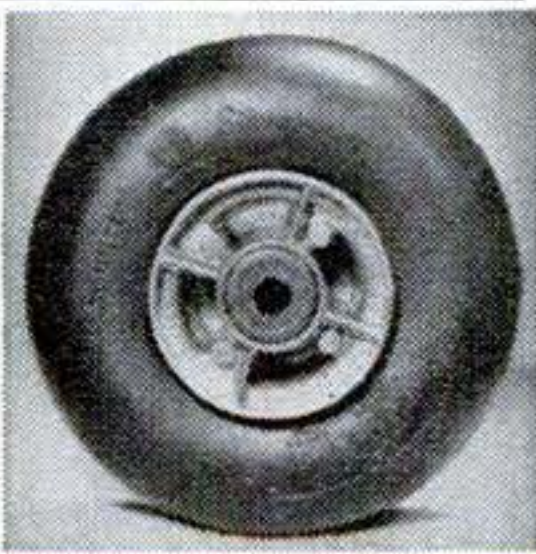
Look —a 10½x4, 6-ply Tire, Tube, Machined Wheel and Bearing at a "give away" price. Supplied in two types:—

- 1. With Highspeed **TIMKEN BEARING** (with Grease Retainer) **\$8.95**
- 2. With Slowspeed **NEEDLE BEARING** (with Grease Retainer) **\$5.95**

Freight Collect (8½ lb.)

Ideal for Handcarts, Bogies, Trailers, Soap-box Racers, etc. A bargain from the world's largest stock of all types of Airplane Tires. Send your check or money order to:

Airplane Tire Co., 99 Hiway, Tulare S., California



Treasure and Mineral LOCATORS GEIGER-COUNTERS

FOR URANIUM-ORES
 CREDIT PLAN—FREE LITERATURE
FISHER RESEARCH LABORATORY Inc.,
 Palo Alto, Calif.



"CLEAN DRY" CLOTHES BRUSH

NEW "CLEAN DRY" CLOTHES BRUSH. Chemically treated. Truly a marvel. Cleans Suits, Coats, Dresses, Hats, Suede Shoes, Window Shades, Upholstered Furniture, Automobile Cushions, etc. **Magic Home Cleaner.** Simple. Easy. Use like brush. Cleans as it brushes. Saves dry-cleaning bills. **Sells like wild!**
SAMPLES for Agents! Sample offer sent immediately to all who send name at once. A handy postal will do. **SEND NO MONEY—just your name.**
KRISTEE CO., 730 Bar Street, AKRON, OHIO

FREE get it now—
ALLIED'S NEW 1950 RADIO CATALOG!

196 PAGES OF BIG VALUES

EVERYTHING IN RADIO AT LOWEST PRICES



Send for **Radio's Leading Buying Guide**

Save money on every radio need! Get the new 196-page 1950 ALLIED Catalog, preferred and used by everyone in radio. See the world's largest stocks of top-quality equipment, all at low, money-saving prices! Latest TV releases, home radios and radio-phonos, Amateur equipment, PA systems and High-Fidelity Sound, recorders, test instruments, builders' kits—plus thousands of parts, tubes, tools, books and diagrams. Have all the advantages of quick delivery, complete selections, big savings and expert personal help from the World's Largest Radio Supply House. Send today for your FREE copy of the 1950 ALLIED Radio Buying Guide!



TELEVISION AND HOME RADIOS



SERVICE SUPPLIES BUILDERS' SUPPLIES



AMATEUR GEAR



AMPLIFIERS, P.A. SYSTEMS, RECORDERS

ALLIED RADIO

ALLIED RADIO CORP.
 833 W. Jackson Blvd., Dept. 7-KK-9
 Chicago 7, Illinois



Rush FREE 1950 ALLIED Catalog

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

FINANCING

PROFITS

POLICIES

TAXES

COSTS

AUDITS

BECOME AN EXPERT

ACCOUNTANT

Choice of Bookkeeping — Advanced Accounting or CPA Coaching — No experience necessary!

The demand for skilled accountants—*men who really know their business*—is increasing. National and State legislation is requiring of business much more in the way of Auditing, Cost Accounting, Business Law, Organization, Management, Finance. Men who prove their qualifications in this important field are promoted to responsible executive positions.

Free Book—"Accountancy, the Profession that Pays"

Knowledge of bookkeeping unnecessary. We train you from ground up, or according to your individual needs. Low cost; easy terms.

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

LASALLE EXTENSION UNIVERSITY
A CORRESPONDENCE INSTITUTION

417 South Dearborn Street
Dept. 1083-HR Chicago 5

Please send me information on the training checked below, also "Accountancy, the Profession that Pays"—all without obligation.

- Accounting
- CPA Coaching
- Expert Bookkeeping

FREE



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

Address.....

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

Growing Demand Requires More Local Plants

Here's an outstanding manufacturing opportunity for men with vision, energy and a little capital. Brikerete is sweeping the country because it has beauty, long life and ultra comfort. Truly the world's most modern masonry. Distinctively different. Yet costs less than lumber because it is locally manufactured of local materials by local labor for local building needs.



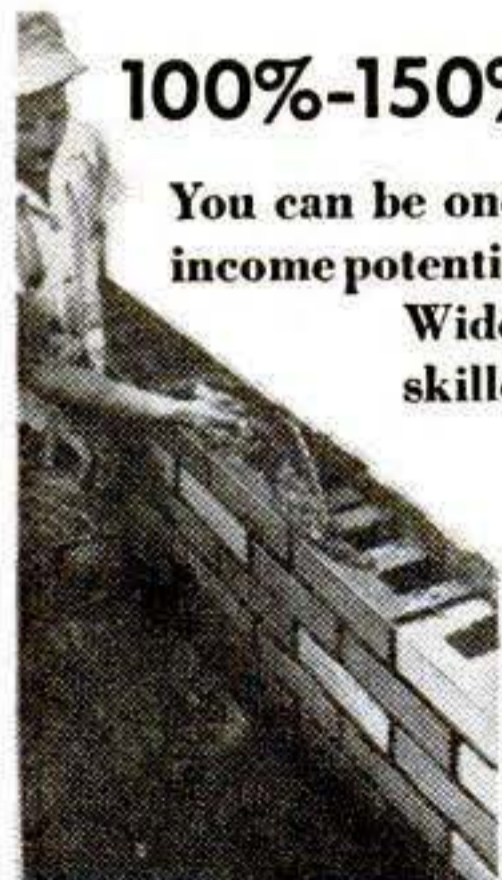
100%-150% Mark-Up on Costs

You can be one of a national chain of local plants. High income potentials. Can be started on moderate investment.

Wide-open market. Requires no experience; no skilled labor. We supply all equipment. Easy terms, if necessary. We work with you to put it over. Write for Brikerete Book No. 2 and tentative reservation of territory.

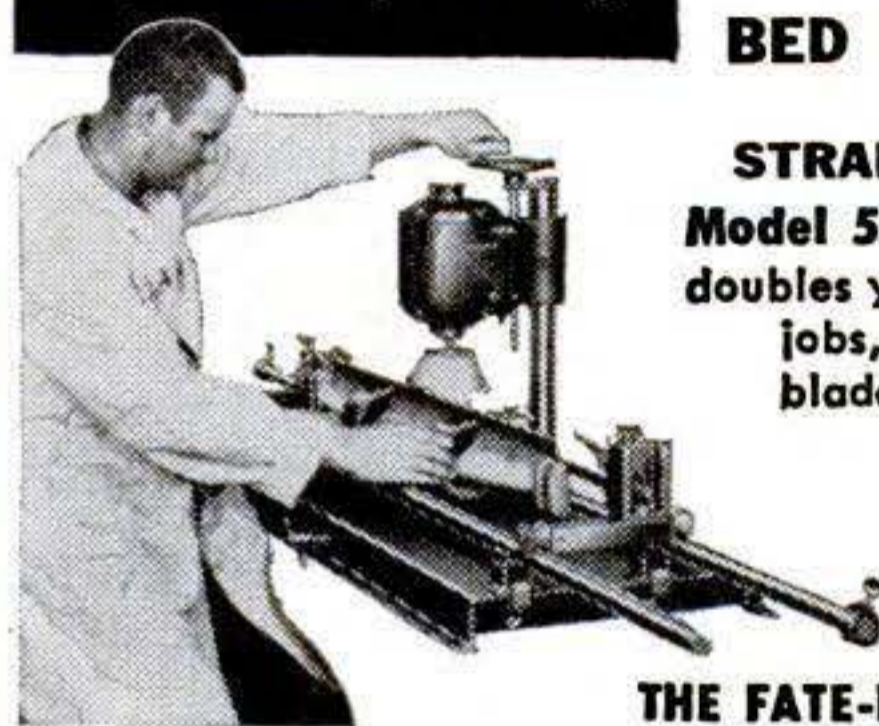
Brikerete Associates, Inc.
4675 S. Division Ave., Grand Rapids 8, Mich.

BRIKRETE



LAWNMOWER SHARPENER OPERATORS

Increase your output...
Year 'round business!



NEW BED KNIFE GRINDER
sharpens all
STRAIGHT EDGE TOOLS

Model 50 Ideal Bench Grinder
doubles your output of sharpening jobs, speedily grinds straight blade knives. Sharpens all kinds of straight edge tools and ice skates. Write for **FREE**, fact-filled folder.

THE FATE-ROOT-HEATH COMPANY
Dept. D-4, Plymouth, Ohio

U-MAK-IT BOAT KITS **EASY TO BUILD**

- 5 ROWBOATS** 8 TO 14 FT.
- 6 OUTBOARDS** 12 TO 16 FT.
- 3 INBOARDS** 16 TO 23 FT.
- & CABIN CRUISER**



SEND 25c (coin) ORDER YOUR CATALOGS TODAY
U-MAK-IT PRODUCTS 703R-WHITTIER ST.
New York 59, N. Y.

Big money in spare time! **\$** learn at home Tune pianos in 30 days

No musical knowledge needed. Piano tuners in great demand everywhere. Train under experts. Learn with phonograph recordings in 30 days. We furnish recordings, instruction books and professional tools (including record player if needed). We show you how to line up part or full time work for big earnings. Send for **FREE** literature today.

CAPITOL CITY TUNING SCHOOL
Dept. 1033, 211 E. Michigan Ave., Lansing, Michigan

LEATHERCRAFT COPPER TOOLING TEXTILE PAINTING

Make your spare time **PROFITABLE**. Send today for **FREE** illustrated catalog showing everything you need.
KIT KRAFT, 7377 Melrose Ave., Dept. BD-10, Los Angeles 46, Calif.

MANY NEVER SUSPECT CAUSE OF BACKACHES

This Old Treatment Often Brings Happy Relief

When disorder of kidney function permits poisonous matter to remain in your blood, it may cause nagging backache, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness. Frequent or scanty passages with smarting and burning sometimes shows there is something wrong with your kidneys or bladder.

Don't wait! Ask your druggist for **Doan's Pills**, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from your blood. Get **Doan's Pills**.

MONEY BACK
if not delighted
IN 10 DAYS

AMERICA'S BEST WATCH VALUES
WHOLESALE PRICES • DIRECT TO USER

ORDER WITH CONFIDENCE
**1 YEAR WRITTEN
GUARANTEE**

men's fully guaranteed
15 JEWEL WRIST WATCH
ORIGINALLY \$30 to \$55

Luminous dial
sweep
second hand.
water repellent
shock pro-
tected
anti-magnetic.
Imported Swiss
precision move-
ment and case. Worth
triple this low price
Only \$12.95 plus \$1.30 tax
Don't delay. Order now

OUR PRICE
Now only
\$12.95



14-KT. LADIES
FILLED
17 JEWEL GOLD WATCH
YELLOW
ORIGINALLY \$39.75

A thrilling
precision watch
with beautiful
cord band.
Built for life-
time service.
Shock protected
construction.
Lowest price
ever. Only \$13.95 plus
\$1.40 tax. Don't delay
Order now.

OUR PRICE
Now Only
\$13.95



Thousands
sold at \$71.50
2-push button
combination
wrist watch
stopwatch,
telemeter,
tachometer.
Incablock shock resistant
feature. Sweep second
hand. Anti-magnetic.
Radium dial. Stainless
steel back. Unbreakable
crystal. Only \$21.95 plus
\$2.20 tax. Order now.

OUR PRICE
Now Only
\$21.95



Sturdy WRIST WATCH

- Sweep Second Hand
- LUMINOUS DIALS
- WATER-PROOF PLASTIC BAND

Sturdy guaran-
teed men's
watch. Built to
keep accurate
time. Many
formerly sold
at double this price and
more. Yours now at
only \$4.95 plus 50c tax.
Order now for self and
gifts.

OUR
PRICE
Now
Only
\$4.95



17 JEWEL SELF WINDING
ORIGINALLY \$71.95

OUR PRICE NOW ONLY
One of World's
finest. Needs
no winding.
Winds self as
you move.
Water and shock
resistant. Anti-
magnetic. Ace
value at former \$71.50
price. Now only
\$24.95, plus \$2.50
tax. Order now.

\$24.95



**17 JEWEL SHOCK PROOF
WATERPROOF**
INCABLOCK—Shock Protected
ORIGINALLY \$59.00
OUR PRICE NOW ONLY

Handsome
accurate.
Has sweep
second hand.
Non-magnetic.
Kept accurate
time after 72-hour
test under water.
Amazing value at
\$16.95 plus \$1.70
tax. Order now.

\$16.95



FREE!

Handsome expansion band in-
cluded free if you send full
payment plus tax with your
order

ORDER DIRECT FROM THIS AD, FOR SELF AND FOR
THRILLING GIFTS. Lowest prices ever, for these guaranteed
watches! Order now on famous 1-year written guarantee. Send
only \$1 down payment with order. Pay balance to postman on
arrival plus postage. Or we pay postage if you enclose full pay-
ment plus tax with your order.

MARYLAND DISTRIBUTORS, Dept. 85

501 E. Baltimore St., Baltimore 2, Md.



**WHOLESALE SLIGHTLY
USED TIRES
DIRECT TO YOU**

(10% discount on 2 or
more tires if you send this
ad with order)
TUBE DELIVERED WITH
TIRE AT NO EXTRA COST
For 15" or 16" Passenger Tires

Safe—Our tires used on school buses and ambulances
All good tires with a
GOLD BOND GUARANTEE FOR 12 MONTHS

550-16 \$3.54	600-20 \$7.98	825-20 \$11.19	1000-22 \$17.70
600-16 3.59	30-5 7.98	900-20 11.89	1100-22 16.89
650-16 3.89	650-20 7.69	1000-20 12.89	900-24
700-16 4.59	700-20 (8) 9.29	1100-20 13.89	(40-8) 21.60
550-15 3.79	700-20	1200-20 18.78	900-16 8.98
650-15 3.89	(10) 12.48	750-24	825-15
700-15 3.98	750-20 (8) 8.19	(36-6) 12.21	(14 ply) 14.10
550-17 5.69	750-20	38-7	750-15
750-16 8.40	(10) 9.19	(825-24) 13.75	(12 ply) 11.30

Exceptionally good tread—No recaps—With a
GOLD BOND GUARANTEE FOR 24 MONTHS

600-16 6 ply Military—Mud and Snow Tire \$6.37	600-20 \$ 9.75
550-16 \$5.19	550-15 4.81
825-20 \$15.98	650-20 9.75
600-16 5.29	525-18 6.69
900-20 15.98	700-20 10.98
650-16 5.29	550-17 7.99
1000-20 16.89	32-6(8) 10.49
700-16 6.29	650-15 4.98
700-15 5.29	32-6(10) 13.75

GOLD BOND SPECIAL—750-20 MILITARY TIRES
Will fit 650 x 20 700 x 20 (8 & 10 ply) 34 x 7 (8 & 10 ply)
Special \$10.49 Guaranteed 12 months
Superior Quality 12.98 Guaranteed 18 months
Gold Bond Finest 14.98 Guaranteed 24 months
900 x 16 Special 9.03 900 x 16 extra \$11.19

Send check or money order with this ad

GOLD BOND TIRE CO., Dept. PS 24
512 NORTH 1ST ST., RICHMOND, VA.
"A gold bond written guarantee with every tire"

The easy way to paint!

Speedy Sprayer

ONLY \$29.95 LESS MOTOR

Favorite of home owners and craftsmen for 20 years! SPEEDY SPRAYER gives your work that professional paint finish everyone admires. Sprays paint, enamel, varnish, lacquer, etc. . . . 4 to 7 times faster than hand brushing! Lightweight, portable, uses any 1/4 H.P. motor. Improved diaphragm principle assures clean, oil-free air. You'll find dozens of time and money saving uses for SPEEDY SPRAYER, including spraying insecticides 2-4-D and DDT. Complete outfit, without motor, only \$29.95.

At leading hardware, lumber, and auto supply dealers.
FREE—write for handy booklet "How to Spray."

W. R. BROWN CORPORATION
5718 Armitage Ave. • Chicago 39, Ill.

SAVE MONEY while Living Better!

A furnished Schult offers big value in all-season comfort for living or travel. Innerspring beds, private bedrooms, shower, toilet, etc. Electric refrigerator and oven range. Three-year written warranty. One monthly payment buys all!



Free..

"HOW TO BUY A TRAILER COACH"

Send today for new booklet. Tells what to look for... how to judge values... protect your investment... and make your dollars go farther.

NEW MODELS... NEW ECONOMY!

Write for free catalogs showing latest models. Convenient floor plans, unique features for all-year living and travel.

SCHULT CORP., Dept. 3110, Elkhart, Ind.

In Canada: John Inglis Co., Ltd., Toronto



SCHULT

Trailer Coaches

Pioneers

AIR RIFLES

BENJAMIN

WITH SAFETY LOCK

Leaders

AIR PISTOLS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY

If you want a REAL GUN for PRACTICAL USE inside or outdoors, get a SAFE—CLEAN—ECONOMICAL—BENJAMIN with Adjustable Power and Amazing Accuracy. Use BENJAMIN H-C PELLETS for BEST RESULTS in all rifled models. WRITE AT ONCE.

BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

Command Bigger Money! STUDY LAW

STUDY AT HOME for BUSINESS SUCCESS and LARGER PERSONAL EARNINGS. 40 years expert instruction—over 114,000 students enrolled. LL.B Degree awarded. All text material furnished. Easy payment plan. Send now for FREE BOOK—"Law and Executive Guidance." It explains the course—how you may enroll and the many ways you may profit from Law Study. Write TODAY to: (U.I. Approved)

AMERICAN EXTENSION SCHOOL OF LAW

Dept. 19-PS, 646 N. Michigan Ave., Chicago 11, Ill.

96 POPULAR SCIENCE

AMES UNIVERSAL DIAL INDICATOR SETS

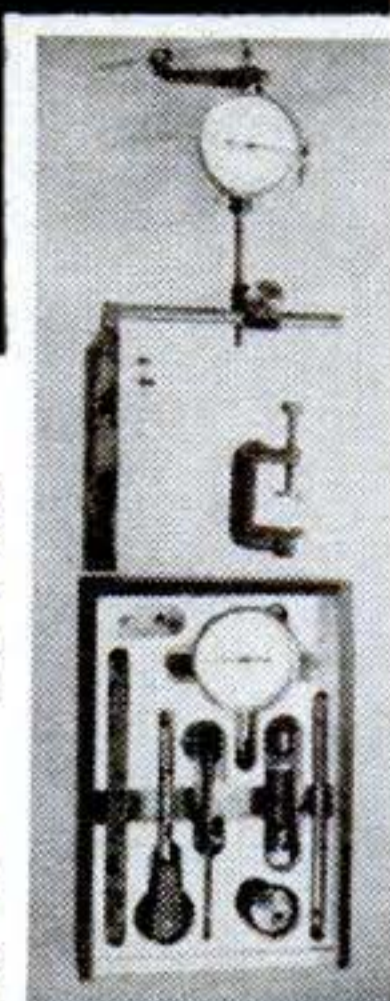
New Surplus

Dial indicator-face-2 1/4" graduated in 1/1000ths. Dial reading-o-50-0; spindle travel-1/4; can be used on stationary or revolving parts on lathes, milling machines, drill presses, etc. and for automotive work. Comes complete with dial gage, hole attachment, bar with upright, clamp sliding swivel, dial holding rod and 3 contact points—with case shown.

Reg. Sold \$23.00

NOW \$15.00

SID TOOL CO., 183 Grand St., New York, New York



Build it — Fix it with AMBROID



The Universal Liquid Waterproof Cement
"It Stays Stuck"

At your dealers—or send 25c for generous 2 oz. tube. Postpaid.

AMBROID CO., 306 Franklin Street, Boston 10, Mass.

LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, \$1.00 Postpaid.

FLYING DUCK

Wind revolves wings. Realistic appearance. Pattern, Instructions and wing Pinion Kit; brass bearing, steel shaft, wing lugs, bolts, nuts and washers. 50c. Pattern and Instructions without kit, 25c. Postpaid.



Dept. 7-BA STROTHER PATTERN SERVICE Box 128 Belington, W. Va.

BURIED TREASURE, MINERALS AMAZING NEW GOLDAK LOCATORS

SENSATIONAL NEW MODEL!

ONLY 11 pounds weight! One hand operation! Money-Back Guarantee of Superiority. Write for full details.

THE GOLDAK CO.

1544 WEST GLENOAKS BLVD.
GLENDALE 1, CALIFORNIA

World's largest maker of fine locators.



SEND FOR THIS FREE!

Make money. Know how to break and train horses. Write today for this book FREE, together with special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse, check here () Do it today—now.

BEERY SCHOOL OF HORSEMANSHIP
Dept. 5810 Pleasant Hill, Ohio

NEWEST B-M POWER MOWER For Modern Lawn Care

Low Factory Price

Fully Guaranteed

Some Dealerships Available



Model D-3

Newest addition to our family of fine power lawn mowers. Light, 3-wheel, rotary blade mower. Lifetime construction. Powerful 1 1/2 h.p. 4-cycle engine. Self-propelled and other models available, including build-it-yourself Kit.

Write for Free Literature

B-M MOWER CO., Box 66-PS, Blue Mound, Kans.

LIKE WALKING ON A MILLION BUBBLES!



\$8.80

NEW BUOYANCY IN EVERY STEP!

Now you can walk on a million air bubbles. Sponge rubber cushioned innersole protects your feet from jars and jolts. A handsome Regal Dress Shoe acclaimed by many as "the Most Comfortable Shoe in America". Wonderful for men who are on their feet all day. Complete range of styles — all at Regal's new reduced low price of \$8.80. Send for FREE catalog today!

WRITE for FREE CATALOG

REGAL SHOE CO. Dept. 226, Whitman, Mass.

\$\$ EXTRA PROFITS! \$\$ Flocks & Sandblasts



Only \$19.75 complete

Dual Purpose Spray Gun! Uses only 25 lbs. Air Pressure!

• Thousands of uses in Home, Shop, Industry: Makes Auto Interiors Clean & New, Lines drawers, Marproofs lamp bases, Refinishes any object. All in colorful Flock. Etch & Frost windows, glassware, etc. Removes Paint & Rust from Autos, Tools. Guaranteed! Send \$19.75 or write for free information. Flocking supplies.

BLASTO SPRAY GUN MFG.

Dept. S-Oct., 7007 Haas Ave., Los Angeles 47, Calif.

WALL MODEL



TELEPHONES

We can meet any inter-communication telephone requirement.

Telephone set, 2 \$17.95 of either model Complete with batteries, wire, etc. Telephone supplies and parts of

every description. 25% deposit with order, balance C.O.D., F.O.B. Brooklyn. **INQUIRIES WELCOMED**

EASTERN TELEPHONE CO. Dept. PS-7 320 18th St. Brooklyn, 15, N. Y. SOut 8-6161

DESK MODEL



Hobbyist Catalog



64 pages

WE PAY POSTAGE!

SHIP MODELS . . . TRAINS . . . PLANES

Cars . . . Art Supplies . . . Tools . . .

Project . . . Games.

U.S.A. and Canada Orders Only.

10¢

write Braun-Crafts

1232 ETOWAH, DEPT. PS-2, ROYAL OAK, MICH.

SAVE UP TO 50% AND MORE

OUT OF PAWN GENUINE DIAMONDS

TYPICAL BERMAN VALUE
Approx. 1/2 Carat Retail Value \$200

Tax Incl. in All Prices

All Diamonds Reset in new Mountings

Iron-Clad Money Back Guarantee

VALUES FROM \$10 TO \$10,000

Send today for **FREE Catalog**

BERMAN'S DIAMOND LOAN BANK

Dept. PS Berman Bldg., Balto. 1, Md.

NO OBLIGATION

Handy Hank says:
"Try these slick tricks with PLASTIC WOOD"

Fill cracks in chairs—

Makes loose joints firm, sands to a smooth finish!



Reset loose hinges—

Replaces rotted wood, tightens loose screws . . . easy to apply!



Repairs broken toys—

Mend cracks, nicks! Smooth finish!



Also useful in filling cracks in floors, nail and screw holes, repairing loose tiles. Handles like putty . . . hardens into wood!

PLASTIC WOOD

A CELLULOSE FIBRE FILLER



IN CANS OR TUBES



DOZENS OF OTHER USES

4 Keys to SUCCESS IN AVIATION

Through **Embry Riddle** Training



AIRCRAFT & ENGINE MECHANICS

1



We have hundreds of urgent requests for A. & E. Mechanics -- key men in Aviation -- from airlines, oil companies, fixed base operators, etc., both U. S. and Overseas. Training in a C. A. A. approved school is the quickest way to get ahead. Embry-Riddle students learn fast with modern equipment... working on live aircraft in airline-size hangars.



ENGINEERING

2



Embry-Riddle's Design Engineering and Maintenance course offers you eligibility for A. & E. certification plus necessary basic engineering knowledge required to fill positions such as Maintenance Foreman or Field Service, Project or Sales Engineer. If your aim is high, take this course.

A.&E.

COMBINED WITH COMMERCIAL



3

Pilot Mechanics who can test fly the ships they repair... executive pilots able to service their own aircraft -- airmen with dual ability are needed by aviation companies and operators. Embry-Riddle combination training offers you the most in your aviation career.



COMMERCIAL PILOTS



4

Flying holds a real future for Embry-Riddle trained pilots. A quarter-century of experience with 30,000 students... the best instructors, up-to-date aircraft, superb year-'round flying weather... qualifications unexcelled anywhere. Instrument and instructor's ratings are also available.



Aviation needs you now! Never has there been such opportunity for you in Aviation. Start your career now at Embry-Riddle -- living facilities directly on the Airport. Write today for full information and proof of job opportunities.

AUTHORIZED G. I. TRAINING

Dean of Enrollments - Dept. 91
Embry-Riddle School of Aviation
Miami 30, Florida

Please Print

NAME _____

ADDRESS _____

City _____

State _____ Age _____

I am interested in...

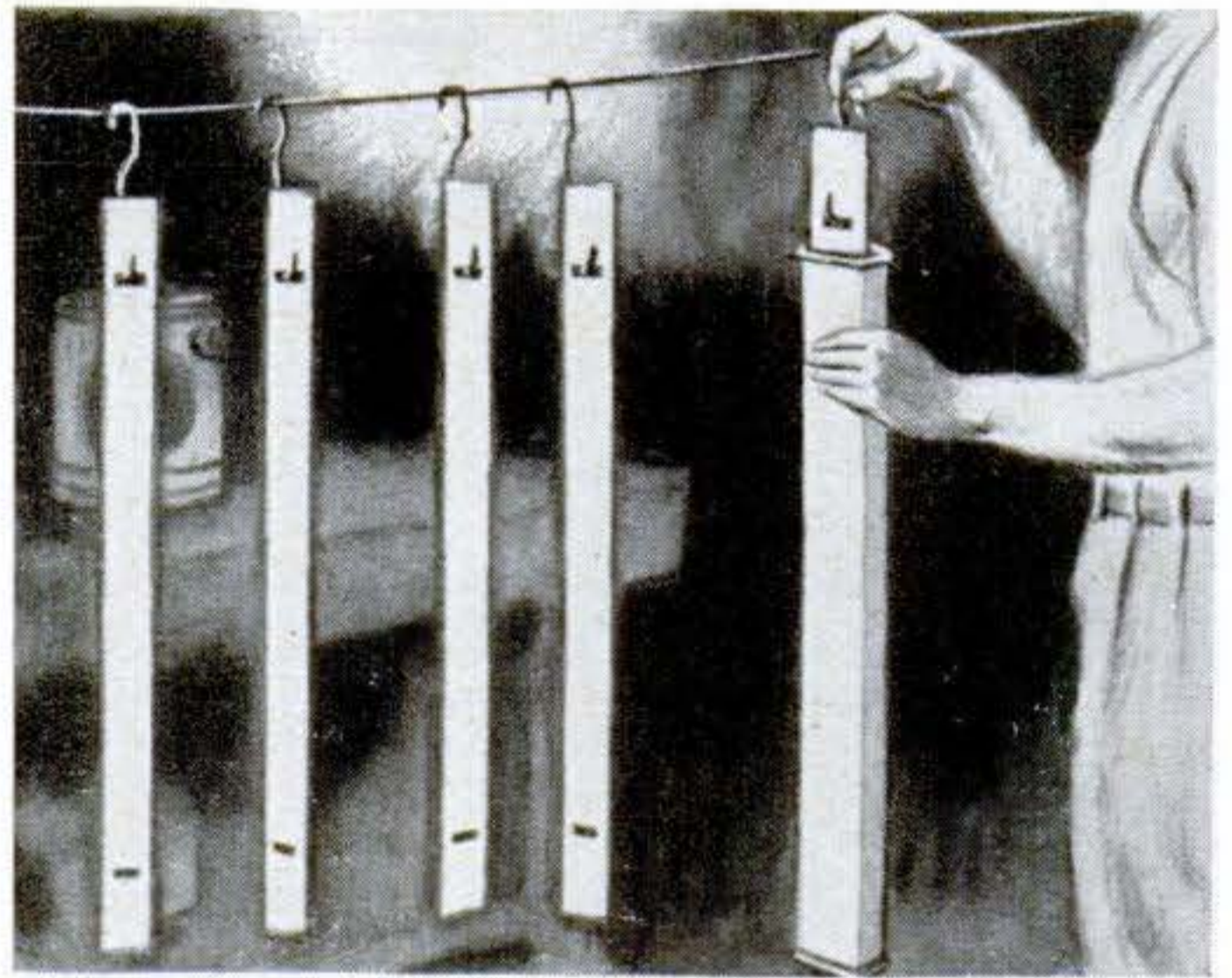
- A.&E. Mechanic
- Commercial Pilot
- Engineering
- A.&E. Combined with Commercial Pilot
- Flying Mechanic
- Drafting & Design

Check One Veteran Non-Veteran

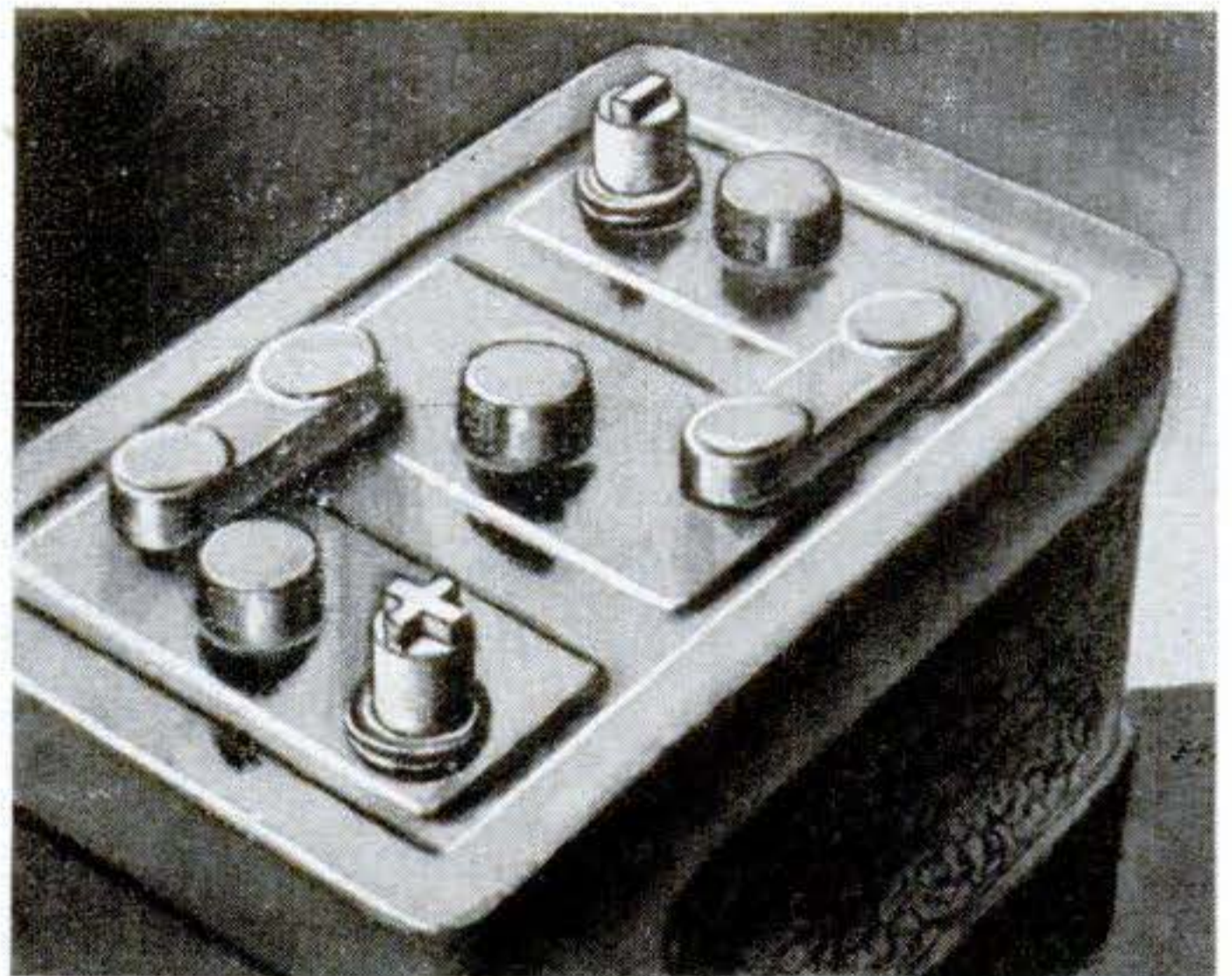
TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD

I'd like to see them make...

Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science* will pay \$5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.



Dipping vats for painting Venetian blinds. These could be of various depths to accommodate different length slats. One dip would paint each slat and they could be hung up to dry.—*V. Hoffman, Springfield Gardens, N. Y.*



Raised positive and negative symbols on auto storage batteries. Then it would be simple to identify the poles even if the battery were dirty and the poles corroded or marred by tools.—*Harold Myers, Kennewick, Wash.*



WHITE SIDEWALL TIRES, CHROME WHEEL COVERS, REAR BUMPER GUARDS AND REAR FENDER SCUFF GUARDS OPTIONAL AT EXTRA COST

The car that likes
to be compared

NEW PLYMOUTH

Yes, it likes to be compared for COMFORT, too!



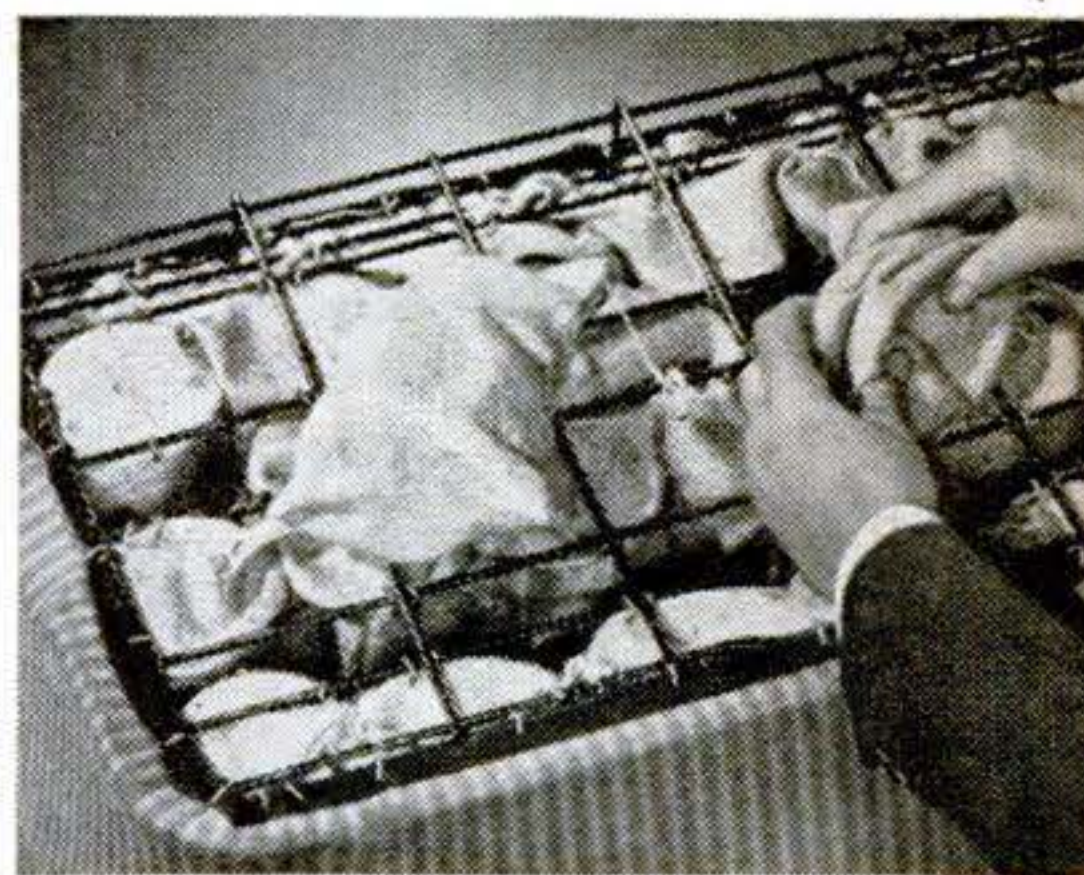
Ride with a new glide! The new Plymouth cradles all passengers between the wheels. It has airplane-type shock absorbers; a lower center of gravity; and a new diagonal mounting of rear shock absorbers that reduces sidesway.



Sit straight up — then compare! The new Plymouth gives you generous head and shoulder room where you need it. Chair-height seats are wider, deeper from front to back.



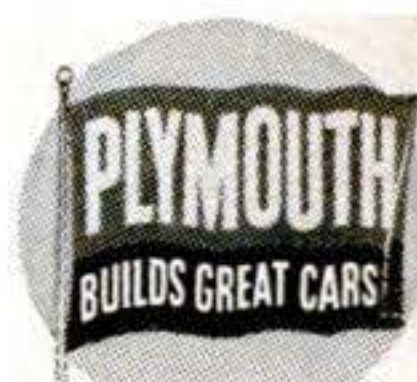
Breathe clean fresh air the year 'round. An optional under-the-hood system provides the comfort of ventilation in summer, both heat and defrosting in winter.



Bolster heavier-than-average people with individual cushioning! These extra seat springs front and back can be inserted to meet family requirements for cushion firmness.

COMPARE!	
of 22 quality features found in most high-priced cars	
Low-priced PLYMOUTH has	21
Low-priced car "A" has	13
Low-priced car "B" has	4

Check- Plymouth value against other cars. Not only for comfort, but for performance, for safety, for all features! Drive Plymouth. Compare it on the road. And see the new Quality Chart at your dealer's; a condensed version at left. PLYMOUTH Division of CHRYSLER CORPORATION, Detroit 31, Michigan



MOTORISTS WISE
SIMONIZ

T.M. REG. U.S. PAT. OFF.

MAKES CARS STAY BEAUTIFUL

*Better than 10
 'Here-Today...
 Gone-Tomorrow'
 Polishings!*



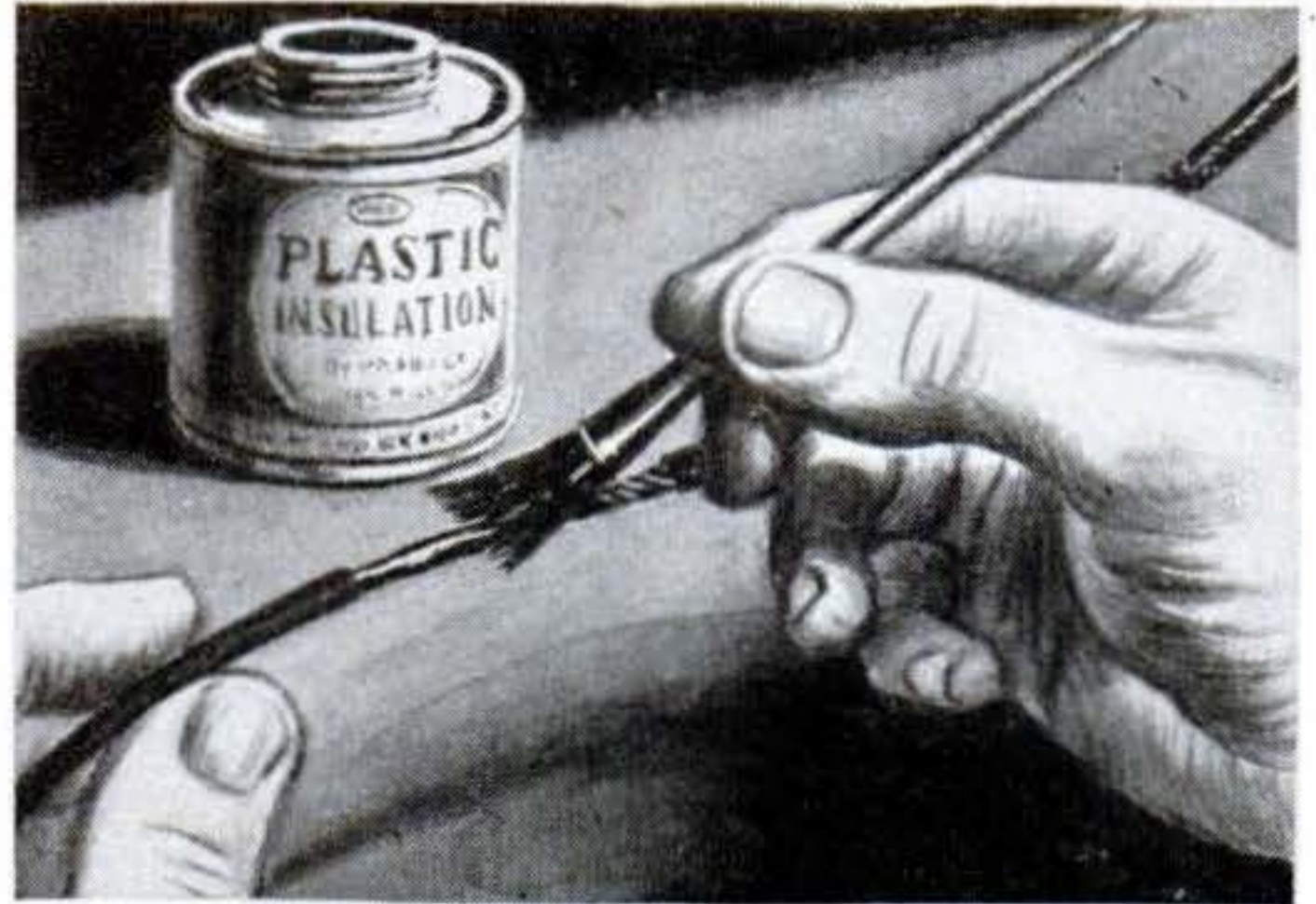
**Simonizing saves you time as
 it saves the finish!**

Don't waste your time with 'temporary polishings'! Simonizing gives long lasting beauty... protects the finish and keeps colors from fading. Do as millions of motorists... Simoniz your car. It's easy to do yourself.
THE SIMONIZ COMPANY, CHICAGO 16, ILL.



**Use Simoniz Kleener (liquid or paste) to clean finish.
 Then Simoniz for lasting beauty. Sold everywhere!**

I'd like to see them make . . .



Plastic insulation. After you spliced two wires, such a liquid could be painted over the splice. When dry, it would be neater and less bulky than a wrapping of tape on the wires.—*Ray Sherman, Belleville, Wis.*



Offset posts for electric fences. Weeds and grass grow up and sometimes cause shorts. With the posts offset, you could run a mower beneath the wire or cut the weeds with a scythe.—*Archie Casebolt, Brooklyn, Iowa.*



One handle for broom and mop sets. The end of the handle could be threaded to fit various brooms and mops. Such an arrangement would be a space saver in most storage closets.—*Sula Butler, Los Angeles.*



RCA scientists develop new *direct-reading* Loran instrument which simplifies problems of navigation.

The homing pigeon goes to sea

Now science gives the navigator an improved "homing pigeon instinct," a way in which —without checking sun or stars —he can head directly home.

Already thoroughly proved, *Loran equipment* has been simplified through RCA research and engineering, so that almost anyone can learn to use it in a few minutes. Free of human error, readings appear *directly* on the instrument. A quick check gives the ship's position.

Brain of the new Loran is a circuit

developed at RCA Laboratories which splits seconds into millions of parts —accurately measures the difference in the time it takes a pair of radio signals to travel from shore to ship.

Given this information, the Loran navigator, hundreds of miles from shore, can determine his position quickly and accurately. Loran's simplicity adapts it to every type of vessel from merchant ship to yacht. Manufactured by Radiomarine Corporation of America, a service of RCA, it is already being installed in U. S. Coast Guard rescue ships.

The meaning of RCA research

RCA's contribution to the development of the new direct-reading Loran is another example of the continued leadership in science and engineering which adds *value beyond price* to any product or service of RCA.

* * *

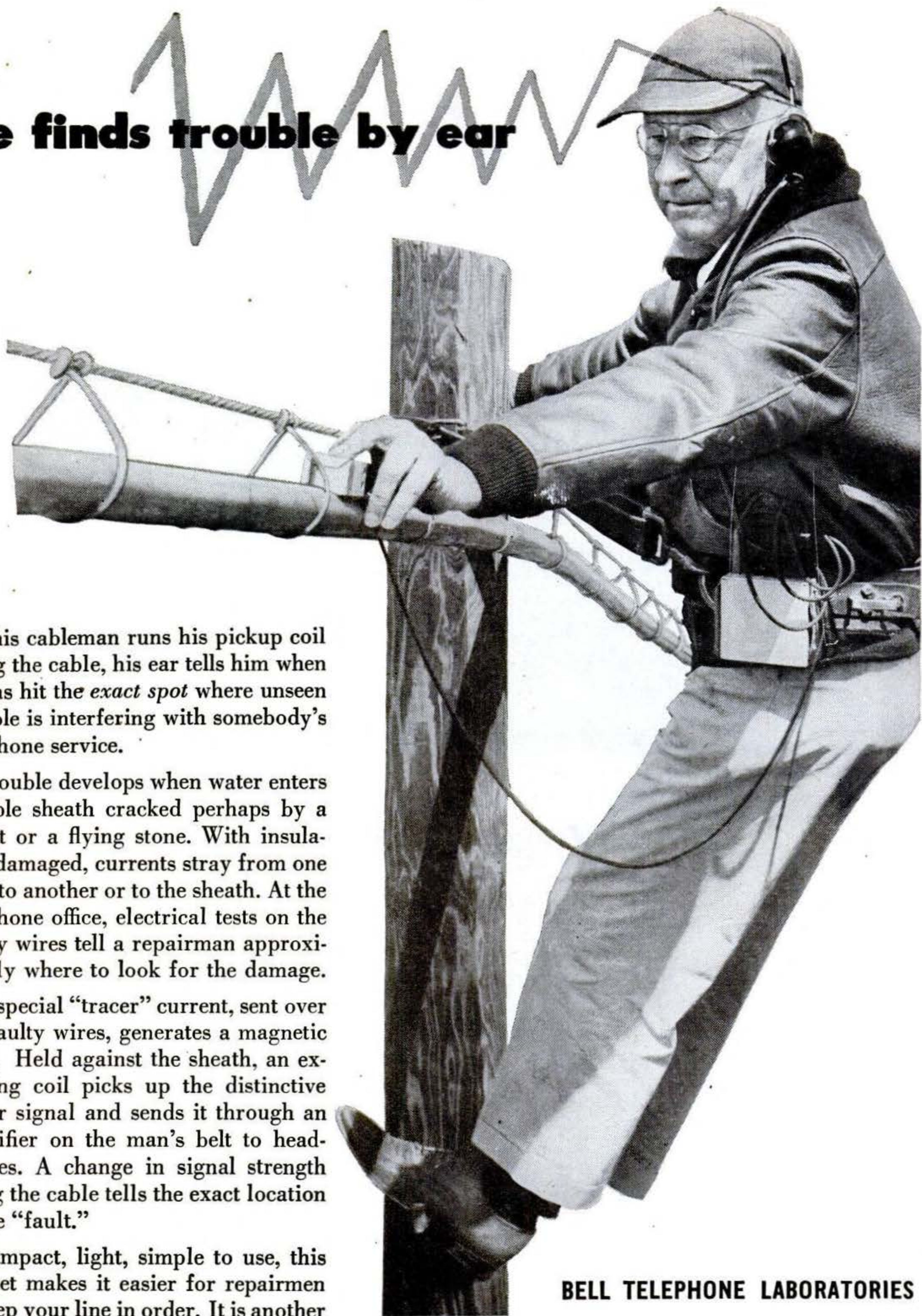
The newest developments in television, radio, and electronics can be seen in action at RCA Exhibition Hall, 36 West 49th St., N. Y. Admission is free. Radio Corporation of America, RCA Building, Radio City, N. Y. 20.



RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

He finds trouble by ear



As this cableman runs his pickup coil along the cable, his ear tells him when he has hit the *exact spot* where unseen trouble is interfering with somebody's telephone service.

Trouble develops when water enters a cable sheath cracked perhaps by a bullet or a flying stone. With insulation damaged, currents stray from one wire to another or to the sheath. At the telephone office, electrical tests on the faulty wires tell a repairman approximately where to look for the damage.

A special "tracer" current, sent over the faulty wires, generates a magnetic field. Held against the sheath, an exploring coil picks up the distinctive tracer signal and sends it through an amplifier on the man's belt to headphones. A change in signal strength along the cable tells the exact location of the "fault."

Compact, light, simple to use, this test set makes it easier for repairmen to keep your line in order. It is another example of how Bell Laboratories research helps make Bell Telephone service the most dependable in the world.

BELL TELEPHONE LABORATORIES

Exploring and inventing, devising and perfecting, for continued improvements and economies in telephone service.



Tomorrow's Workmen Need Better Tools



THE old saw that "a good workman never complains of his tools" is too often used to excuse poor tools. It really means that a good workman won't put up with bad tools that make his job harder. So he begins a job by working on the tools before he starts on the work.

Only an expert, in fact, can make do with poor tools if he must. *A beginner needs the best.*

Yet, every day, some father or big brother tosses an eager youngster a bent screwdriver or a battered hammer and thinks he has done his duty.

Perhaps the worst offenders are the parents and doting uncles who pay good money for boy-size "kits" that even an expert would curse.

Saws of trash steel with "teeth" that hardly cut soap. Hammers with soft heads that come off on the first try—and handles of as-

sembled splinters. Edged tools sharp enough only to cut young fingers.

The excuse for this slick junk is that it comes in small sizes—and real tools to fit small hands are hard to find.

This is a challenge to the makers of those good tools of which no good workman complains. And they have a bigger stake in the problem than fitting bigger hands. For it will be a sad day for this country when boys stop wanting to make something for themselves, of themselves, and by themselves.

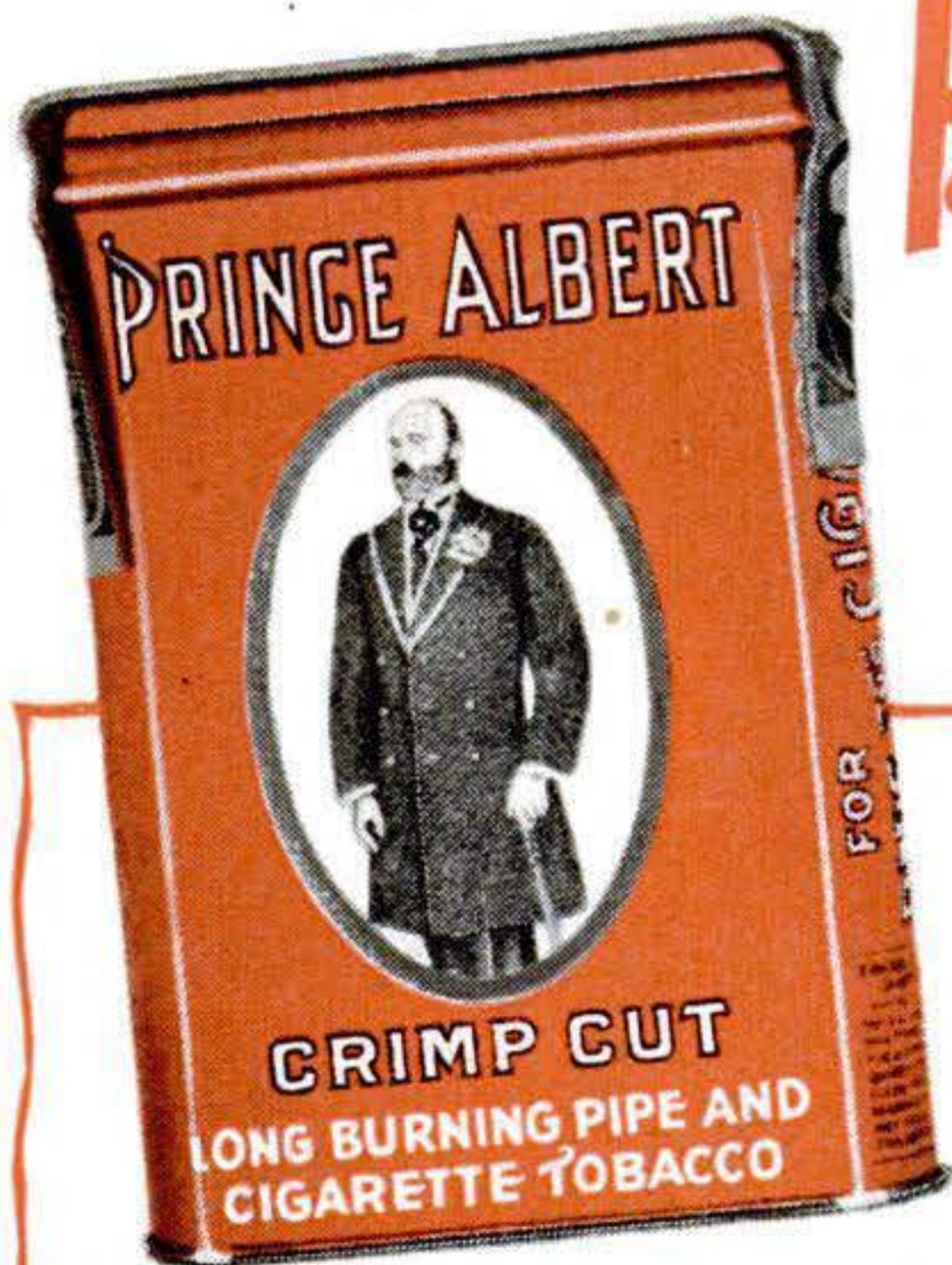
The manufacturers have a double responsibility to make and merchandise tools for beginners. First quality tools, for young hands, that can wear the proud old labels. That can drive the junk back to the scrap pile.

If there are to be good workmen tomorrow, they must have good tools today.

Perry Withers



R. J. Reynolds Tobacco Co.,
Winston-Salem, N. C.



P.A.* means **P**ipe **A**ppeal
P.A. means **P**rince **A**lbert

A pipe-smoking man scores a hit with the ladies. And Prince Albert—America's largest-selling smoking tobacco—scores with pipe smokers who demand a mild, rich-tasting tobacco. P.A.'s choice, crimp cut tobacco is *specially treated to insure against tongue bite*. Get P.A.!

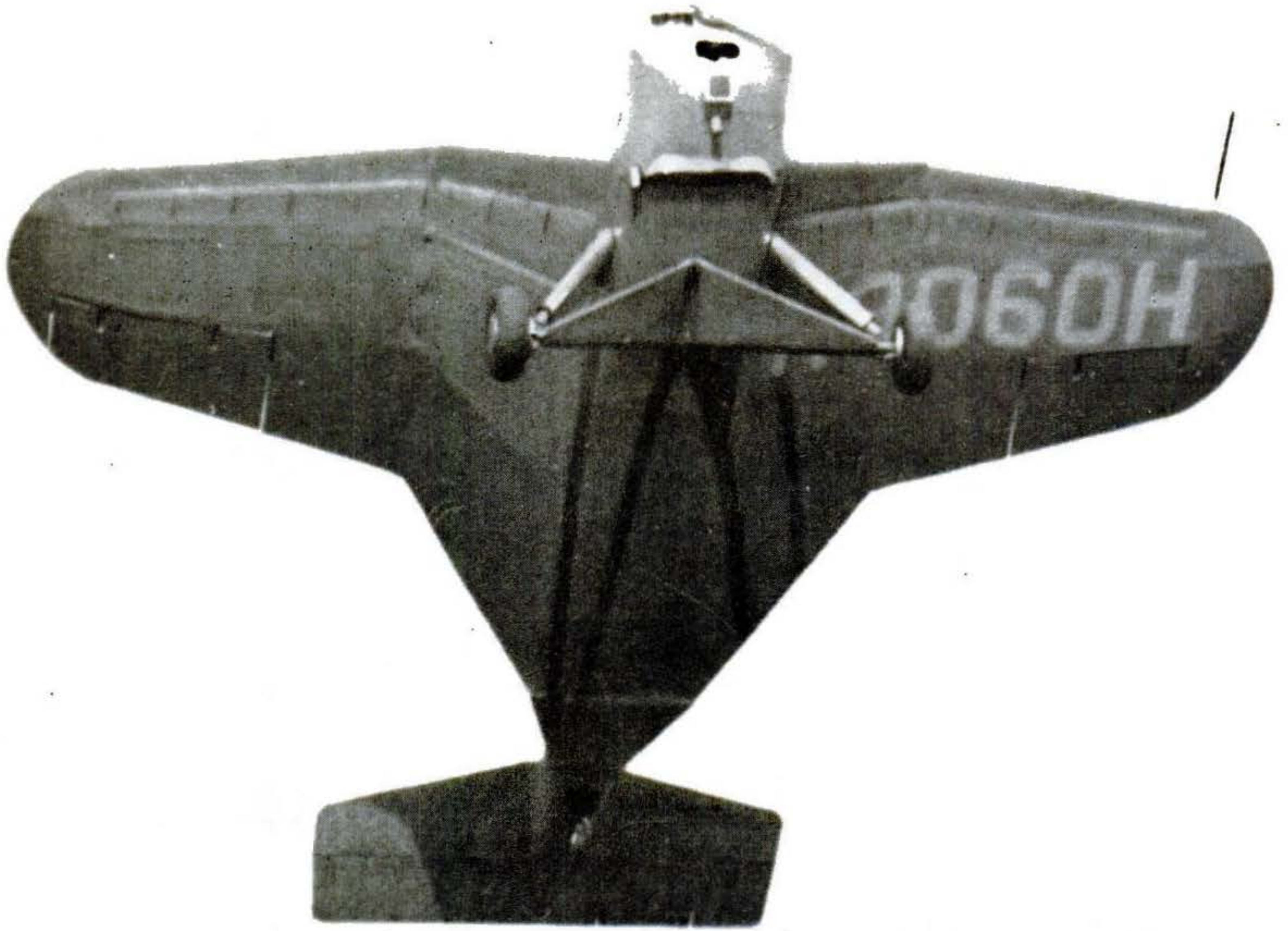
GRAND FOR ROLLING YOUR
OWN CIGARETTES, TOO!

The National Joy Smoke



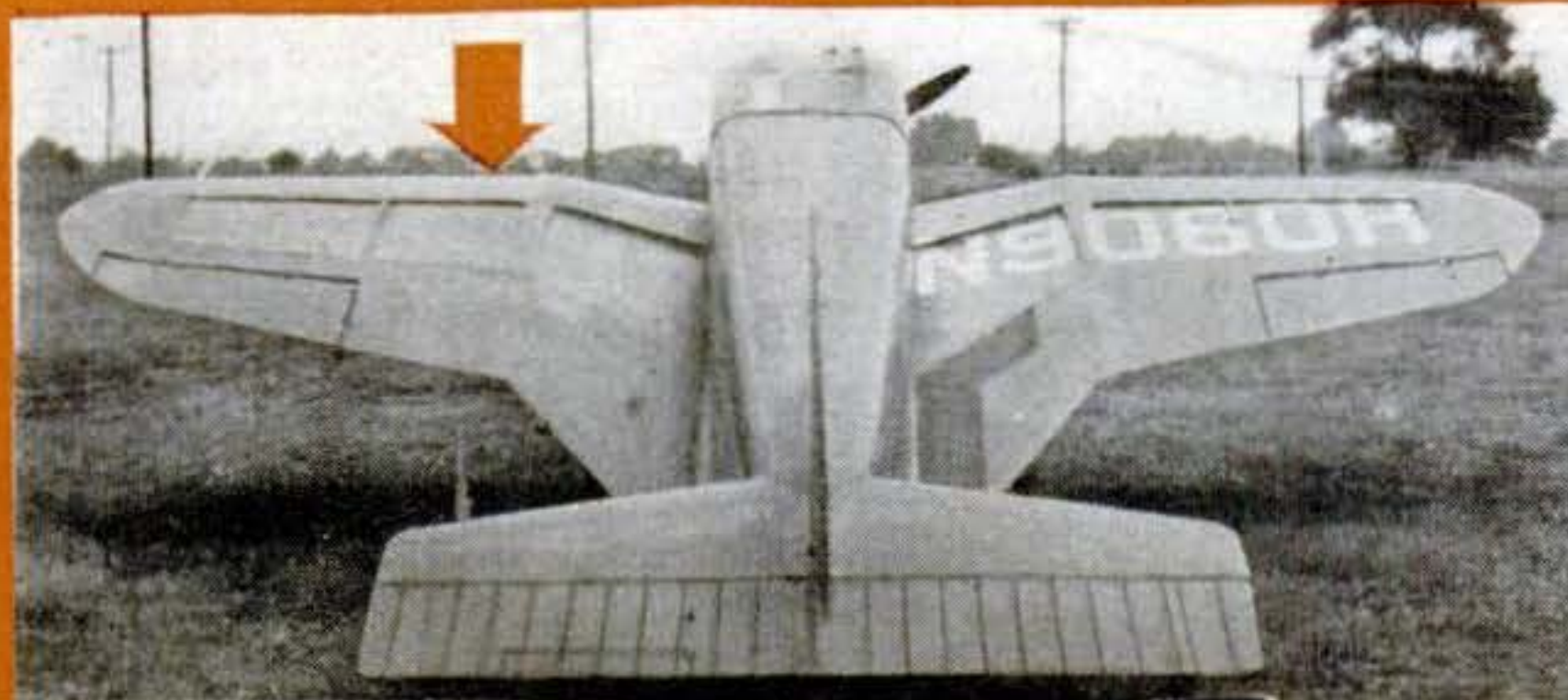
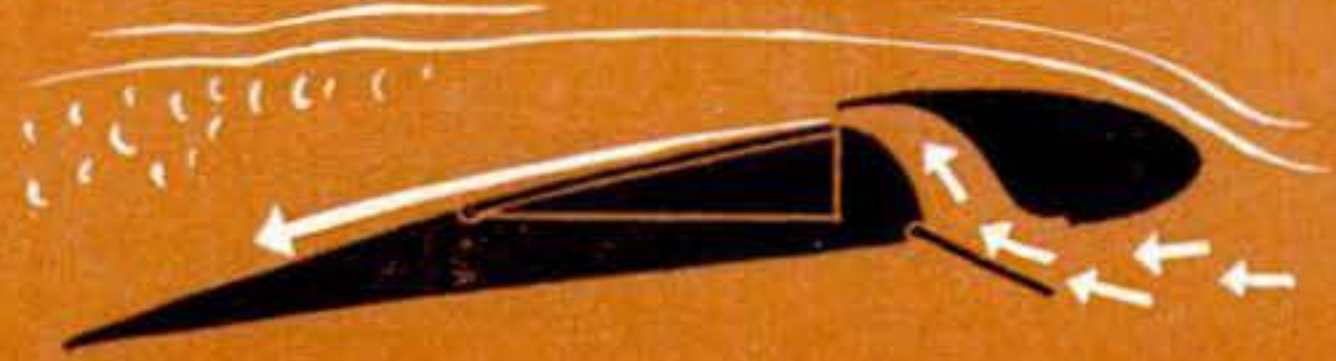
“Hot” Farming... There’s more than sun to make this farmer hot. The sun helmet is for shade, but the rubber gloves, respirator, special clothes, and shield are to protect him from the deadly effects of the radioactive phosphorus, mixed with other fertilizing agents, that he is spreading over the soil. With a Geiger counter, soil scientists at the Georgia Experiment Station near Griffin then trace the “hot” phosphorus in sample plants and determine the exact amount and distribution of the fertilizer they have absorbed. This helps tell farmers just when, where, and how much fertilizer to use for best results. To hold the phosphorus, the tractor is equipped with a special Plexiglas® hopper that provides a protective shield against its radiation.

Scoop-Wing Plane



Paraplane's radical wing-with-the-holes works like this—

I Doors in wing surface, hinged at rear, open slightly for take-off. Scooped air flows backward through jets to control boundary layer (see text), aid lift. But in normal flight . . .



Leaps off Lawn

**Your yard can be your airport
with two new planes that
land or take off in a few feet.**



Cover by Reynold Brown

By Devon Francis

*PS photos by W. W. Morris
and Hubert Lockett*

FOR a quarter of a century they have been talking about designing personal airplanes capable of landing on and taking off from a piece of real estate no bigger than a tennis court. Small airplanes, airmen argued, had to do that if they were going to have any utility. Hundreds, if not thousands, of false starts have been made on that kind of a flying machine.

Now, at long last, it looks as though they are getting somewhere.

Two new experimental planes promise to fill the bill. Both have "fixed" wings, like other airplanes. Both would let their owners fly to and from any place boasting a sizable lawn, not just between airports. Neither has the helicopter's costliness or its complexity.

One, called the Heliplane[®] (to liken it to a helicopter in performance), lands in half the width of a city lot, against a 25-m.p.h. wind. It takes off, in the same wind, in 50 feet. It requires about twice that when there's no wind.

The other plane is called the Paraplane[®] (to liken it to a parachute in performance).

Its designer expects the production version will at least equal the Heliplane.

By contrast, present-day standard lightplanes cruising at 100 miles an hour or better require several hundred feet for landing in still air and somewhat more space for taking off—unless there is a crackerjack pilot at the controls.

One of these two new planes was built by a couple of college professors, the other by the son of the man who invented the ice-cream cone. And, weirdly, the ice-cream cone had more than a little to do with the design of that second airplane.

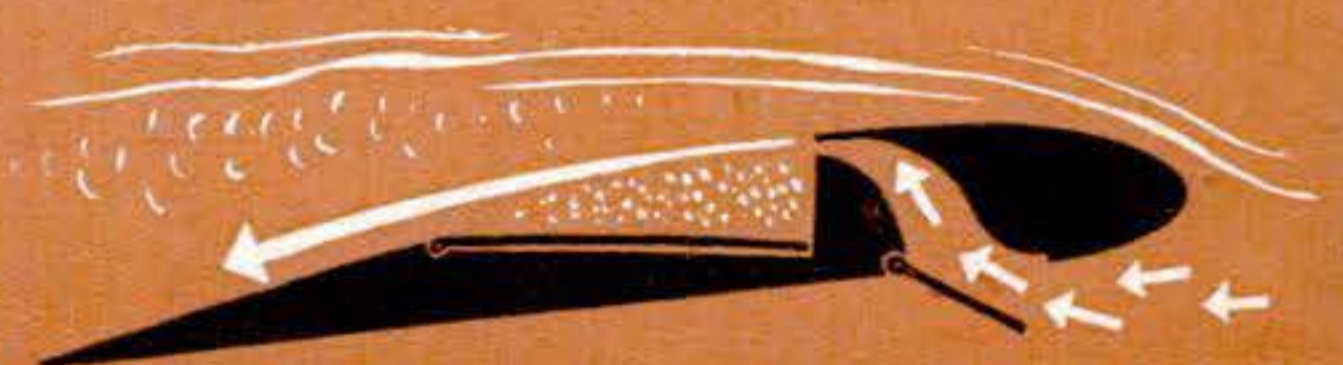
Except in performance, and the fact that both have been built on a financial shoestring, the two planes have little in common. One looks like almost any other lightplane. The other resembles a vest-pocket edition of a gull-wing Navy fighter. But both have fantastic angles of climb and descent. And both are as well-behaved at low speeds as a hobbled lamb.

The Paraplane (which is pictured on the cover of this issue of POPULAR SCIENCE) has the more romantic background. The inventor, Edward M. Lanier, and his father, Edward H. Lanier, both unredeemed skeptics in lightplane design, experi-

2 Doors are fully closed to reduce drag to minimum, convert Paraplane into conventional machine. Pilot flies right up to lip of landing field before closing throttle, cranking doors...



3 Open, as shown here. This creates high air resistance to slow speed, jets air back into boundary layer, and creates low-pressure area in wing top to cushion descent for slow landing.

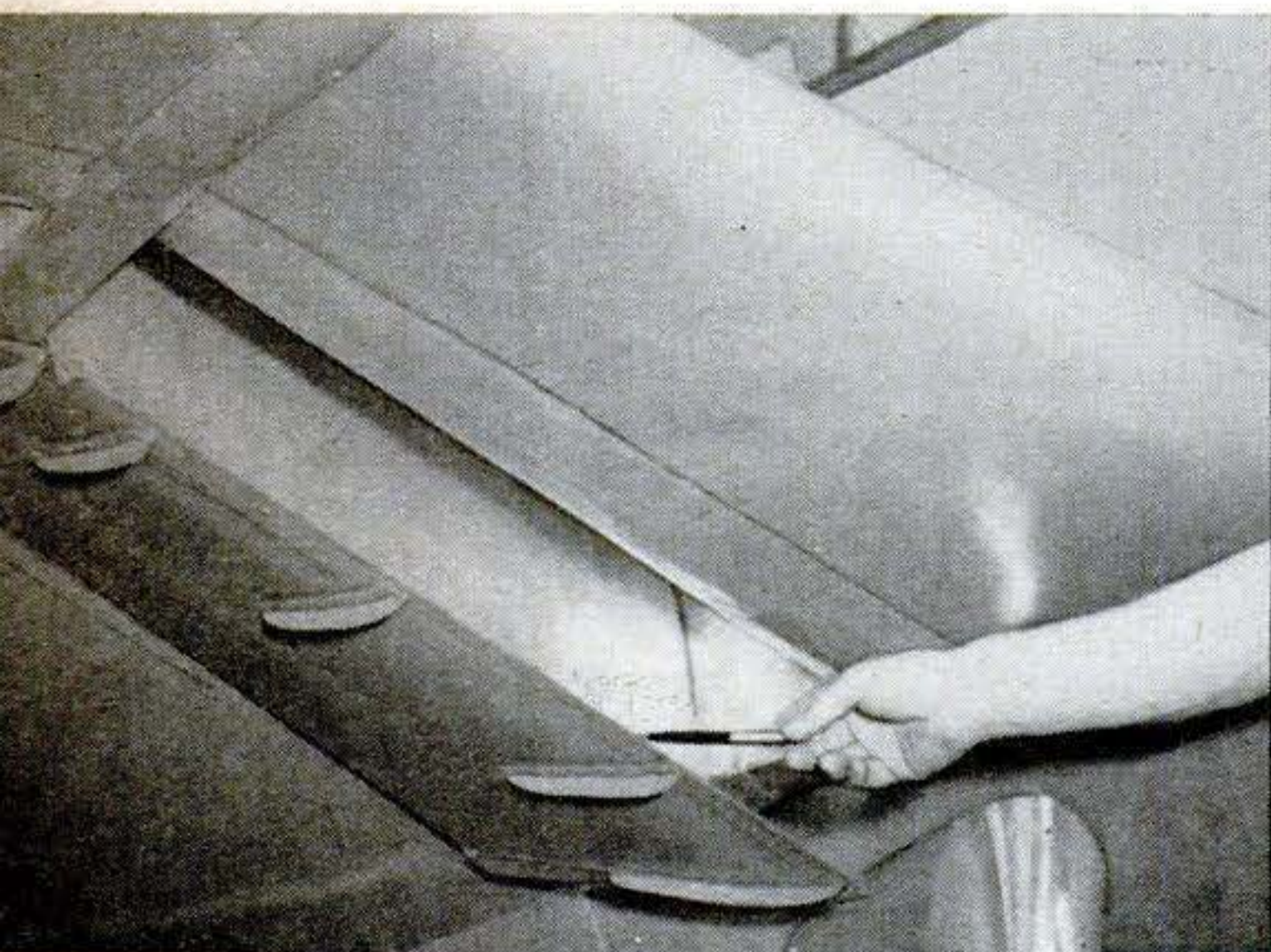




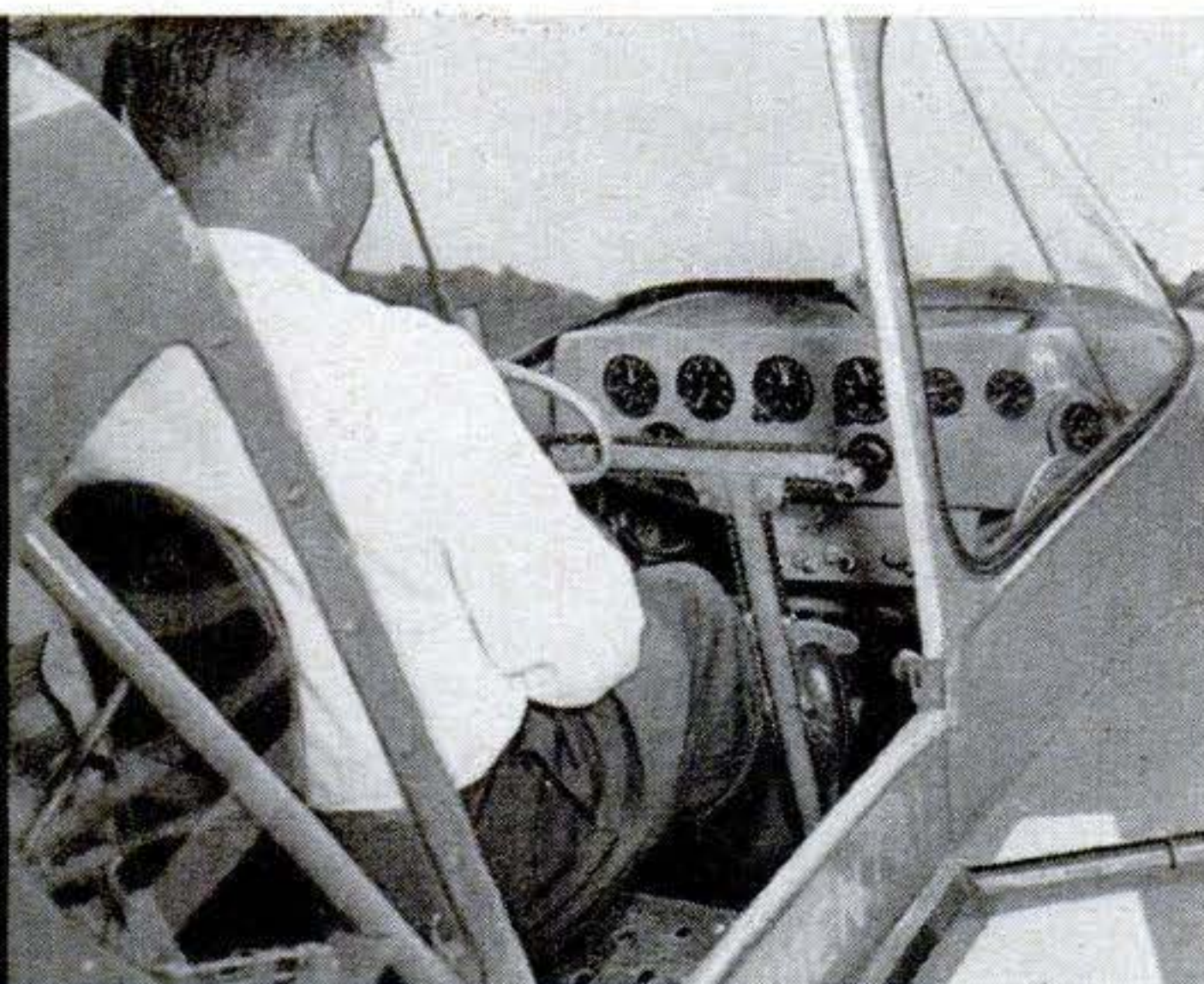
Batlike configuration plus gull-wing dihedral helps Paraplane's lift, aids stability. At root, wing chord is 10 ft. Wing loading is 12 lb. compared with the usual lightplane's 7 or 8 lb.



Pencil points to bank of jets through which air streams from scoops in front. Maximum depression of doors, which cover third of wing area, varies from 8 in. inboard to 1½ in. at tip.



Scoops take in air, also change contour of wing's lower surface, boosting lift. Their maximum opening ranges from 6 in. to 2 in. Wing area is small—100 sq. ft., about half usual area.



Control for scoops and doors is hidden at right in experimental cockpit. Power is from Continental 90-hp., opposed-cylinder engine. It turns ordinary propeller at 2,300 r.p.m. for cruising.

mented for years with odd-looking flying machines. They got the idea for a cell of low-density air in the top of the wing right out of the ice-cream cone that the elder Lanier invented.

Ruminating on the cone, the Laniers dropped weighted paper cups from the window of a 12-story building. Some of the cups were open at the top, some were sealed. The sealed cups beat the open cups to the ground.

Here's why. A low-pressure area forms inside an open-top cup on its way to the ground. It falls too fast for the surrounding air to flow inside and maintain normal density. Thus the low-pressure area slows the cup's fall by creating added lift.

Lanier figured he could get the same kind of added lift by building big holes in the tops of his Paraplane's wings. The

holes create a greater-than-normal low-pressure area—a mild semi-vacuum—on the wing surface while the plane is descending. The reason for that is the same reason that most airplane wings are bulbous in front. The air has to speed up to get over the bulge, and when it speeds up it gets thinner. An airplane flies only because the air speeding across the top of the wing is thinner than normal. The air below the wing keeps trying to push up into this semi-vacuum. That creates lift. In this way, some three-fifths of the lift generated by a wing in flight comes from the top surface. The rest results from the "planing" effect of the bottom of the wing on the air—the same thing that makes a flat stone skip along the surface of water.

Thus the Paraplane uses its wing holes to supplement ordinary lift. The pilot

creates the holes merely by pushing a lever in the cockpit. The lever opens doors in the tops of the wings. By releasing it, he can make the wing tops again as smooth as those of a conventional airplane.

That's only half the trick Lanier performs with his wing. Some airplanes have slots on the leading edges of their wings, amounting to a secondary leading edge. These slots control a very thin layer of air flowing close to the wing surface. Known as the boundary layer, this air must wash the wing smoothly for lift to result. But at low speed, or when the wing is tilted up sharply, the boundary layer tends to separate from the wing too soon and "burble"—thereby sacrificing lift

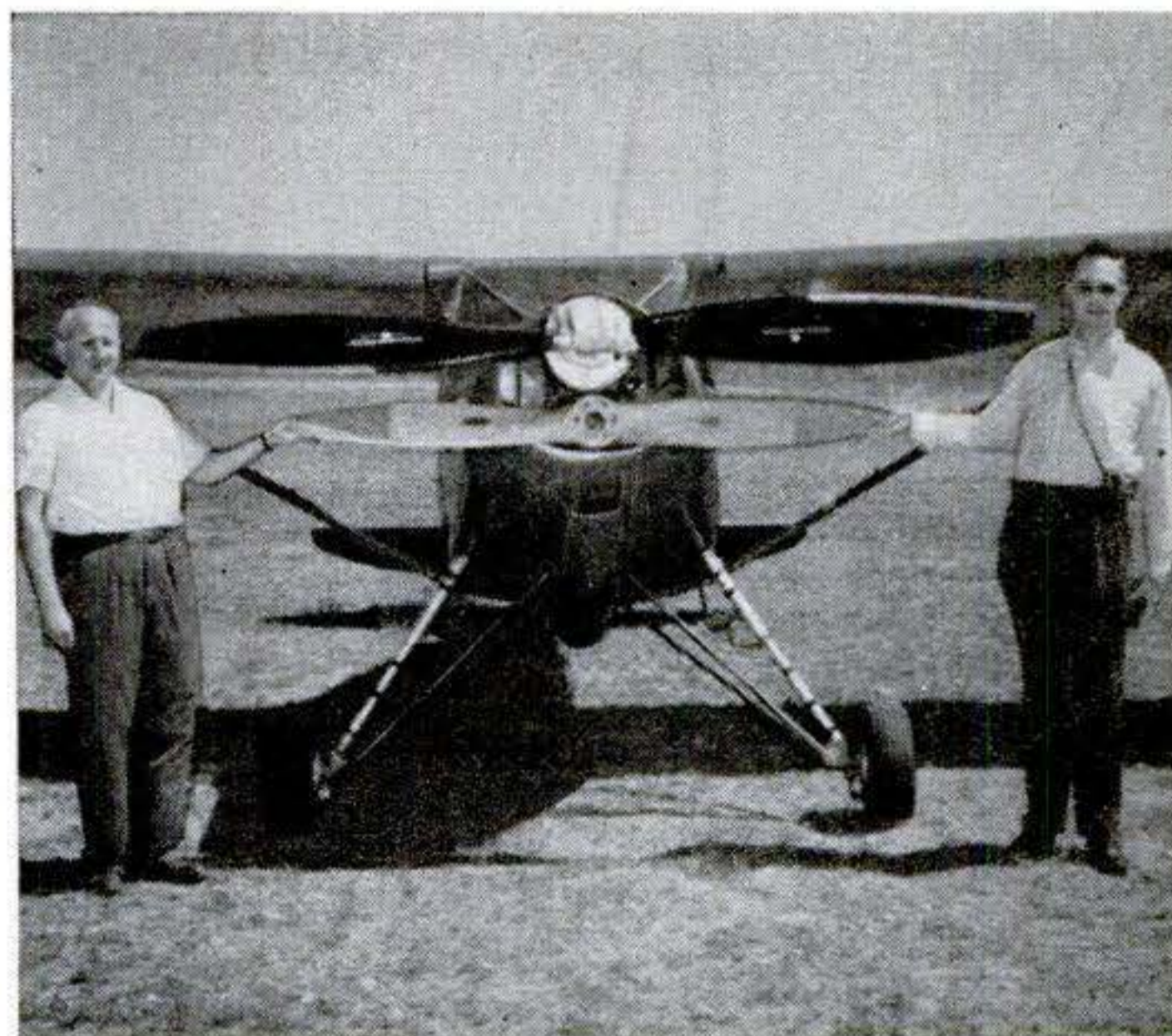
and increasing drag. It is the boundary layer that gets out of control when a "stall" develops. Slots help prevent stalls. Air streams through them, washes back over the wing, and re-establishes part of the lost lift.

Lanier attacks the problem of boundary-layer control—but in a different way. Instead of slots, he has scoops just under the leading edge. They serve the same function. By making the scoops big and their outlets on the wing top mere slits, he gets a venturi effect. Compressed by the restricted space, the escaping air leaves faster than it entered. This helps control the obstreperous boundary layer and provides the Paraplane with added lift. ▶



Second high-performance ship, Heliplane, takes off at spectacular climb angle without danger of stalling. Plane's 29-foot span is normal, but length is 4 ft. greater as aid to stability.

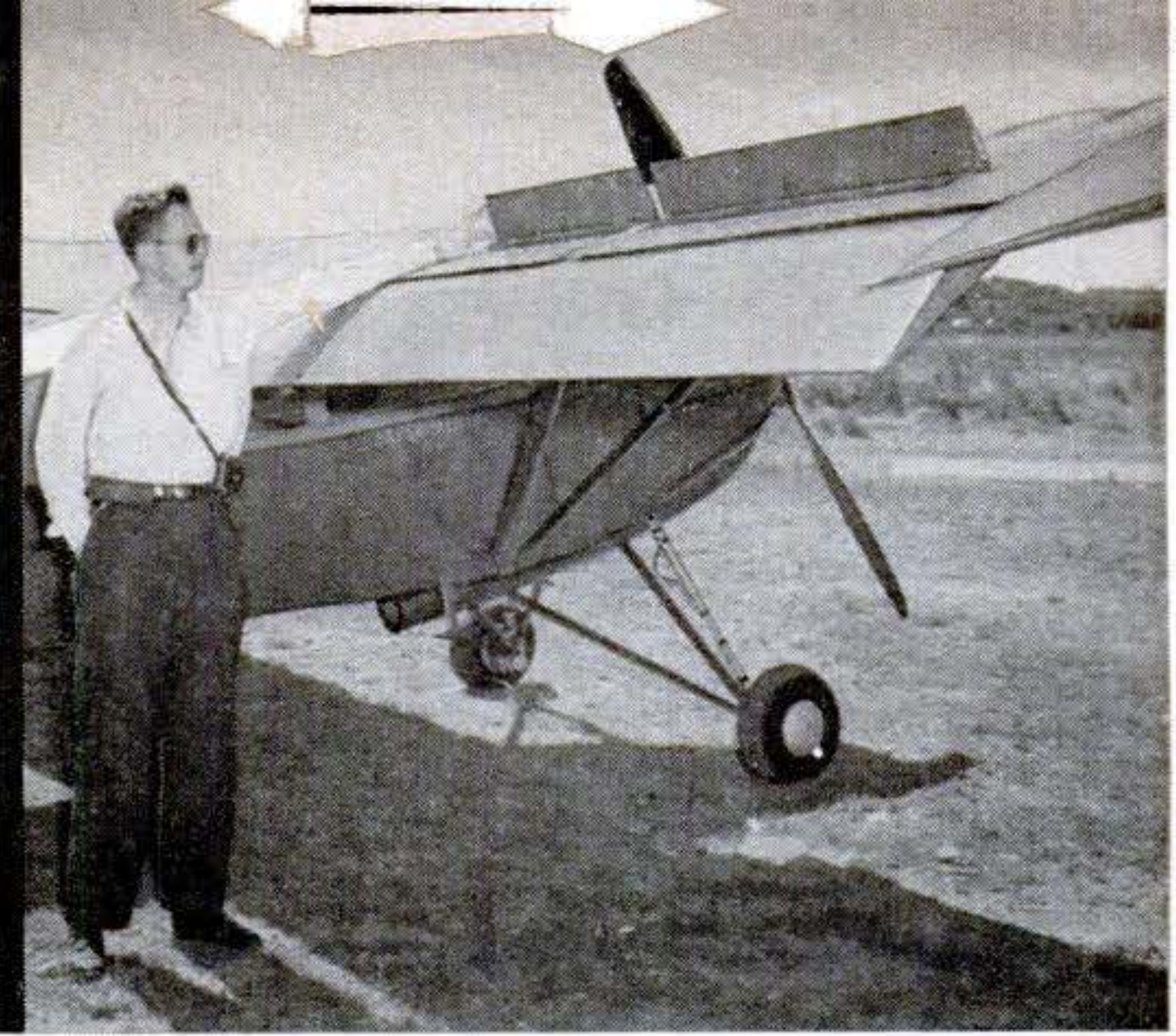
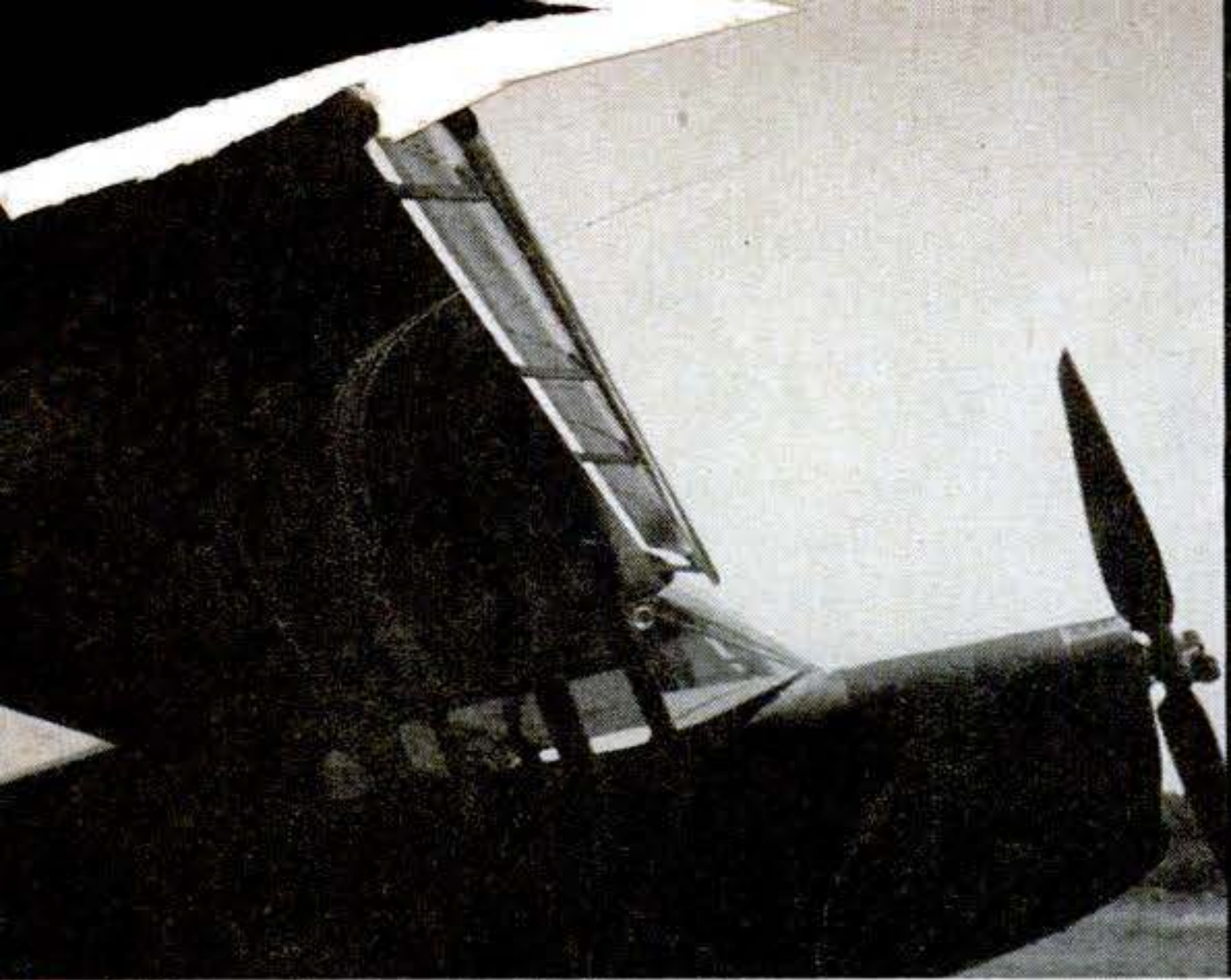
Wing is from standard Piper Vagabond with 5-ft.-3-in. chord. Goodyear landing gear casters for crosswinds. Plane was built for two college professors by Wiggins Airways' Joseph Garside.



Big 9-foot Aeromatic propeller (PS, May, '48, p. 164) dwarfs standard 6-foot prop. Performance depends on area covered, goes up as square of length. Engine is fuel-injection Continental.

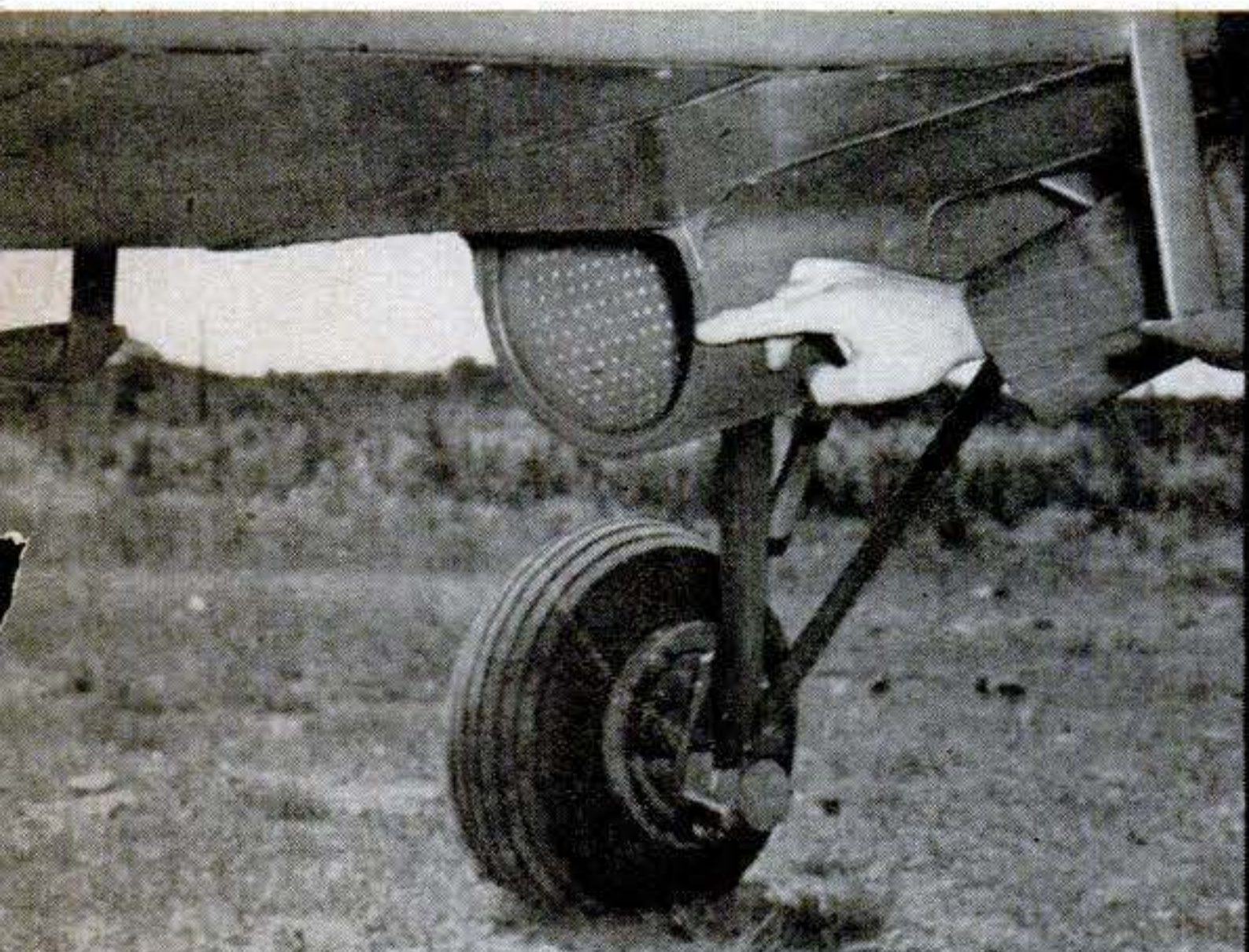


Reduction gear lets engine turn 2.3 to 1. Prop turns 1,200 revs maximum and 1,080 at cruise. Inventors stress that the minimum speed, unlike most planes', is above wing's stall point.



Full-span automatic slots give Heliplane boundary-layer control at high angles of wing attack. Pilot retains full control at 30° —twice the angle of climb that ordinary wing will permit.

Flaps and spoilers also contribute to extraordinary control characteristics. Full-span flaps are also ailerons, responding to stick at any setting. For present, spoilers are experimental.



Innovation in Heliplane is lack of vents in cowling for escape of air taken in to cool engine. Instead, air is routed through exhaust pipe and into "hush-box," above, reducing noise level.

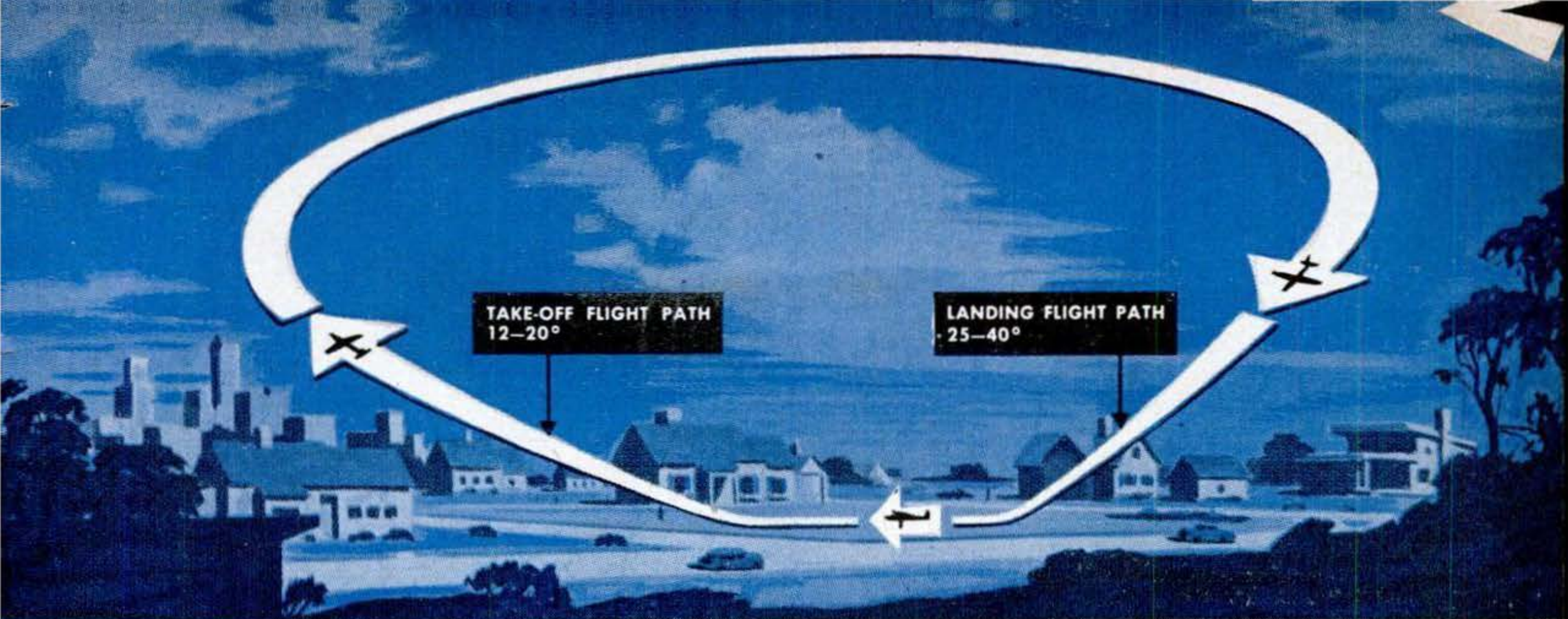
One of plane's neat problems was yaw at low speed—tendency to turn opposite to bank. This was remedied by splitting rudder. Bottom half is linked to ailerons, top half to rudder pedals.

So much for the Paraplane. The new Heliplane is something else again. Being flown at Norwood, Mass., it is the brainchild of Otto C. Koppen, professor of aeronautical engineering at Massachusetts Institute of Technology, and Lynn L. Bollinger, former transport pilot who is now professor of business administration in the Harvard Business School. On Professor Koppen's own statement, this airplane incorporates nothing new in lightplane design. What it does do, however, is combine known principles of flight in a new way.

It has slots. It also has full-span flaps on the trailing edge of the wing. Flaps are no novelty; all transports have them. They momentarily change the shape of the wing, giving more lift for take-off, or high lift and added drag for landing.

The Heliplane also has spoilers, the gimmicks used on gliders to disturb the boundary layer and decrease lift for landings. The Heliplane's spoilers, unlike a glider's, respond not to a separate control but instead to the control stick. They are being used experimentally for added lateral control at very low airspeeds. If a wind gust pushes a wing up, the spoilers open up on that side of the plane to kill part of the lift.

But the Heliplane's most unusual feature is a huge propeller geared down to turn at about half engine speed. The reason for that is based on the same fact that makes pilots of jet airplanes cautious about their airspeed in landing and taking off—a gas moving at high velocity doesn't provide much thrust at low aircraft speeds. The gas displaces too much air too fast.



Steep descent and climb, low speed of new experimental planes make good-sized lawn an

airport. Even so, several hundred feet of "free-way"—unobstructed area—must be available.



Present-day lightplanes, unlike Paraplane and Heliplane, lack utility because they require low

approaches and several hundred feet of take-off-landing space when there is no wind to help.



Among attempts to produce useful personal aircraft have been Curtiss Tanager (left), win-

ner of 1929's 100,000 Guggenheim contest, Ercoupe (center), curved-wing job (right). ▶

The reverse is also true: a big volume of air displaced at low velocity provides a lot of push at low aircraft speeds. The average lightplane's propeller threshes the air with a considerable loss of thrust until flying speed is attained. By contrast, the Heliplane's big, slow propeller gives ample, instantaneous thrust right away.

The giant prop helps another way, too. Any schoolboy knows that an airplane's wings derive additional lift from the backward "prop wash." That's why propellers are mounted as they are on transports. The Heliplane's propeller covers much more wing area with backwash than does that of the conventional lightplane.

It is not abusing the meaning of the word to say that both the Paraplane and the Heliplane perform sensationally. I watched both of them fly. The Heliplane will float along level without losing altitude at less than 30 miles an hour. In its present form the Paraplane will do the same thing at something above 30 miles an hour.

The Paraplane, based at Marlton-Medford airport in western New Jersey, took off with a run of less than 200 feet, against a choppy wind of perhaps 20 m.p.h. It landed with a run of about 150 feet. In itself, that wasn't too impressive. I've done that in a Piper J-3. The Heliplane performed a lot better against a 25-mile wind.

Paraplane Climbs Like Rocket

What was impressive was the Paraplane's rocketlike rate of climb and sharp angle of descent. Moreover, Lanier says that his experimental airplane is 225 pounds overweight, beefed up for its tests, and that his production job will land in less than 100 feet and take off in 100 feet.

Both airplanes are described as spinproof. Each will cruise at 100 to 110 miles an hour.

As a run-of-the-mill lightplane pilot, I have three criticisms to make of the Heliplane, one of the Paraplane. The Heliplane's owners are touchy on the subject of the meager ground clearance of their propeller. They can well be. Because of the size of the prop, the machine must be taken off and landed tail-low to prevent damage to it. That fault could be mended with a slow-turning three- or four-bladed prop. Second, because the Heliplane is so eager to fly, I suspect that it would prove difficult to handle on the ground in a high wind unless it were fitted with a tricycle landing gear to provide the wing with a slightly

negative angle of incidence and kill its lift. And finally, I wonder whether the high efficiency of the plane's engine-propeller combination at low airspeeds is only at the sacrifice of efficiency at cruising speeds.

The Paraplane is outside my experience. But it struck me as providing too little visibility for the pilot in the landing maneuver. In landing a conventional lightplane, the nose is down on final approach, giving the pilot a good view. But the Paraplane must be nose-level or nose-high throughout the final approach to get the benefit of the vacuum-generating wing. The pilot sits high and forward in the ship, in fact, for just that reason. Even so, his visibility, vital to safe flying, must suffer.

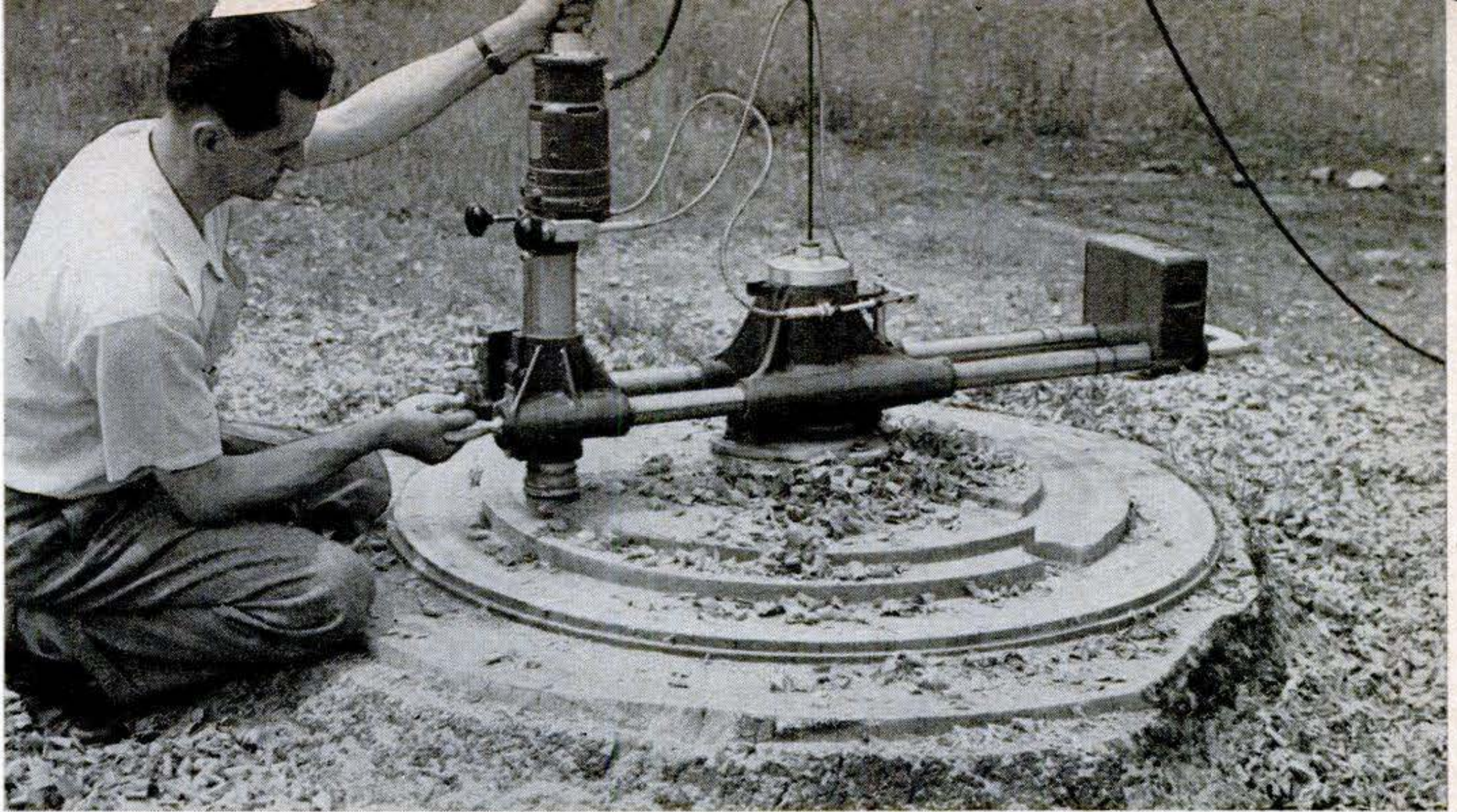
New Designs Promise Wider Market

Both the Heliplane and the Paraplane, put into production, unquestionably would boost the use of personal aircraft. The record of lightplane ownership in the U. S. is a glum one. After a brand-new pilot with his brand-new airplane exultingly has taken his family and friends for a ride, he finds himself wondering what to do next. He can't drive his mount to Aunt Martha's across town. He can't use it to go to the grocery store. Every time he lands at an airport he must find motor transportation into town. The general rule has been that after a year or so he sells his plane in disgust.

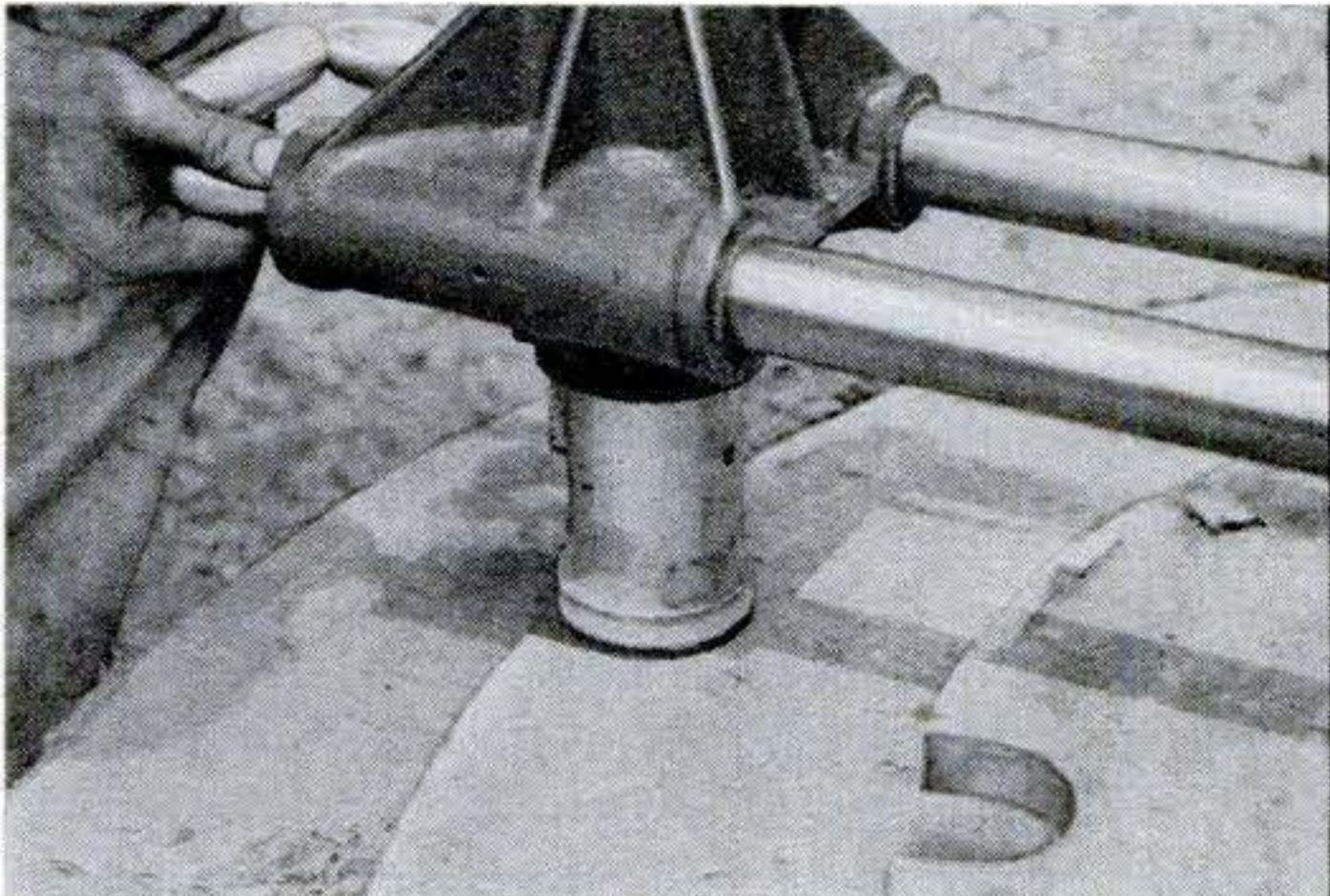
Lightplanes that will get into and out of tight places—that will fly off your lawn—will have a much greater utility. They will give more for the invested dollar. Lanier even proposes to put folding wings on his craft so it can be hangared in the family garage. Lightplanes probably never will whip the weather bugaboo, the main bar to all-around usefulness, but the new experimental designs should release them from the restrictions of the airport. END

How Many Colors Do You See?

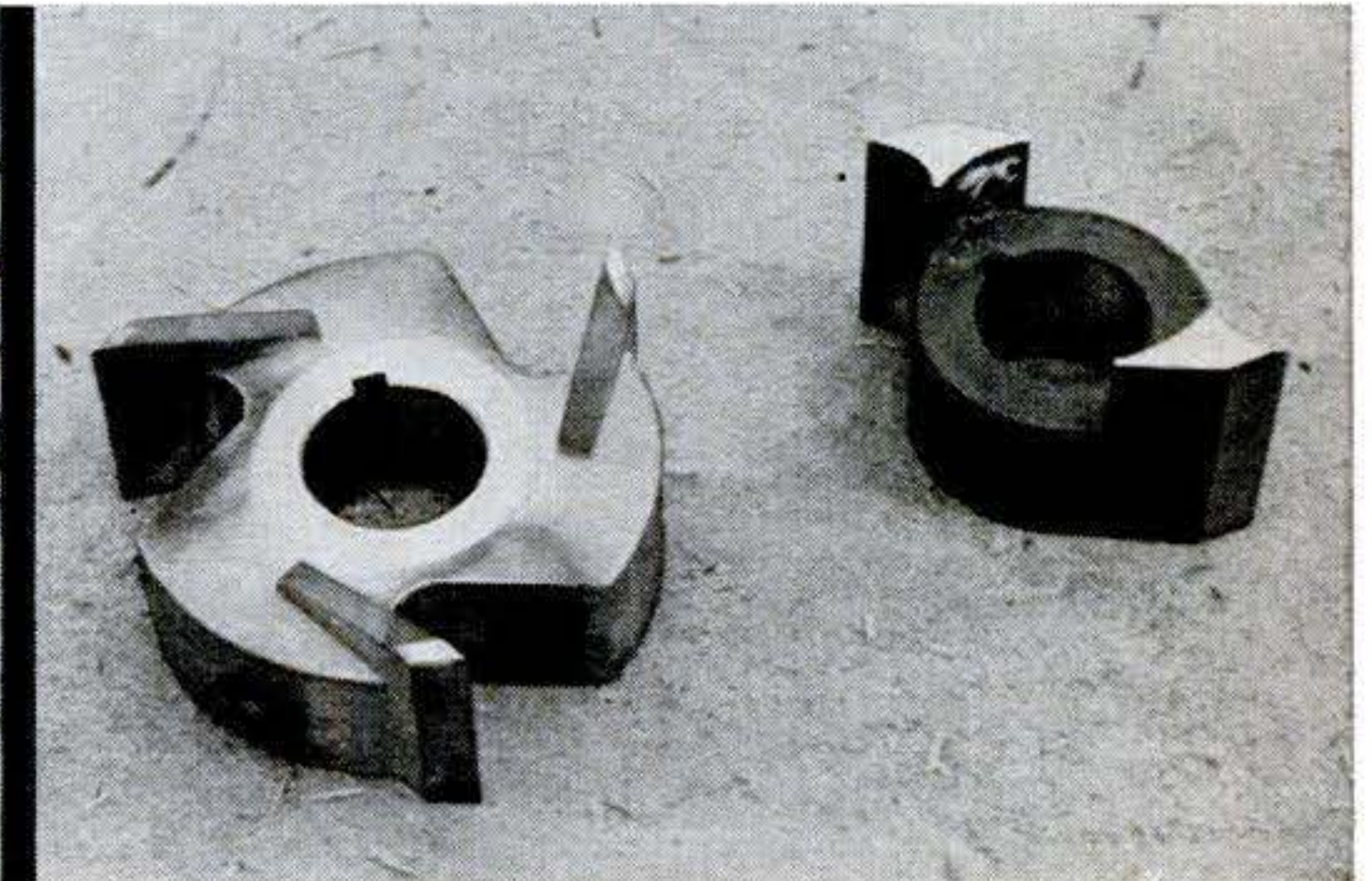
SEVENTEEN thousand distinct colors are visible when observations are made with a precise optical instrument. To this figure Dr. David L. MacAdam, of the Kodak Research Laboratories, adds the fact that when large pieces of colored paper are observed with the naked eye, roughly 50 per cent more colors can be distinguished than by the finest optical means. Dr. MacAdam estimates that there are about 250 distinguishable colors in the spectrum, plus 10,000 distinguishable tints of spectral colors and 7,000 non-spectral colors, such as purple.



Router bites away at stump 68 inches across. Block at right of machine is counterweight.



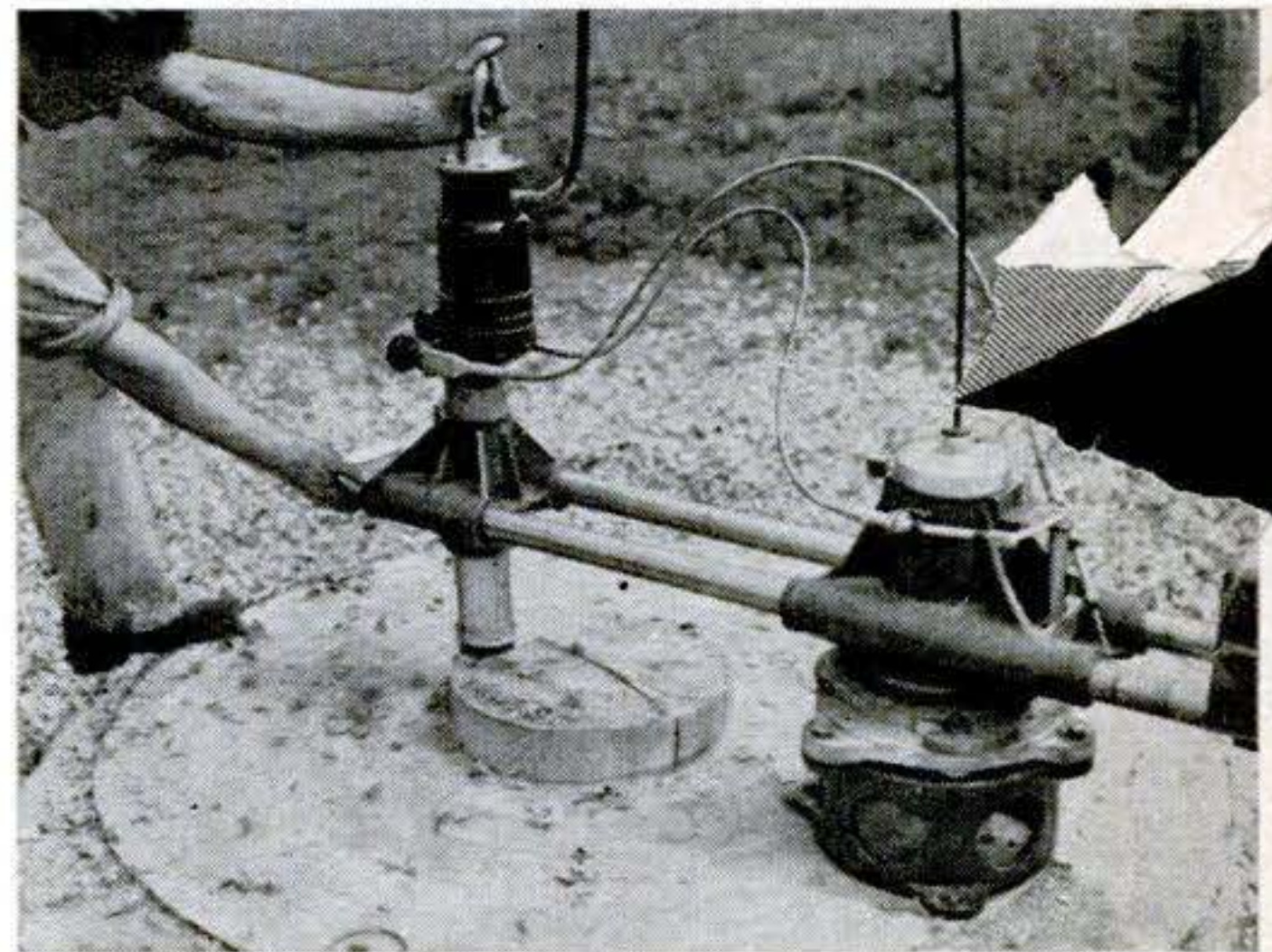
Close-up above shows steel cutter head, $3\frac{1}{4}$ inches in diameter, ready to tear into the stump. Whirling at 5,200 r.p.m., it chips away an area $2\frac{1}{2}$ inches wide and $1\frac{1}{8}$ inches deep.



Stump remover has two types of steel cutters. The three-bladed one, left above, is used on smooth-grained wood; the two-bladed one, right, chews right through hard, knotty areas.

Steel Beaver Chews Out Stumps

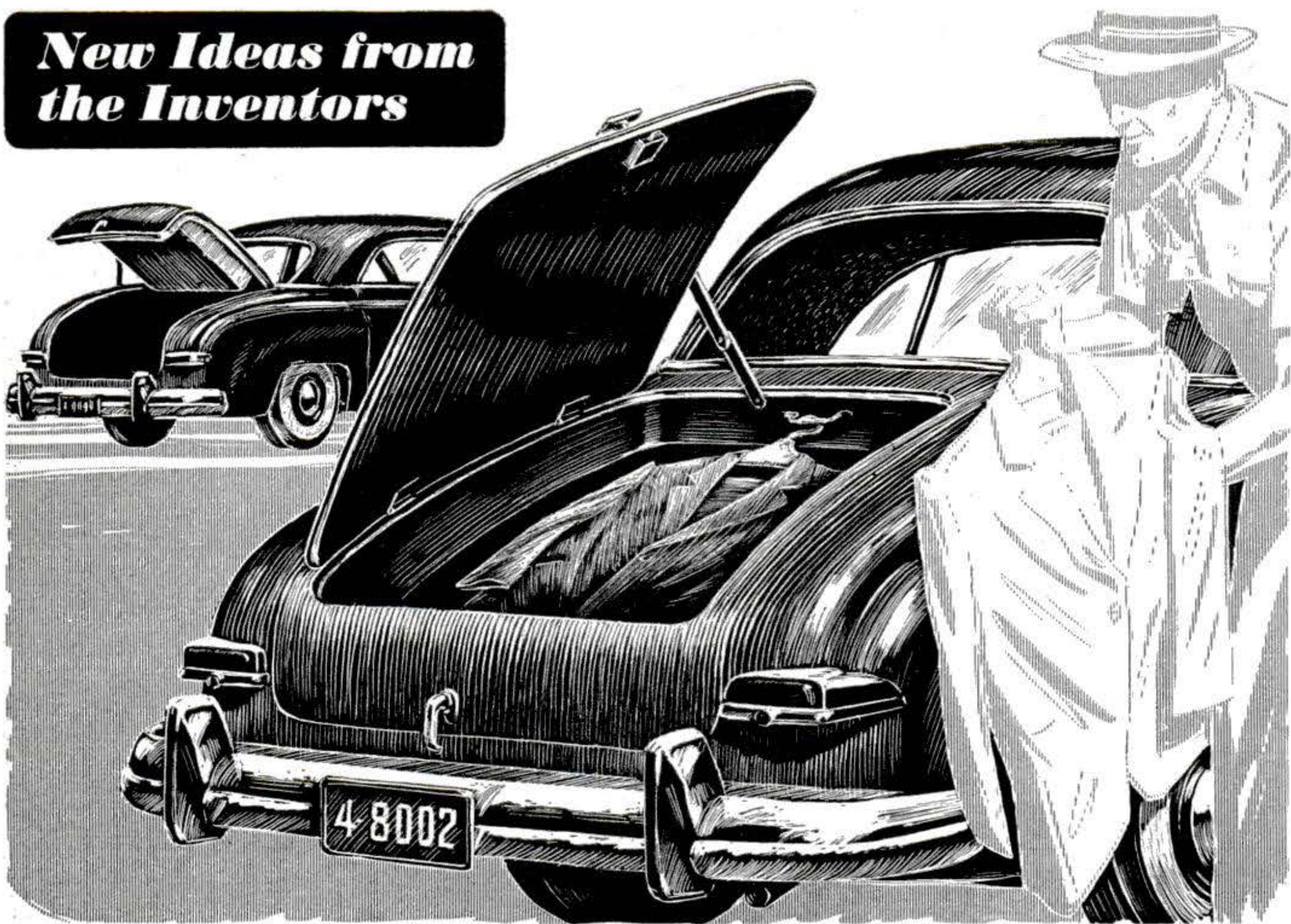
THE steel "teeth" of this machine can rout out in 10 hours a big tree stump that would take you 10 days to chop out by hand. Fastened to the center of a stump, the machine is rotated by hand while a revolving cutter chews away the wood. After a cut is made all around the stump, the operator unlocks a radial brake and pushes twin bars, on which the motor assembly is mounted, toward the tree center for another rotation. A spindle, with a six-inch stroke, permits adjustment of the cutter to an uneven surface. Powered by a $2\frac{1}{2}$ -hp. electric motor from a portable generator, the Stump Beaver® routs out a stump to any depth. In-



To cut down the stump's center part, the machine is remounted at the side of the stump on an adapter platform, which raises the device up to the surface of the pole for cutting.

vented by Walter S. Spott, of Verona, N. J., it is still in the experimental stage. **END**

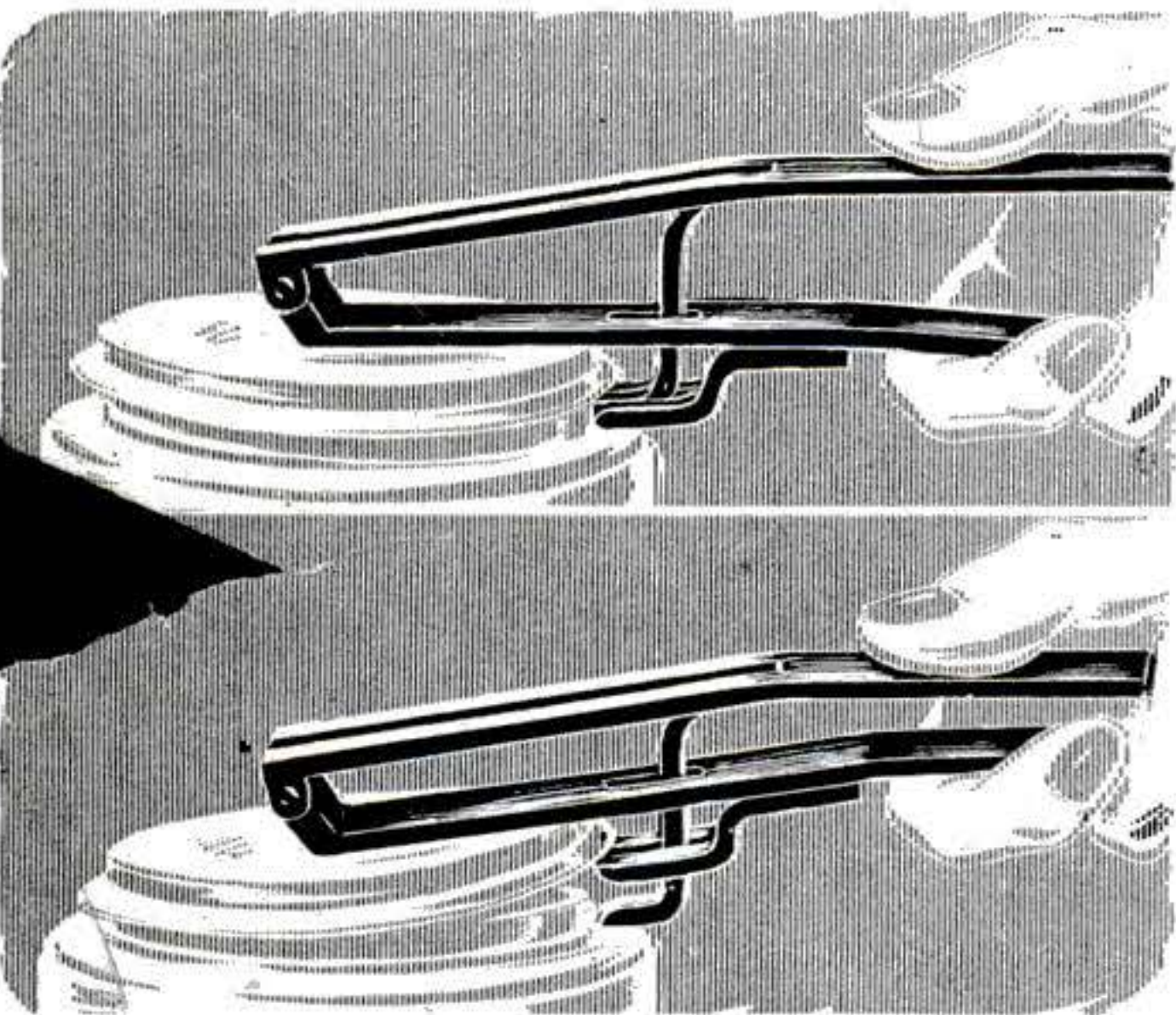
New Ideas from the Inventors



Car Trunk Packs Clothes Flat.

Auto travelers wouldn't have to pack their clothes in suitcases or hang them up inside the car with this special compartment. A shallow tray with its own door built into the

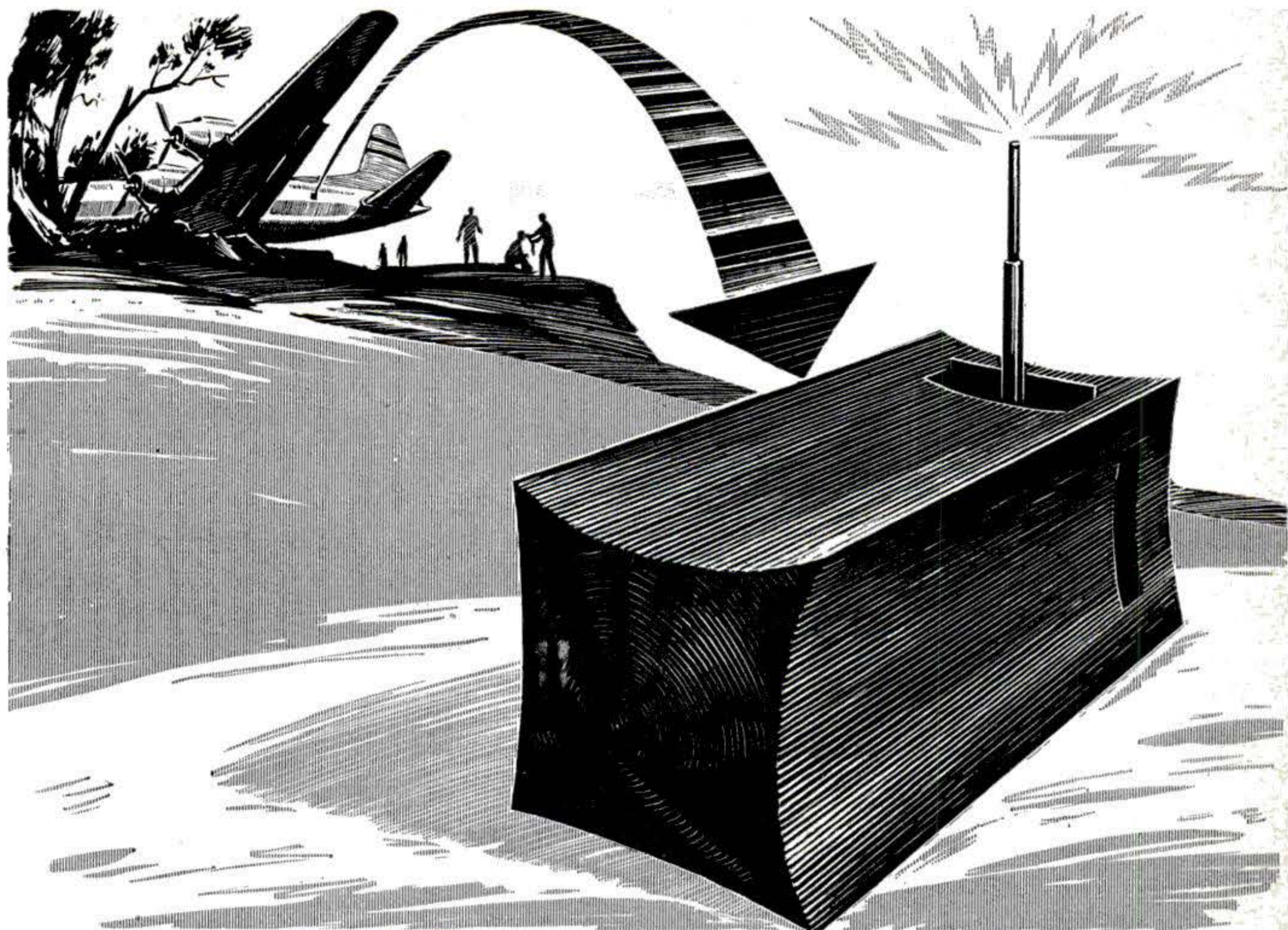
lid of the regular luggage compartment, it permits suits and dresses to be carried flat and unfolded so they won't wrinkle. Patented by S. W. Ford, of Dayton, O., it takes little space, leaves the usual room for luggage.



Opener Pries Off Jar Tops. Easier opening of jars with pressure caps is the object of the opener invented by N. Eastman, of New York City. A fork on the lower handle hooks under the lid's edge. When lifted up, this pries off the cap while a foot extending down from the upper handle rests against the jar's shoulder for leverage.



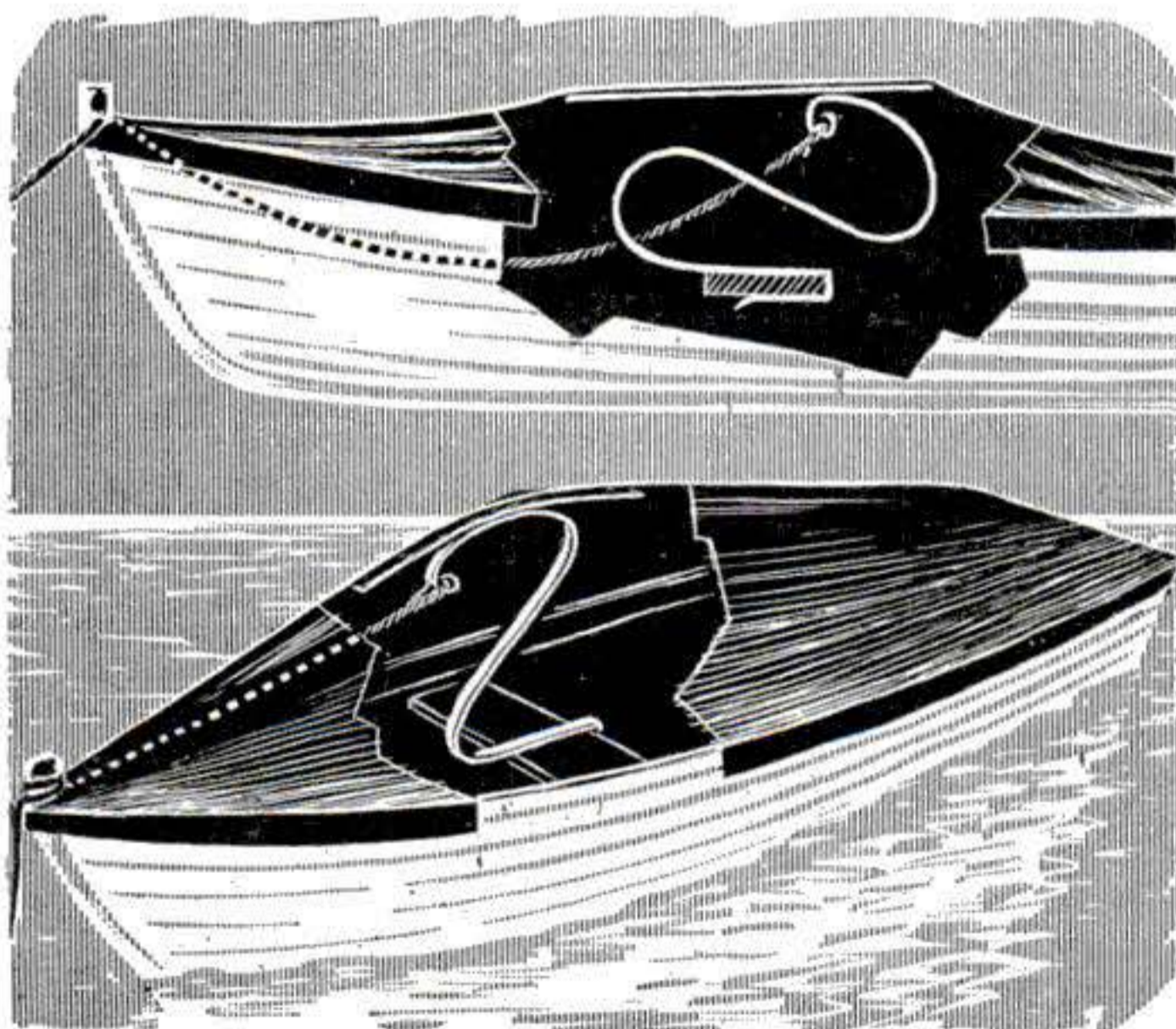
Tube Vents Baby's Bottle. Babies would get milk, not air, out of this bottle. When a vacuum begins to form, outside pressure forces in air through a flexible tube in the bottom. A weighted collar keeps the tube bent over to close it until the pressure builds up enough to straighten it out. The inventor is R. M. Soper, of Tacoma, Wash.



Crash Radio Leads Rescuers.

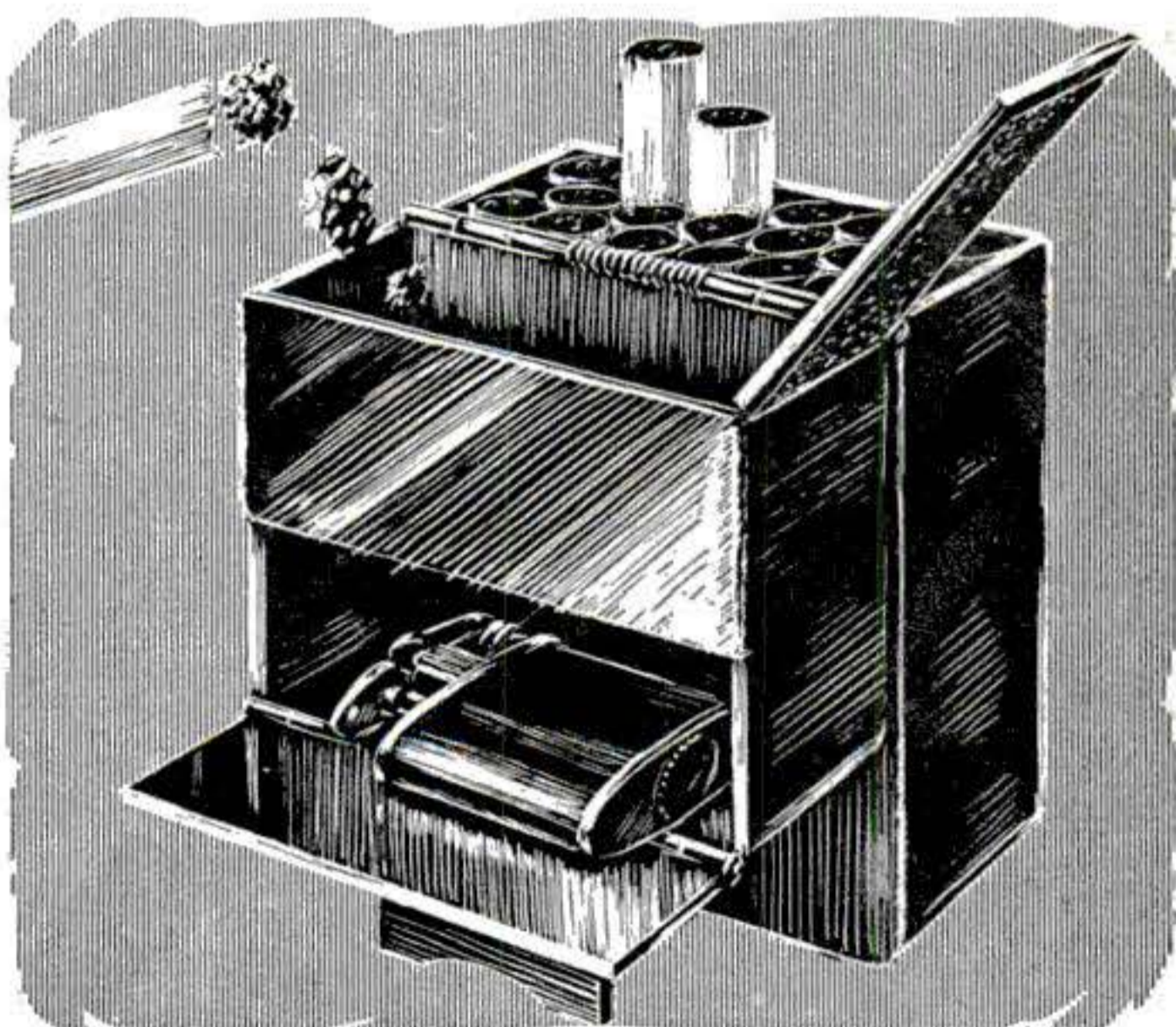
If an airplane crashes, this shock-mounted radio transmitter is designed to be ejected by an explosive charge set off by the impact. Safely away, it then sends out distress signals

to help rescuers locate the plane. A telescoping antenna, pivoted inside like a pendulum, automatically slides out of a slit in whichever side comes to rest on top. The inventor is C. J. Camp, of Palo Alto, Calif.



Spring Supports Boat Cover.

Heavy boat tarpaulins could be put on easily with the S-shaped leaf spring patented by F. D. Burns, of Muskegon, Mich. The cover is put on loosely with the spring compressed. Pulling a rope tied to the top of the S forces the spring upright, tightening the tarpaulin and raising it up so water will run off.



Case Meets Smokers' Needs.

In addition to holding a full pack of cigarettes, this novel container has a compartment for a lighter or matches and a built-in ash tray. When moistened with water, a strip of blotting paper on top of the ash-tray lid helps keep the tobacco from drying out. The inventor is V. Trinko, of Downers Grove, Ill.

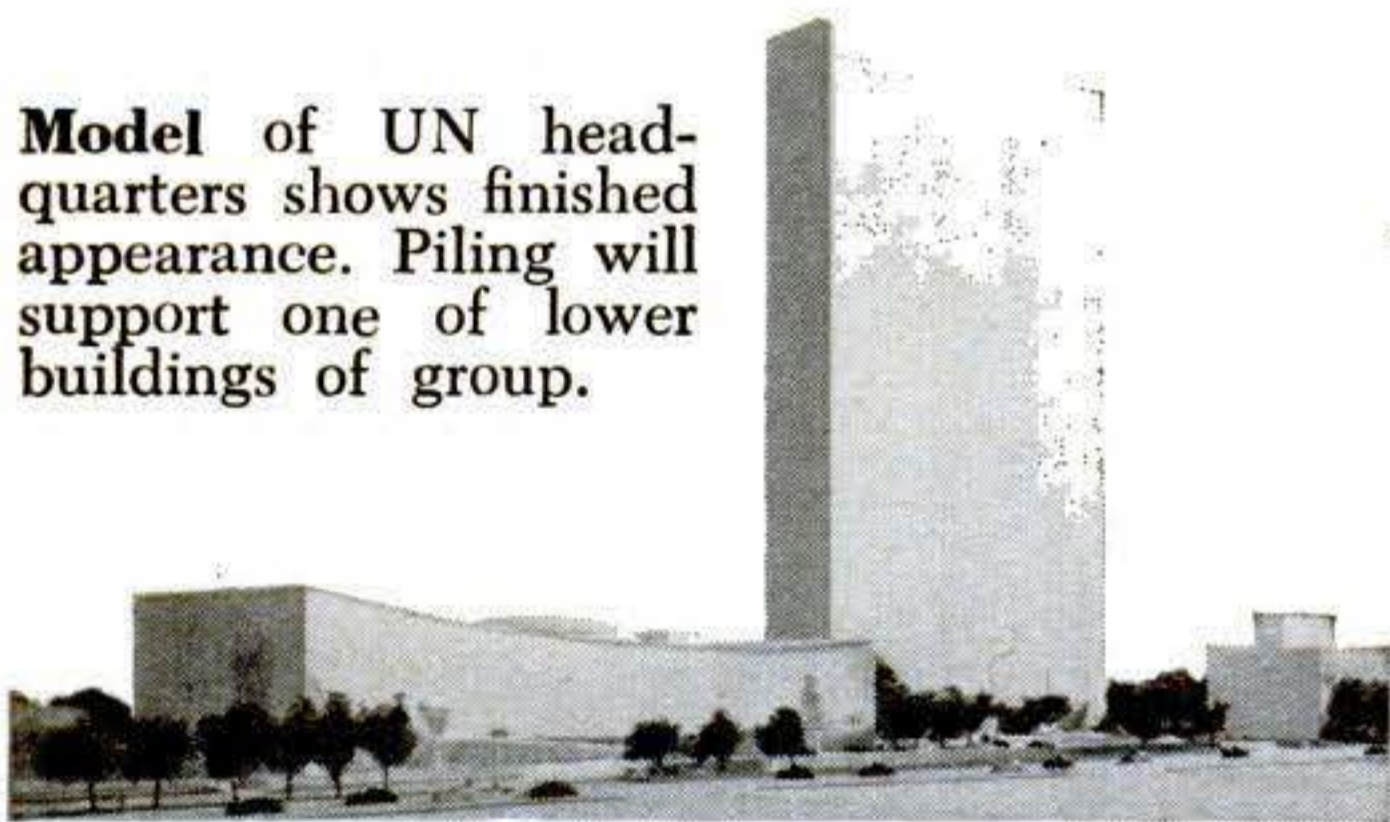


1. After big mobile pile driver has been maneuvered into place on endless tracks, cable is attached to long steel pile, and rig swings it aloft, to stand on end for driving to bedrock.



2. Men scrambling up rig, to help guide pile, give idea of its comparative size. But even this big pile driver is far from largest of type, giants that have driven piles 194 feet in length.

Model of UN headquarters shows finished appearance. Piling will support one of lower buildings of group.



Big Hammers Speed Job of Pile Driving

By Alden P. Armagnac

PS photos by W. W. Morris

THERE'S more to driving a pile than brute force—it's an art that experts write whole books about. These pictures of how a big, modern pile driver does its job give you an idea of the skills involved.

Largest of several in action on the site of the United Nations' future New York City headquarters, this steam-hammer pile driver is sinking steel piles as underpinning for a low building of the group. The whole construction project is being carried out by leading contractors associated under the name of Fuller-Turner-Walsh-Slattery, Inc.

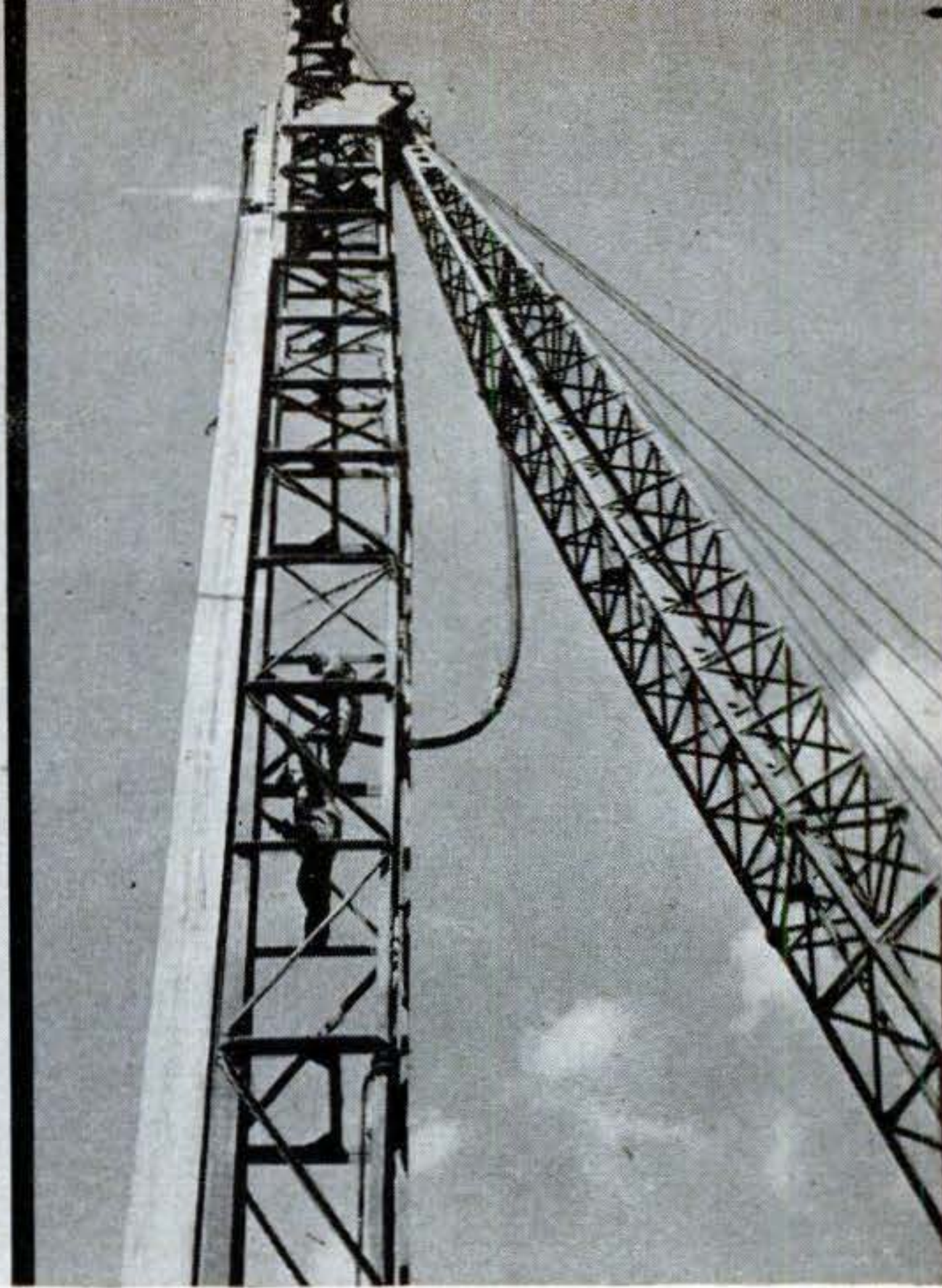
Steam-hammer pile drivers have almost entirely supplanted the old-fashioned drop-

hammer kind, which hoisted an iron weight of a ton or so to the top of a derrick-like frame, and then dropped it on a pile. A steam-hammer rig is a simple form of steam engine, using a piston in a cylinder to raise the striking weight or ram. Drop hammers can deliver five to six blows a minute; steam hammers, 10 to 20 times as many, driving more piles a day with less damage to the piles and, through vibration, to nearby foundations and structures.

Single-acting steam hammers, like the one shown here, use a ram of 3,000 to 14,000 pounds that falls by gravity from the top of its approximately three-foot stroke. Double-acting steam hammers add steam pressure to force of gravity to propel the ram downward, permitting a lighter ram, a



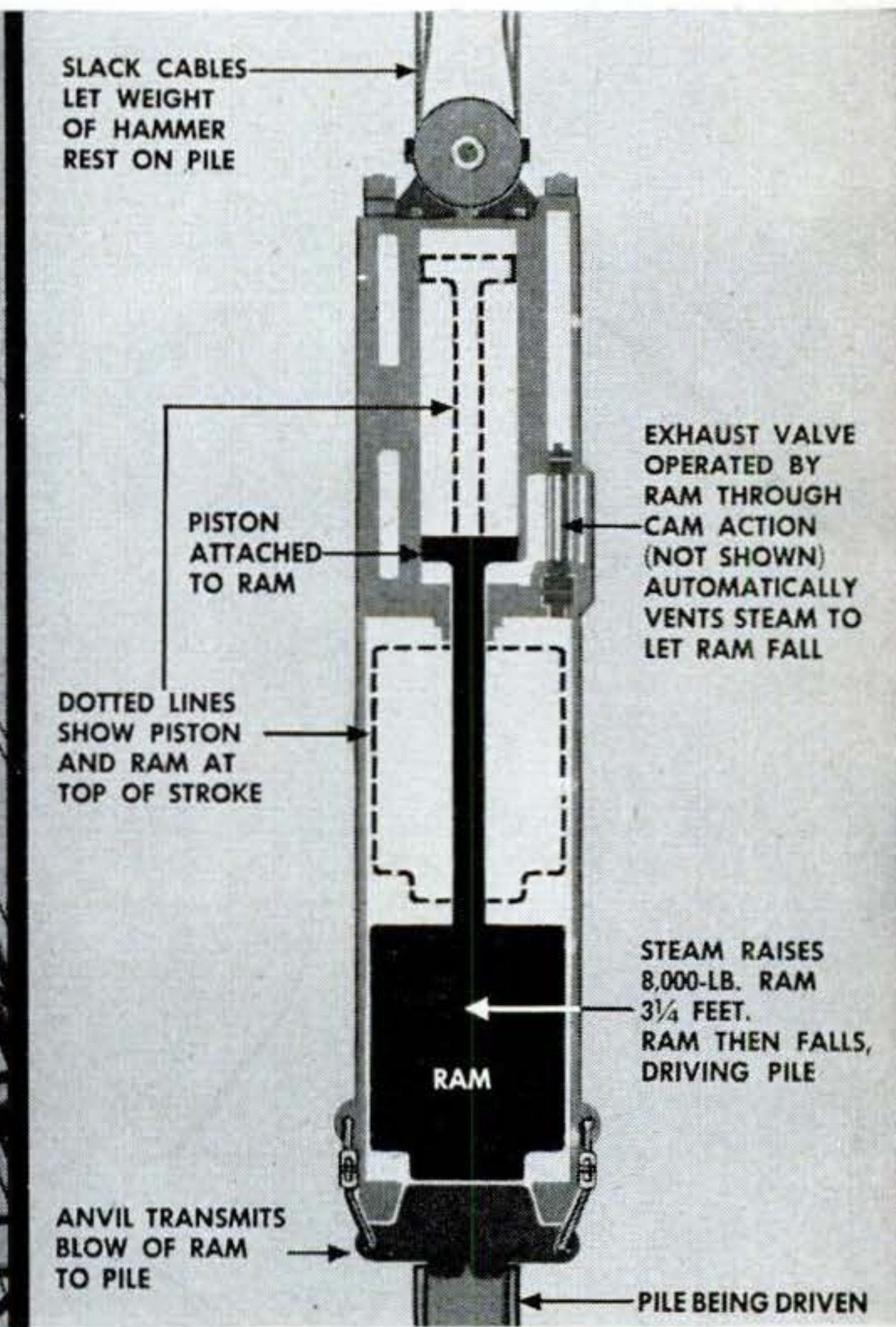
3. Worker drops rock to check position of rig over right spot. Seen just above him, anvil of steam hammer is notched to fit and engage H-shaped end of pile that hammer will drive.



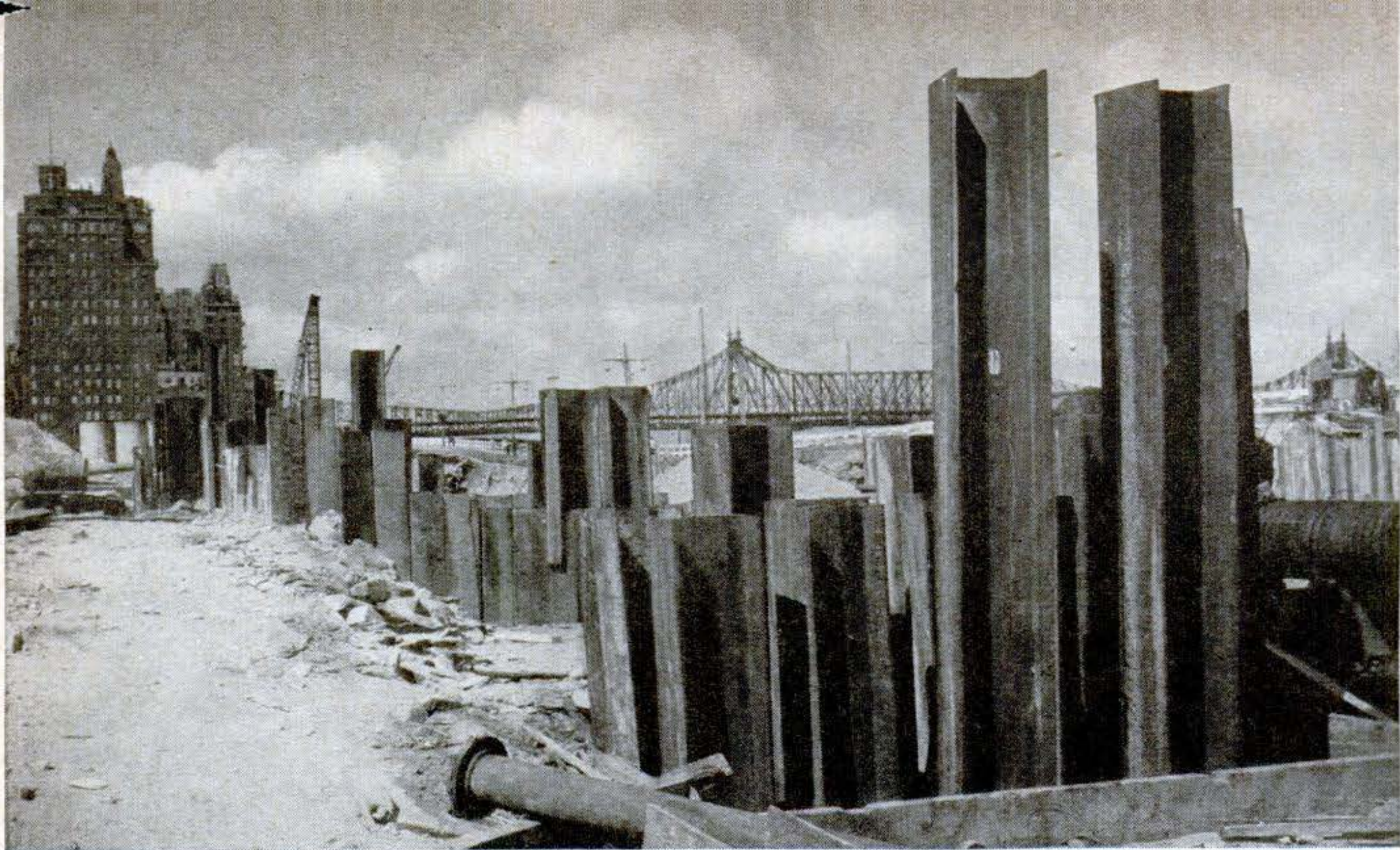
4. Pile now stands vertically on ground, ready to be driven. Whole weight of steam hammer rests on its top end. Hoisting cables of hammer are slack, and hammer will follow pile down.



5. Fifty-five clanging blows a minute from four-ton ram of steam-spouting hammer drive pile home. Rapid at first, progress gradually slows, ending when pile reaches bedrock.



6. Inside view of steam hammer shows how piston raises ram, which trips exhaust valve and falls against anvil, driving pile. Operation is automatic so long as operator feeds steam. ▶



7. Sunk to "refusal" or until they will go no farther, these piles have come to rest against bedrock, deep below the surface of the ground. Because of irregularities in the underlying rock

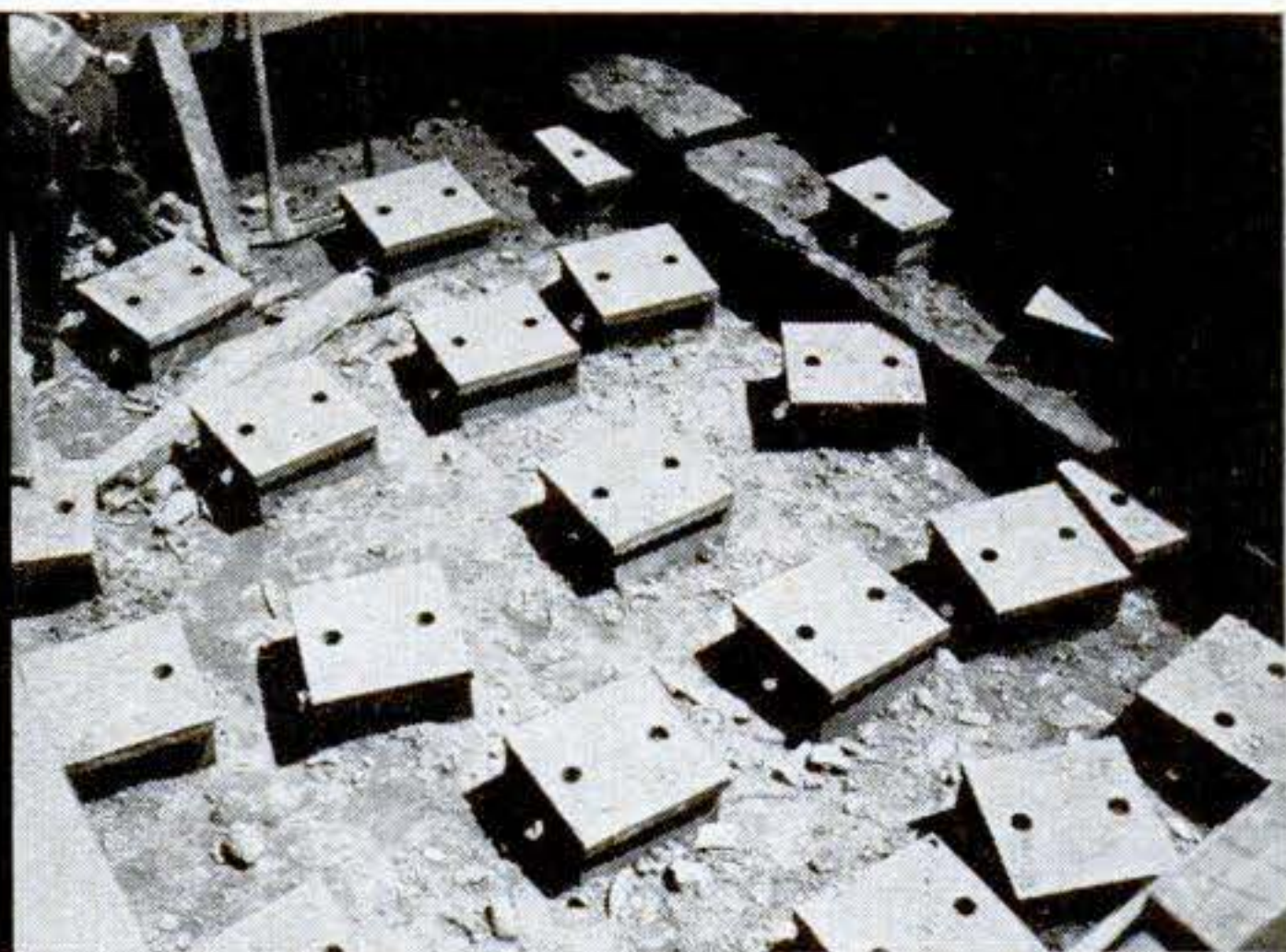
strata, some piles are left projecting farther than others. All will be cut off evenly, before concrete is poured over them in the boxlike forms seen in the illustration above.



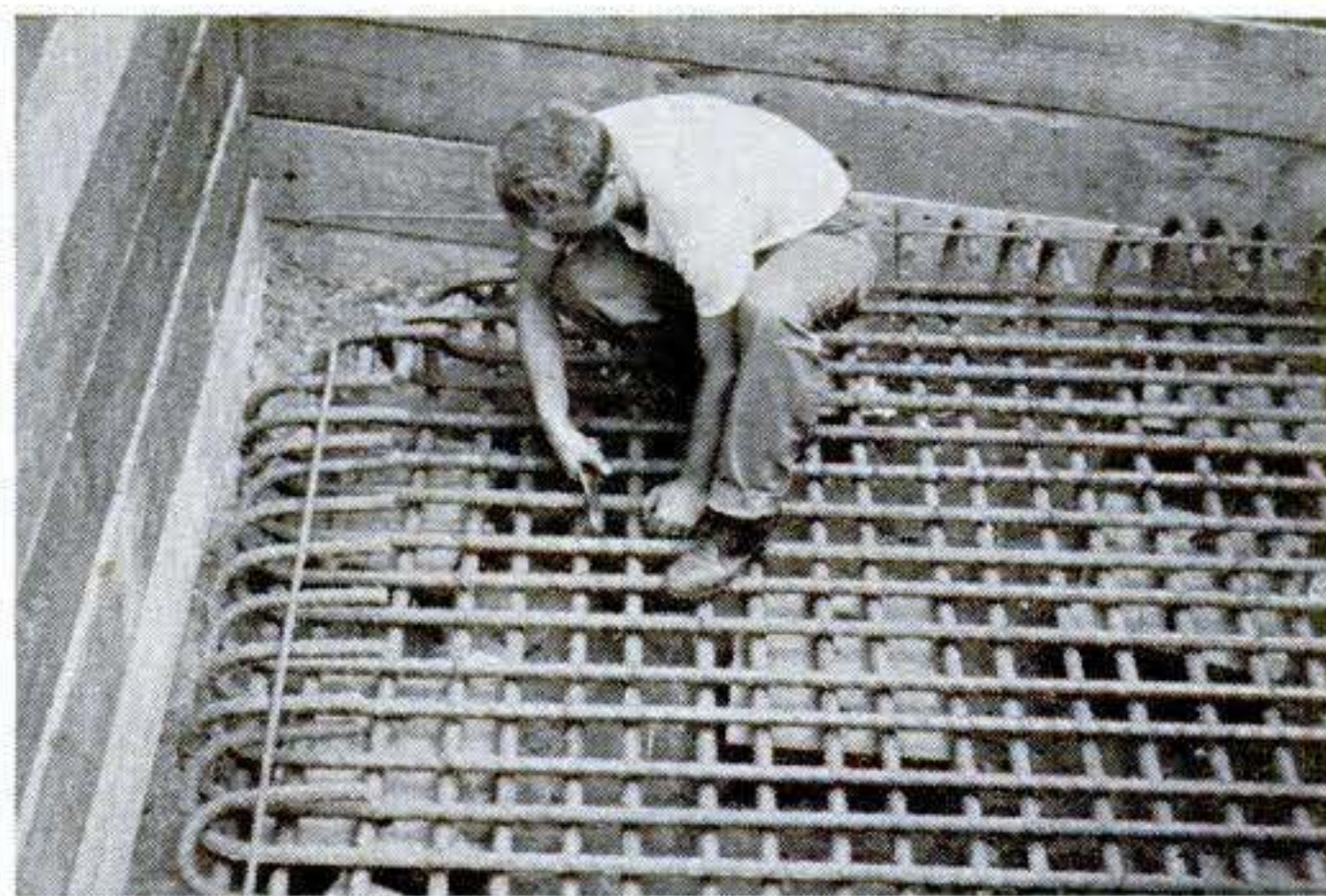
8. Trimmed off with cutting torch, ends of sunken piles clearly show their H-shaped cross section. Except for their uniform thickness throughout, they resemble structural girders.

shorter stroke, and more blows per minute. However, builders sometimes prefer and specify the heavier single-acting type because the force of its blows is absolutely uniform, depending on gravity alone and being unaffected by varying pressure of steam supplied from the boiler of the rig.

Types of piling include timber piles; concrete piles, either precast and driven with the aid of protecting metal caps, or cast in place within driven steel tubing by several patented methods; and, more recently, steel H beams. The last are finding increasing favor, especially in hard-to-penetrate ground such as is found at the UN site. **END**



9. Flat plates, welded to tops of piles, serve as bearing surfaces to support weight. Piles now are ready to serve as underpinning for reinforced-concrete foundation of a building.



10. Network of reinforcing bars, laid over capped tops of piles, is being wired together above. Final step of pouring in concrete makes piles an integral part of building they support.



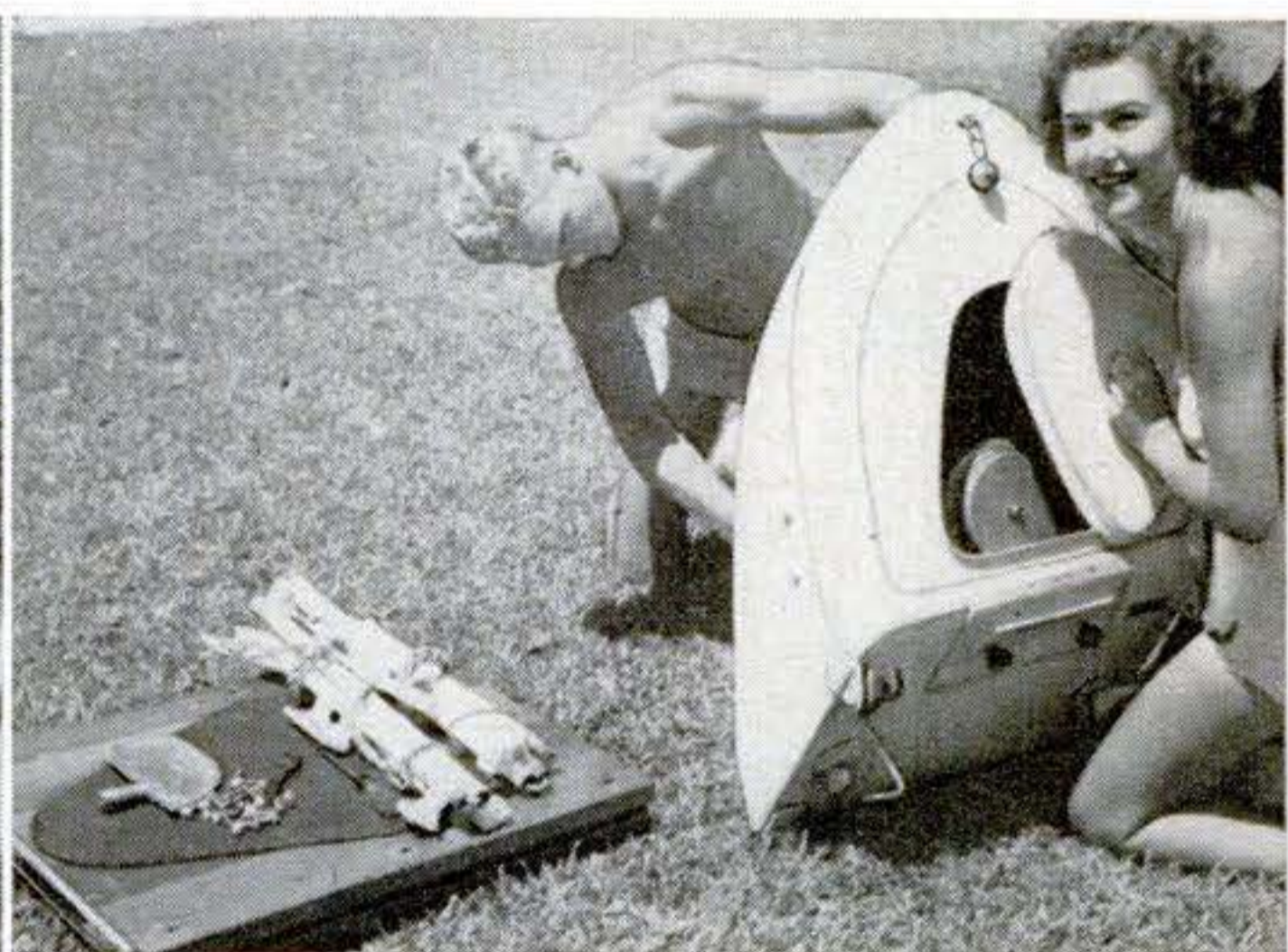
Bail-Out Net Trains Pilots

PILOTS learn how to bail out of a speeding plane by making practice jumps on the ground into this new type of net. In use at the Naval Air Station, Alameda, Calif., the net stretches above the plane's wing just be-

low the cockpit rim and turns upward at one end to keep trainees from overshooting it or rolling off onto the ground. Old-type nets were lower and flat, causing occasional injuries. The jumps are made with the plane standing still but with its propeller turning to provide a realistic airstream.



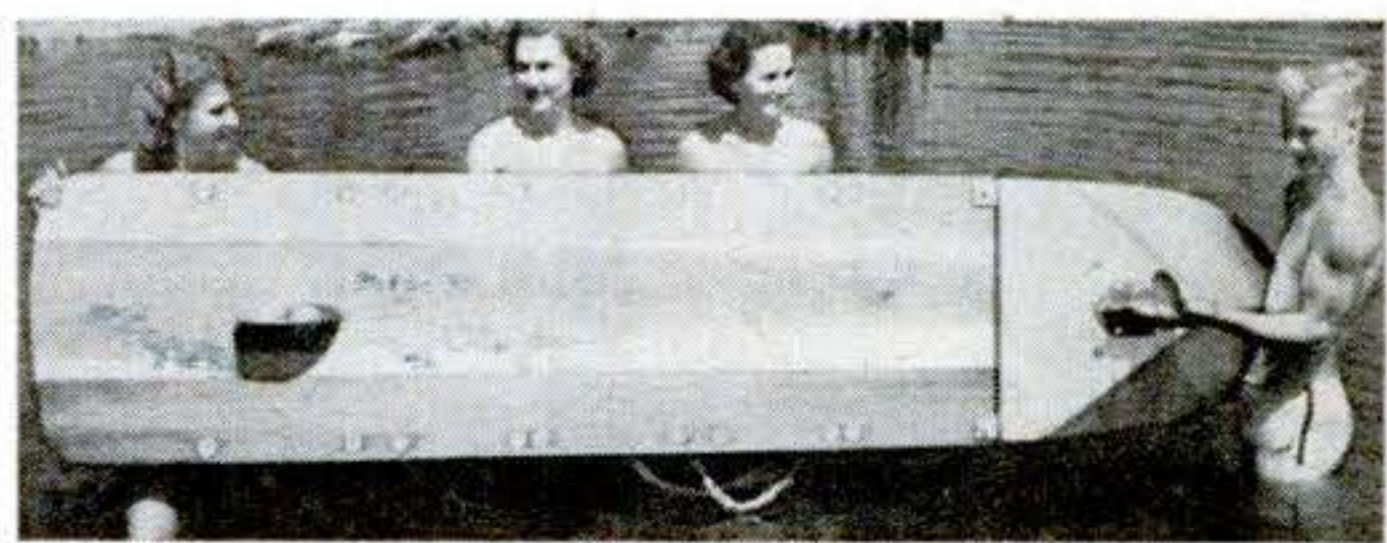
Ridden like aquaplane, motorized Skim Boat® hits speeds up to 35 m.p.h. Unsinkable, it is steered by pulling on hand ropes that run back through side rails to tiller near rear of sled.



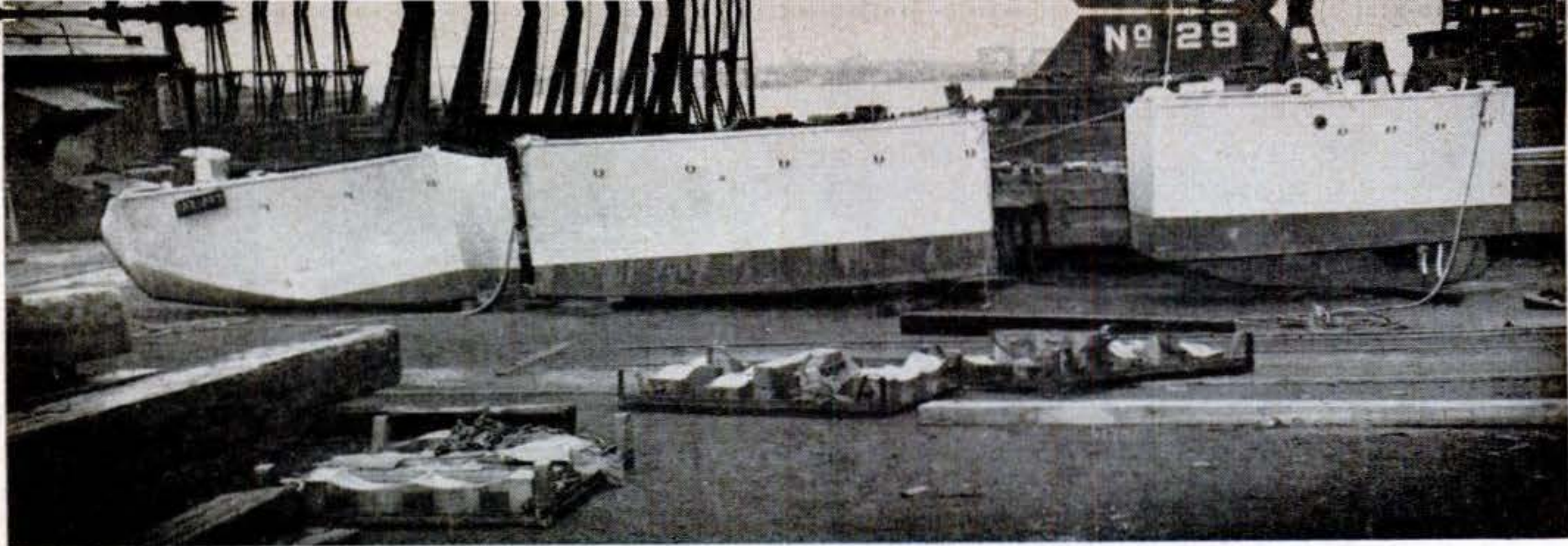
Watertight, aluminum compartment (right, above) forms bow and houses 7½-hp. outboard engine. Sled, which hooks on behind, comes apart in sections for easy carrying in car trunk.

Outboard Powers Aquaplane

You don't need a boat to pull this aquaplane. A 7½-hp. outboard engine, housed in its metal prow, speeds it over the water at up to 35 m.p.h. Placing the engine up front keeps spilled riders from falling backward into the propeller. And if a rider falls off, letting go of the steering ropes automatically stops the motor. Hansen, Inc., Bryn Mawr, Pa., makes the Skim Boat®.



Weighing only 120 pounds, including engine, sled is 90 in. long, 24 in. wide. Engine's propeller (right) protrudes into water below metal nose. Fin near sled's stern (left) is steering tiller.

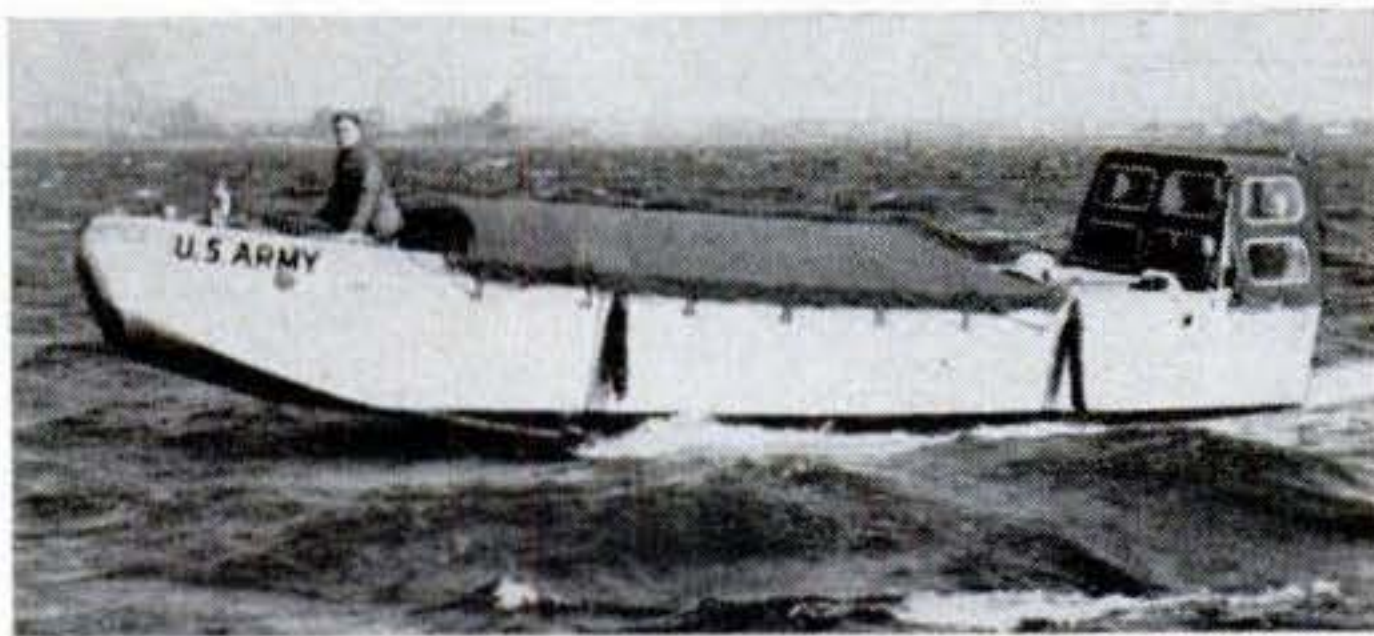


Here's how the Army's come-apart cargo launch looks with its three sections disassembled.

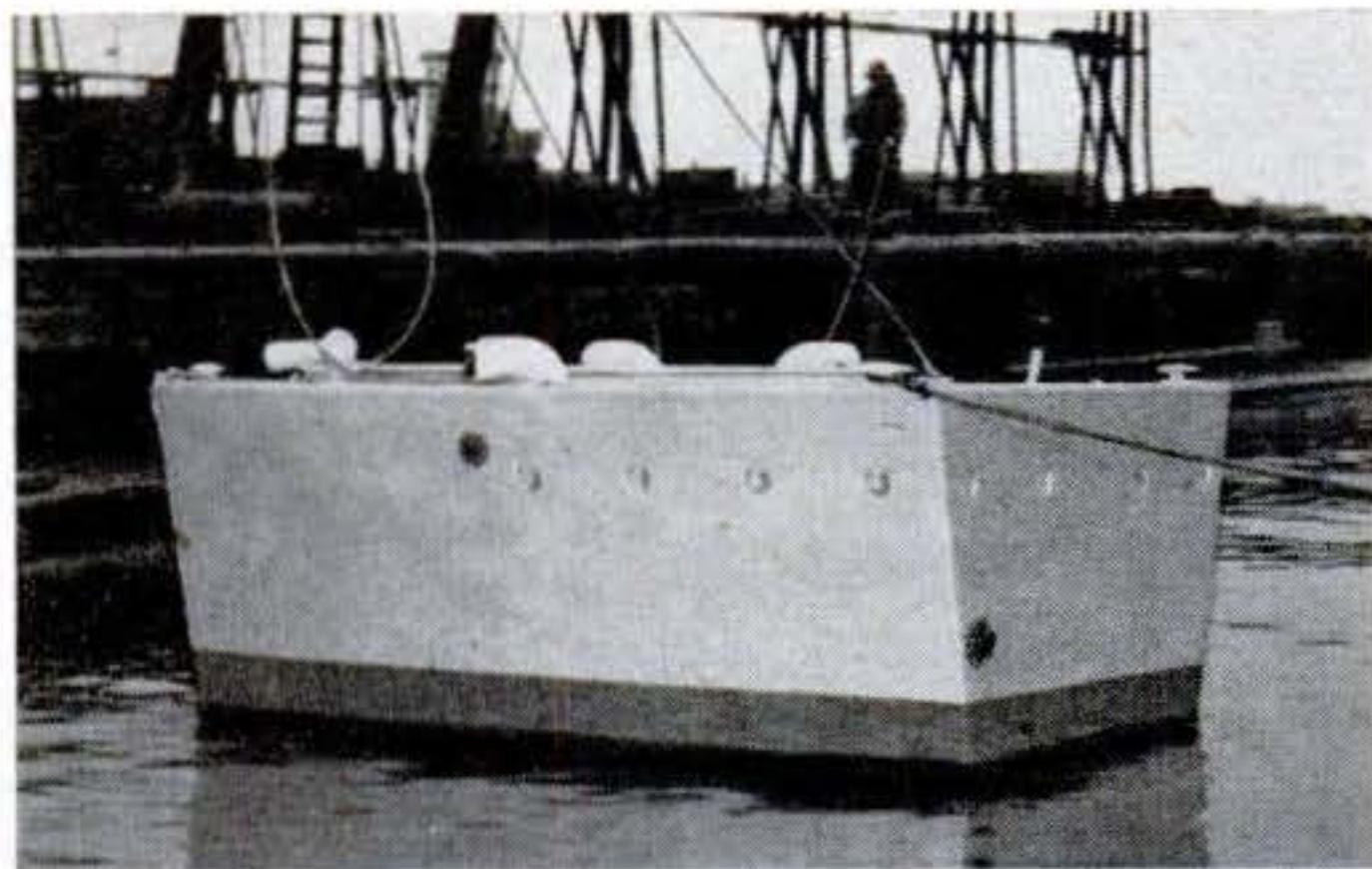
Come-Apart Boat For Arctic Army

ON THE varied terrain of the Arctic, boats are as essential Army equipment as tanks—but they must have overland mobility. That's why this 32-foot cargo launch is built in three sections. Only eight bolts connect the three parts, making possible assembly or disassembly in a few minutes. The bow and center sections weigh less than 800 lb. each, while the stern unit, including the 60-hp. engine, weighs about 1,600 lb.

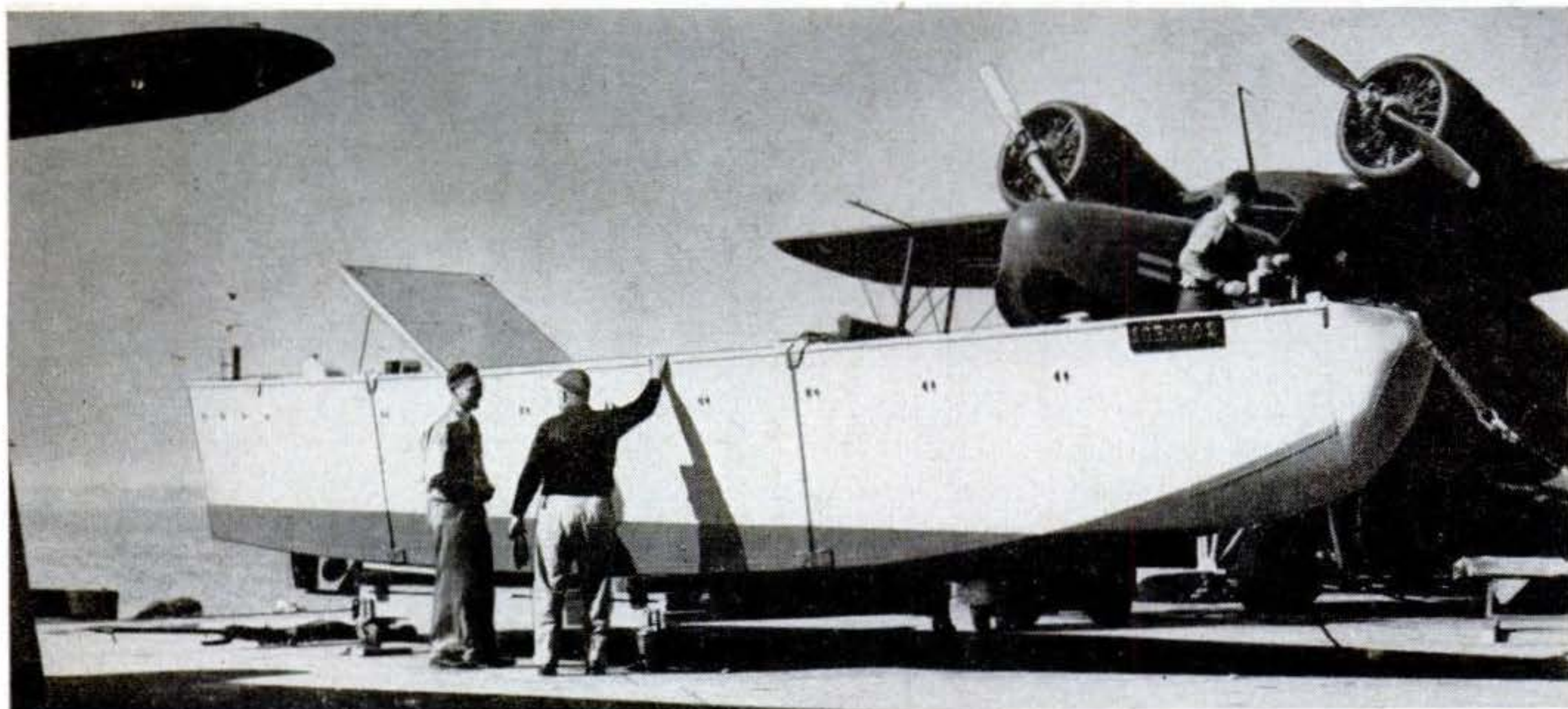
The all-aluminum boat, built by Edo Corp., of N. Y. C., for the Army, is especially designed for the Far North. Except for the V-shaped section, the bottom is flat, with two runners to facilitate skidding across the ground. Drawing only 24 inches with a load of 5,000 pounds, the boat is ideal for operations in shallow waters. The propeller, located in a semi-tunnel, is protected from damage against rocks. The upswept bow permits the craft to be beached under its own power.



Assembled and launched, the boat has a speed of 10 miles an hour. The enclosed helmsman's cockpit in the rear can be heated for Arctic operations. Canvas canopy covers cargo space.

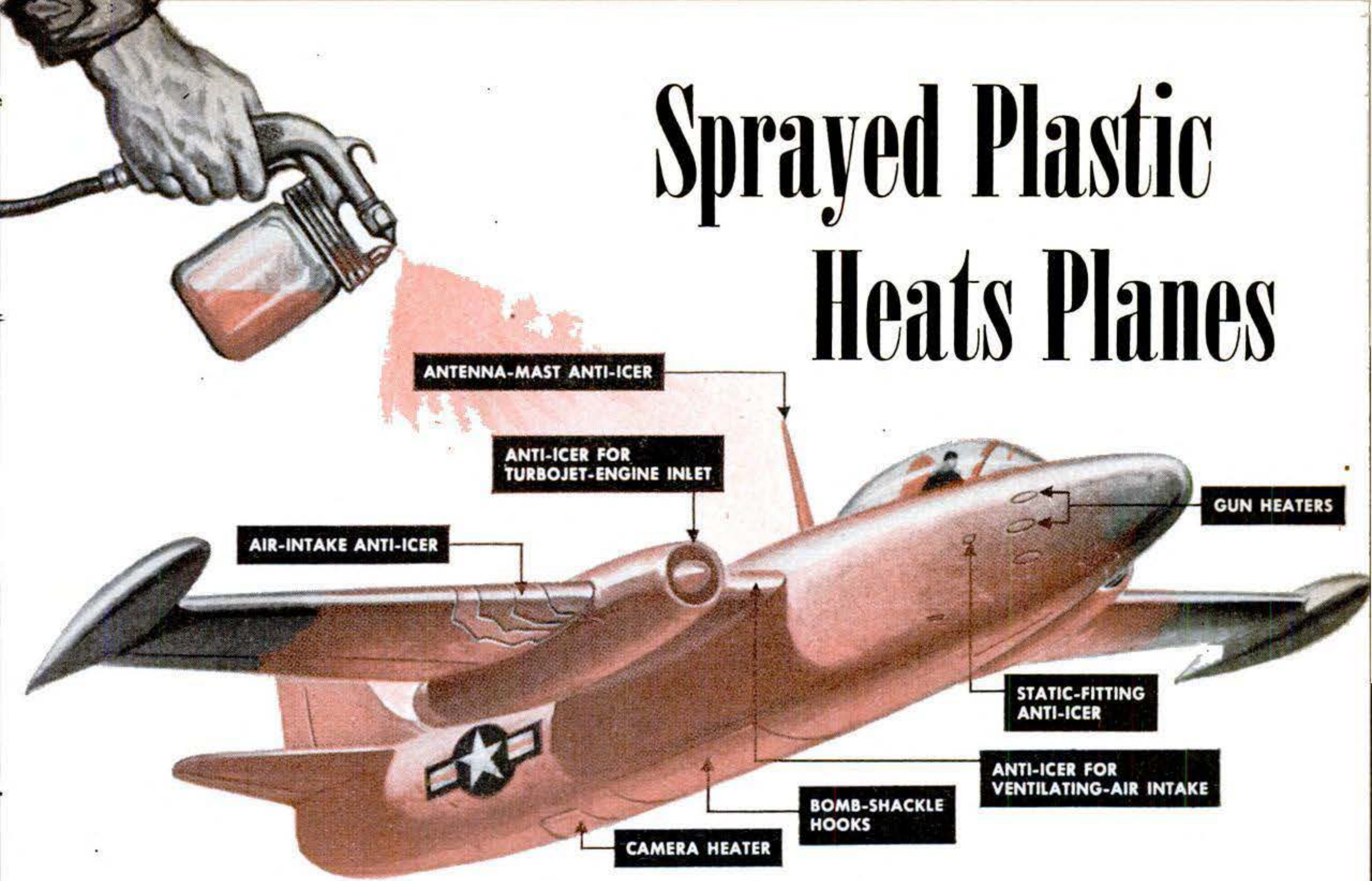


The rear section, shown above, contains all the controls and the gas engine in a weather-proof compartment. It can be used separately as a marine tractor for moving rafts or barges.



Fully assembled, the sectional launch can be transported in a Fairchild C-82 Flying Boxcar.

Sprayed Plastic Heats Planes



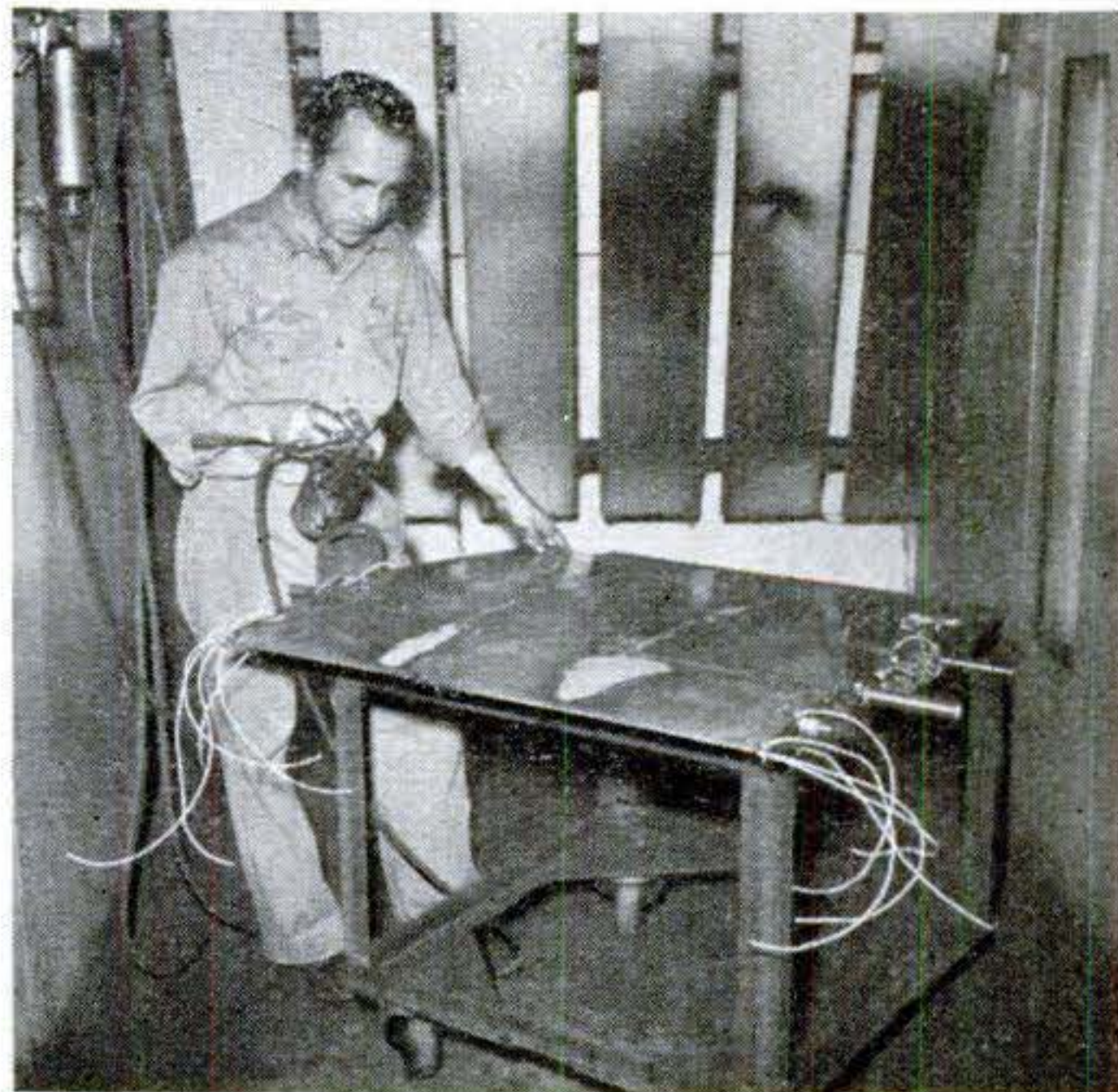
PATCHES of plastic, some thinner and smaller than a postage stamp, are being used to keep ice from forming on vital parts of airplanes and to keep guns warm. The secret: a special type of electrically conductive plastic that acts as a heating element.

Applied to anything that would suffer from low temperatures, the substance, called Electrofilm®, becomes a covering so tough

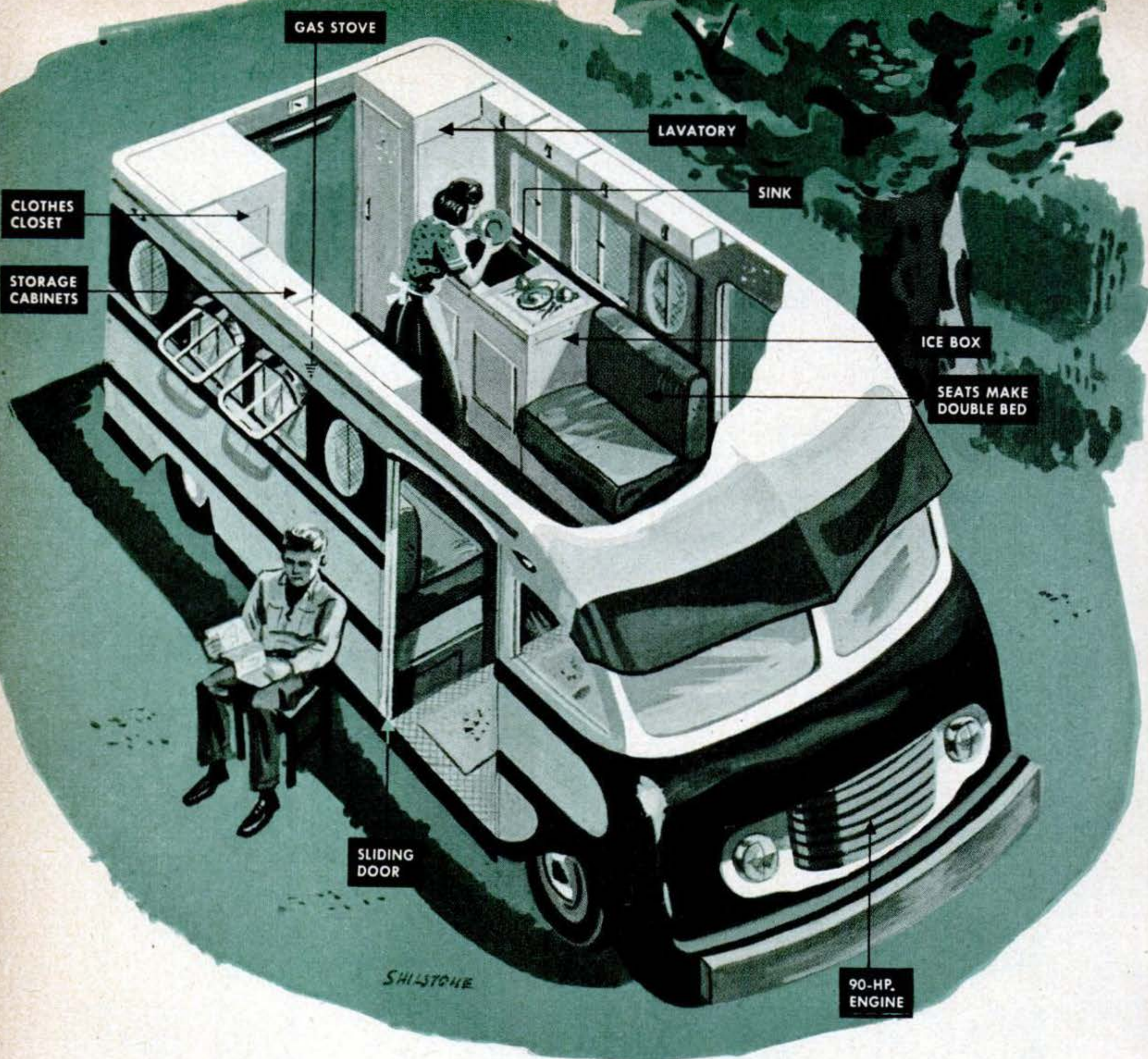
that sandblasting is required to remove it. When electricity flows through it, it heats up, warming aircraft antenna masts, accessories of jet engines, cabin air intakes, bomb-shackle hooks, and the cold-affected parts of guns. Weighing less than an ounce a square foot, it can produce temperatures up to 600° F. It was developed by the E. R. Hall Co., of North Hollywood, Calif.



Electrofilm cemented to bucket bottom and electrically energized boils water in a few minutes. Formulas vary. One type can be applied in watt densities up to 250 to the square foot.



The thermosetting plastic may be brushed or sprayed on. Here wing for wind-tunnel model plane is being treated. Usually applied over varnish, film thickness varies from .003 to .02 in.



Parked by the wayside, the \$3,500 house car is at least as comfortable as a roadside cabin.

Backing up or parking is only a little harder than in a conventional passenger car. There's a full-length sliding door on each side. Twin rear-view mirrors show driver his side clearance.

Big windshield and high, independent seats give fine forward visibility. Map table in front is big enough for a child to sleep on. Over windshield is a large storage locker.



Road Cruiser Made from Light Truck

PS Photos by W. W. Morris

COMMON delivery trucks, like the ones your laundryman or baker use, are being converted into "roadable homes" that may soon appear in numbers on U. S. highways. They combine in a single vehicle the housing conveniences of a large trailer, the roadability of a passenger car, and the ruggedness of a truck.

A house car isn't a new idea. Occasional ones have been custom-built for wealthy owners, usually on a bus chassis. Bulkiness, high first cost and fuel bills, and licensing complications have kept their numbers down. Now the Boyertown Auto Body Works, Boyertown, Pa., has begun to make "touring coaches" as a modification of its light delivery truck.

Boyertown house cars use a Ford F-3 chassis having a 122-in. wheelbase. Overall dimensions—18½ ft. from bumper to bumper and 7 feet wide—are about those of a large sedan. In most states passenger-car license plates will serve. Gasoline consumption depends on load, road, and speed, but averages around 10-14 miles per gallon.

The cab is entered through sliding doors. A third door is in the center of the back. Two trailer-type windows and two fixed-

glass portholes in each side light the interior of the body. Further ventilation is provided by air intakes up front, a rear window, an exhaust fan over the stove, and a hinged roof ventilator. A built-in gasoline space heater warms the interior. Two 4-ft. side seats fold down to make a double bed, and there is sleeping space for two other persons in a pinch. The steel body is undercoated and dustproofed, and the roof insulated with Fiberglas®.

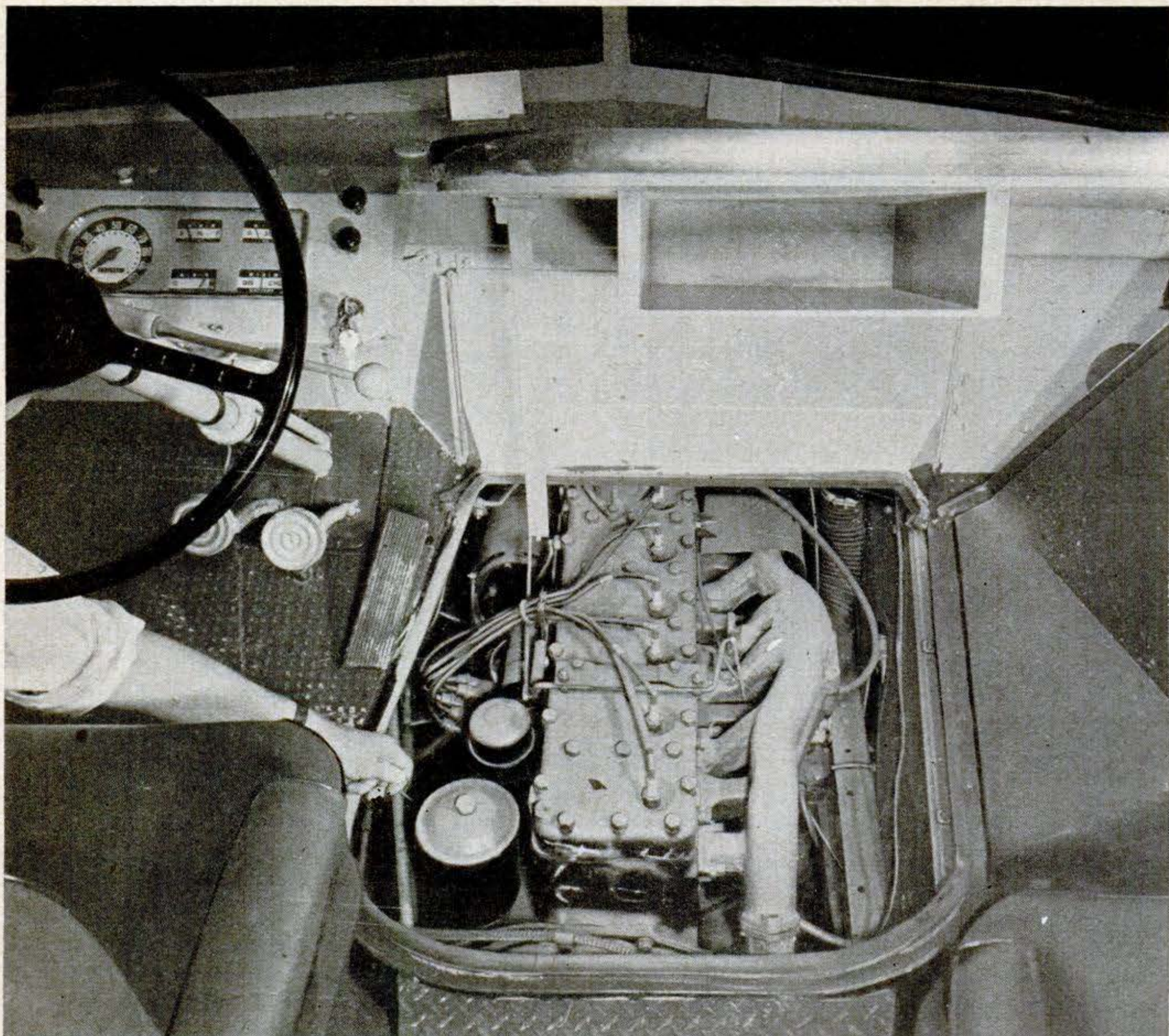
Counters topped with stainless steel house a gas stove, a 50-lb. icebox, and a sink fed by a 12-gal. water tank. At the back there's a clothes closet on one side, a lavatory on the other. When both doors are opened across the aisle, they enclose an area that serves as a dressing room. Numerous lockers and cabinets can hold small articles. Excluding the large cab and rear "bustle," the body has 360 cubic feet of usable space. A luggage carrier can be mounted on the roof, and a hitch is provided to tow a box trailer or boat.

This latter-day Conestoga wagon will probably cost around \$3,000, with optional extras. For users who don't want to lay out that much money, it may be possible to rent them from drive-it-yourself companies for vacations on the high-road.

Rear window hinges upward and locks there. Curved compartments beside door hold butane bottle for stove and emergency water and fuel cans. Spare tire is in lower compartment.

"Bustle" hinges downward to make ramp and step for rear door. Chain stops it from touching the ground. Locked horizontally, the bustle becomes a small "back porch." 



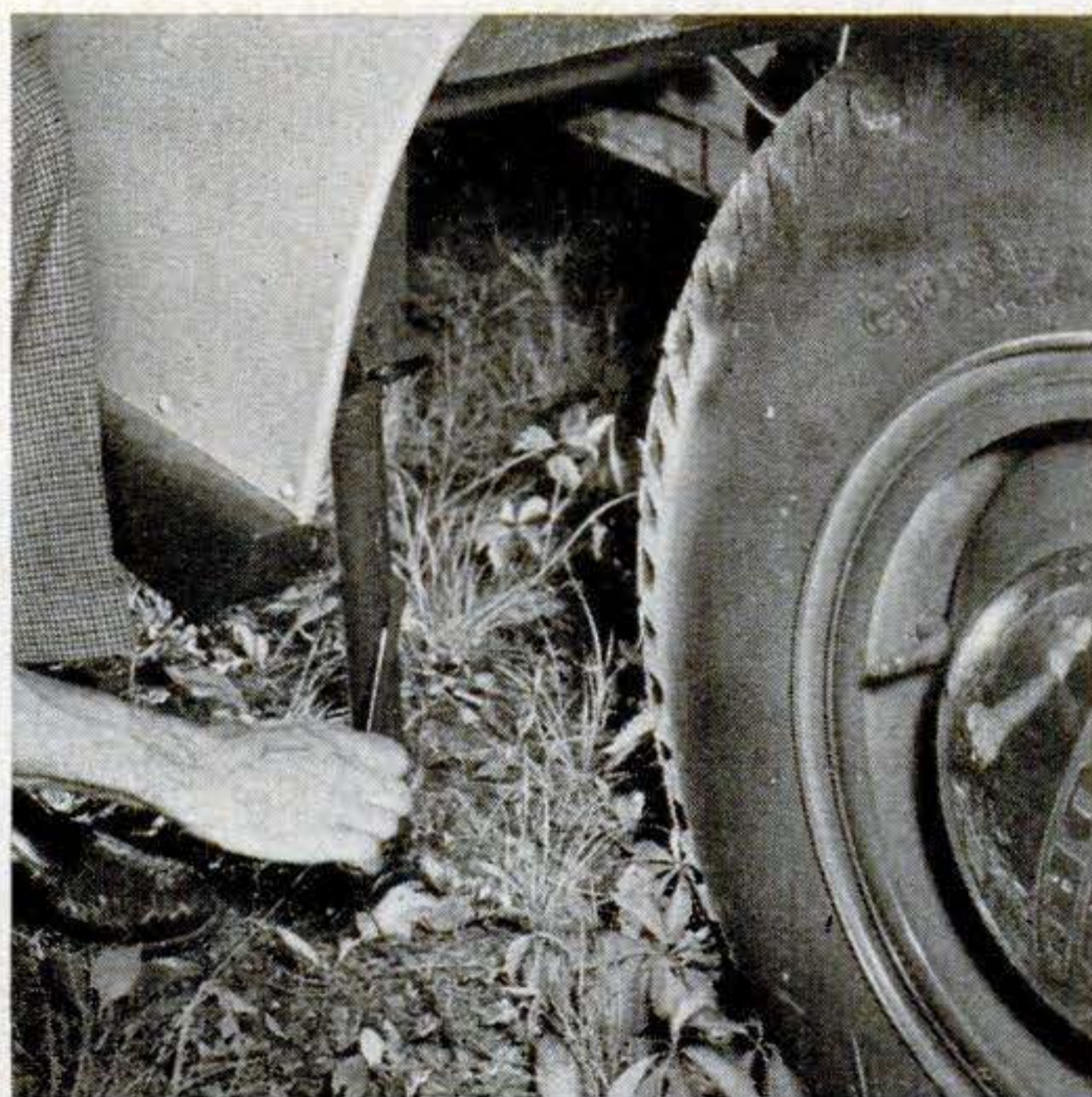


Lifting hinged, insulated cover gives access to 95-horse, 6-cylinder Ford engine. Hand

shows location of oil dipstick. The map table swings up to let the engine cover pass.



Oversize radiator is reached by sliding front panel out and down over grille. Twin vacuum motors swing big wipers. The insigne in the center reads "Ford-Boyertown Touring Coach."



Two screw-jacks are pivot-mounted just forward of rear wheels. Let down when the vehicle is parked for the night, they keep body from jouncing on its springs. Tires are 7.50 x 17.



Good meals can be cooked on the three-burner gas range with temperature-controlled oven. Exhaust fan is in locker overhead. Icebox, sink, and more storage space are in counter at right.



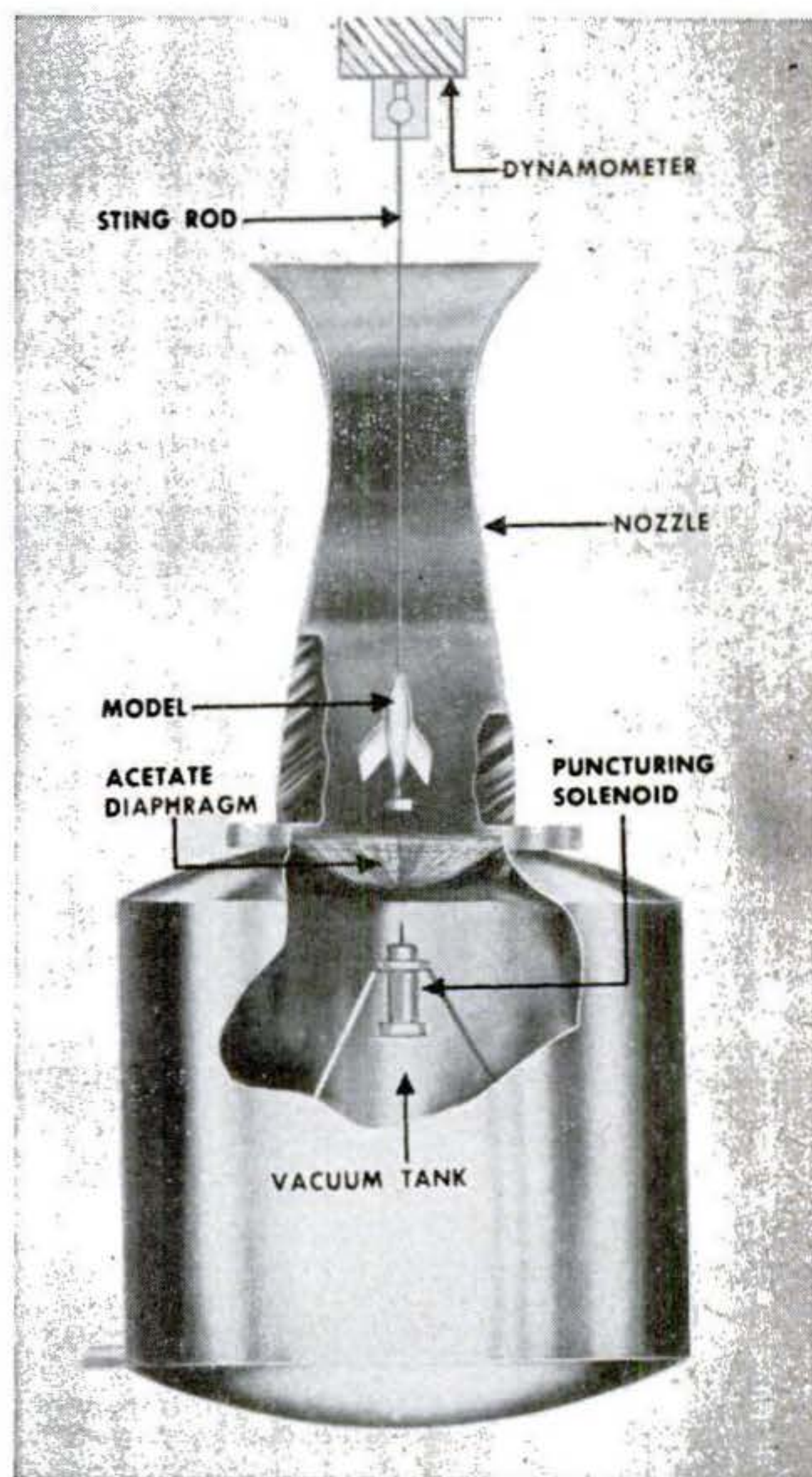
Folding center table and long side seats can accommodate four at meals. There's enough headroom inside for a six-footer to stand straight. Table folds flat and can be stowed at one side.



Seat backs bridge aisle to make a comfortable double bed. Rear aisle is big enough to sleep a third adult on an air mattress. A bunk for a child can be fitted at front of the vehicle.

Baby Tank Tests Sonic Models

MOST supersonic wind tunnels are enormous, expensive pieces of apparatus. But engineers of the National Advisory Committee on Aeronautics have designed a baby model that is comparatively easy on the pocketbook. Its supersonic wind is brief, and drag measure-



ments are rough, but that is enough to indicate promising avenues of design.

The tunnel consists mainly of a steel tank five feet in diameter and five feet high. Atop it are a supersonic nozzle and a test section. The test section is separated from the tank by a sheet of acetate plastic. Once a pump has created a vacuum in the tank, this sheet is pierced by an electrically operated punch. The air that then rushes into the vacuum tank creates supersonic flow in the test section.

How Native Ingenuity Met a Polio Crisis

From grease drums, vacuum cleaners, and whittled wooden valves, the mechanics of Muncie, Indiana, improvised their own "iron lungs."

By Stewart Rouse

Photos by Ralph Satterlee

Drawing by Reynold Brown from eye-witness description of scene in Ball Memorial Hospital

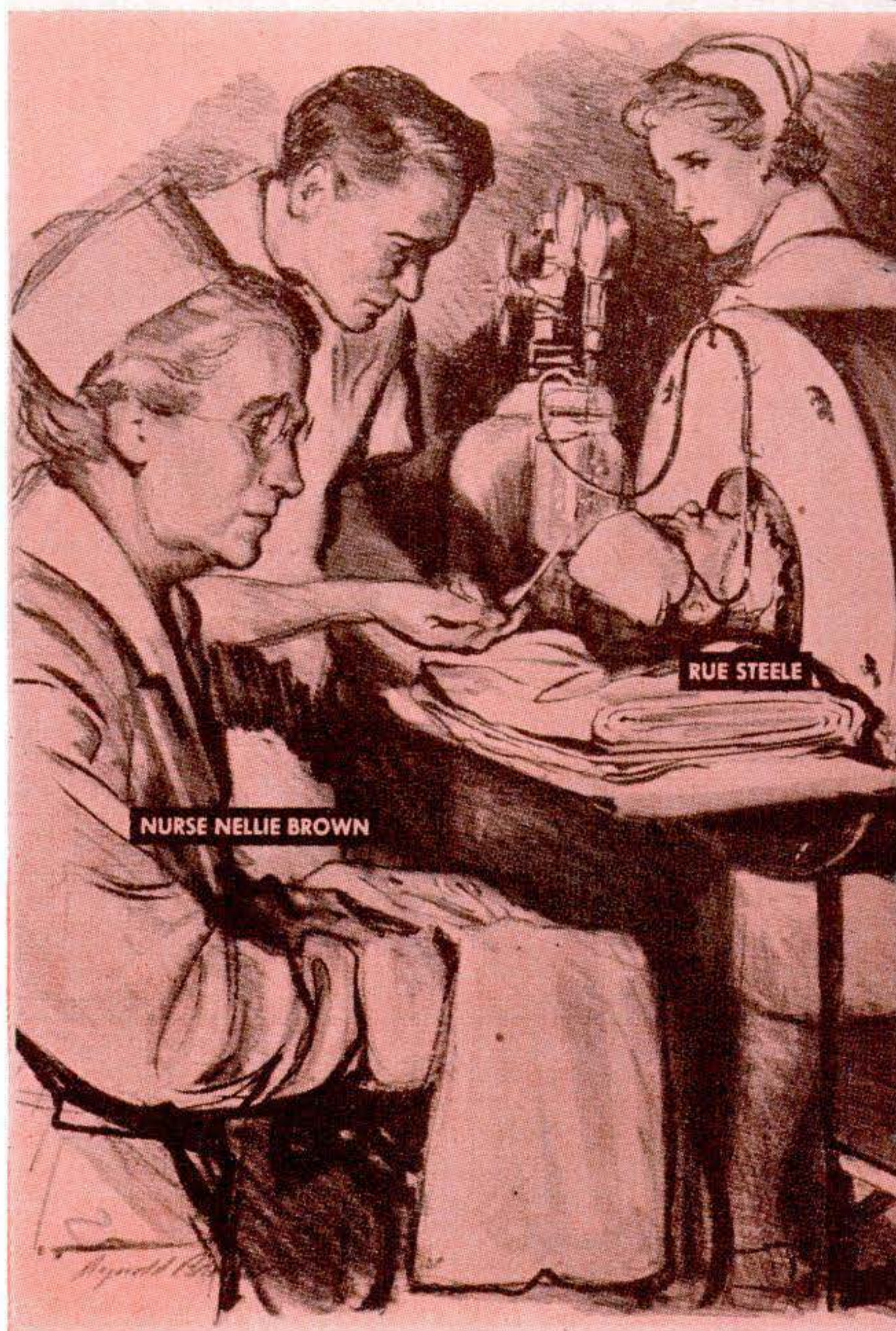
ONE blistering day this past summer the telephone rang loudly in the office of Jack Reichart, an appliance manufacturer in Muncie, Indiana.

"This is Nellie Brown at the hospital," said the voice in the receiver. "You'd better get started on that iron lung we discussed last week. It's an emergency."

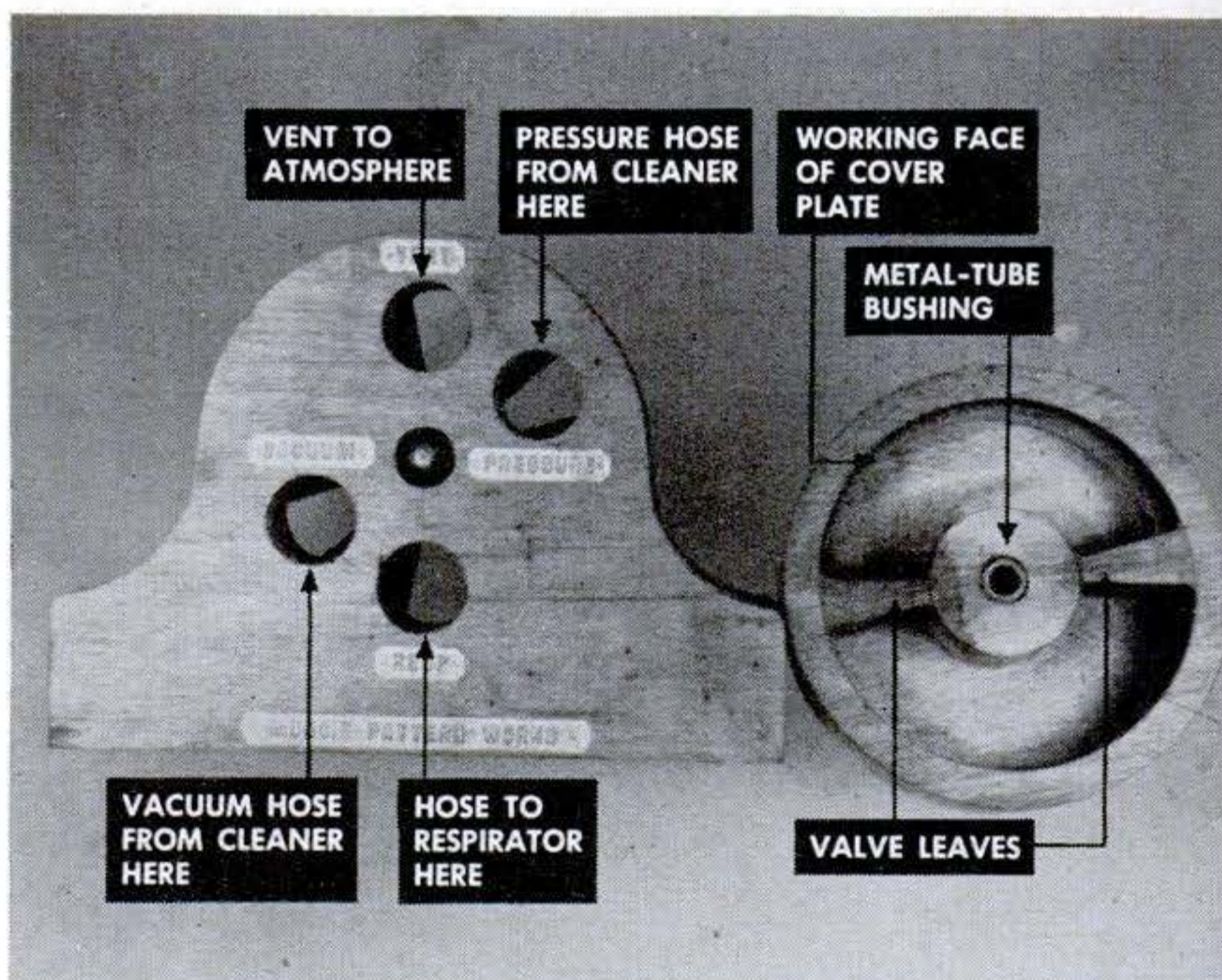
A boy was dying.

On the Monday morning that Miss Nellie G. Brown, superintendent of Ball Memorial Hospital, telephoned Reichart, polio (poliomyelitis, or infantile paralysis) was becoming epidemic in the city and in the three-county area around it. Some of the cases were the dread bulbar variety, in which paralysis of the diaphragm muscle finally prevents breathing unless artificial respiration is applied. That meant a need for "iron lungs," the specially constructed cylinders into which air is alternately pumped, then partly exhausted at the normal rate of breathing.

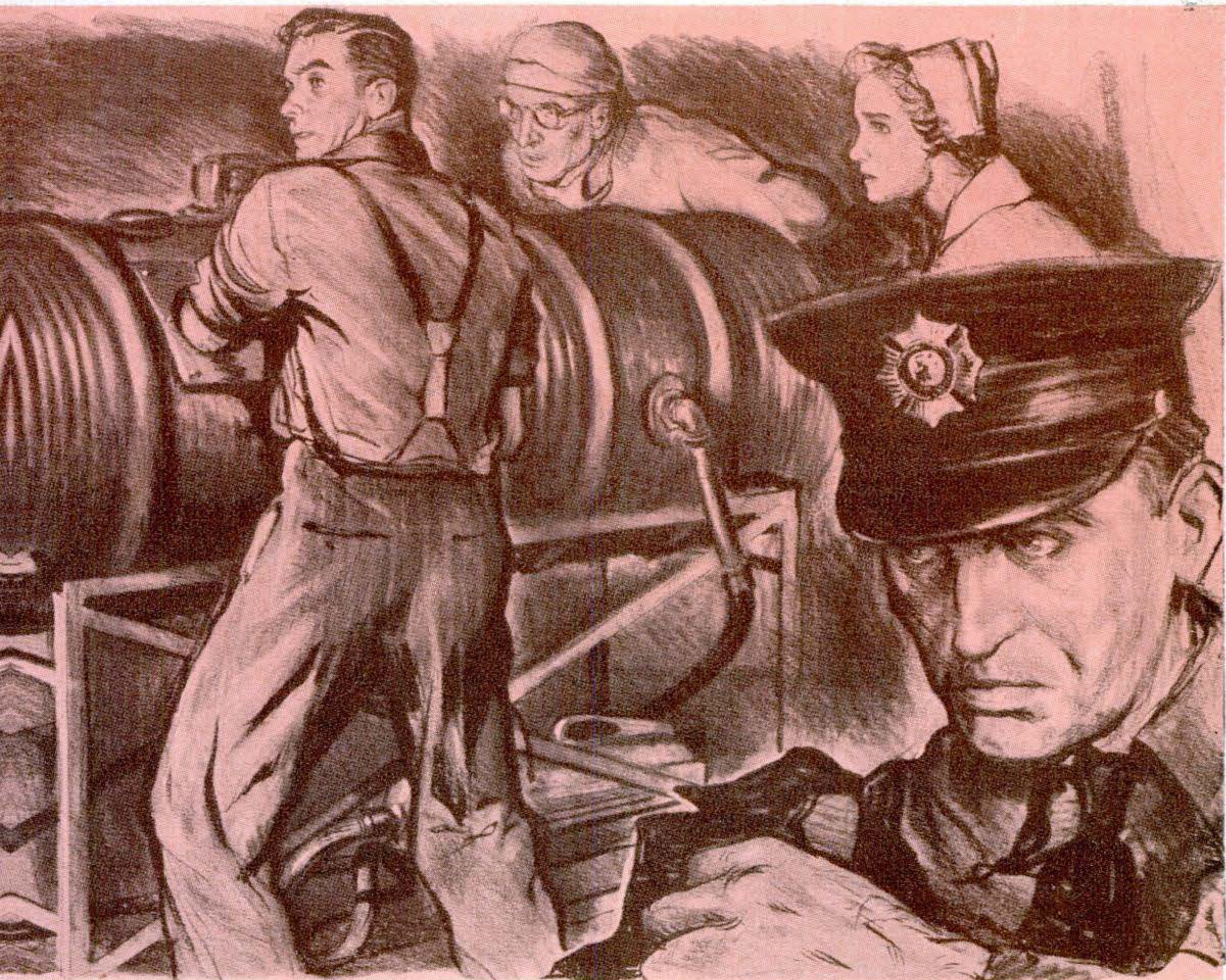
But iron lungs are expensive. Anyway,



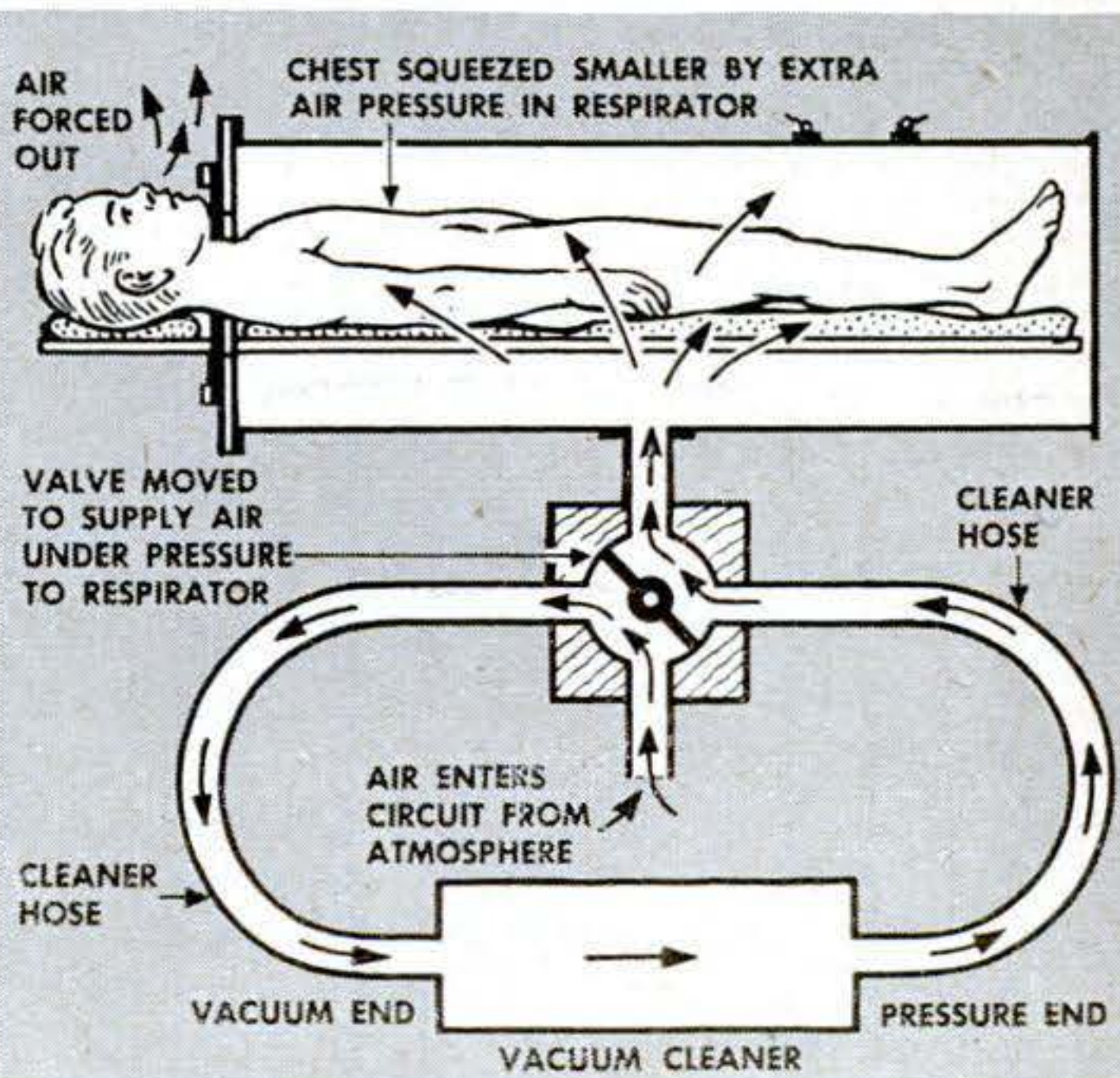
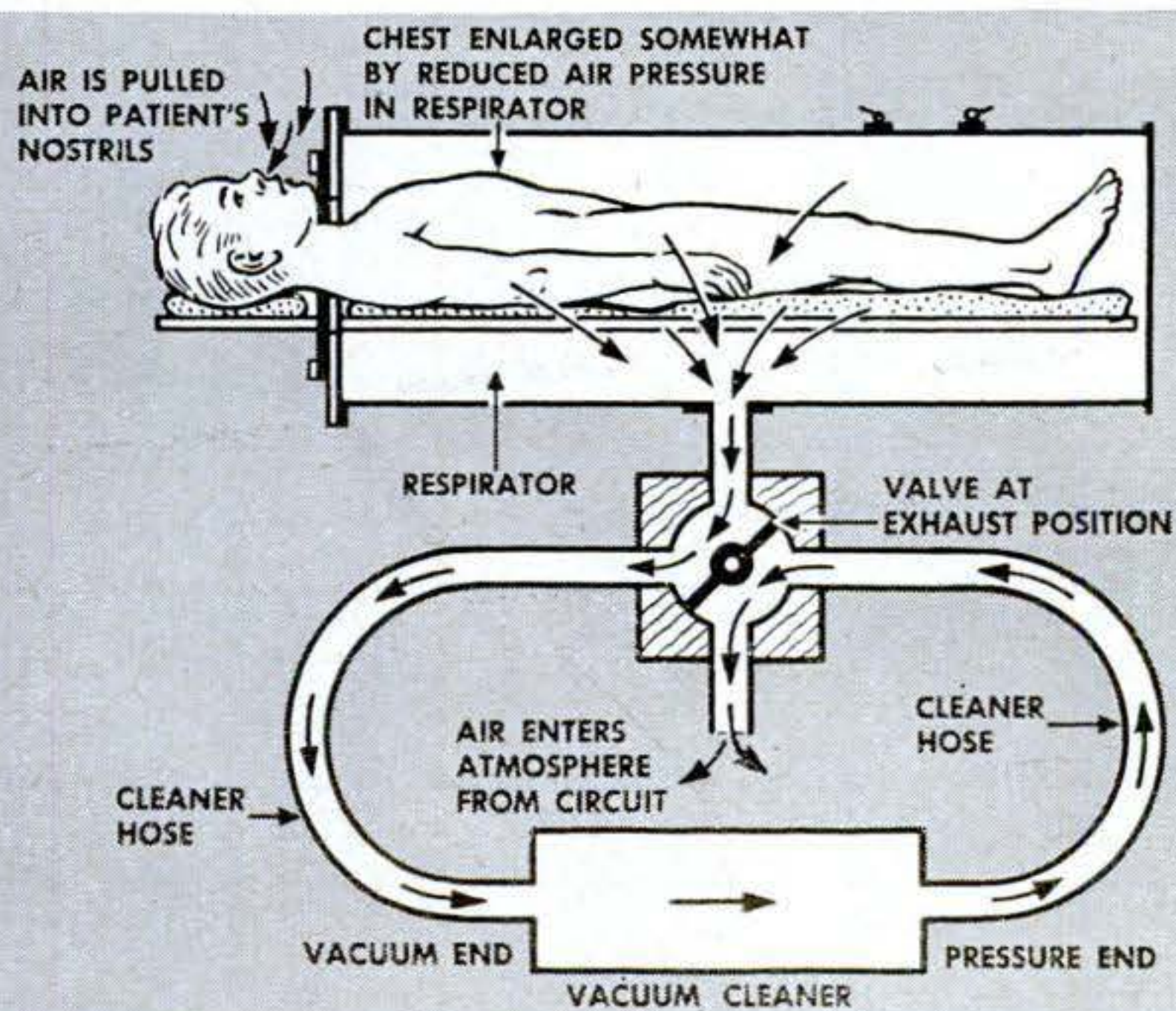
Firemen, working shifts, kept the tired boy



First valves were of hand-carved mahogany. They made it possible to use both ends of vacuum cleaner, thus providing positive pressure in chamber to help patient exhale air in his lungs.



breathing—pressing the air out of his chest with their hands—until a valve could be made.



Tank-type vacuum cleaners ran emergency iron lungs that met Muncie's polio crisis. During inhalation period, valve sends air from iron lung to suction end of cleaner, lets its blower vent outside.

During exhalation part of breathing cycle, valve position is reversed. Air from blower end of cleaner is directed into iron lung. Suction end of cleaner draws air from the atmosphere. ➡

you couldn't buy one that quickly, even with the money. Ball Memorial had three, plus a little portable model. They were already in use. The hospital couldn't wait.

Reichart had a shop accustomed to turning out unusual jobs.

"Can you make an iron lung?" Miss Brown had asked him two days before.

"I don't know," he replied. "I can try."

Over the weekend he had drawn plans for one of the complicated machines, using as a guide an article in a medical magazine several years old Miss Brown had given him.

Now Reichart went to work in his shop. He ripped an end out of each of two big alcohol drums and welded them together. Then he got an ordinary tank-type vacuum cleaner from Sears, Roebuck. He installed a flapper valve in a bung hole on the top of his crude cylinder, and to it attached the hose from the cleaner.

10-Hour "Iron Lung"

He knew he had to control the pulsing of air in and out of the cylinder, so he scrounged around until he found a geared-head electric motor that turned at 3 r.p.m. On its shaft he put a 10-tooth bicycle sprocket. As the sprocket revolved, a tooth moved a little lever actuating the flapper valve. This permitted the vacuum-creating end of the cleaner to draw air from the cylinder 30 times a minute.

When he was done, he glanced at the clock. The job had taken him just ten hours.

The crude but workable artificial respirator was hurried to the hospital. The boy patient was put in this machine-shop version of an iron lung. When the vacuum cleaner pulled down the atmospheric pressure in the cylinder enclosing his chest, he inhaled by muscular relaxation. The reduced pressure also arched the diaphragm away from the lungs and gave them room to expand. When normal atmospheric pressure flowed back into the respirator, 30 times each minute, the boy exhaled.

Local resourcefulness had won the first round. But the crisis with the patient was not over. It had only been postponed.

A few hours later another emergency developed. The boy's chest muscles began to tire. Atmospheric pressure alone was not enough to produce the sharp exhalation needed to keep pumping a supply of oxygen to his system. Doctors gathered around. At the rate the patient was tiring, he had no more than four hours to live.

Something had to be done to supply positive pressure outside his chest cavity to force the air out after each inhalation.

The vacuum cleaner was taking part of the air out of the cylinder, but it wasn't forcing any back. Its blower was just venting positive air pressure into the room.

There was the problem: to make some sort of a compound valve with ports that could use, in correct sequence, both the negative and positive pressures already available. Moreover, it had to permit a choice in operating speeds. Human beings of different ages breathe at different rates.

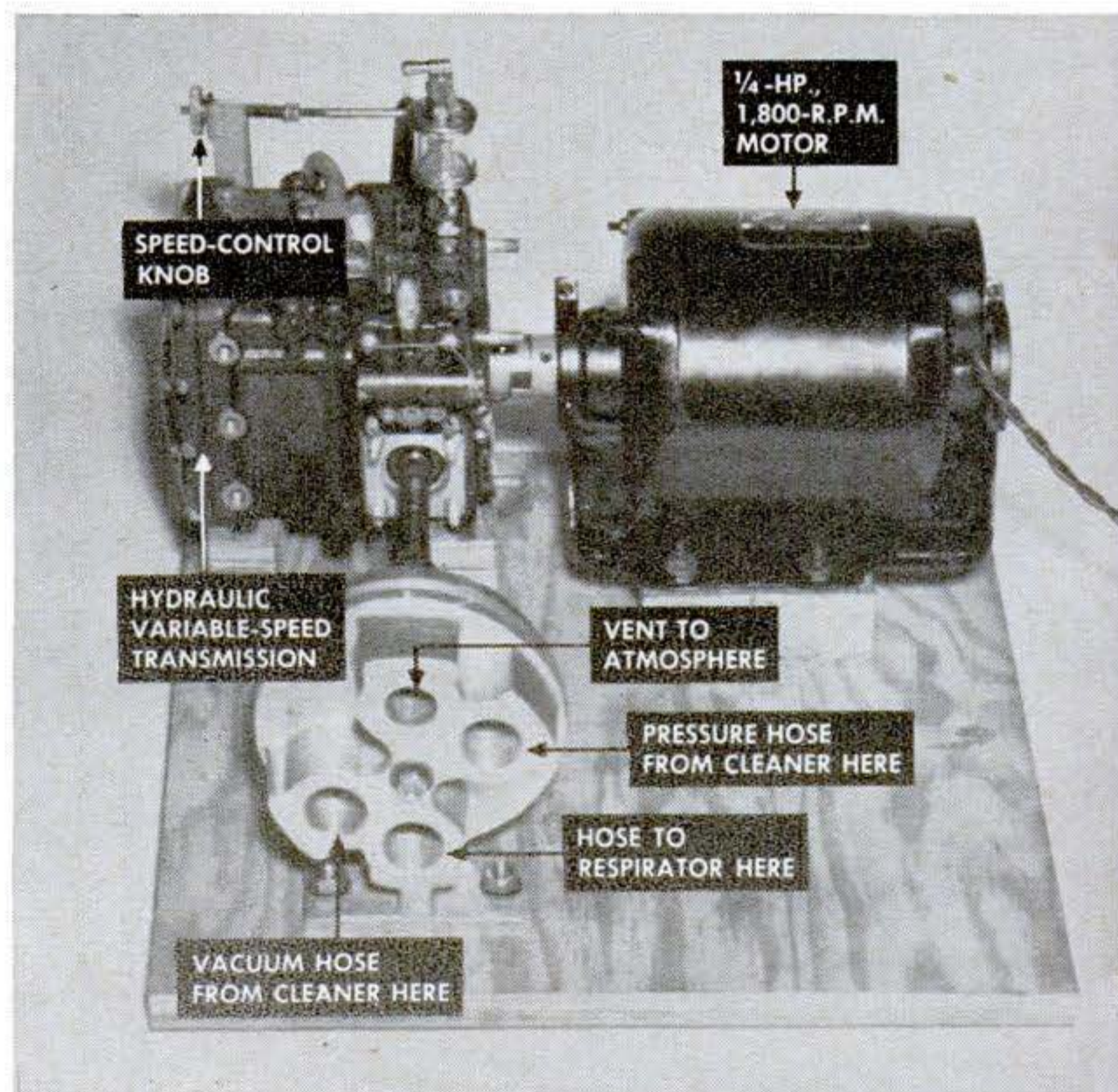
Here the Borg-Warner Corp. stepped in. This firm's Warner Gear Division has no mean talents. Readers of POPULAR SCIENCE know it as the home of the automobile overdrive (PS, Apr. '49, p. 180).

A Warner engineer started to work on that valve. Meantime, volunteer firemen, with their arms stuck through access holes in the respirator, applied hand pressure to the child's chest to aid each exhalation.

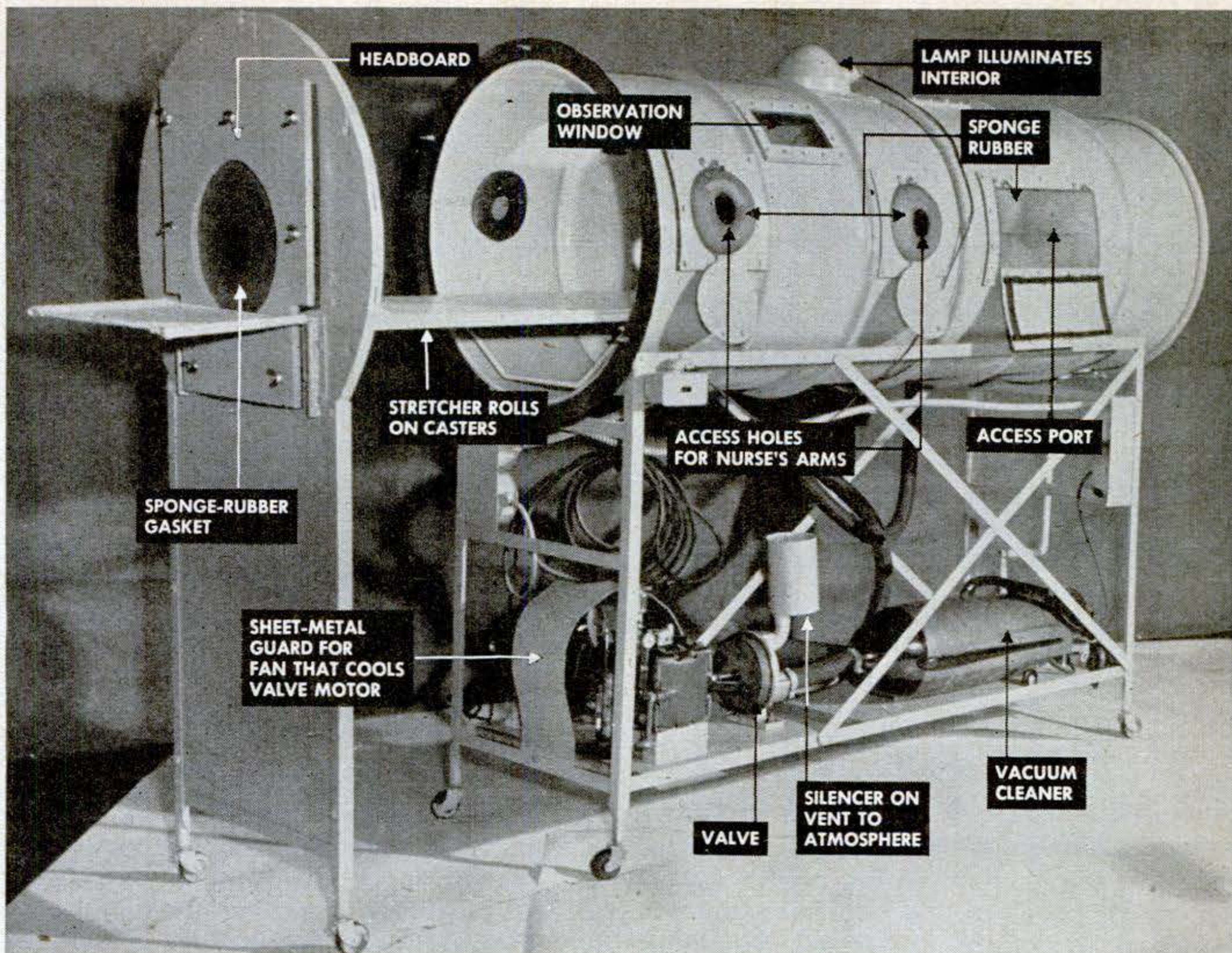
The engineer telephoned two skilled pattern makers.

"Get ready to do some fast whittling," he said. "We're trying to save a life."

In just 90 minutes the engineer had drawn up a design for the valve. The pattern makers whittled. The wood over which their

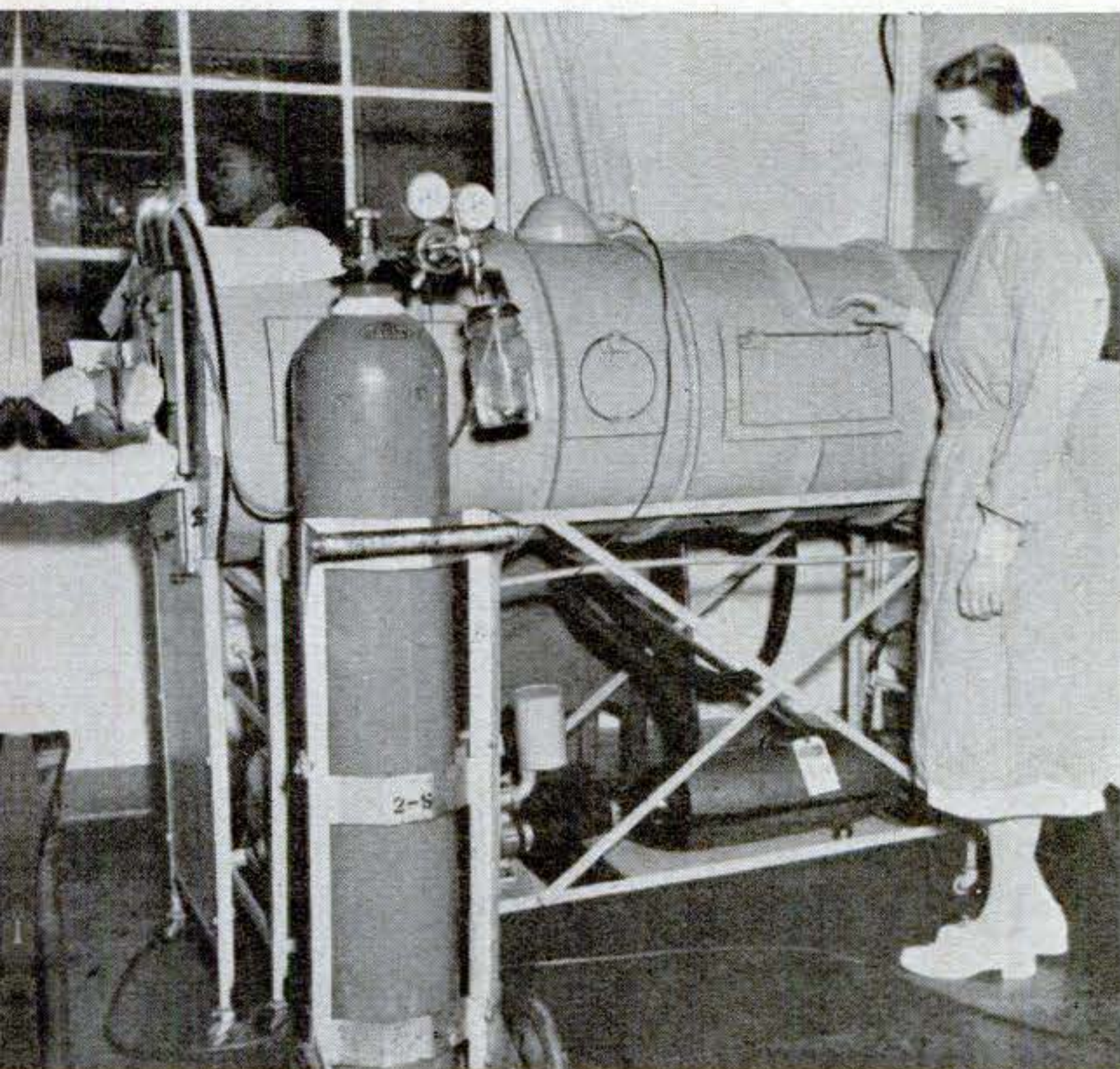


This is a close-up of the motor-driven control-valve unit. In time, aluminum casting replaced handmade wooden valve. Valve allows an inhalation time twice as long as the exhalation period.

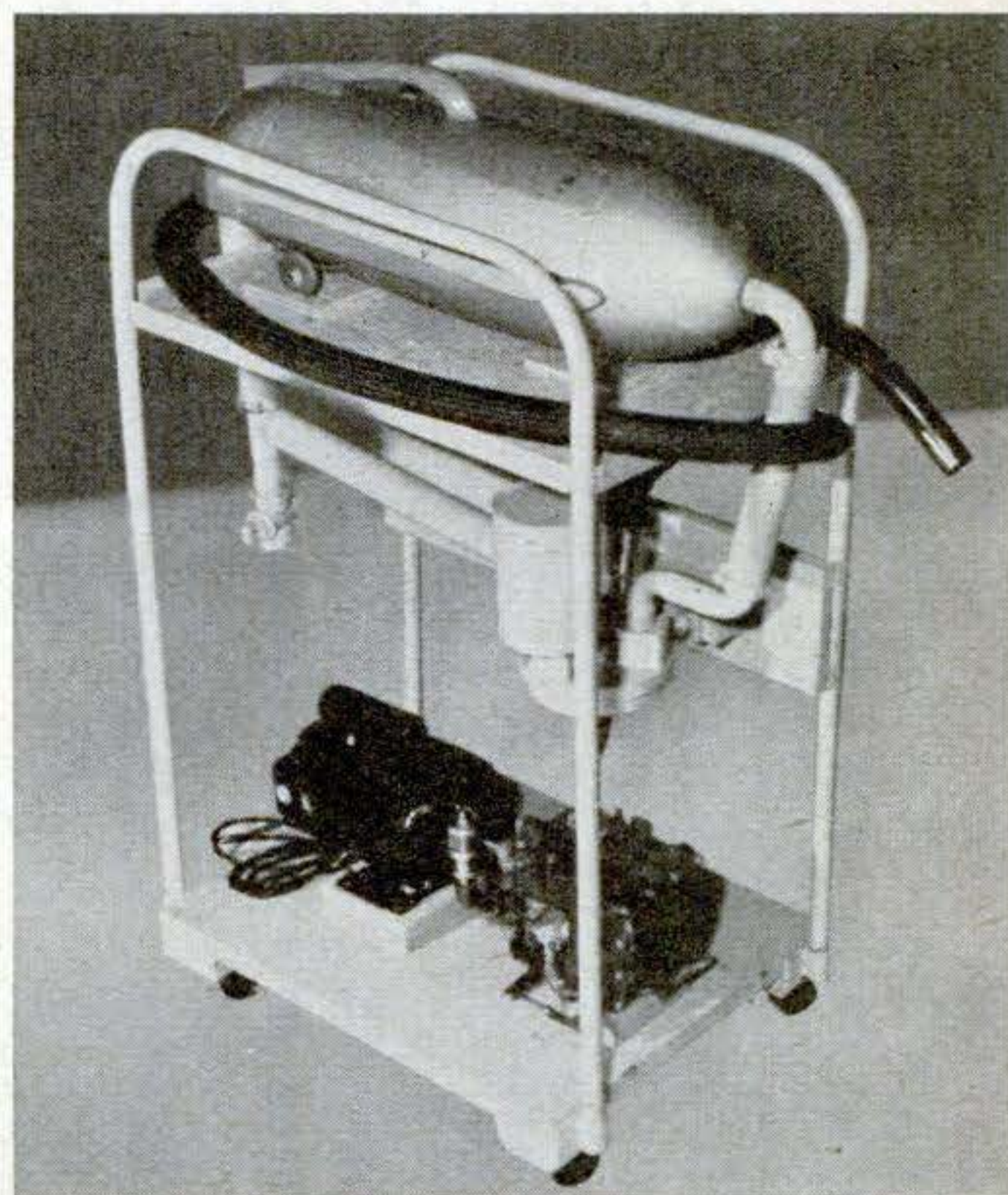


This is a general view of "production-line" iron lung, local ingenuity's answer to the Muncie emergency. Headboard is pulled away from cham-

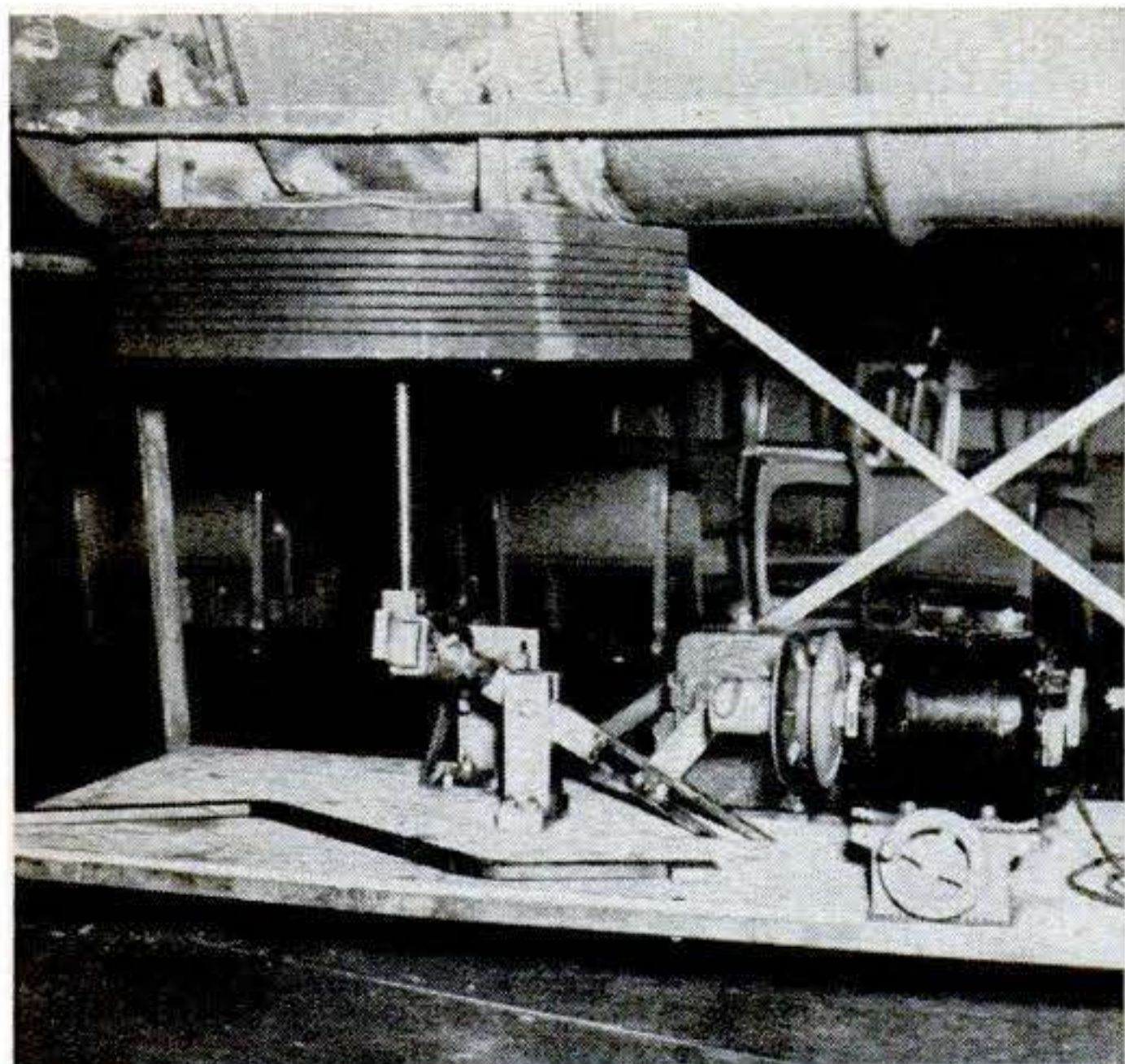
ber. The model shown above incorporates the latest improvements, including a fan to cool the electric motor that turns breathing-cycle valve.



On duty in hospital, machine shops' iron lung is supplemented with oxygen apparatus for patient in critical condition. Cleaner and valve assembly are mounted on plywood sheets.



In case of breakdown of cleaner unit, portable emergency unit is provided. It can be plugged in instantly to restart respirator. Connections are regular hose, ferrule fittings. ➡



Warner Gear produced another type of iron lung in which single bellows both pressurizes and evacuates cylinder. Bellows is 24 in. in diameter, 10 in. long extended, 6 in. collapsed.

hands flew was mahogany. It was tough going—mahogany is hard. But in just four hours a two-piece wooden rotary valve had been fashioned and installed in Reichart's emergency iron lung. For the next ten hours it was hand-operated by one of the volunteer firemen.

The child patient, his weary chest muscles relieved of the task of expelling the air from his lungs, was breathing at a normal rate.

But in the Warner workshop one thing remained to be done. A motor drive had to be devised for that valve. The engineer went back to his bench. Several war-surplus, variable-speed hydraulic transmissions—the kind that revolve power turrets on bombers—were lying around.

To the input shaft of one of these transmissions he connected a $\frac{1}{4}$ -h.p. electric motor turning at 1,800 r.p.m. On the output shaft he put a steel yoke to turn the valve cover plate of the iron lung's wooden valve at any desired speed. By twisting a knob on the transmission, the respiration rate of the lung could be set to any speed from 15 to 38 breaths a minute.

The valve motor drive was installed. The youngster in the lung was given a new, if momentary, lease on life.

Now that they had proved it could be done, both Warner Gear and Reichart proceeded to make mechanical respirators as fast as they could to meet the challenge of the epidemic. Other wooden valves were turned out. Other power turret transmis-

sions were found in the area. Sears continued to supply vacuum cleaners without charge. Many other retail stores, supply houses, and manufacturers joined in donating much-needed materials and services.

Presently the wooden valves were replaced by metal ones using a steel rotating cover plate and a stationary aluminum port plate. Castings for these, requiring a minimum of machining, were produced at a Muncie foundry. For "production-line" respirators, two 55-gallon steel grease drums were substituted for the alcohol drums. The grease drums required less work. They had removable lids.

Failure of a vacuum cleaner had to be thought of. What would happen if one of the units got out of order? So Warner began supplying a portable valve unit, valve drive, and vacuum cleaner, ready to plug into a respirator if anything went wrong.

New Respirator Devised

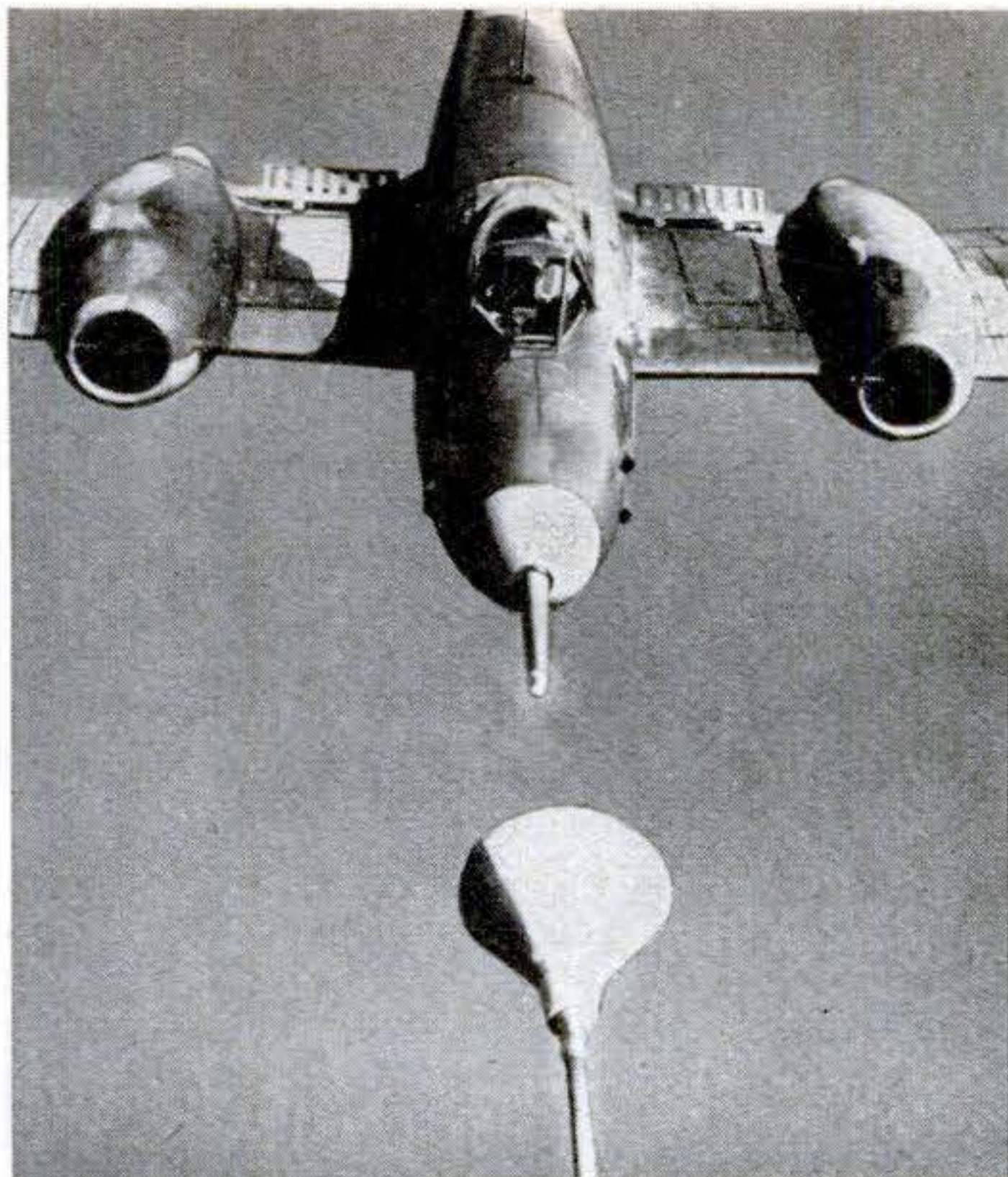
Not content with that, Warner designed and sent a new type of respirator to the hospital to be put to work. This one was bellows-operated. A concertina-like bellows made by a Muncie organ company provided both the vacuum and pressure phases of the operating cycle. A single pipe connected it to the respirator. When the bellows was extended, it caused a partial vacuum within the lung. When it was collapsed, it built up pressure in the lung. No valves were required except the relief valves to control the amount of vacuum and pressure.

It would be good to close the story of the emergency iron lungs with the news that the young patient who inspired the work, Rue Steele, son of a Muncie truck driver, recovered from his polio attack. We can't. The paralysis induced by the disease eventually proved too much for his 10-year-old body to combat.

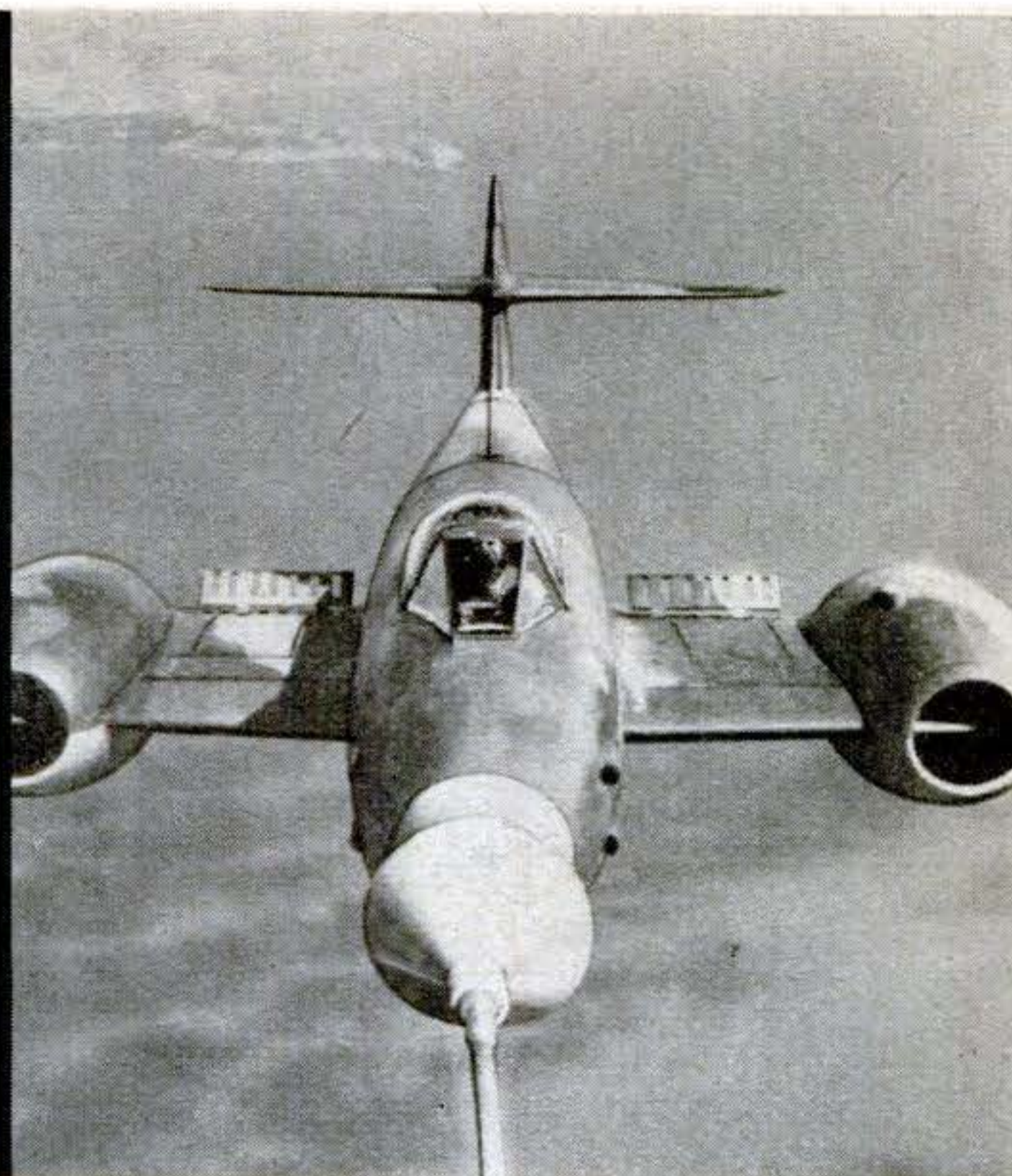
But he left a legacy—a growing row of iron lungs created by native inventiveness, produced by a couple of Midwestern machine shops, in the American tradition of ingenuity and self-help. And because of this, several other children and adults are alive today in Muncie, Indiana. END

Tractor Carries Rescue Gear

A LIGHT tractor developed in England has a power winch and 100 yards of cable mounted in front to pull itself across a field if the going gets too tough when plowing a deep furrow.



Meteor jet fighter approaches funnel-tipped refueling line to replenish tanks in experiment.



Contact is made. Note perforated dive brakes used to slow plane's speed, maintain altitude.

Jet Refuels Like Humming Bird

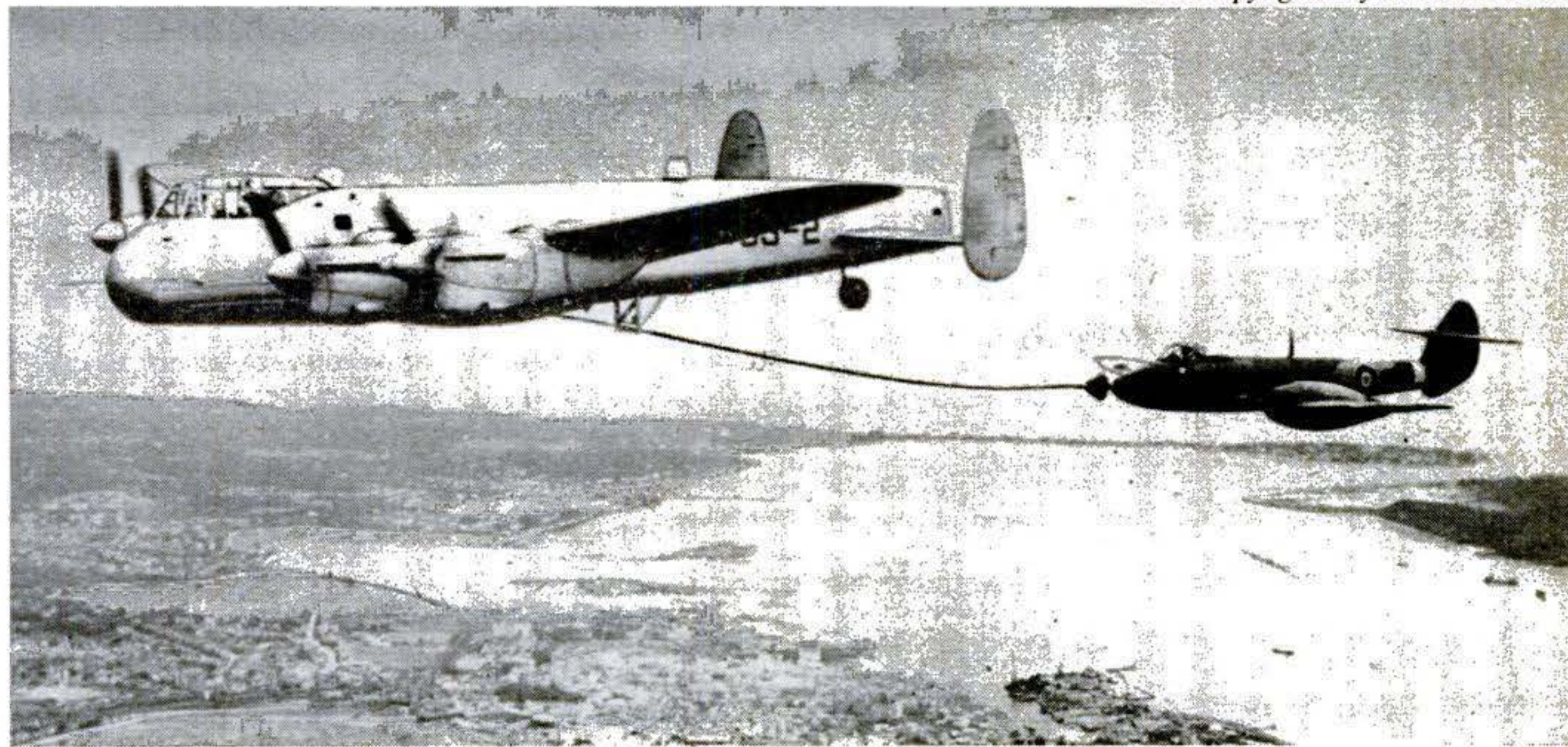
STICKING its nose into a refueling funnel in mid-air as a humming bird would explore a flower, this British jet fighter was able to stay aloft for twelve hours. With a normal flight duration of only 90 minutes, it had to take on fuel ten times.

In this new type of refueling, in which the

Meteor, Britain's fastest jet, was used, the objective was to determine whether the range of such aircraft could be increased. Incidental to the experiment was the setting of what is believed to be a new world's record for jet-flight duration. A propellered plane was used as a tanker. A total of 3,000 gallons of kerosene was transferred.

Once contact was made, the tanker proceeded to pump fuel rearward to the jet. Britain, a pioneer in mid-air refueling, started experiments before the war.

Photos copyrighted by Charles E. Brown



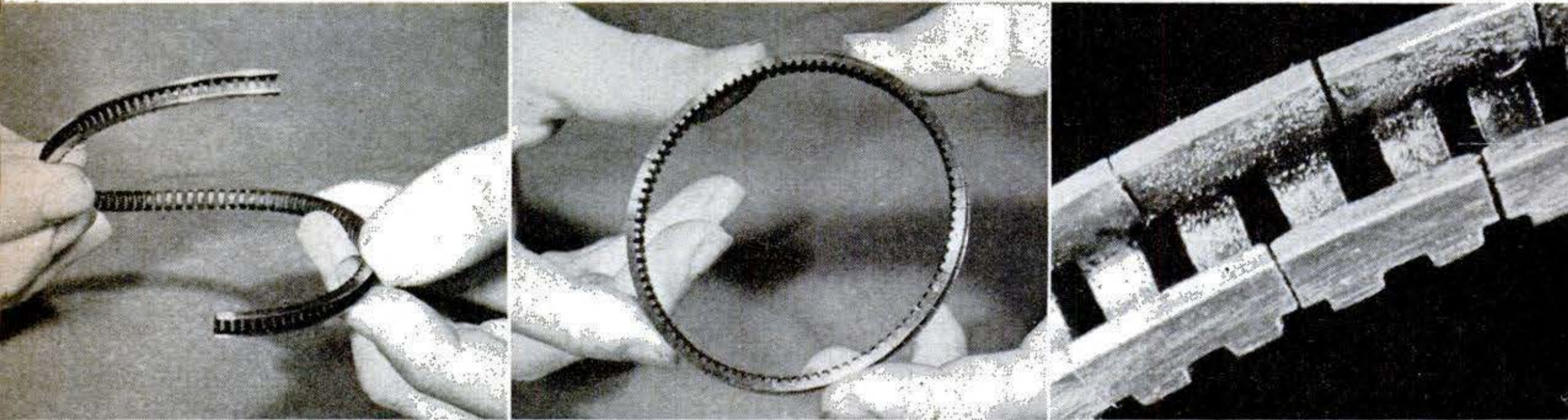
Here is a side view of refueling operation as jet noses into cone slightly below tanker's level.

1950 Nash Boasts Longer-

AN ENGINE reported to run 50 percent longer between major overhauls is the big feature of the 1950 Nash, unveiled late last month. The secret lies in just one change—a new type of piston ring that always keeps the right amount of oil flowing

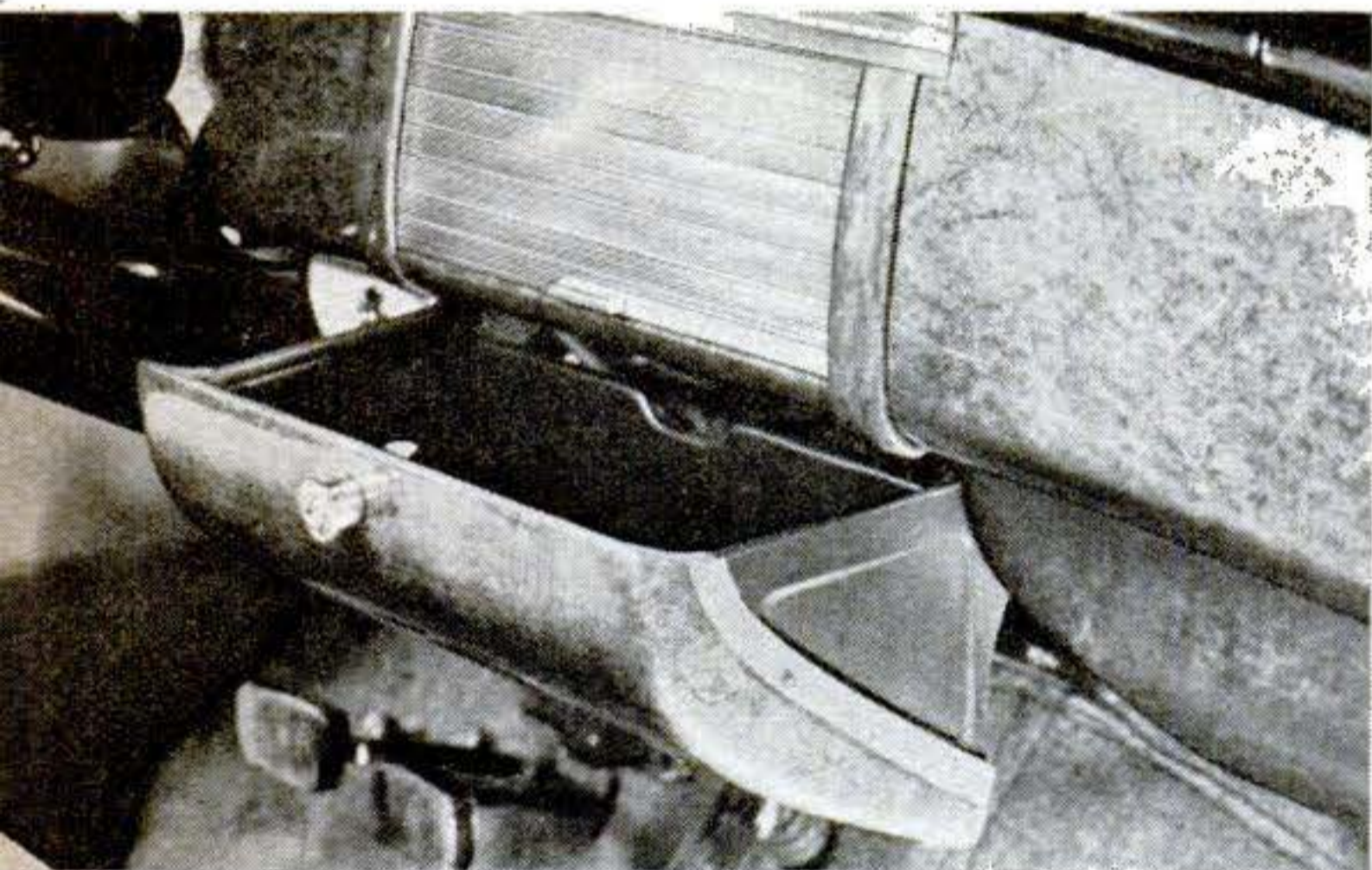
to the cylinder walls. It does this even when the cylinder is worn or out-of-round, say Nash engineers.

While keeping the same general styling, Nash has increased window area and slicked up the interior. Some models have a back-



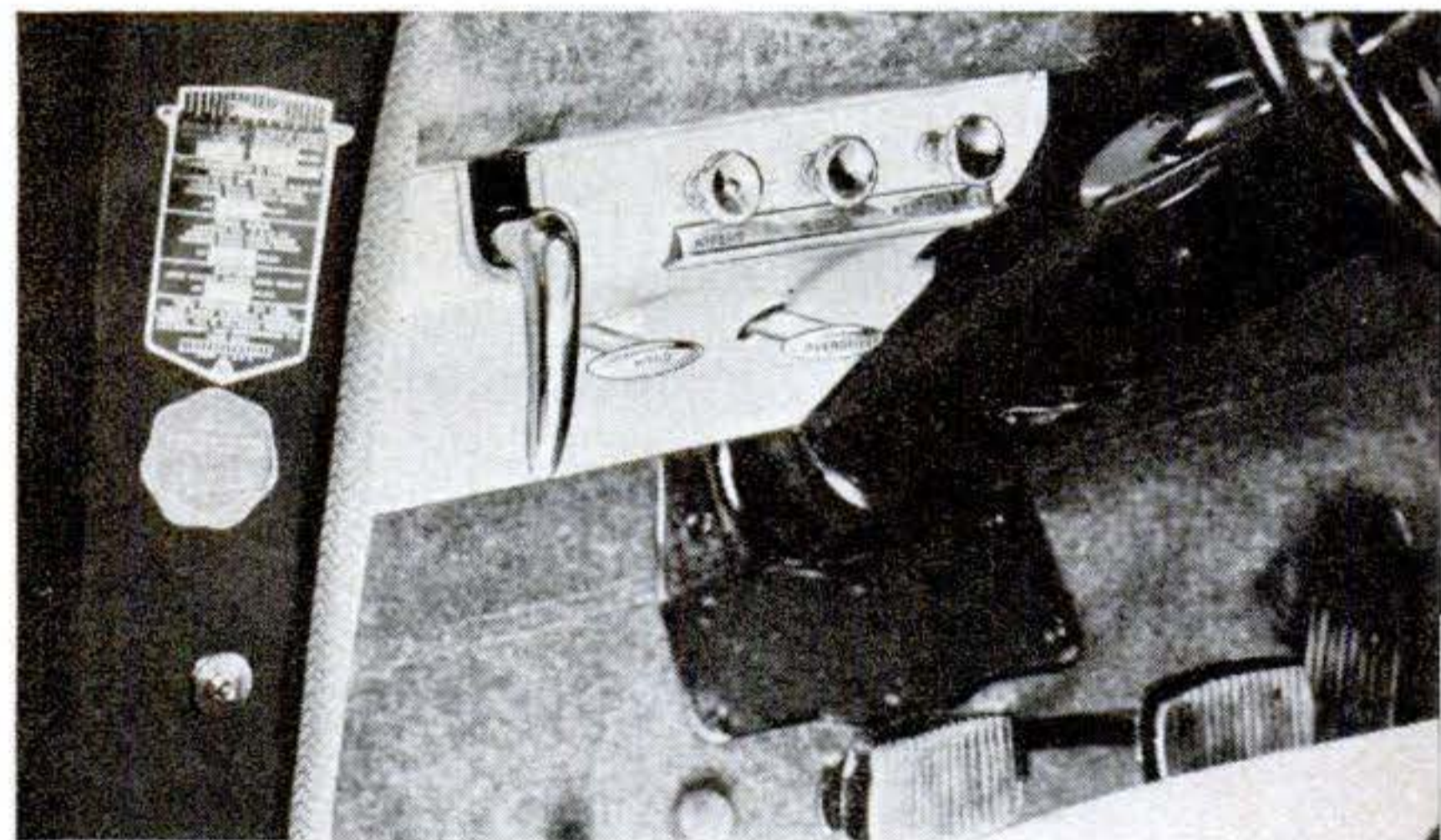
Key to expected longer engine life for the new Nash is Seal-Flex® oil control ring, developed by Thompson Products. Lowest of four rings on piston, its oil-wiping surface is formed

by U-shaped sections placed end to end. Tiny slots, .001" wide, channel oil to upper cylinder walls. Tests show wear has little effect on the size of slots, maintaining good oil economy.



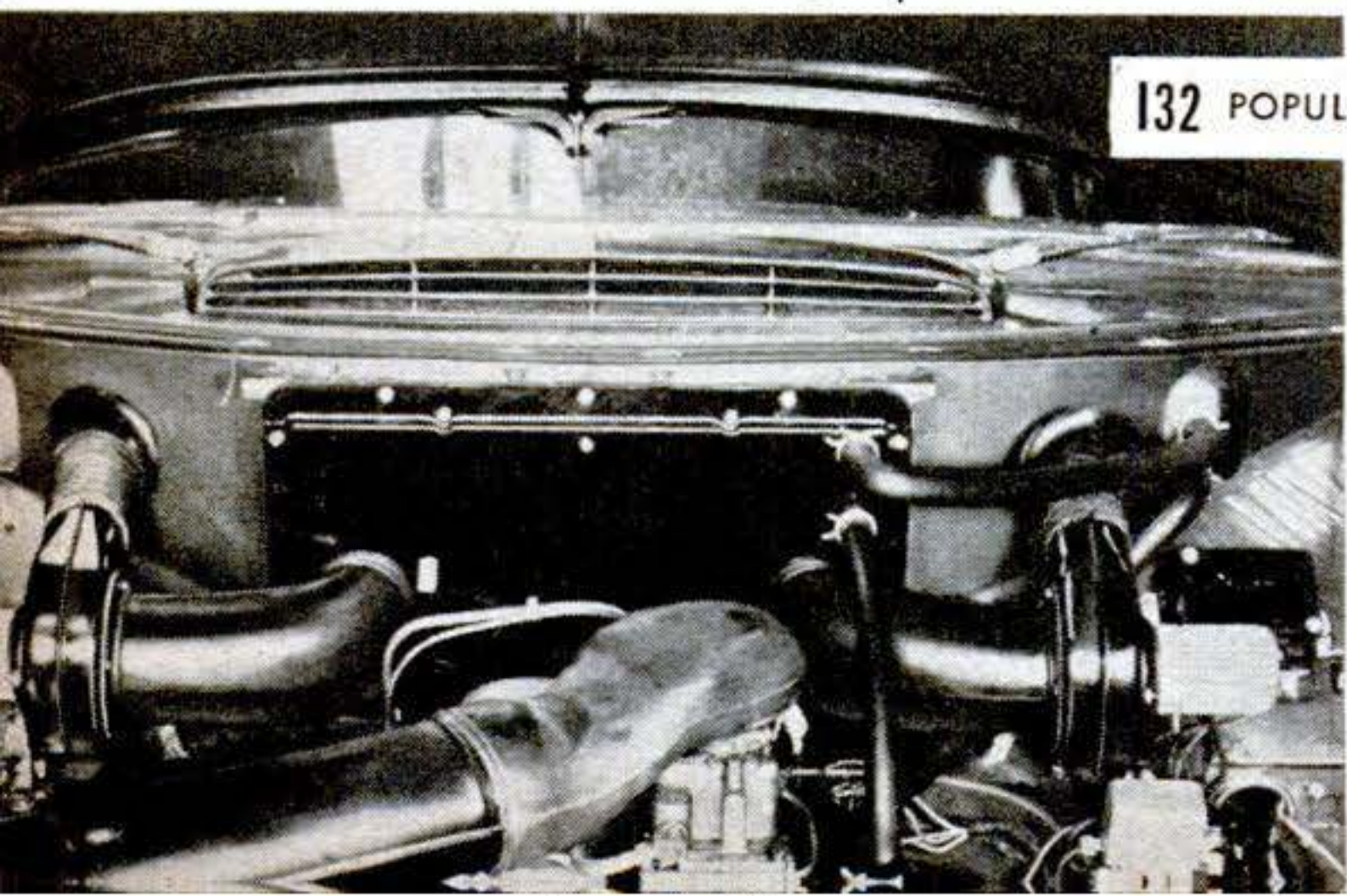
Sliding bin replaces drop-door glove compartment. Maps, knickknacks can't fall out. Roll-top sliding panel covers radio, secondary driving controls. One lock secures bin and panel.

Nash's Weather Eye air conditioner is improved. Defroster effectiveness is increased by dual blowers and motors, one for each side of windshield. One knob replaces two on heater.

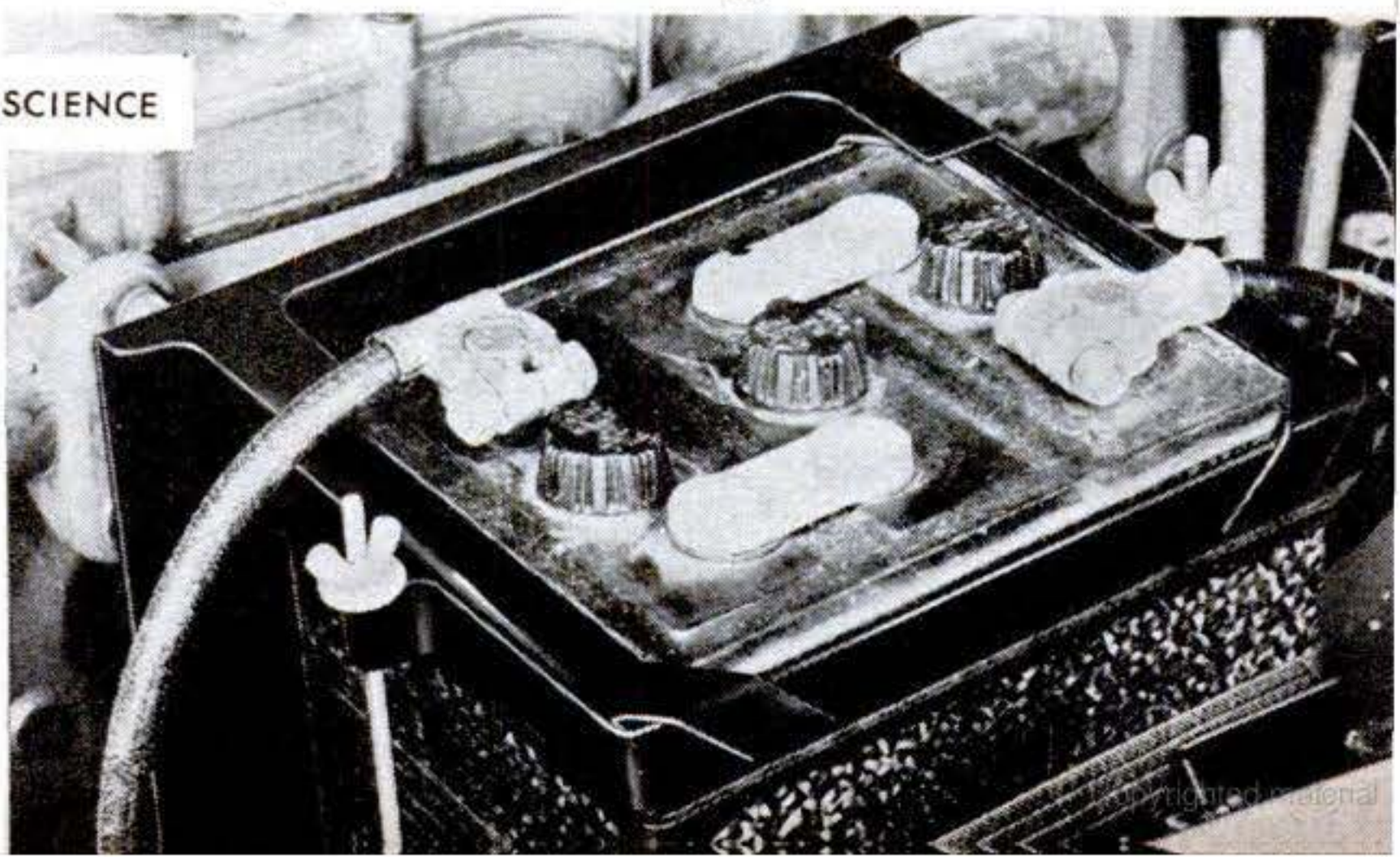


Basic controls are grouped at left of steering column where they're easy to reach. Hydra-Matic is now optional in Ambassadors; when used, engine is started by lifting selector lever.

Metal shield now protects battery from engine heat on hot days. Ambassador has vertical tube radiator, replacing cross-flow type. Hand-brake cable is fully enclosed in housing.



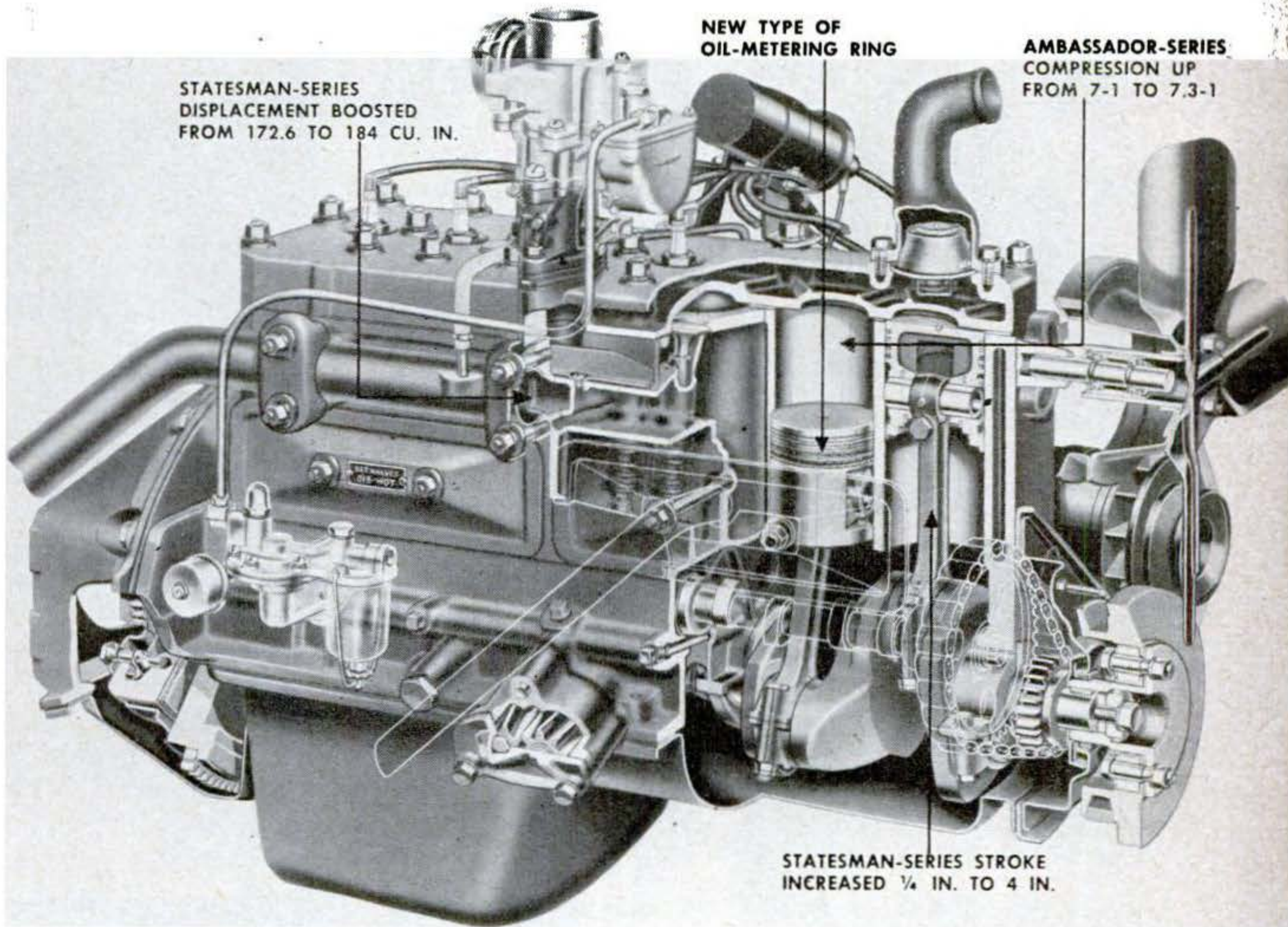
132 POPULAR SCIENCE



Lasting Engine

seat armrest big enough to play gin rummy on and a front seat adjustable to any angle.

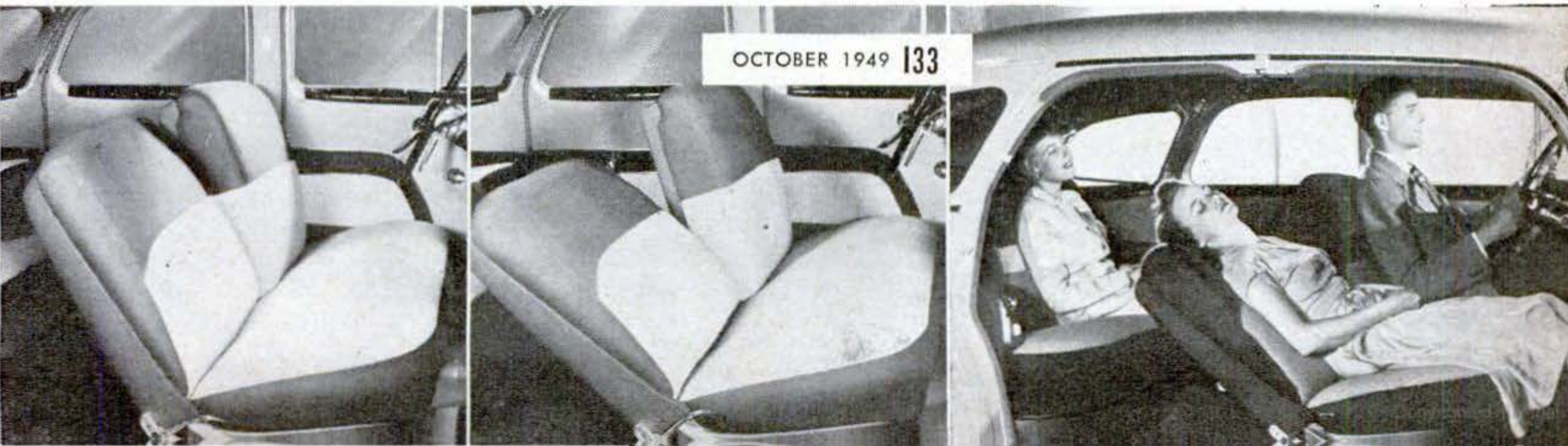
In the Ambassadors the compression ratio has been boosted. In the Statesman—which replaces the "600" series—the stroke is longer and the displacement bigger. END

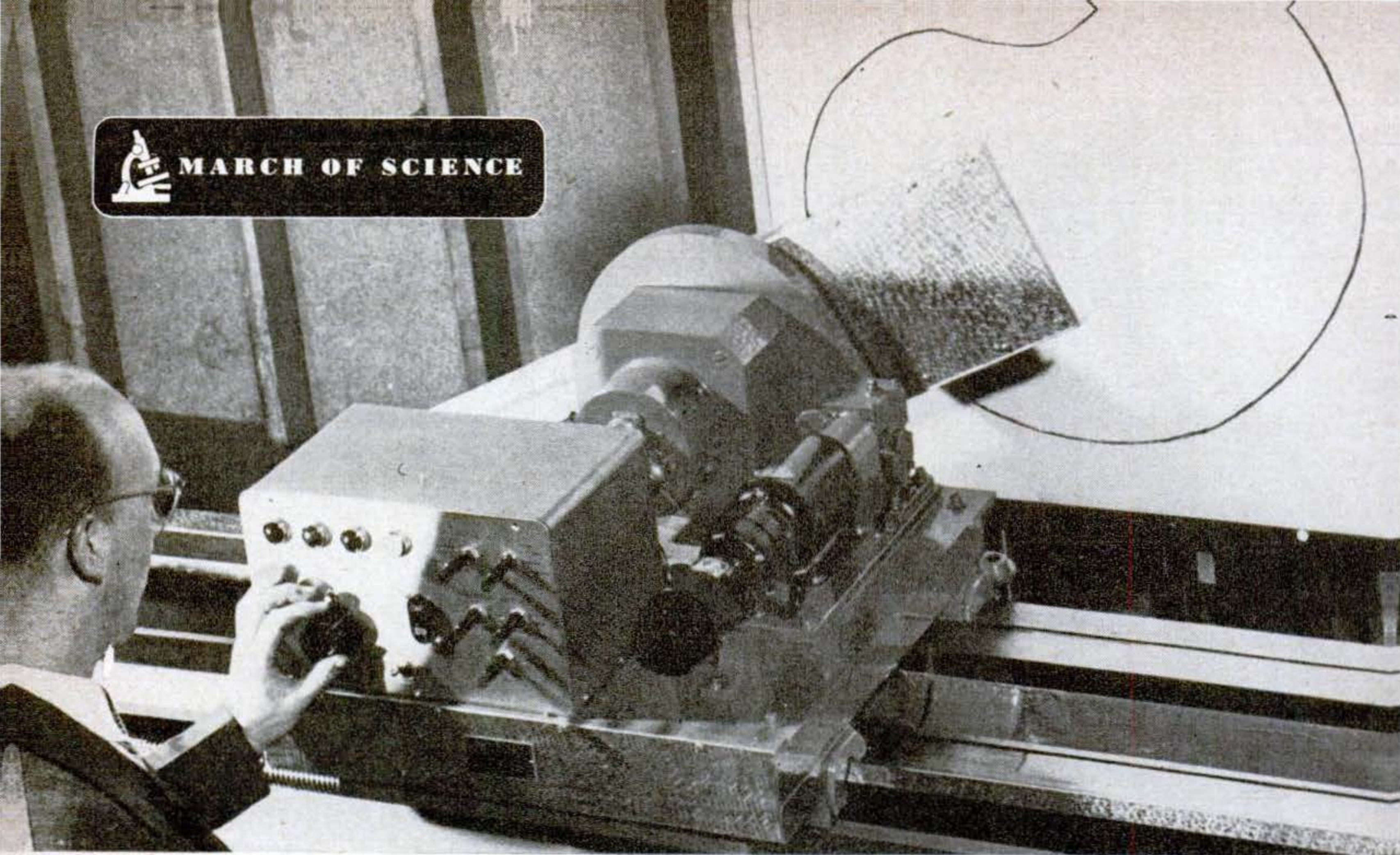


New engines feature improved cylinder heads, harder valve stems, and better lubrication.

Right front seat has feature motorists have been wanting for years. It is airplane-type, can be adjusted to three intermediate positions plus upright and horizontal. Fully reclined, seat

forms one of twin beds that have long been Nash accessory. Available as extra-cost, optional equipment on all models, it can be made up and used as a separate bed while car is moving.



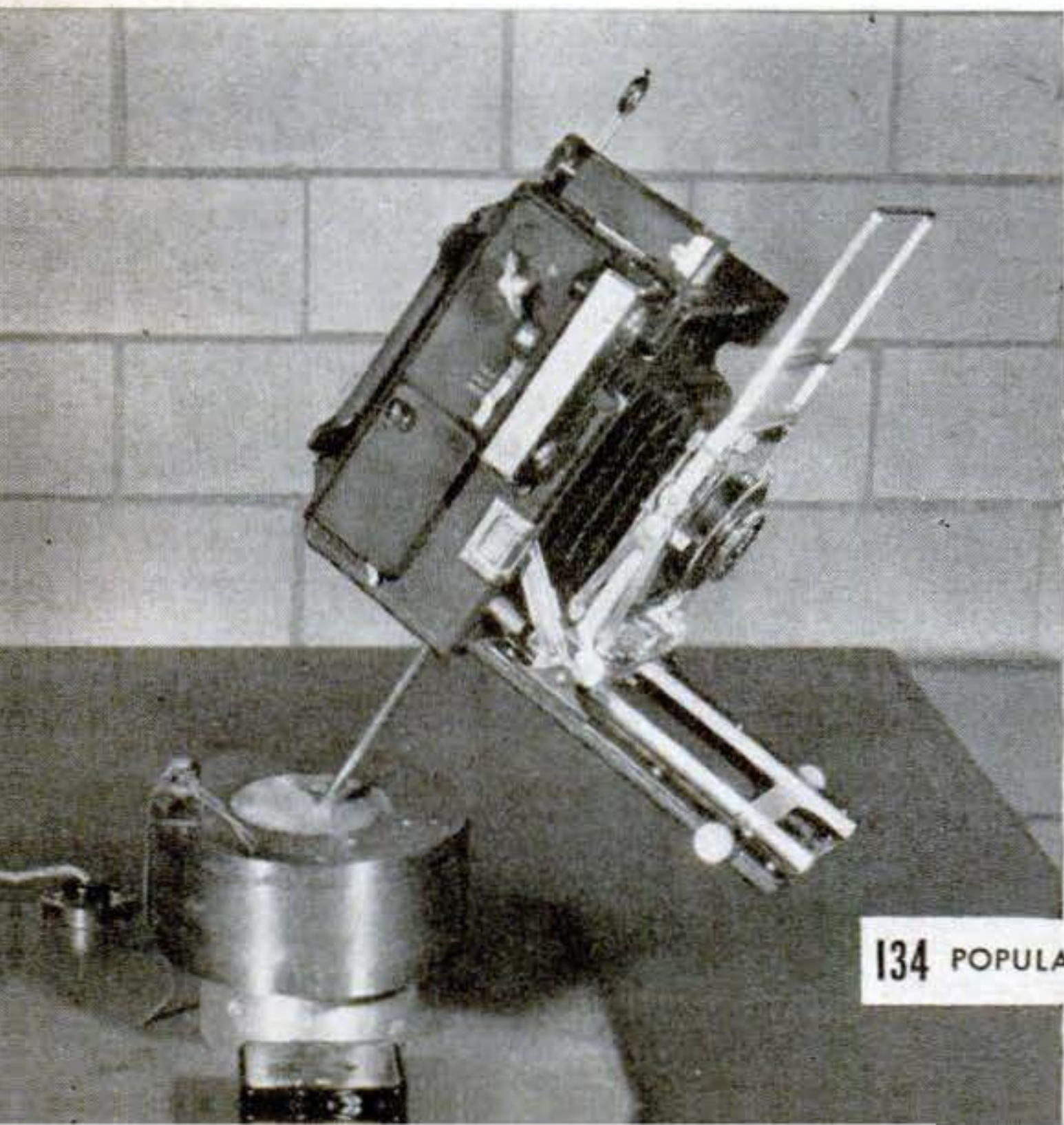


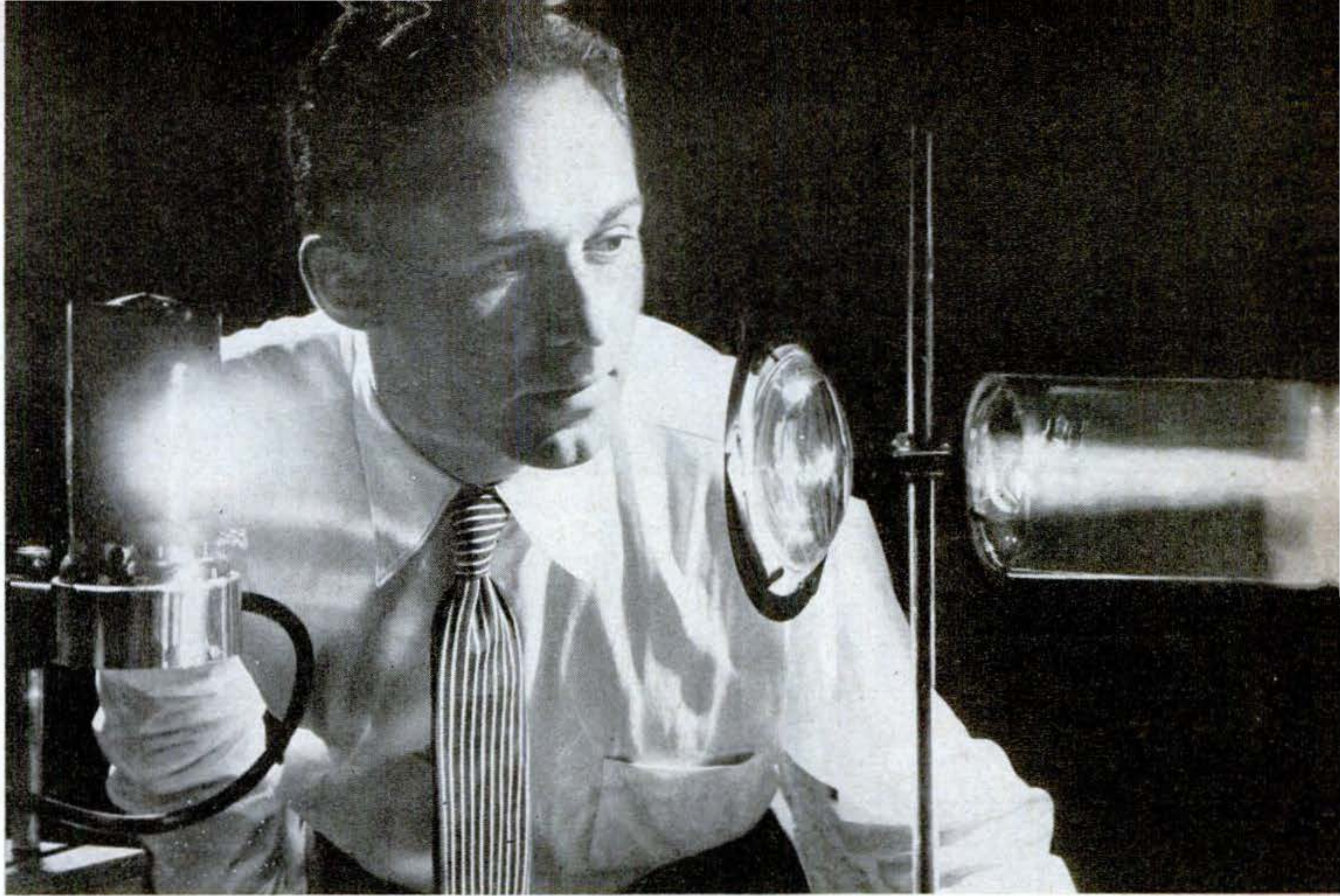
Eye Guides Cutting Tool. Odd-shaped pieces of metal can be cut out automatically with the help of GE's electronic "contour follower" above. A microscope and photoelectric cell nose along an outline

drawing. If they deviate as much as 3/1,000 inch from the path, an electronic signal brings them back. Controls order a jig-boring machine to move in exact synchronism, cutting the shape in metal.

Magnetism Holds Camera. Turn off a switch and you can tilt the camera below to any angle. Turn it on and the camera mount freezes. The tricky "pan head," a Bureau of Standards' adaptation of its magnetic clutch (PS, June '48, p. 83), consists of a metal ball in a socket containing oil and iron filings. When magnetized by an electromagnet, the mixture solidifies.

Machines Fret, Too. In big thrust bearings, the mating parts shift less than a millionth of an inch, but that is enough to cause mechanical and chemical action that eats away the metal. Westinghouse engineers use the model below to find ways of stopping this "fret corrosion." "Pipes" sticking up are spring-loaded screws that can vary pressure between parts.



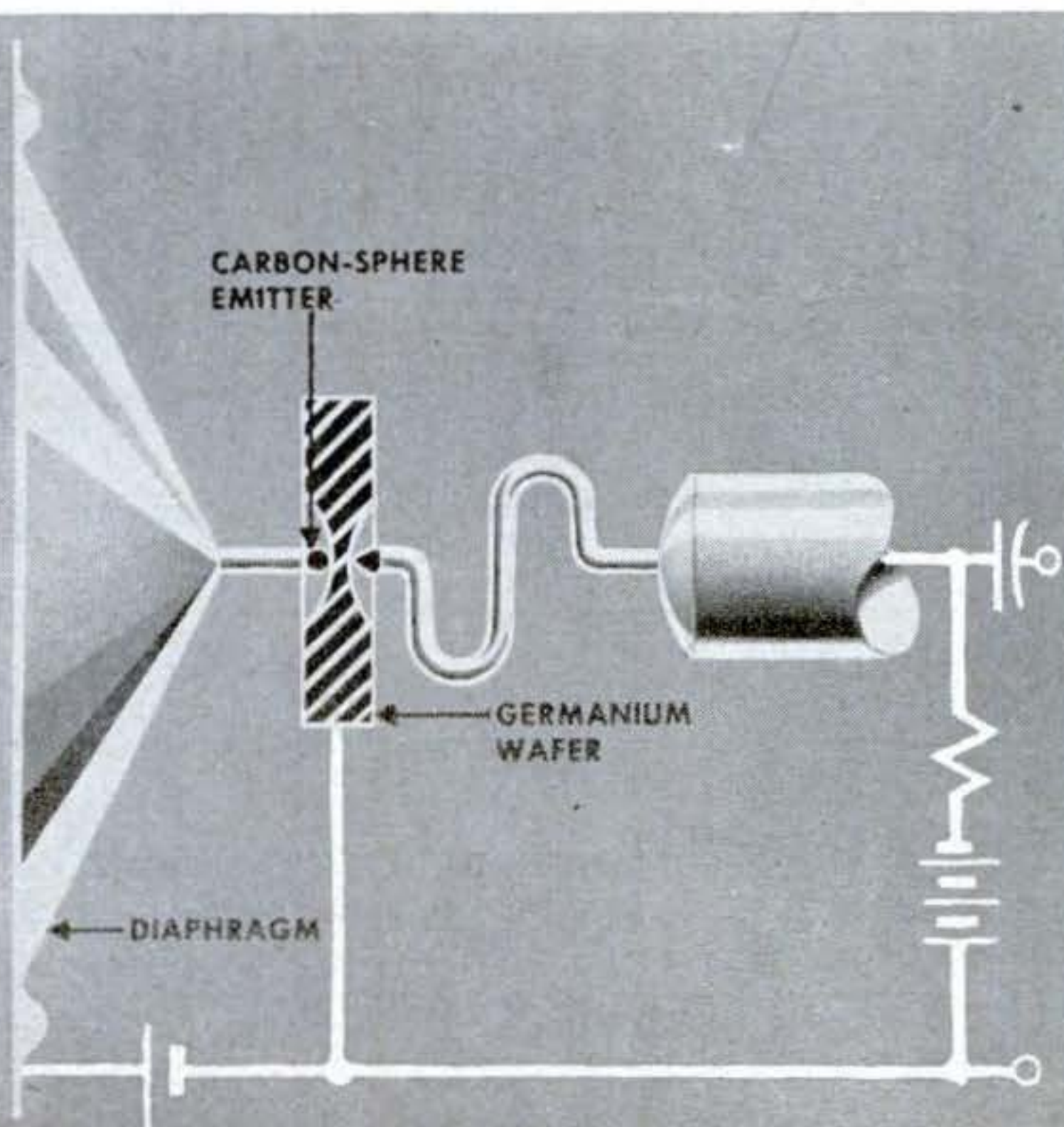


Study Trapped Light. It looks like Dr. Daniel Alpert has bottled up some light in the sealed, unconnected flask at right above. Actually, the flask contains sodium vapor, which radiates light of its own when

struck by ultraviolet light from the projector at left. By studying such phenomena, Westinghouse Research Laboratories hopes to improve fluorescent tubes and perhaps discover new light sources.

New Mike at Last? Edison invented the carbon telephone transmitter 72 years ago and it is still used today, basically unchanged. But now Bell Laboratories scientists have produced a new kind, employing the Transistor® (PS, Sept. '48, p. 117), that may someday replace it. When the diaphragm vibrates, it moves the Transistor's "emitter" (see sketch), varying the current.

Baking Preserves Crystals. The quartz crystals that keep radio, television, and radar equipment in tune are now being baked in ovens to make them stay young. Ordinarily the crystals change their characteristics with age, causing their frequency to "drift." The new heat treatment, developed by physicists of the Army Signal Corps, makes them last indefinitely.





Planes "Type" Messages in Sky

Radio taps the keys as seven-ship flying typewriter prints 15-mile-long placards at 10,000 feet.

By Herbert Johansen

WRITERS in the sky have abandoned old-fashioned, one-plane "penmanship." Now they're "typing" out their aerial messages in neat block letters.

The "keys" of Skytyping are seven planes that fly a straight, parallel course across the sky. Electronic controls puff smoke at pre-selected intervals to form celestial letters as in the word "TEST," shown in the photo at the top of this page.

A "mother" plane, flying in the center of the formation, automatically controls the entire operation. It transmits a constant stream of radio tone signals at one-second intervals. As receiving sets in each of the seven planes, including the mother plane, pick up the signals, switches are thrown in a control board that has 200 plug-in sockets. The board in each plane has been preset according to a message pattern.

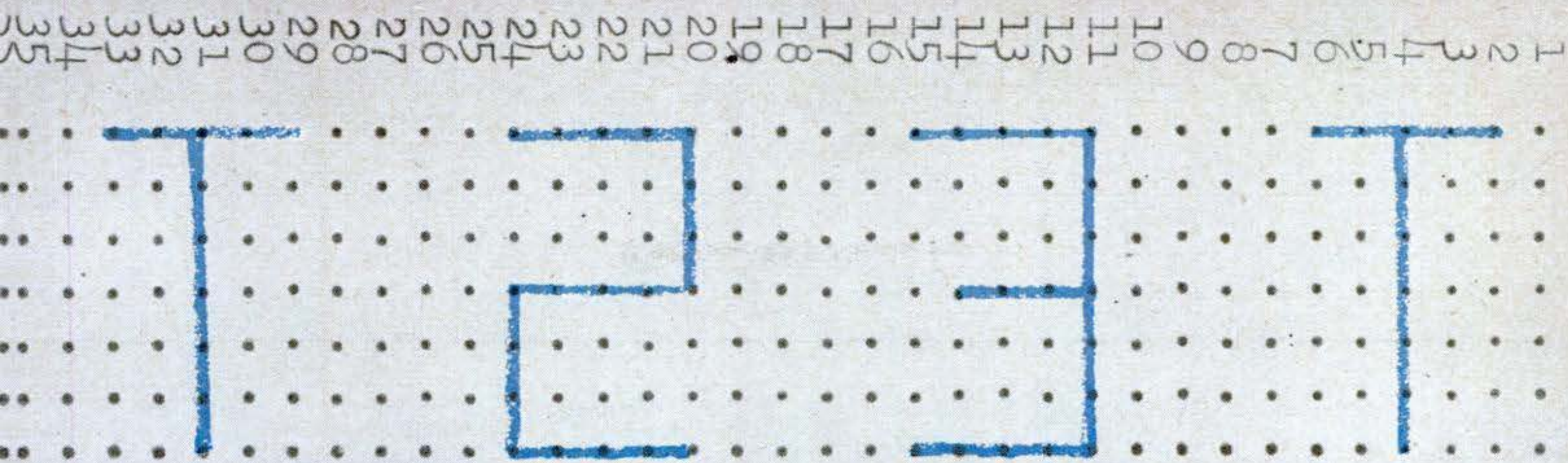
When a puff of smoke is desired to form part of a letter, a plug-in closes an electronic circuit. That, in turn, opens a special valve in the engine, releasing a small quantity of oil-base chemical into the exhaust pipe.

Heat of the engine expands the chemical into smoke at a rate of 1,000,000 cubic feet a minute. The result is a huge, 375,000-cubic-foot smoke puff left in the sky. Where no puff is desired, there is no plug-in on the control board, and the switch activated by the mother plane's radio tone clicks a blank.

Skytyping, a patented process, is the brain child of S. S. Pike, head of The Skywriting Corporation, New York. Since it requires fast planes of equal performance, he only dreamed of his sky-printing process for many years until war-surplus AT-6 Air Force trainers became available. Then he went to work with electronic engineers to develop the complex radio equipment that could belch an educated aerial alphabet.

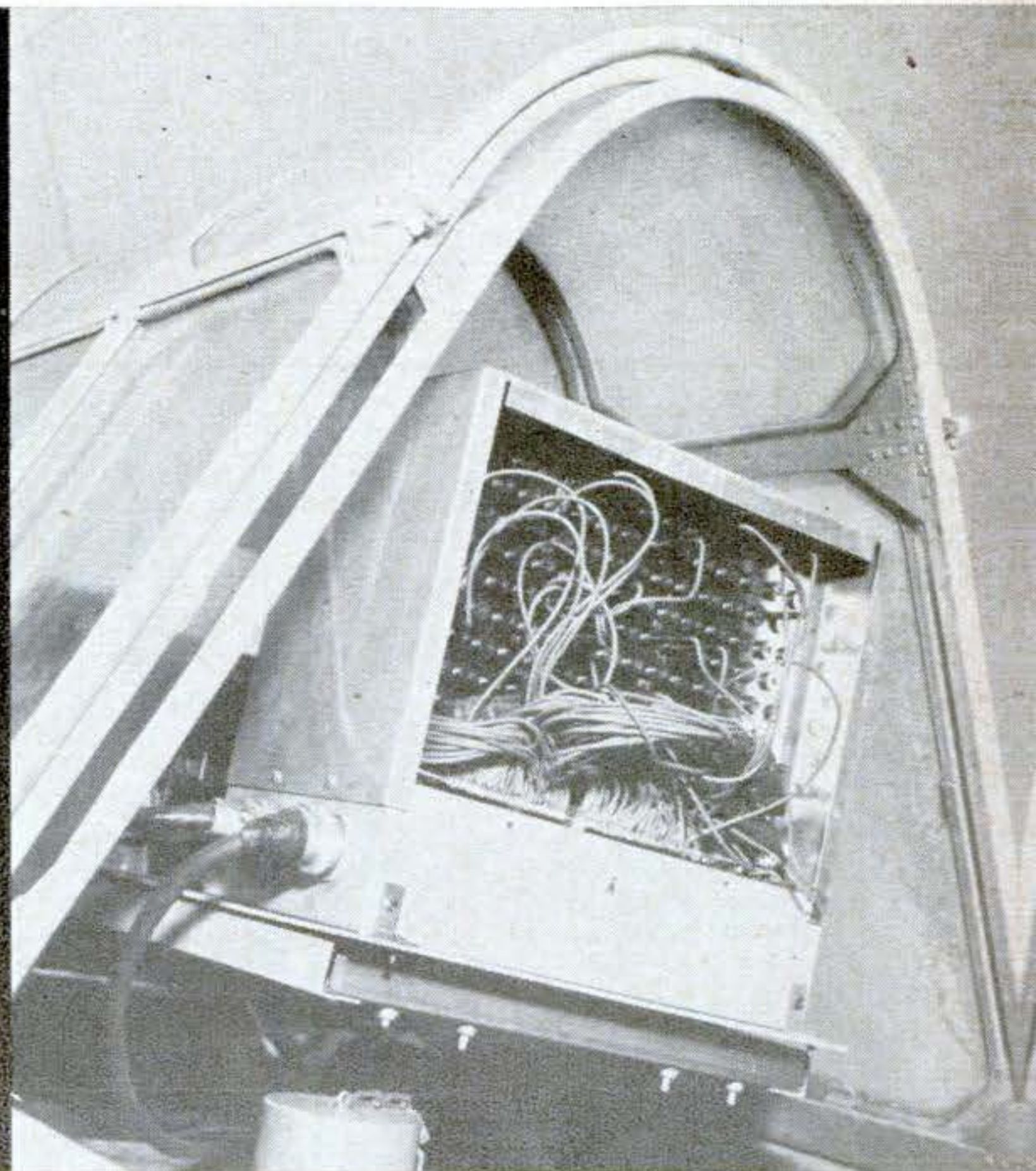
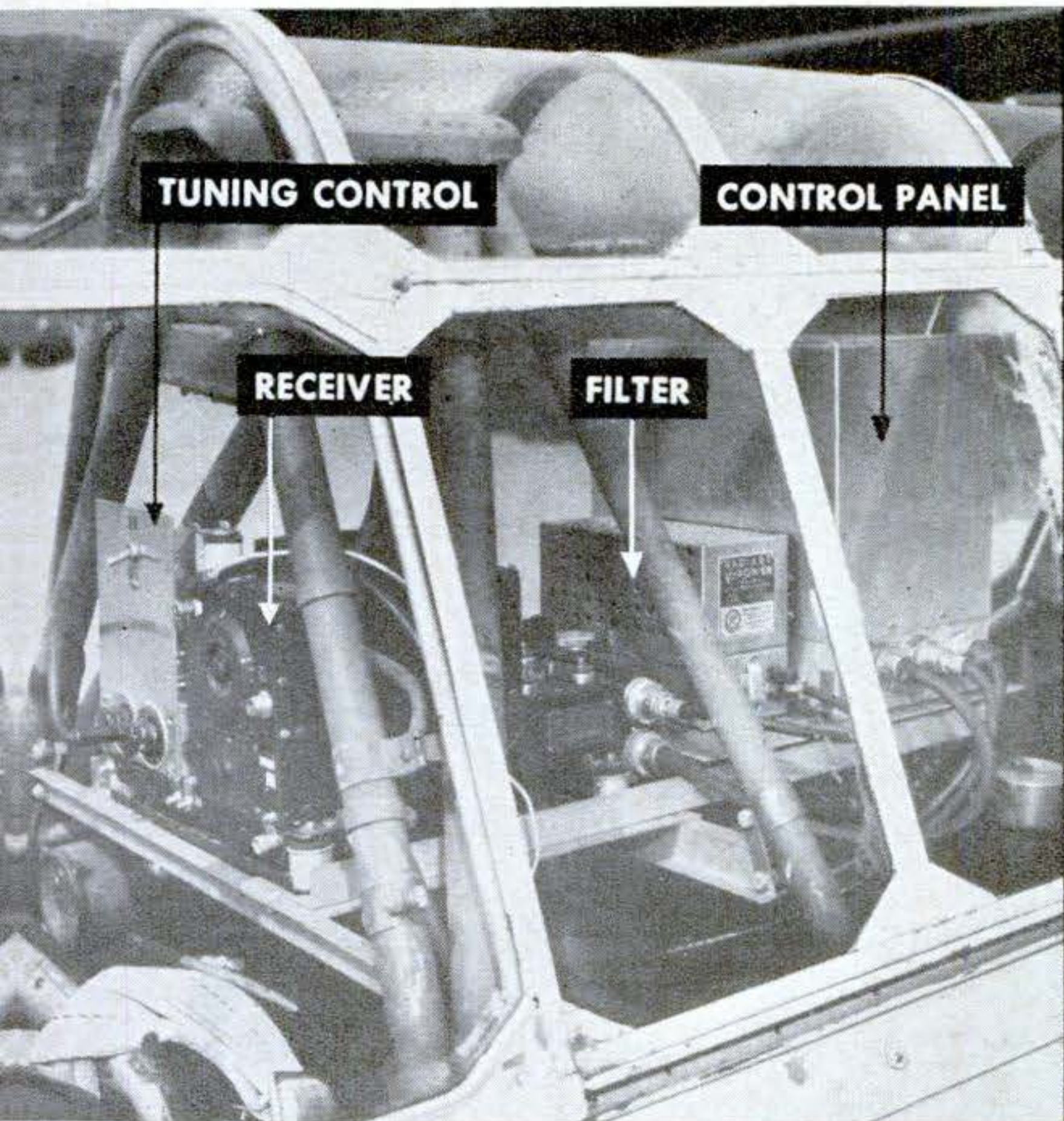
Early Experiments Produced Queer Results

Metropolitan New York saw the first samples of the flying typewriter at work. And early experiments left many citizens with cricks in their necks and puzzles in their minds. Failures of the electronic relays played some queer tricks. A puff skipped here and there, and a message would resemble something written in Arabic or Chinese. And more than once the Skytyping pilots, all war veterans, feared they might have been putt-puffing highly censorable phrases.



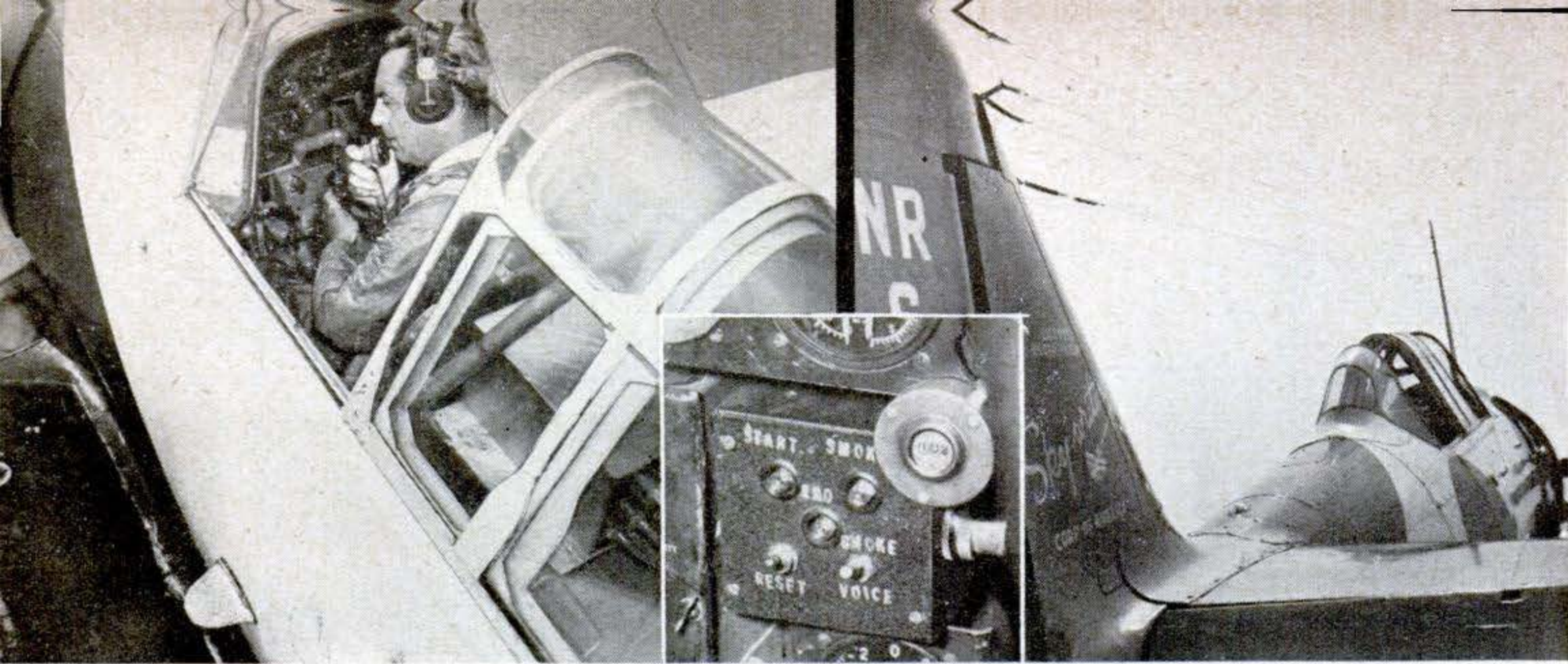
Letters of a message are drawn on a strip of paper, using seven rows of numbered dots. Each row represents the flight path of one plane. Where lines cross dots, corresponding plugs are

inserted in the plane's control switchboard. Each will let radio signals close a circuit, causing puffs of smoke to form the sky letters. Written backwards, they appear normal from ground.



Rear seat in the AT-6 cockpit is filled with radio equipment, as seen at left above. It is war-surplus Navy apparatus rebuilt for Sky-typing. At right is rear view of the control

panel. Plugged-in lines represent sky spaces where this plane will puff smoke to form its part of each letter. A 70-gallon chemical tank is located just below the control panel. ➡



Chief pilot in the mother plane gives the go-ahead over voice transmitter when the planes are lined up. Inset shows his switch panel that controls the operation. Switch at lower left,

flipped when a light indicates the end of a message, resets the electronic relays for another run. Photo at right shows the special transmitting antennas of the control plane.

But that's all straightened out now, according to Mr. Pike. His spelling planes do a smooth job. Flying at about 180 m.p.h., a team of seven AT-6s can print a 21-letter, 15-mile-long message across the sky in five minutes. Each letter, approximately a mile long and half a mile wide, is made in 10 seconds flat.

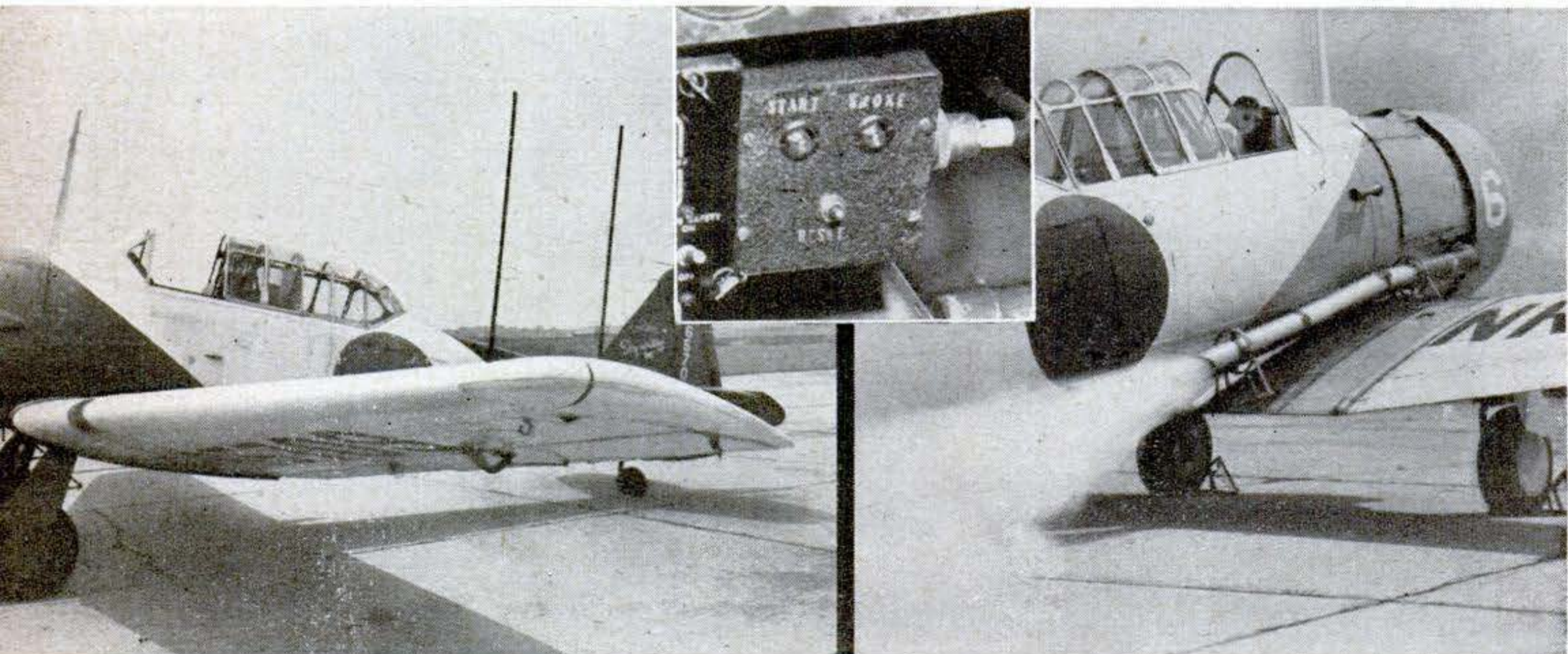
The messages, or slogans, are written at altitudes of from 10,000 to 15,000 feet, depending on air turbulence. Pike says that on clear days his Skytyping can be read 40 miles away, with the letters remaining intact as long as half an hour.

In the old, one-plane skywriting, the first letter of a word is often gone with the

wind before the last letter is formed. It also involves complicated flying maneuvers, with hazardous loops, rolls, and dives needed to form the characters.

In Skytyping, on the other hand, the pilots simply fly a straight line. Everything else is automatic from the word "Start," called out by the pilot of the middle mother plane over his voice radio.

When the full message has been spelled out, as preset in the switchboards, a light signals "End," and the control pilot orders everyone to flip a "Reset" switch that zeroes the electronic relays, readying the planes' smoke-puffing apparatus for another spelling run across the sky. END



Guide bars on wingtip at left above help the pilots to line up with the mother plane in flight and to maintain an interval of 400 feet between planes. Simplified switch box shown in inset

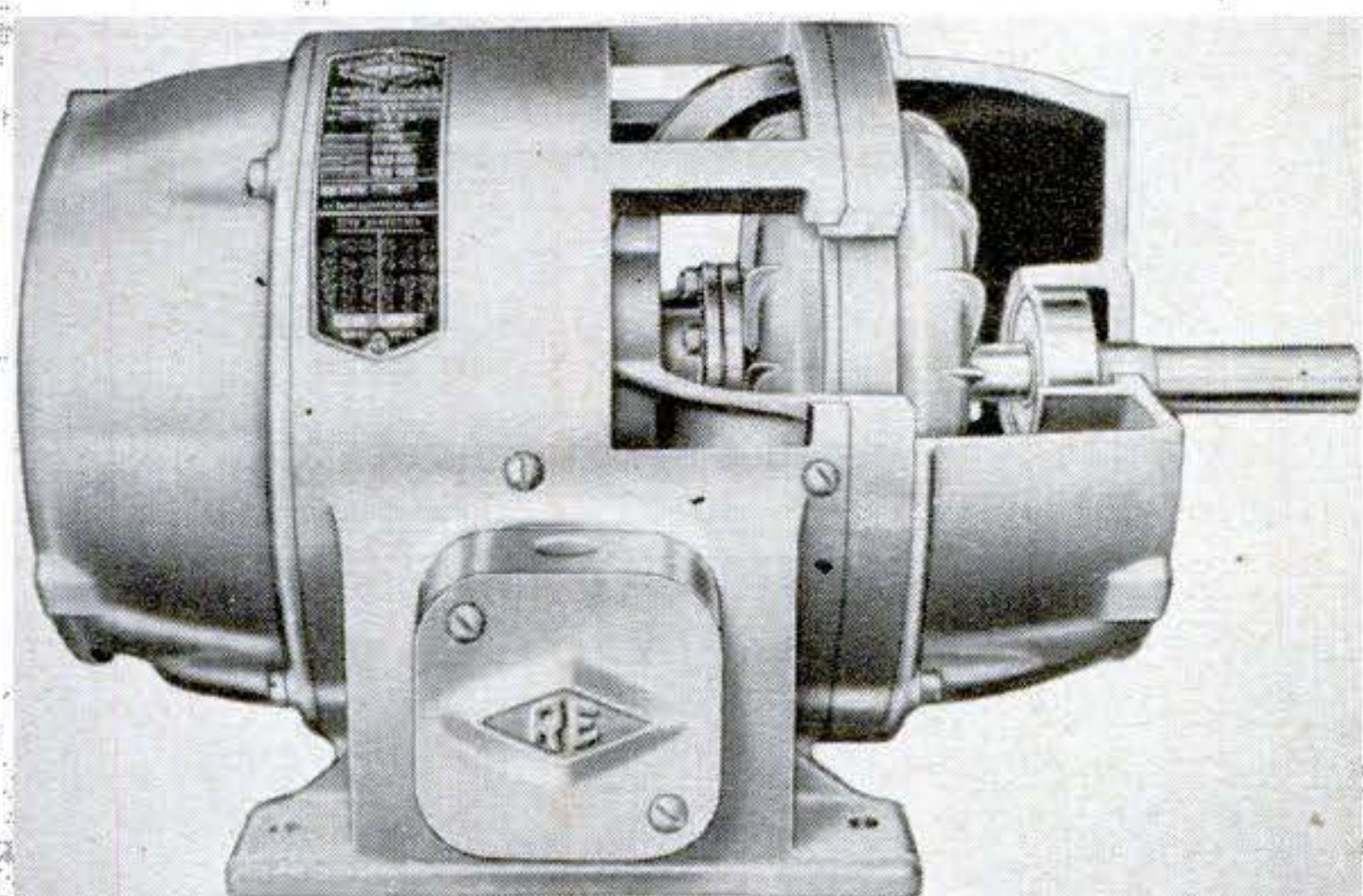
has only reset switch. Lights on top indicate that message has started and that smoke puffer is working. Photo above right shows a smoke puff leaving engine exhaust of plane on ground.



Station Wagon Has Jeep Drive

THE war-famous jeep now comes in a station-wagon model that has the same selective 2- and 4-wheel drive the jeep used during the war. Loaded to its half-ton

capacity, the car can climb a 59-percent grade. Willys-Overland, the manufacturer, says it can travel off the road through mud, snow, or sand that would bog down ordinary vehicles. It has a 104½-in. wheelbase, comes with either right- or left-hand drive.



Motor Gets Fluid Drive Shaft

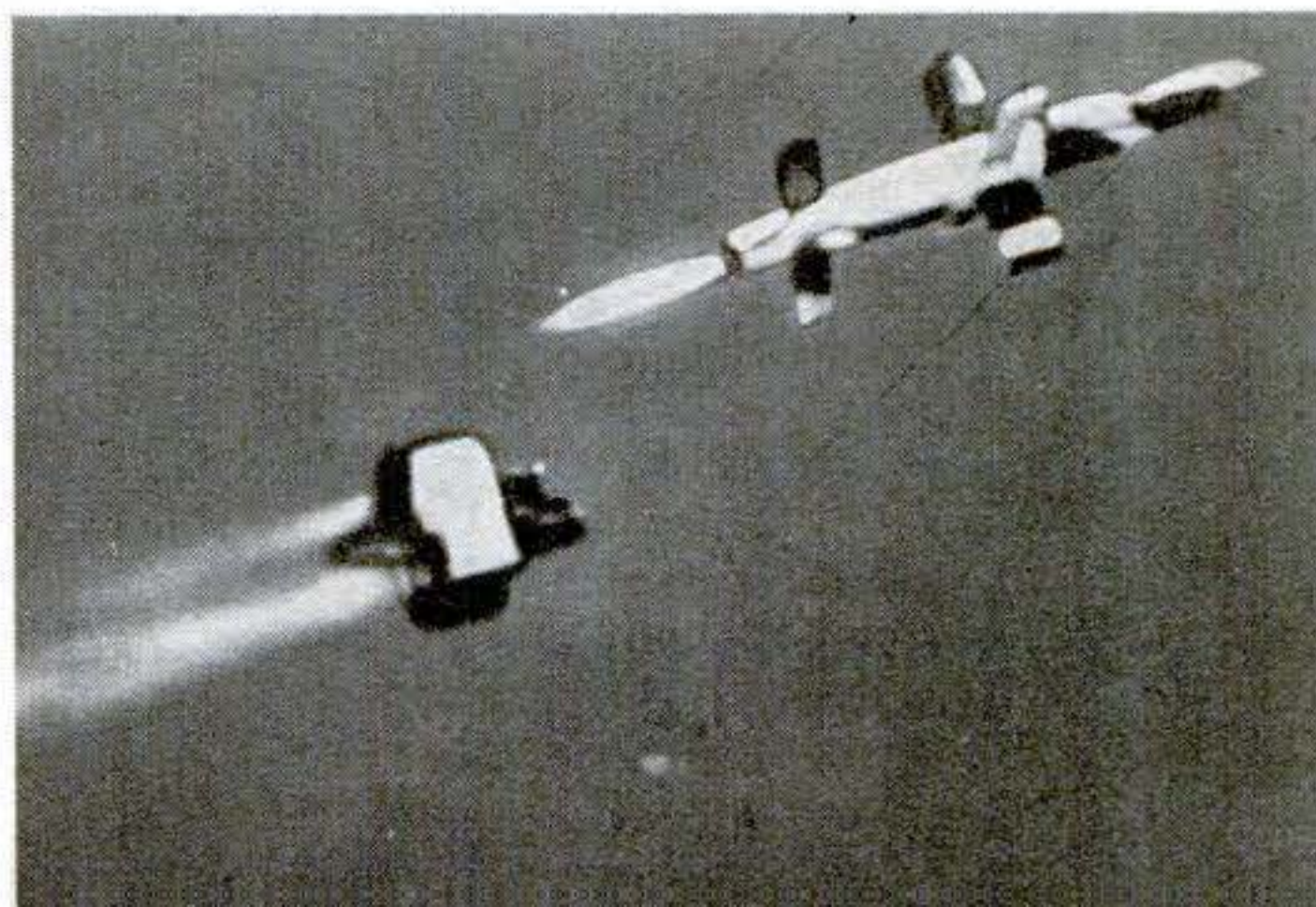
THE new electric motor at left is the first of its type to feature a fluid coupling built right into its drive shaft. Designed to permit easier starting under heavy loads and to prevent jamming, the combination motor and oil drive is said to occupy about the same space as a motor alone and to cost less than two separate units. Among its applications are conveyers, extractors, and bridge and trolley drives for cranes and mixers. Made by the Reuland Electric Co., of Alhambra, Calif., the Fluid-Shaft® motors range from ½ to 10 hp.

Dropped Rocket Boosts New Navy Missile

ONE of the newest wrinkles in guided-missile research is the Navy's Lark, launched from aboard ship. Officially designated the XSAM-N-4, it is powered primarily by a high-thrust, liquid-fuel rocket motor, but as it is launched (below, left), added boost is

supplied by a jettisonable twin rocket. This is shown dropping away from the missile at right. Made for the Navy's Bureau of Aeronautics at the San Diego plant of the Consolidated Vultee Aircraft Corp., the new missile is designed to intercept enemy planes.

OCTOBER 1949 139



Rare Metals, Once Forgotten, Now in Production

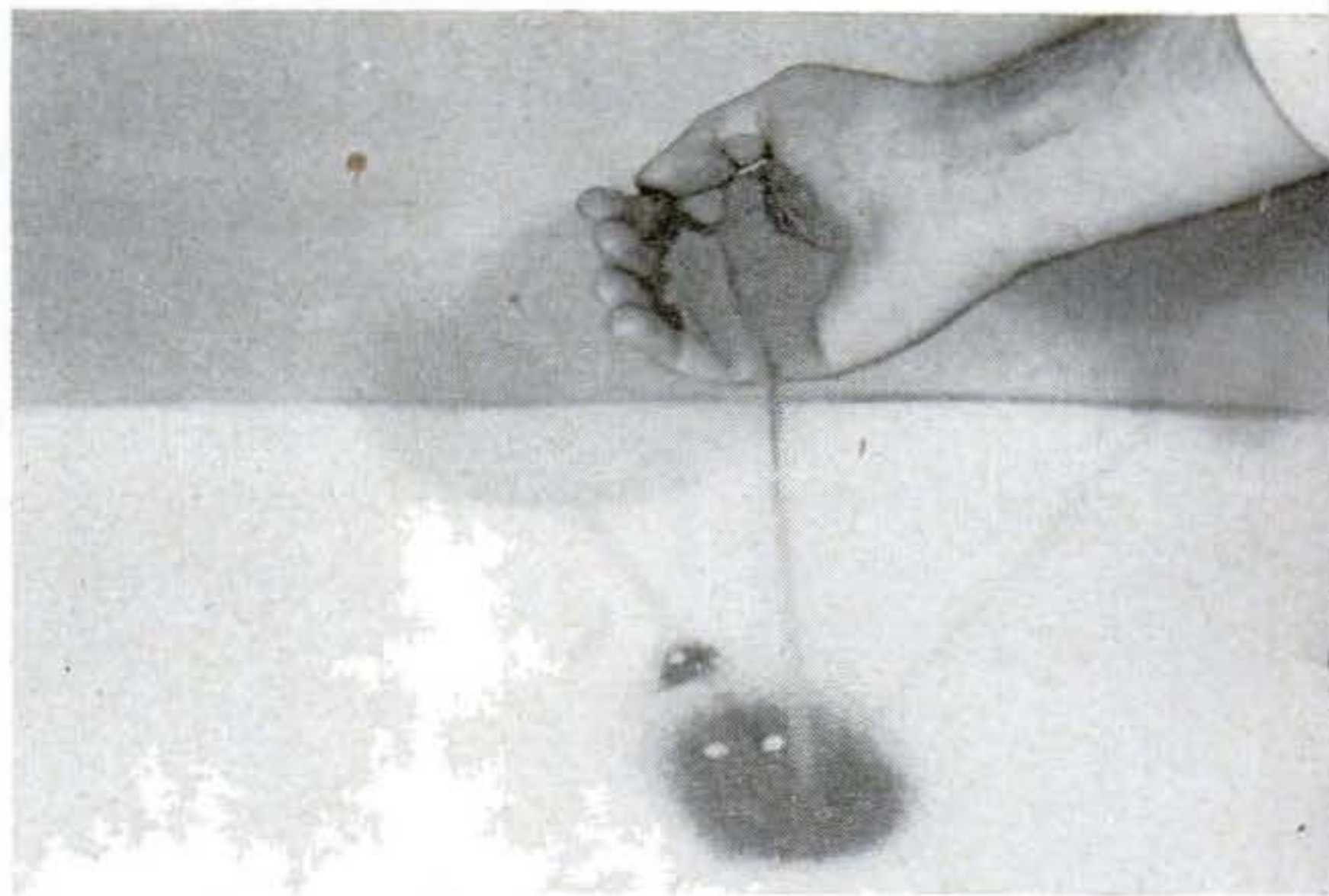
Metals of atomic age may have names like praseodymium, thanks to new process for purifying rare earths.

By Alden P. Armagnac

SPANG in the middle of Iowa there's something nearly as tall as the corn—and more exciting. It's a bank of glass tubes. Out of them come strange metals, some of the most precious on earth, whose unusual properties may prove vital to the atomic age.

They once were rarer than diamonds and actually priceless. Even now, being produced in pound lots by a method born of the atom-bomb project, they cost up to 31 times their weight in gold.

Few people have ever seen them. Gray to light gray with high metallic luster at



Worth 31 times its weight in gold, silvery praseodymium metal in vial at left is sealed from air, which turns it black. One source of rare-earth metals is monazite sand, above.

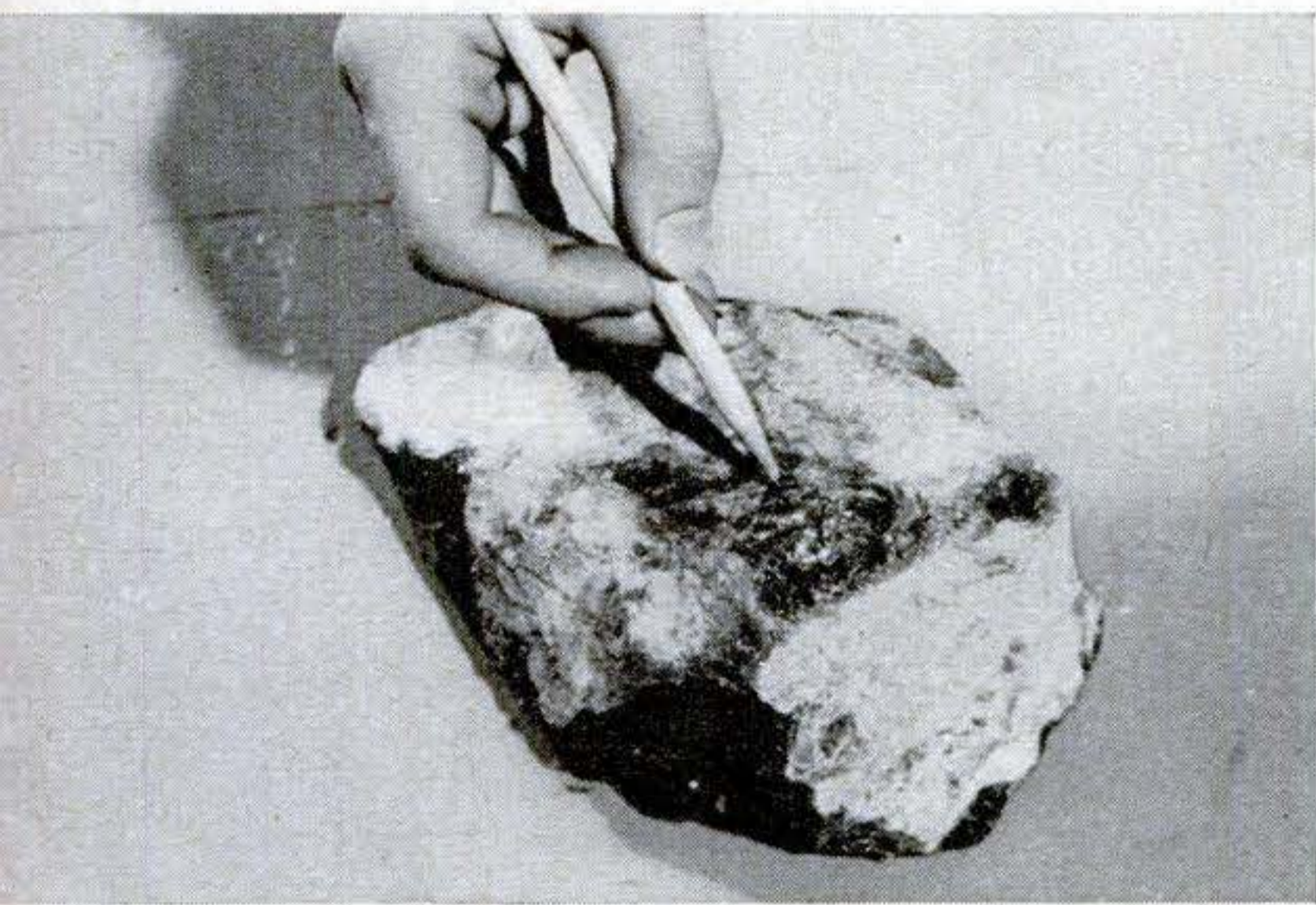
first, they turn odd shades on exposure to air—pale yellow, cream color, black, grayish pink. Their compounds vie in brilliant hues with the colors of the rainbow.

Called the “rare-earth” metals, they are true chemical elements, just as iron, copper, and silver are. Their names sound like something out of an apothecary shop—lanthanum, cerium, praseodymium, neodymium, to mention a few.

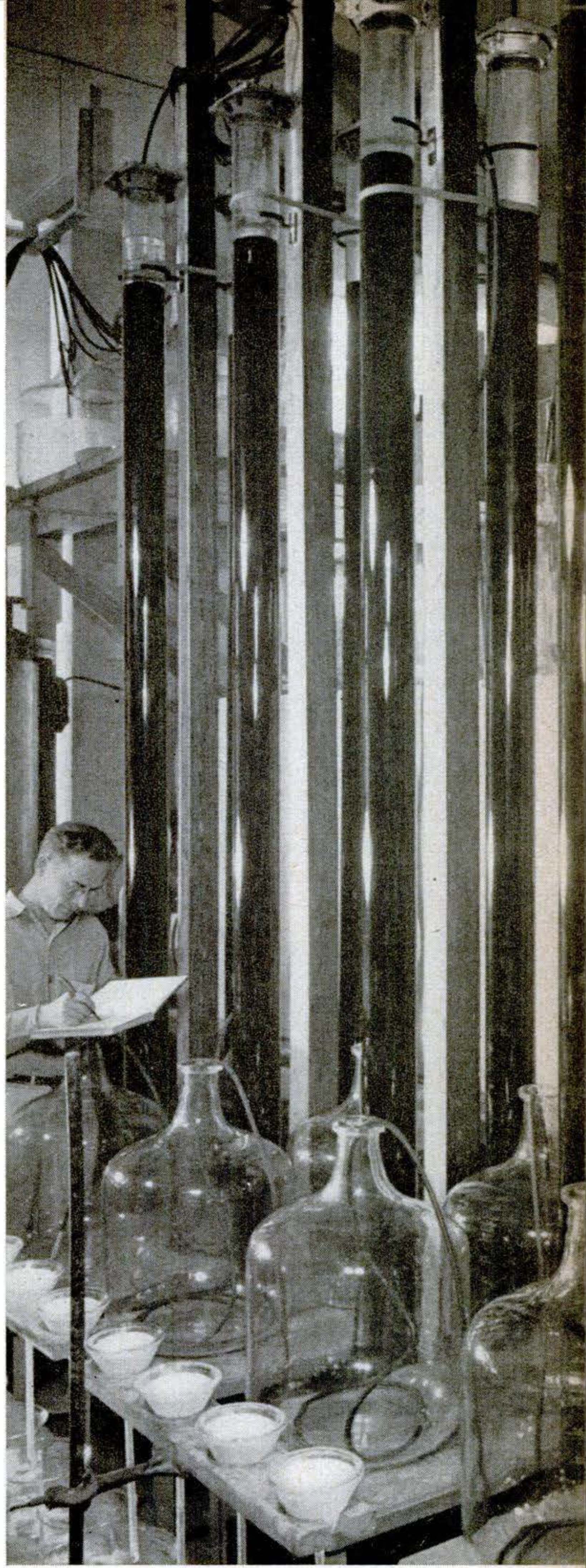
Small wonder if the names are new to you. For the whole group of 15 rare-earth metals, listed on page 143, might well be called the “forgotten elements.” They make up nearly one-sixth of the 96 known elements, the basic materials of which all things are made. Yet a typical college textbook on chemistry, more than 1,000 pages long, devotes a scant two pages to them.


Practical uses have been as few in proportion. Just one may be familiar to most laymen. Spin the wheel of your cigarette lighter, and you are striking fire from pyrophoric, or spark-producing, rare earths, cerium metal in particular, in the alloy of the flint. Lanthanum oxide goes into special optical glass for aerial-camera lenses. Neodymium oxide absorbs glare in glass-blowers’ goggles. Carbon-arc projectors in movie theaters give an intense white light because of rare earths in the carbons. There have been a few other uses for rare earths, but not many.

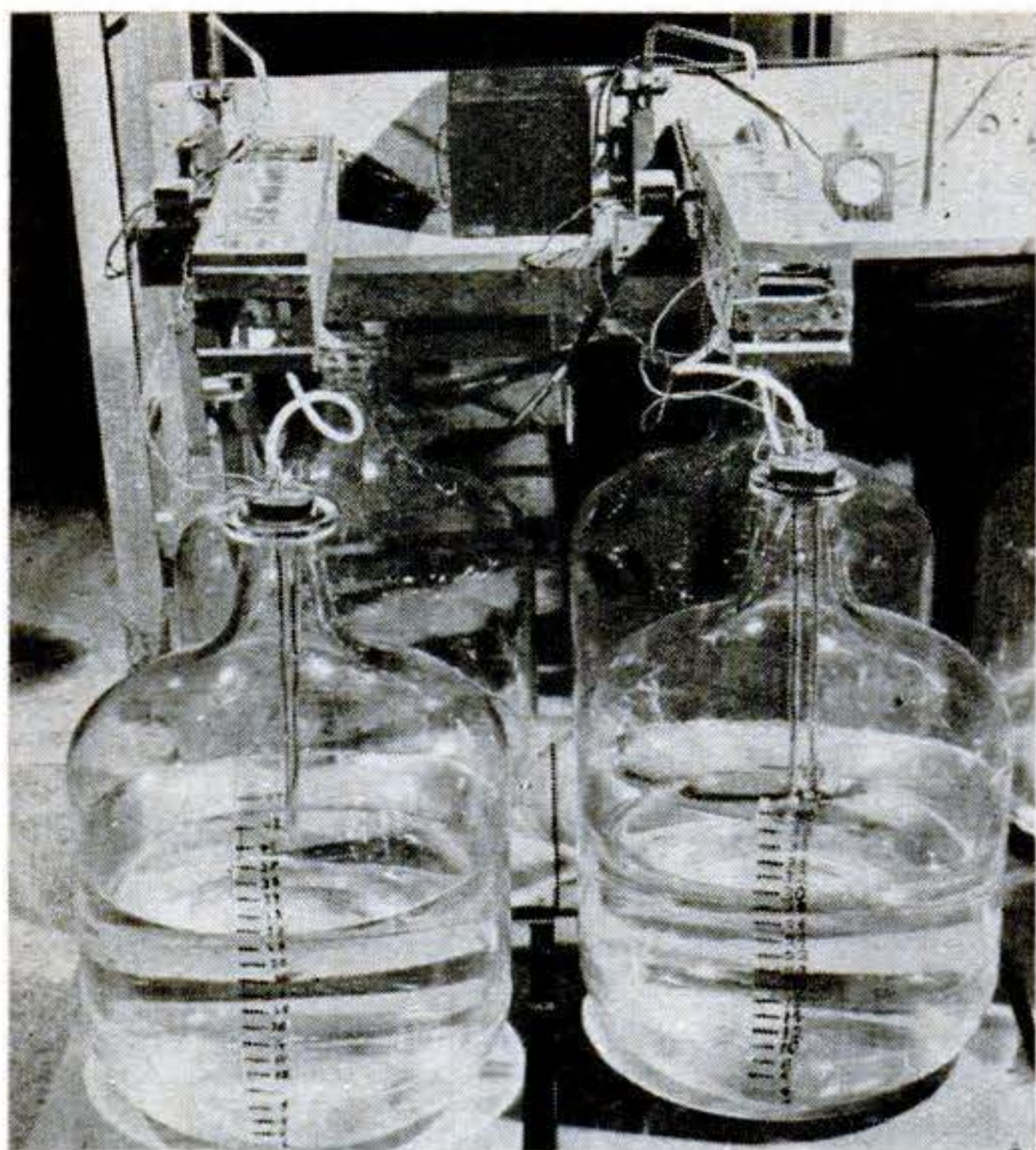
Today, however, these forgotten elements have become news. Atomic research has focused the spotlight upon them. And under the direction of Dr. Frank H. Spedding,



Glossy black portion of gadolinite ore, pointed out above, also yields many rare-earth elements. Ore and one of metals, gadolinium, are named after Finnish rare-earth chemist Gadolin.



Dozens of these eight-foot-tall ion-exchange columns, at Ames, Iowa, “refinery,” accomplish feat of separating rare-earth elements, which are almost identical chemically. 



Ingenious control automatically switches output of column from full to empty collecting bottle. Rising liquid trips electric circuit, shifting carriage holding funnels and delivery tubes.

Iowa State College chemist, the Ames Laboratory of the U. S. Atomic Energy Commission has begun producing highly purified rare-earth metals and compounds in unprecedented quantity.

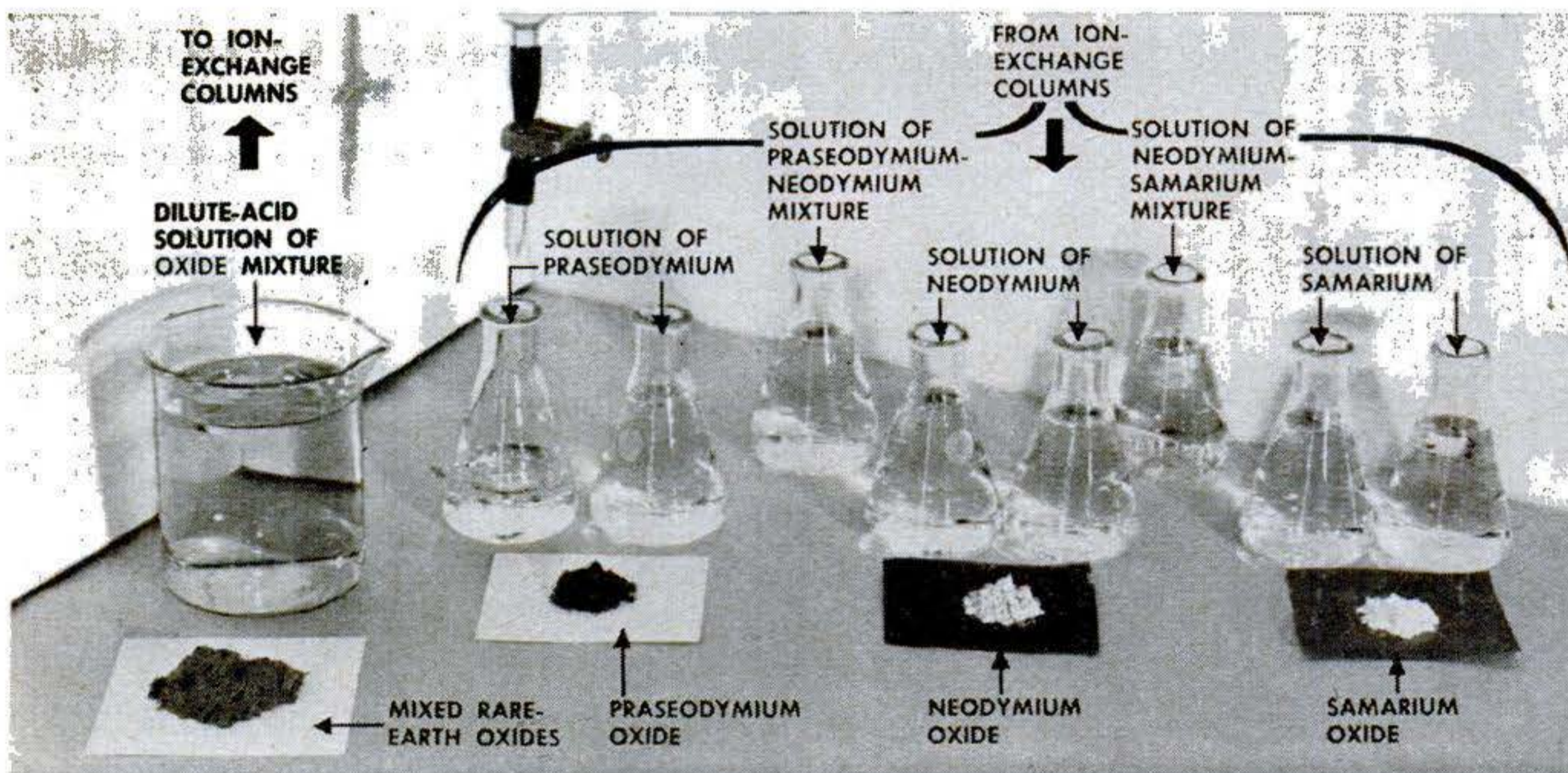
One object is to see if they may be useful materials for future atomic power plants—for instance, in control rods and in lightweight shielding against dangerous radiation from atomic engines of ships and

planes. Forming as “ashes” in uranium rods of piles, rare earths have been a nuisance, tending to put out the atomic fires by absorbing neutrons. But that very vice would be a virtue in shielding and control.

“Moreover,” says the U. S. Atomic Energy Commission, “it now appears that they may have a bright commercial future as alloy metals in the manufacture of high-temperature structural materials.”

It's partly the small proportion of rare earths in the earth's crust—there's as much gold in sea water—that makes them “rare,” not scarcity of places where they can be found. One widely distributed ore is the yellow-to-brown monazite sand of the Carolinas, Brazil, Africa, and India. Norwegian mines furnish gadolinite, a glossy black rare-earth ore, and others. Rare earths of commerce have been relatively inexpensive “concentrates” or crude mixtures obtained from these ores. For example, cerium for cigarette-lighter flints is a \$4-a-pound commercial alloy known as “mischmetal,” consisting of cerium and seven other rare-earth metals, and other impurities.

But one of the biggest reasons the rare earths are so “rare” is their unusual chemical resemblance to each other. They are so much alike that ordinary chemical methods cannot separate one from the others. *Years* of tedious evaporating and redissolving were formerly necessary to get a few specks of material.



Pictorial diagram shows separation process at a glance. Rare-earth oxide mixture, dissolved in acid (in beaker) goes into columns. Rinsing with citric acid and ammonium citrate yields

series of “fractions” in flasks, of which last obtained is beneath delivery tube. From pure fractions, oxalic acid precipitates oxalates, converted by heat to pure oxides shown.

Then in early 1944, workers on the atom-bomb project, including those at Ames, Iowa, made the amazing discovery that rare earths formed by uranium fission could be separated—in hours instead of years—simply by passing a solution of them through a vertical tubeful of synthetic resin. Samples were, at first, sub-visible “tracer” quantities; later, visible ones of ten-thousandths of an ounce.

Exciting news came from Clinton Laboratories at Oak Ridge, Tenn., when two young chemists separated a mysterious substance from fission-produced neodymium with one of the new resin tubes or “ion-exchange columns.” It proved to be the long-missing rare-earth element No. 61, which they named promethium. Radioactive and shortlived, it is believed nonexistent in nature. First visible samples, pink and yellow smears on white porcelain disks, are minute quantities of promethium nitrate and chloride respectively.

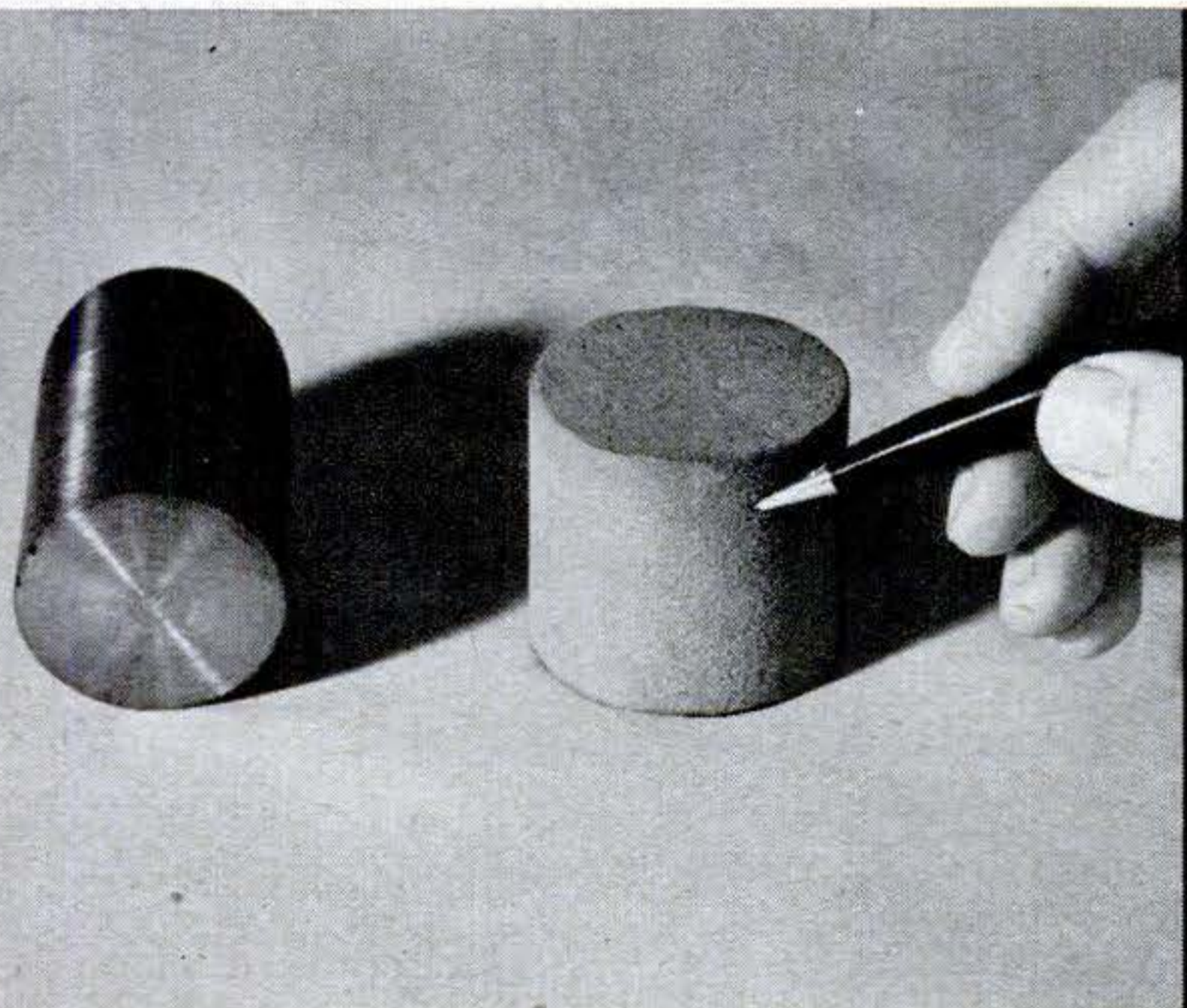
In the meantime, Dr. Spedding of Iowa State proposed as bold a step-up in scale as that from a pinhead of plutonium to pounds of it for the bomb. Instead of being content with “micro” quantities of pure rare earths, why not adapt the new method to produce them in “macro” amounts of grams or even pounds? He and his colleagues installed a battery of 24 resin columns, eight feet tall and four inches in diameter—and made history by accomplishing the feat.

Watching the precious liquids trickle

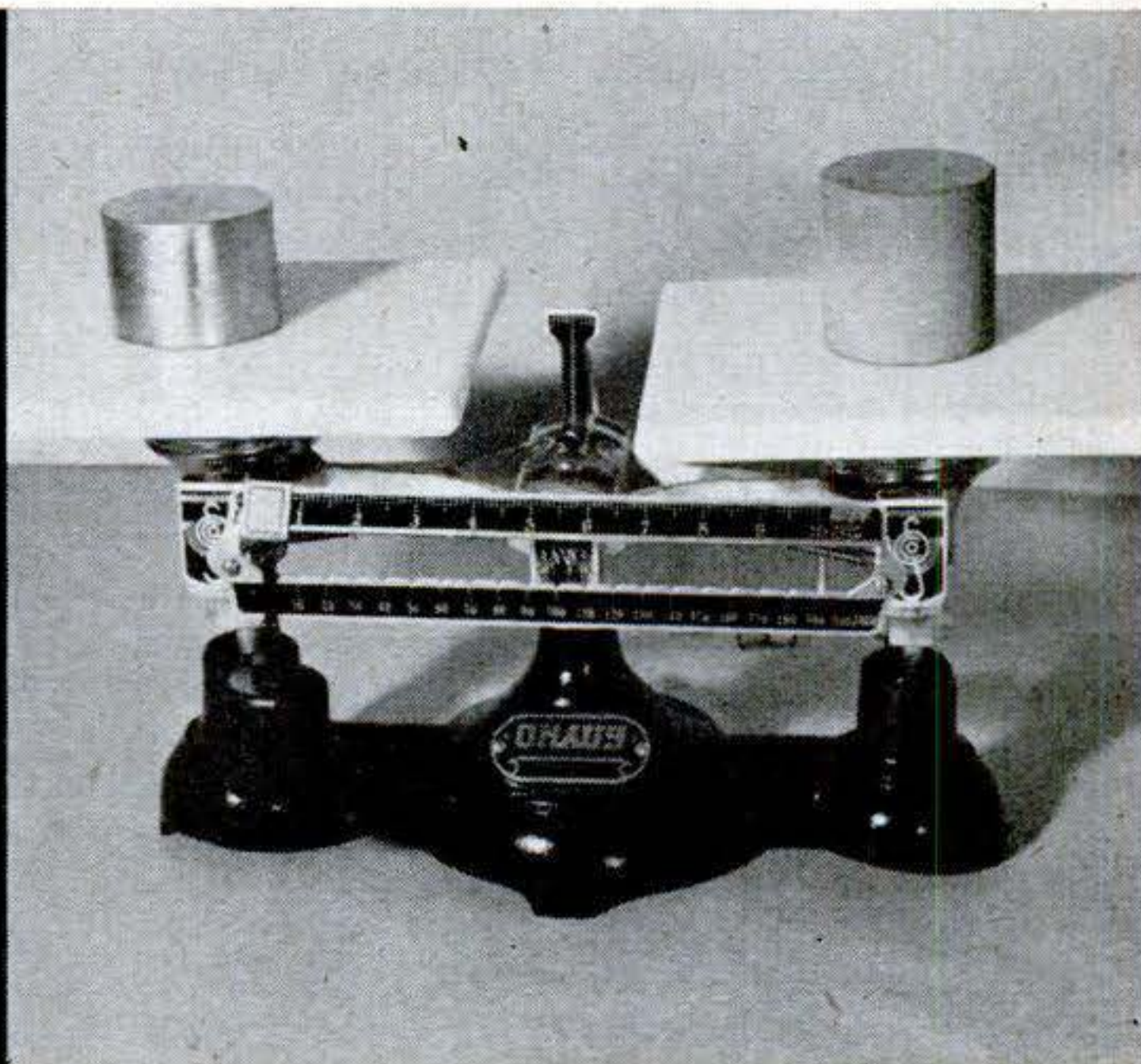
These Are the 15 “Forgotten Elements” Known as the Rare-Earth Metals

NAME (with source or meaning)	CHEMICAL SYMBOL	ELEMENT NO.:
LANTHANUM <i>“To lie hidden”—Greek.</i>	La	57
CERIUM <i>Ceres, a planetoid.</i>	Ce	58
PRASEODYMIUM <i>“Green” (from color of salts), “twin”—Greek.</i>	Pr	59
NEODYMIUM <i>“New,” “twin”—Greek.</i>	Nd	60
PROMETHEUM <i>Prometheus, mythical fire-giver.</i>	Pm	61
SAMARIUM <i>Samarski, a Russian mine official.</i>	Sm	62
EUROPIUM <i>Europe.</i>	Eu	63
GADOLINIUM <i>Gadolin, Finnish chemist.</i>	Gd	64
TERBIUM <i>Ytterby, in Sweden, source of rare-earth ore.</i>	Tb	65
DYSPROSIUM <i>“Hard to get at”—Greek.</i>	Dy	66
HOLMIUM <i>Holmia, Latin name for Stockholm.</i>	Ho	67
ERBIUM <i>Ytterby—see above.</i>	Er	68
THULIUM <i>Thule, or “Northland.”</i>	Tm	69
YTTERBIUM <i>Ytterby—see above.</i>	Yb	70
LUTECIUM <i>Lutetia, Latin name for ancient Paris.</i>	Lu	71

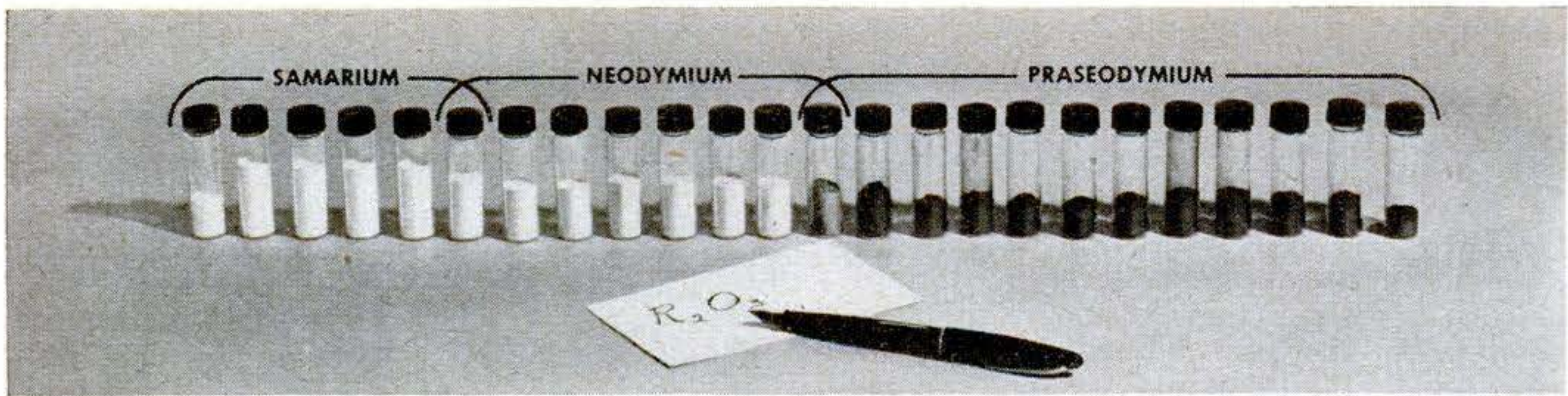
from glistening glass columns into collecting bottles the size of cider jugs, a visitor to this pilot plant hardly realizes the miracle taking place in the tubes. ➡



Air gives cerium, right, this cream-colored coating. Freshly machined lanthanum, left, shines like steel. Each sample of rarely seen metal weighs 1.3 lb. and is valued at \$1,200.



Rare-earth metals are only moderately heavy. Cerium on right-hand side of scales, with density 6.8 times that of water, is balanced by smaller piece of copper with density of 8.9.



Yields of rare earths in oxide form, from series of 12-hour runs through columns, show almost

total separation of test mixture of equal parts of samarium, neodymium, and praseodymium.

Into the top of a tube goes a hodgepodge of rare-earth elements—redissolved in acid after acid extraction from the ore and crude preliminary chemical separation into two main groups, light and heavy.

Like flies to flypaper, ions—individual charged atoms—of rare earths stick to the resin at the upper end of the tube. Thus they are strained—“adsorbed” is the technical word—from the acid, which is then removed by washing.

Down Go the Ions

Now a dilute solution of citric acid and ammonium citrate is poured down the column. Rinsed from the resin, or “eluted” if you prefer the scientific term, a typical rare-earth ion starts down the tube. Almost at once it sticks to the resin again. This skip-stop progress repeats itself, over and over, all the way to the tube’s bottom.

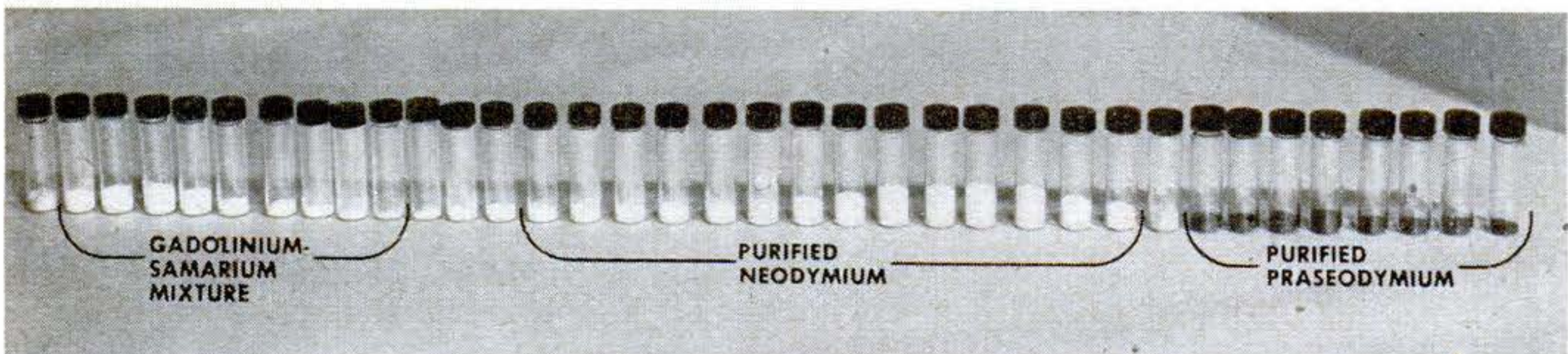
Eventually all the rare-earth particles reach bottom. But those of the element of highest atomic number get there first; those of the next highest number, next, and so on. Switch the liquid output from one collecting bottle to another, at the right time intervals, and nearly every bottleful or “fraction” will contain a single purified rare-earth element. A few fractions in which elements overlap are re-treated; and purified fractions, if still higher purity is wanted, may also be run through a column again.

The solutions yield oxalates, by precipi-

tation with oxalic acid. Then heat treatment converts these to the rare-earth oxides—the form desired for many experiments and from which other compounds may readily be prepared. Purity runs around 99.9 percent.

By “smelting” rare-earth oxides when enough are on hand, the Ames workers produce miniature ingots of the pure metals—tiny 1/20-oz. cylinders of silvery praseodymium and neodymium metals, sealed against corroding air in helium-filled glass vials, and comparatively massive 1.3-lb. chunks of cerium and lanthanum metals. Their weight compares with iron, their softness with calcium; like the latter, they react with water, liberating hydrogen. Producing one avoirdupois ounce of praseodymium costs almost \$1,000; of neodymium, \$170; of lanthanum and cerium, \$57 each—compared with the \$31.90 value of an ounce of pure gold (\$35 per troy ounce).

If new uses require pure metals, even these prices—which the experimenters hope to reduce—may not be commercially prohibitive. Like radium in watch dials, a little may go a long way. Or like platinum in chemical crucibles, advantages may outweigh cost. But it is primarily for research that scientists prize the newly available pure preparations. At last their long-mysterious properties can be fully explored for possible exploitation. The “forgotten elements” are forgotten no longer. END



Results of another test show successful recovery of neodymium and praseodymium from

complicated mixture of other rare earths including hard-to-separate gadolinium and samarium.

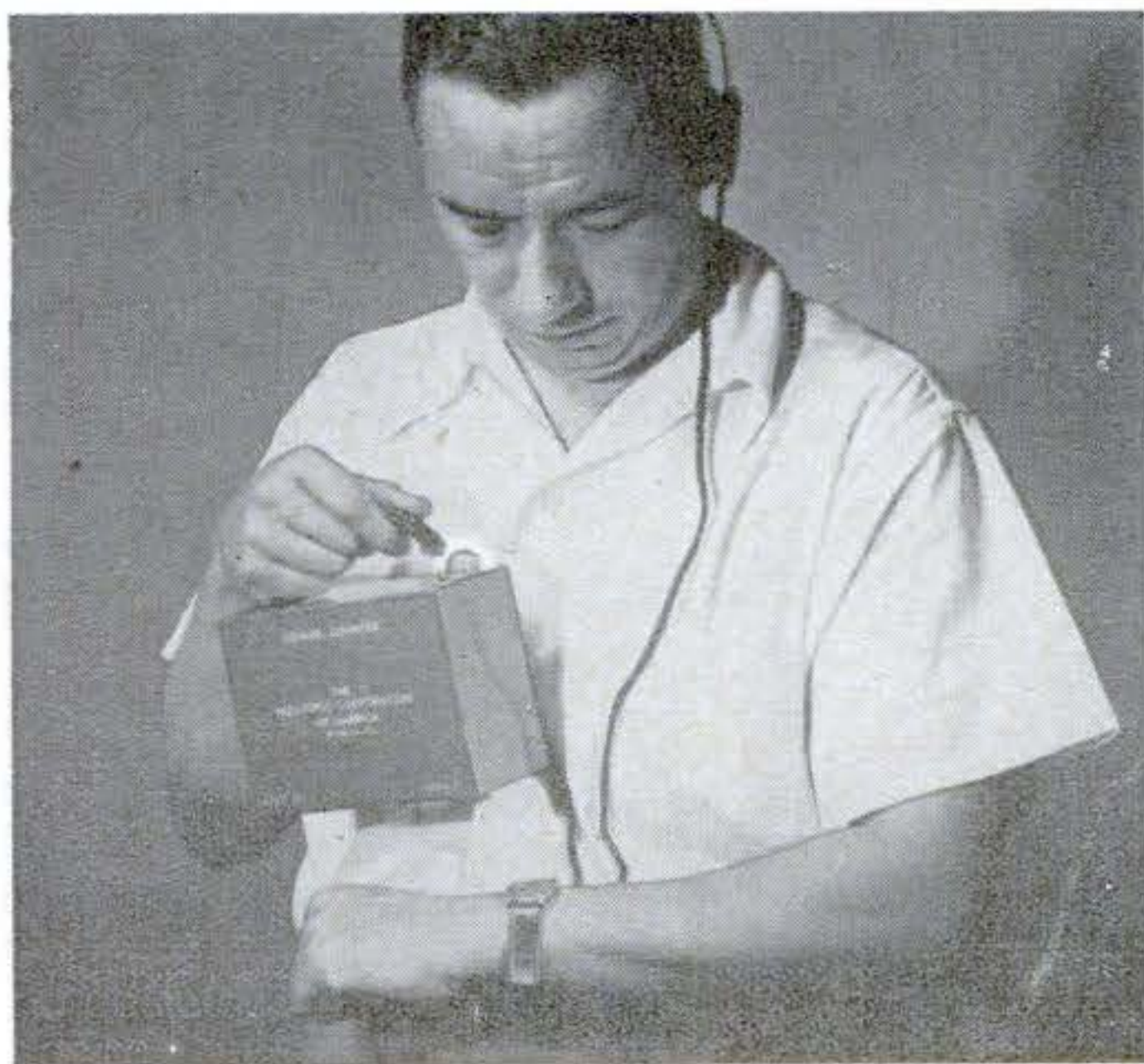


Atom Barrage Cleans Metals

ATOMS have found a new use in industry—they're being shot at pieces of metal, like peas from a blowpipe, to clean off the top surface. Following this treatment, called cathodic vacuum etching, microscopic examination reveals lines showing how the metal

"flowed" when forged under high pressure.

The new process, developed by the Ford Motor Co., works like this: A metal sample is placed in a vacuum, above, with some argon (the gas used to fill light bulbs). A potential of 12,000 volts shoots charged argon atoms down at the metal sample, and the speeding atoms etch the surface.

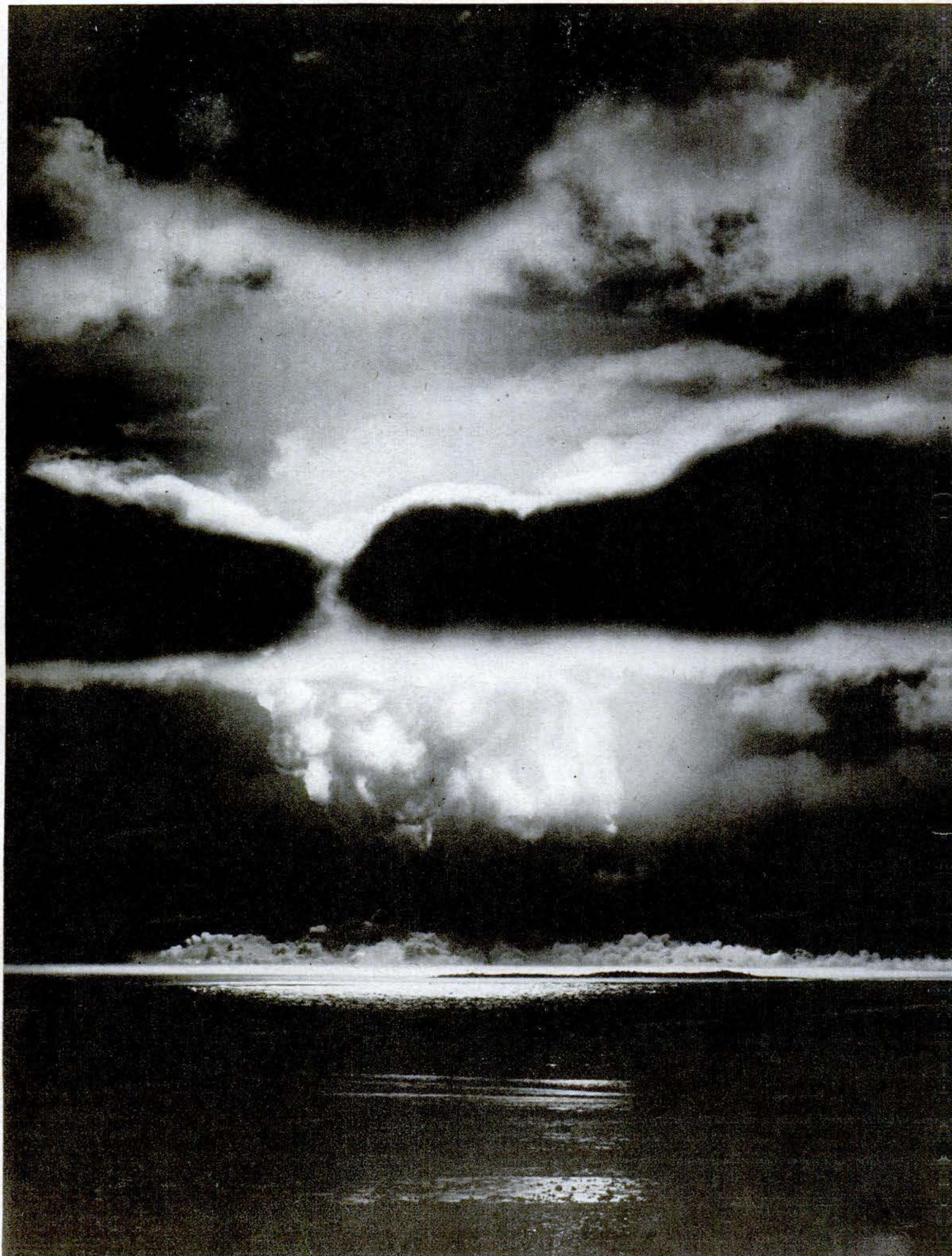


Tiny Counter Finds Uranium

IF YOU hold this midget Geiger counter next to a radium-covered watch dial (left), it will make your earphones click and a neon bulb flash. It will do the same over uranium deposits—and that might mean a \$10,000 Government bonus for the lucky prospector.

Powered by standard, easily replaced radio batteries, the counter weighs only two pounds and measures 2¾ by 4½ by 5¾ inches. It indicates the activity of ores by the speed of the clicks and flashes.

The counter shown, made by Nucleonic Corp. of America, Brooklyn, N. Y., sells for \$67.50. A simpler model without the flashing light is less expensive.



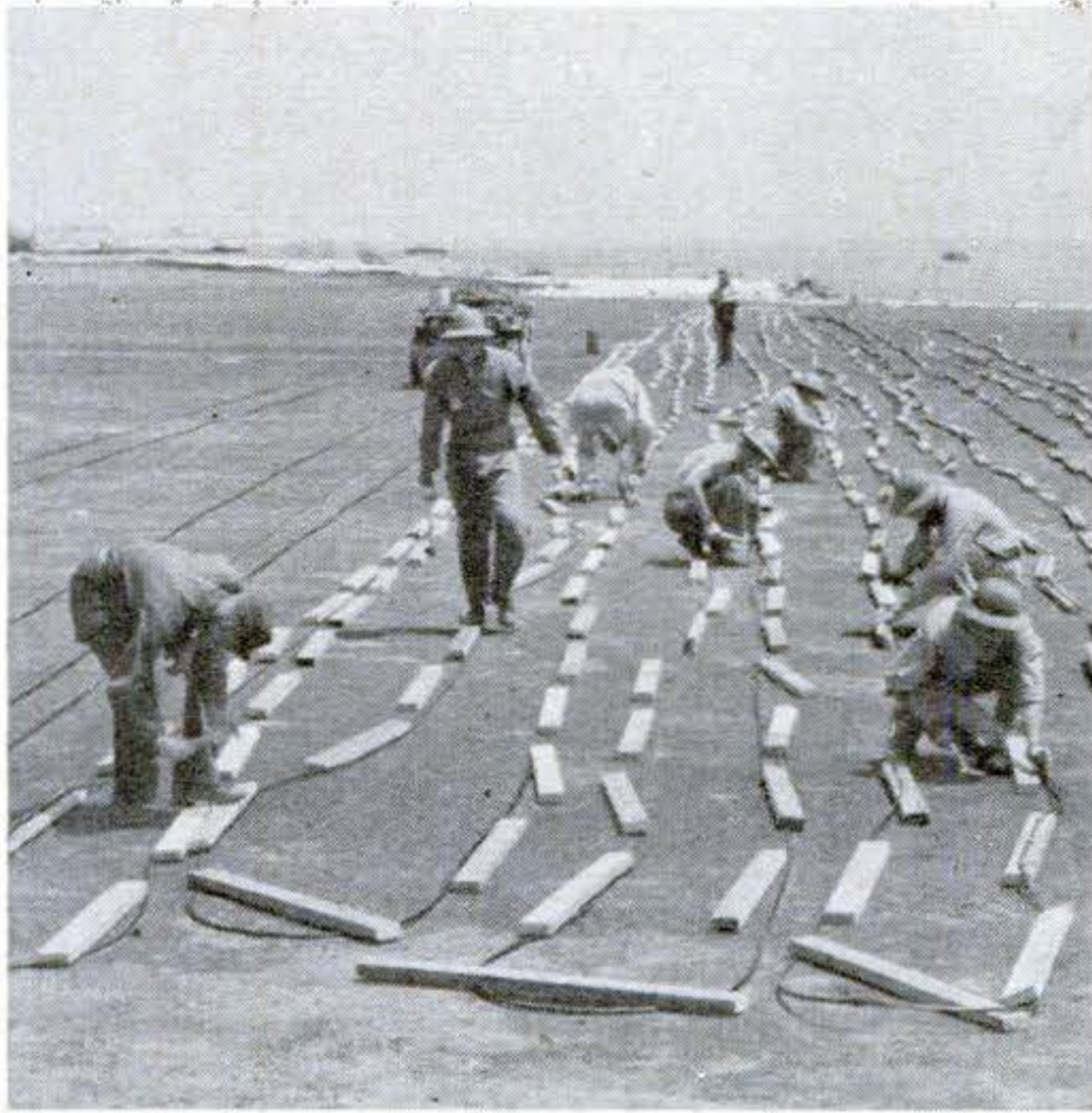
The A-bomb's "signature," the familiar mushroom cloud, is almost hidden in this sunsetlike

picture. Eniwetok Atoll, on which explosion occurred, is seen as long thin line below horizon.

Photos of Secret A-Bomb Test

WHAT went on during the hush-hush test of deadlier atom bombs in the spring of 1948? The curtain has been partly lifted with release of these pictures. But the

Atomic Energy Commission still won't say more about the bombs themselves than that there were three, "each of improved design," and they all went off. **END**



These blocks and cable were part of a gadget that collected samples of sea water after explosion.



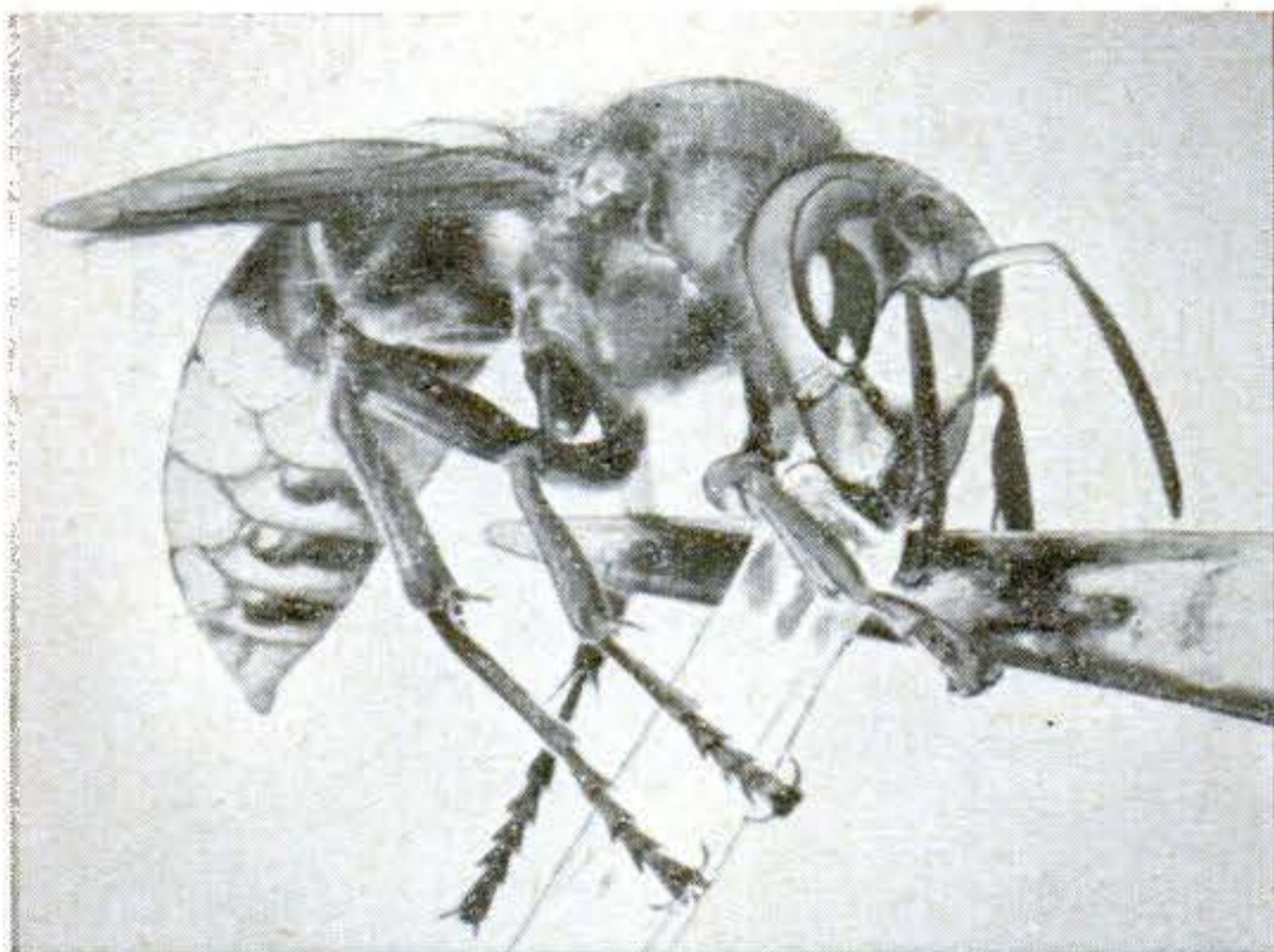
Concrete "igloo," near detonation point, contained instruments to record data during blast.



Men aboard Navy ship turned backs or shielded eyes with glasses at instant of detonation.



After explosion, helicopter picked up ocean samples from raft attached to water-sample cable.

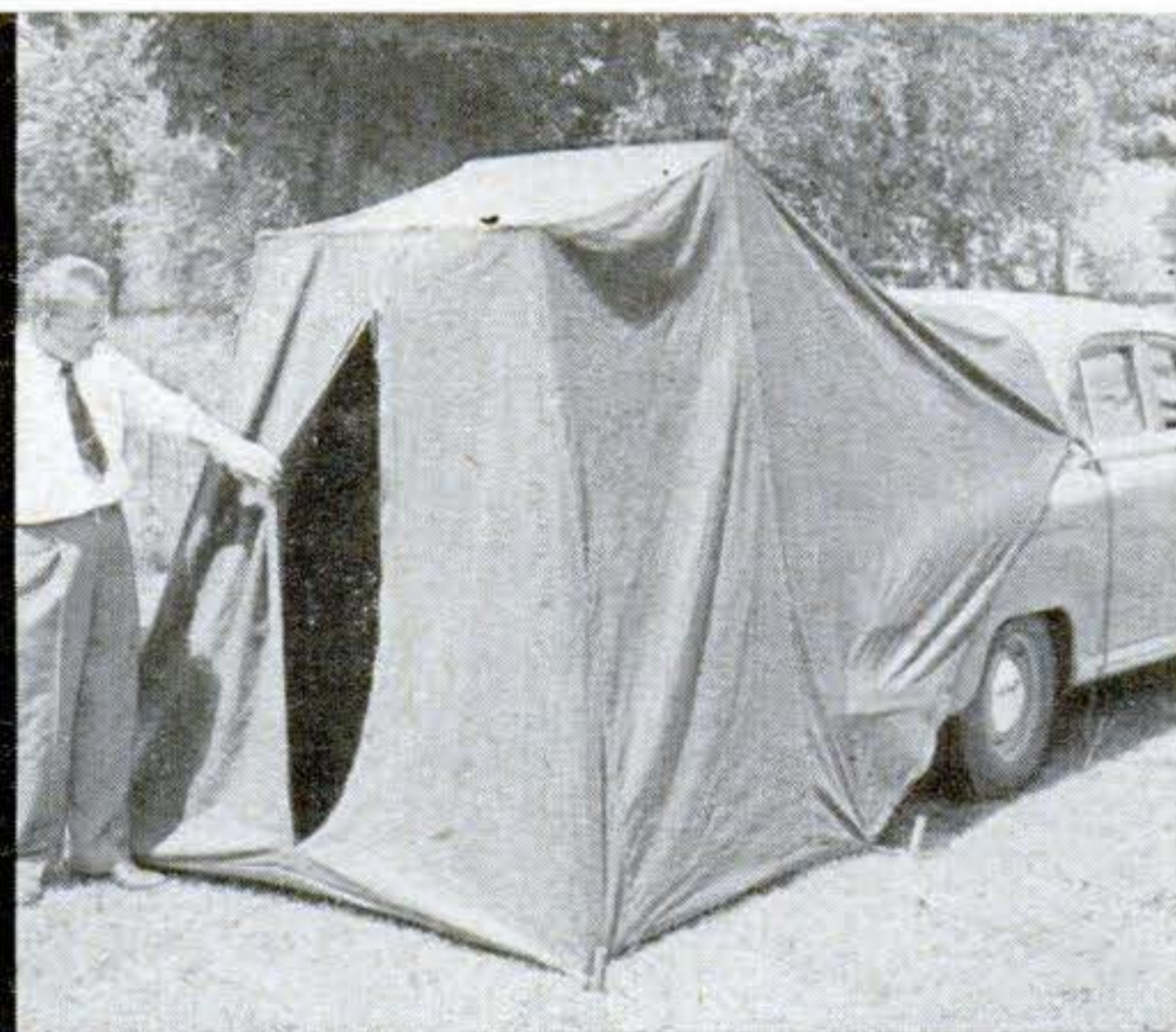
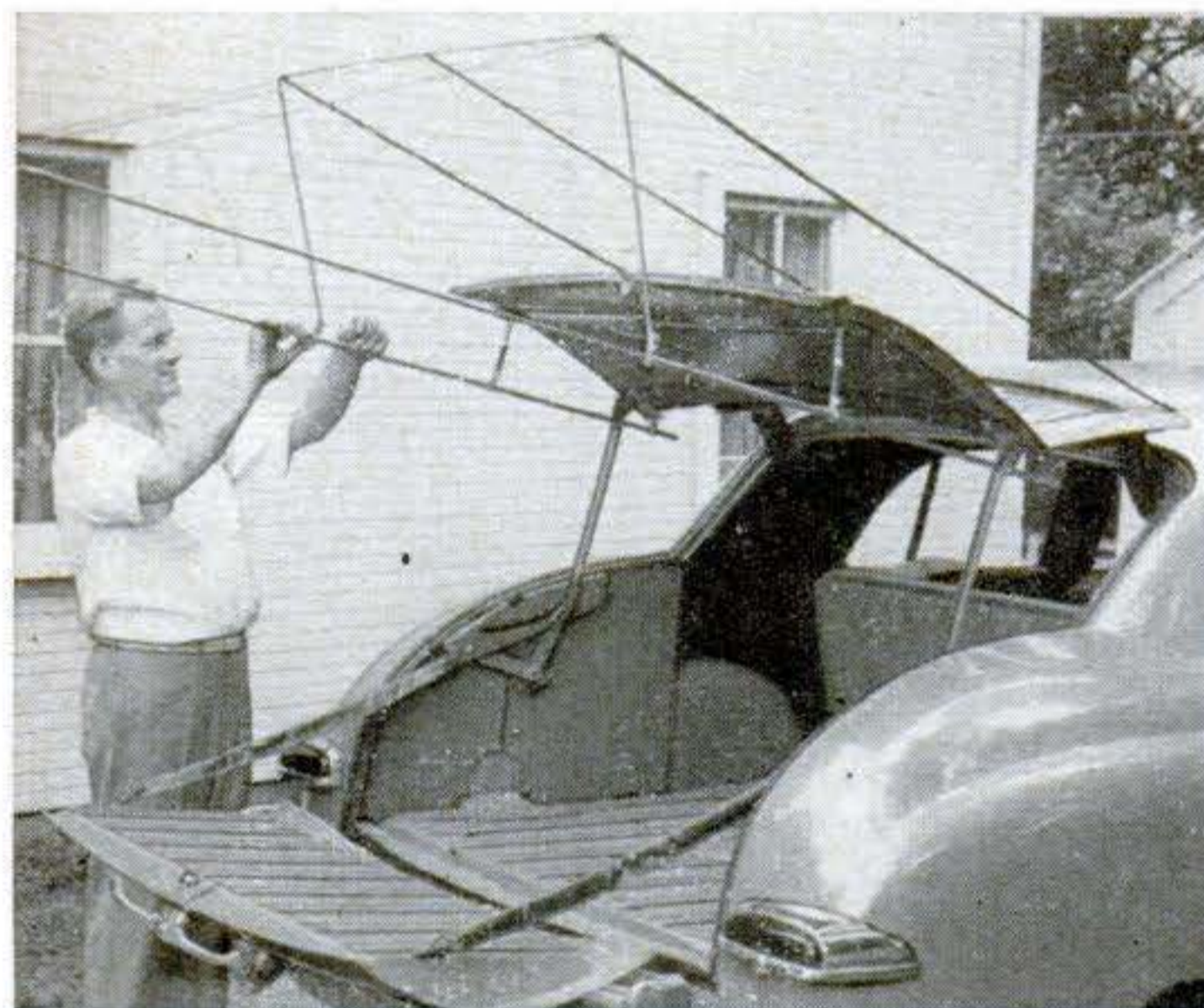
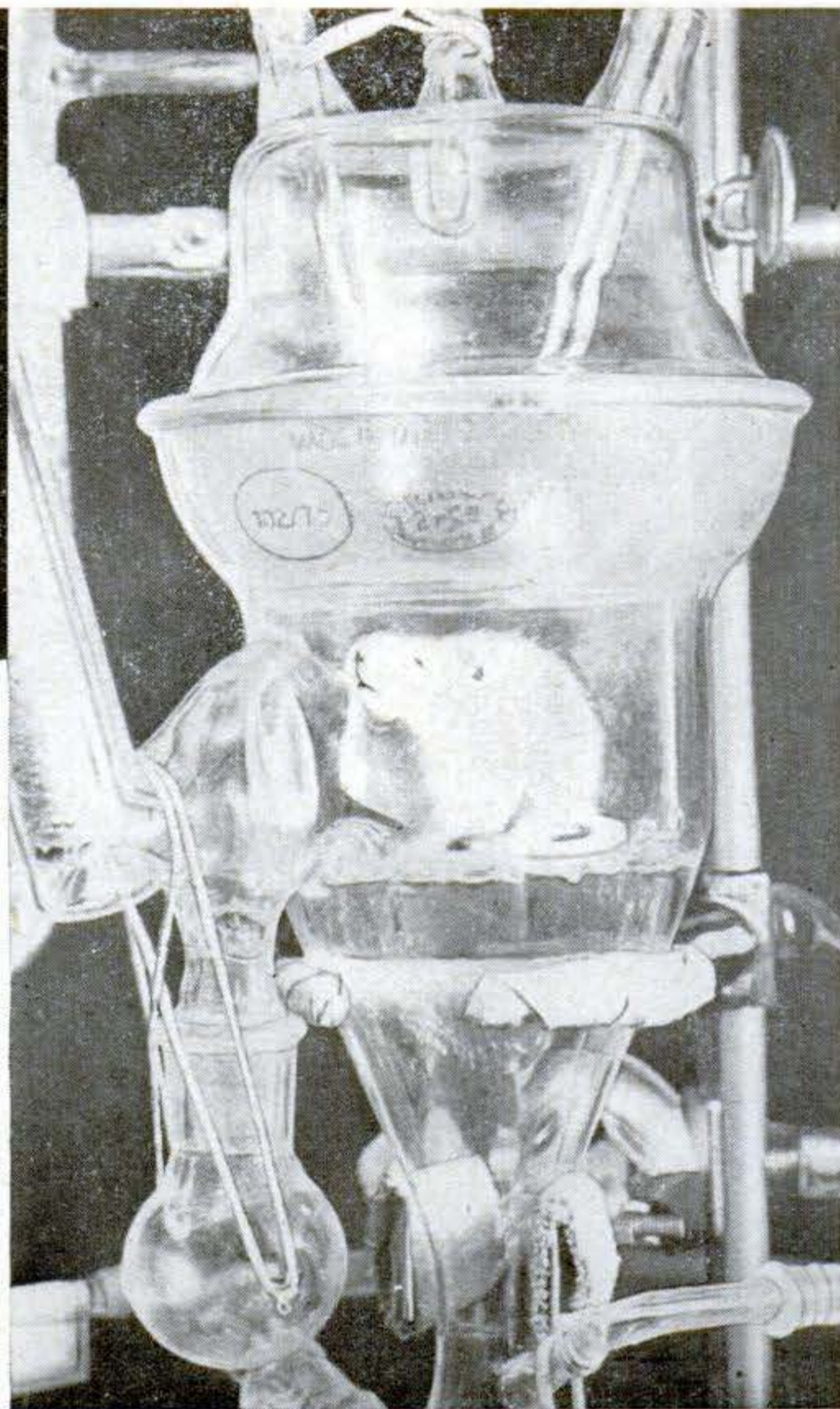


Hornets Help Atom Engineers

WHEN uranium atoms are split in atomic engines, barium is formed. Hornets collect barium. So nuclear engineers propose to keep hornets around reactors—and detect leaks by checking the hornets periodically for radioactivity.

Mouse Can't Lose an Atom

THE mouse in the glass house at right has eaten food containing radioactive carbon. Scientists are following it through his body. This apparatus collects all the air he exhales and all other body excretions.

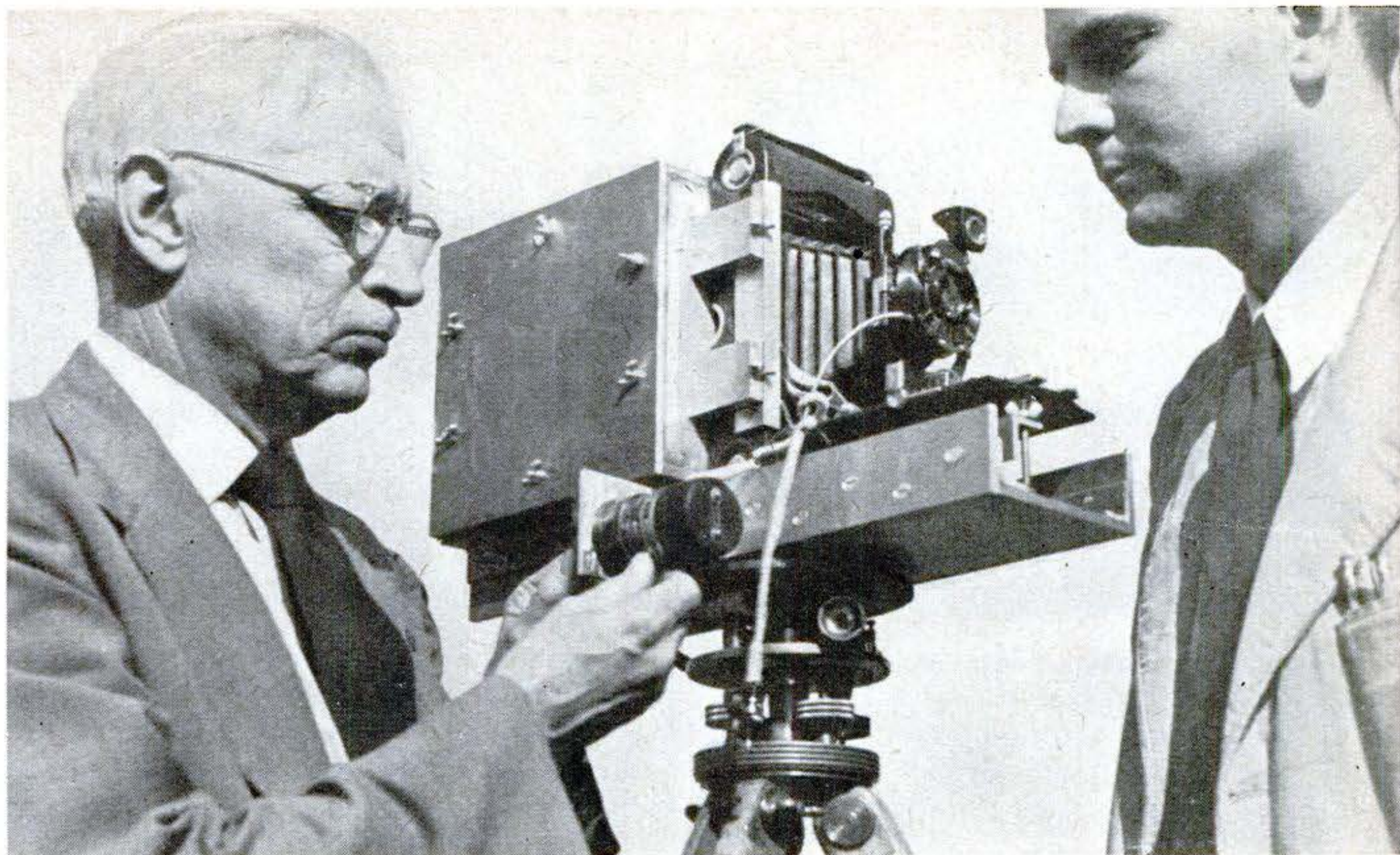


Kaiser Utility Sedan Converts to Tent

THE sedan that converts to a truck now converts to a tent, too. A steel frame and canvas tent fit over the opened deck lid and tail gate of the Kaiser Traveler and Vagabond (PS, April '49, p. 106) to provide quarters for overnight lodging. The waterproof duck and drill tent, which measures 6½ by 6 by 4 feet when open, can be folded

or unfolded in two minutes. It is reported to be insect- and vermin-proof.

The photos above show LeRoy Smelker, inventor of the Travel Tent®, attaching the frame to the deck lid and standing beside the erected tent. Available through Kaiser-Frazer dealers, it is made by Allied Cloth Specialties, Inc., of Greenville, Ohio.



Second-hand and war-surplus materials make up most of 360° camera. Front end is old Auto-

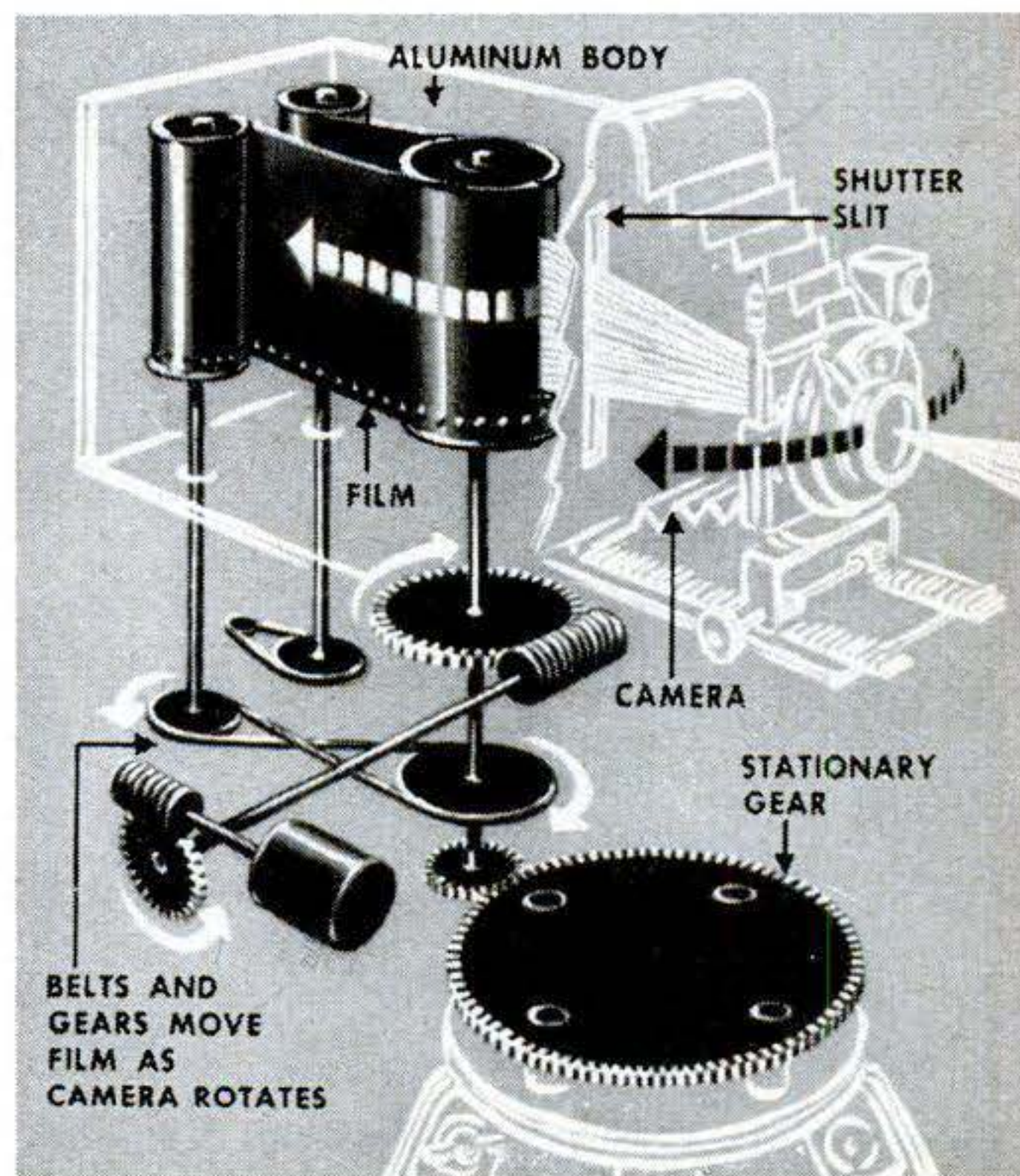
graphic Kodak®. Drive motor, film are surplus; leveling table came from a junked transit.

Spinning Camera Covers 360°

A CAMERA that rotates to get a view all around itself on one negative can now simplify map making. It gives a picture 41 inches long and six inches wide—the two ends overlap slightly to complete the circle. Measurements on the picture then permit quick preparation of a fairly accurate map.

Eliminating the difficult task of accurately joining separate photographs made with ordinary equipment, the homemade 360° camera is an adaptation of the old "panorama" camera used to photograph large groups of people. It turns on a large gear that simultaneously moves the film past an exposure slit.

Two students at Rensselaer Polytechnic Institute, Ralph B. Grahl, Jr., and Robert B. Jarvis, designed and made the camera as their master's-degree thesis.



How it works is shown in drawing above. Motor rotates camera around large stationary gear (bottom), thus causing worms, gears, and belts to move film in synchronism past exposure slit.



Photo shows Rensselaer campus. Note overlap—building corner, stairs are at both ends.

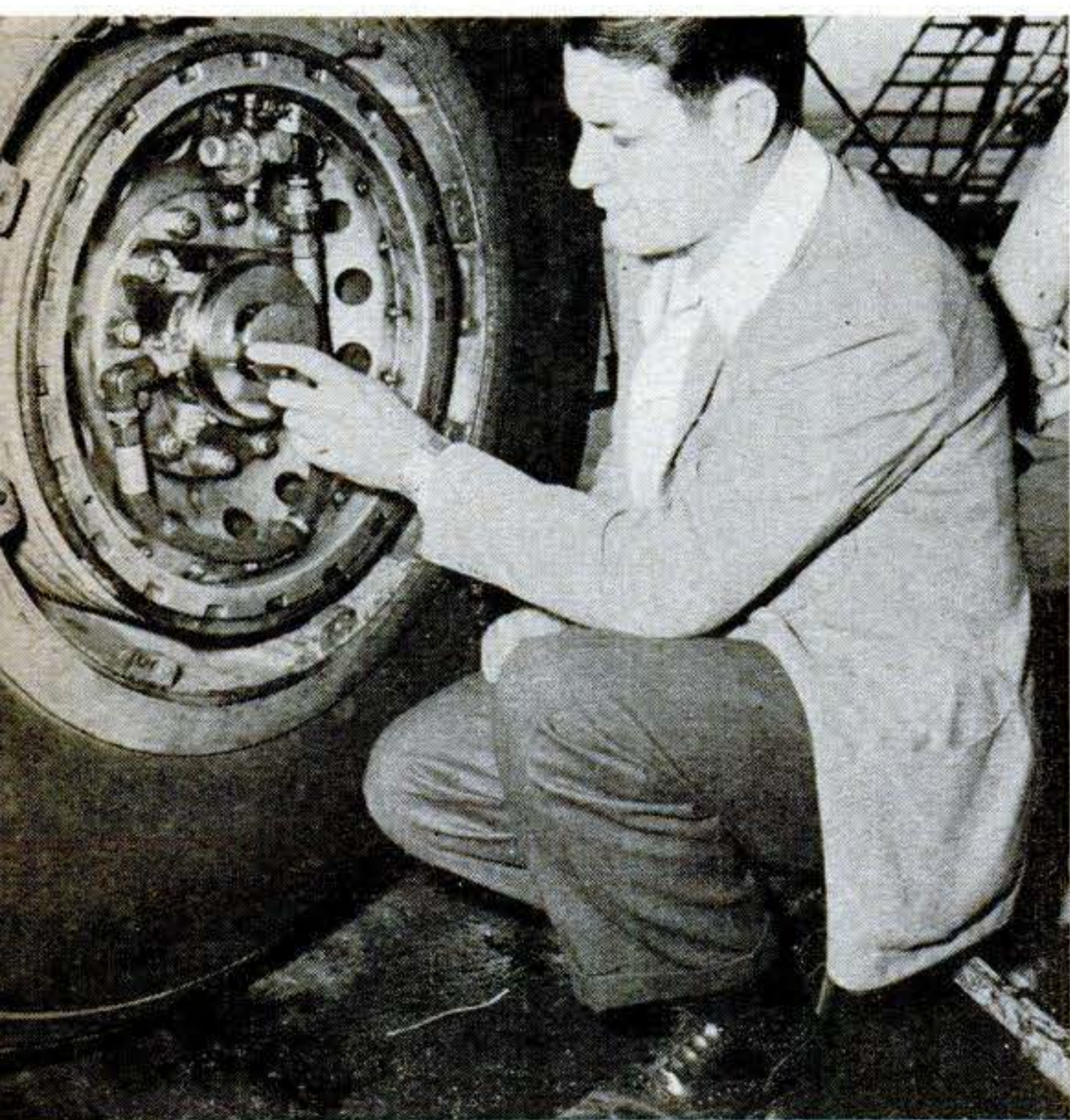
What's New in Aviation



Planes Become Water Babies.

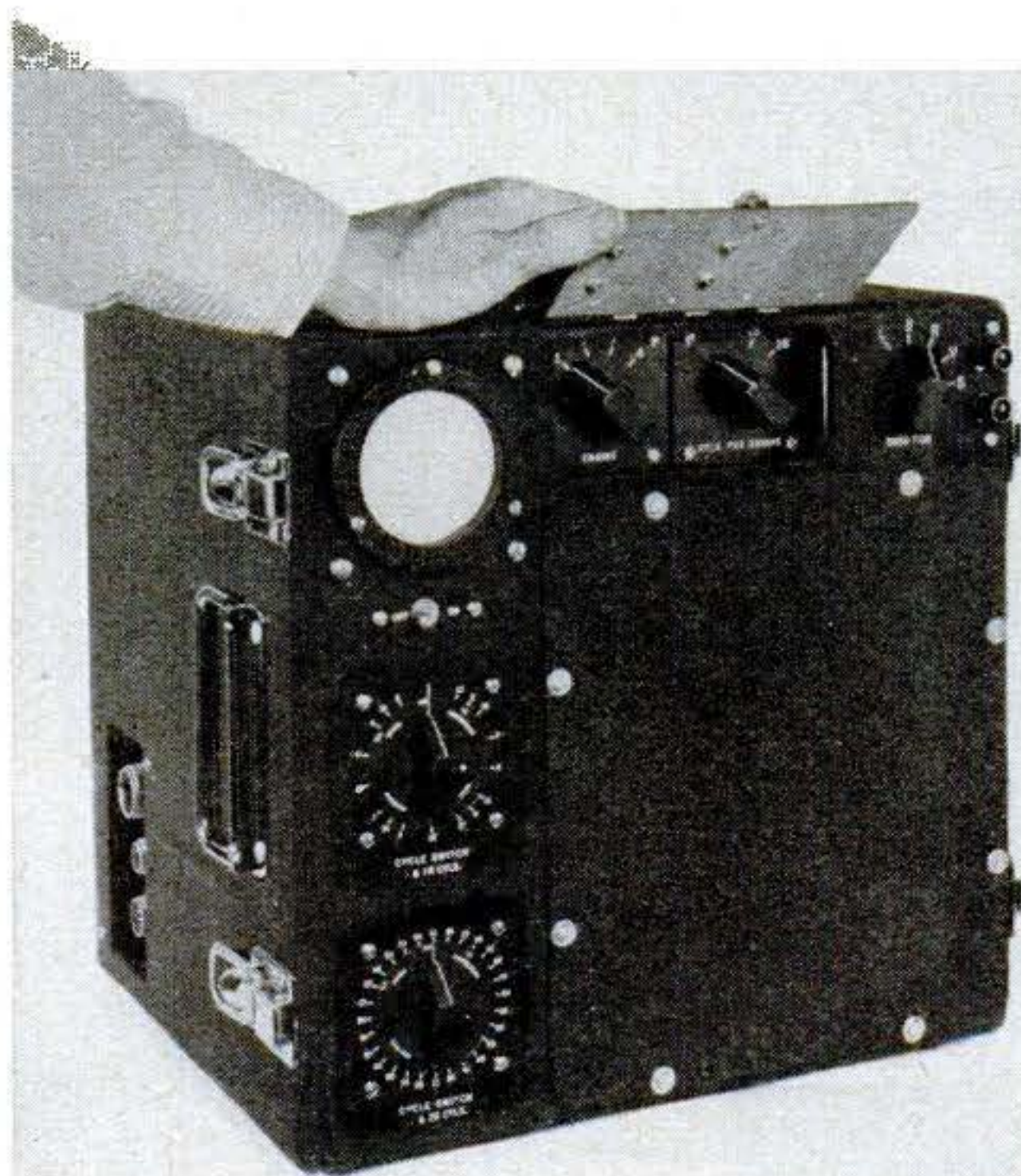
The three aircraft pictured above are showing off their newly acquired aquatic ability with a splash. At left, a Convair L-13 makes its first water landing, chalking up another

achievement for the Air Force's jack-of-all-trades liaison plane. Next to it, a Sikorsky H-5H, claimed to be the first helicopter with amphibious landing gear, takes off after a sea landing. Developed for the Air Force, it



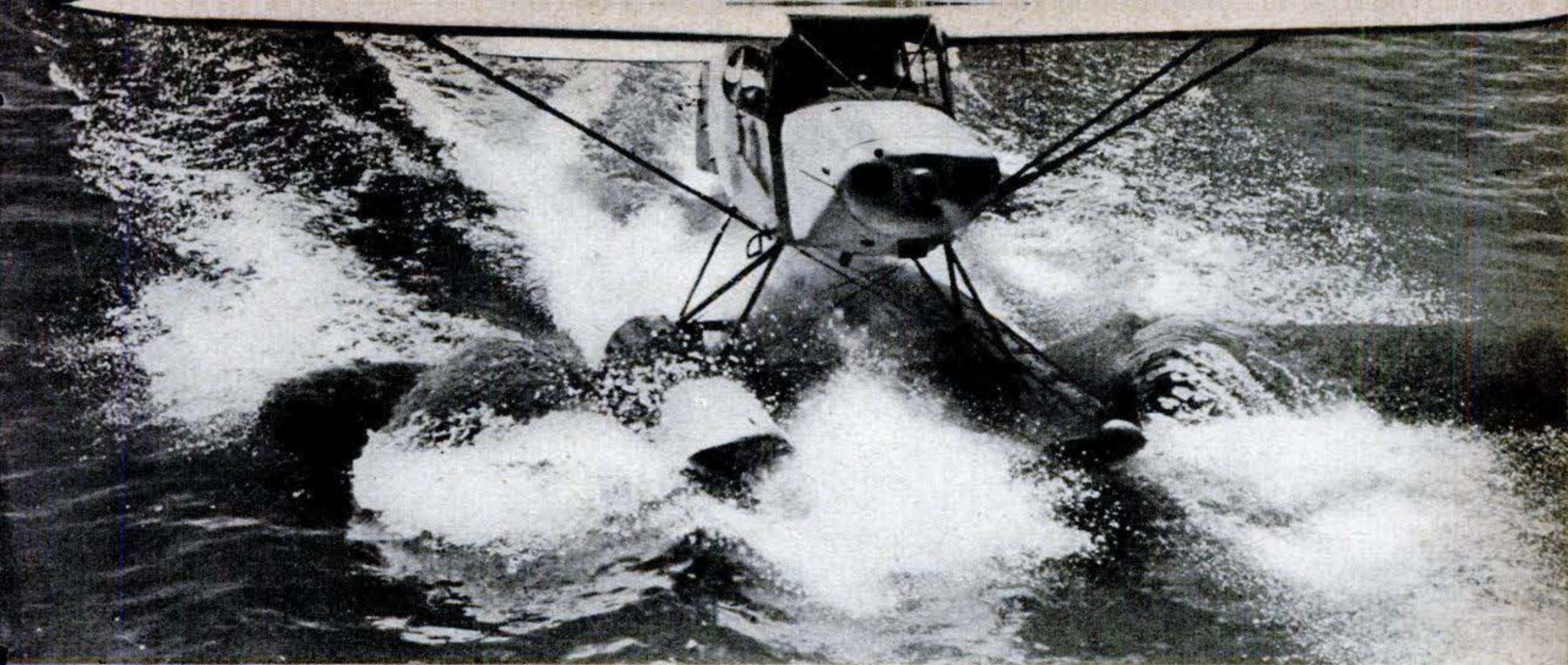
New Brake Device Stops Skids.

Even on icy runways, a plane with a new Boeing attachment shouldn't skid. An electronically controlled valving unit, shown above installed on a main wheel of a Strato-freighter®, opens to cut breaking power a second before the skidding point would be reached. The outside portion, to which the engineer is pointing, is a slotted driving link that engages hub-cover pins. Housing behind it hermetically seals the rest of the device. There is one unit on each of the main wheels.



Electronics Spot Engine Fault.

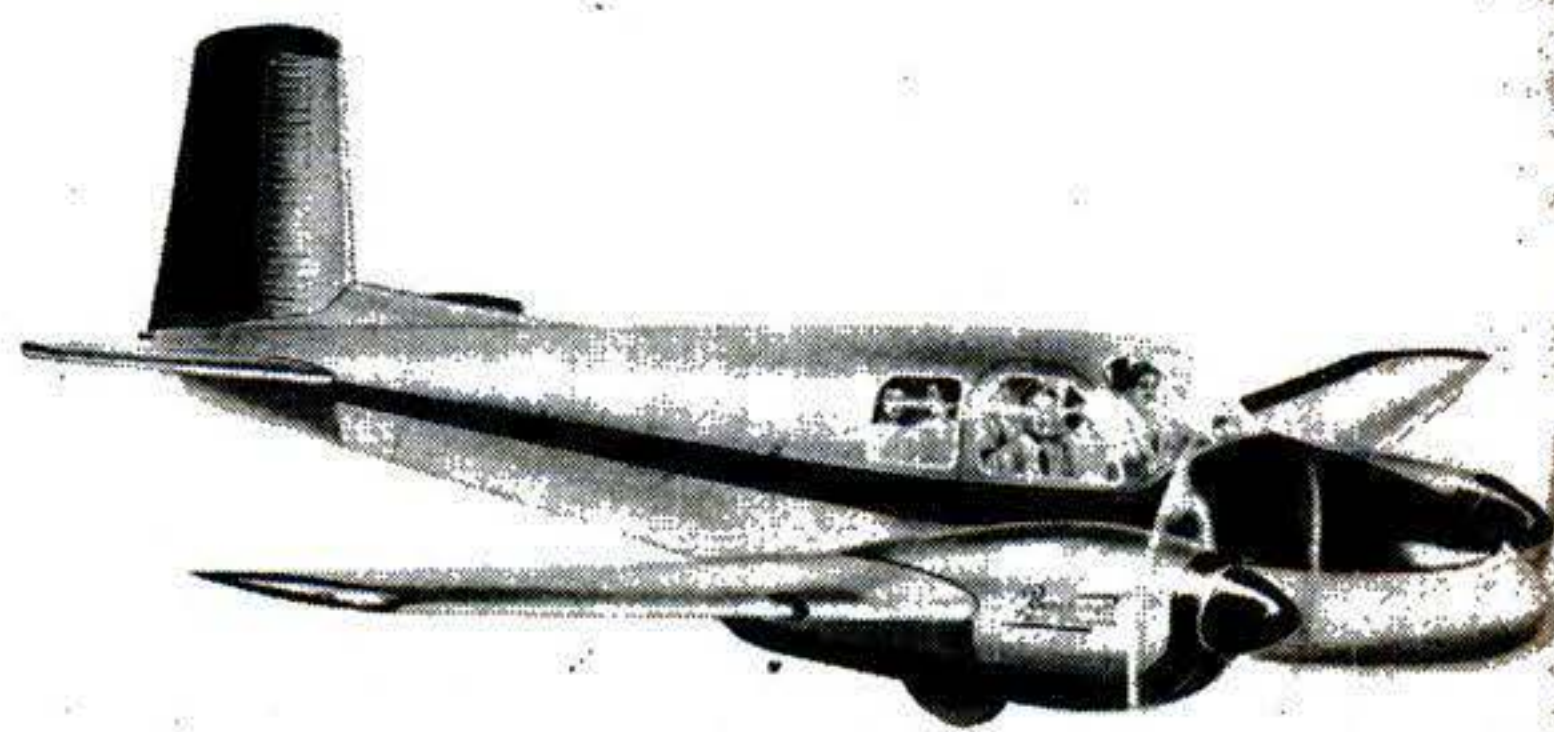
A new version of the Sperry airborne engine analyzer (PS, Nov. '47, p. 109), the portable unit above is designed for use by ground crews servicing planes not equipped with the flying model. Made to suit any engine now in airline service, the 41-lb. analyzer detects vibration, detonation, and ignition troubles. Patterns appearing on the oscilloscope at upper left indicate and locate engine failures. It also can be used in engine- and fuel-research projects.



has both floats and wheels, as shown in the photo, making it equally at home afloat or ashore. At far right, the seaplane version of the Piper Clipper® comes in for a water-spray setdown on its Edo floats. A sportman's spe-

cial, the water Clipper can carry a canoe in sections, an outboard motor, and complete camping equipment for an extended two-man wilderness vacation. Like its landplane companion, it has a 115-hp. engine.

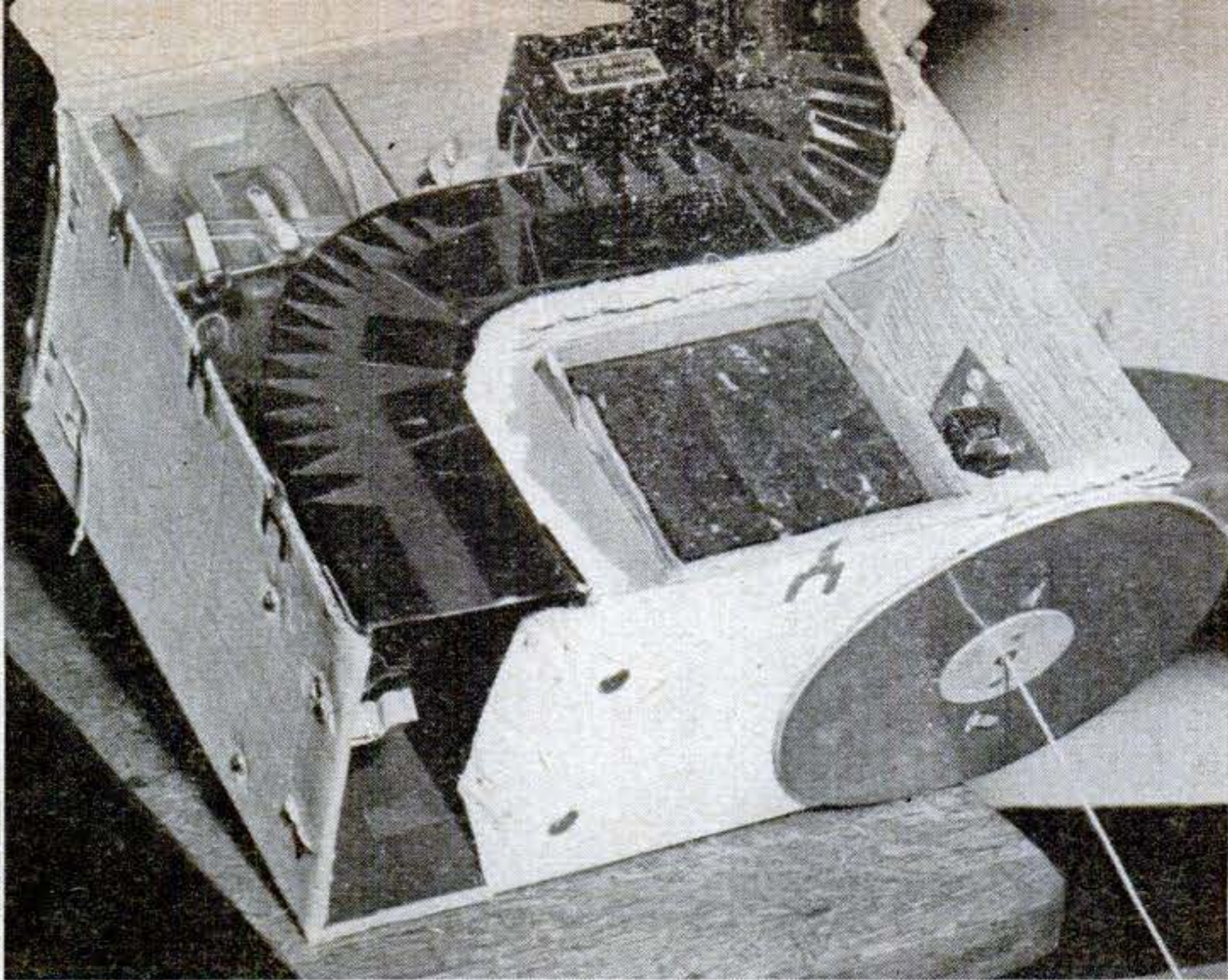
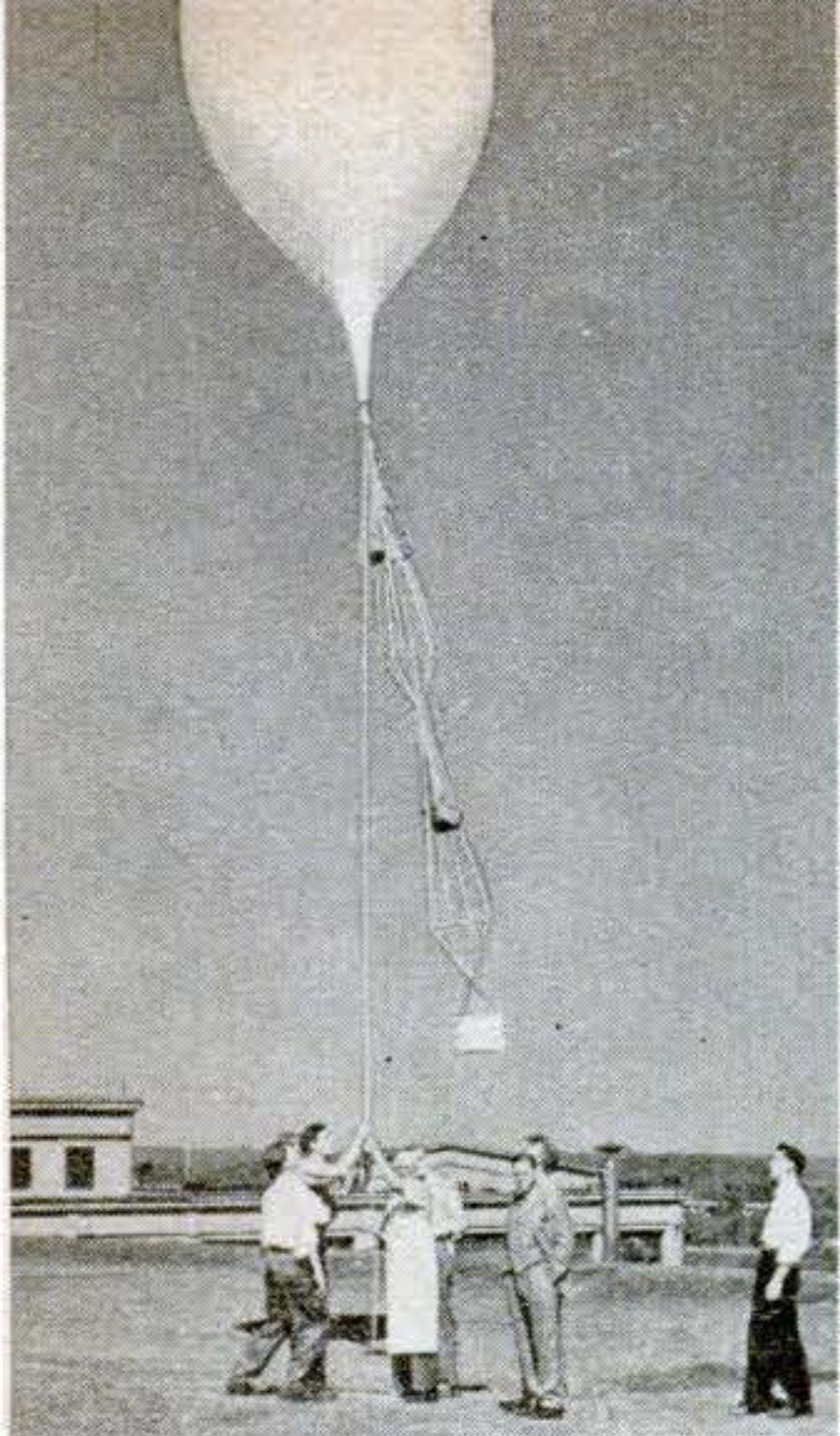
Bonanza Adds an Engine. Artist's sketch at right shows how the Beech Bonanza® will look in its new two-engine version now being built. Although the fuselage and cockpit configurations are similar, the familiar V tail of the single-engine job has given way to a single fin and rudder tail assembly. It is being designed as a five-place airplane, to sell at around \$30,000. The engines are reported to be 185-hp. Continentals. The Twin Bonanza, or Model 50 Beechcraft, debut is expected early in 1950.



New Navy Giant Built for Speed. When this 60-ton flying boat, the XP5Y-1, takes to the air this fall, Convair engineers predict that it will cruise at 350 m.p.h. With four Allison turboprop engines,

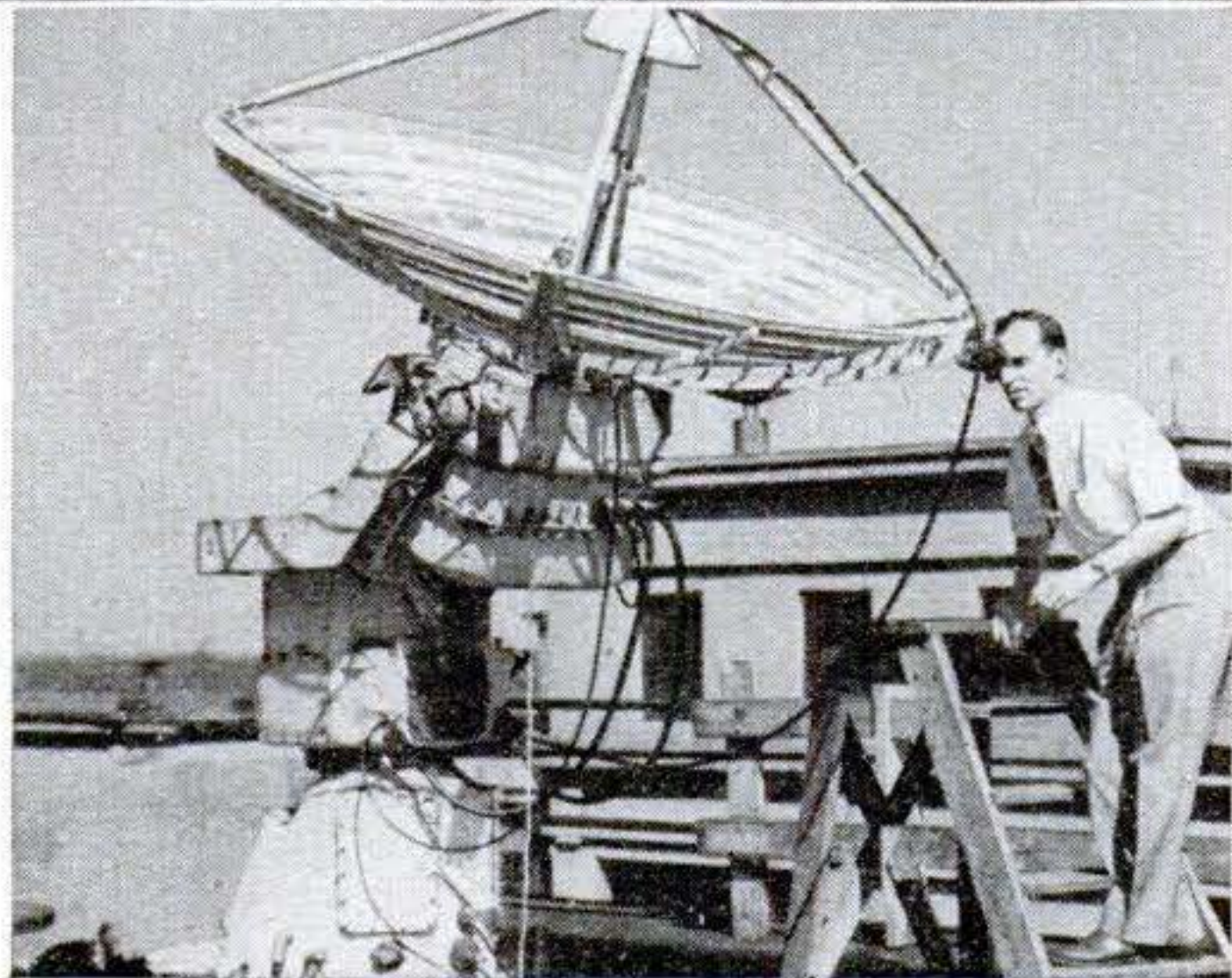
it will have more take-off power per pound of aircraft than some modern fighter planes. This isn't guesswork. Radio-controlled models put it through its paces even before construction began (PS, June '49, p. 120).



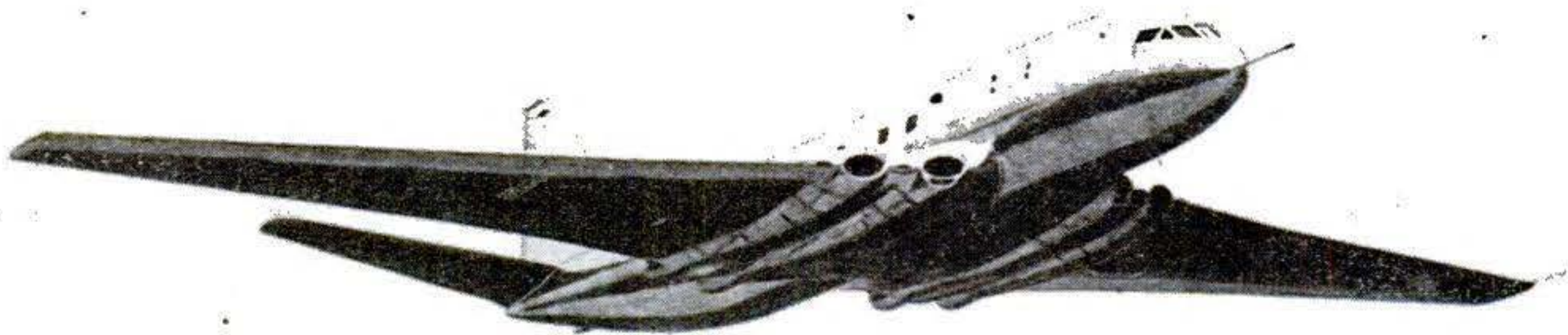


Flying Box Analyzes Clouds

NAVAL weather observers can now measure the size of clouds and take their temperature—all from the ground. A new GE "Cloud Analyzer" is carried aloft by a balloon (left above). It radios data to ground equipment (right) that records it on moving strips of paper. A salt-saturated string (inside S-shaped duct at right above), whose electrical resistance varies with the moisture it picks up or loses, tells a cloud's height, thickness, and density. Other instruments record temperature, air pressure, humidity.

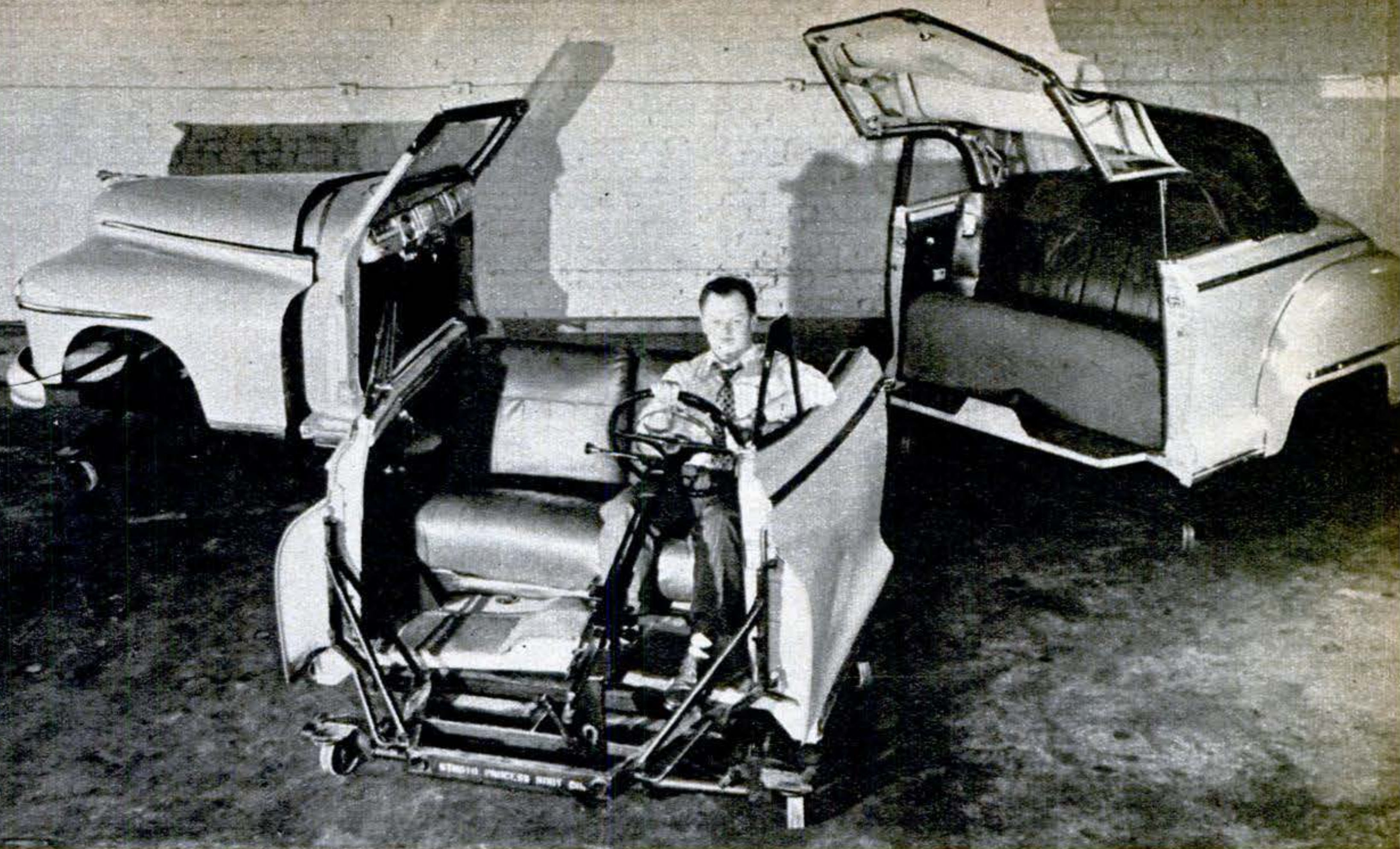


World's First Jet Air Liner Makes Flight Debut



BRITAIN jumped the global gun in the race for commercial air supremacy with a recent announcement that its giant de Havilland Comet, first all-jet air liner, had made successful flights. After nearly three years under construction in secrecy, the sleek, sweptback-wing craft has been unveiled. Above, it is shown in its first test flight at

Hatfield, England. Four Ghost turbojet engines, each developing 5,000-lb. thrust, are designed to give the jet liner a cruising speed of 500 m.p.h. A pressurized cabin will permit it to fly at 40,000 feet. Expected to be in commercial use by 1952, the Comet will carry 36 passengers and a crew of four. Sixteen of the planes are being built.



He isn't going anywhere, and he hasn't had an accident. It's just Hollywood's way of converting a convertible into a three-piece jigsaw puzzle to simplify photographing actors inside the car.

Come-Apart Cars Let Camera In

By Louis Hochman

IF YOU didn't look too closely, you'd say that was a neat-looking convertible the movie stars were getting into on the studio lot. But if you looked again two minutes later, after a couple of stagehands got busy with it, you'd wonder why you didn't hear the explosion that blew the car into so many pieces all over the set.



Here's the convertible all together again and ready to drive away—or so it seems on the screen. The camera doesn't show that it has no wheels and no engine under the hood.

Fact is, the car wasn't blown apart. It was taken apart, section by section, to give the camera an unobstructed view of the performers inside it.

The ingenious car-that-comes-apart is a brainchild of Dick McWhorter, assistant director at Paramount Pictures. When Dick came back from the war to his movie job, he was amazed at how much costly production time studios wasted while prop men improvised mock-up car bodies for interior close-up shots.

For a scene that called for close-ups of actors in a car, prop men would either build a wooden mock-up to order, or hack up an old car body and remove sections that interfered with the camera and lighting angles. ▶



Car splits in two as special leverage clamps are unhooked and the sections pushed apart. Each main section of the come-apart car rests on its own steel frame and rolls away on dolly wheels.

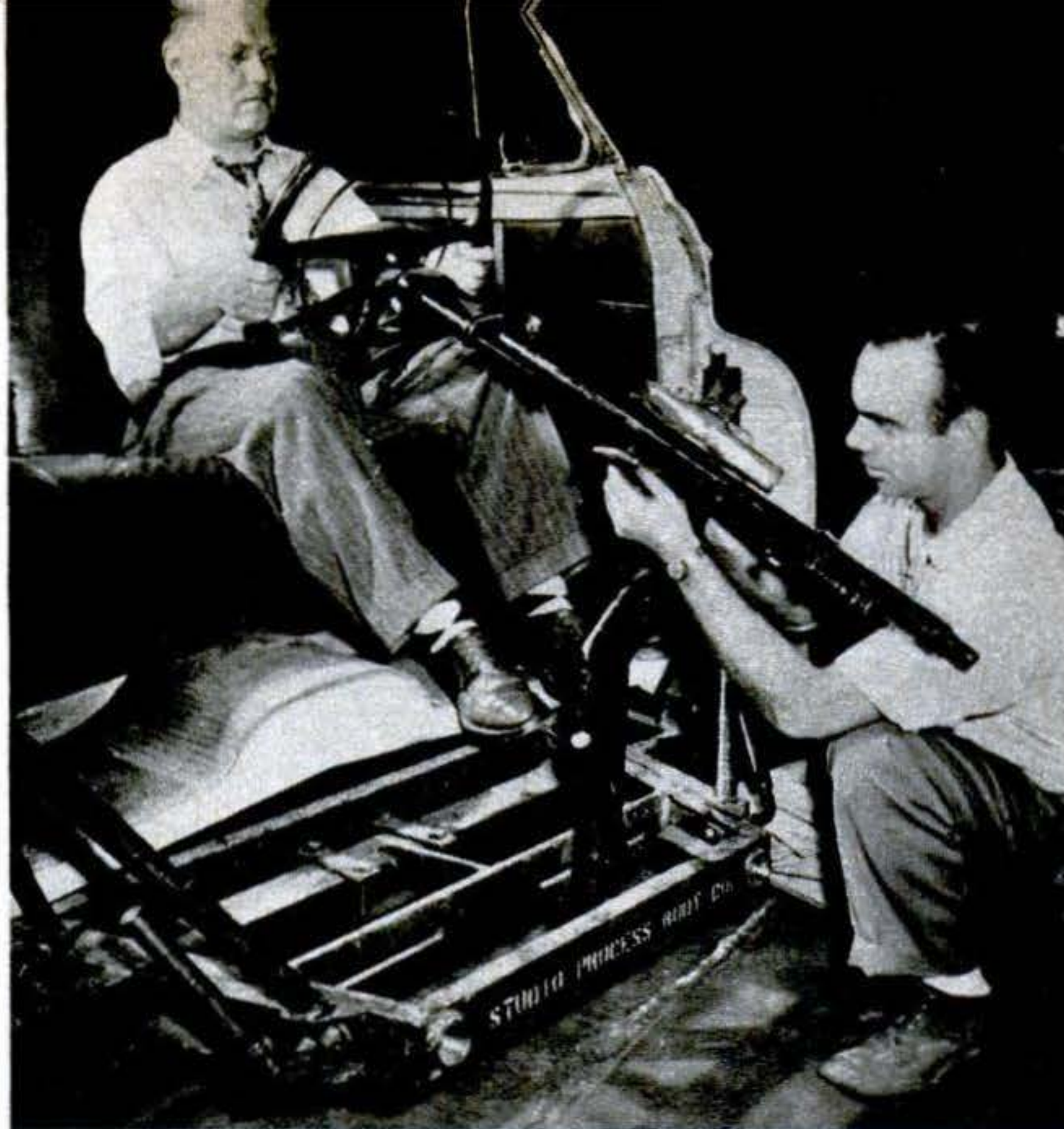
The mock-up would be mounted high on wooden dollies, necessitating a platform for the actors to walk on. And all too frequently, when the director called "ACTION!" the sound men would tear their hair as the mock-up groaned and squeaked under the actors' movements.

Why, thought McWhorter, couldn't somebody take a regular car body, cut it into convenient sections, and rig it with clamps and fittings so you could take it apart any way you wanted — and reassemble it just as easily?

Testing his hunch, he picked up a wrecked '41 Plymouth at a junk yard and had a welder remodel it into break-away sections. This first model, crude as it was, made such a hit with the studios that he soon founded the Studio Process Body Company, which he runs as a highly profitable sideline with Manager Frank Bettis and Chief "Gismologist" Bill Thompson.

Today, his garage off Hollywood Boulevard houses 10 jigsaw-puzzle cars, a sectional wooden bus, and an ambulance, all in constant demand by movie studios. Not only are they cheaper than the custom-built mock-ups formerly used, but actors and technicians find them easier to work with.

The cars — stock bodies bought without their mechanical innards from automobile



You've got to adjust yourself to the steering wheel of your car, but the movie driver doesn't. As shown above, a bracket allows the steering column to be set at any desired angle.

manufacturers — are fitted to special steel frames with arched leaf-spring suspension and large steel dolly wheels. This welded frame is designed to support the body at normal car height and give it the same motion as an automobile moving on the street. To simulate bouncing, a stagehand slips a two-by-four under the frame and rocks it on cue.

Squeezing a cameraman into the back of this Dodge truck for a rear-angle interior shot would be the hard way to do it. Removing the entire rear panel as shown below is much simpler.





Filmland driver can't see where he is "going" in relation to projected rear-window movie landscape. So assistant at right steers wheel for him with crank to insure correct turns of wheel.

The moving landscape seen through the windows is really a movie projected on a translucent "process" screen behind the car.

Most of the cars fall apart into three main sections, which in turn come apart into as many as 20 to 25 pieces. Steel roofs are cut up into removable panels to let light and microphones come in from above. Doors lift

There are lots of tricks to the jigsaw-puzzle cars. Below, a snub-nosed front converts a truck into a cab-over-engine model. Interchanging parts make it possible for one car to play many

neatly off their hinges for side-angle shots.

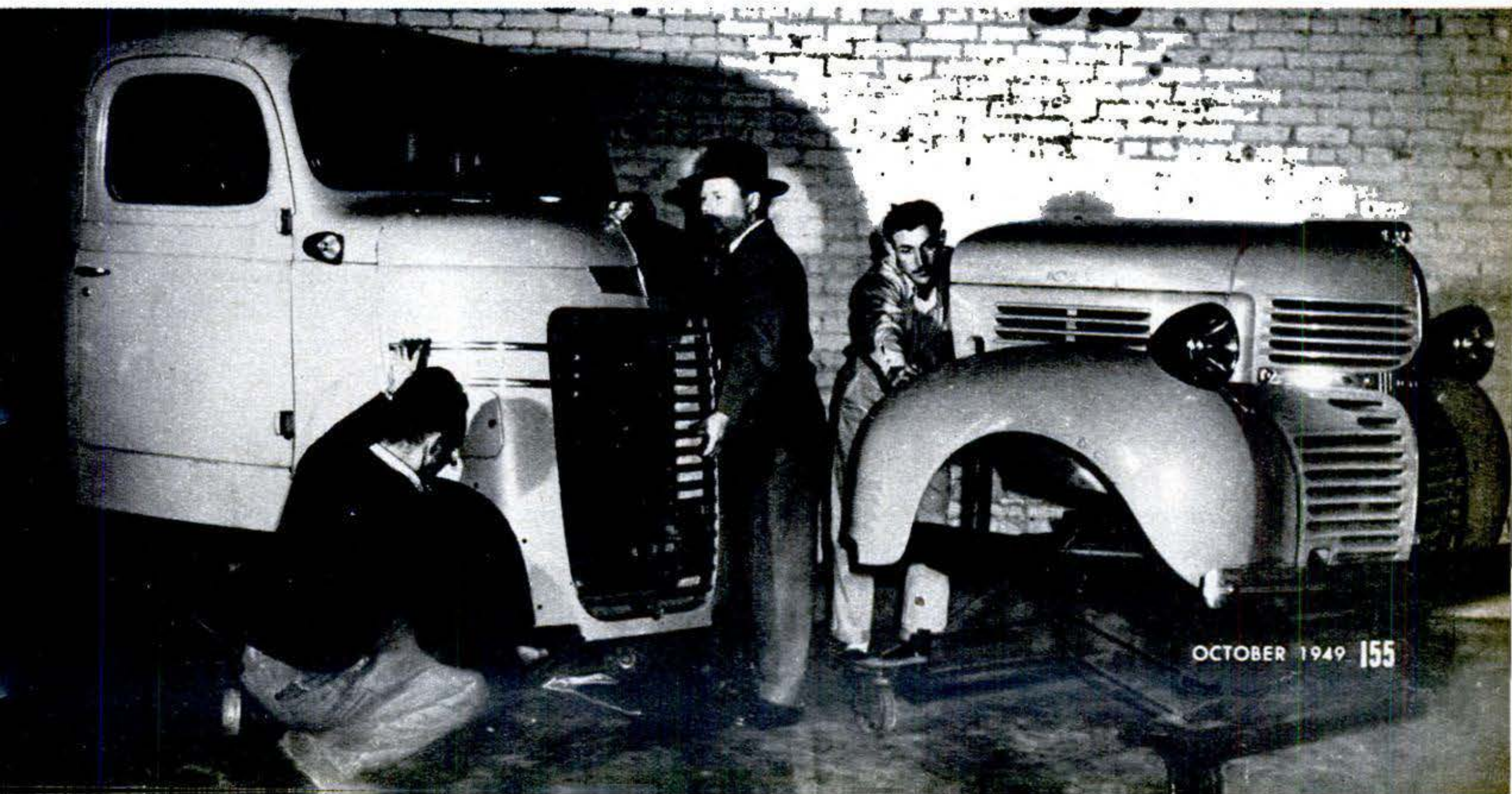
For front views, hood, windshield, and cowl separate from the rest of the body, leaving the front seat and the driver exposed to the camera. Since the doors and steering wheel show in this angle, they are held on by special brackets that even permit them to function normally. But the actor at the wheel can't see the landscape receding on the process screen behind him and doesn't know which way to steer. So he merely holds the wheel loosely and lets a stagehand do the steering by remote control—a long crank handle attached to the base of the steering post.

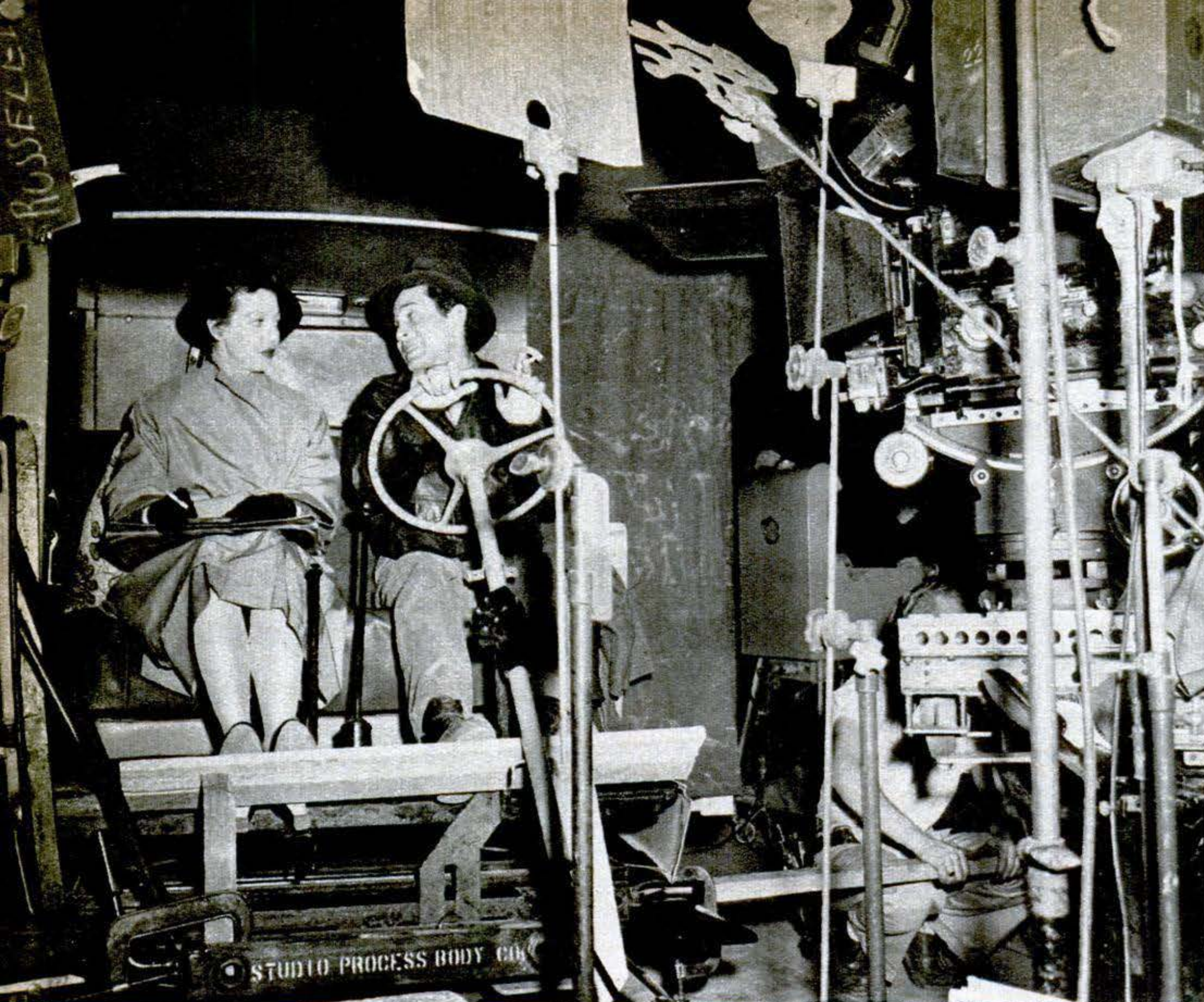
To let the camera shoot through the windshield, all glass can be slid out of the frame, giving clearer pictures of the people inside. Or maybe you want a driver's-eye view? The entire rear half of the car can be detached and rolled away.

Falling apart in the right place at the right time does not exhaust the tricks possible with these movie cars. Although Studio Process has only 10 complete car bodies in stock, those 10 can be made to represent almost any make or model needed.

There's an ingeniously designed 1949 Buick sedan that can assume nearly any name from Ford to Cadillac, simply by switching a few of its parts. A '48 Dodge sedan is changed into a Chrysler Town and Country® by replacing its doors with wooden station-wagon doors that have been cut down to fit. Substitute small cabbie seats and a glass par-

roles. With slight but ingenious changes, a 1949 Buick sedan can double for a Ford, Mercury, Lincoln, Cadillac, Oldsmobile, Chevrolet, Pontiac, Kaiser, Frazer, or Dodge.





Mickey Knox takes Loretta Young for a ride during filming of *The Accused*. Man well concealed by movie camera and lights at far right uses a plank as a lever to bounce the truck on cue from the director. Photo at lower right shows how the scene appears to you on the screen.

tition for the front seat of a '41 Plymouth and—presto!—it's a Yellow Cab. Even a truck body can be regular style or cab-over-engine, depending on which hood is hooked on.

Each main section of a come-apart car sits on its own steel frame and rolls away on a dolly. When brought together, the sections center themselves and slide snugly into place on disappearing doll pins. Specially designed leverage clamps that work on the same principle as trunk catches pull the sections tightly together and automatically lock them in place.

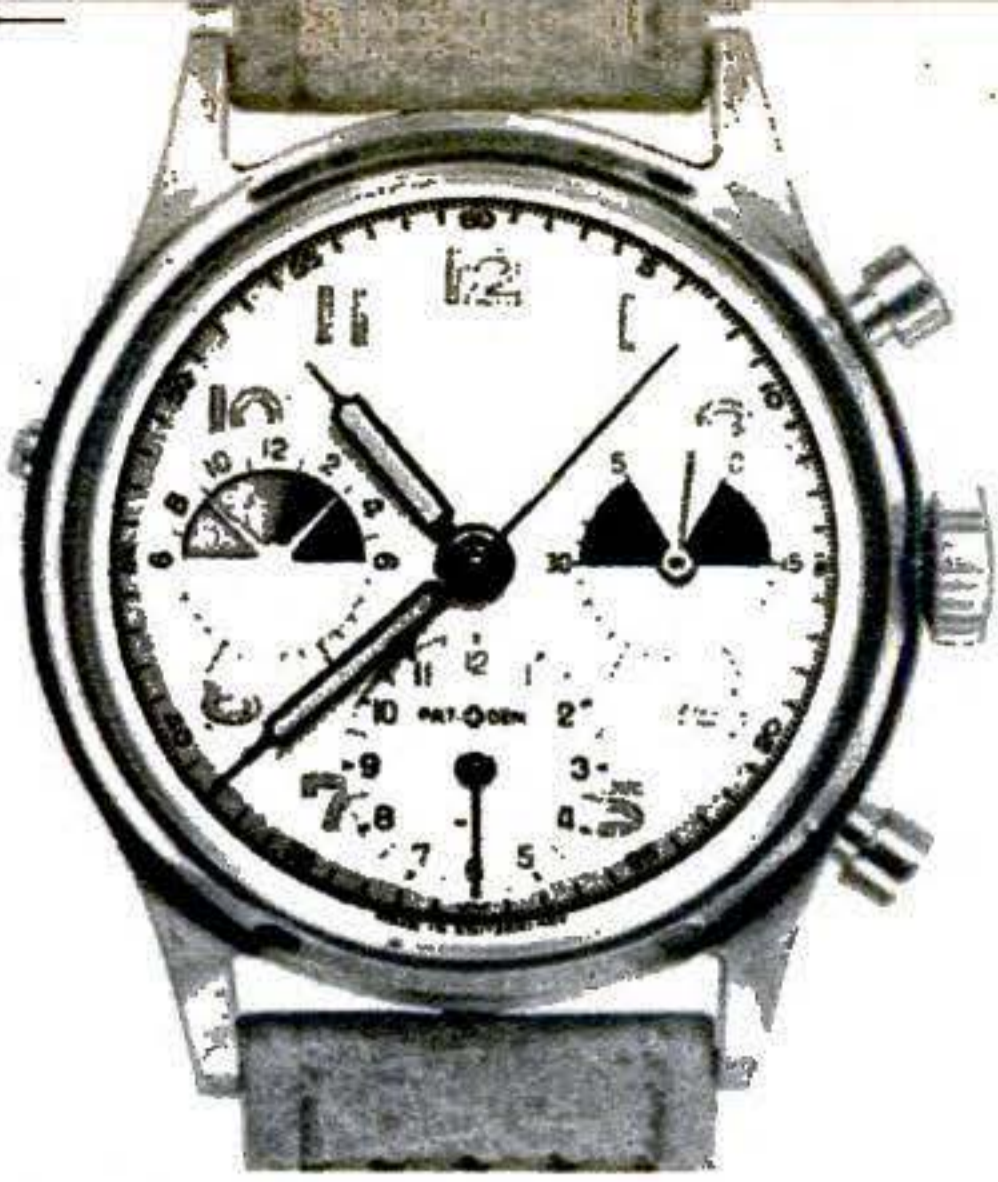
Because of the strange alterations these car bodies undergo, practically every hook, clamp, screw, and bracket has to be made by hand. All this complicated work is done in a small corner section of the shop.

Here, "Gismologist" Thompson goes to work on stock car bodies with an acetylene torch, cutting them into sections, smoothing and upholstering the rough ends, and fitting



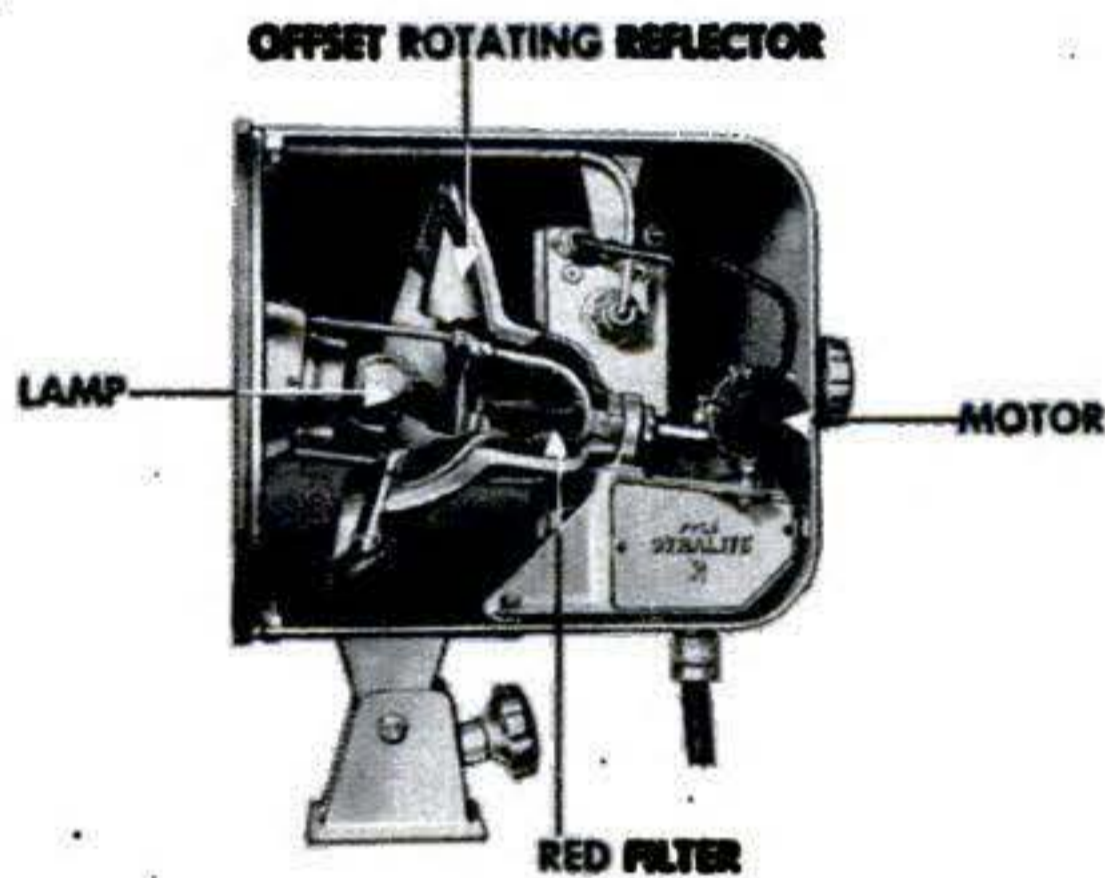
them with disappearing doll pins and leverage clamps. To obtain a satin finish—better photographically than the customary high gloss—Thompson has a trick of mixing his paints and spraying them on from just the right distance so that the spray is partially dry by the time it hits the surface.

Started in September of 1946, the business has flourished nicely in its short three-year life. The jigsaw-puzzle cars have appeared in more than 100 films, the more recent ones being *Criss Cross*, *The Accused*, *Race Street*, *A Crooked Way*, and *Bitter Victory*. END



Watch Tells Tide Time

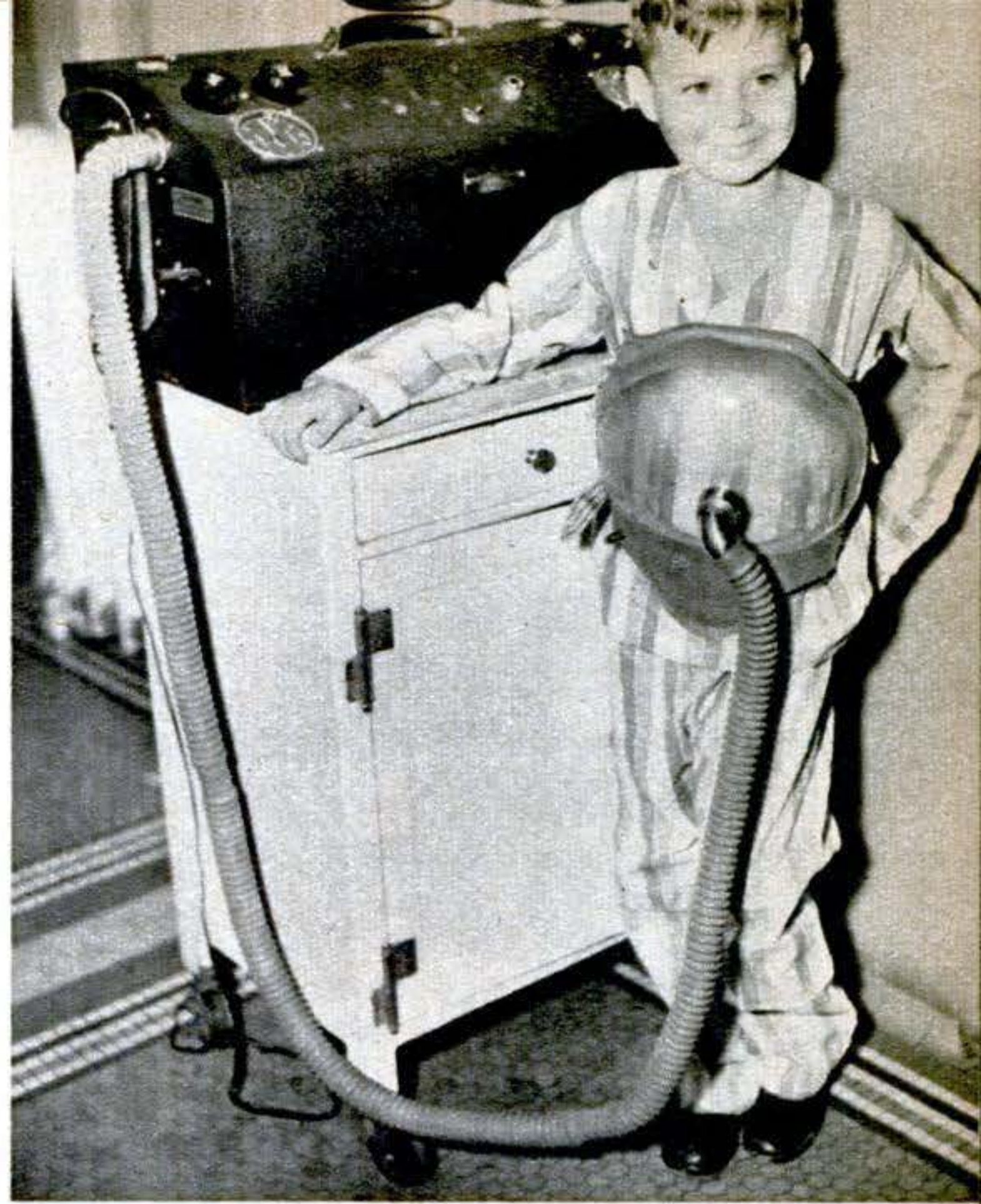
THIS Swiss-made chronograph tells tides as well as time. Once set to the tide schedule of any seaport, it shows the rise and fall of tides at that point on two small dials (left and right), one for high tide and one for low. It automatically advances the time of the tides twice a day—about 25 minutes every 12 hours—as the tides themselves advance. Designed for fishermen and sportsmen, it also offers stop-watch, elapsed-time, time-out, and other chronograph features. Called the Seafarer®, it's sold by Abercrombie & Fitch, New York City, for \$96.



Locomotive Light Looks 3 Ways

THIS new emergency light for locomotives rolls its eye to warn motorists and other trains. A single, offset reflector, rotated by a small motor, gives its 650,000-candle-power beam a gyrating motion for greater attention. This white light is used as an extra warning to motorists at grade crossings. When the train makes a sudden stop, a red filter slides over the lamp, and the light shines a red beam to warn approaching trains. And with the reflector kept stationary, the white beam can serve as an emergency headlight. The three-way light is made by the Pyle-National Co.

OCTOBER 1949 157

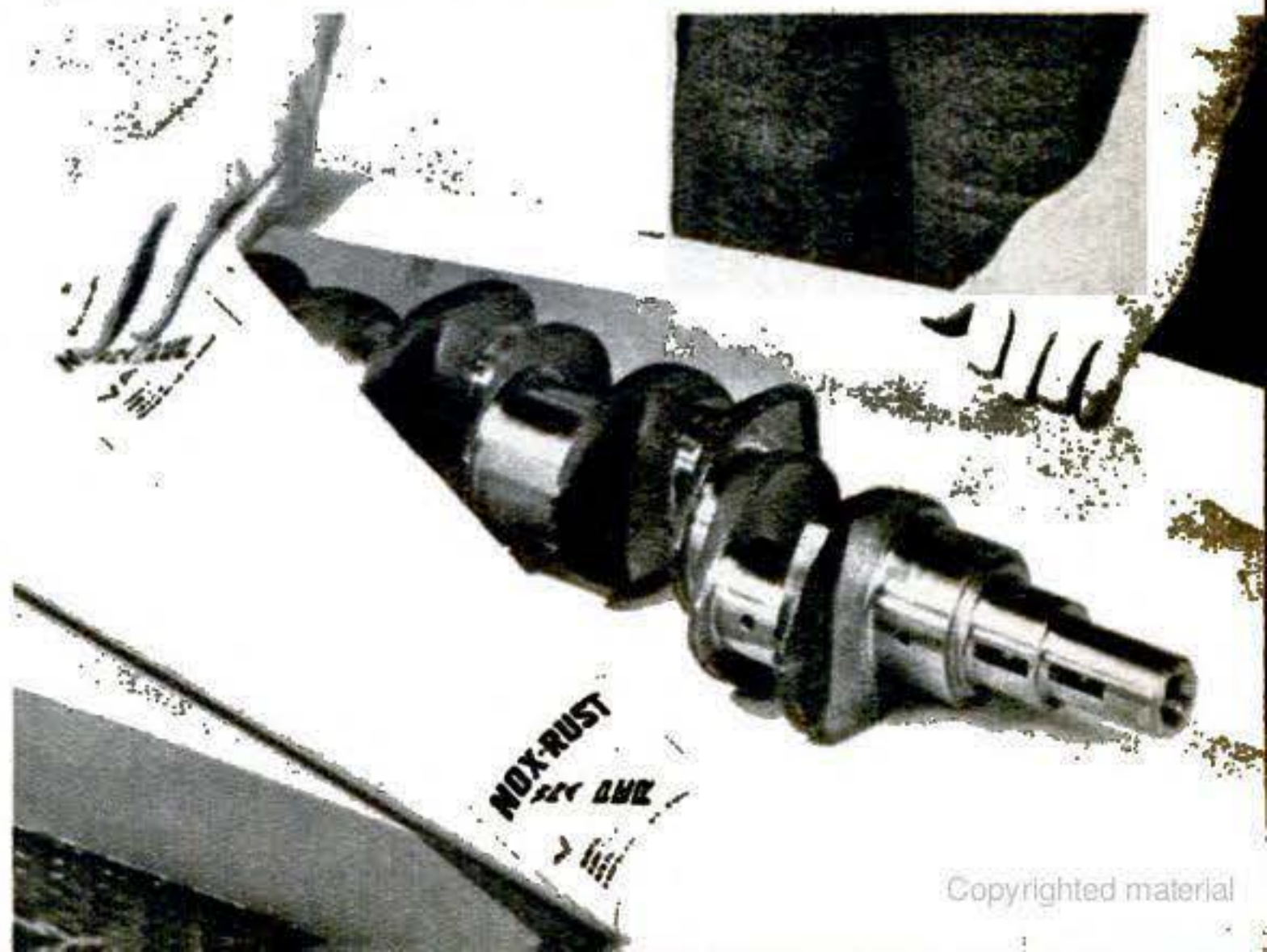


"Iron Lung" Weighs One Pound

RECUPERATING polio patients are freer to move around when wearing this one-pound "iron lung." Called the Monaghan® respirator, it consists of a rubber-plastic chest plate connected to an electric pump by a seven-foot hose. The pump creates an intermittent vacuum in the chest plate, causing the patient's lungs to draw in air. The respirator works on battery or house current and can be regulated to suit the patient's breathing rate.

Paper Keeps Rust off Machinery

IRON and steel machinery parts wrapped in this Nox-Rust Vapor Wrapper® can be stored from three to five years without rusting. Used like ordinary wrapping paper, it is impregnated with a chemical that slowly vaporizes, creating an atmosphere that prevents corrosion even in the presence of moisture. Made by Nox-Rust Chemical Corp., Chicago, it is said to eliminate the need for special coatings and containers.



How's Your Plane IQ?

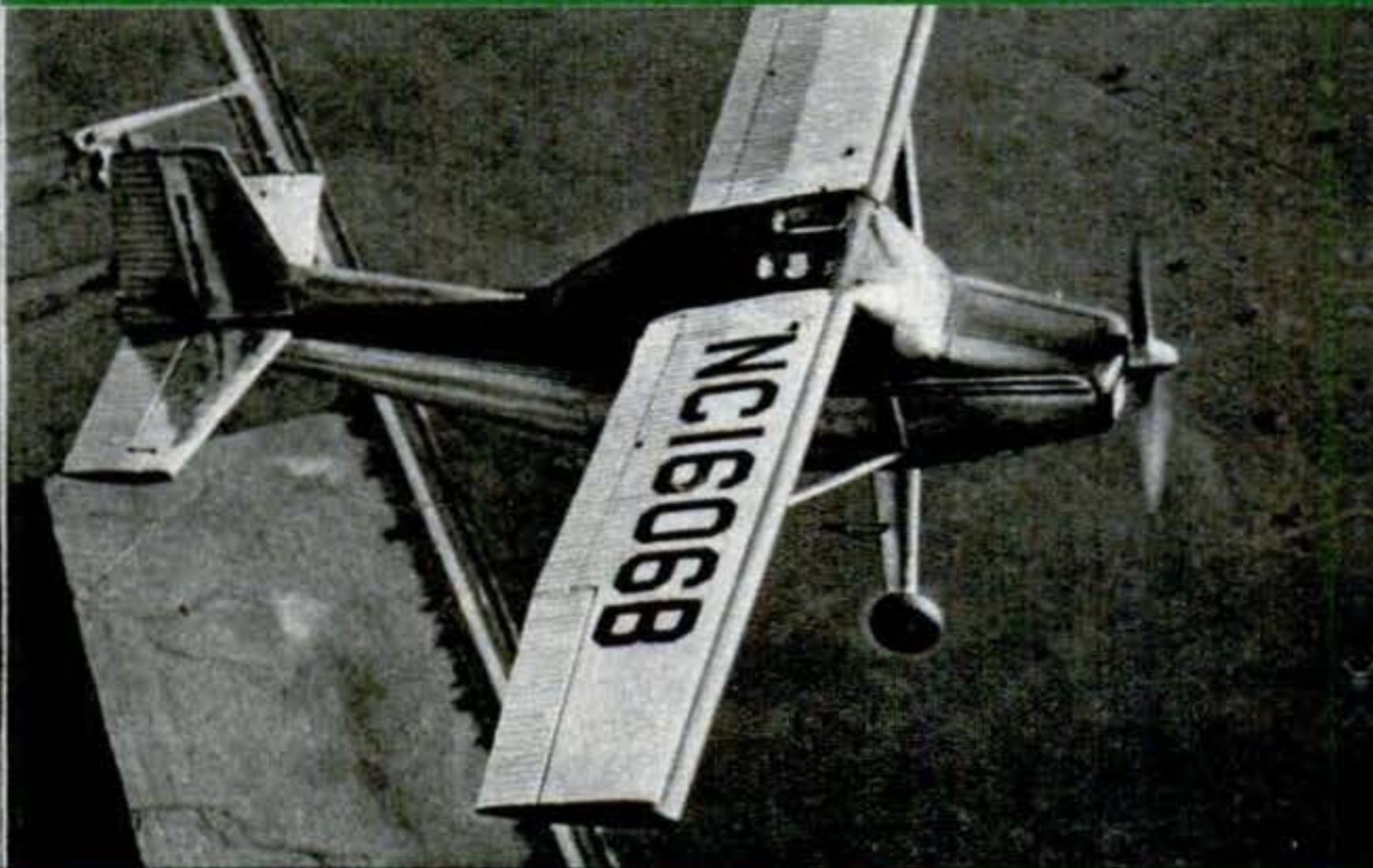
You've probably seen most of these personal planes buzzing around your local airport. See how many you can identify, then check the answers printed upside down across the bottom of these pages.



1. This two-place job boasts a "soundproof" cabin and a landing speed as low as 37 m.p.h. Plane also has steerable tail wheel.



4. Low-price entry among four-placers, its name is one of most familiar among light planes. It has very short span and wide chord.



5. Fixed landing gear is an economy feature on this high-wing, high-performance, 185-hp. four-seater. Note squared tail surfaces.



8. A record nonstop flight from Hawaii to New York was chalked up recently by one of these V-tail, all-metal, low-wing ships.

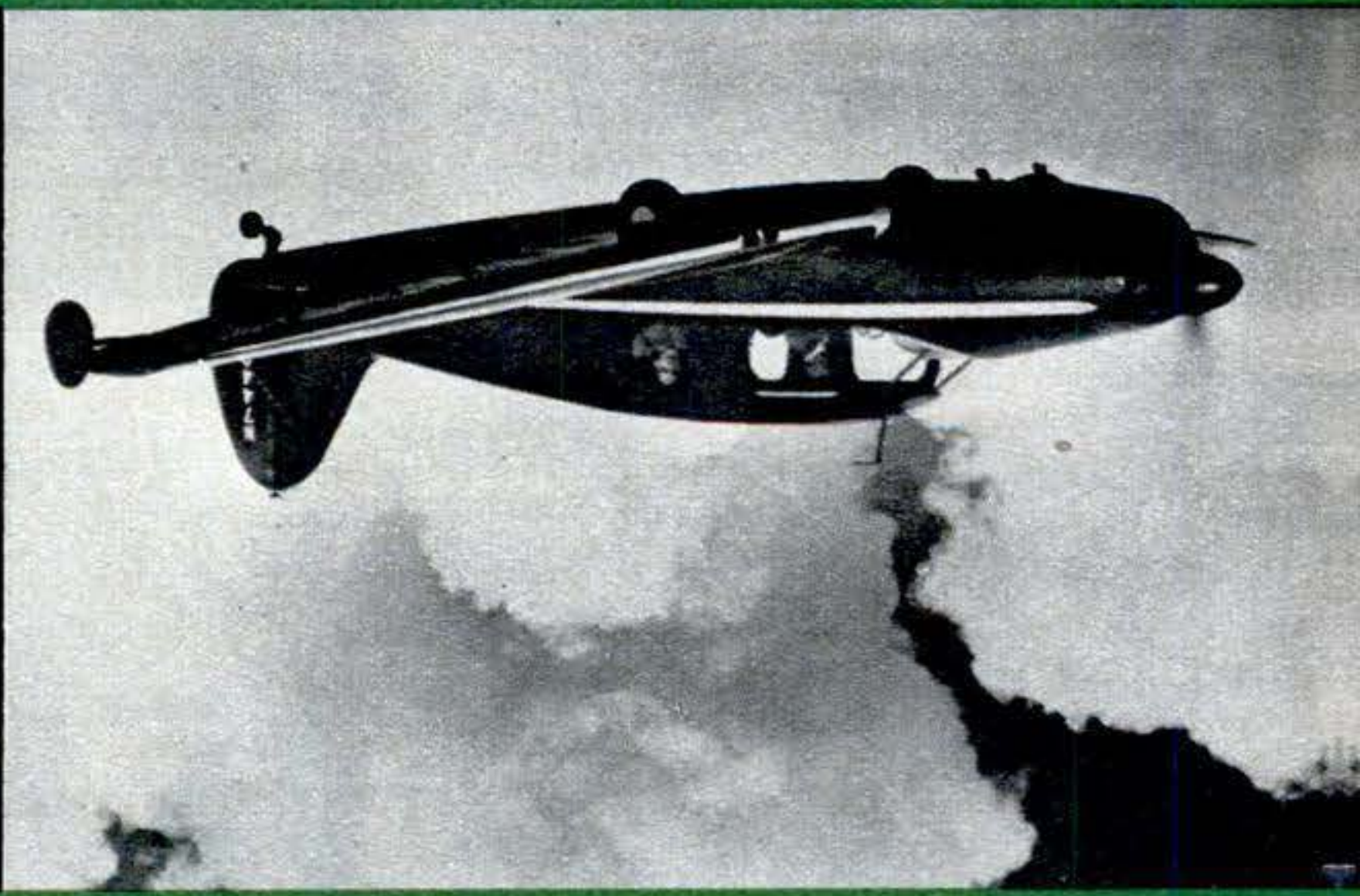


9. Here we have a high wing and fixed landing gear on another four-passenger airplane. A 145-hp. job, it cruises at 114 m.p.h.

7. Stinson '49; 8. Beechcraft Bonanza; 9. Aeronca Sedan; 10. Bellanca Crusair; 11. Club-Air Ercoupe.

1. Funk Customaire®;
2. Cessna 170®;
3. Ryan Navion®;
4. Piper Clipper®;
5. Silvaire® Sedan;
6. Temco Swift®;

10. High performance in this plane means 165 m.p.h. and a climb to 22,000 ft. in 50 minutes. It has a 150-hp. Franklin engine.



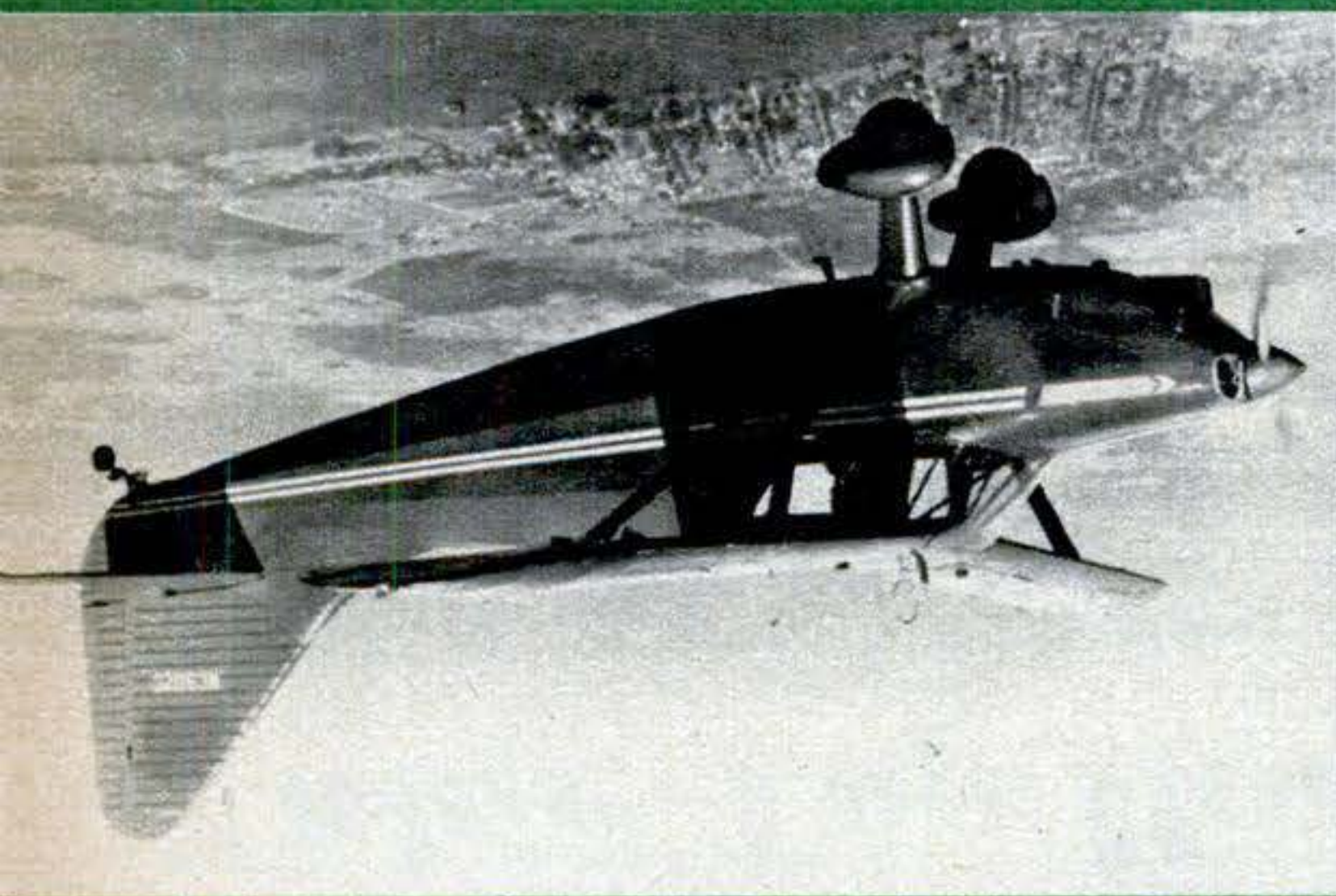
11. Twin rudders and fixed tricycle landing gear are your clues to this 75-hp. two-placer with an extra seat for junior.



6. Fast is another name for the all-metal, low-wing, two-place plane above. It cruises at 140 m.p.h. and lands at 48 m.p.h.



7. High, sloping fin gives improved directional stability to a plane named after a pioneer aviator and light-plane designer.

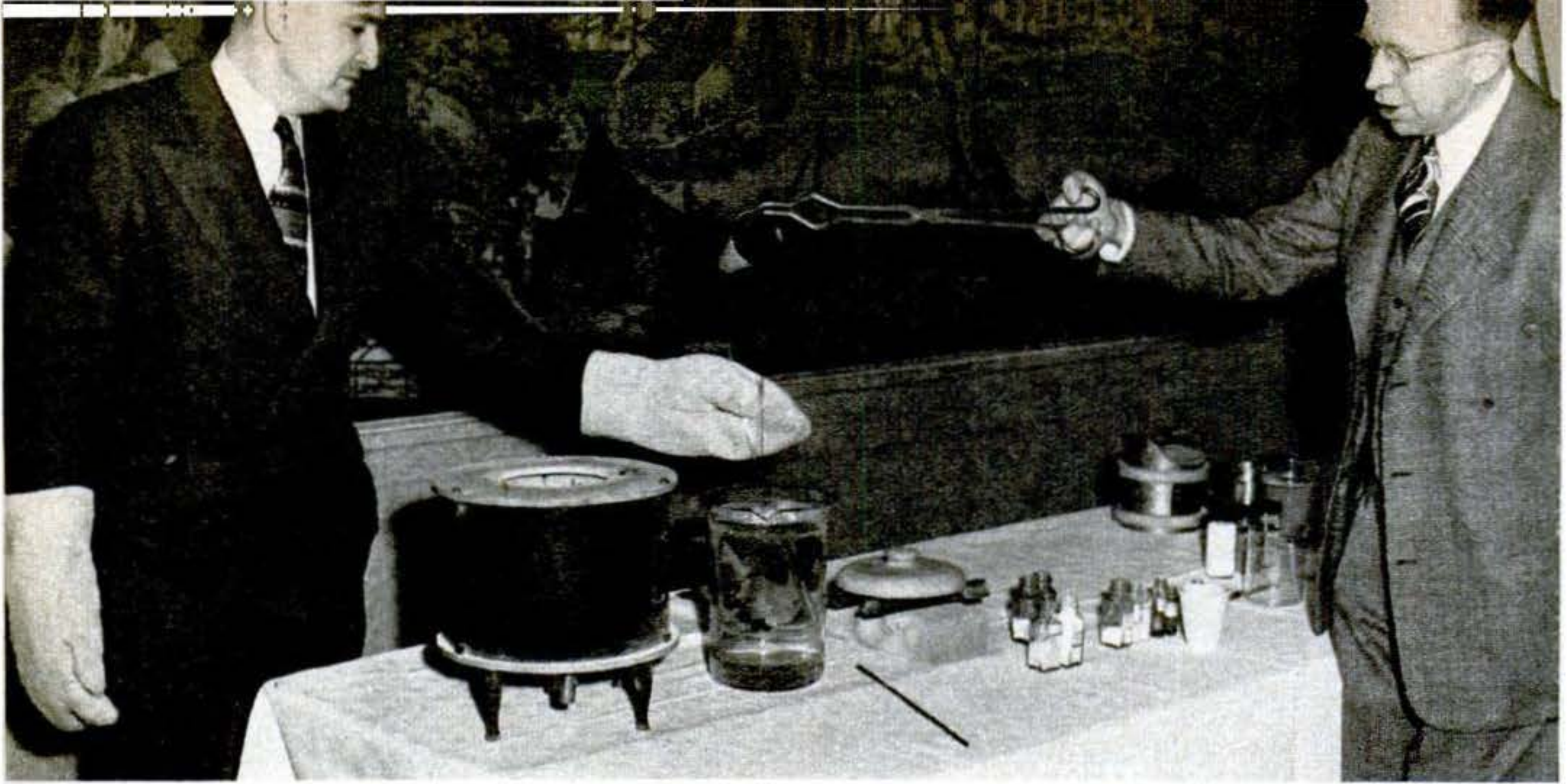


2. All-metal, tapered wing and big flaps for short-field landings and take-offs are features of this popular four-placer.



3. This is another all-metal four-seater, but low-winged and more powerful. It has retractable landing gear and 7 cabin windows.





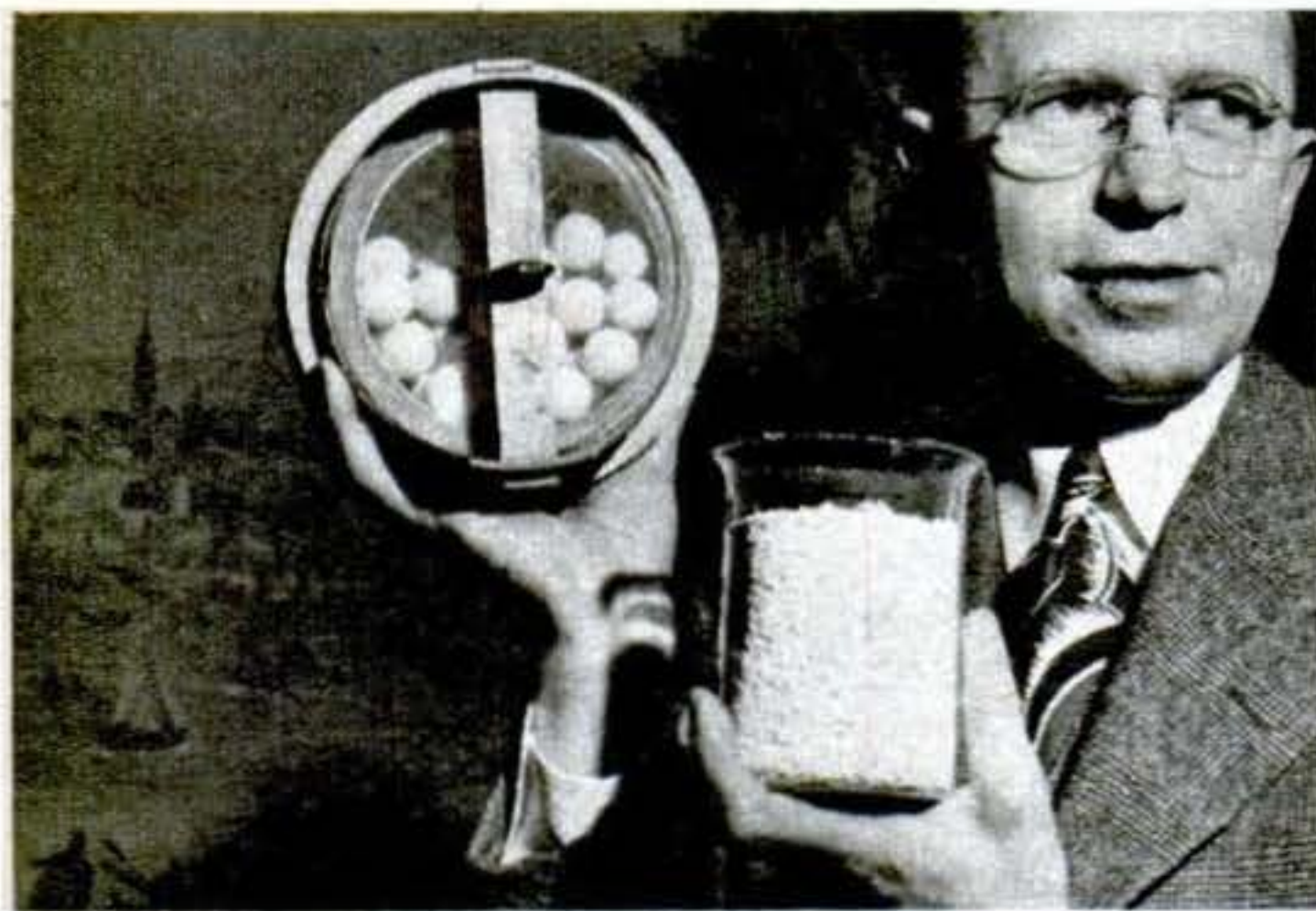
First step in porcelain enameling is processing the glass. Molten glass from the crucible is poured

into cold water, which chills it so fast it shatters into millions of small particles called "frit."

Table-Top Porcelain Plant

A FACTORY that fits on a table top shows how your porcelain-enameled refrigerator got its glassy finish. It demonstrates the steps by which glass is powdered, then fused onto a metal base, forming a hard, easily

cleaned, decorative surface. Dr. M. J. Bahnsen, research director for Ferro Enamel Corp., Cleveland, developed the miniature plant. It's used to boost sales of enamel-manufacturing equipment and supplies.



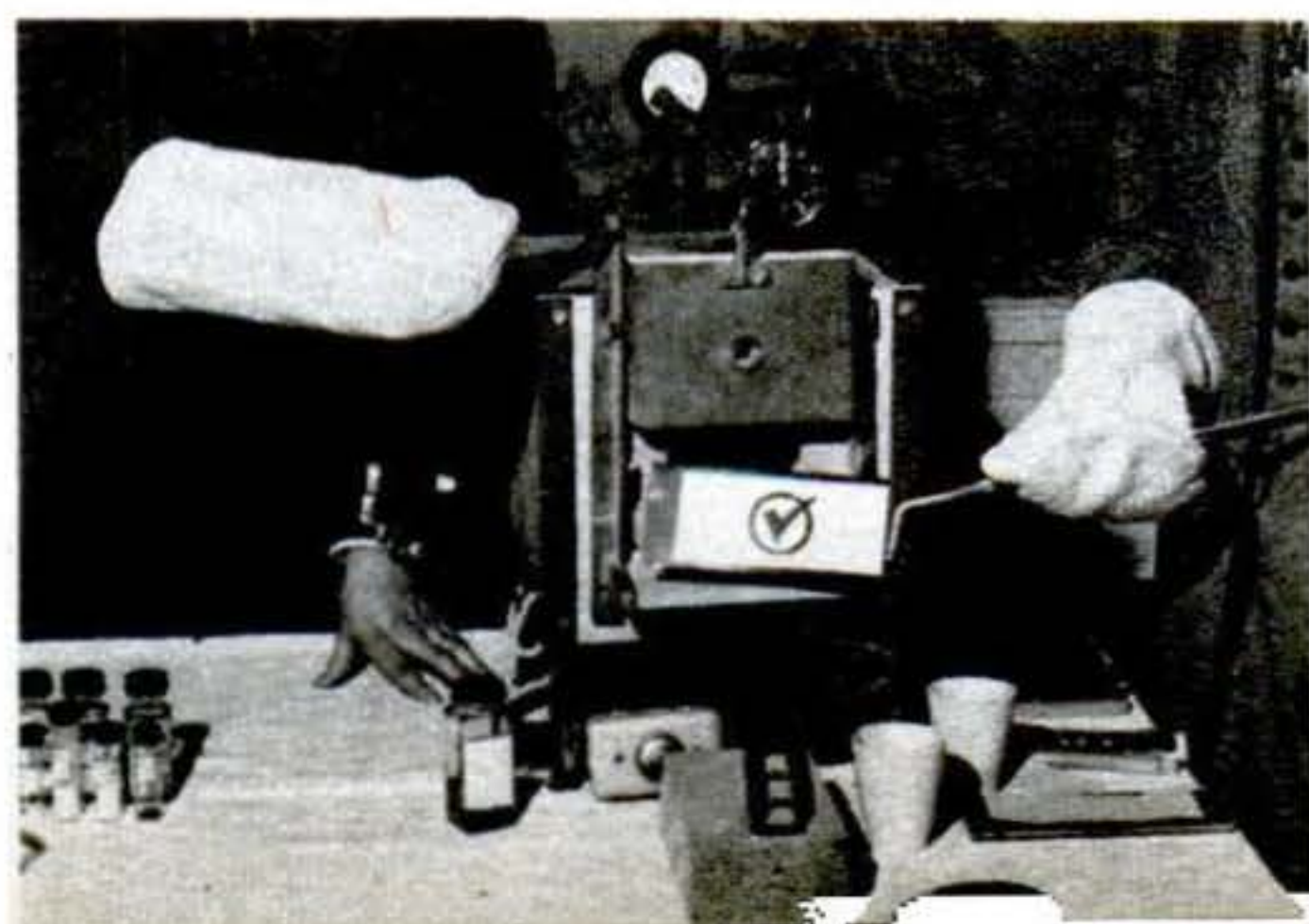
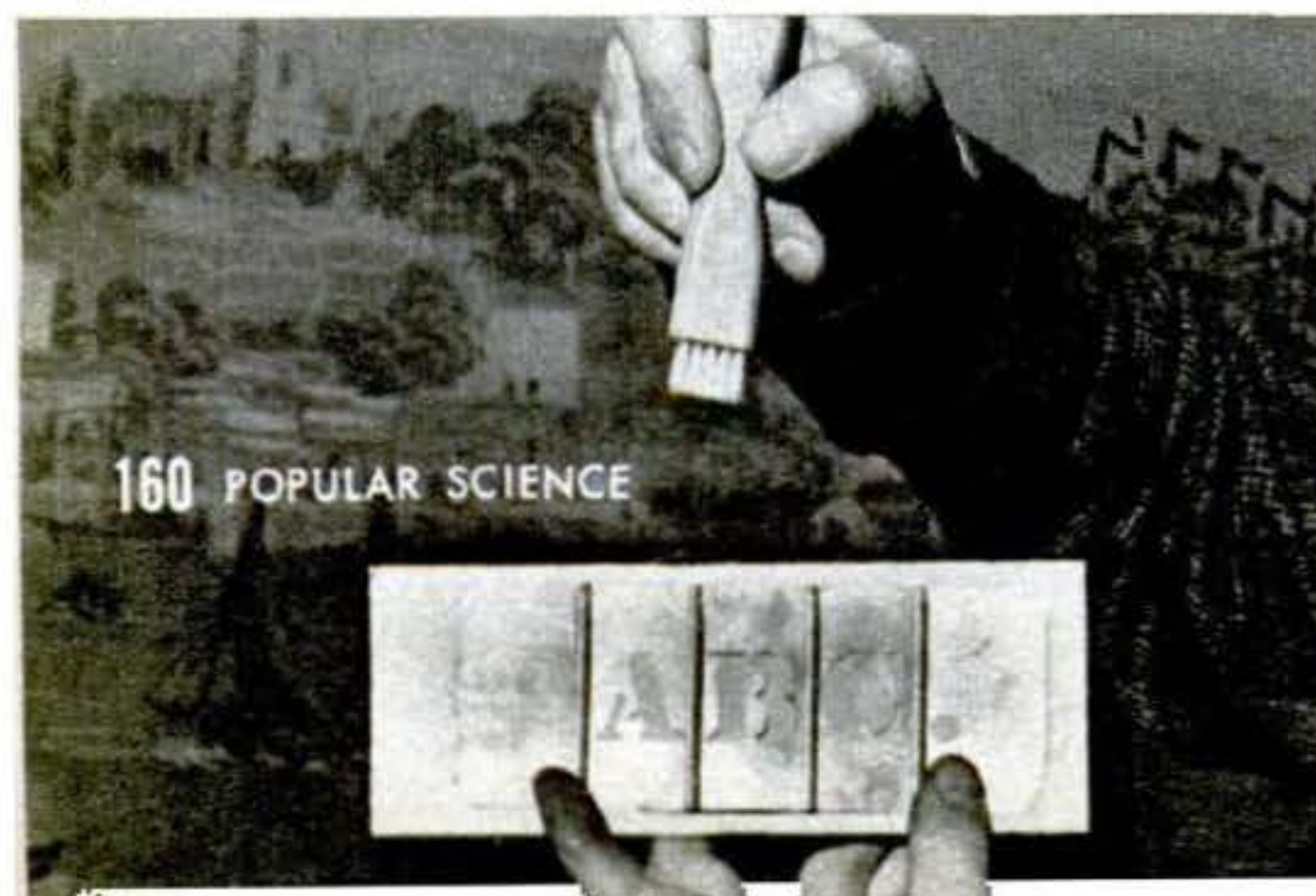
Beakerful of frit (right hand) is ground in porcelain-lined ball mill (left hand), with clay, water, and ceramic pigments. The result is a thick, creamy mixture known as "slip."

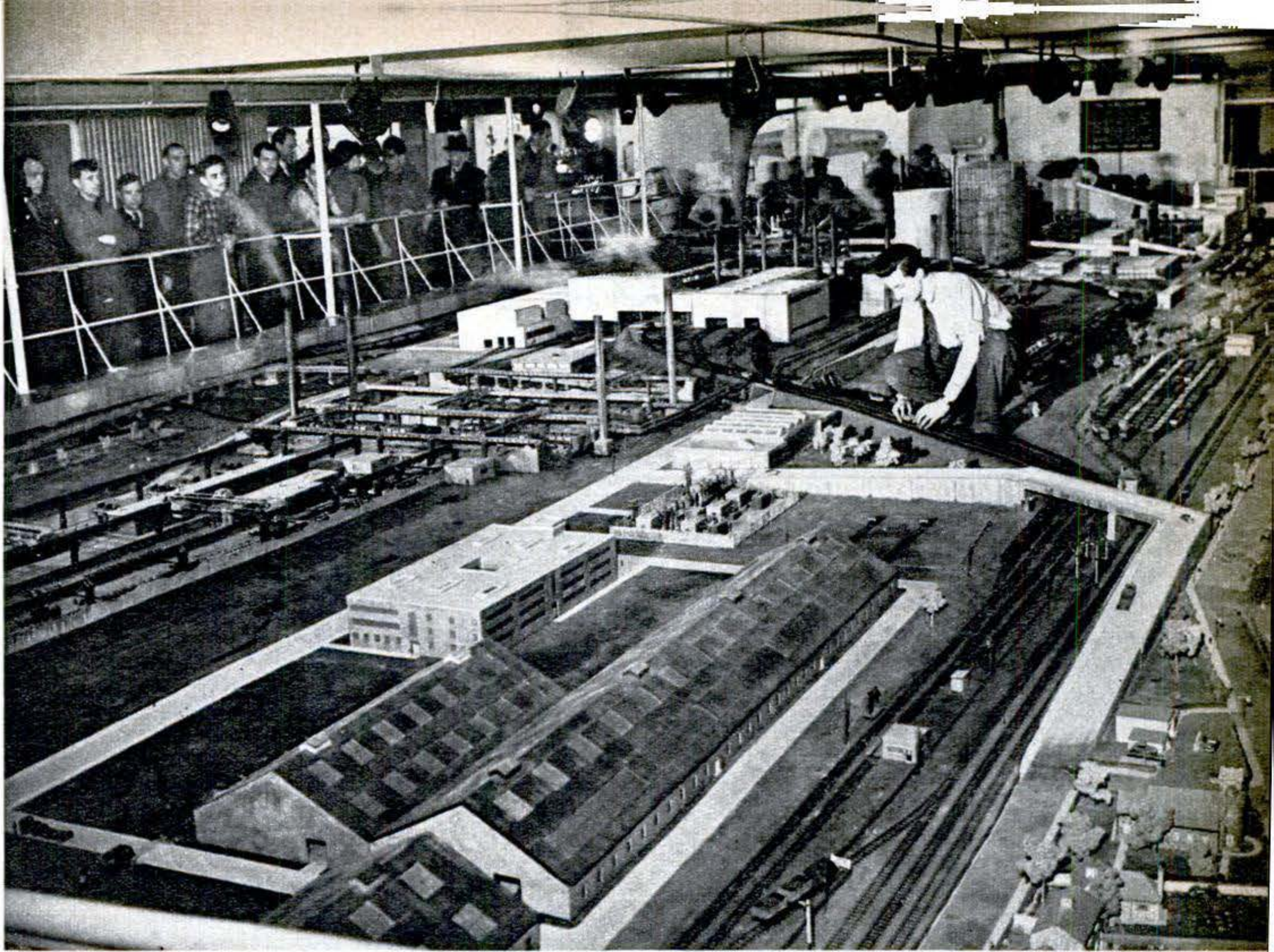
Before final baking, identifying marks or decorations may easily be stenciled on. These become a permanent part of the finish. Another coat of powdered frit is then applied.



Metal panel to be enameled is dipped in the slip mixture. (This may also be sprayed on.) It then gets a preliminary drying in the furnace, leaving a dull, claylike finish.

Metal is then fired in a miniature electric furnace at temperatures of 1,500-1,600° F. Heat melts the frit coating, fuses it to metal backing as a permanent, glass-hard coating.





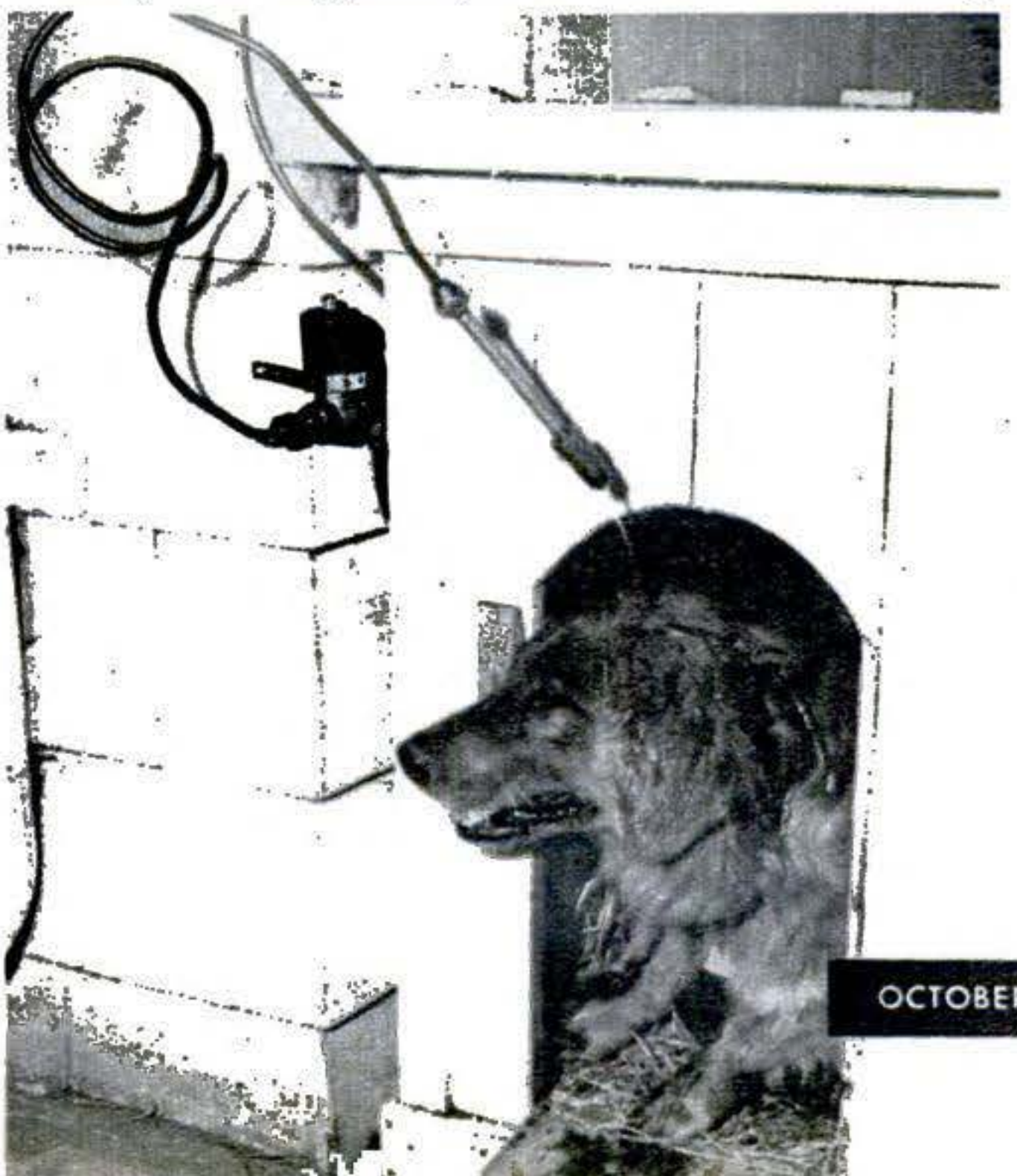
Huge Model Shows Steel-Making

IF THIS model steel mill were life-size, it could turn out 10,000 tons of steel a week. Although built to a scale of one inch to six

feet, the miniature plant covers the area of a tennis court. It shows every step in steel production from ore boat to finished metal—and everything works. British Iron and Steel Federation showed it in London.

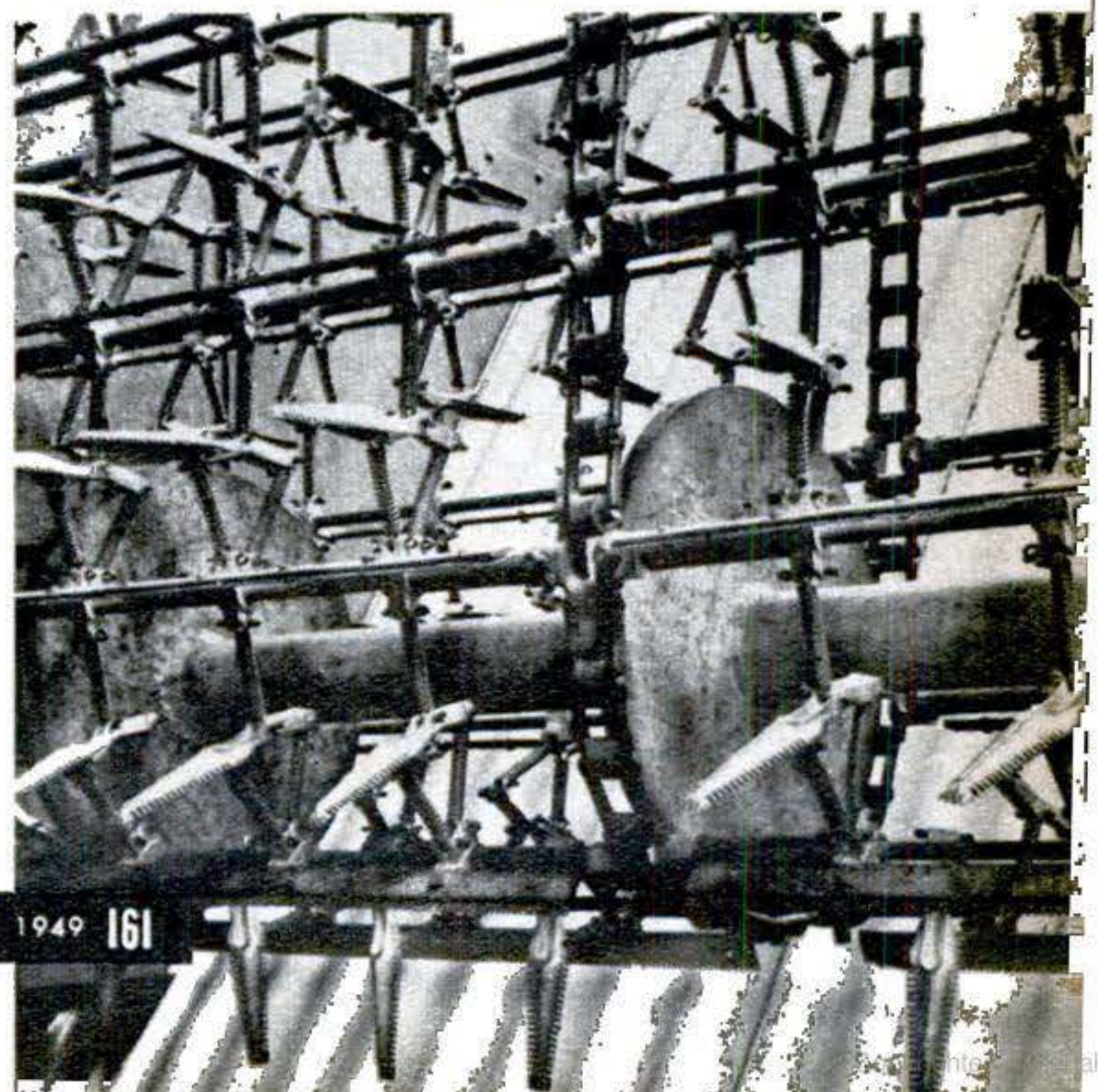
Mike Dampens Dog's Bark

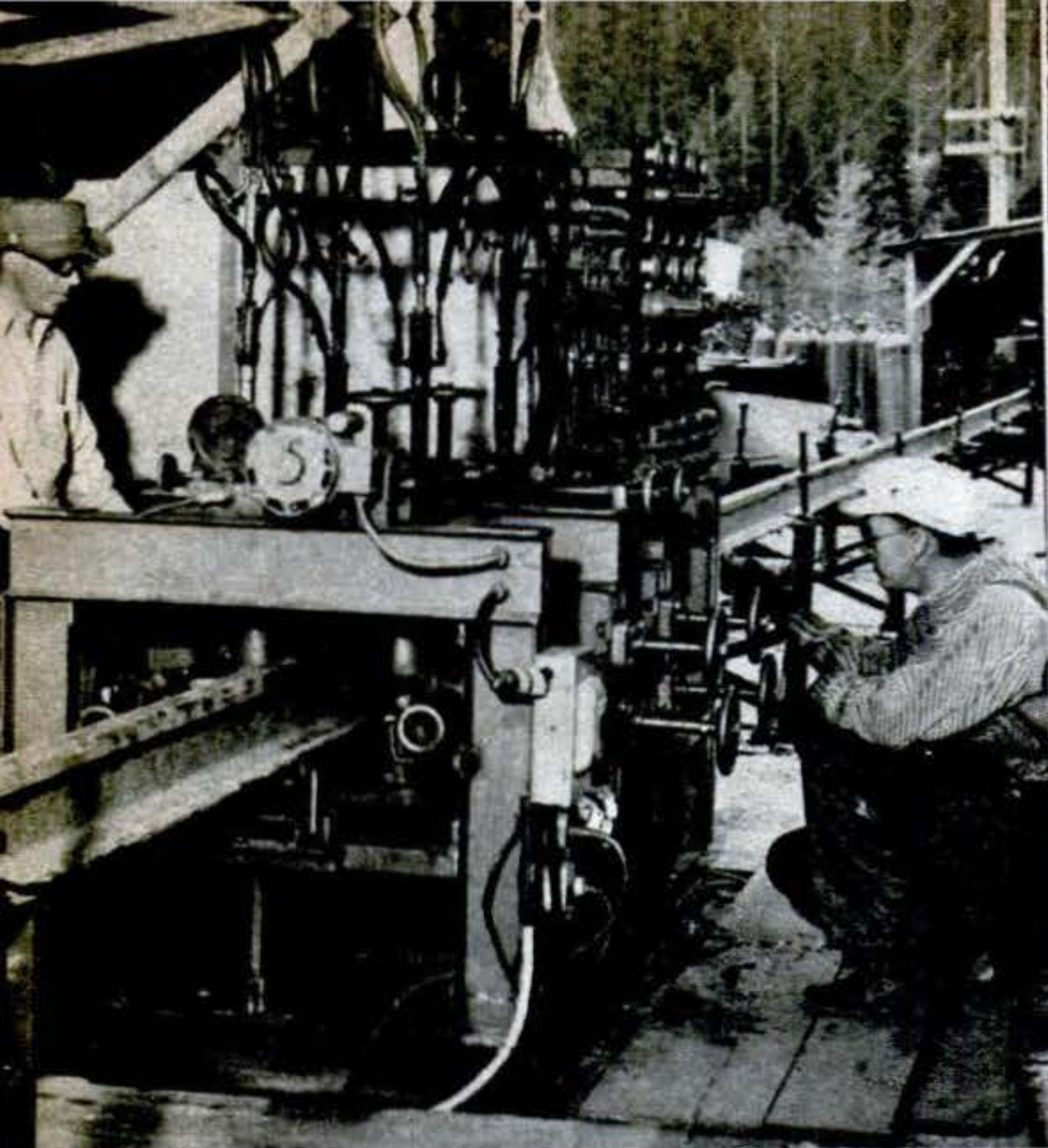
THIS device really dampens your dog's enthusiasm for baying at the moon. A microphone, amplifier, and valve combine to squirt water at the dog if he barks. He soon catches on, says W. J. McGoldrick, Minneapolis-Honeywell engineer, who tried it on his dog.



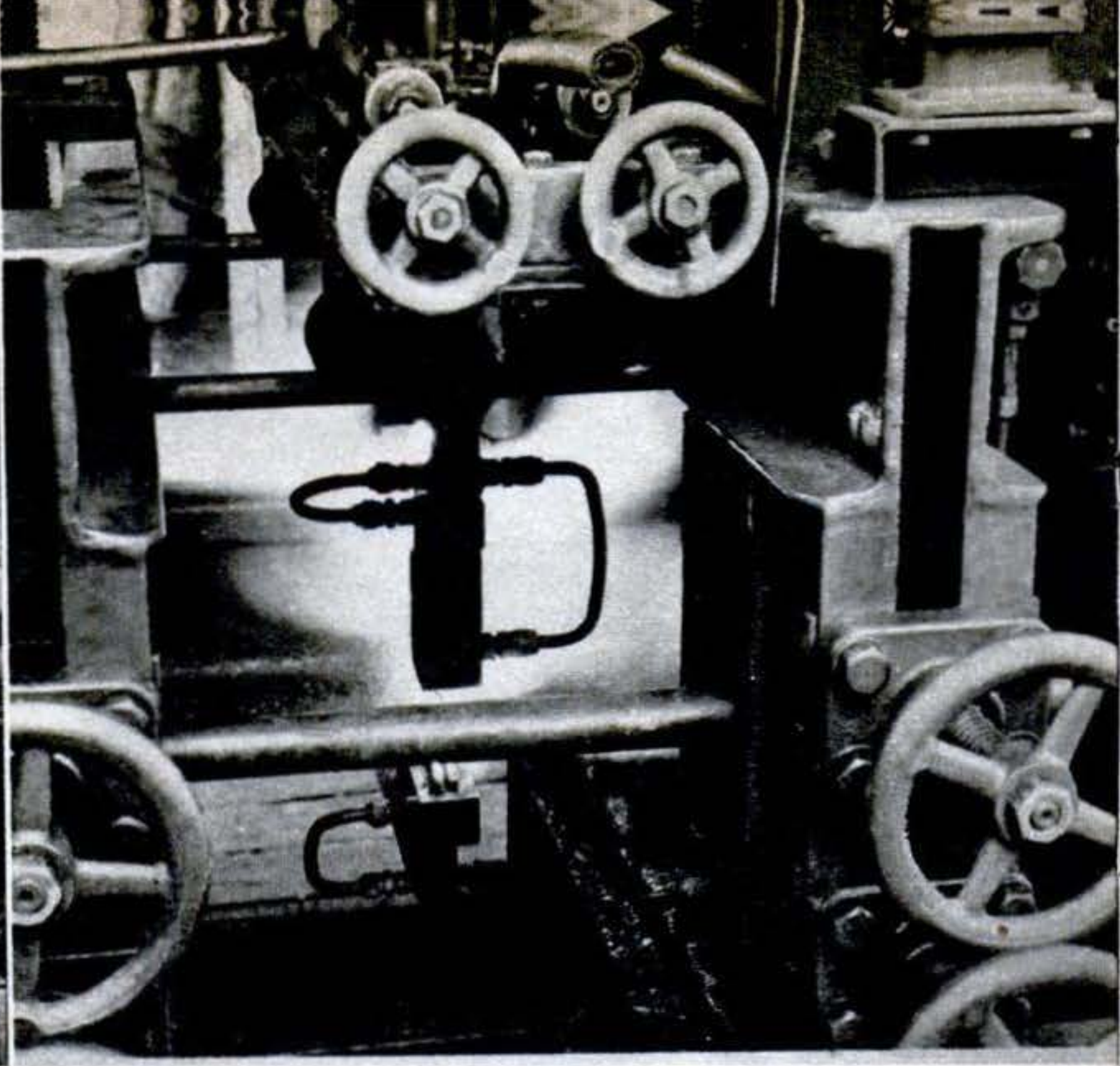
Steel Fingers Harvest Hops

A new machine harvests hops as fast as 300 handworkers. Moving hooks pull the vines past steel fingers (below) that knock off the fruit. Stems and leaves are vacuumed away. Rubery, Owens & Co., Ltd., of London, makes the harvester.





Rail ends are squared up, washed with ethylene dichloride, and polished. This Oxweld® machine then fuses them under 2,500-lb. pressure at 2,300° F. Five minutes of this does the trick.



Close-up shows a few of the 125 welding tips that join the 39-foot rail lengths. After welding, joints are trimmed, ground, and polished to a velvety smoothness by a series of machines.

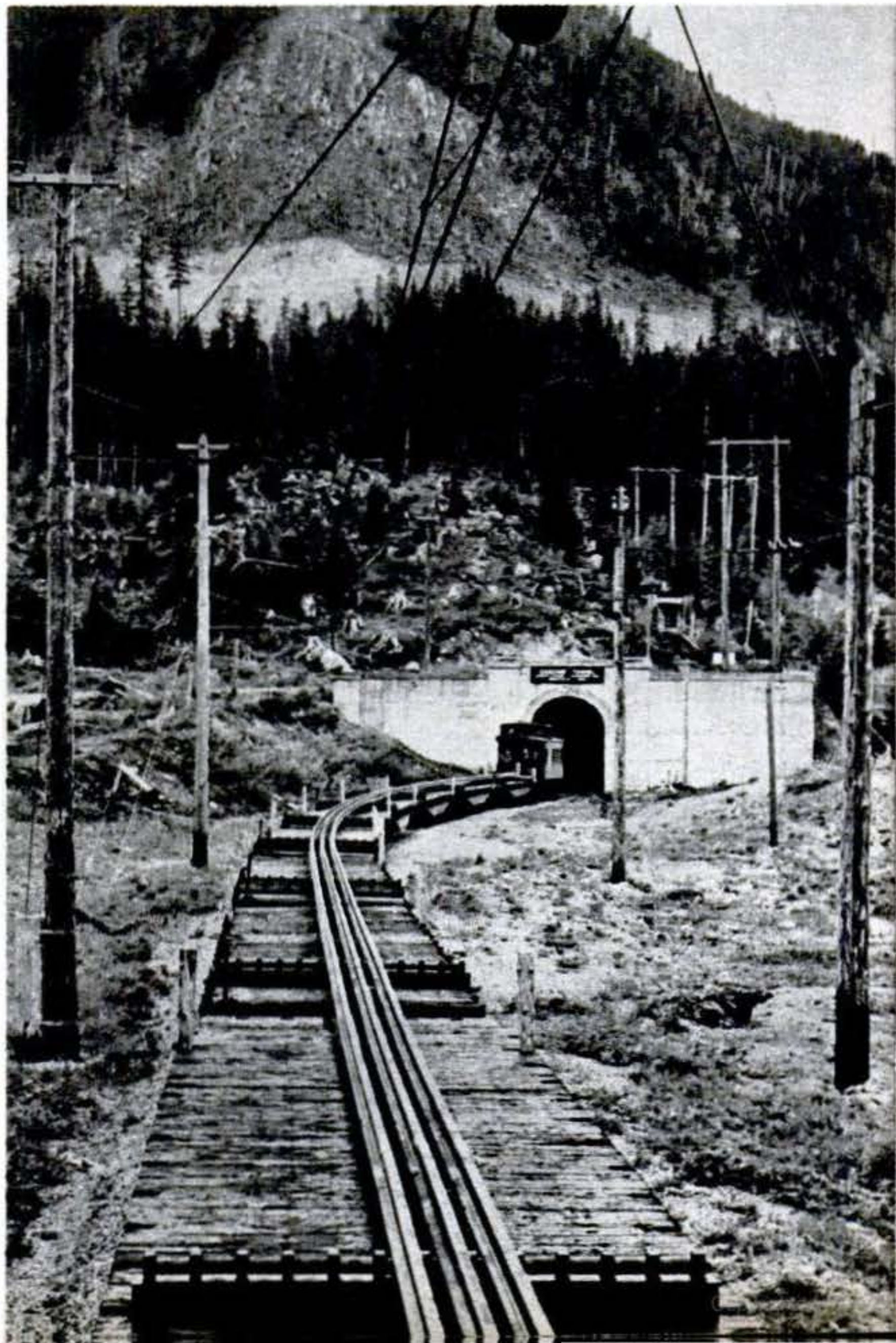
4-Mile Rails Save Work In Tunnel

TRAIN passengers riding through the Great Northern's Cascade Tunnel at Scenic, Wash., no longer hear the familiar clickety-clack of the wheels over rail joints. Continuous rail, pressure-welded on a special assembly line, has eliminated conventional joints over four of the tunnel's 7.79 miles.

Longer service life and reduced maintenance costs are expected to repay the \$189,000 laid out for the project. No joints means no pounding of rail ends by wheels. On ordinary track, these impacts flatten rails, weaken joints, beat down the roadbed, and chew up ties. In the cramped quarters of the single-track tunnel, longest in the Western Hemisphere, repair can be a bottleneck.

The assembly line pictured here, at the west portal of the tunnel, last summer rolled out 1,300 feet of rail per day. Flatcars hauled the sections into the tunnel, where they were spiked down and the remaining joints hand-welded.

The heavy steel flexes easily around four-degree curve. Flatcars can handle up to 12 rails simultaneously, but only three are loaded since narrow tunnel restricts train movement.





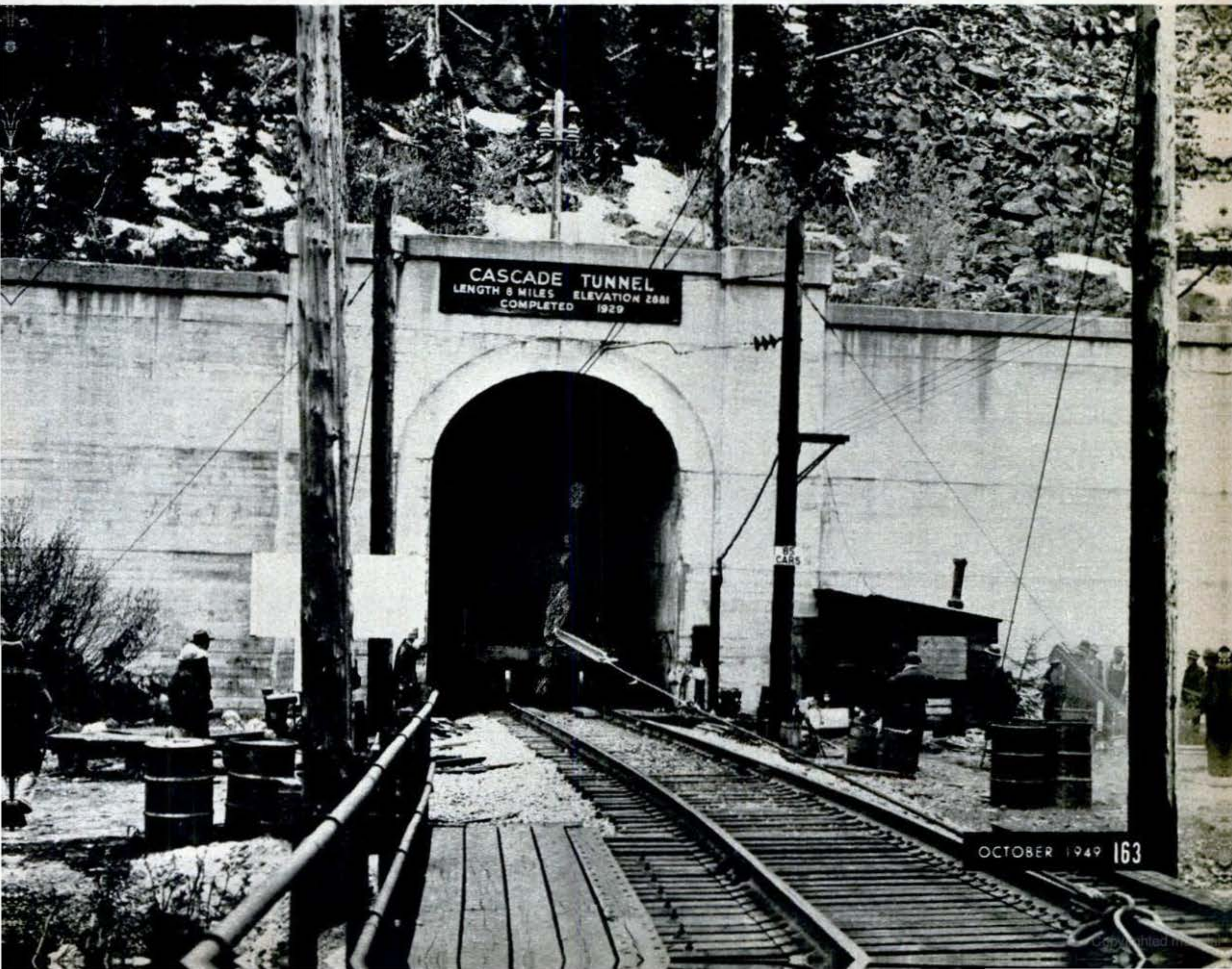
Finished joints are dusted with Magna-Flux® powder and checked with electromagnetic testing unit. Pattern created in the powder shows up flaws invisible to the naked eye.

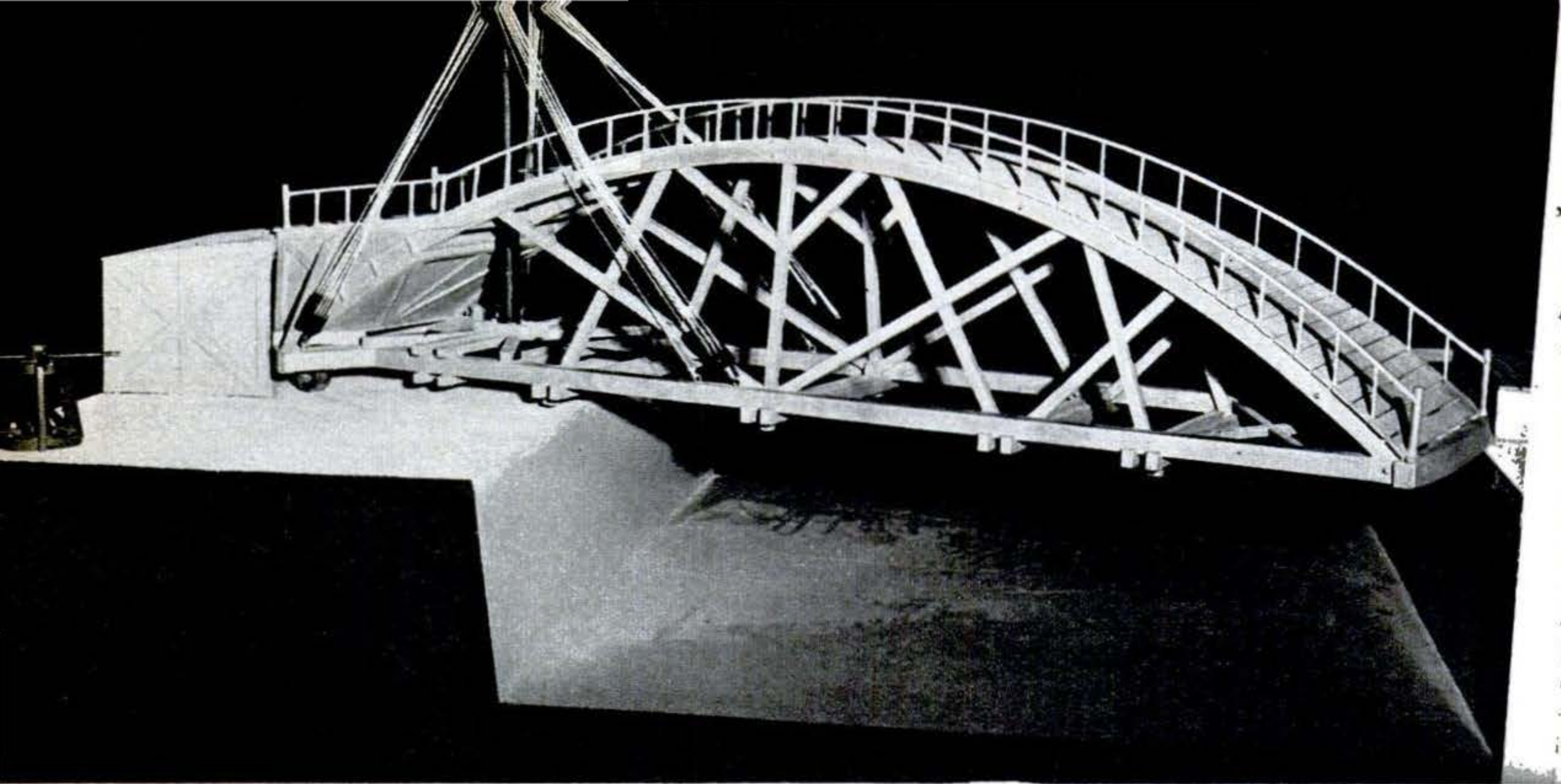
To unload, rail is clamped to anchored steel cable at tunnel's end. Cars are then pulled from under it, the rail slipping easily over the rollers. Section gang waits at the right to move in, spike



Lengths of welded rail are loaded with help of rollers on string of 25 flatcars. Worker tightens a clamp near center of 1,300-foot section to prevent lateral shifting during ride into tunnel.

the rails to the ties, and hand-weld the joints between lengths. Next year the remaining 3.79 miles of rail in the tunnel will get the same treatment, according to present plans.



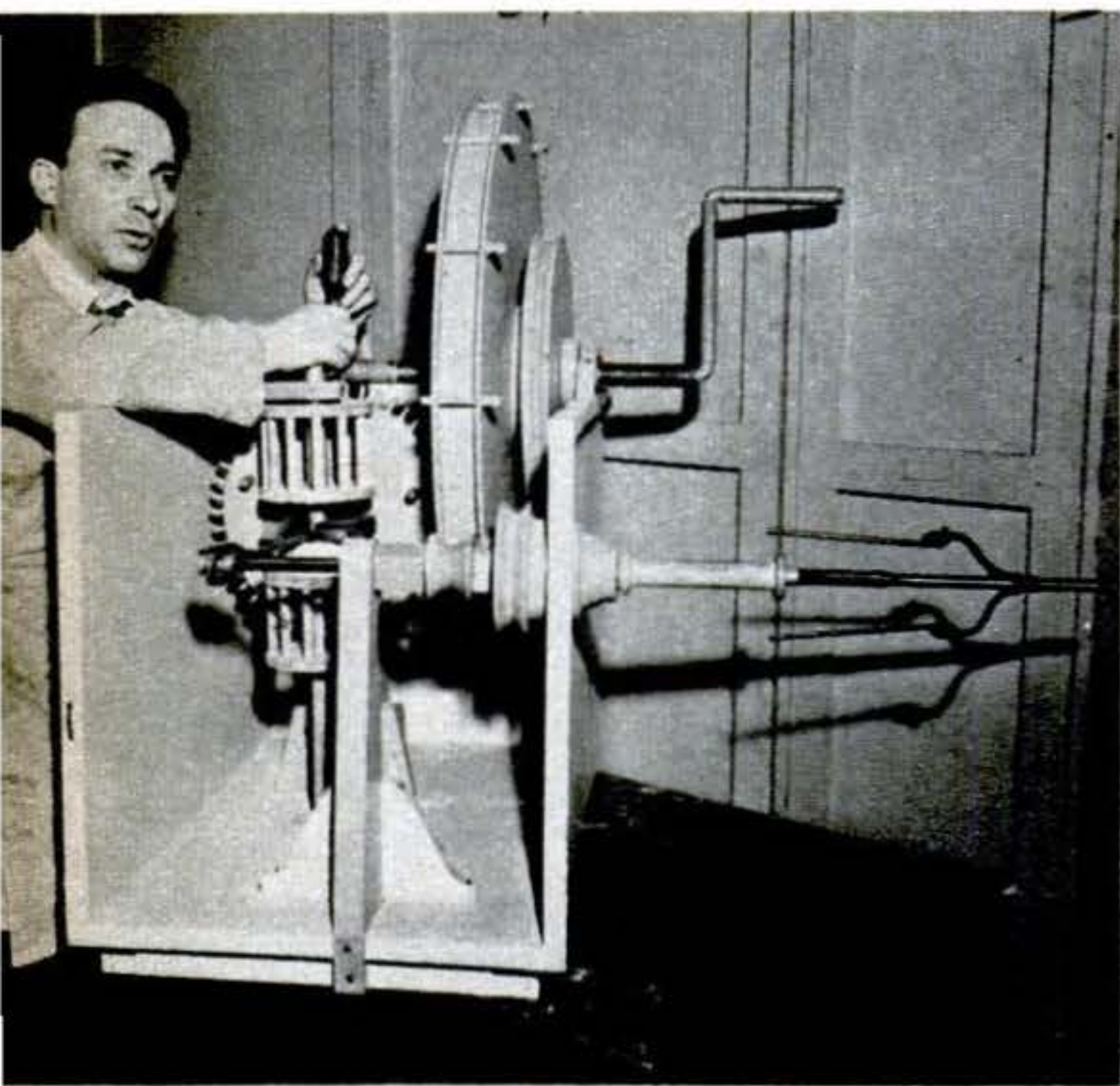


Of the many types of bridges designed by da Vinci, the rotating cantilever model shown above was one of his most important contributions to the defense of a military position. In-

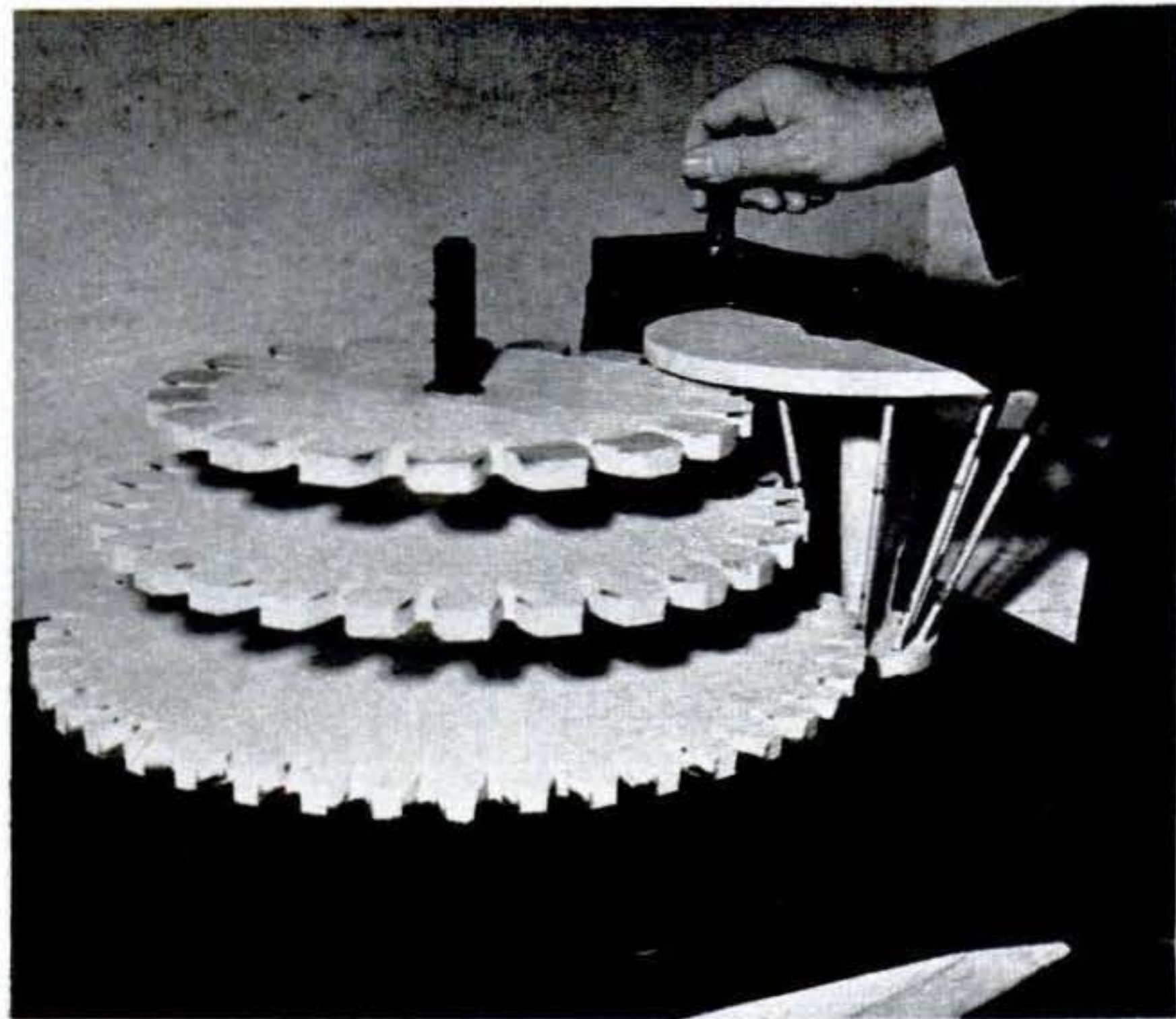
tended to connect an island fortress with the mainland, the bridge could be swung away when not in use. Its construction principles are still in use by bridge builders today.

Leonardo Comes to Life

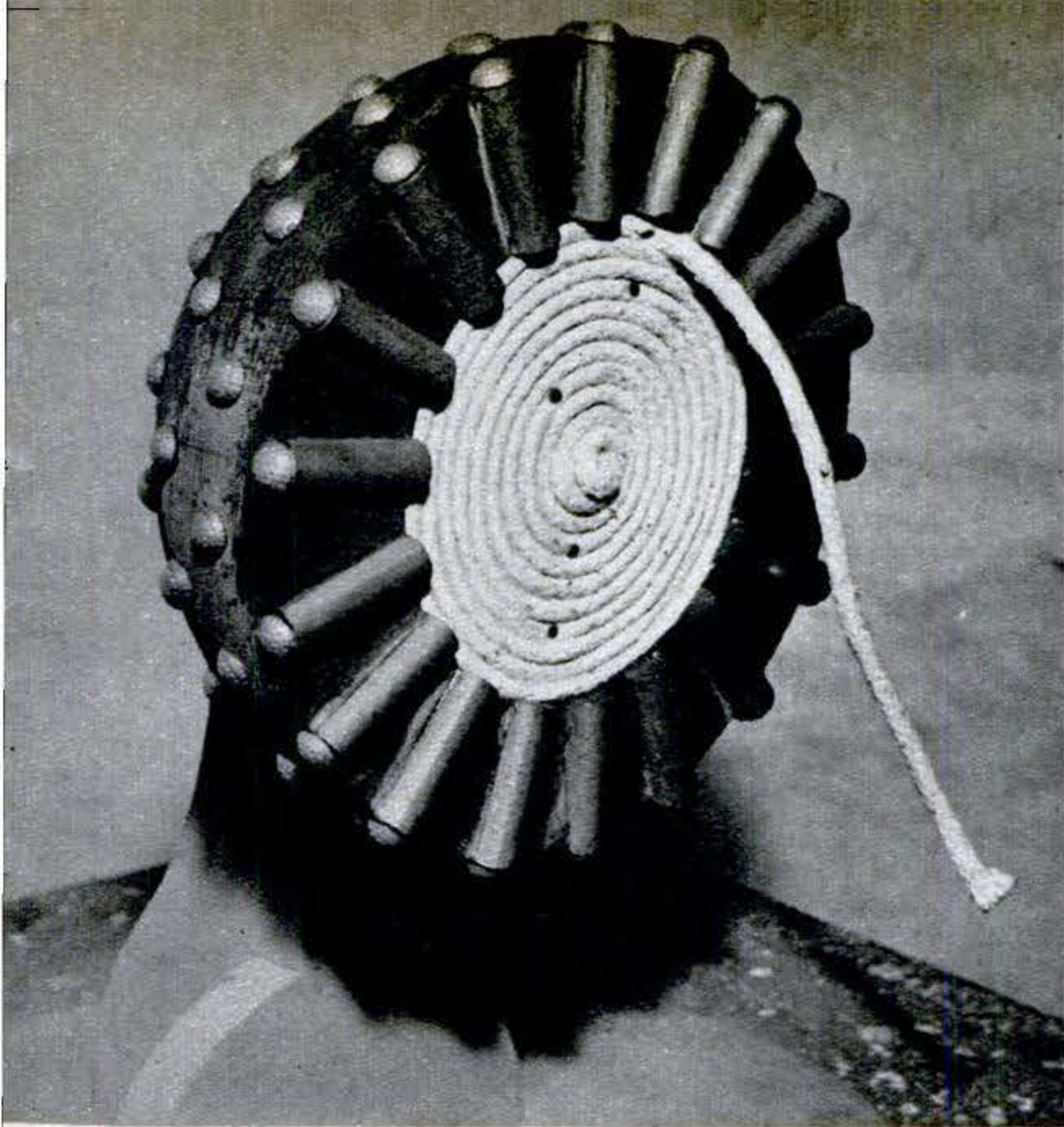
IF POPULAR SCIENCE had been published some 450 years ago, it undoubtedly would have carried these items in its "New Ideas from the Inventors" section. A three-speed power transmission, a form of which you use in your car every day, is but one of



Here is an ancestor of the modern flyer spindle. A complicated arrangement of gears enables an operator turning handle at upper right to wind thread smoothly on revolving spool below it.



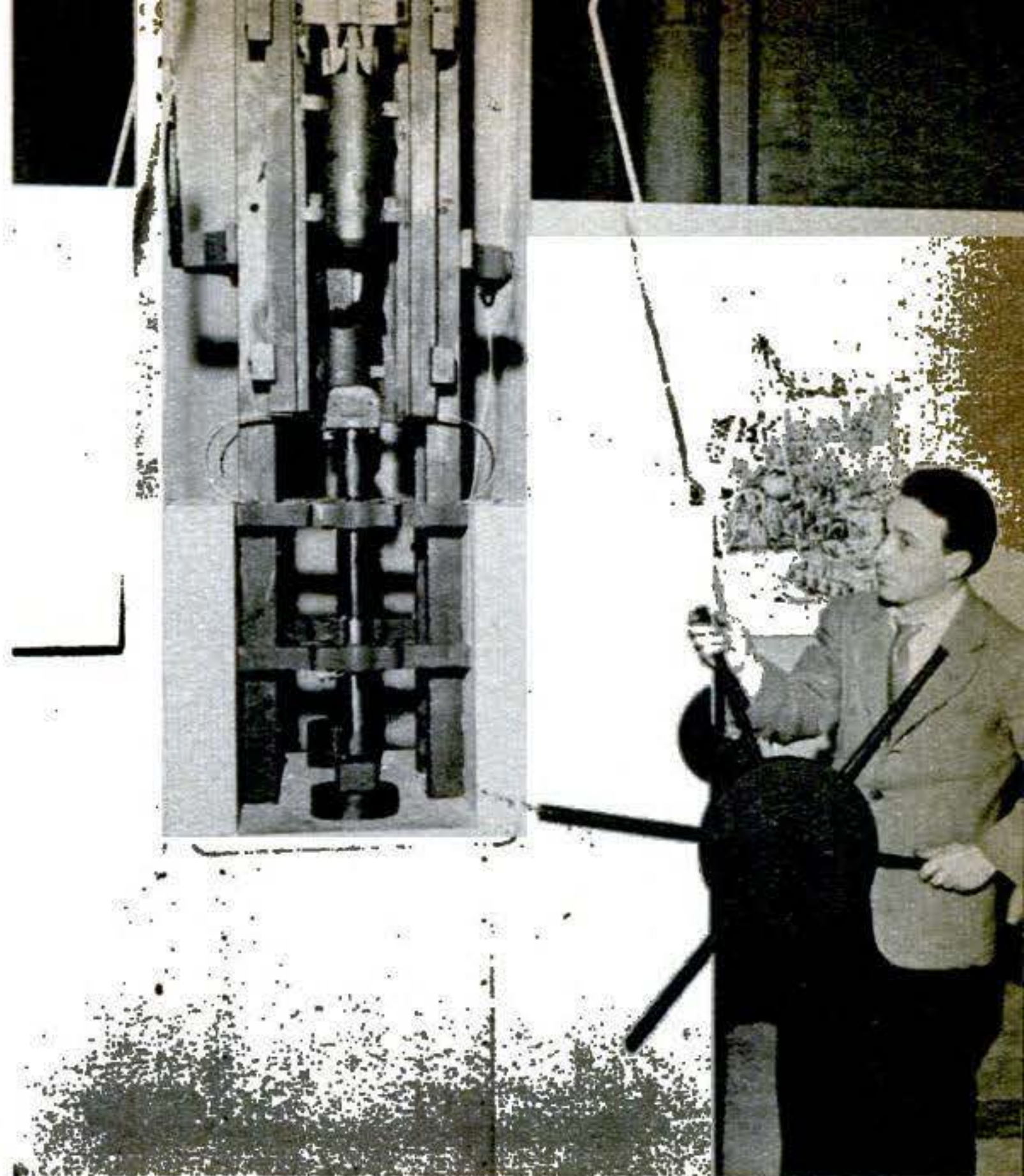
The variable-speed drive can be credited to Leonardo. As shown here, he meshed three cogged wheels of different diameters with one central (lantern) wheel, seen being turned at right.



A forerunner of shrapnel, this aerial projectile was one of his many military weapons. When coiled fuse burned down, the disk exploded, scattering the bullet-like spokes embedded in it.

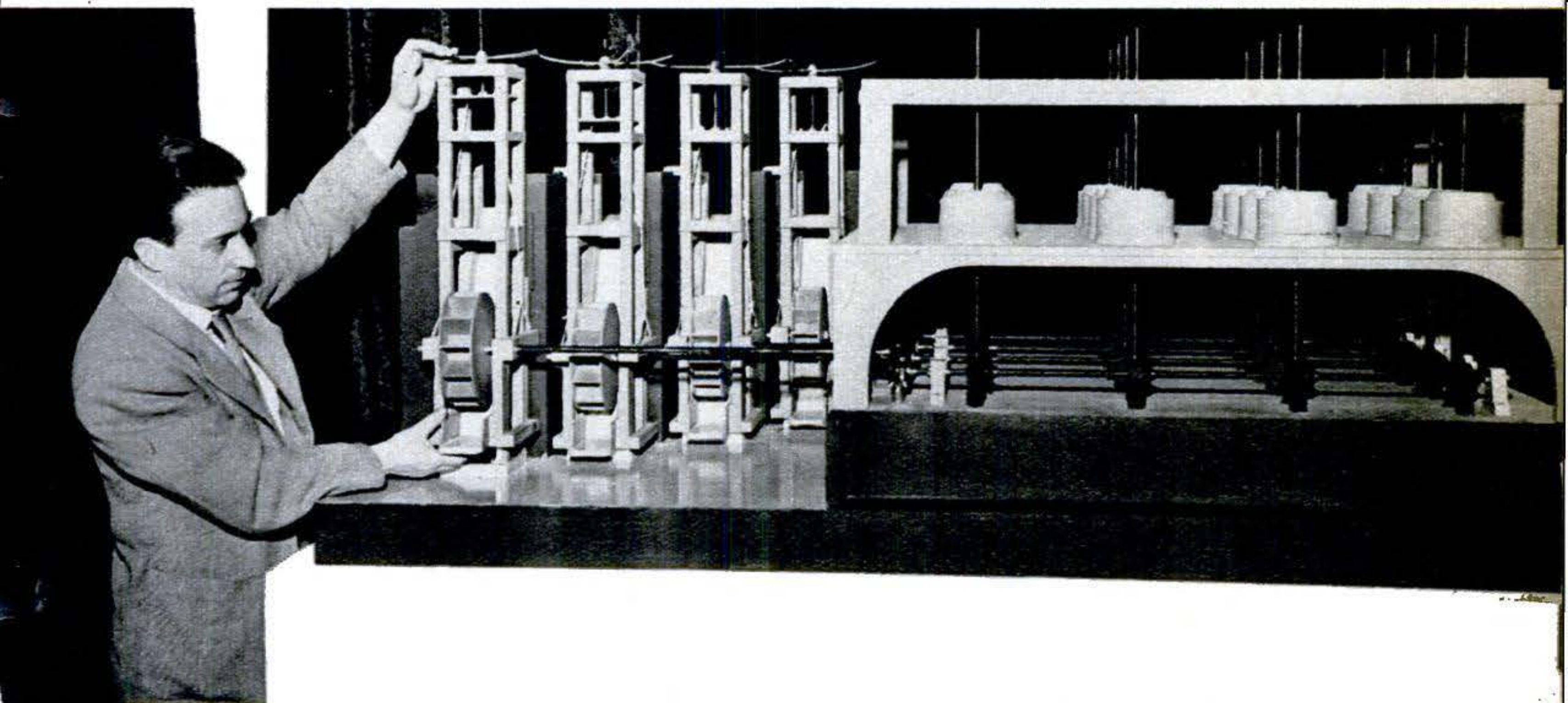
the more than 300 machines, weapons, and other inventions designed by Leonardo da Vinci, famous 15th-Century Italian artist.

Now 66 of these have been re-created by Roberto A. Guatelli, an Italian-born mechanical engineer, in faithful counterparts of the



This hand-operated minting press is believed to be the first to stamp both sides of a coin simultaneously. Weight, shown being raised, is released by the plierlike device seen at top.

originals. These models not only illustrate mechanical principles discovered or adapted by Leonardo; they actually operate. Working in the Los Angeles County Museum from the old sketches, Guatelli built his re-creations mostly of hard wood. END



A mechanical version of today's massive hydroelectric plants is the da Vinci grinding mill shown above. A set of grinding machines, seen at right, was placed on each bank of a swiftly

moving stream. Power was furnished by a series of water wheels, shown at left, located in mid-stream and connected to the grinding weights by a system of shafts and gears.



Barton's bathysphere is hauled up by cable after 340-ft. test dive at Long Beach, Calif. Two powerful, externally mounted searchlights give illumination within a radius of 10 feet.

OTIS BARTON, New York scientist, likes to get to the bottom of things. This time it is the Pacific Ocean off the California coast. He hoped to sink himself below its waves to twice the 3,028-foot depth he reached off Bermuda in 1934. That was in the famed bathysphere he built for William Beebe.

His new vehicle is a thicker-shelled, hollow, two-man steel ball mounted on three huge, wide-tread, wooden wheels. His ocean-bottom trailer is towed by a ship, enabling

There's not too much room for Barton, seen below peering through port of his 52-in. diameter sphere. It is made of chrome-nickel steel $1\frac{1}{4}$ in. thick, and has two fused-quartz windows.

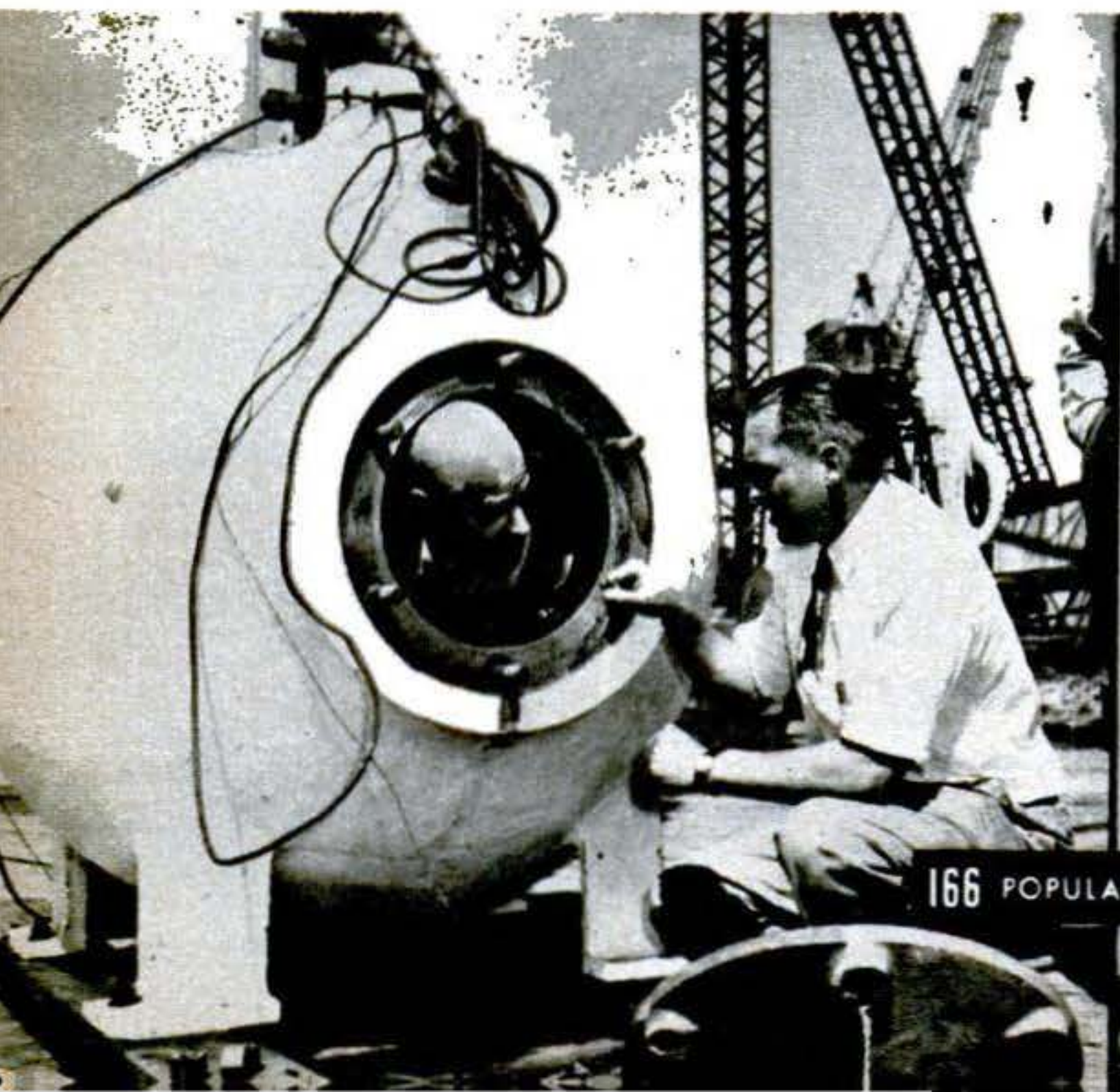
Artist's conception at right shows fish's-eye view of ocean-floor explorer in action. Main wheels are old cable drums.

Ocean-Bottom Cart Explores New World

him leisurely to study strange marine life and undersea canyons.

Called a bathysphere—meaning “view of the ocean depths”—Barton's oceanic crawler already has come through “wet runs” at 40 feet. The project is sponsored by the Hancock Foundation for Scientific Research of the University of Southern California. If the Pacific perambulations were successful, Barton saw no reason why he couldn't roll his way across the “not-so-deep” Atlantic.

Breathing in the bathysphere is a problem. Below, the inventor is loading trays of soda lime that absorb carbon dioxide exhaled by the occupants. Tank at left holds 16-hr. oxygen supply.





Bob Probst



Operator puts trees from side box into trench.



Plow holds trench open, does not turn soil.

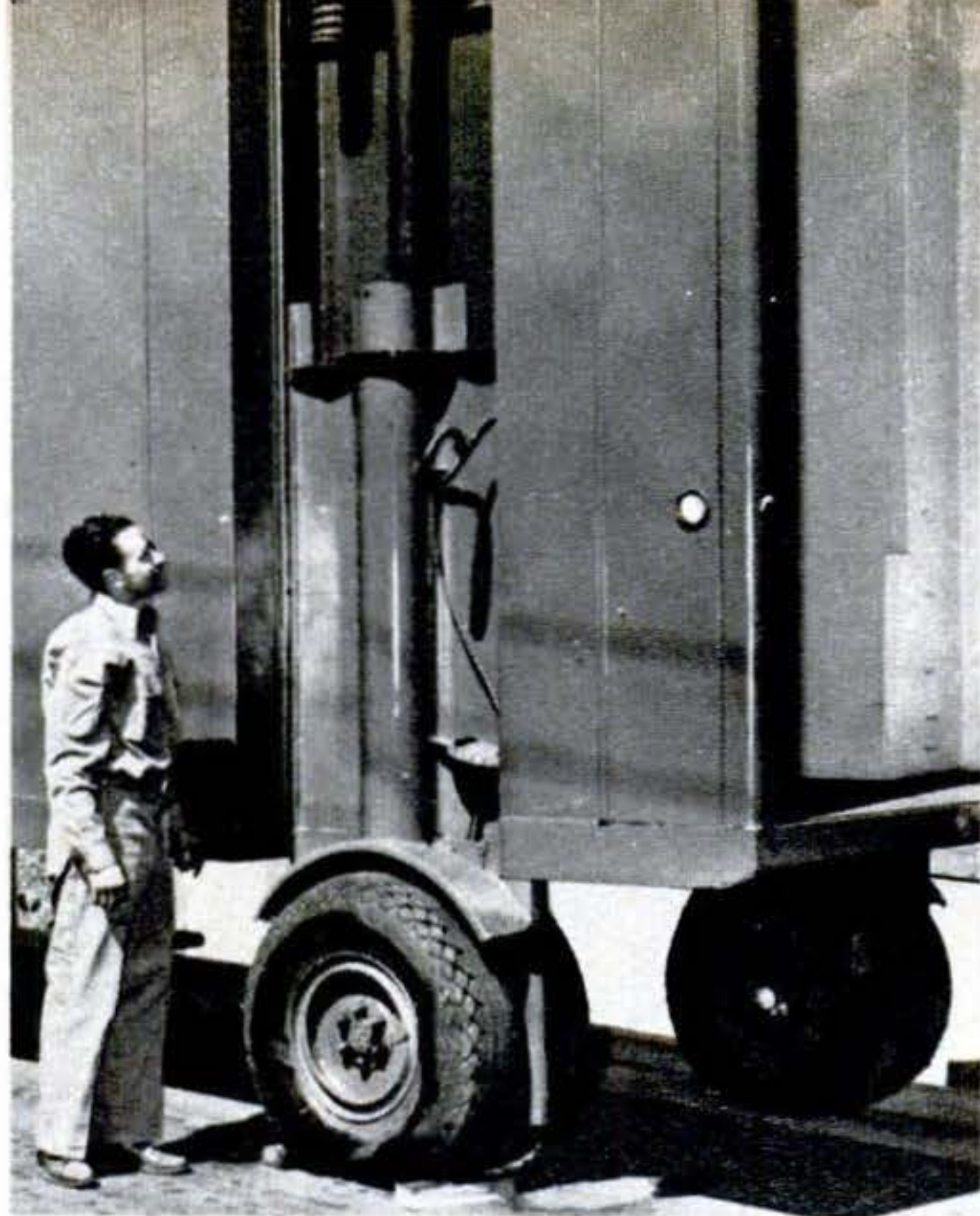


Wheels (under seat) pack soil around roots.

Sled Plants 1,000 Trees an Hour

A THOUSAND trees an hour can be planted with the help of a small steel sled that digs a narrow trench, holds it open long enough for the seedling to be inserted, then closes it and packs the earth around the seedling's roots. Designed particularly for use in the Northeast, the TreeP[®] has a special cutter for slitting stony soil, a larger one for other types of soil. Retractable front wheels are used for towing the sled between jobs.

168 POPULAR SCIENCE



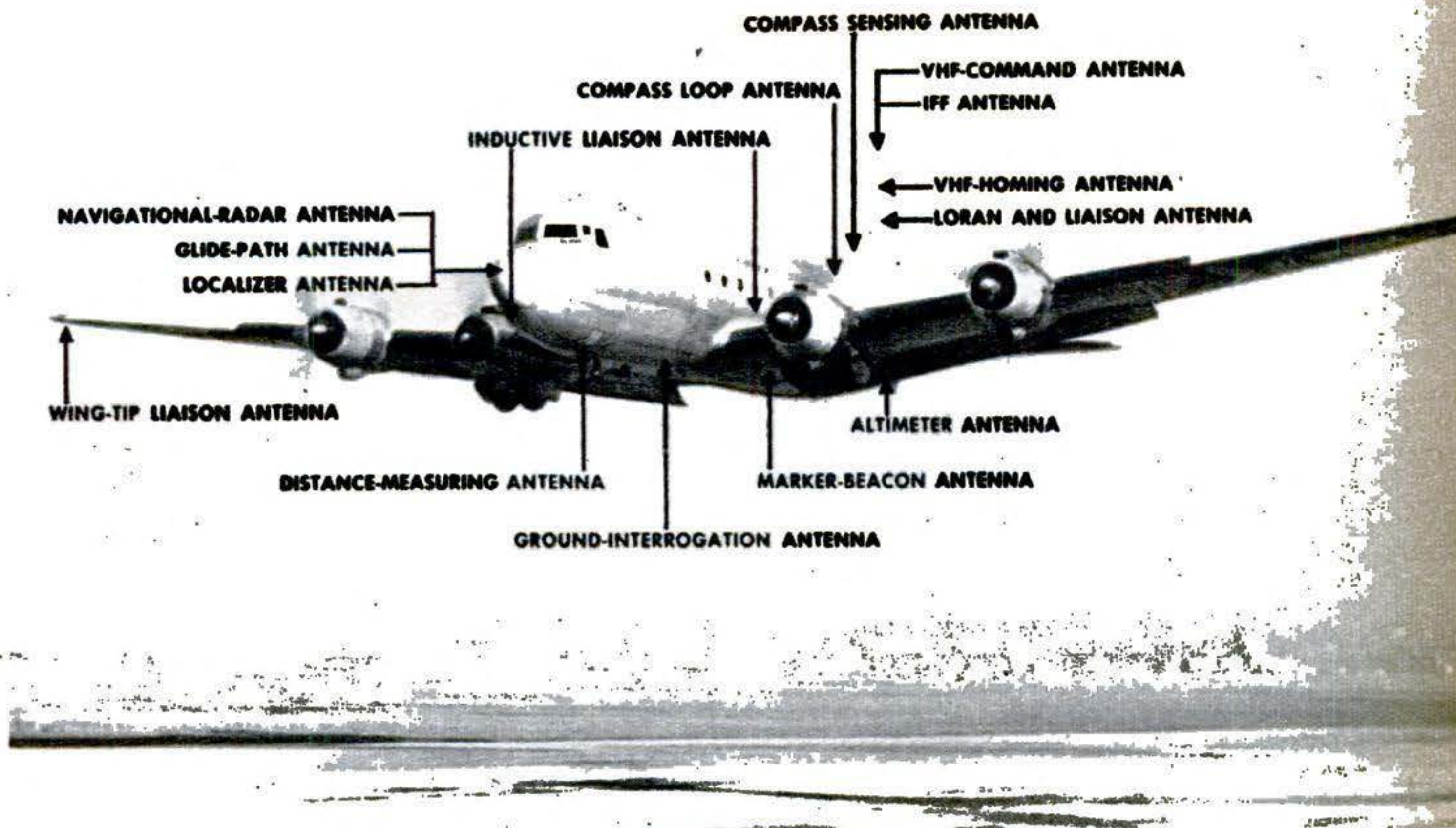
"Landing Gear" Adjusts Trailer

WHEEL units that retract like the landing gear of an airplane permit this trailer to adjust itself to the height of a loading dock. A small gasoline engine powers the hydraulic mechanism — visible through door in photo above—that raises and lowers the wheels as much as 53 inches. Each wheel unit works independently of the other. A. M. Meldrum (above), San Francisco, invented the Hi-Lo Trailer[®] after two years of experimentation.

Hypo Needle Paints Dials

THIS hypodermic needle squirts paint. It is used to letter dials — such as the compass dial shown below—with luminous paint. E. L. Bermuda, of the Air Force Depot at San Bernardino, Calif., made the device by fitting a sawed-off hypo needle to a steel cylinder and plunger. He reports it's easier and faster to use for fine work than a brush.





There are 16 hidden or flush-mounted antennas in this Air Materiel Command's C-54 flying

laboratory, used to test new developments. Buried, the antennas add nothing to aerodynamic drag.

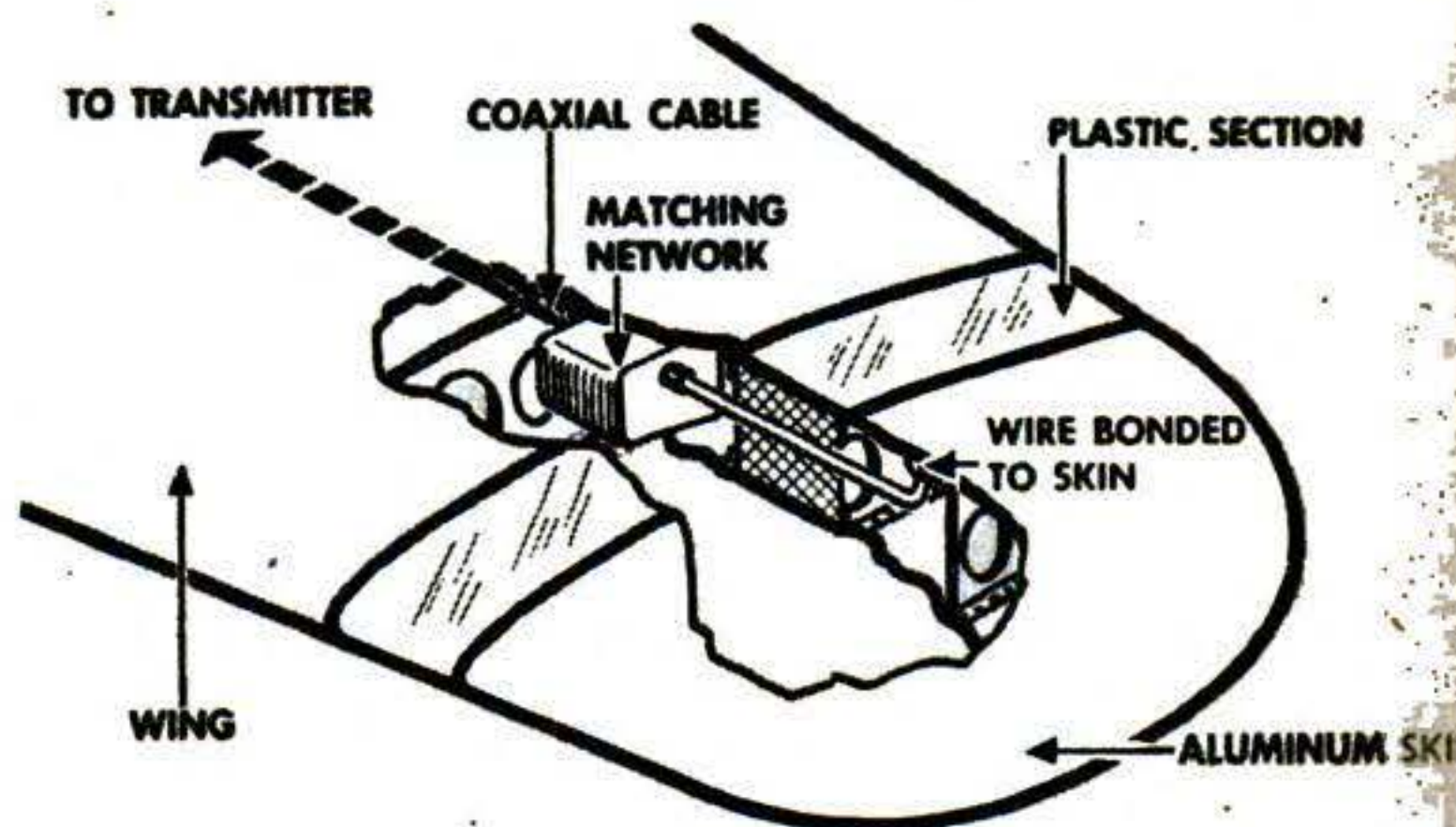
Antennas Go Into Hiding

RADIO and radar devices have been added to airplanes so rapidly that with the accompanying exterior antennas the planes were beginning to look like flying porcupines. And in their other role, as gremlins, the antennas were acting as brakes on the high speeds the Air Force was aiming at.

As one radio expert put it, "When they take the propellers off, then we'll take off the antennas." Along came jet propulsion, and, true to his prediction, the experts are burying the antennas to give the speed-of-sound-nudging planes clean-swept exteriors.

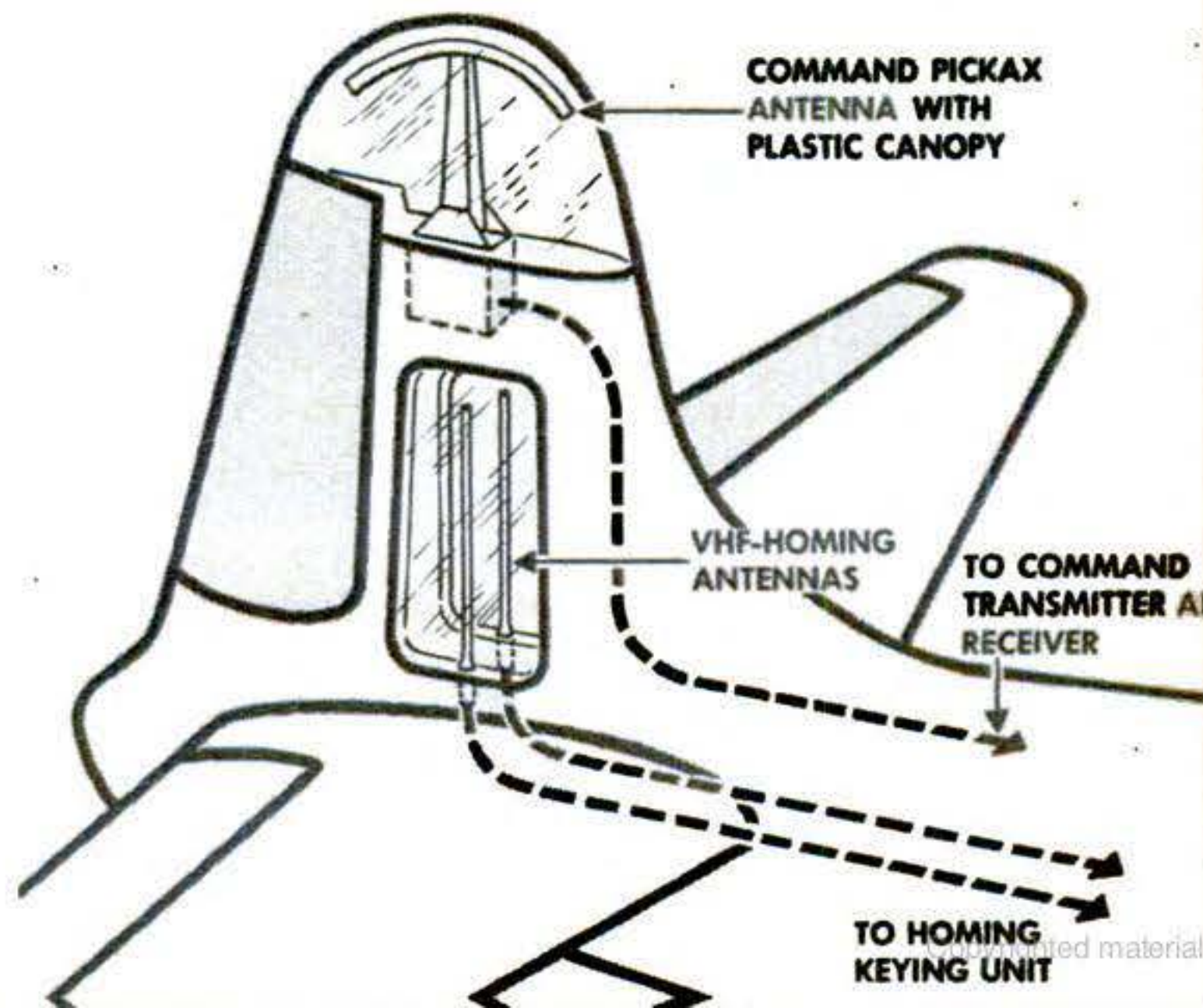
As an example, figures compiled for only nine of the 16 hidden antennas on the experimental C-54 at the top of this page show that these antennas, if mounted externally, would use up 634 hp. at 600 m.p.h. That's enough horsepower to pull half a dozen automobiles.

Among the other advantages of buried antennas are the elimination of icing dangers, added protection against precipitation static, the sealing out of moisture, and freedom from the threat of aerials breaking off at high speeds and interrupting communications.



A zero-drag antenna, buried in a wing tip, is shown in the above drawing. Plastic section isolates tip from rest of wing. If necessary, plane's entire wing can be used as an antenna.

Pickax antenna shown at top of drawing below was the first type of hidden antenna. Designed to follow conventional curve of plane's tail, it is protected by a plastic canopy.



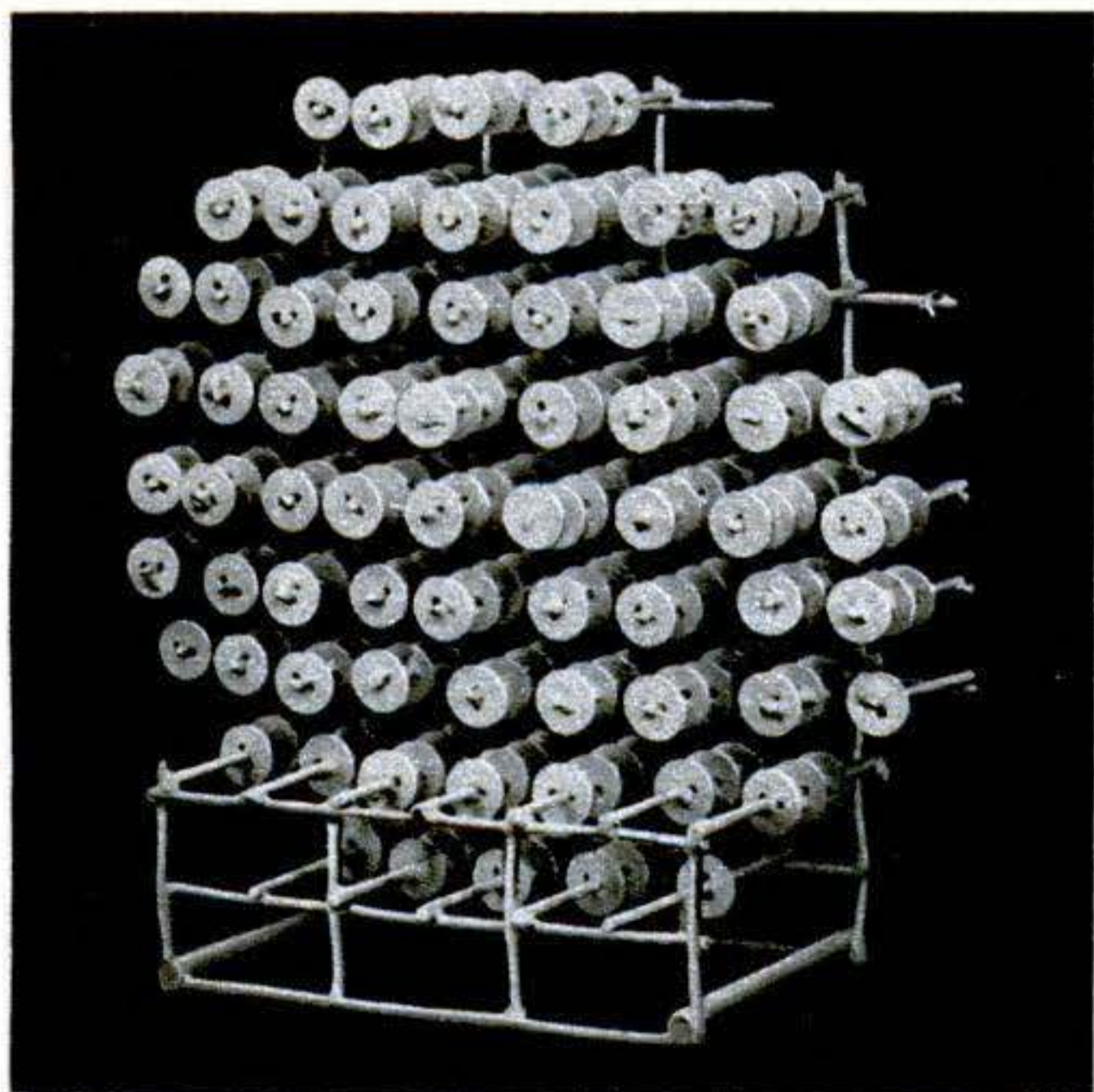
Telephone of the future? POPULAR SCIENCE artist's conception shows phone made possible by new sound lenses. You wouldn't have to pick up the handset—just talk and listen to the black box.



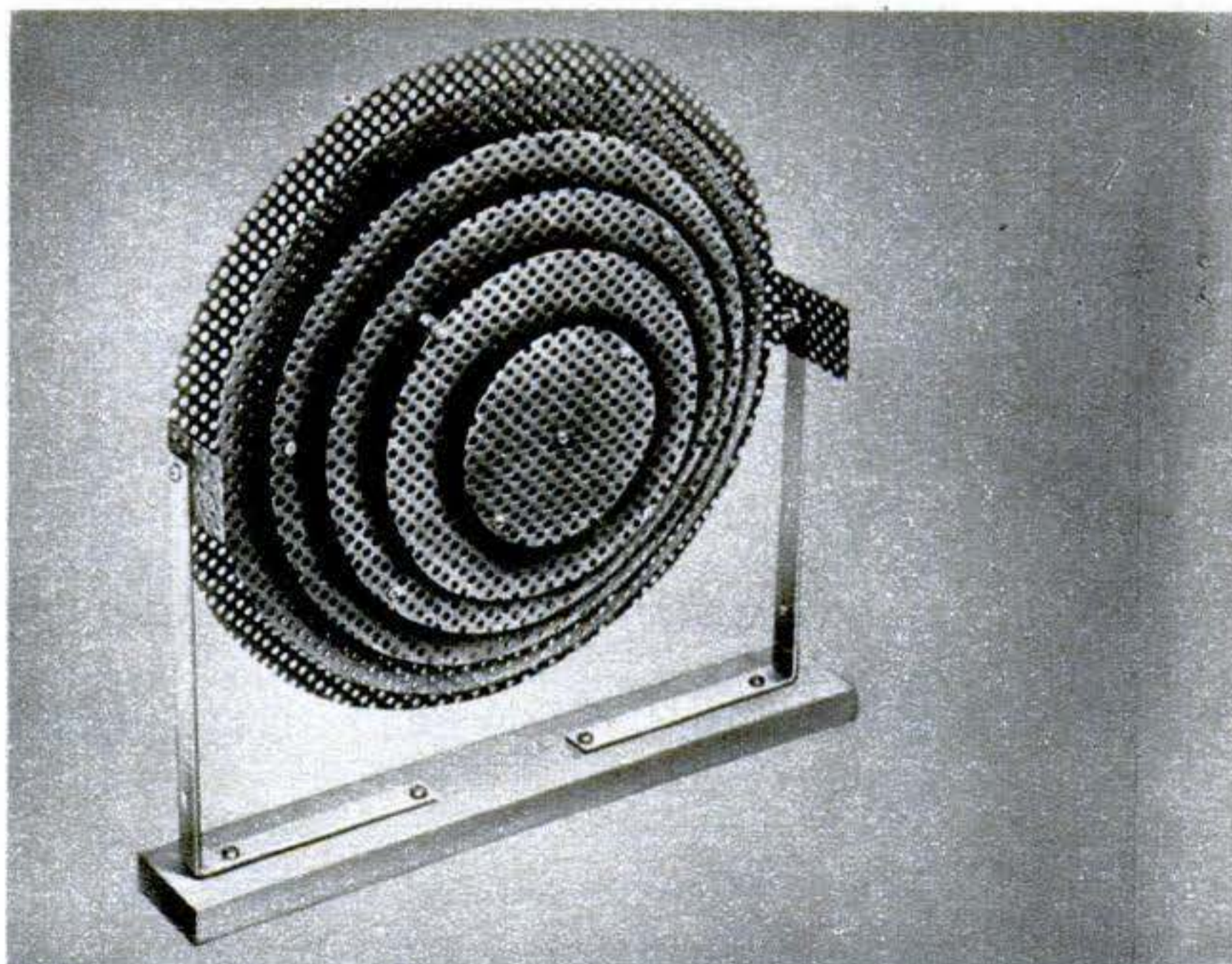
Lenses Promise No-Hands Phone

BEING a good engineer, Dr. Winston E. Kock is a lazy man. He thinks it's too much trouble to lift up a handset every time you want to talk over the telephone. His idea of a telephone is a little black box you never touch—just talk and listen to.

Since Dr. Kock is a physicist-engineer for Bell Telephone Laboratories, he did something about his idea. He developed lenses that focus sound, a necessary preliminary to the lazy-man's telephone. The telephone it-



Sound lenses can be made from many kinds of materials. The one above consists of metal disks on an open framework. It was originally built for microwaves, but works just as well for sound.



Circular sheets of perforated metal make another type of acoustic lens. This particular model, however, cannot be used to focus microwaves, which are reflected by the metal sheets.



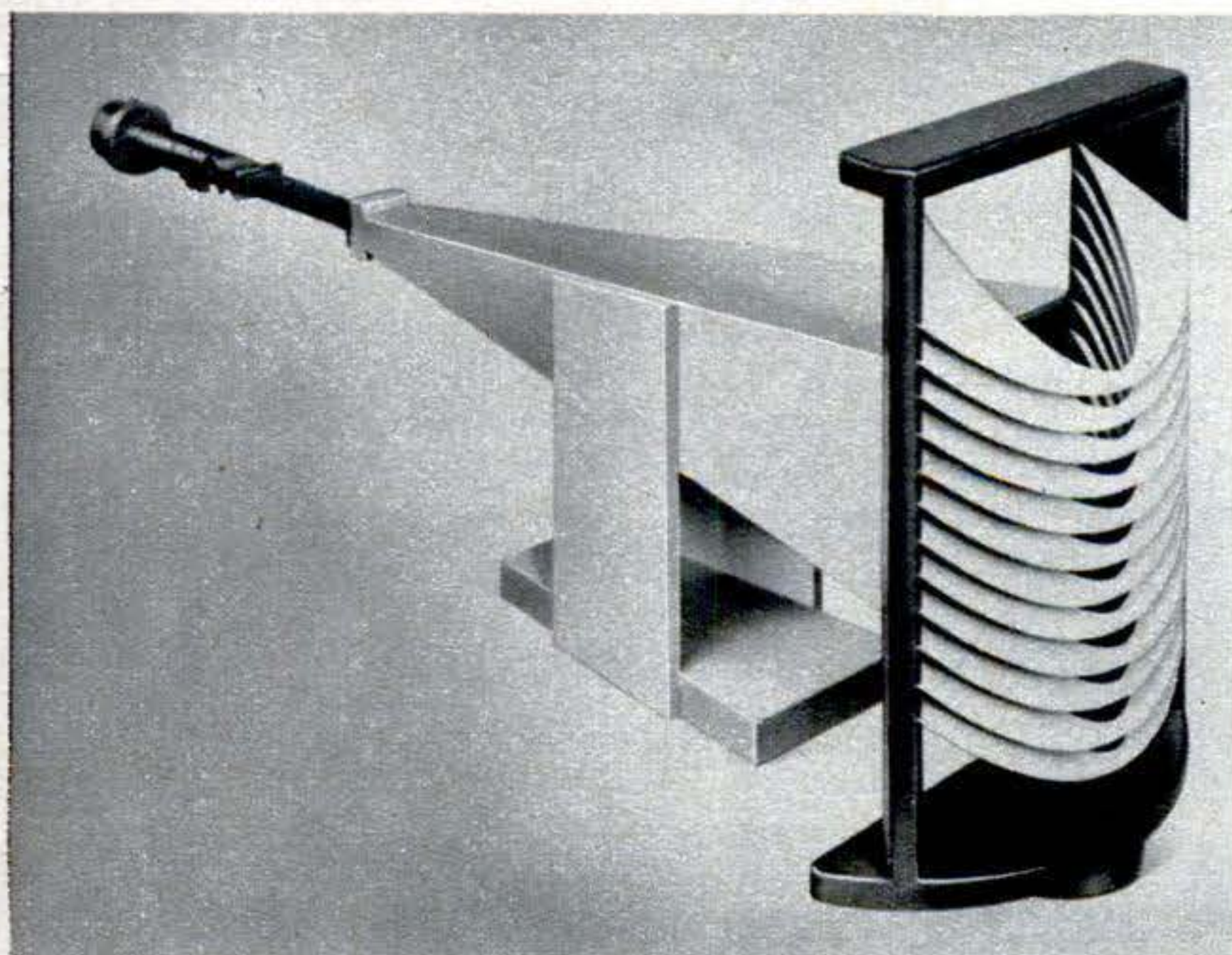
Microwave ancestry of sound lenses is shown by using one lens to focus both types of waves.

self is still only an idea, but the lenses have been made and should have many uses.

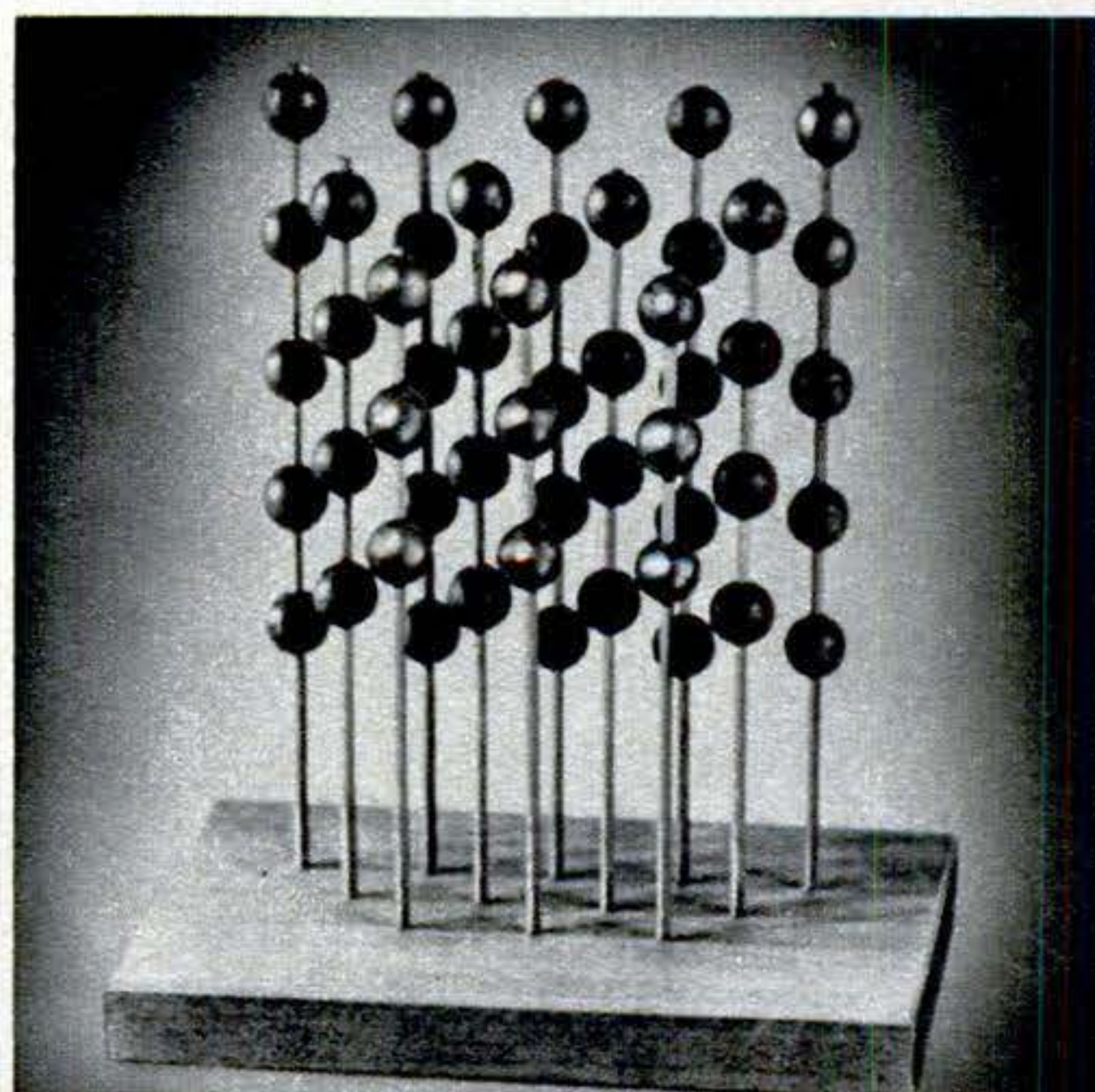
You can understand why lenses are necessary if you've ever held an old-fashioned telephone receiver near the transmitter. The transmitter picks up the receiver's sound, which keeps going around the circuit until it is a howl. A lens would direct the receiver's sound at the user and keep it away from the transmitter. ("Intercom" systems do have combination receiver-transmitters, but you

must press a switch to talk—more work than holding a handset.)

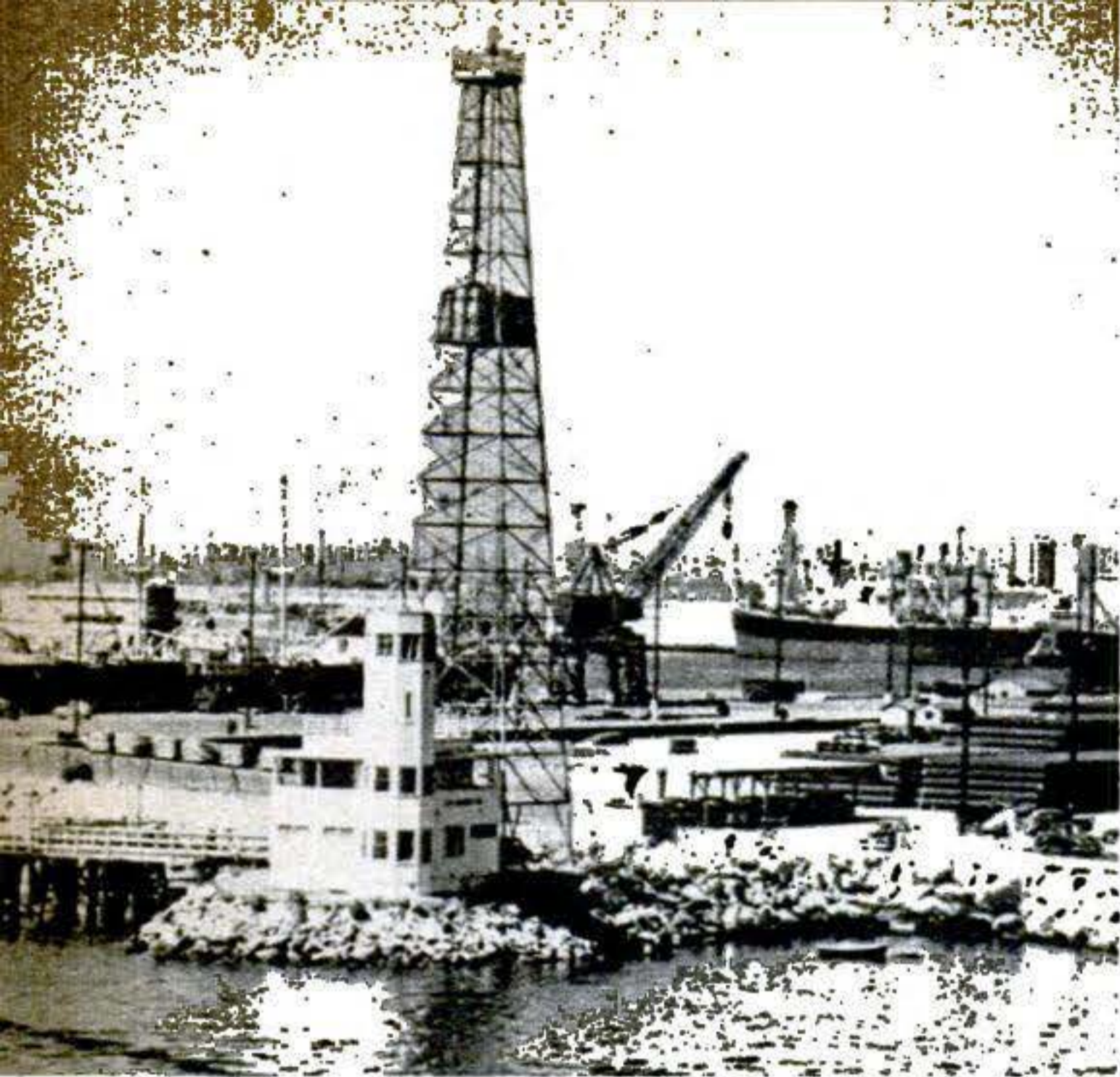
The sound lenses grew out of Dr. Kock's research on lenses for microwave radio relays (PS, Aug. '46, p. 90). A little figuring showed that sound and microwaves have the same wavelengths (although they are very different otherwise); so they should be focused by the same lenses. And they are, as Dr. Kock proves by sending both through the same lens, as shown at the top of this page. **END**



Spreading high-pitched musical notes from single speaker may be use of lens. Since high frequencies are directional, good radios now must use two "tweeters" to distribute music.



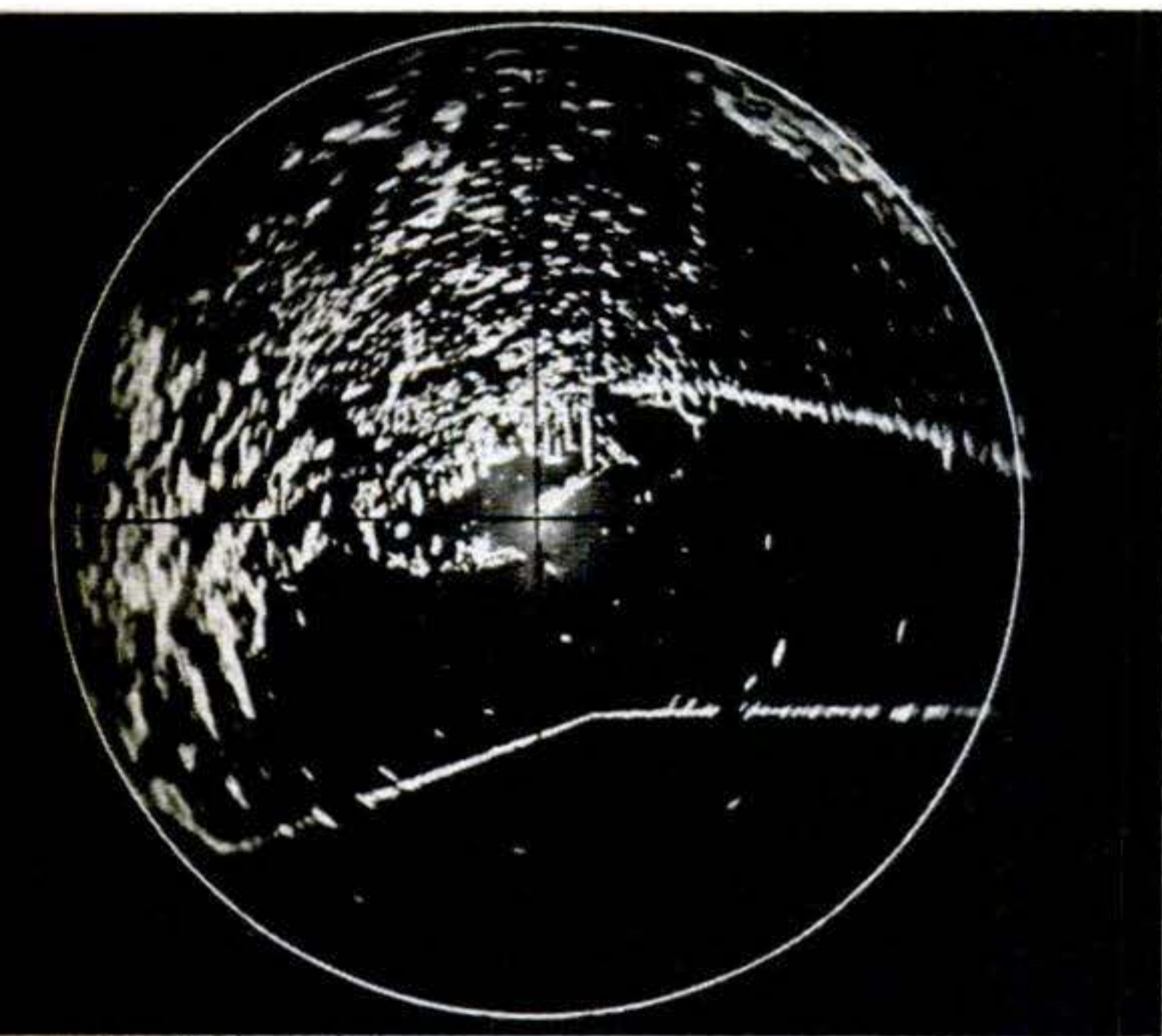
Balls are used for this lens. Acoustic lens works just like optical kind: difference in thickness between edge and middle slows some waves more than others, making them focus at a point.



1 Radar tower and pilot station landmark outer harbor at Long Beach, Calif. Scanner is located on top of the 122-foot steel structure.

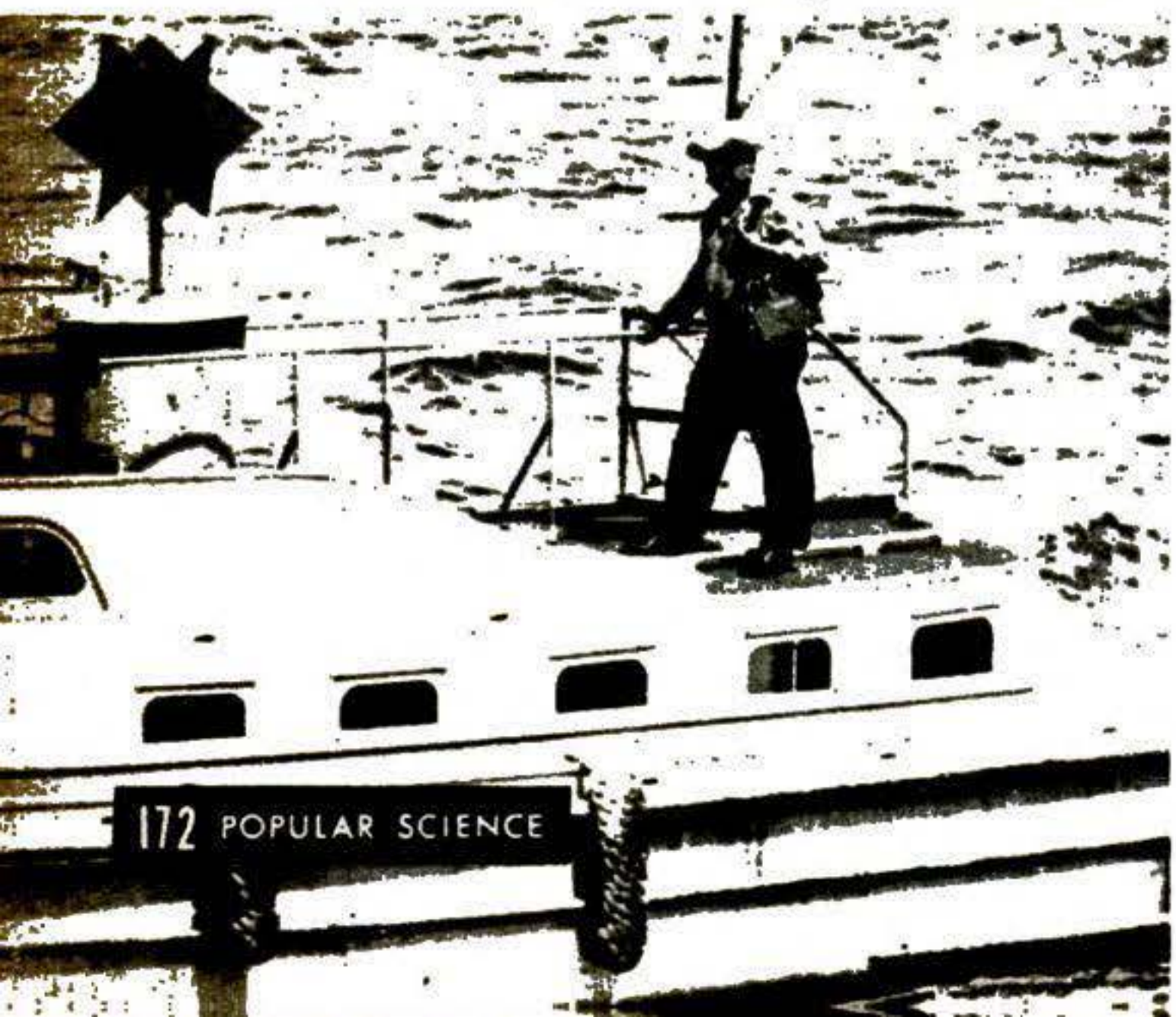


2 Position of an incoming ship is being plotted on a harbor-area chart. The port makes no extra charge for the radar-piloting service.



3 Long Beach Harbor is shown on a radar viewing scope. Line across bottom is breakwater. Elongated pips are ships; dots are buoys.

4 Equipped with walkie-talkie, the harbor pilot is directed to the ship he will guide in. Note the special reflector on top of the launch.

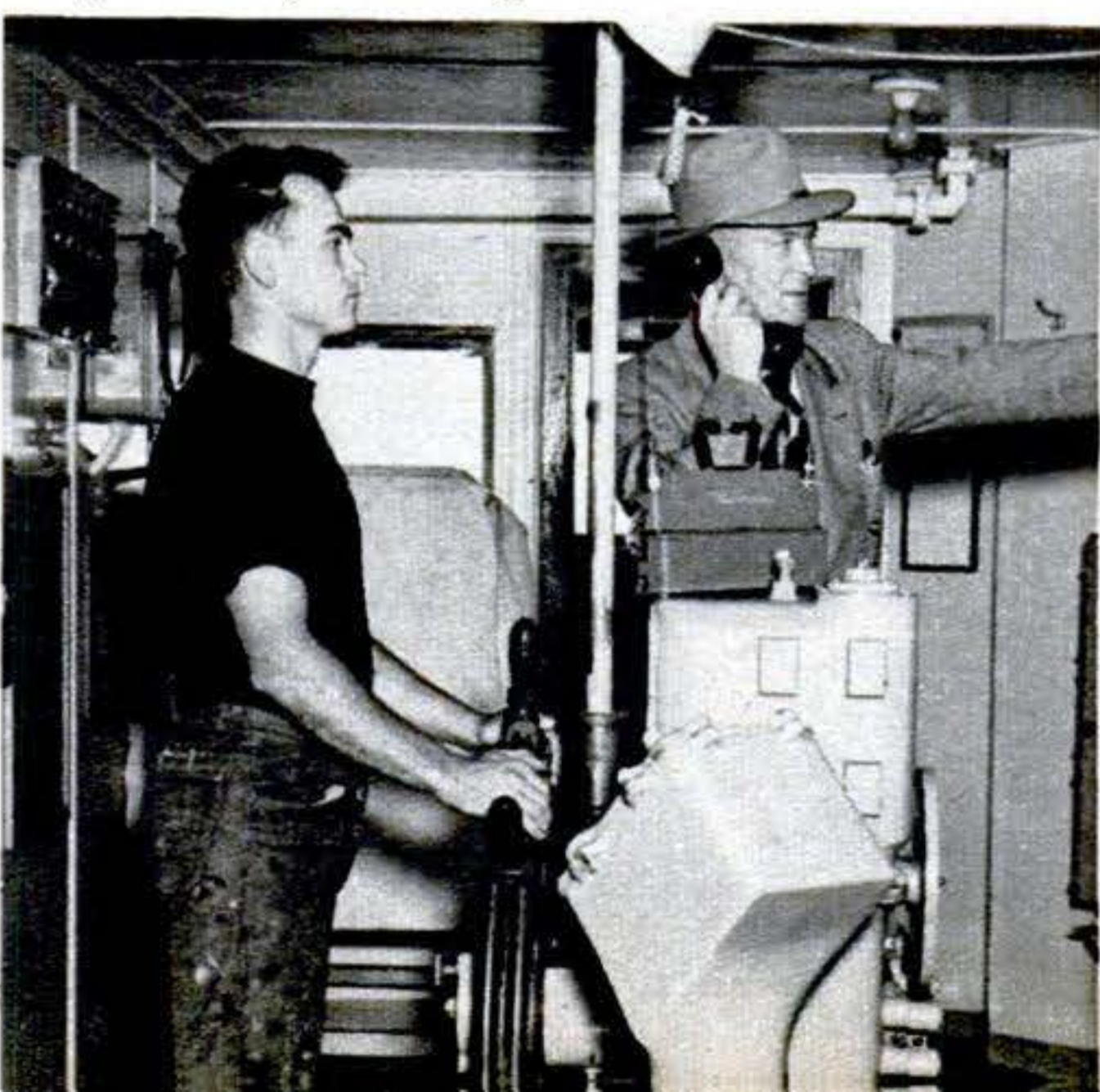


Radar Talks Ships into Port

TAKING a tip from aviation, the Port of Long Beach, Calif., has installed a radar system to guide ships safely into and out of the harbor in even the foggiest weather. It works much like the Ground Control Approach radar system by which an airplane pilot is "talked down" to an airport runway.

The harbor pilot is radar-guided to a ship, which he then boards and maneuvers in, obeying instructions sent from a shore station where the ship's course is constantly followed on a radar scope. The new system, first in America, makes it possible to locate ships 30 miles away. The electronic equipment was supplied by Sperry Gyroscope.

5 The harbor pilot takes over in the ship's wheelhouse. Listening to the shore radar station, he relays steering orders to the helmsman.





“Carfeteria” Serves Motorists at Wheel

EATING is made easy for motorists who patronize the wheellike Los Angeles Motor-mat shown above. Spokes of the wheel are tracks along which run small carriages. You drive into one of the 20 stalls, where a carriage and menu are waiting, make your selection, write the order, and press a button.

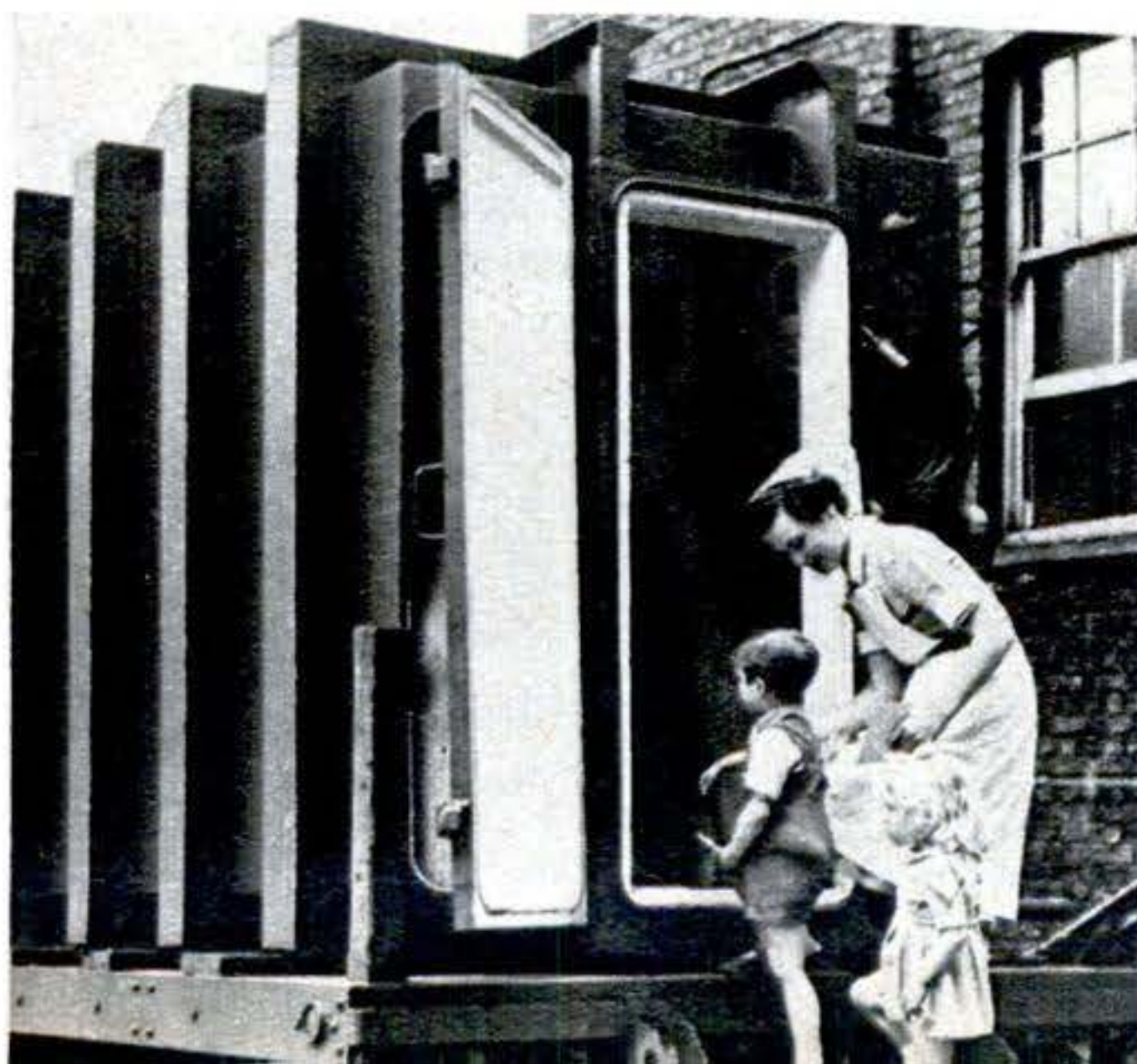
Presto! the carriage whizzes into the kitchen, stopping along the way only long enough for an attendant to figure the cost. In a few minutes the meal is shot back to your car. When you have finished eating from a lap tray, you put the empty dishes back in the carriage—plus the price of the meal.

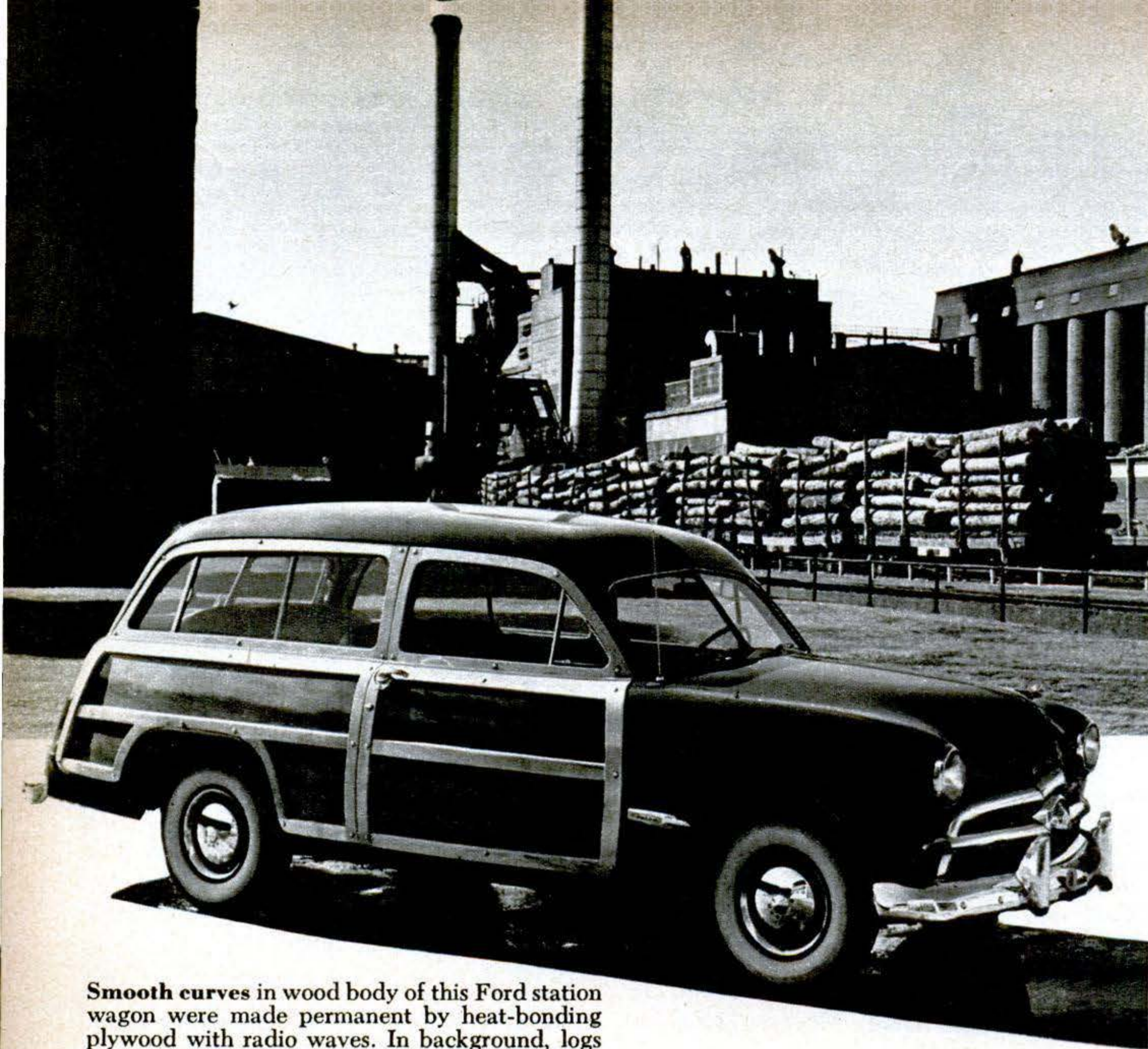
“Flight” Chamber Fights Disease

DURING the war British pilots used the decompression chamber to check the effects of breathing at high altitudes. Now it is being used by their children in a war against whooping cough. Small fry suffering from the disease enter the mobile chamber below, where pressure is gradually reduced to the equivalent of that at 12,000 feet. This lowered pressure permits congested lungs to breathe more deeply, speeding recovery. The new treatment, it is believed, may cut recovery time from weeks to a few days.

Mobile Bins Save Space

WASTED aisle space has been eliminated by a new British system of metal cabinets and lockers that roll on tracks. The rows of storage bins below hug each other for maximum space use but can easily be pushed aside for access to the sections in back. Sliding on ball-bearing wheels, the cabinets move easily and noiselessly. It is claimed that the Foulkes Rolstore Mobile Storage® system saves 20 percent in walking distance. Acrow, Inc., of Newark, N. J., is introducing the units in the United States.





Smooth curves in wood body of this Ford station wagon were made permanent by heat-bonding plywood with radio waves. In background, logs for wood roll into Iron Mountain, Mich., plant.

Radio Toasts Wood Sandwiches for Car Bodies

Dielectric bonding cures glue between plywood sheets in a fraction of the time required by older processes.

EVER wonder how those smooth curves on station-wagon bodies got that way? The Ford Motor Co. uses radio waves to turn the trick. The radio treatment sticks together plywood sheets for the panels and posts in less time than it takes to tell about it.

This method is called dielectric bonding. High-frequency radio waves of about 13 megacycles—one of the frequencies used in short-wave radio—are shot through the layers of wood. Those flowing body curves on Ford and Mercury station wagons result.

When the radio waves, produced by a high-frequency generator, pass through the wood, they set its molecules in motion. The resulting friction between the molecules produces heat that cures the glue between the plywood layers in four to five minutes. Some 350 to 375 pounds of hydraulic pressure per square inch help speed up the process. The waves-plus-pressure combination raises the wood at the glue line to about 280° F.



Raw plywood veneer is first checked for moisture content, which must be just right, by instrument that pricks wood, measures electrical conductivity, records amount on sensitive meter.



Radio waves for heat bonding are produced by this high-frequency generator, an oscillator tube with a tuned circuit consisting of coil and condenser. Fins around edge are for air-cooling.



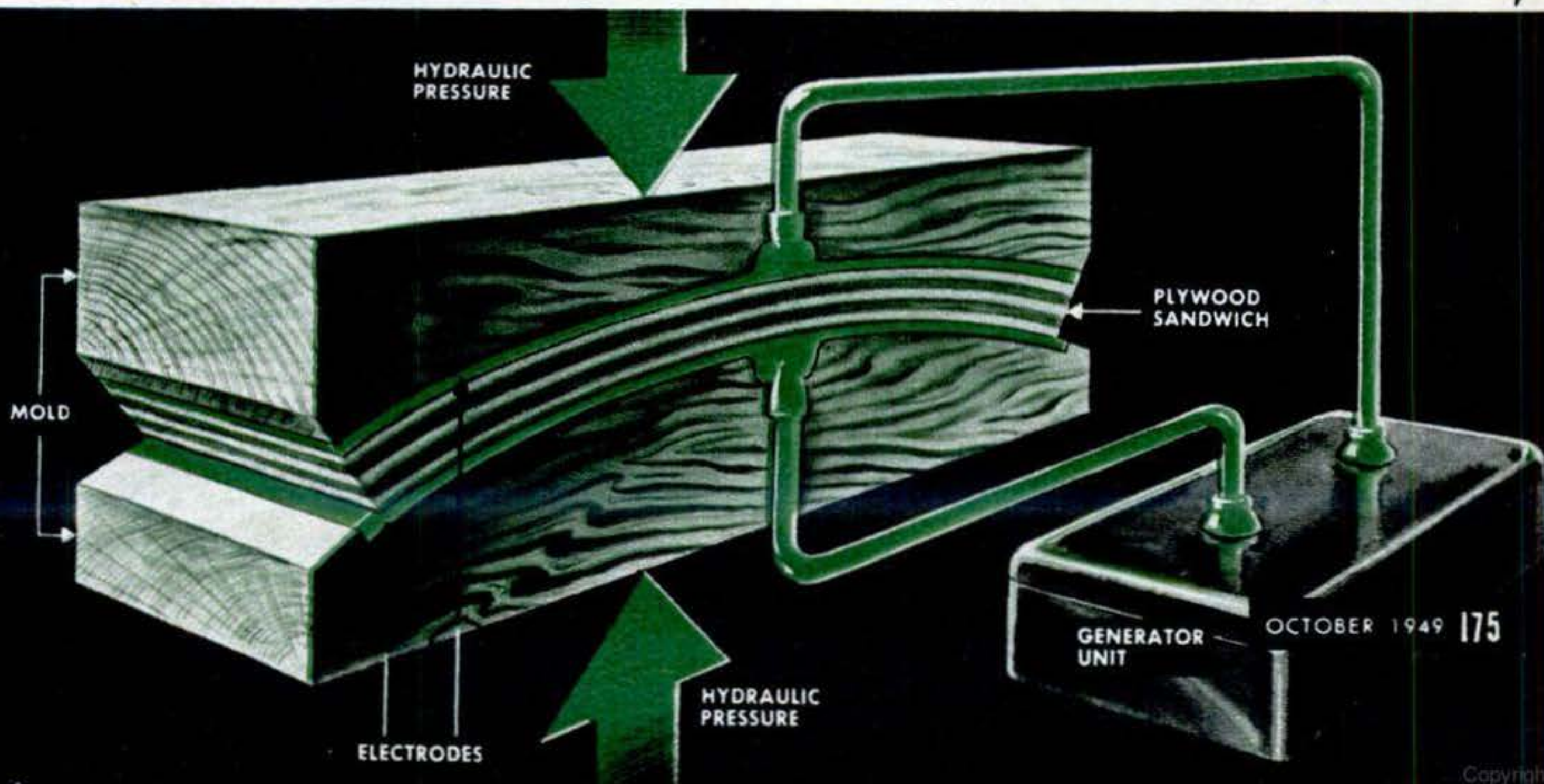
Double-roller spreaders apply glue, a special phenolic-resin type, to veneer sheets after they have been cut to size by rotary cutter. Narrow strip above will form part of door-frame pillar.



Loosely stacked, glued "sandwich" of veneer sheets for door-frame pillar now goes to forming mold. Pressure of 350 to 375 lb. per sq. in. will be applied hydraulically from above and below.

Drawing below shows how two halves of heavy mold squeeze plywood sandwich between them under hydraulic pressure while high-frequency

radio waves are shot in to cure glue. Copper electrodes, connected to wave generator, run along top and bottom of mold next to wood. ▶

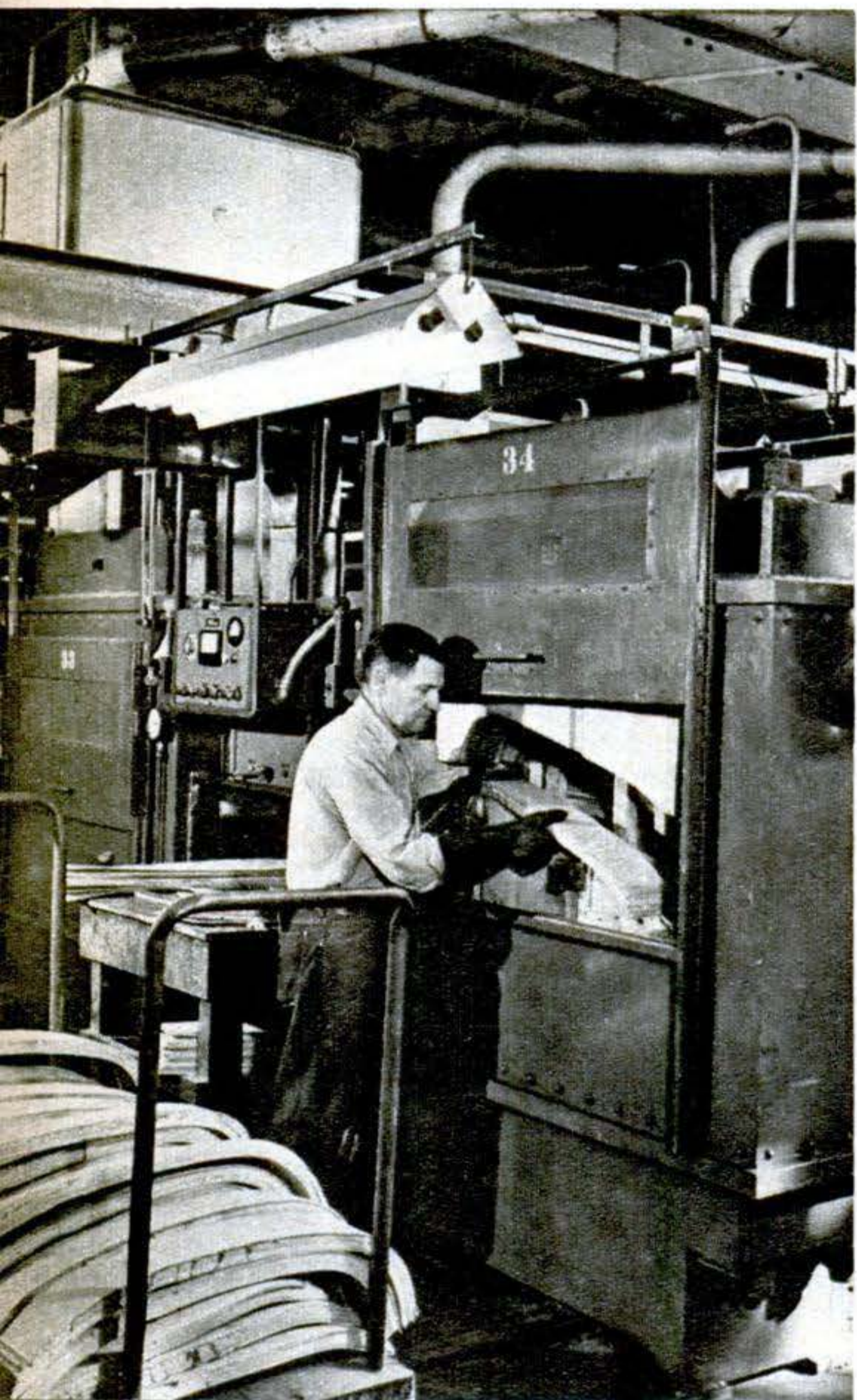




Here workman removes guides around mold before applying current. He will then pull down copper shield, enclosing mold, to prevent harmful radiation. Molds are made of wood to provide good insulation against loss of heat and energy.



Close-up of plywood sandwich shows how excess glue has bubbled out along edge during heat-and-pressure process. Glue is cured in 4 to 5 minutes, but panels remain in molds an additional 3 to 5 minutes under pressure but not heat.



Finished door-frame pillar is removed from press, permanently glued and shaped. Ford now has 18 of these 75-ton-capacity presses. At top left are power and oscillator sections of Thermex® dielectric heating unit. Timer automatically shuts off power in hydraulic press at end of heat cycle.



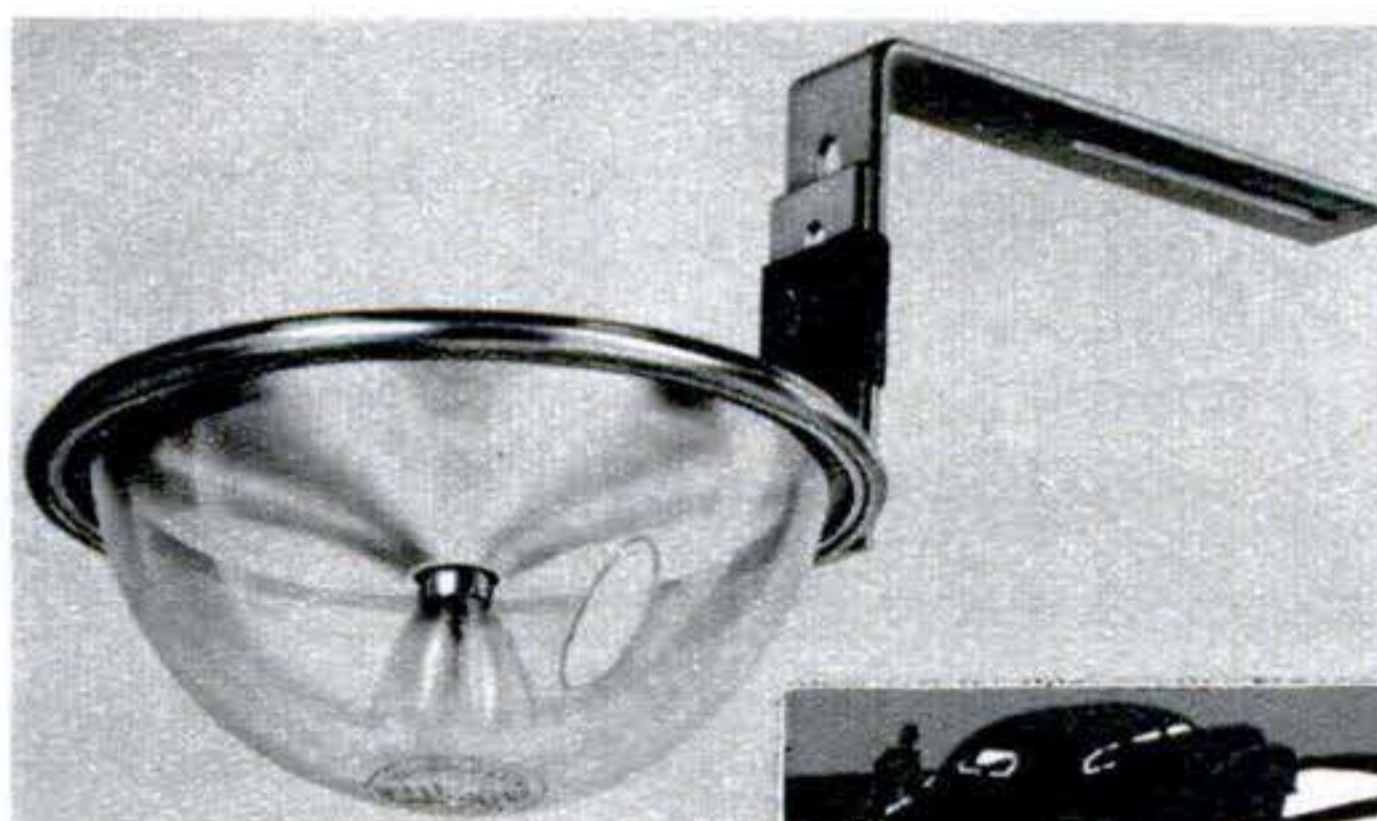
Plywood panels are bolted directly onto outside of all-steel underframe to form station-wagon body. Panels are so attached that individual sections can be removed and replaced if damaged. Phenolic-resin glue in panels makes moisture-resistant bond that's stronger than wood itself.

Transit Measures New Cars

EXACTLY how long is a new car? How high and how wide? What's the leg, head, and hip room inside? The road clearance?

To determine these and other dimensions of Ford and competitive cars, Ford engineers use surveyor's transits, a height-gauge manometer, levels, and other instruments. Results are accurate to a fraction of an inch.

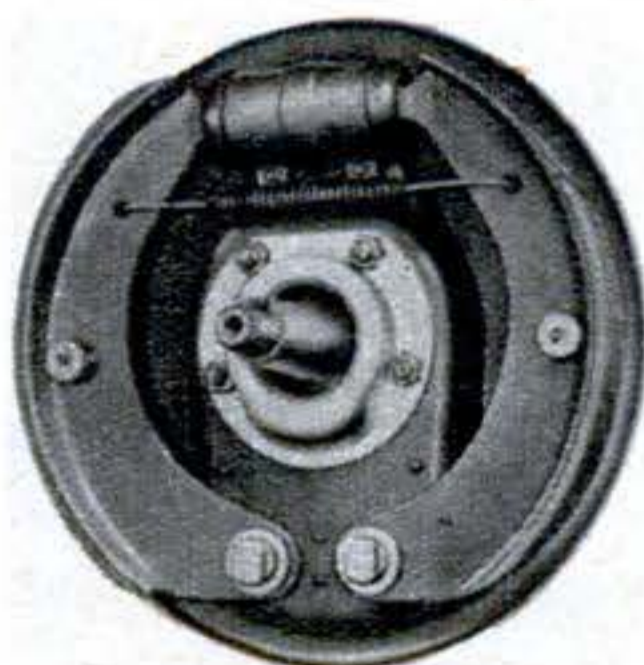
The work is done on a steel floor that can be levelled to hairline precision. Transits slide along a railing at one side and one end of the floor. Used as seen in the photo at right, these yield length and width measurements. The manometer, a liquid level device, gives most of the vertical figures.



Lamp Bolted Under Auto

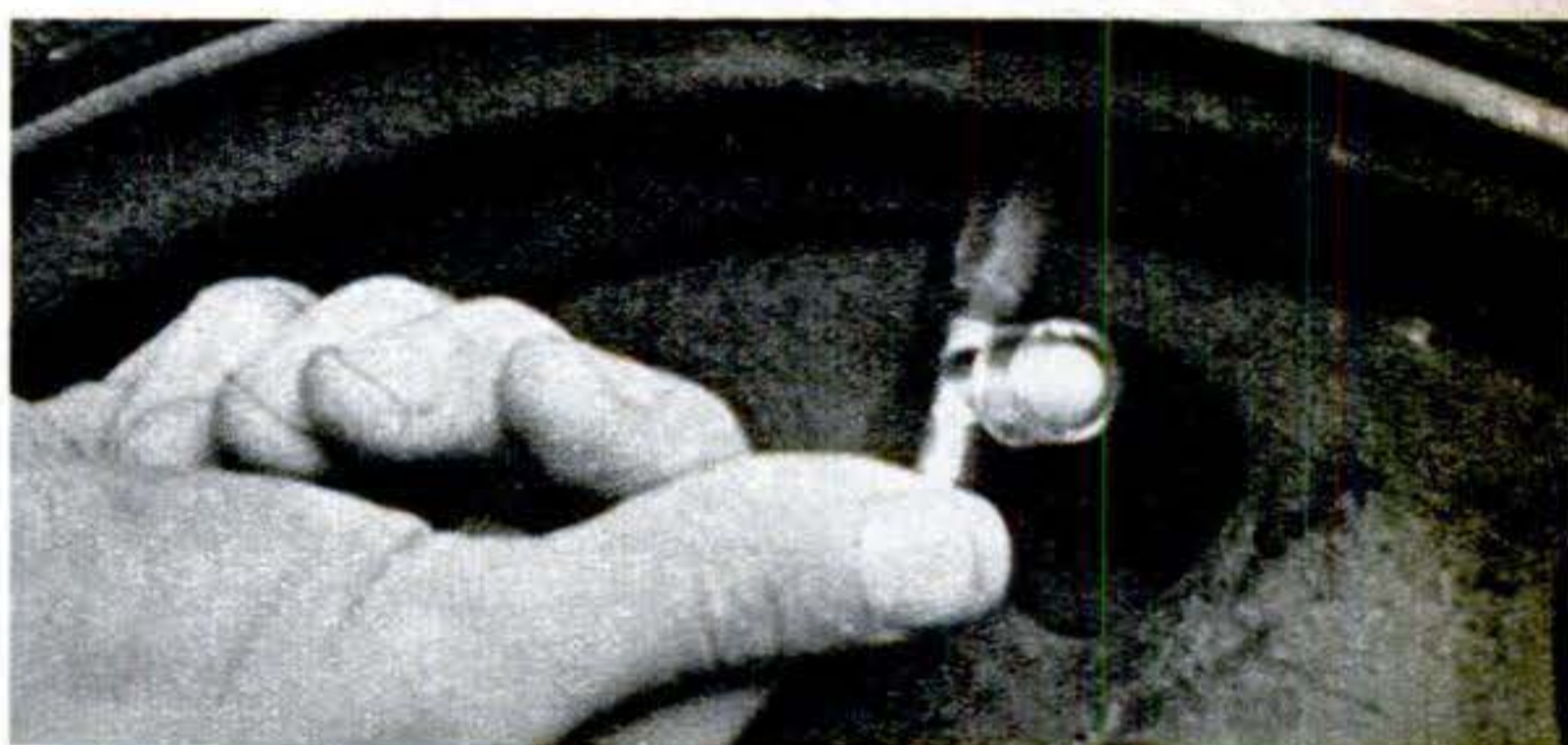
THE Wix-Lite®, bolted to the underside of a car frame, throws a 40' circle of light. Made by Wix Accessories Corp., of Gastonia, N. C., it provides illumination for passing, fog driving, entering and leaving a car, tire changing, and backing. It can be installed on tractors for night work. The lens is shock-resistant plastic. Price is about \$9.

Retainer By-Passes Grease



LEAKAGE of excess grease into rear brake drums is said to be eliminated by use of the Thomas By-Pass Grease Retainer® made by South Gate Brake Specialities, South Gate, Calif. This re-

tainer by-passes excess grease to the outside instead of letting it go through the retainer. The backing plate's bottom bolt is left out and grease passes out through the hole. A felt retainer wipes the hub free of grease that's passed to the outside.



Pressure Gauge Kept on Tire

PERMANENT gauges made by K. Emsley, Ltd., Bradford, England, guard against underinflation. They work at predetermined pressures. To check, you press a plunger. Unless a bubble appears in a plastic dome, air is low. It's added with the gauge on.

Stethoscope for Mechanics

A STETHOSCOPE-LIKE device, adopted by the Studebaker Corp., probes an engine's innards in much the same way a physician listens to your heartbeat. A metal rod leads to an amplifying diaphragm encased in a plastic housing. Sound, boosted by the diaphragm, travels up to the hearing ends in the mechanic's ears. Outside noises are shut out.



Gus Prescribes

By Martin Bunn

YOUNG Dr. Rhodes, fresh from his internship, has been in our town only a few months. The going hasn't been easy. He finally found a little office and then sweated it out for a couple more weeks while waiting for office equipment. Add to this an old sedan with a chirp that was a cross between an anemic canary and a peanut roaster, and you'll see why Doc was ready to visit a doctor himself.

The older, established physicians were feeding Doc a lot of their night calls. That's why he bought the car. He'd only had it a short time when that high-pitched chirp developed. The birdie only sang when the engine idled or when the car was moving slowly in high.

The squeak while idling was worst. That usually took place at an intersection when he was waiting for a light. Doc, hoping the noise would go away, tried to ignore it.

But the afternoon he stopped at an intersection near the high school—that did it. Mandy Manville was riding with Doc. She's about the prettiest music teacher our high school ever saw and Doc was seeing her regularly, picking her up after classes nearly every day. The squeak started as usual when he pulled up to wait for a red light.

"Listen to the birdie," jeered one of a group of students waiting for a bus.

"Somebody gave him the bird and he kept it," said another. This brought laughs from the boys and giggles from the girls.

"Maybe we could get him to bring it to our singing class," said the first student. "It might be some kind of rare canary."

With a very red face, Doc drove away from the intersection. He shot a sidelong glance at Mandy. She was looking at him.

"Doctor Rhodes," she began with mock seriousness, "that bird has got to go—if I have to shoot it myself."

"I know," he said. "Maybe it will just go away. It just came, you know."

"It sounds as if it has moved in perma-

nently," she said. "I think it likes you a lot."

"I'll put salt on its tail," he told her.

"John," Mandy said, "I'm serious. You heard those students back there."

"I did," he replied. "They sounded like uncouth brats. Any of them in your classes?"

"Yes, and they really aren't uncouth brats. They're just at that age when they think everything is a wisecrack. They don't mean to be cruel—just to be funny."

"It didn't sound funny to me," Doc said.

"I think," he told the doctor,

"that you've got the cure for this right there in your black bag."



for the Doctor

Mechanics who handed out a free diagnosis and then prescribed the wrong remedies were getting the doctor down, especially when they charged him for operations he didn't need.



- RAY QUIGLEY -

OCTOBER 1949 179

"Nor to me. It's not the first time," she went on. "The other day I overheard one of them referring to you as Doctor Squeaky. That's not very good for a young doctor just getting his start."

Doc's face reddened again. "All right," he agreed. "I'll take it to a garage as soon as I drop you off. I'll pick you up this evening for the movies."

"I hope you really have it fixed," she said. "I'm not so sure I want to go to the movies in this car if that bird hasn't been shooed."

"If nothing else," Doc grinned, "I'll personally wring its neck. No bird—especially one with a voice like that—is going to come between us and the movies."

After leaving Mandy at her home, Doc pulled in the first garage he saw. A mechanic, wiping his hands on a wad of waste, walked from the rear of the shop.

"Listen to that squeak," Doc told him.

"I hear it," said the mechanic. He raised the hood and listened for half a minute. "It's the water pump. Maybe a shot of grease will fix it, but you probably need a new pump."

"Try grease," Doc suggested.

The mechanic gave it the grease but the chirping went right on.

Tries New Pump

"I guess it didn't need grease," the mechanic said sadly, staring at the engine.

"What's a new pump cost?" Doc asked.

"It'll be \$8.49, including labor."

"Okay," Doc sighed, "put on a new pump." While the mechanic worked, Doc stood around and watched.

"All right, start 'er up," the mechanic said at last.

Doc started the engine and the squeak started too. Doc looked at the mechanic. The mechanic shrugged his shoulders.

"I thought you said it was the water pump," Doc accused. "Or do all the new water pumps come complete with squeaks?"

"I guess I was wrong," the mechanic admitted, "but you needed a new pump anyway. The old one was about shot. Wouldn't have lasted through the winter."

Doing a slow burn, Doc paid his bill and drove away with his chirp. Several blocks away he saw another garage. He was determined to get rid of the squeak. It had gotten to be a sort of personal thing now, as if the car were heckling him. He drove into the second garage.

"Ah, a birdie," said a mechanic as Doc let the motor idle.

"Yes," Doc said grimly, "a birdie—a squeak—a chirp—but what is it?"

"What you need, mister," said the mechanic, "is a new water pump."

"I do?" Doc raised his eyebrows.

"Yes," the man repeated, "a new pump. The bearing's shot on that one. No use trying to fix it. Cost more than a new one."

Another New Pump?

"You make up your mind in a hurry, don't you?" Doc asked.

"Well, I got ears," he answered. He raised the hood and turned to Doc in surprise.

"I had that pump put on less than an hour ago," Doc told him. "Guess again."

"If it's not the pump, it must be the fan," the man said. "Ever try lubricating it?"

"No," Doc snapped. "You try."

The mechanic oiled the fan bearing but the chirp didn't stop.

"Now what is it?" Doc asked.

"It must be the fan belt," the mechanic said. "Watch this." He squirted powdered graphite on the belt. The birdie continued. He squirted more graphite. The squeak went on and the fan belt began to slip.

"Got any more suggestions?" Doc asked.

"Yeah," said the mechanic. "You need a new fan belt."

"How much?"

"Dollar seventy-five."

"Put it on," Doc told him.

It was the same story when the new belt was installed and the engine started. Doc's birdie was still on active duty.

"Can you think of anything else?" Doc asked. "Would you like to put in a new engine?"

"Well, I'll tell you. Maybe . . ."

"No," Doc said firmly. "I'll tell you and without a maybe. I've had enough." He paid the bill, slammed the car in gear, and roared out of the garage.

A few blocks away, he saw Mandy. She was leaving a grocery store. Doc and the squeak pulled up to the curb.

"Hear you still have that rare bird," Mandy said.

"I've been to two garages," Doc replied, opening the door for her. "Get in. I'll drive you and the groceries home."

"Did you try the Model Garage?" she asked.

"No," he answered, "but the two I did try didn't have the cure. The diagnosis is free but you pay for the remedy, even if it's the wrong remedy."



"You sound like a doctor's patient," she laughed. "Try the Model Garage. Father swears by Gus Wilson."

"The way I feel now," Doc told her, "there isn't a mechanic in town I wouldn't swear at."

"Go on," Mandy urged. "Try the Model Garage. Remember, I'm still debating whether I want to go to the movies if that nasty little bird tags along." She was smiling as he left her at her home.

When Doc drove into the Model Garage shop, Stan Hicks was checking the water in the batteries on the charge rack. He looked up and grinned.

Doc Himself Has the Cure

"Don't tell me what's wrong," Stan said. "You need a new water pump."

"Look," Doc began, fast running out of temper. "I'm going to tell you. I don't need a new pump. The fan bearing doesn't need greasing. I don't need a new fan belt. But what I do need is a mechanic who has enough brains to stop that chirp instead of sticking me with a lot of new parts I don't need."

"Now wait a minute," Stan said, taken aback by the outburst. "You're that new doctor—Doctor Rhodes, aren't you?"

"That's right," Doc snapped, "but what's that got to do with this squeak?"

"When patients come to you, do you tell them what's wrong, or do they tell you?" Stan asked.

"What goes on?" Gus asked, stepping over from his bench.

Dr. Rhodes told him about the other two garages, what they did, and how much the tariff had been. Gus listened patiently until Doc had finished.

"Just selling parts isn't our business," Gus said. "We correct what's wrong or it's no sale."

"You're the first one I've heard say that," Doc grinned.

"All right," Gus said, "start the engine." He listened a moment and then added: "It's a fact that a chirp like that very often is the fan or pump. But I'm glad to know it's neither

in this case. Simplifies the job of diagnosis."

Gus listened to the squeak as the engine idled. He decided the sound wasn't coming from the front of the engine—by the pump or fan—but farther back.

"It might be the fuel pump," Gus said, "but it might be here. Cut the ignition."

Gus snapped off the distributor cap and then turned to the doctor.

"I think," he told Doc, "that you've got the cure for this squeak right there in your little black bag."

"What do you mean?" Doc reached for his bag on the front seat.

"Got a tube of petroleum jelly?"

The doctor opened his bag and handed Gus the tube. Gus pulled off the distributor rotor and dabbed a thin film of the jelly on the cam. He replaced the rotor and snapped the cap back in place.

"Start the engine," Gus said.

This time, when the engine idled, there was no squeak.

"That's wonderful!" Doc grinned.

"I wouldn't say so," Gus chuckled. He cut the ignition and removed the cap again. "See that little fiber block on the breaker arm that bears against the cam? When the cam's bone dry, the block makes a chirping sound at low speeds. When the engine revs up, the cam spins too fast to let it chirp. Not a good idea to oil it. Spinning around, it might throw oil around inside the distributor and foul the points."

"It still seems wonderful to me," Doc said. "The way you located it so quickly. How much do I owe you?"

"The way I figure it," Gus grinned, "your petroleum jelly plus half a minute of my time add up to nothing at all."

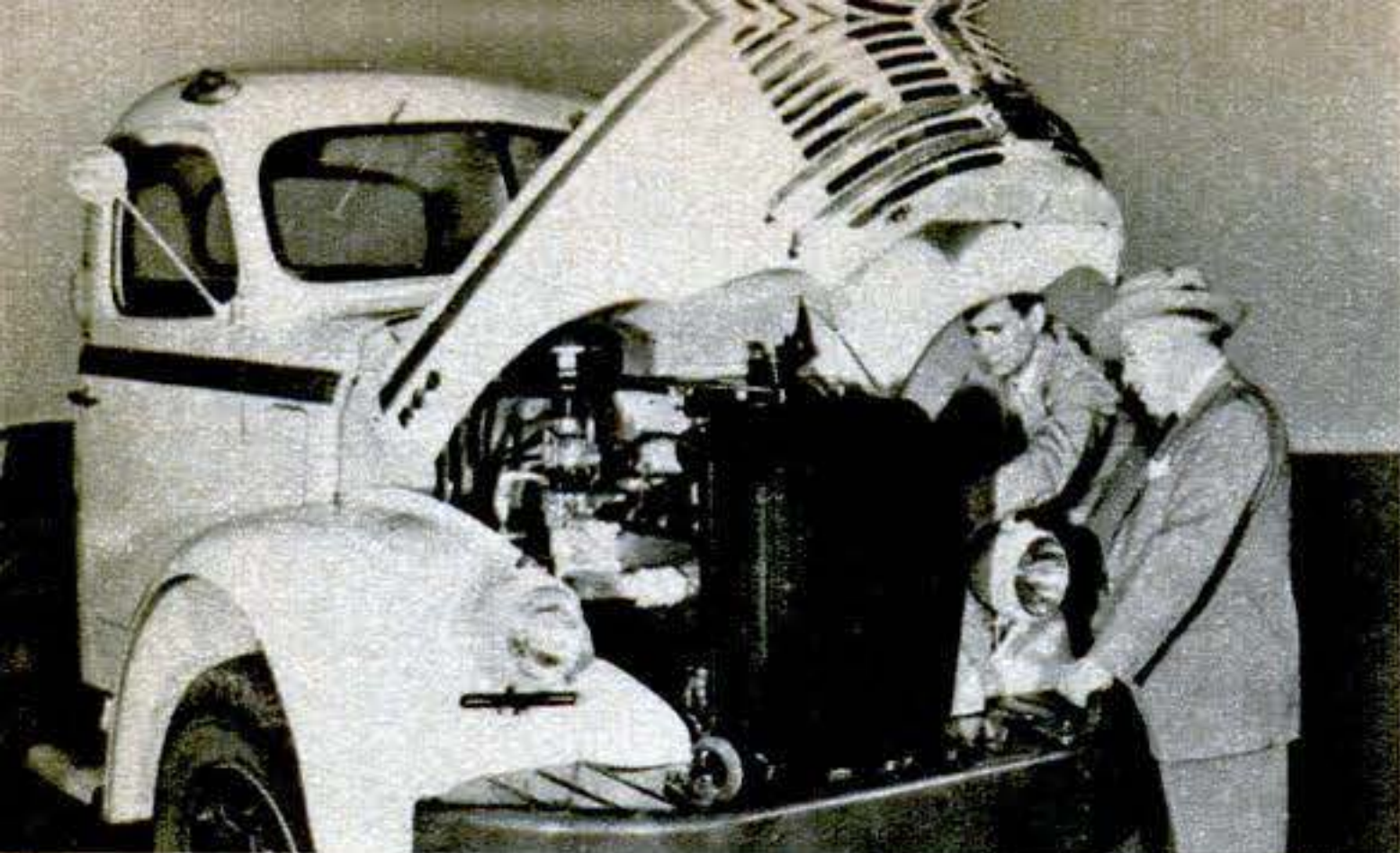
Doc grinned back. "Thanks a lot. You may not know it, but I think you've just made a lifetime customer."

"That's the kind we're always looking for," Gus told him.

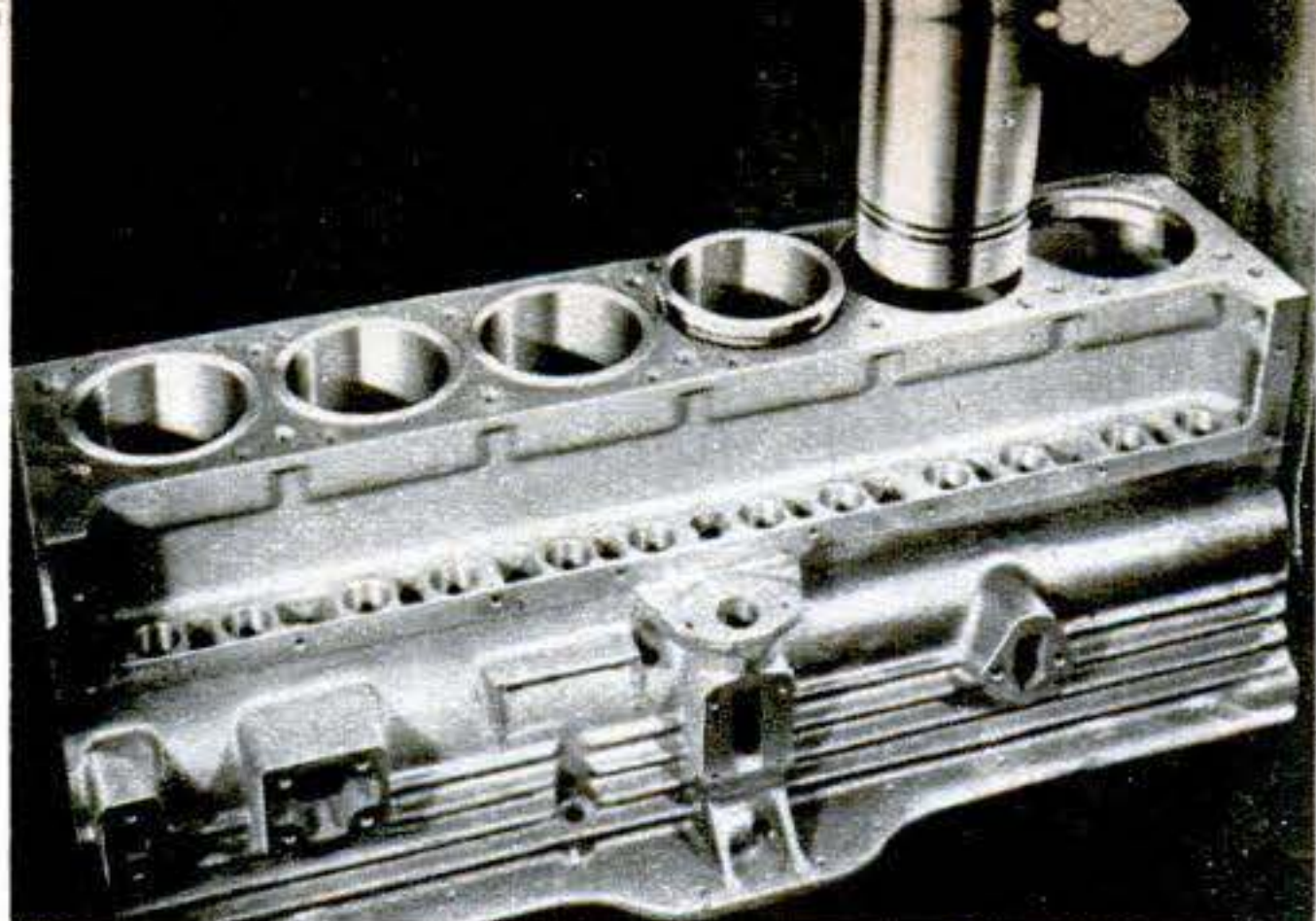
As Doc drove out of the garage, Stan turned to Gus. "I sure got off on the wrong foot with that guy," he said.

"So I noticed," Gus answered. "You know, Stan, a good garageman is like a good doctor. One of the most valuable things he offers his customers is a listening ear. Talking about their car troubles makes the folks who foot the bills feel a little better. And sometimes, listening to them saves a mechanic from pulling a boner."

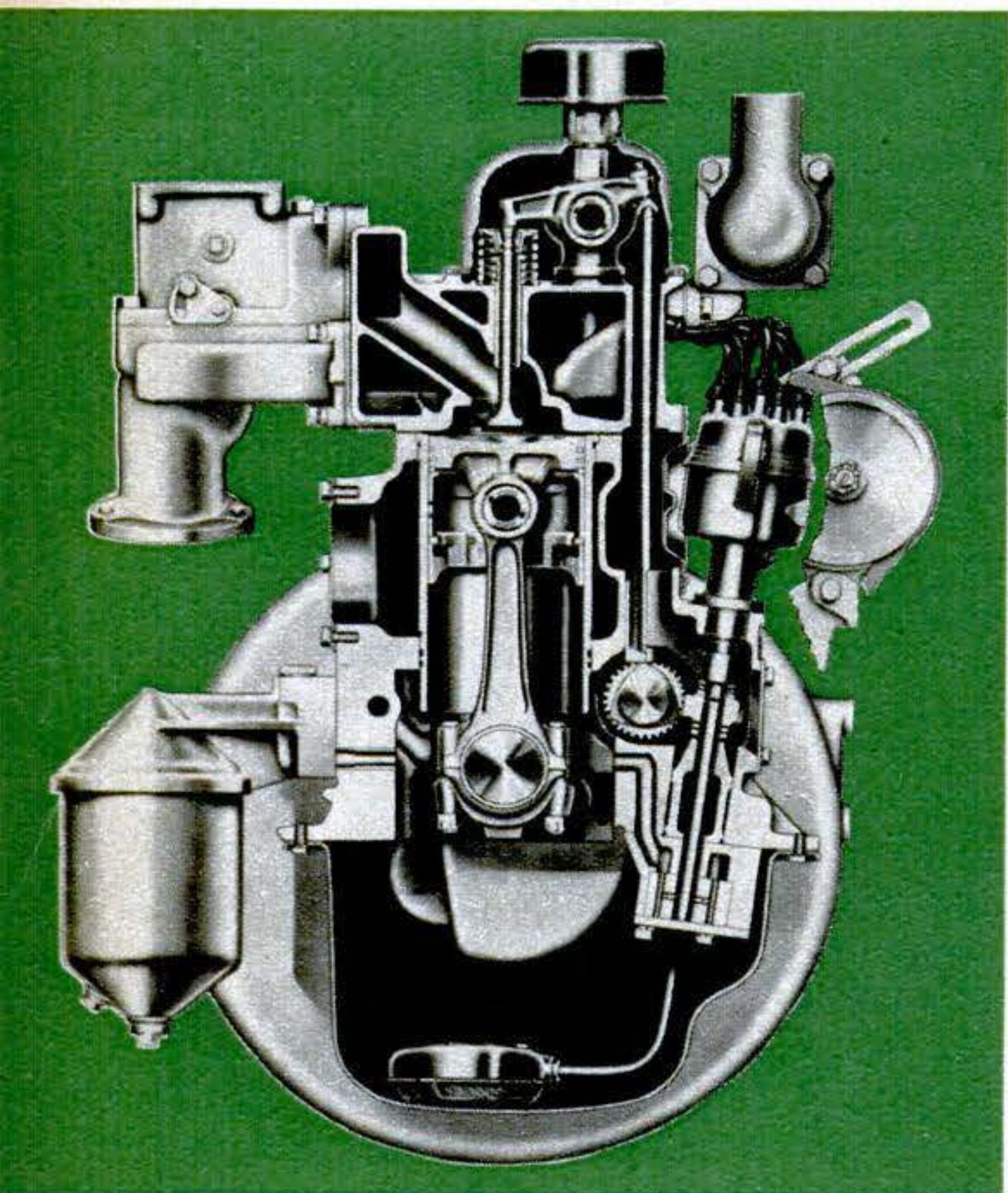
"From now on," Stan said, "I'm known around here as The Ear." END



Hood swings up from the bumper line on Reo's new trucks to make engine more accessible. Engine has 6 cylinders and overhead valves.



Cylinder sleeves are easily replaced without special tools. An overlapping block gasket and rubber seals at bottom keep them watertight.



Cross section of new Reo engine shows how the sleeves fit in the block. The intake manifold is cast as a unit with the cylinder head.

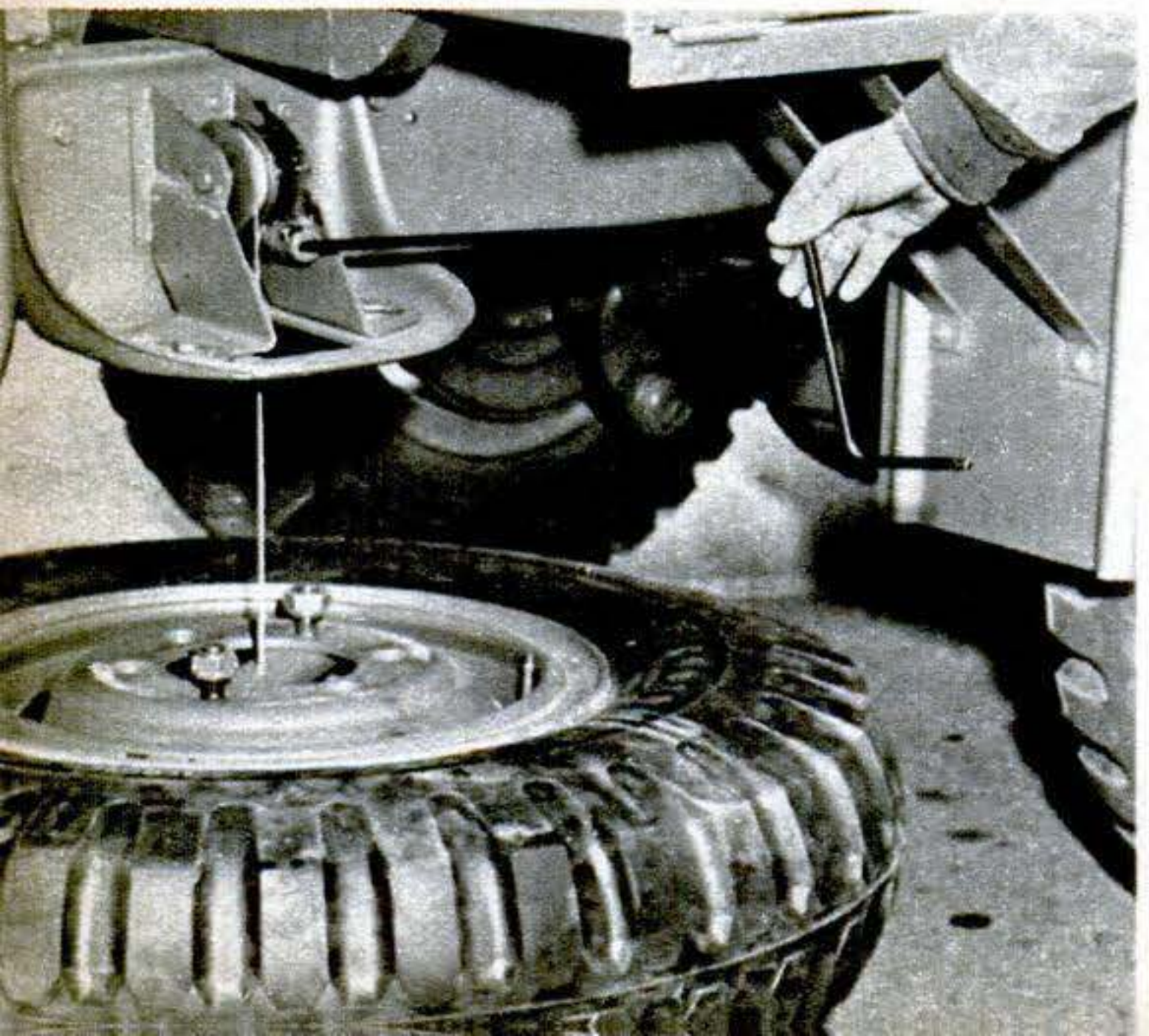
Reo Adopts Removable Cylinder Sleeves

RENEWABLE cylinder sleeves of the "wet" type are used in a new heavy-duty gasoline engine engineered by Reo Motors, Inc., for its big trailer trucks. This means that cooling water comes in direct contact with the outer surface of the sleeves.

Adoption of a cylinder of this type offers truckers two advantages. When an overhaul is due, sleeve and piston assemblies can be replaced, producing what amounts to a new engine. While the engine is in operation, the cooling water can do a better job of heat removal because the sleeves are of uniform thickness. In contrast, conventional solid engine blocks have uneven surfaces on the water-jacket side of the cylinder wall.

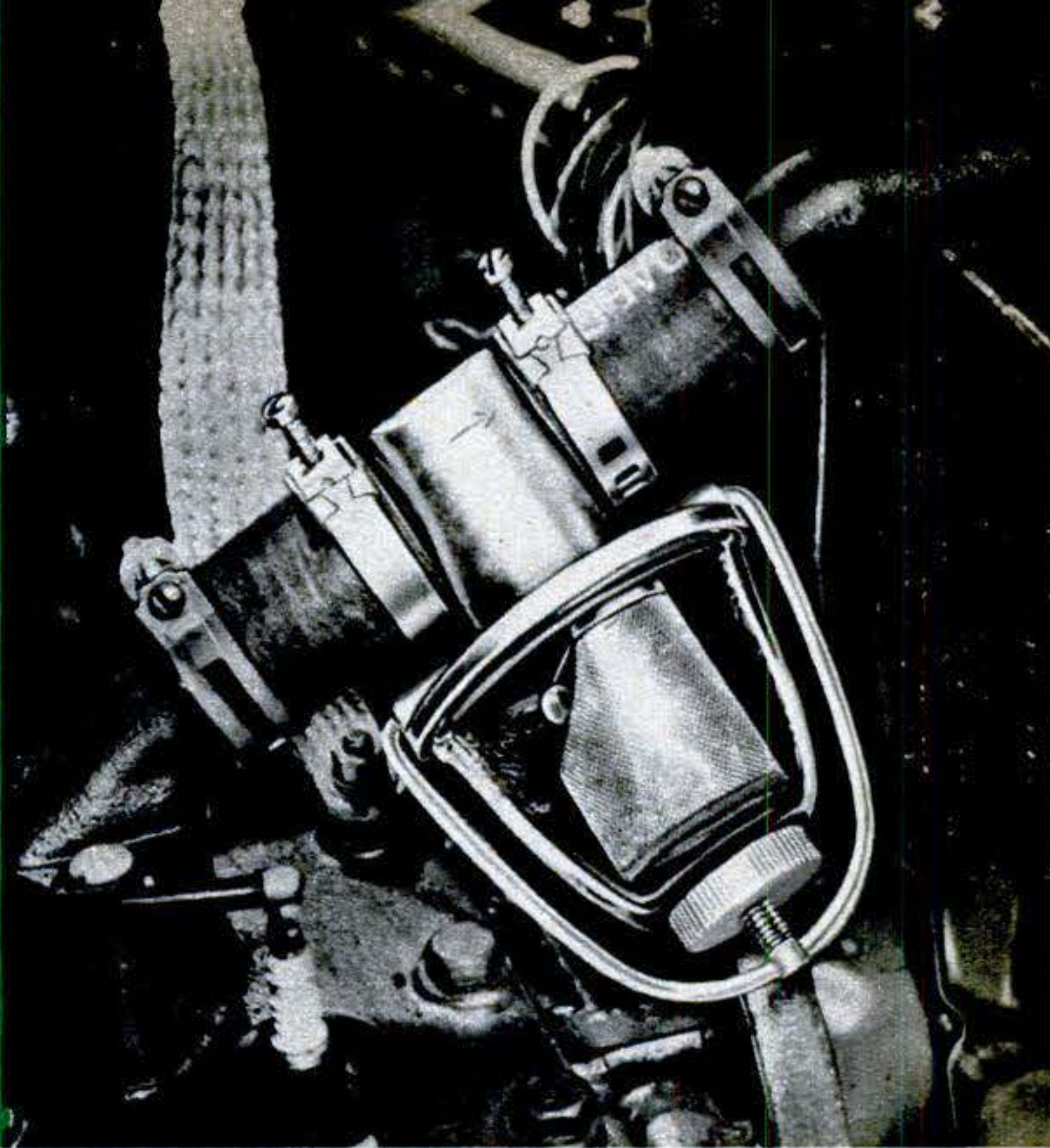
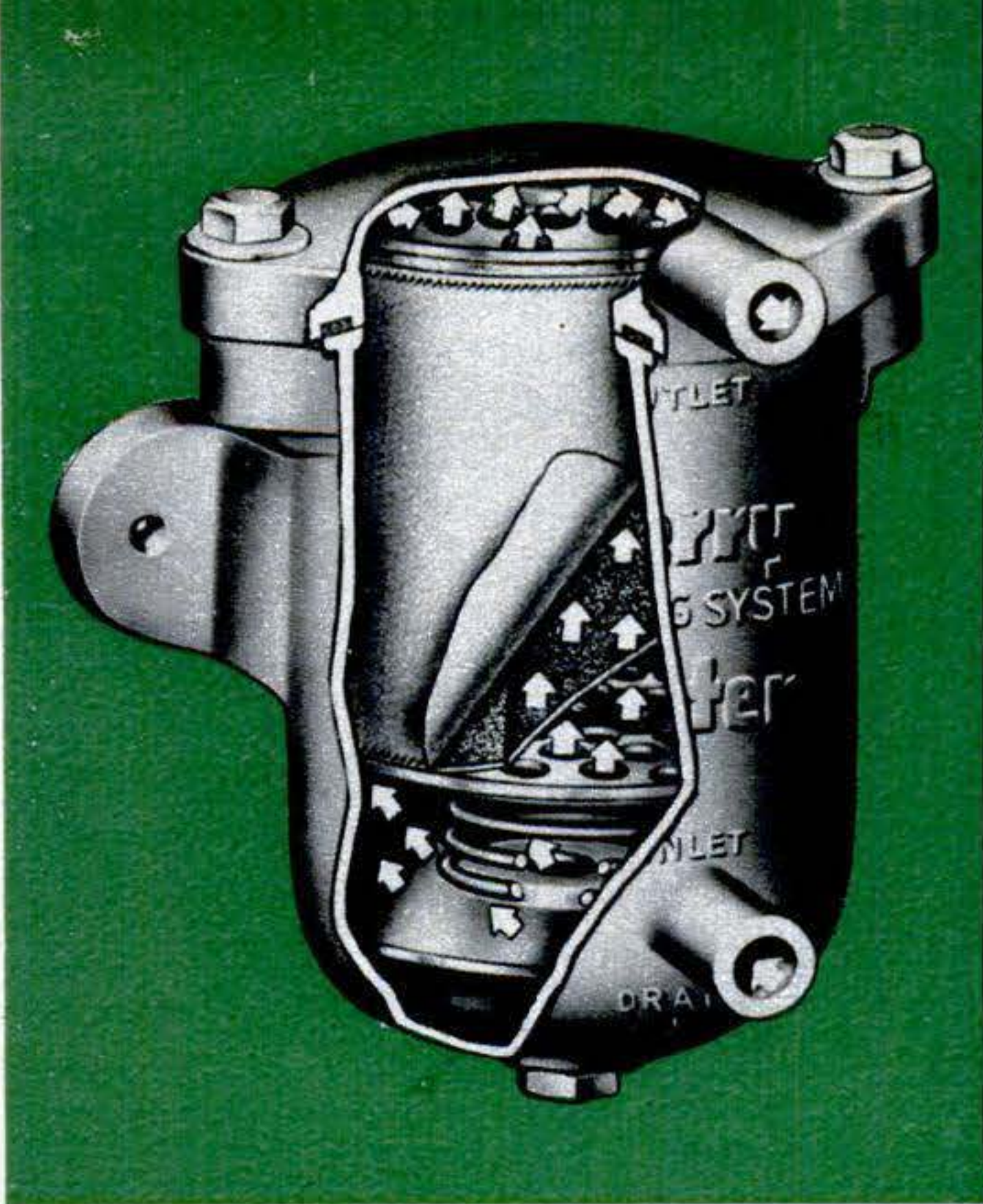
Called the Gold Comet®, the 331-cu. in. engine develops 140 hp. at 3,200 r.p.m. The engine is "square"—that is, the bore and stroke are equal, both 4½".

Hoist Enables One Man to Handle 225-lb. Spare



THIS spare-wheel hoist is located under the frame of a new 2½-ton military truck that Studebaker has submitted to the Government for trial. Operated by a removable crank, the hoist permits one man to raise the 225-lb. wheel and tire into position for mounting on the carrier.

The new truck has six-wheel drive. An undergeared front axle, coupled with a free-wheeling clutch, automatically controls the six-wheel drive on soft or wet ground. All axles are double reduction, with a straight-line drive from three propeller shafts.



Perry Cooling System Filter, left, and the Mota Gard, right, remove sludge and other foreign

matter from cooling systems, preventing overheating that can lead to expensive repair bills.

Filters Clean Radiator Coolant

MUCH of the trouble caused by engine overheating can be eliminated with one of these new filters in the cooling system. The Perry Cooling System Filter®, made by Spark-O-Liner Corp., Minneapolis, contains a chemically activated element that softens and

cleans the water. Vulcan Mfg. Co., Inc., Winona, Minn., makes the Mota Gard® that removes sludge, grease, and scale. When Mota Gard is filled, a bypass automatically opens—signaled by a red ball in the filter—to let the water continue to circulate.

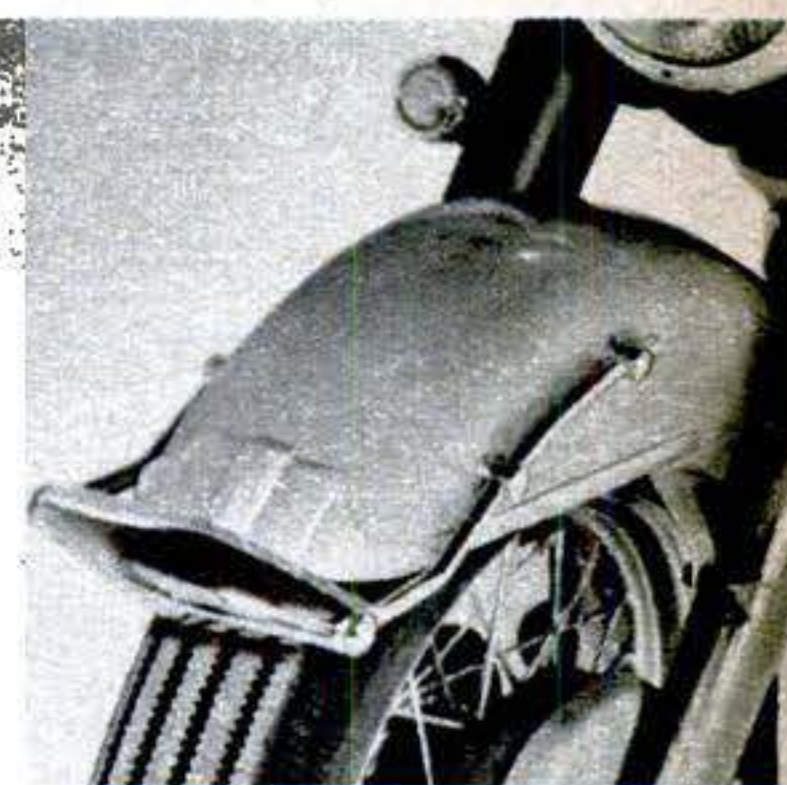
Jack Made of Cast Aluminum



THIS transmission jack for repair shops, made by Accurate Parts Mfg. Co., Cleveland, is of cast aluminum with a threaded steel spindle. It weighs 7½ lb. and has a lifting capacity of 500 lb. The overall lift is 7" from a low limit of 13¾". It's mounted on rubber-tired wheels.

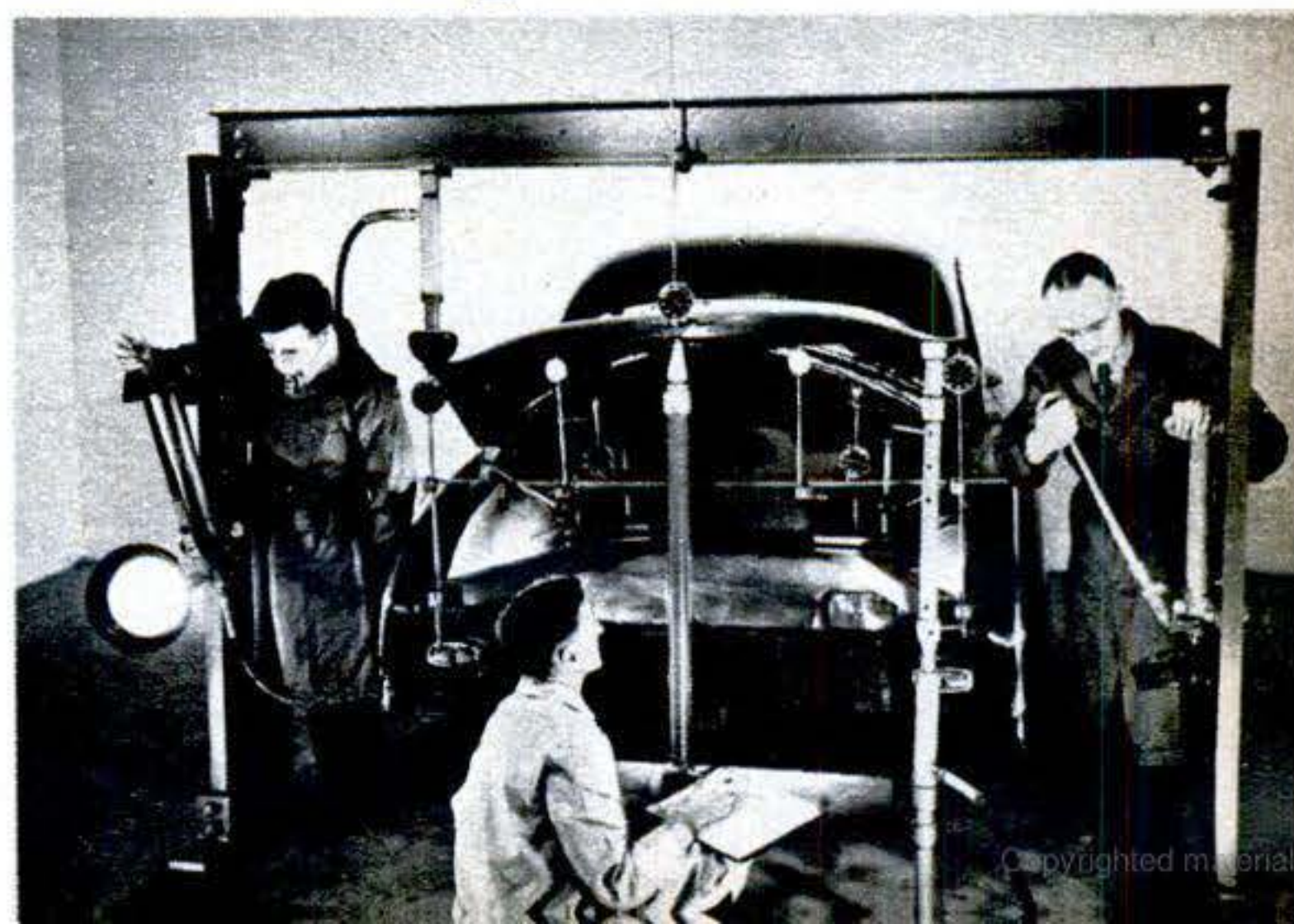
Bumper for Motorcycles

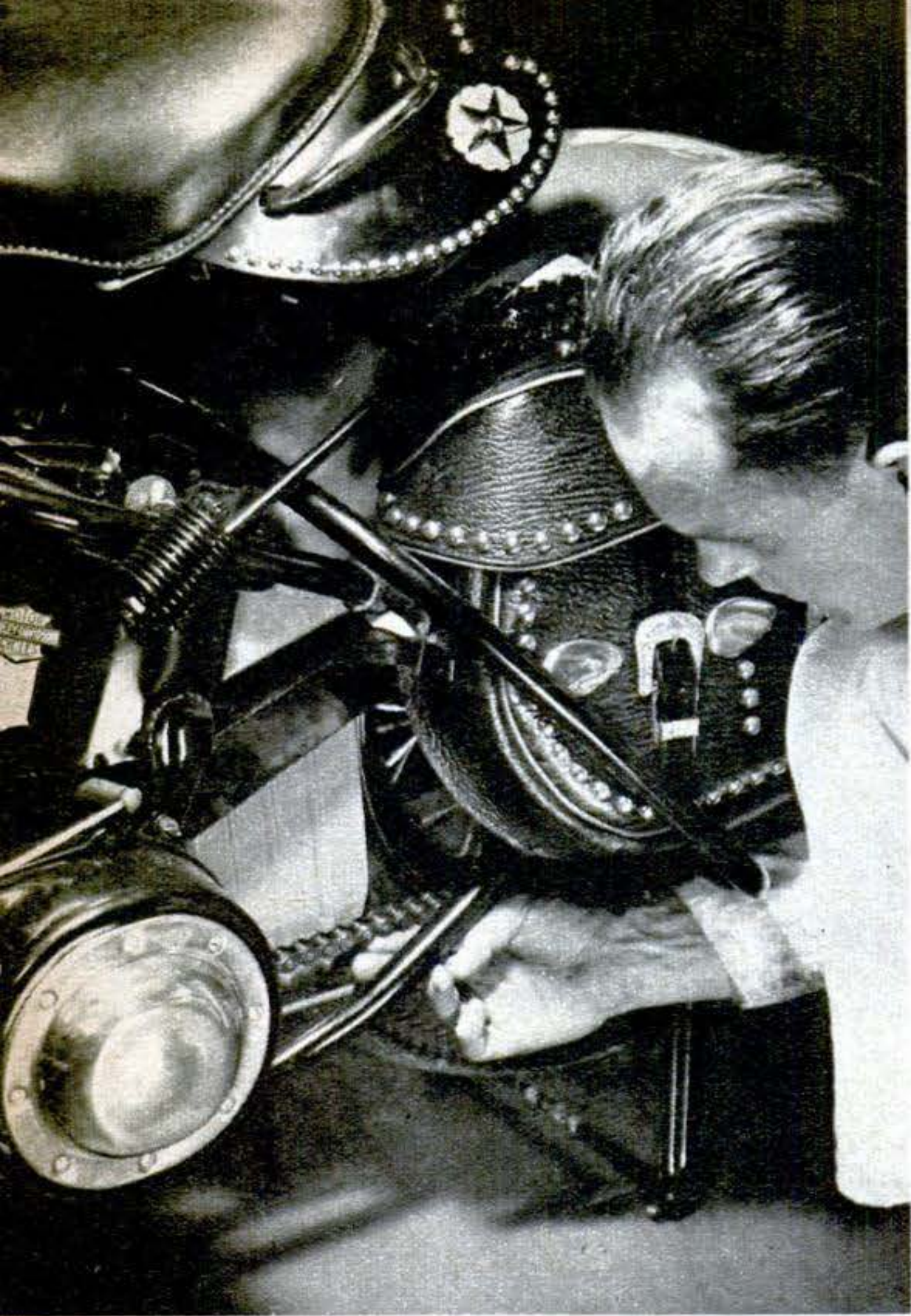
MANUFACTURED by Harley-Davidson Motor Company, of Milwaukee, Wisconsin, a chrome-plated steel front bumper for motorcycles combines utilitarian value with a decorative, streamlined appearance.



Theftproofing Tests Given Rear Compartments

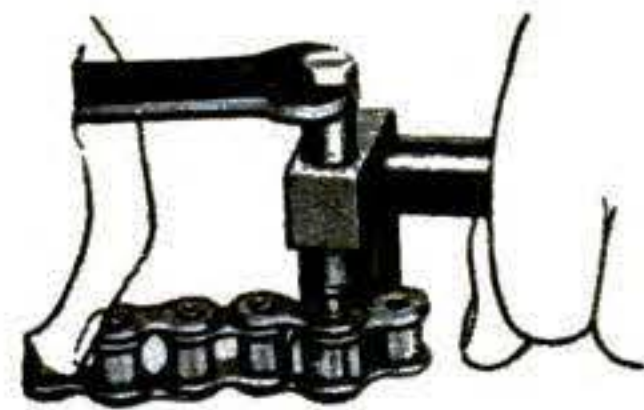
ENGINEERS of the Fisher Body Division, General Motors Corp., in attempts to make the rear compartments of their new models as theftproof as is practical, are using a series of jacks and gauges in stress tests. In the photo at right, the jack on the left pushes down, the one in the center is stationary, and the one on the right pushes up. Gauges are used to measure the amount of deflection of the lid under various pressures.





Motorcycle Drive Chains Need Exact Adjustment

DRIVE chains on motorcycles shouldn't be so loose that they slap other parts, nor so tight as to have no free play. There is no better



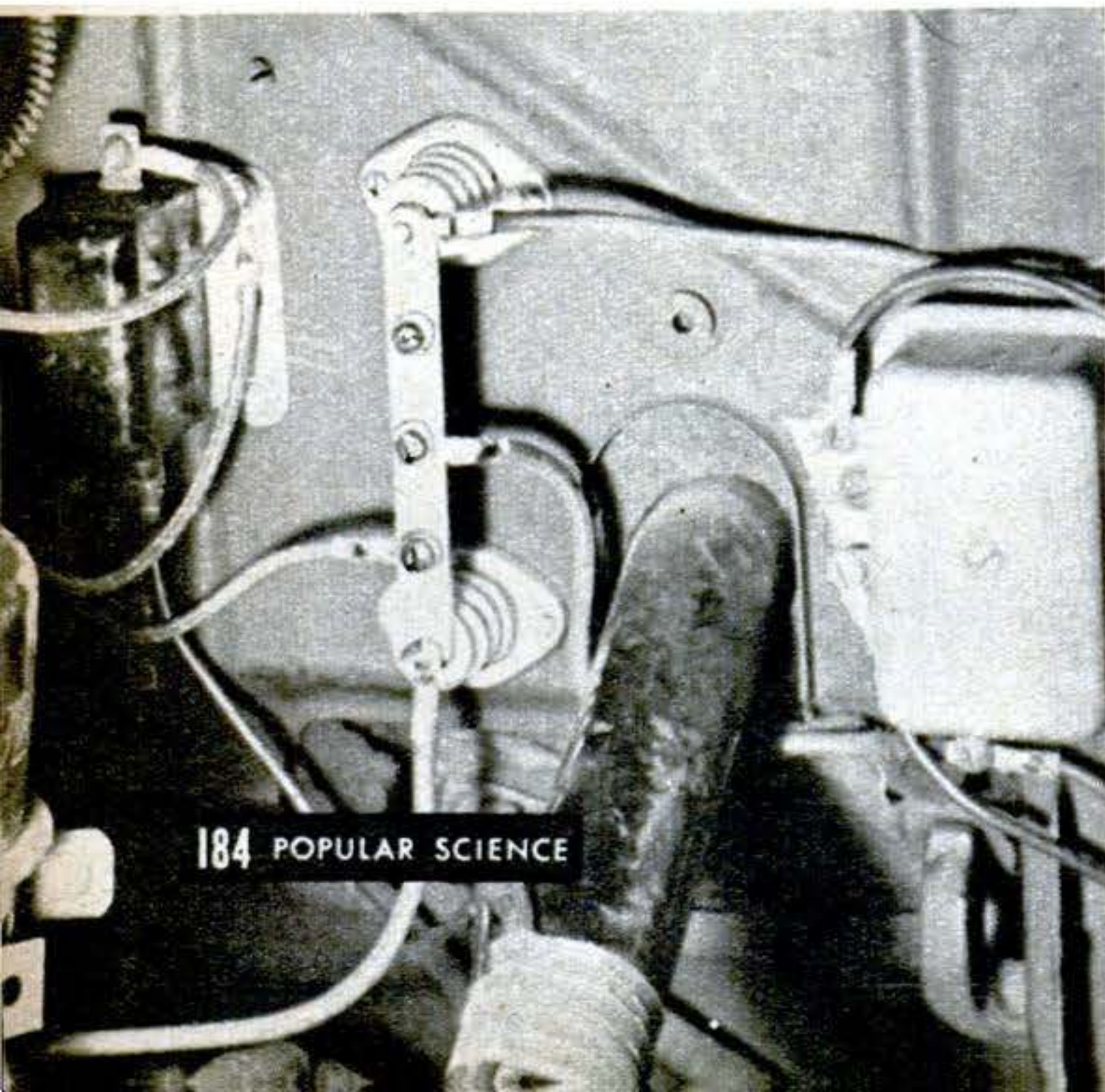
way of inviting a broken chain on the road. In adjusting a chain, first turn the wheel to find the tight spot (used chains almost always run tighter at one point on the sprocket). At this setting, adjust to leave about $\frac{1}{2}$ " up and down movement midway between the sprockets, as at left.

It's a good idea to inspect the chain once a week and make any required adjustment or repair. A damaged link can be replaced with the chain-repair tool seen above.

Remove the chain occasionally, soak and wash it in kerosene, and hang up to allow the kerosene to drain off. Then swish it around in a pan of light engine oil, or grease heated to that consistency, until the lubricant has worked into all inside parts. Wipe off excess oil and allow to drain.

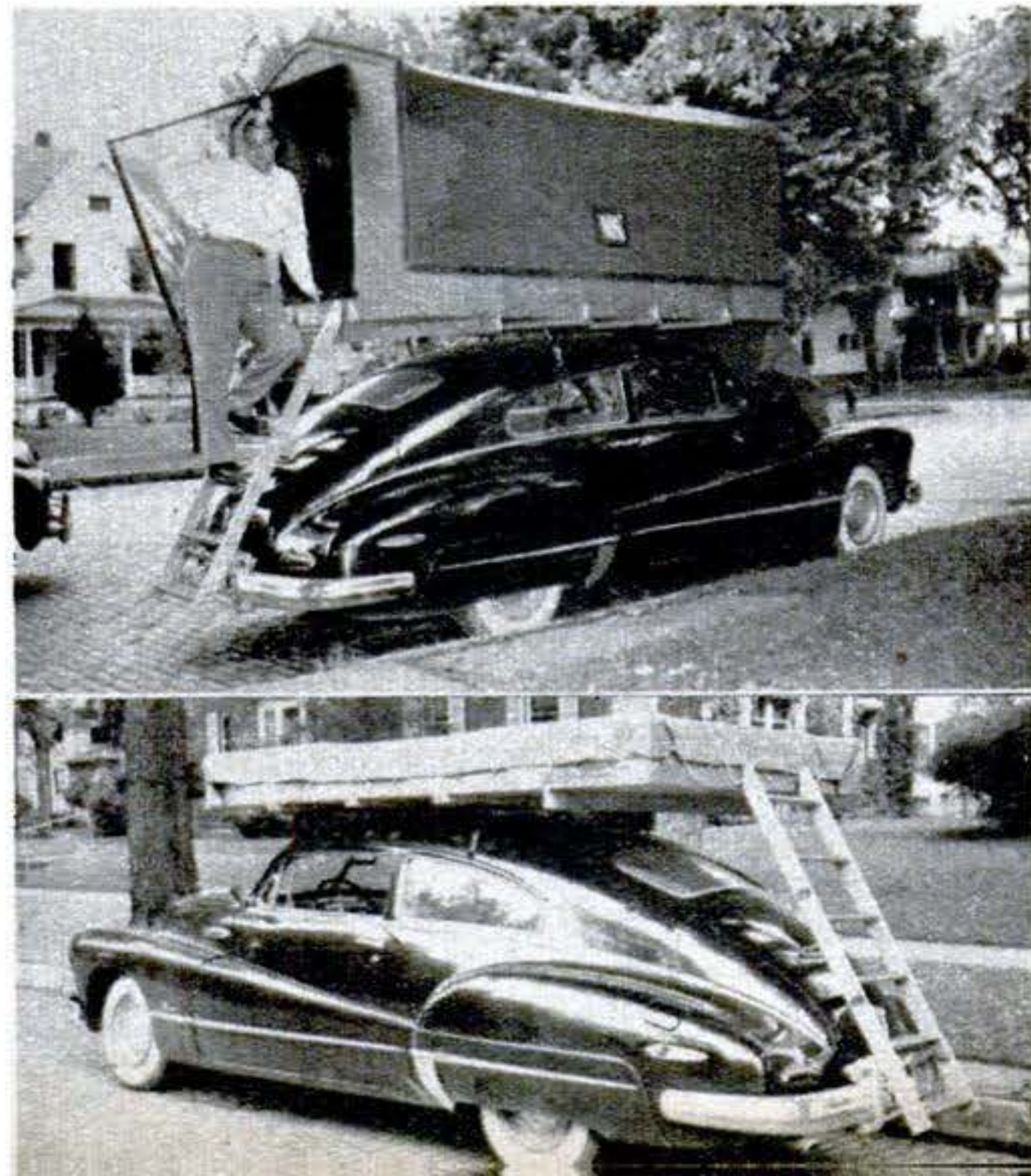
Rewiring Job Simplified

WHEN adding lights or horn relays to the wiring system of an old car, a terminal strip on the firewall simplifies connections. The metal strip shown in the photo below is $\frac{3}{8}$ " by $\frac{1}{2}$ ". It's tapped for connections and mounted near the steering column on two standoff insulators. The lower wire is connected to the starter terminal; the upper wire to the ammeter. In this hookup, the other wires run to the headlights and horn relay. The unused screw is for a possible additional connection. —John M. Avery, Dexter, N. Y.



Tent Carried on Auto Top

COMFORTABLE sleeping accommodations with such refinements as air mattresses, screened windows, and electric lights are incorporated in this auto-top sleeper. The unit, designed by Robert O. Bickel and Homer Carley, Jr., of Cedar Rapids, Ia., can be opened or collapsed for traveling in a couple of minutes. The platform is 1' deep, 5' wide, 10' long. There's 4' 10" of headroom in the tent. In driving tests, the designers hit 90 m.p.h. with the sleeper folded and 65 m.p.h. with it opened to full height.



Mechanics and Handicraft

REG. U. S. PAT. OFF.

One-Cylinder Midget Racers

PAGE 186

How to Model Contour Maps

PAGE 194

Machining a 2-Hp. Engine

PAGE 215

Print Your Photos to Last

PAGE 222

Substituting Radio Parts

PAGE 228



**Homemade one-lung racing cars
roar on country track in a new
amateur sport. See next page.**



Homemade Racers Hit the Dirt Track

Coming out of a tight turn, Eubank car has a good lead over Howard's. Note latter's wheel tilt.

Indiana group builds and races tiny "micromidget" speedsters in sport started by article published in PS.

By Stewart Rouse

Photos by Bill Mickler

IF SOME evening you should happen to be flying over the Indiana corn belt, a bright patch of light in the darkness might catch your eye. Circling low, you see a tiny race track, packed into the feed lot between a farmhouse and its barns. A judging stand, strings of overhead lights, and lines of spec-

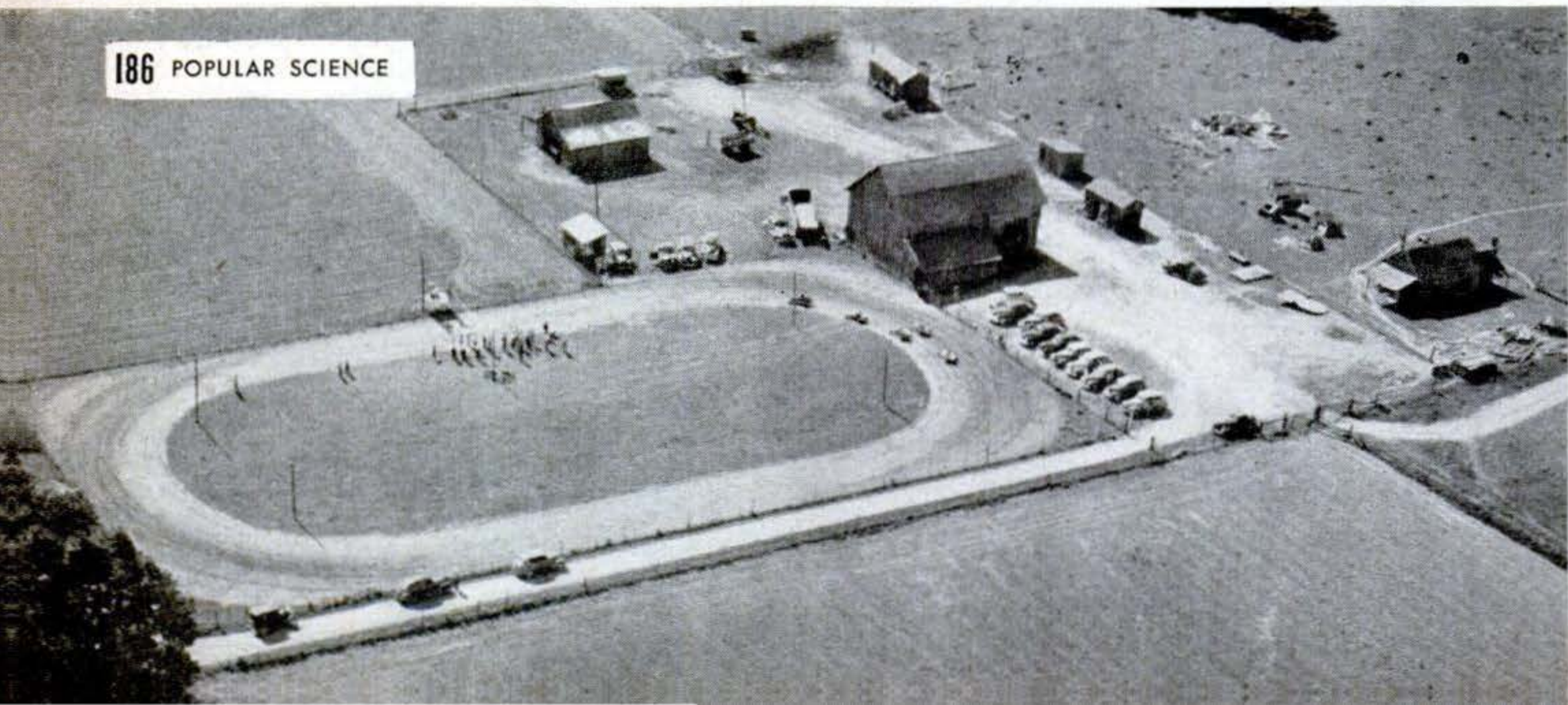
tators' cars make you think of a big-city speedway. But any notion you're circling a conventional race track disappears as you see the drivers up-end their little cars like wheelbarrows and trundle them out on the track for a race. What you're seeing is the regular weekly meet of the "Rushville Micromidget Racers."

How did this farm-yard speedway get its start?

Last winter a POPULAR SCIENCE article called "Engineering Your Own Midget Car" (PS, Dec. '48, p. 176) caught the eye of Lewis Eubank, operator of the Rushville

Air view from the writer's plane, showing Davison feed lot converted to "micromidget" track.

186 POPULAR SCIENCE





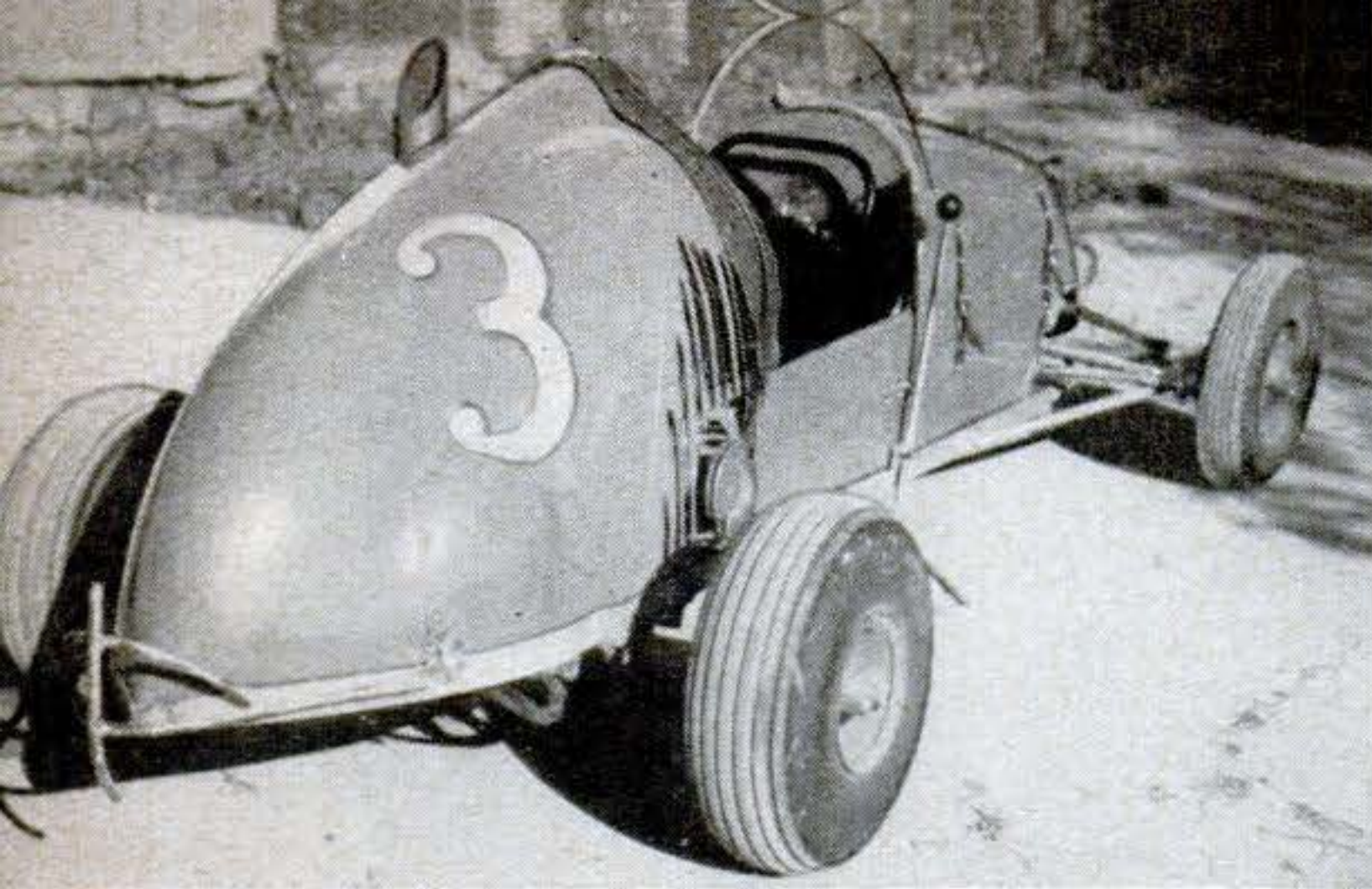
Car on grass has spun out and been lapped. A helper is pulling on the engine-starting rope.

(Ind.) Airport. Following the article closely, he put together his car in about six weeks' spare time. Practicing on the airport turf, Eubank found that the little speedster would corner, skid, and spin like a full-size racing car. Others in the airport "hangar gang" tried it out, and in short order five or six more cars were under construction. Lawrence Davison, a farmer flyer, volunteered to build an eighth-mile track in a feed lot on his farm. Surfaced with oiled dirt, the track was built with farm machinery and measures about 150' by 295'. Spectators watch from their cars outside the fence.

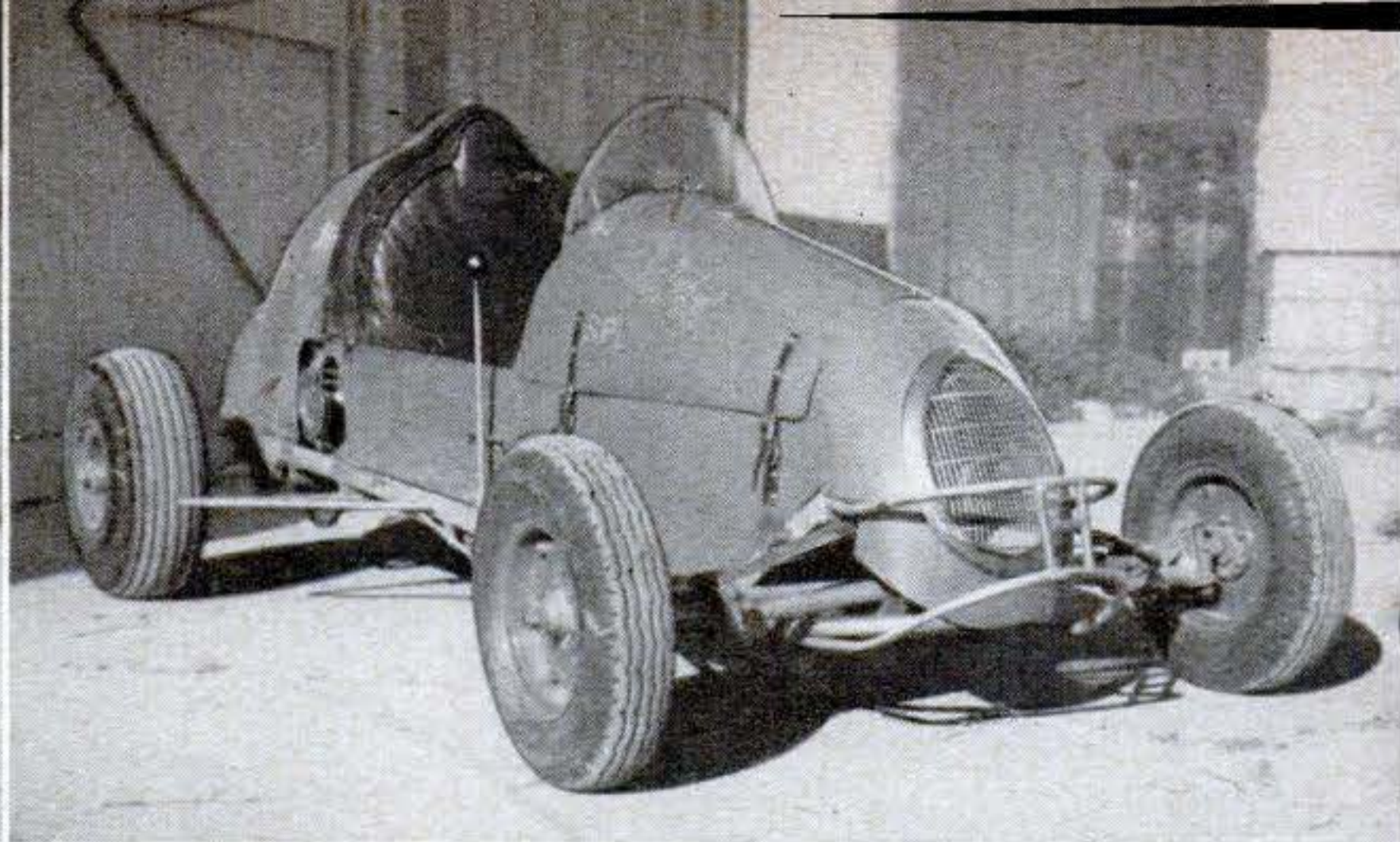
To give the group necessary unity, the Rushville Micromidget Racers Club was formed, officers elected, and car specifications established. The club now has 16 members, whose ages range from 22 to 45. They include farmers, salesmen, mechanics, and retail-store owners. The cars are required to have a tread (width) of not less than 40" nor more than 48". Engines are limited to a piston displacement of 18 cu. in. for L-head 4-cycle power plants; 15 cu. in. for overhead-valve 4-cycle engines; 11 cu. in. for overhead valves and twin overhead cams; and 7½ cu. in. for 2-cycle jobs. ▶

Extreme smallness of the racers is emphasized when they're seen alongside conventional car.





Smooth engine housing on Harold Stark's car, above, was made by welding together rear left and rear right auto fenders along a centerline. Rope-starting drum extends through housing.



Hood hold-down straps on Stark car were once dog collars. The front grille is framed by an oval auto-headlight rim, and the transverse front spring came from an old farm-wagon seat.

Since I was very interested* in these subminiature racers, I persuaded Bill Mickler, official photographer for the Indianapolis Speedway, to come out and photograph the micromidgets. After Bill had snapped the accompanying pictures, he volunteered to try out one of the little cars. Starting out cautiously, he was soon broadsiding the turns in fine style. Inevitably the hangar gang thought it would be fine if I tried one out too, and before I could protest effectively, I found myself fitted into a micromidget** and picking up speed fast. Bill kept lapping me like a cannonball, throwing up dirt in my face.

At first the track seemed smooth, but as we began to roll I found it took everything I had at the wheel and throttle to keep the roaring little car under control. When I finally managed to stay up with Bill, the two cars seemed to float along, apparently stationary, while the track, fenceposts, and onlookers revolved turntable-fashion past us. It became very clear to me that handling these cars in competition is far from kids' stuff. Instead, it's a real test of driving skill, judgment, and nerve.

Considering the size of their engines (from 4 to 7 hp.), the performance of these 200- to 300-lb. cars is astonishingly good. Top speeds on a level, windless highway are better than 50 m.p.h. On the tiny track with its short straightaways and 180° turns they make a full lap every 16 or 18 seconds. This figures out under 30 m.p.h., but when you're pounding along inches off the dirt, it feels like three times that.

The first step in building a car is locating an engine. Burk Jagers, president of the

*Stewart Rouse, writer of this article, collaborated on and illustrated "Engineering Your Own Midget Car."—Ed.

**Rouse is 6'4", and probably still growing.—Ed.

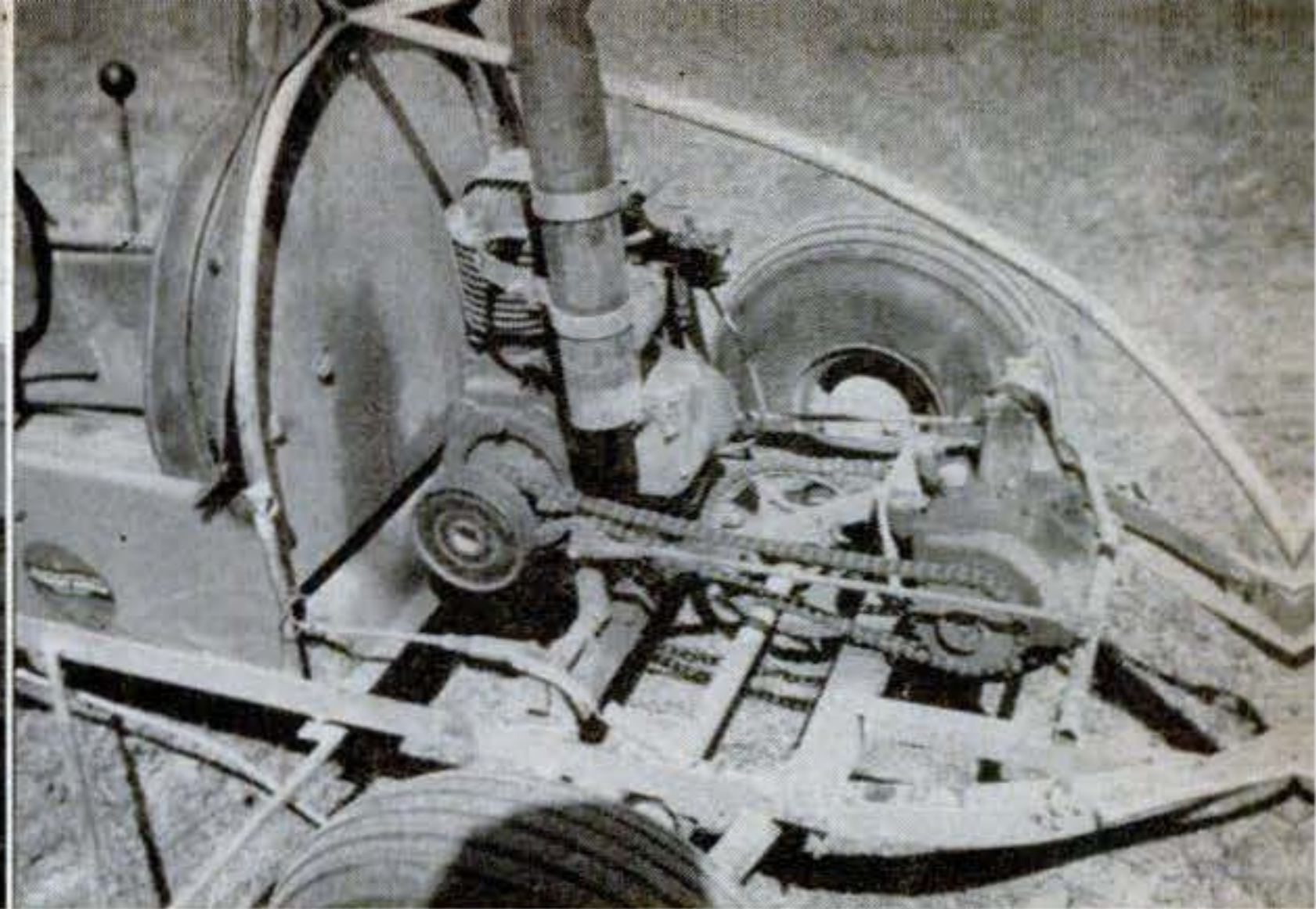
club, picked a Harley-Davison 125 2-cycle engine to power his racer. Larry Davison and Harold Stark, also a farmer, chose Wisconsin 4-cycle jobs, model AKN. Most of the others used Cushman motor-scooter engines. For chassis side members, most builders used the side rails of old beds, commonly 1½" by 2" or 1½" by 1½" steel angle. The only departures from this were Jagers' use of 1" by 2" channel steel, and welded aircraft tubing in the case of the Davison car.

For the arches and trusswork needed to support the steering column, hood, and seat back, preferred materials are ⅝" o.d. steel tubing, ½" steel rod, or angle stock, with most joints brazed or welded. Rear axles are the straight-through type, made of 1" or 1½" steel shafting, and running in pillow-block bearings on the frame. Usually the left wheel is fitted with roller bearings to turn free on the shaft and the right or drive wheel is splined to the shaft. One car has an Austin rear axle, complete with differential. Wheels chosen include 4 by 8 wheelbarrow wheels, 4 by 8 and 6 by 6 motor-scooter wheels, and plane wheels from Cubs and Aeroncas.

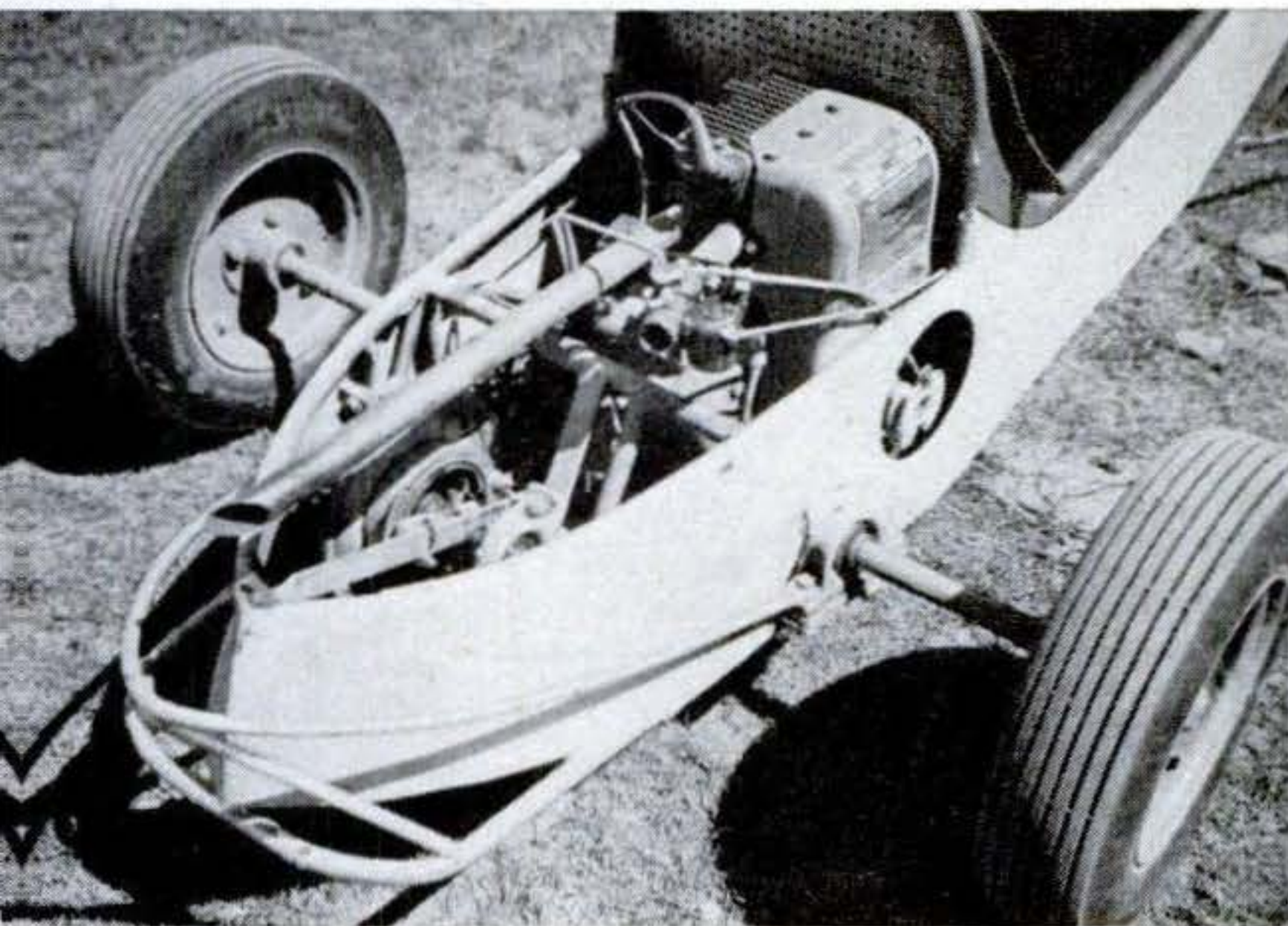
Front-end suspensions, copied from professional midget race cars, use a steel shaft as front axle with steering knuckles at the ends. Knuckles are designed to give correct wheel camber. Steering arms are connected by tie rods adjusted for toe-in. Spring shackles on the ends of the axles connect them to two-leaf transverse springs, clamped Ford-fashion to a frame cross member. Castor or lean-back of the axle is sometimes provided by a wedge shim between spring and frame. Steel radius rods running back to the side of the chassis are commonly employed. One car is fitted with triangular



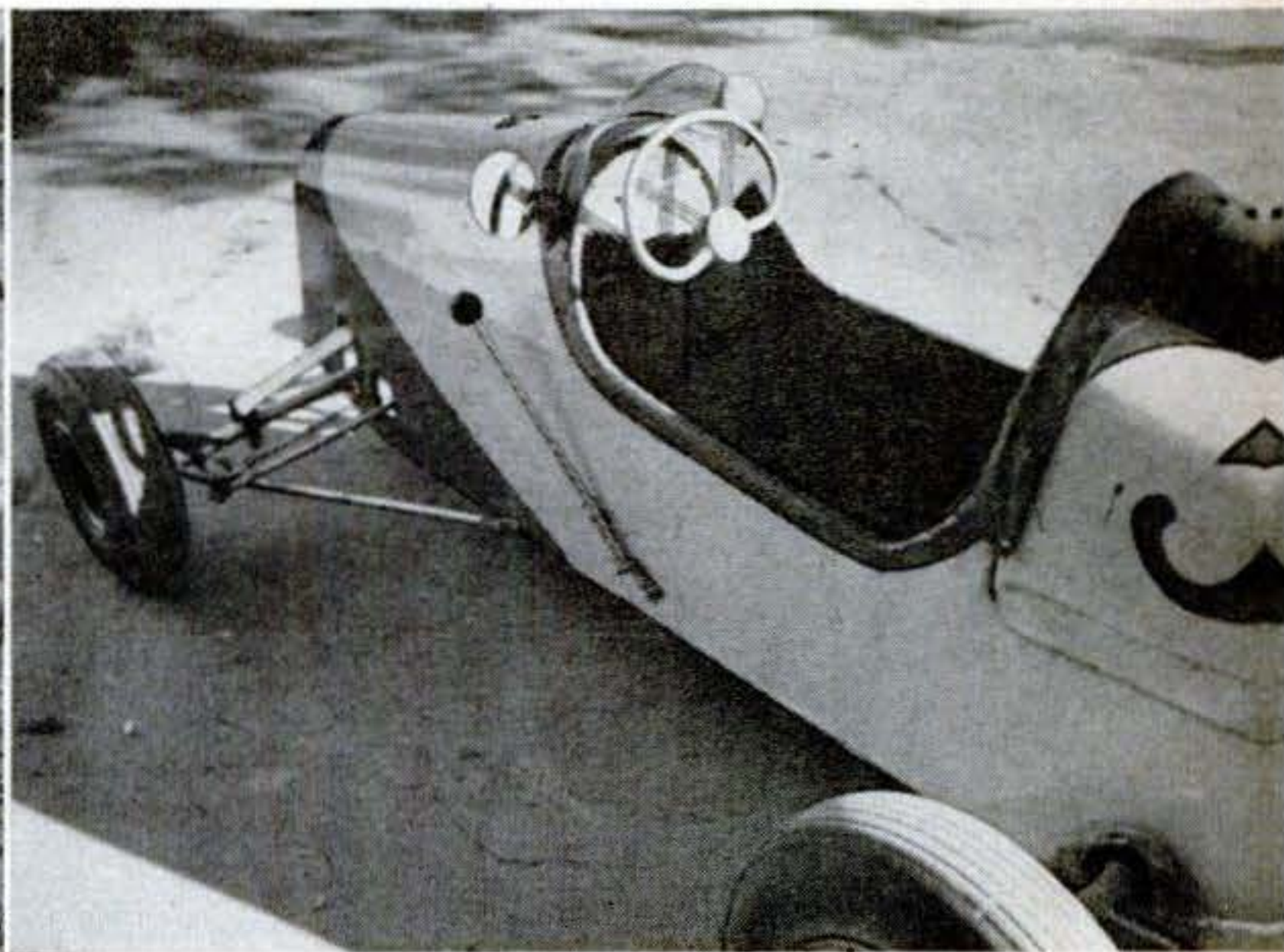
Underview of the same car shows how the frame was curved by notching, bending, and welding the flanges of steel angle stock. Note the coil seat springs and the steel wheel guards.



Power train of the Stark car is from Wisconsin engine to Mercury clutch; then via chain to an Indian motorcycle transmission; and then by a second chain to axle and 6 by 6 drive wheel.

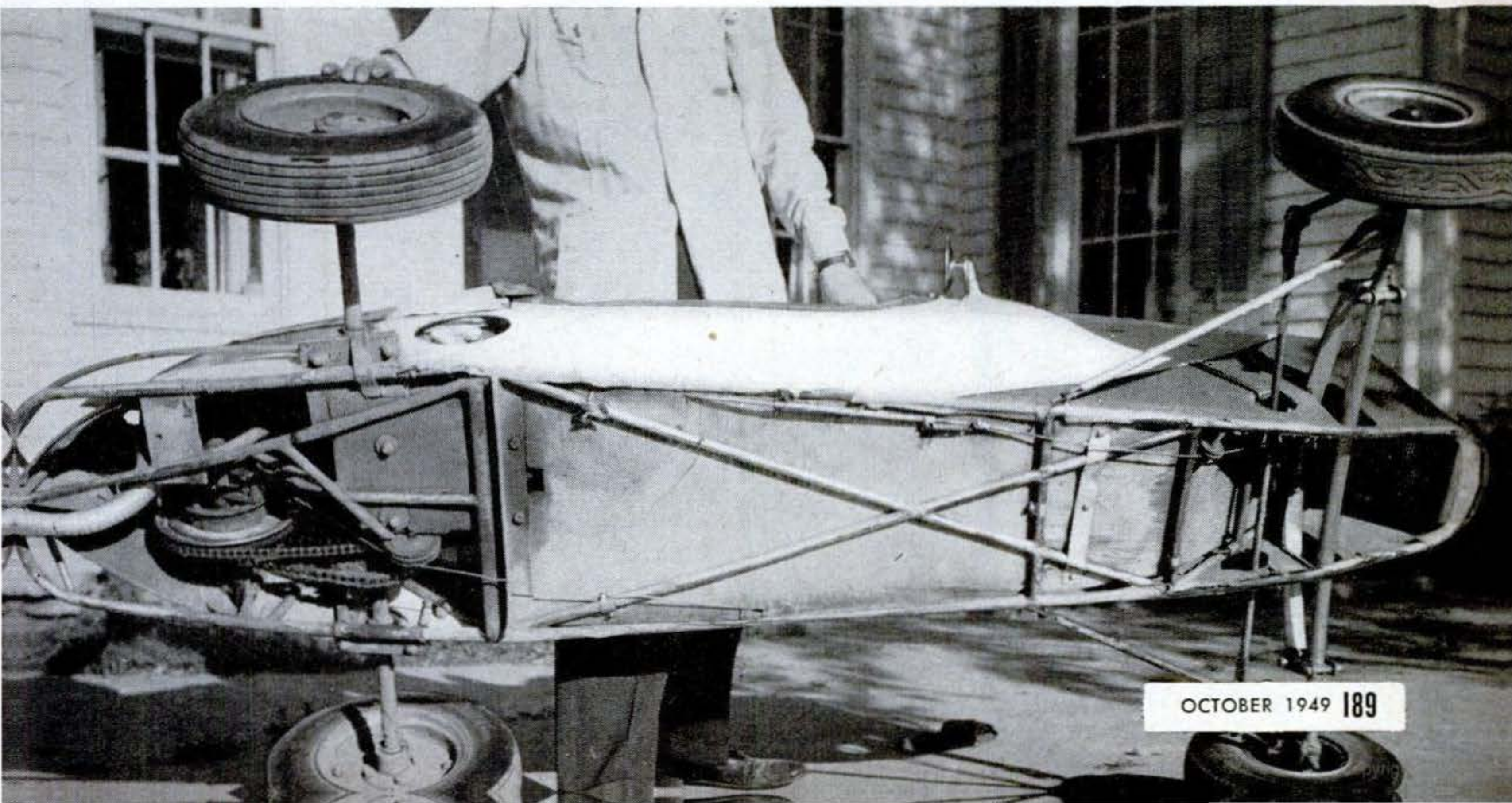


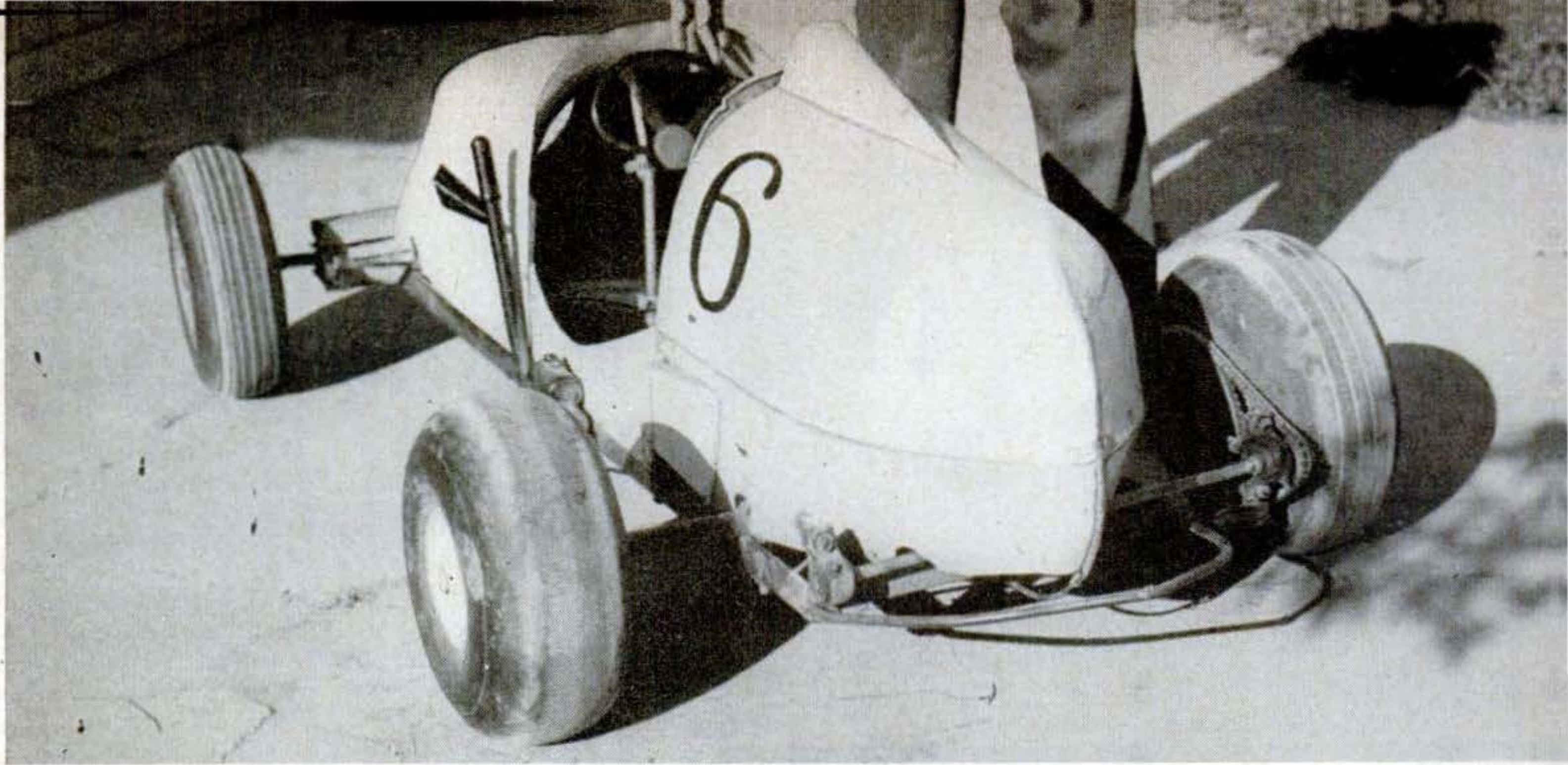
Compact and light, the engine compartment of the Davison-Dobbin car contains a Wisconsin engine and jackshaft in rear. Note the brake on jackshaft and pillow-block bearing for axle.



Steered by a plane wheel, Davison-Dobbin car has trim lines. Steering cable is held to end of tie rod by aircraft turnbuckle. Rear-view mirrors are a help in jam turns. ▶

Davison-Dobbin car has welded tubular frame, weighs only 225 lb., and holds the lap record.





Airplane influence in Eubank car shows in use of Aeronca wheels in front, Cub wheels in back, plane control wheel, and Cub control stick as a brake lever. Latter pumps a master cylinder

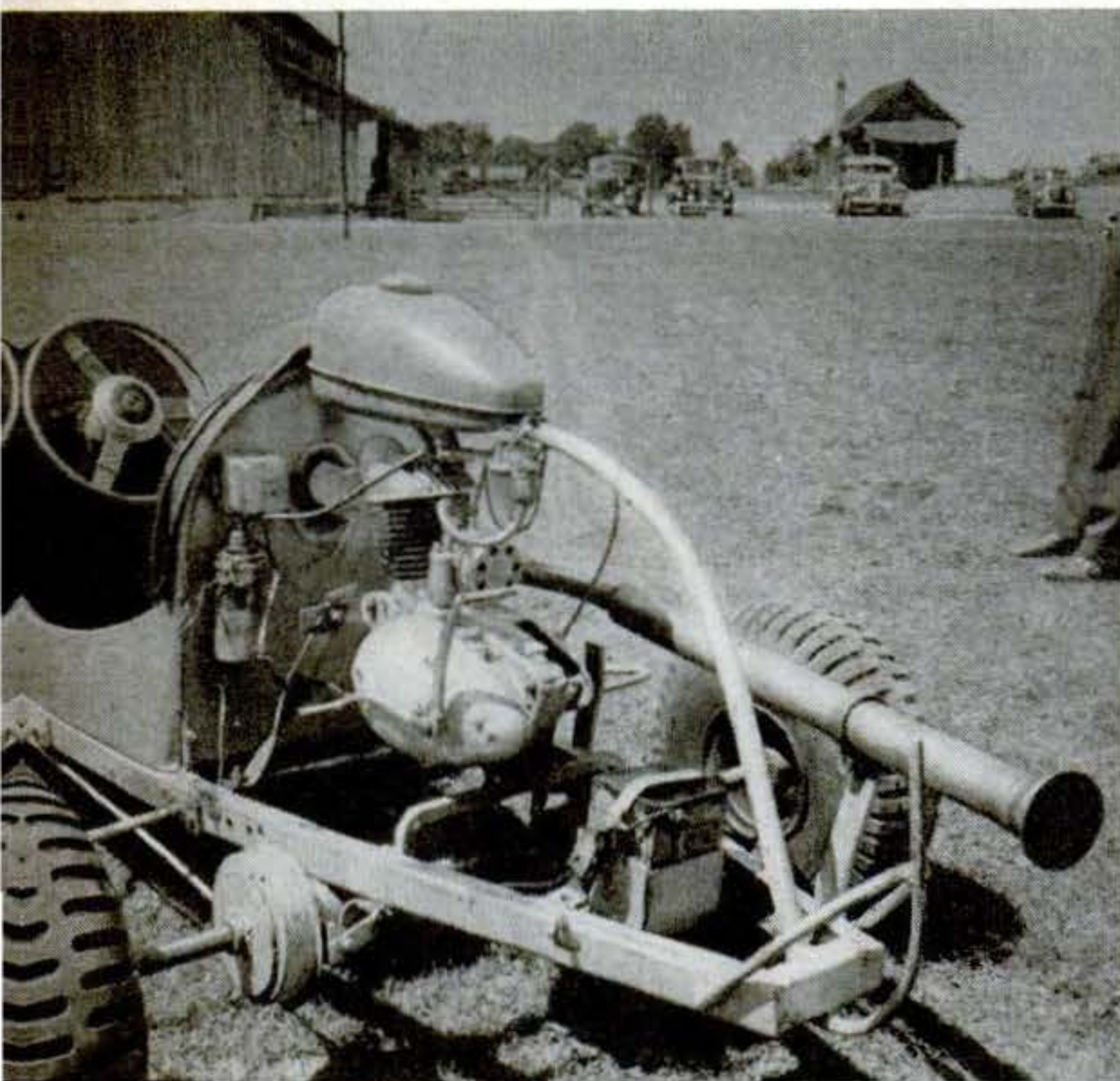
to apply Cub hydraulic brake on rear axle. End of the jackshaft can be seen under tail. The engine is from a Cushman motor scooter and has been fitted with oversize valves from a Pontiac.

steel guards in front of the rear wheels to prevent hooking wheels with other cars in crowded turns and mixups.

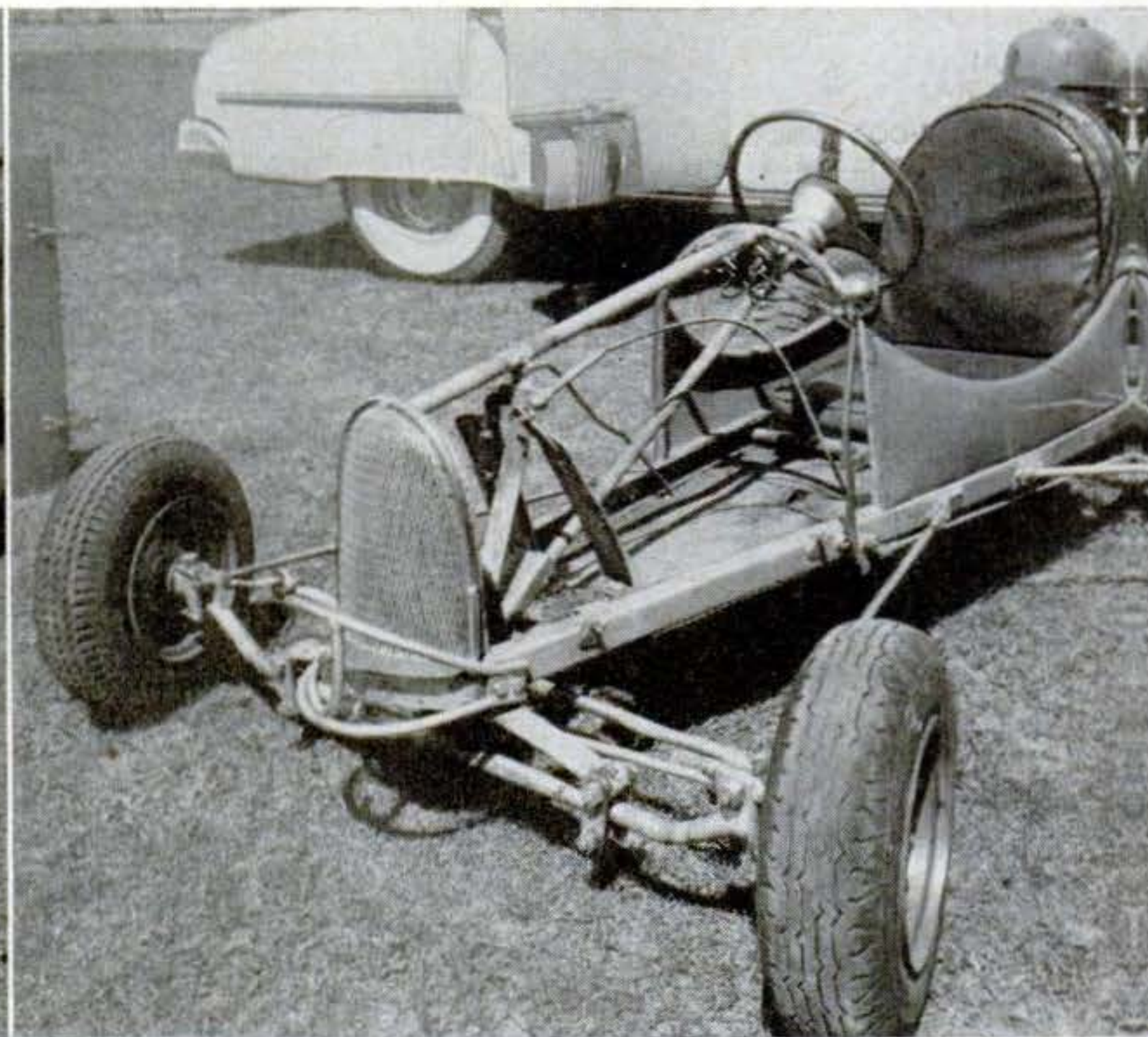
Drum-and-cable steering systems are mainly used, though Jagers cut down a Ford Model-T gear for his car. Since the steering columns measure 1" to 1¼" in diameter, they serve as drums, being wrapped with about seven turns of ⅛" steel

aircraft control cable and anchored with a clip on the middle turn. The cable generally runs through turnbuckles to lugs welded on the ends of the tie rod. Steering wheels are either cut-down auto wheels or light-weight control wheels from planes.

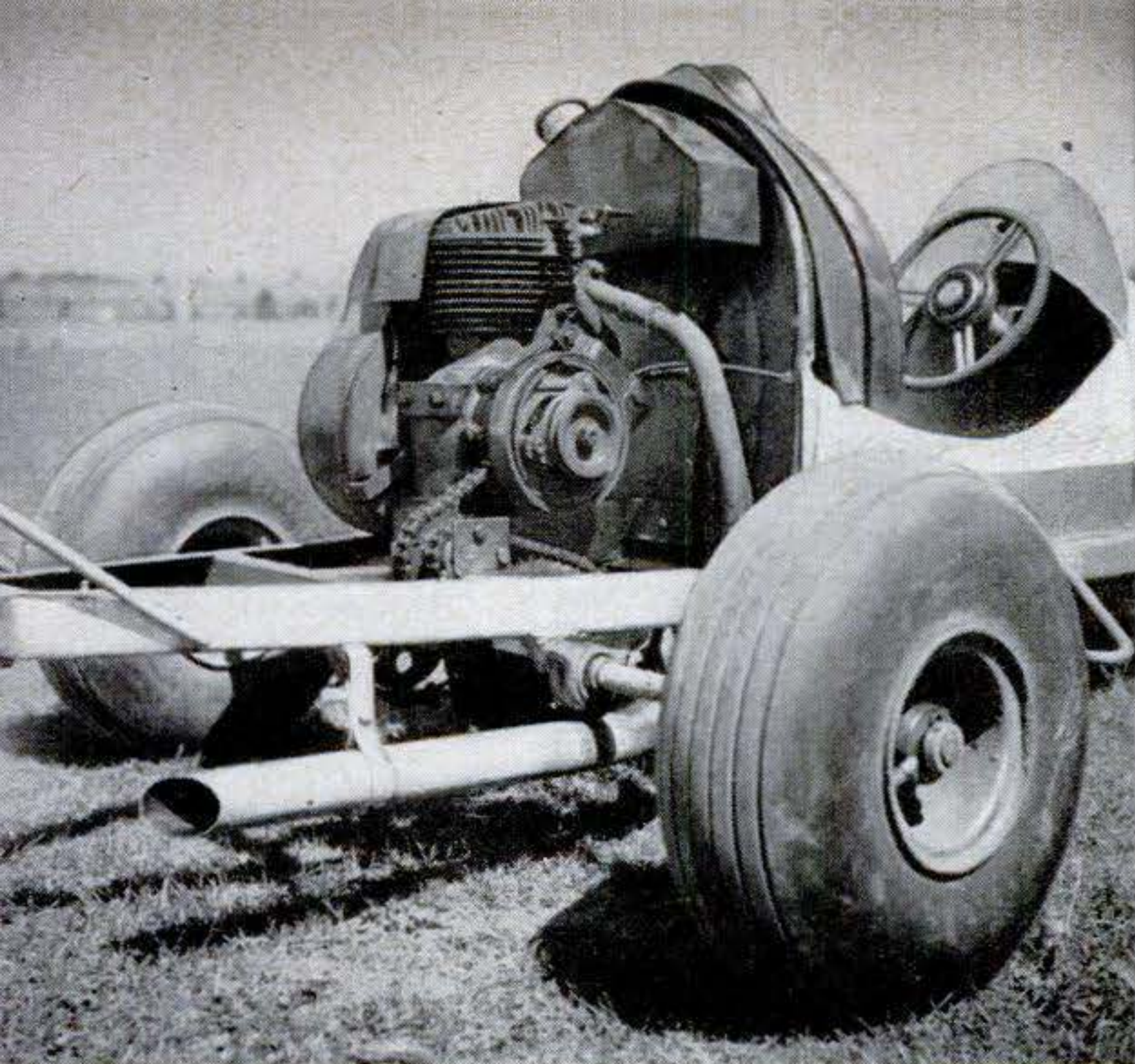
Brakes, all hand-lever operated, include mechanical brakes taken from scooters, hydraulic brakes from planes, and in one



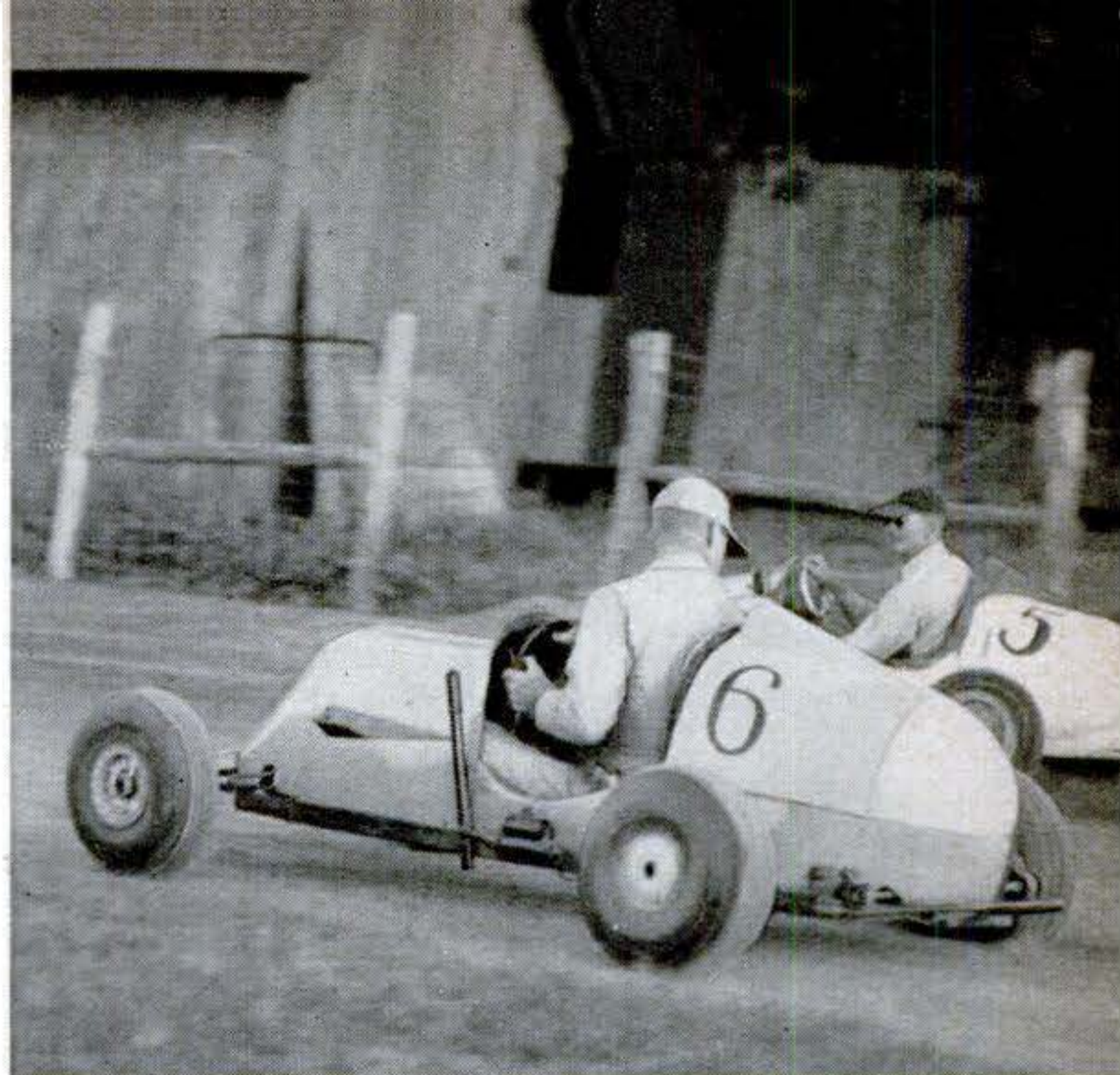
Driven by a motorcycle engine, the Jagers car has a small fan to cool cylinder when engine is running but car is standing still. The big flaring tailpipe was originally a brass bedpost.



Cut-down auto steering gear guides Jagers car. The two large pedals that straddle steering column control the clutch and throttle. The lever with knob on top applies a motor-scooter brake.



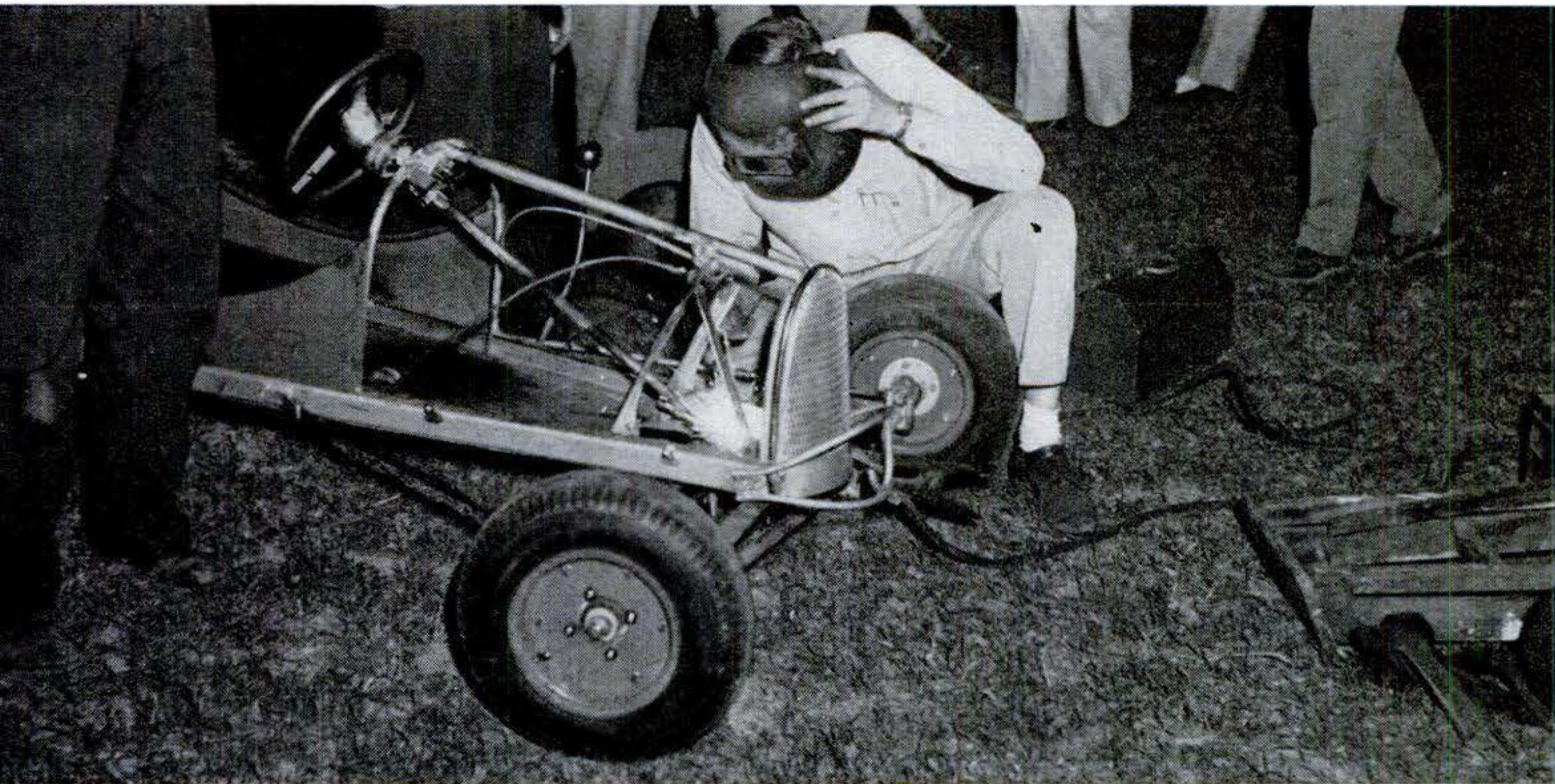
A standard Cushman engine powers the Howard car, which has ingenious ratchet system that permits both rear wheels to drive on the straight-aways but lets the left one go slower on turns.



Camera catches a tense moment here: the drive wheel on No. 6 goes flat at full speed and driver fights start of a spin. Car No. 5 swings wide to pass in clear. No. 6 skidded to safe stop.

instance a homemade band brake. Clutches of the centrifugal type are used with the Cushman and Wisconsin engines; the car with a motorcycle engine has a built-in clutch and transmission. For most cars a primary chain drive to a jackshaft and a final chain drive to the axle has proved satisfactory, though several cars use a selective gearbox.

Bodies on these micromidgets are made of cut-apart and welded auto fenders and hoods. Judicious piecing of fenders makes it possible to get the compound curves involved in the tail and cowl. Leatherette upholstery, plastic windshields, and hood hold-downs made from dog collars are the finishing touches on some cars. Most of them sport a fine sprayed paint job. END



Fixing 'em on the spot is no trick when you've built them. Here Burk Jagers is using a portable arc welder on the infield grass between races. Though practically all cars in the club

have had minor or major crackups, no driver has been hurt. Wide tread, sturdy construction, comparatively low speeds, and driving skill help account for this good safety record.



Wagon-wheel spokes and a well-seasoned plank were the raw materials for this low bench. It was decided to retain the uneven

edge to help give the piece the homemade look of furniture that came from the shops of early craftsmen. Natural finish shows off grain.

Three Antique Benches

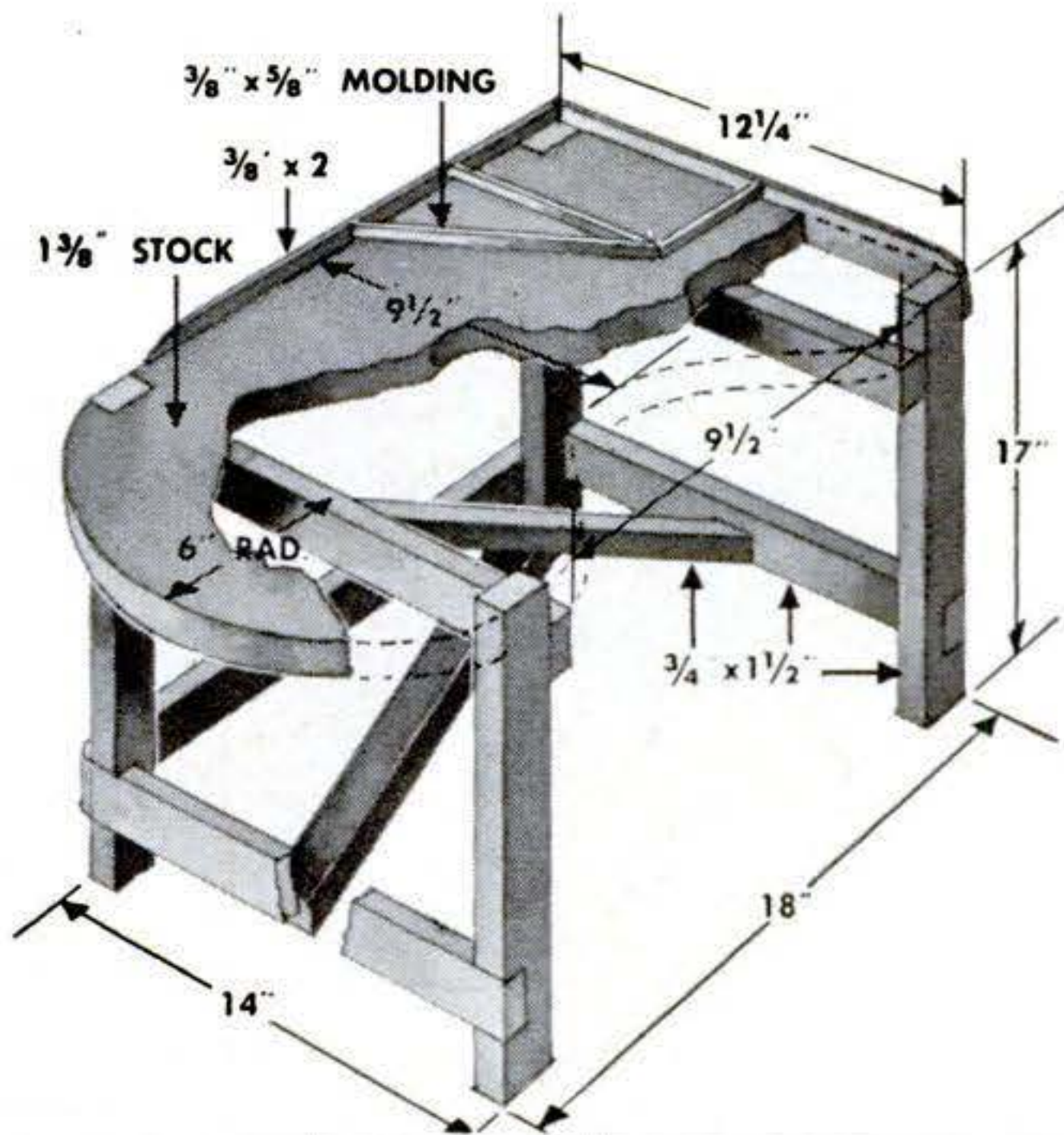
WOOD salvaged from an old building, perhaps a barn, offers ideal material for building furniture of this kind. A weathered appearance makes no difference as long as there's solid wood underneath. Planed down and given a natural finish, such wood imparts to simple furniture an air of antiquity that you'd never get otherwise. A few worm holes help this idea along.

For the bench tops, it's more convenient to have full-width stock, although you can of course glue up separate pieces. Don't let

open knotholes or other openings scare you away. You can fill these with plugs cut out of scrap from the same stock.

Because of their lowness, two of the benches shown are most apt to find use as stools or odds-and-ends tables beside chairs, indoors or out. The other is high enough to win a job as a coffee table.

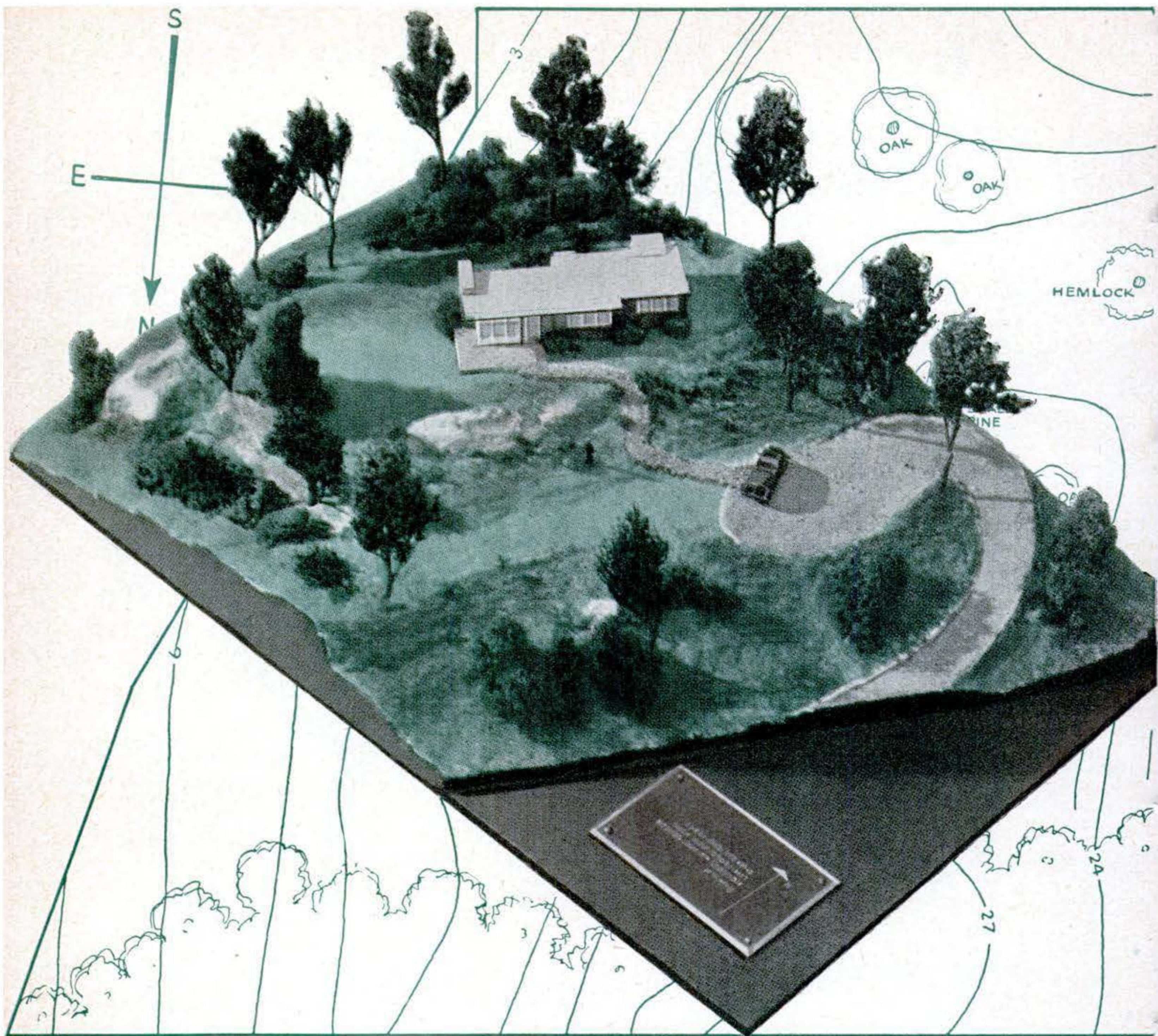
The two low benches require no screws—just careful fitting and glue. If screws are used in the cobbler's bench, countersink them and plug with dowels. **END**



A cobbler's bench inspired this coffee table. Notice the diagonal bracing. The short piece, at the near end, butts against the longer one.



Long enough to seat two, this sturdy bench was made from a billet of used lumber. Note that previous holes in the plank were filled.



Picture your dream house in three dimensions to make best use of the land you have. A real

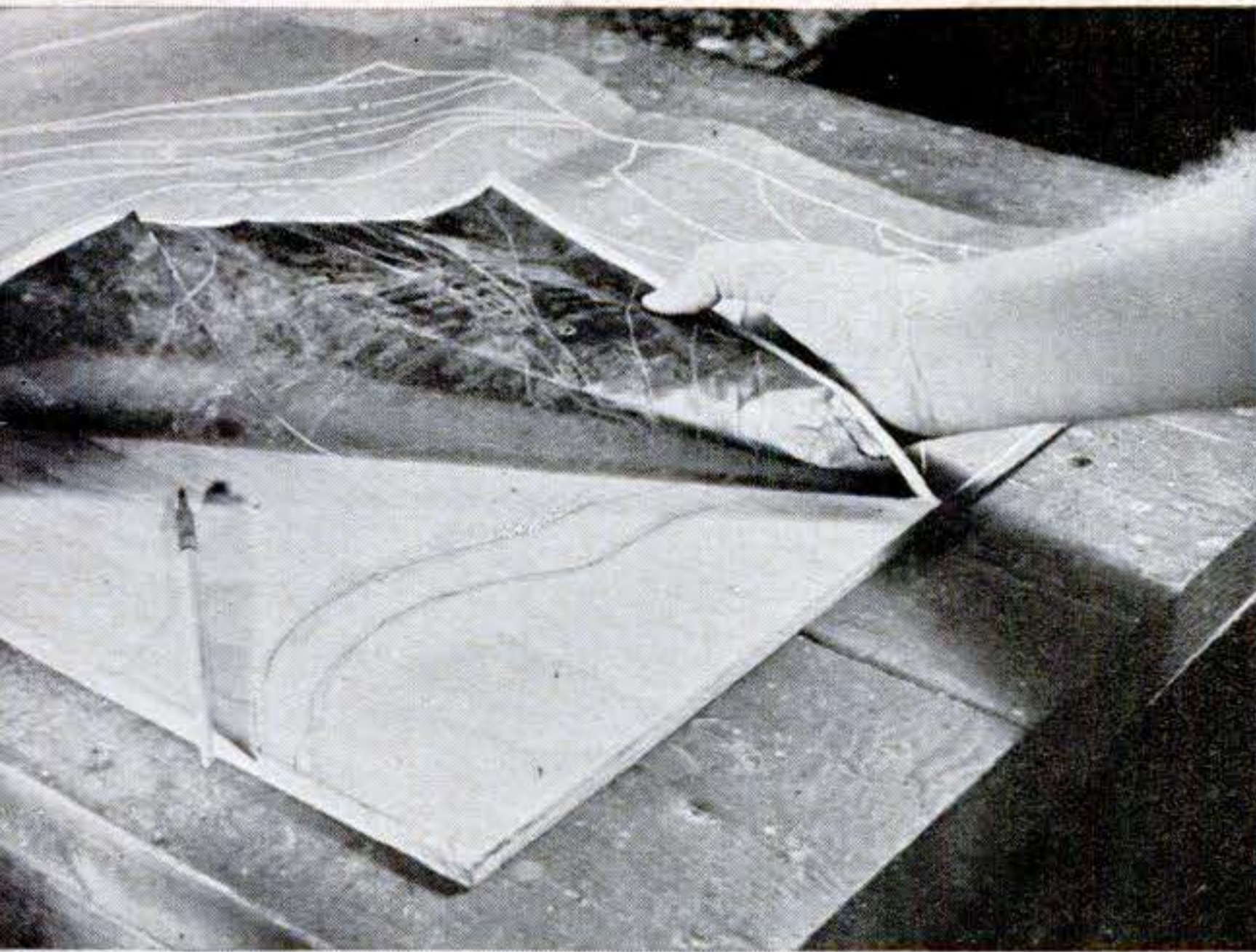
help in planning, the model can eventually be used as an unusual decoration in the home.

How to Model Your Contour Map

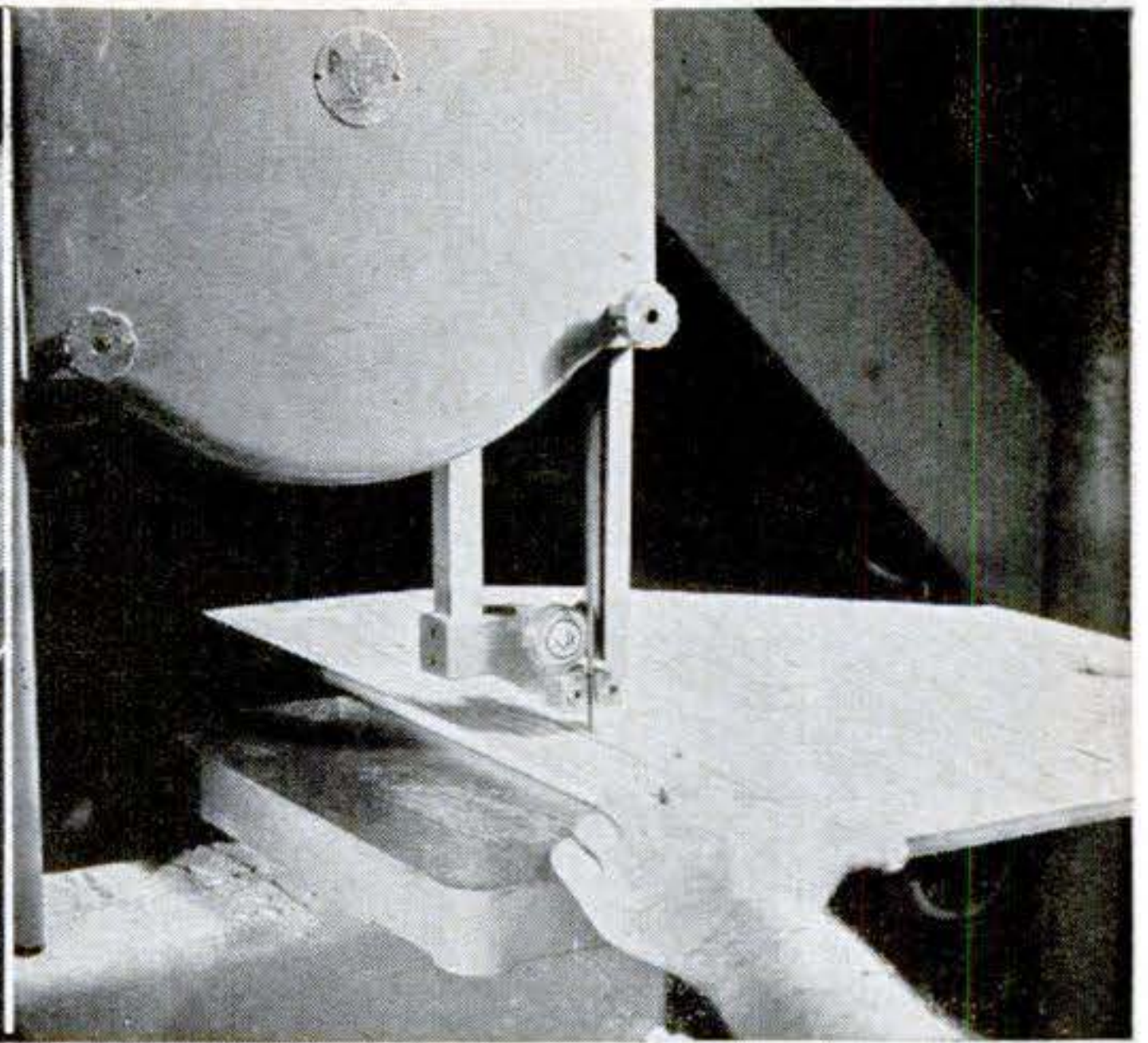
By Harry Walton

IT TAKES practice to read a contour map, but everyone can "read" a terrain model at a glance. The three-dimensional quality of a model makes it vastly superior to a sheet of paper for planning home sites, driveways, or other improvements on your property. Such a model is fun to build, too. After it has served its original purpose, it makes an unusual display piece.

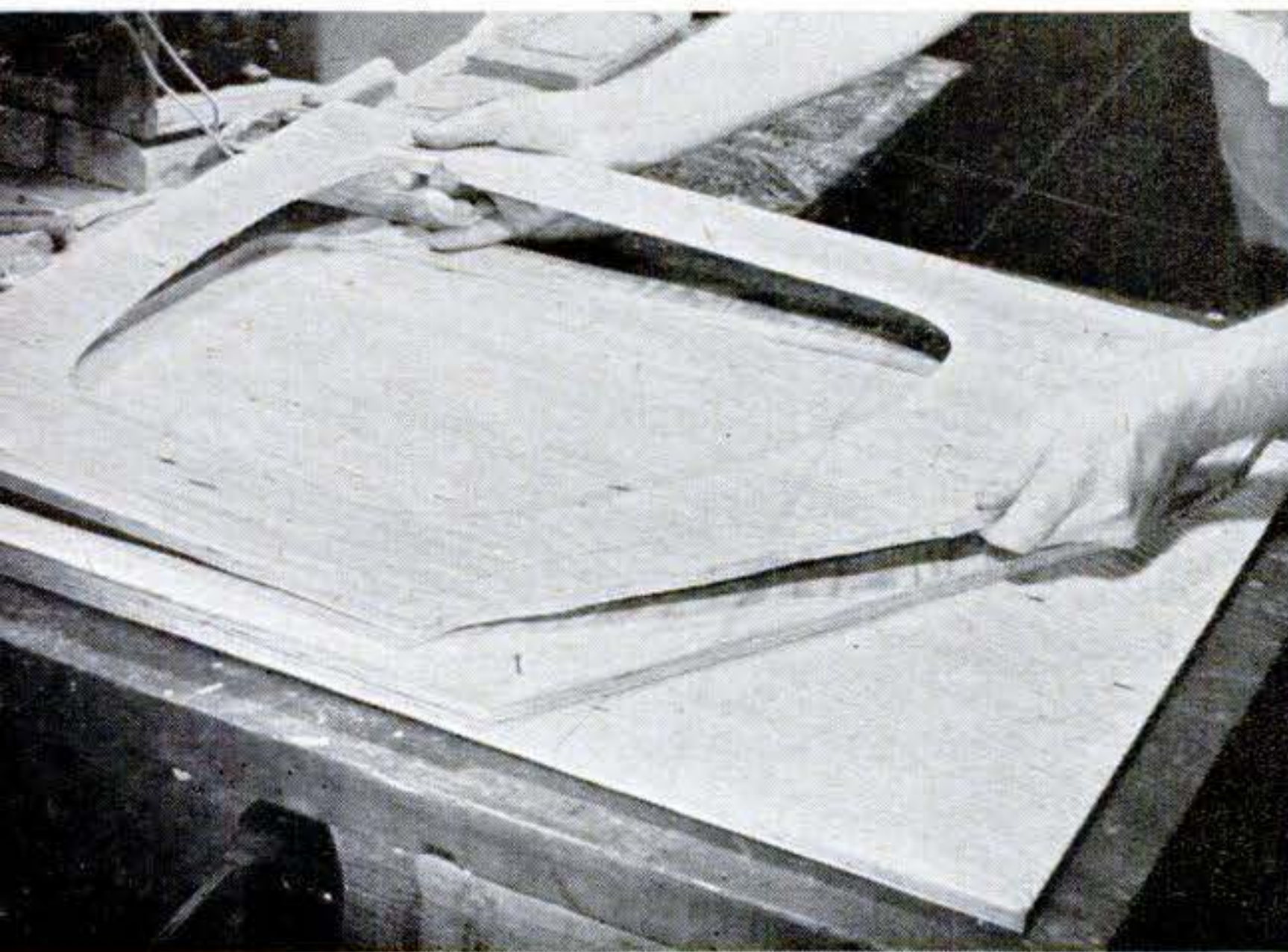
You can survey land contours yourself with a few simple tools (PS, Sept. '49, page 180). The contour map resulting becomes a blueprint for your model. If the land is mainly level, you can model it by building up a plywood panel with clay or plaster. But if the ground is hilly, freehand modeling



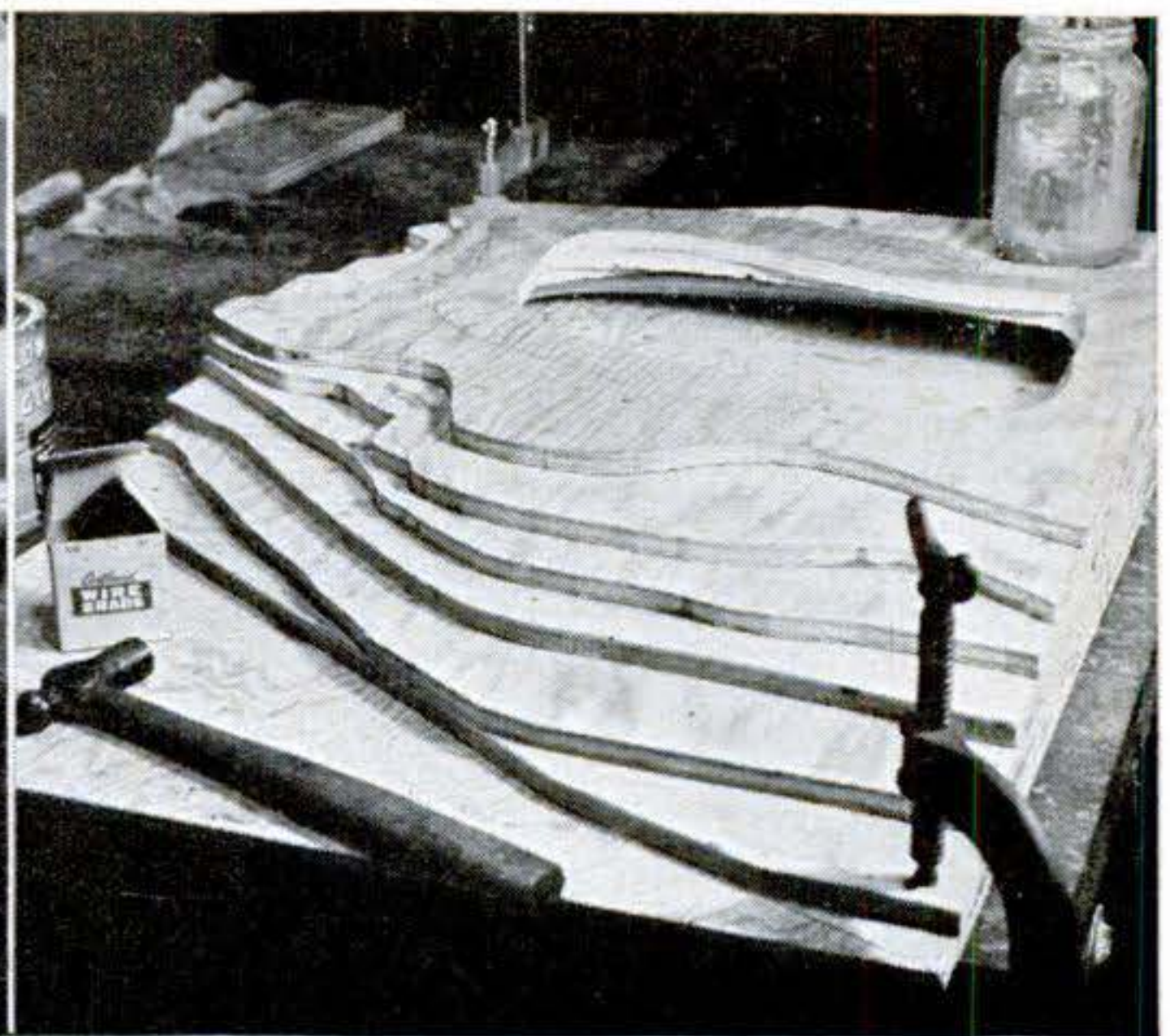
Stick carbon paper, black side out, to the back of the map with rubber cement. For each lift, draw two contour lines, the outer to cut it on, the inner to locate the next lift.



Bandsaw makes fast work of cutting out the lifts. A jigsaw would also serve. The map shown was built up of $\frac{3}{8}$ " plywood. Inside of lift is cut out to lighten total weight.



Base is a plywood panel. Here second lift is being attached; it is aligned with the second contour line on the first lift. Hole is bandsawed, the entrance kerf being filled with glue.



If base has any warp, clamp the high corners down on a true surface. Coat the joining surfaces of lifts with glue and nail the upper one down with brads. Note the hollow interior.


is wasteful and inaccurate. You should build on a core shaped to the contour lines of your map.

In drawing the map, you've probably picked a convenient scale that will be equally suitable for the model. A model of a 50' by 100' city lot to $\frac{3}{8}$ " scale would be $18\frac{3}{4}$ " by $37\frac{1}{2}$ ", a manageable size. If you're modeling a half acre, $\frac{1}{8}$ " to the foot may be better.

Your scale, plus the contour intervals of your map, determines the thickness of the layers, or lifts, of which the model is built. If the intervals are 3' and the scale is $\frac{1}{8}$ "

to the foot, then $\frac{3}{8}$ " fiber board or plywood will be suitable lift material.

When the lifts are assembled, they're a three-dimensional rendering of your contour map. To blend the contour lines, fill in the intervals with a modeling medium. Clay can be used but makes a heavy model. Lighter and equally permanent materials include powdered asbestos, sawdust, or wet newspaper pulp, mixed with plaster of Paris and animal glue or library paste.

Vinegar slows setting time and so gives you a chance to model the stuff. Nothing beats fingers for applying the mix. 



Add 1 teaspoon animal glue to $1\frac{1}{2}$ cups water and $\frac{1}{2}$ cup vinegar. Sift in 1 pt. plaster of Paris and $1\frac{1}{4}$ pt. asbestos powder. Mix should be doughlike, wet enough to adhere to wood.



Fingers are used to press the mix on wooden base. Don't pile it on top edges of lifts, which should be barely covered. Note 1' intervals on top of model, consisting of $\frac{1}{8}$ " lifts.

Work it in well at the edges, but don't overload the contour lines. Be sure the plaster is completely dry before any painting is done.

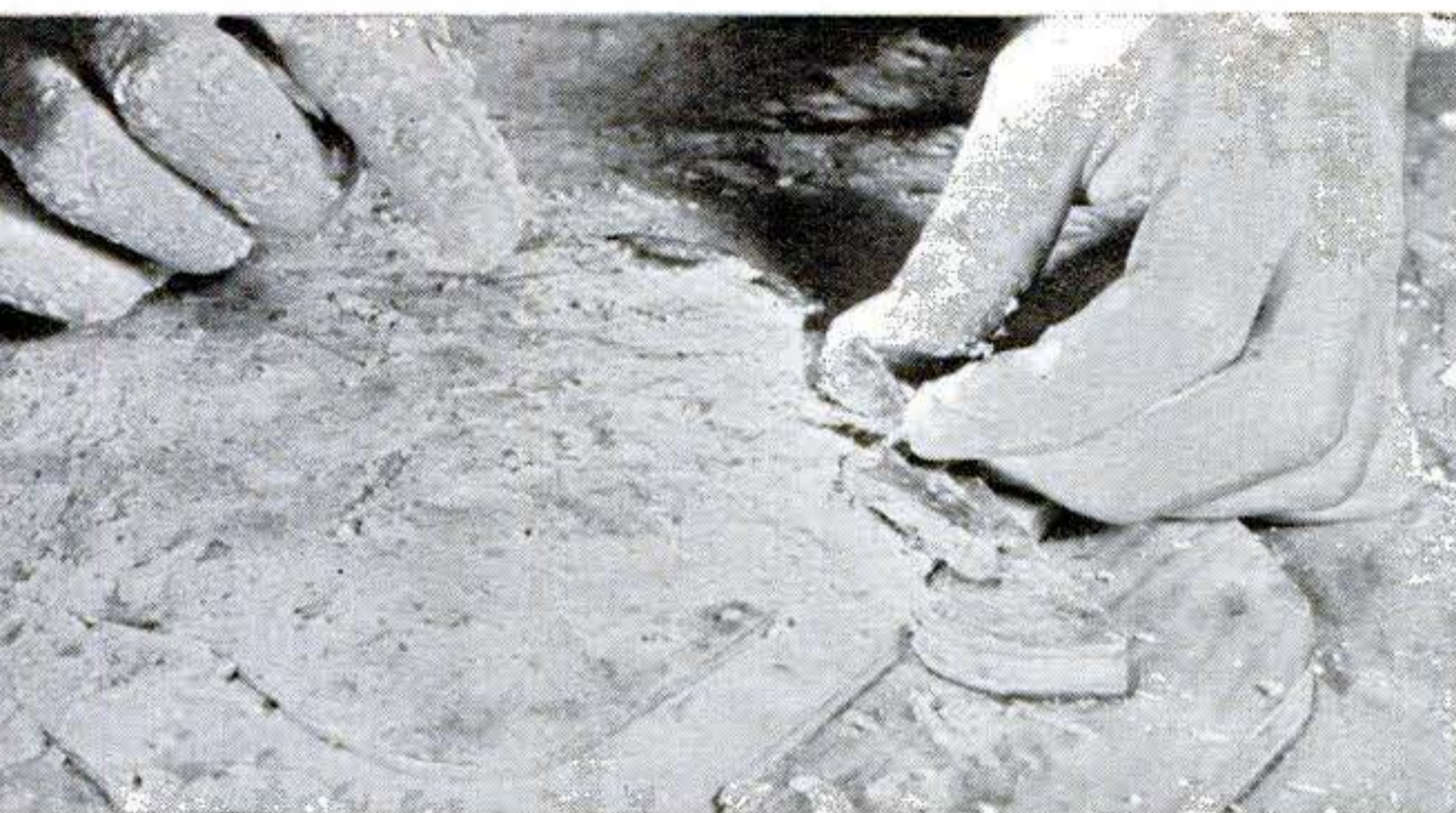
You can use oil paints or flat house paints, but avoid glossy paints and enamels. Poster paints are cheap, easy to use, quick drying, and have a good flat finish. But color alone

produces a flat, artificial effect, whereas large-scale models like this demand textured surfaces. Apply a sealing coat of thinned paint, shellac, or varnish, and then a coat of flat paint the color of the desired surface. While this is still tacky, sift on it dyed sawdust, coffee grounds, sand, birdcage gravel,



It's not too late, even after mix hardens, to change details. Driveway was bulldozed while

map was being modeled. To add it, some plaster was scraped off, some added to form the bank.



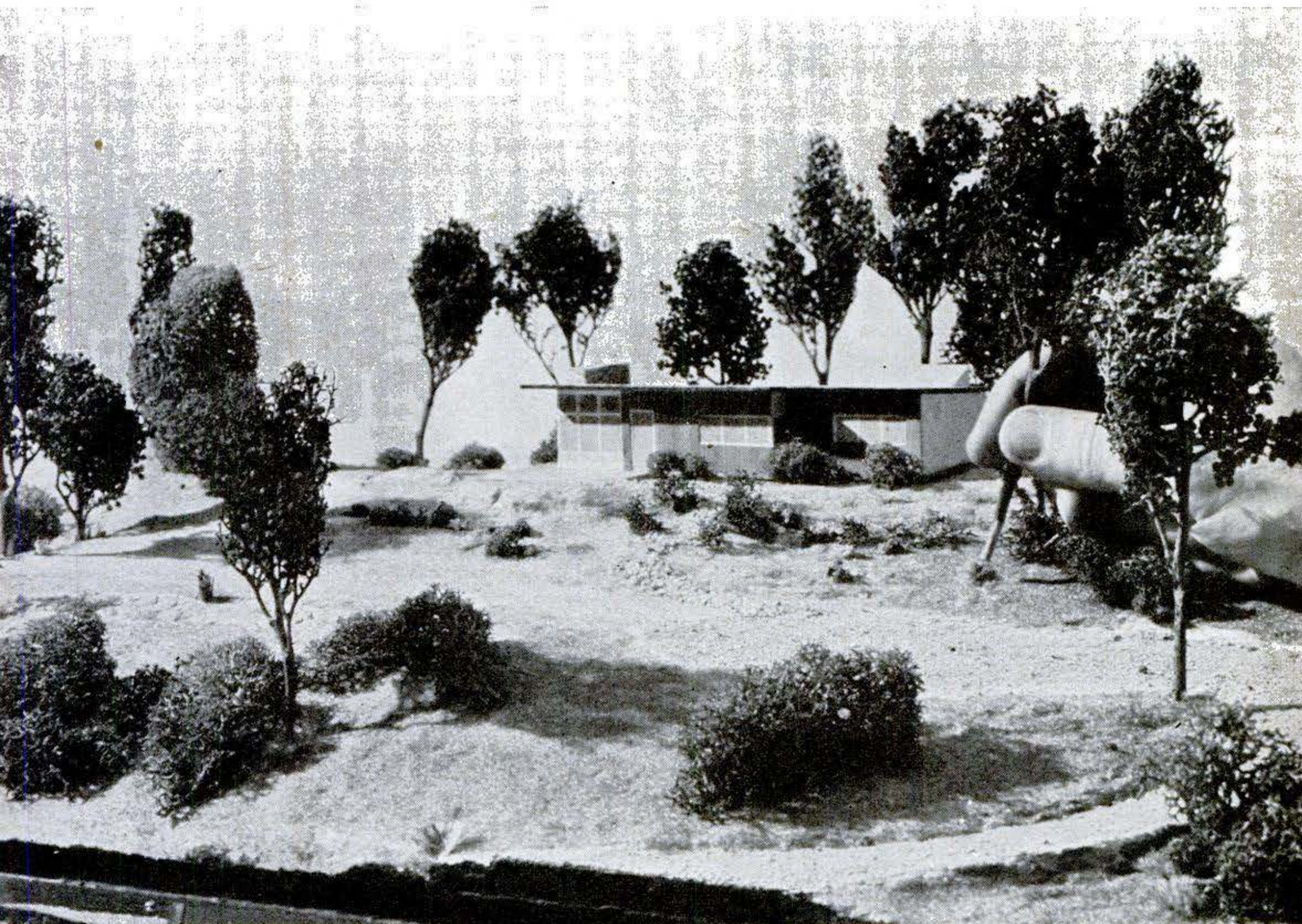
Best imitations of big rocks are little rocks. Dampen them and set into wet mix, or bed them in plain plaster. Formula given soon becomes dry and crumbly, so mix small batches often.

Go out on location for last-minute detail modeling. Here, last touches are put on rock outcropping that represents, on the model, the rocky ledge extending into background.

or other material that will give the scale effect wanted. When the adhesive coat has dried, blow or brush away the excess.

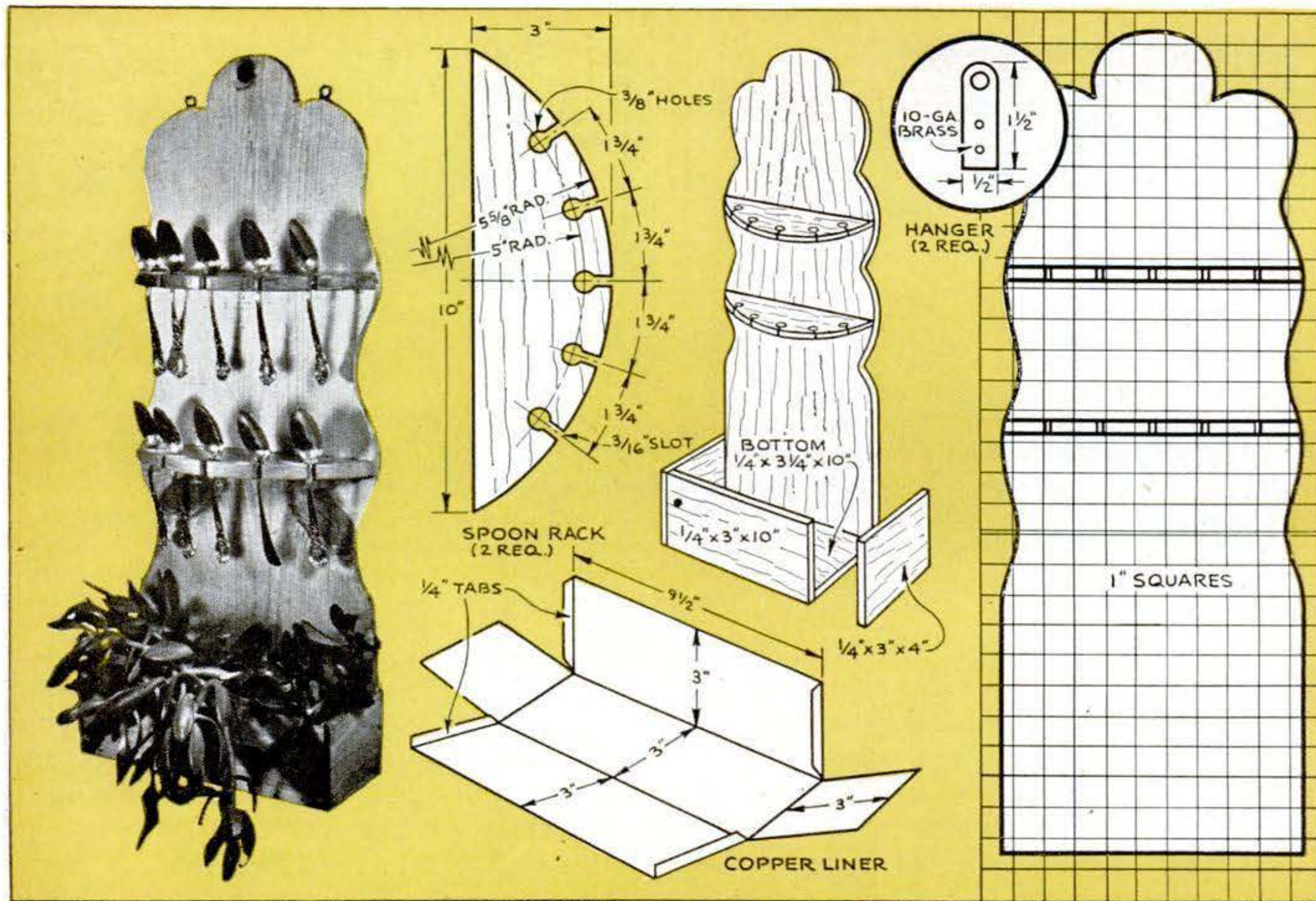
Rayon flock, which comes in many colors, is a versatile surfacing medium. Be careful, in applying the adhesive, not to cover rock outcroppings, except to represent moss.

Trees and shrubs can be bought from model-railroad supply houses. Sponge rubber, dyed green and torn (not cut) into shape with the fingers, makes realistic ones. Some types of trees must be built up out of wire (PS, May '44, page 161). Frayed rope cut short represents grasses. **END**



Trees fit into holes drilled through plaster into plywood beneath. Shrubs are Norwegian

lichen moss, sold for model-railroad scenery. House is removable, built to same scale as map.



Living-Room Planter Shows Off Spoons

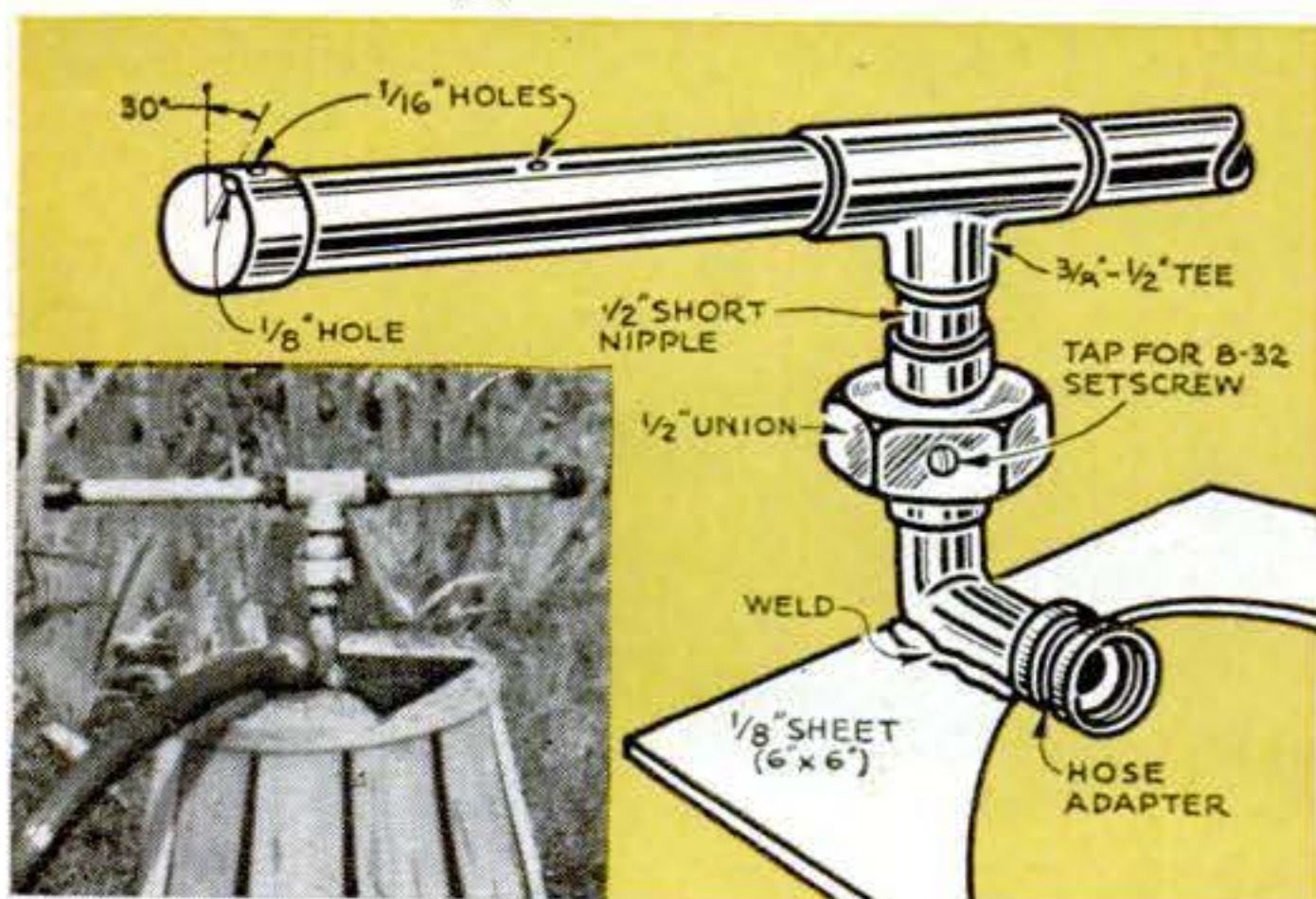
A TOUCH of green and a showplace for fine silver are combined in this planter. The rack shown was built of $\frac{1}{2}$ " knotty pine. Other wood can be used to match your furniture.

Lay out the back, using the squares, and cut it to shape with a coping saw or on a jigsaw. Cut the two spoon holders to size and drill the $\frac{3}{8}$ " holes. After the pieces are sawed and drilled, the notches are cut to the holes. Attach the spoon racks to the back

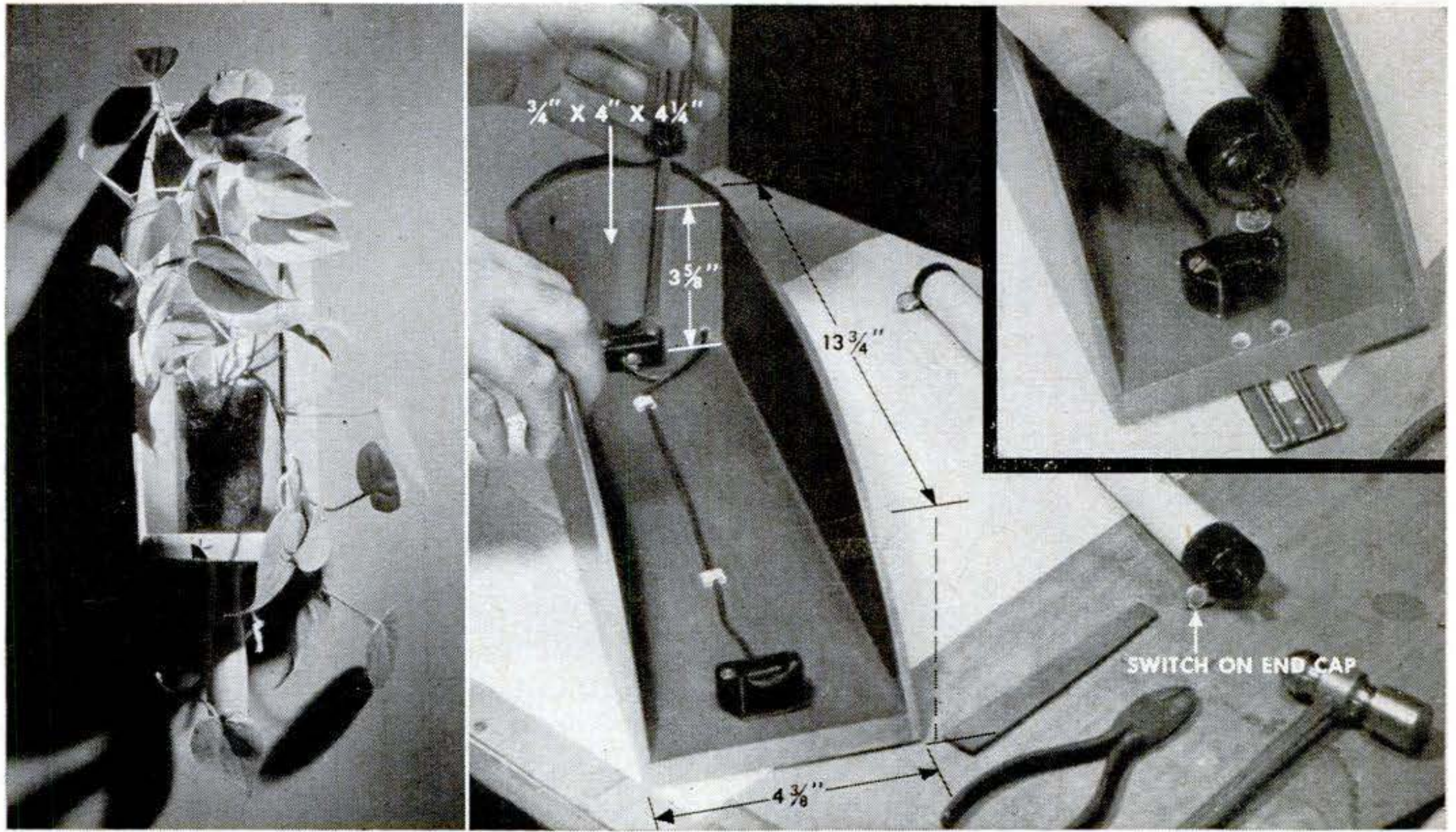
with glue and No. 4 finishing nails, driven in from the back and countersunk.

Assemble the wooden box and glue and brad it to the back. The copper liner comes next. Cut it to shape and fold up the ends and sides. **To make straight**, sharp bends, clamp a piece of scrap wood inside the bottom. Use another piece of scrap to force the tabs up 90° . Clamp the tabs in position and flow solder along the joints inside the liner. —Whitney K. Towers, Los Angeles.

Lawn Sprinkler Built of Standard Pipe Fittings



ONLY about \$2 worth of parts went into the heavy-duty sprinkler pictured at left. With six outlet holes in the long bar, it covers far more territory than the average sprinkler. The caps can be turned to raise or lower the end sprays, but the $\frac{1}{8}$ " holes must be located at opposite sides at the two ends to effect rotation. To adjust, draw the union nut hand-tight and then just loosen until the bar turns freely. Lock it with the setscrew. Lubricate with cup or pump grease.—D. C. Van Alostyne, Beverly, N. J.

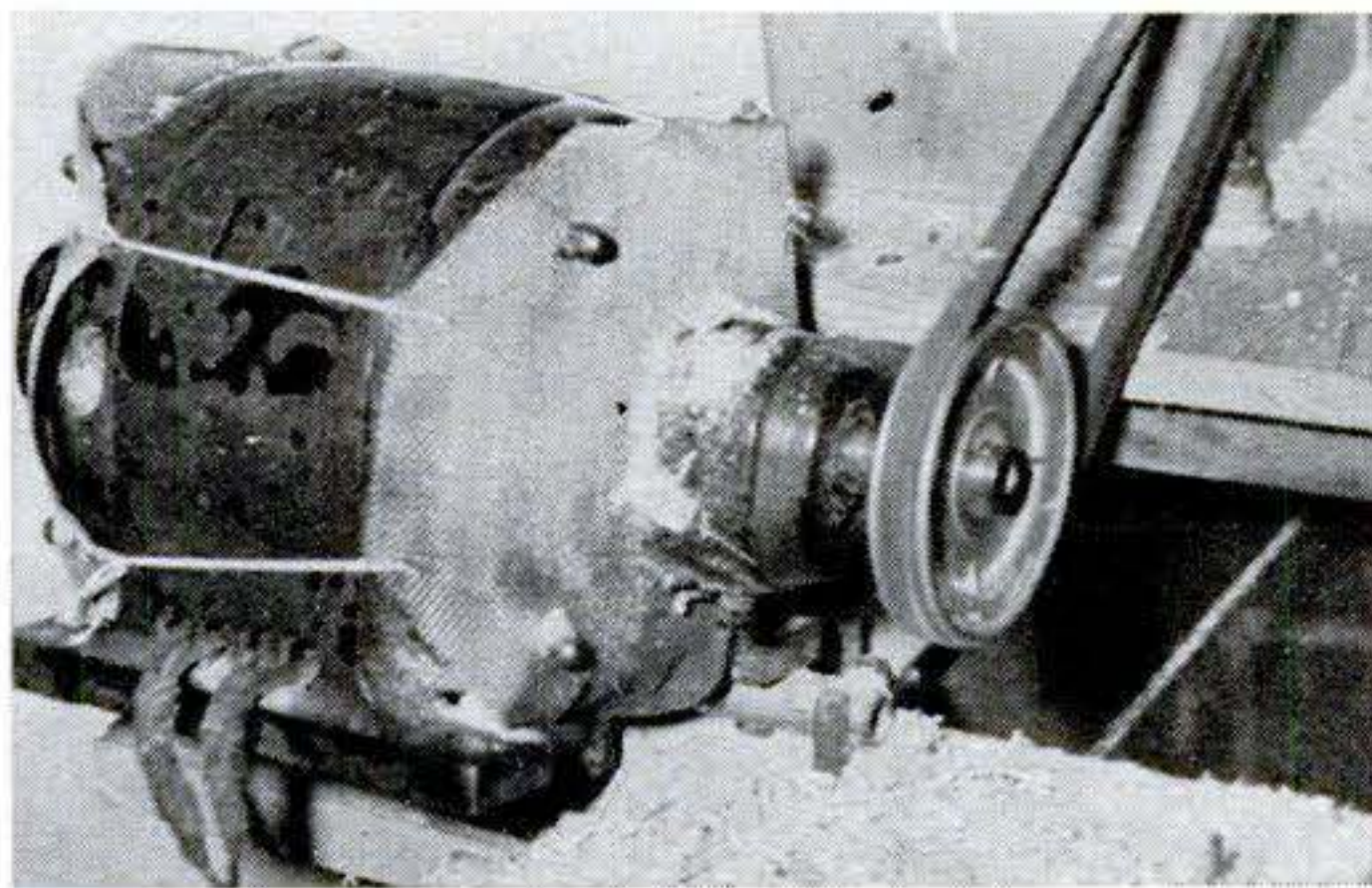


Old Scoop Makes Modern Electrified Sconce

FIND an old-fashioned wooden grocer's scoop and it's only the work of an evening to convert it to an unusual wall sconce. The one pictured here was picked up in a second-hand shop. You can make one easily enough. Use $\frac{1}{2}$ " stock for bottom and back, $\frac{1}{4}$ " stock for the sides, and attach a big file handle to carry out the scoop idea.

The light is a 40-watt Lumiline® lamp

made by General Electric. It looks like a fluorescent tube but it's an incandescent lamp. One of the fixtures has a canopy switch built into it. Screw the fixtures to the scoop and drill a $\frac{3}{16}$ " hole in one corner of the scoop for the wire. Split the cord, running one wire up the center of the scoop to the top fixture. Connect the other wire to the lower fixture.



Screen Keeps Motor Clean

SAWDUST and chips may cause overheating and fouling of shop motors. Two pieces of window screening, cut to fit the end bells of the motor, will catch much of this waste. Cut a center hole for the bearing and smaller holes for the acorn nuts. Dip the screen in light oil, drain well, and fasten it in place with string or fine wire as shown. The oil will help the screen catch dust.—John Pugh, Iliion, N. Y.



Sealed Headlight for Bikes

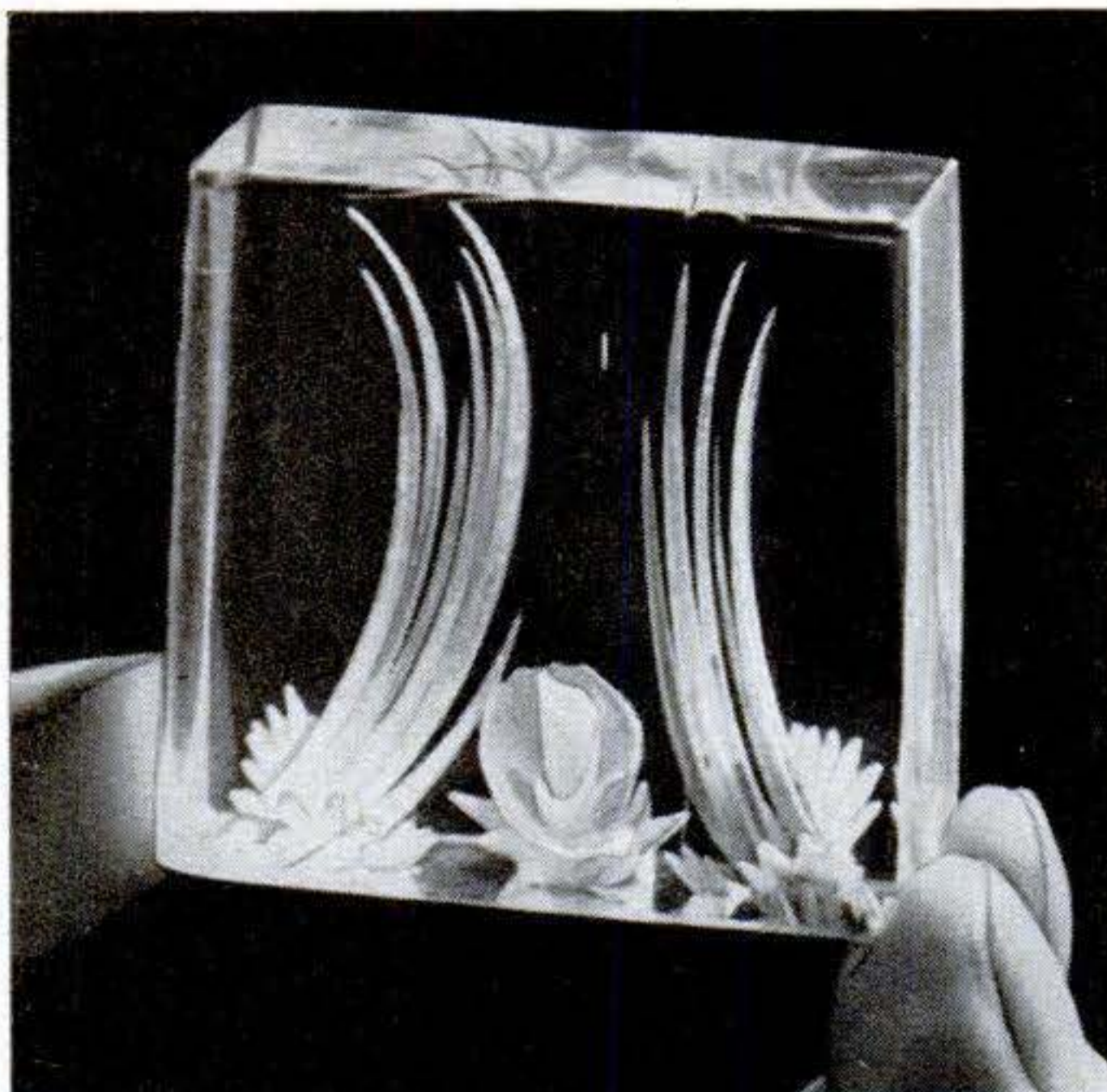
A JUNIOR edition of the one-piece, all-glass, sealed headlamp used on autos now is being manufactured by General Electric for bicycles. The lamp, mounted on the handle bars or front fender, throws a beam pattern about 30' long and 5' wide. It's rated to draw $\frac{1}{2}$ amp. at 5 volts and has a designed life of 100 hours. Either a generator* that's designed for bicycles or a battery of the 5-volt hand-lantern type operates it.

How to Drill Curves in Plastic

THE graceful curves in the plastic block pictured at right were drilled with an ordinary straight taper bit. Plastic memory—the characteristic of certain acrylics of reverting to original shape on reheating—is what changes the straight holes to curves.

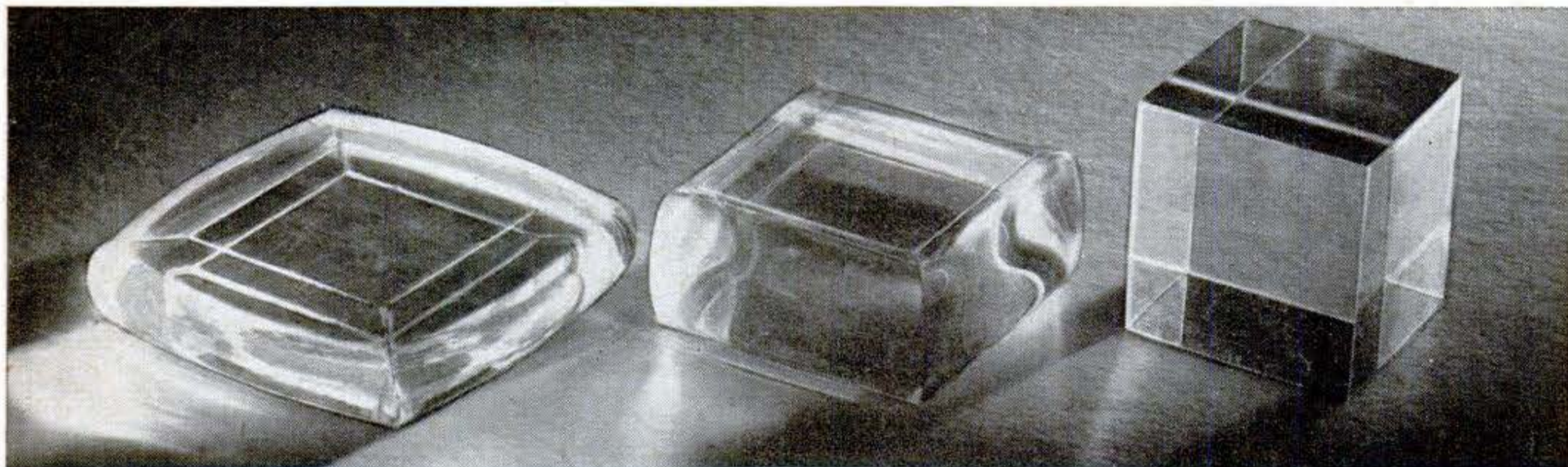
First, cut and polish a block of acrylic. Heat it in an oven and squeeze it hard in a vise, C clamp, or laminating press (PS, Dec. '48, page 204). The more you flatten it, the more pronounced will be the curves.

After it has cooled, drill the holes. It's best to drill the lines you want curved near the edges of the block. The nearer the edges they're drilled, the more they'll curve. A pleasing pattern can be formed by drilling near the four corners.

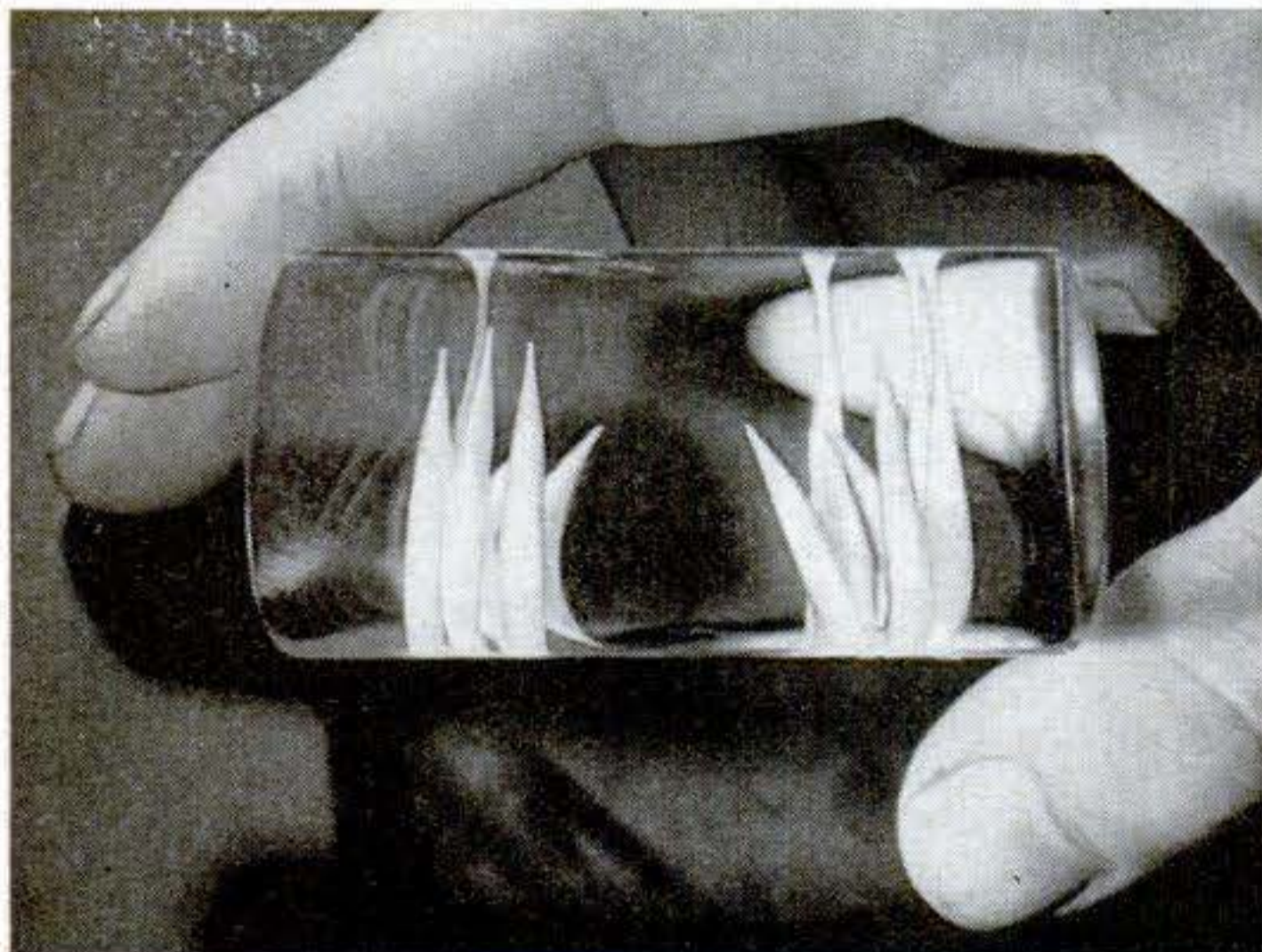


Curves combine with other internal carving to produce unusual effects. The carving may be dyed after block has resumed original form.

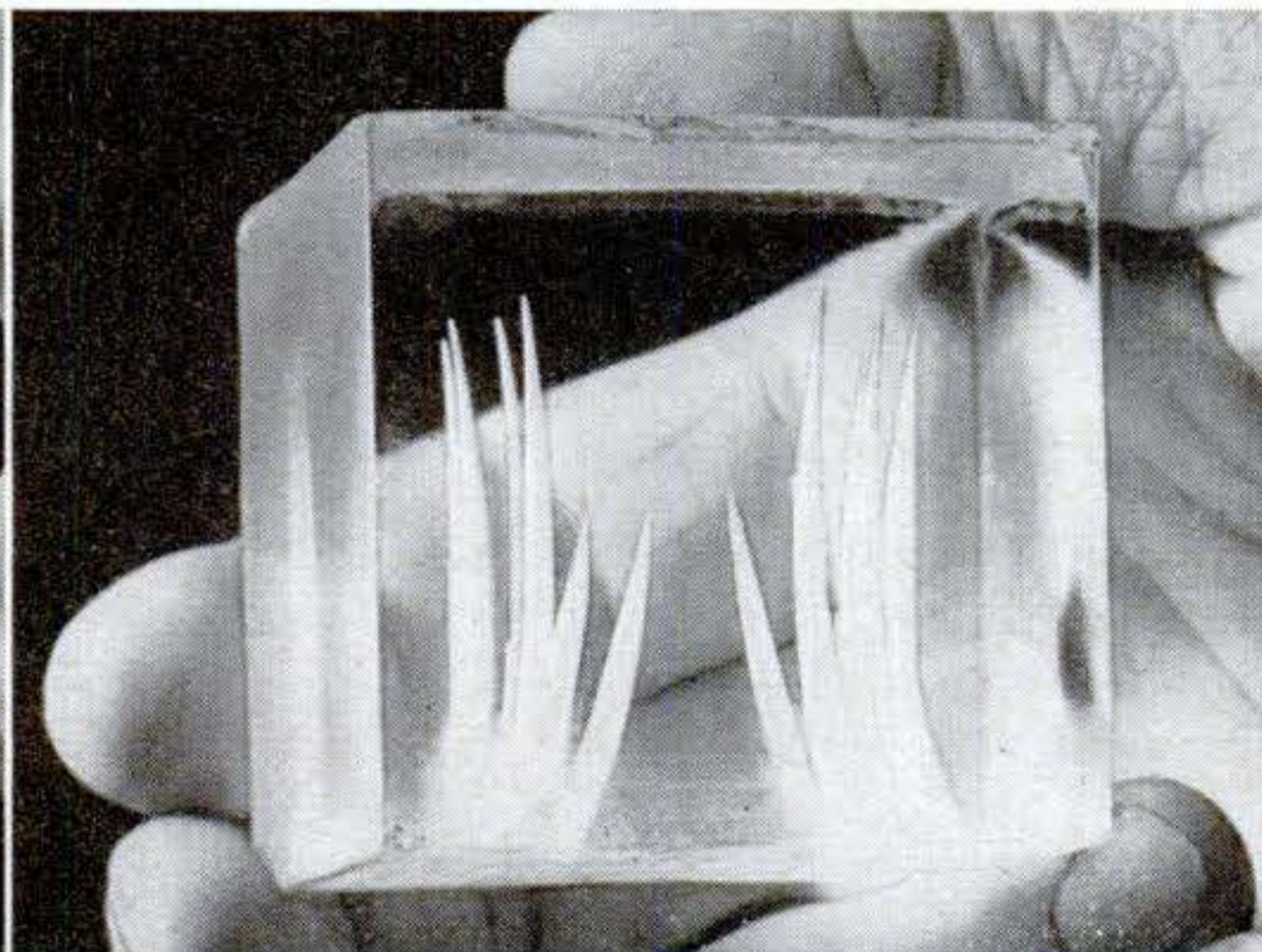
After drilling, put the block back in the oven—not in a press—and reheat until it has returned to its original shape. Do any floral or decorative carving after the block has resumed its shape. The carving then can be dyed.—*M. J. Moch, Jamaica, N. Y.*



At right is the original shape. Center shows it partially compressed. Final step is at left.



After compressing, plastic was allowed to cool. Holes, actually straight, look curved here due to optical distortion of bulged edges.



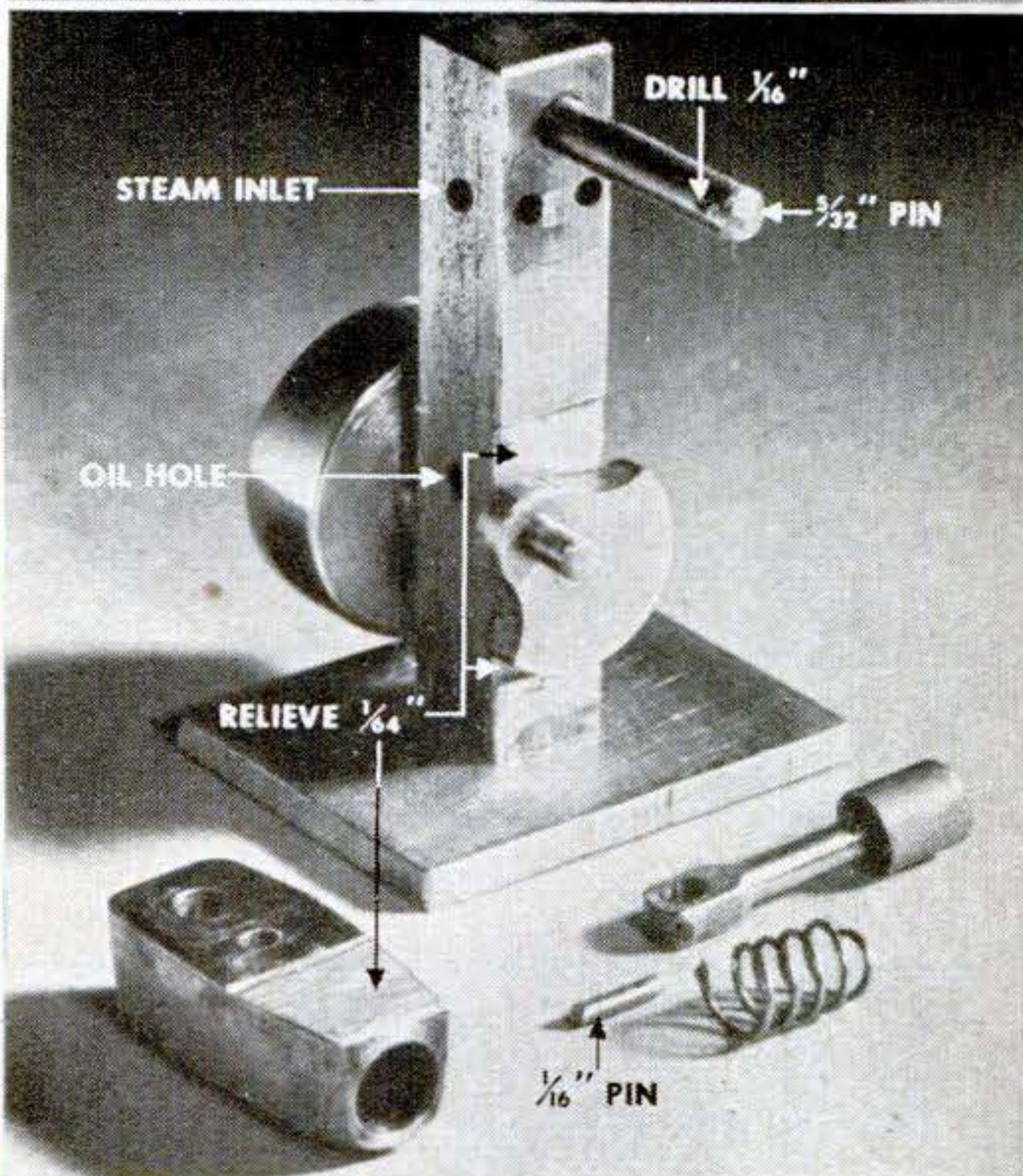
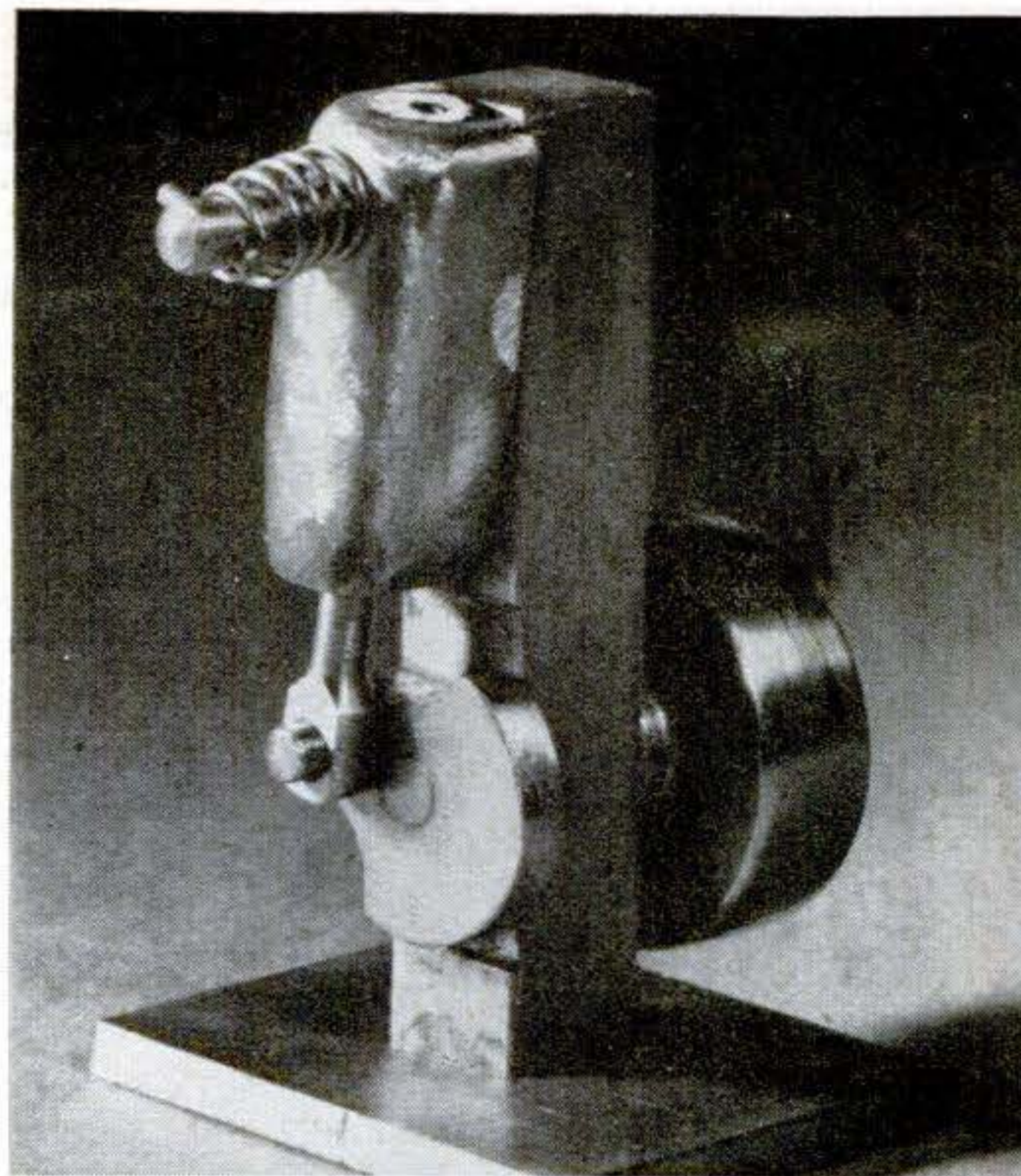
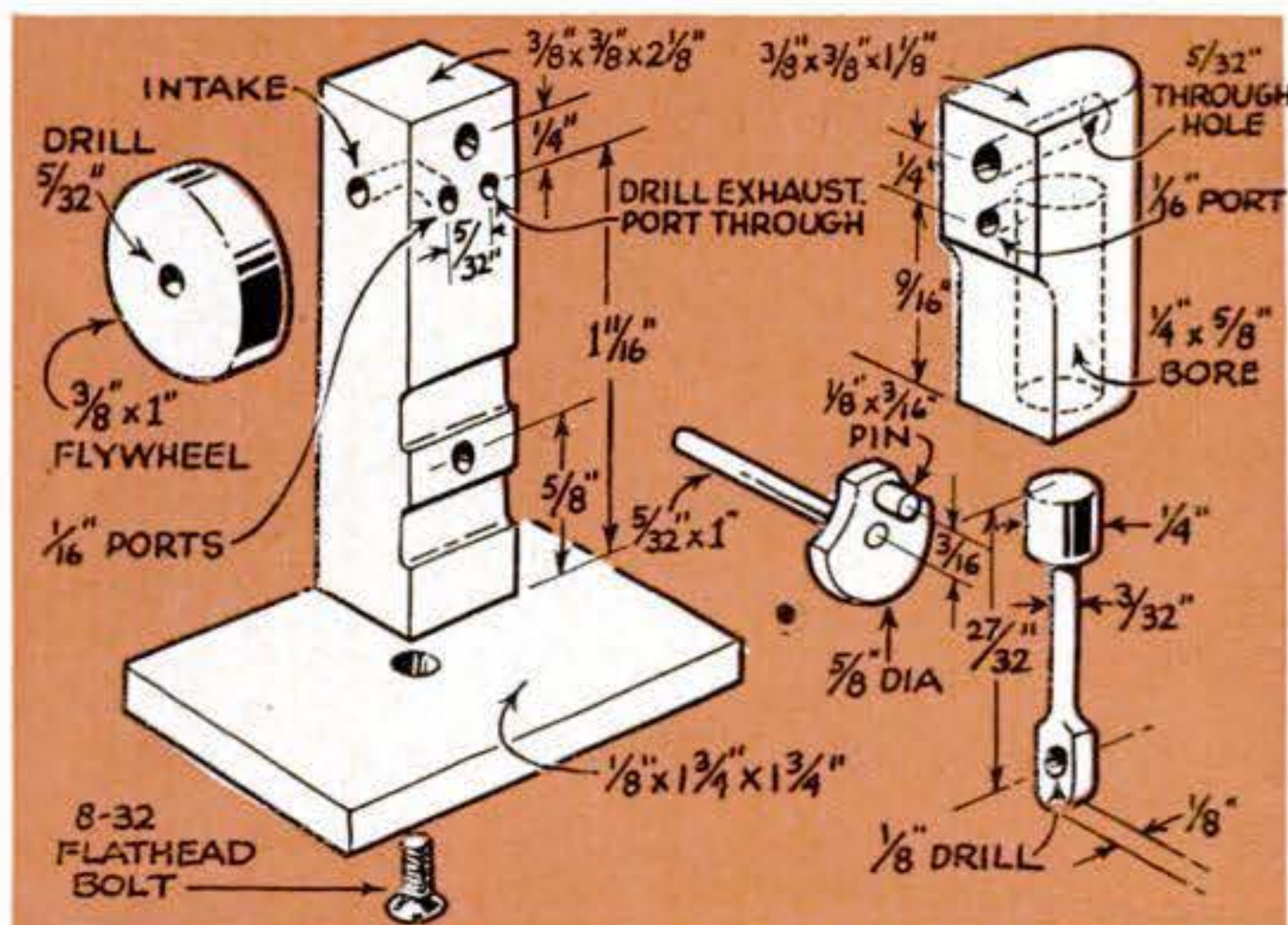
Finished block may need additional sanding and polishing to clean up surfaces that may have been scratched during work.

Midget Engine Has Few Parts

DESPITE its small size, this model oscillating steam engine puffs along smartly. It requires no castings. To make it, you should have a lathe and drill press, but you might get along without the former by substituting an available small wheel or a gear for the turned flywheel.

Precise placement of the valve ports is essential. When the cylinder is on dead center, its single port must fall exactly between the intake and exhaust ports in the post—without overlapping either. The valve face should be ground in to prevent leakage, and the lower part of the cylinder relieved slightly to reduce friction.

For the cylinder, first drill the bore $\frac{15}{64}$ " , then use a $\frac{1}{4}$ " drill. Square the bottom of the bore by using a $\frac{1}{4}$ " drill ground straight at the end. Use $\frac{1}{4}$ " cold-rolled steel or drill rod for the piston, turning down the connecting rod and filing the boss. Drill the boss $\frac{1}{8}$ ". If you have no lathe, it's entirely possible to saw and file down the con rod.—*Alfred Faux and A. Golding, Sault Ste. Marie, Ontario.*



Fireplace Form Helps Amateur Masons Do the Job



If you are planning to build an outdoor fireplace, here's a way you can ease the job. Price Fireplace Heater & Tank Corp., Buffalo, N. Y., offers a steel form around which you can place any kind of exterior—stone, brick, or concrete.

The unit includes a removable steak grill, an adjustable grate, and variable draft. For winter storage, you can pull the entire assembly out of the masonry. Called the Fyro-Grill[®], the unit stands 22" high and measures 17" wide and 21½" deep. It sells for approximately \$20.



Combination bookcase is a big space saver in a small apartment. Unit includes room for a

typewriter and typing paper as well as books. Above, hinged support for leaf is screwed on.

Bookcase Includes a Desk Shelf

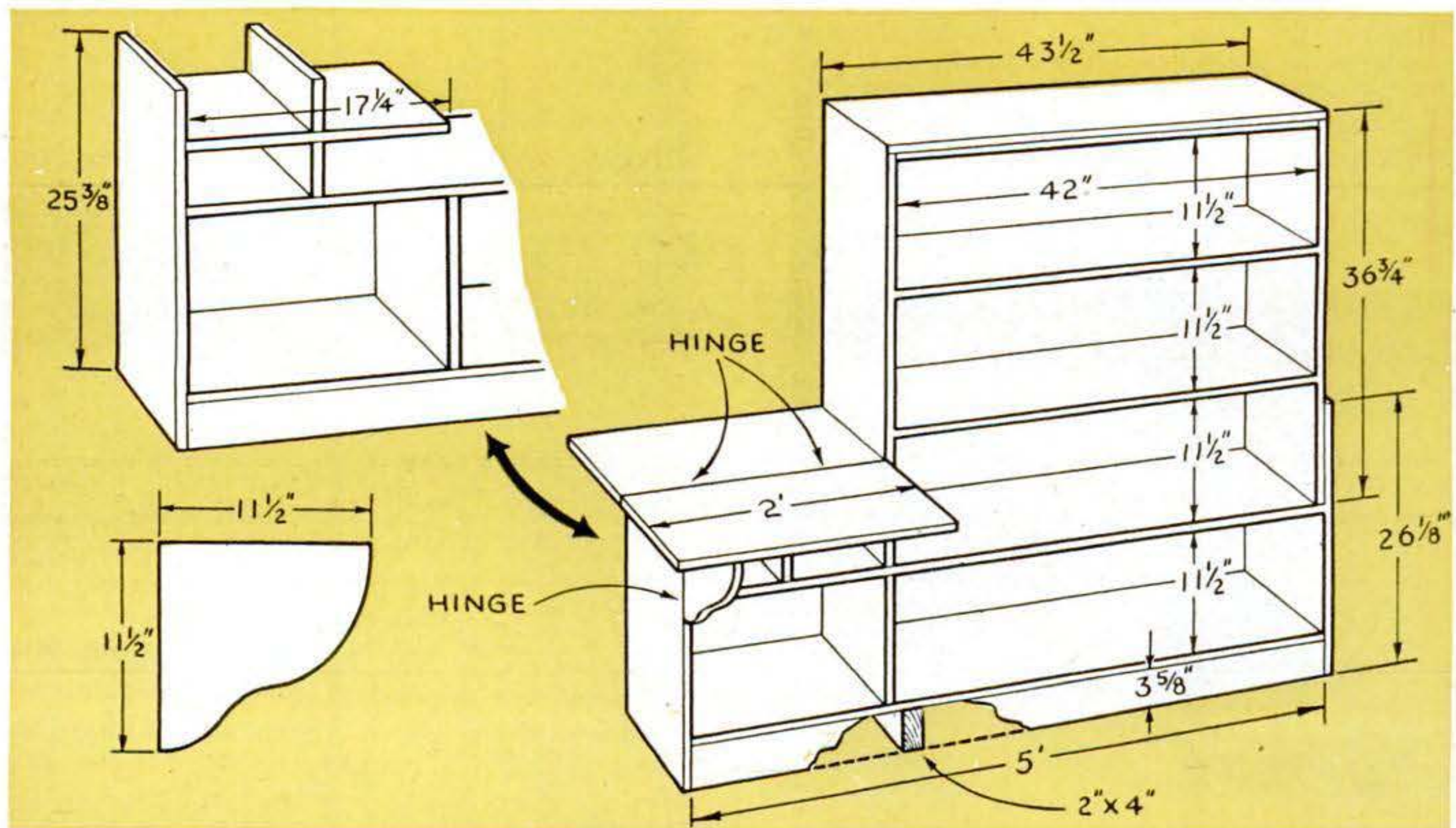
WRITING desk, typewriter stand, paper cabinet, and bookcase are all combined in this one unit. When the leaf is dropped, the cubbyholes for paper and envelopes are concealed and the top may be used as a radio table. I built this one in two sections for lightness in moving. Top, sides, and the two top shelves are one unit that fits onto the base.

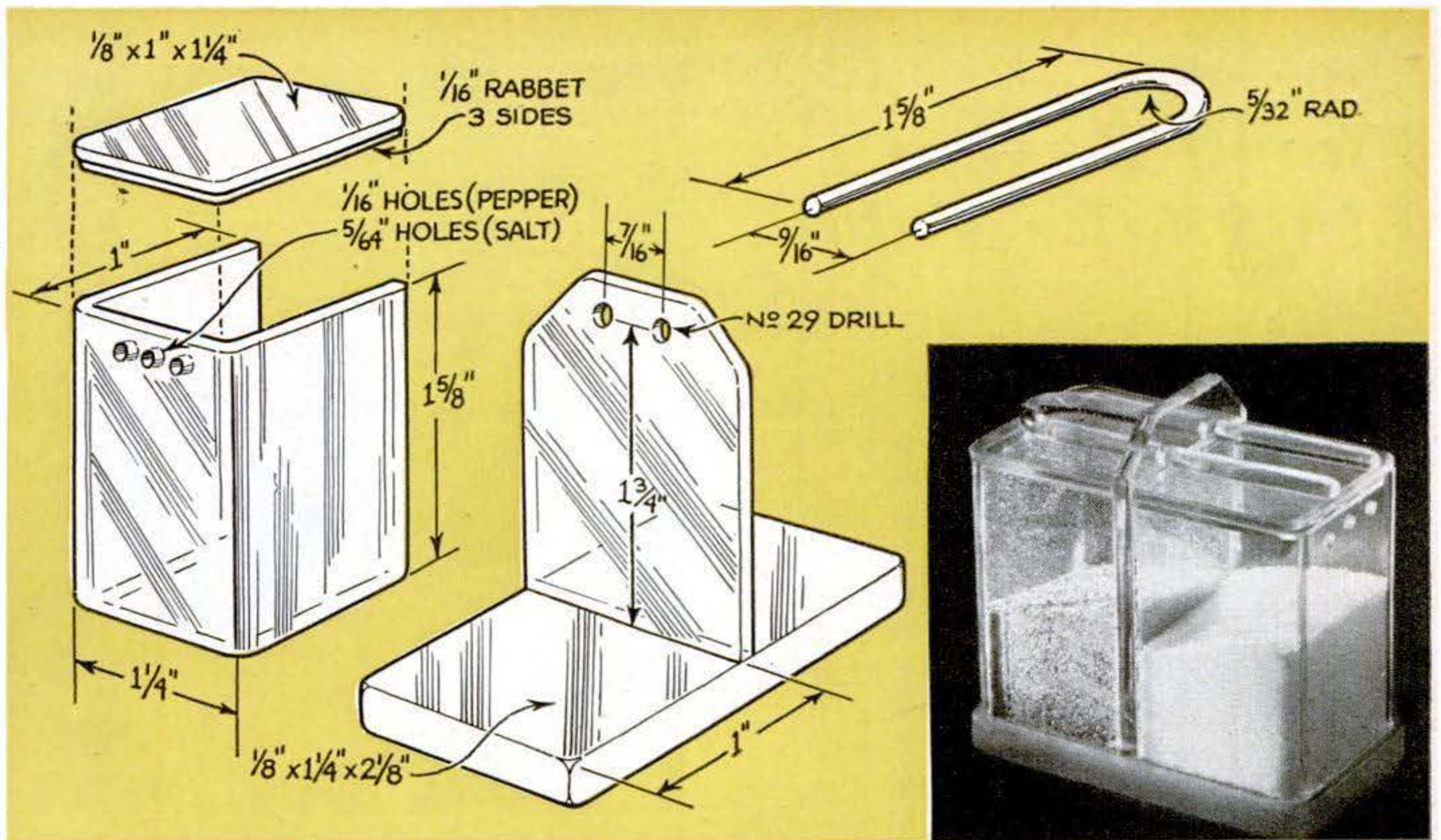
Most of the lumber used was 1" by 12". When dressed, this stock is about $\frac{3}{4}$ " by $11\frac{1}{2}$ ". In building the base, you can insert as many two-by-fours as you want, depending on the

weight the lowest shelf will have to bear.

The uprights at each end are glued and screwed to the base. One upright supports the desk top; the other stabilizes the upper section of the bookcase. The back boards are set inside the shelves for additional support. Two butt hinges join the leaf to the top. Another pair of butts is used to hinge the leaf support, which swings out of the way around the end when not in use.

Before the leaf and support are put on, the entire unit should be painted or varnished. —D. W. Brentlinger, Richmond, Calif.





Pepper Pot and Saltcellar Combined in Plastic

THIS neat little Plexiglas® package does the work of both a salt and pepper shaker. The rabbeted lids are held tightly by a removable keeper bent from $\frac{1}{8}$ " bar stock.

Bend the sides around a balsa form block after heating the plastic in an oven. Wearing gloves, hold it in shape around the block until it cools. Bending causes slight bulges at the edges of the bends. File or sand these until you have a true surface.

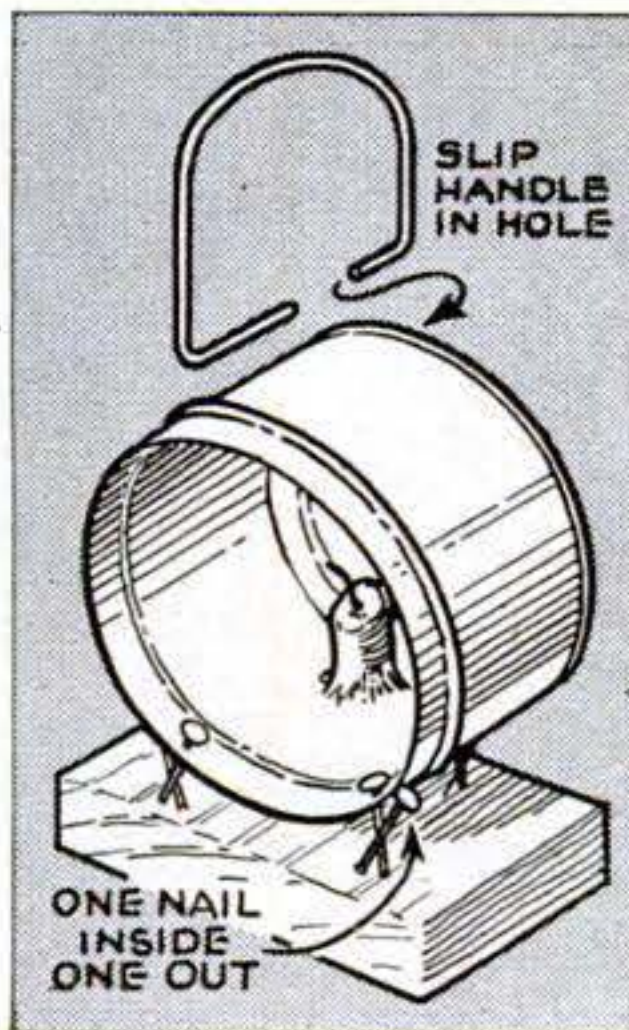
Pour a little ethylene dichloride into a saucer—just enough to cover the bottom—and soak the base of the centerpiece in it for about a minute. Spot the center on the base accurately by using the sides to locate

and square it. Let the center stand until it sets. Soak the side and bottom edges of the sides in the solvent. Do this by repeatedly dipping first one surface and then the other for about a minute. Set these in place and let them dry.

While the joints are drying, rabbet the lids. You can do this with a small router bit in a drill press, with a hand grinder locked solidly in a jig, or by careful filing. Fit the lids in place and lay out the holes for the keeper. The bottoms of these holes should be slightly below the tops of the lids. When pressed into place, the keeper will then hold the lids.—*Frank Pars, Washington, D. C.*

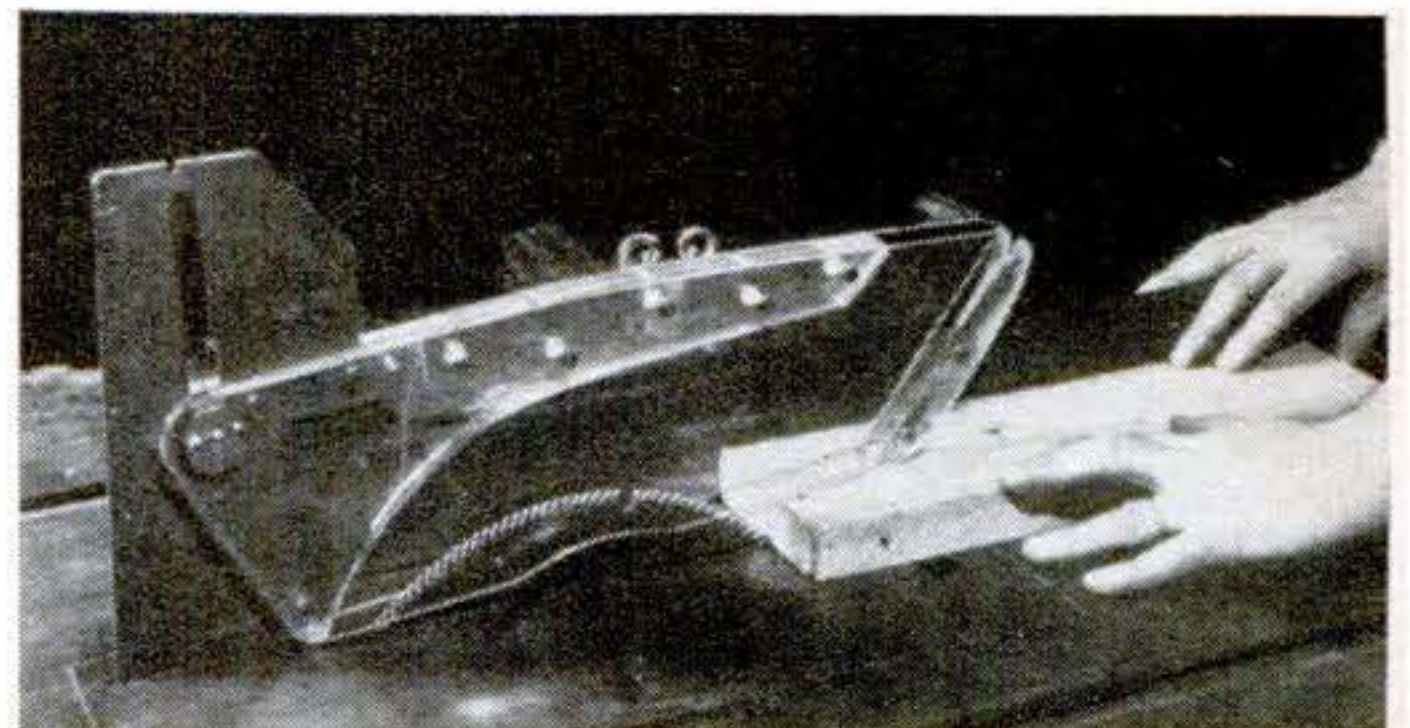
Lantern Made from Can

EVEN on windy nights the candle in this make-shift lantern won't blow out. As shown



in the sketch at left, six nails hold a coffee can to the base. Three of the nails pass through the can. The handle is a piece of stout wire that's bent to shape. One end fits in a hole in the rear of the can and the other end is turned under to hook below the front rim.—*W. J. Spangler, San Francisco.*

Saw Guard Is Transparent



MADE of Plexiglas® by the Laminated Sheet Products Corp., Boston, this guard covers the blade but permits the operator to view the work. It's for circular saws from 8" to 20" and comes in two sizes, one for stock up to 3" and the other for thicker.

Floral Basket Lights the Table

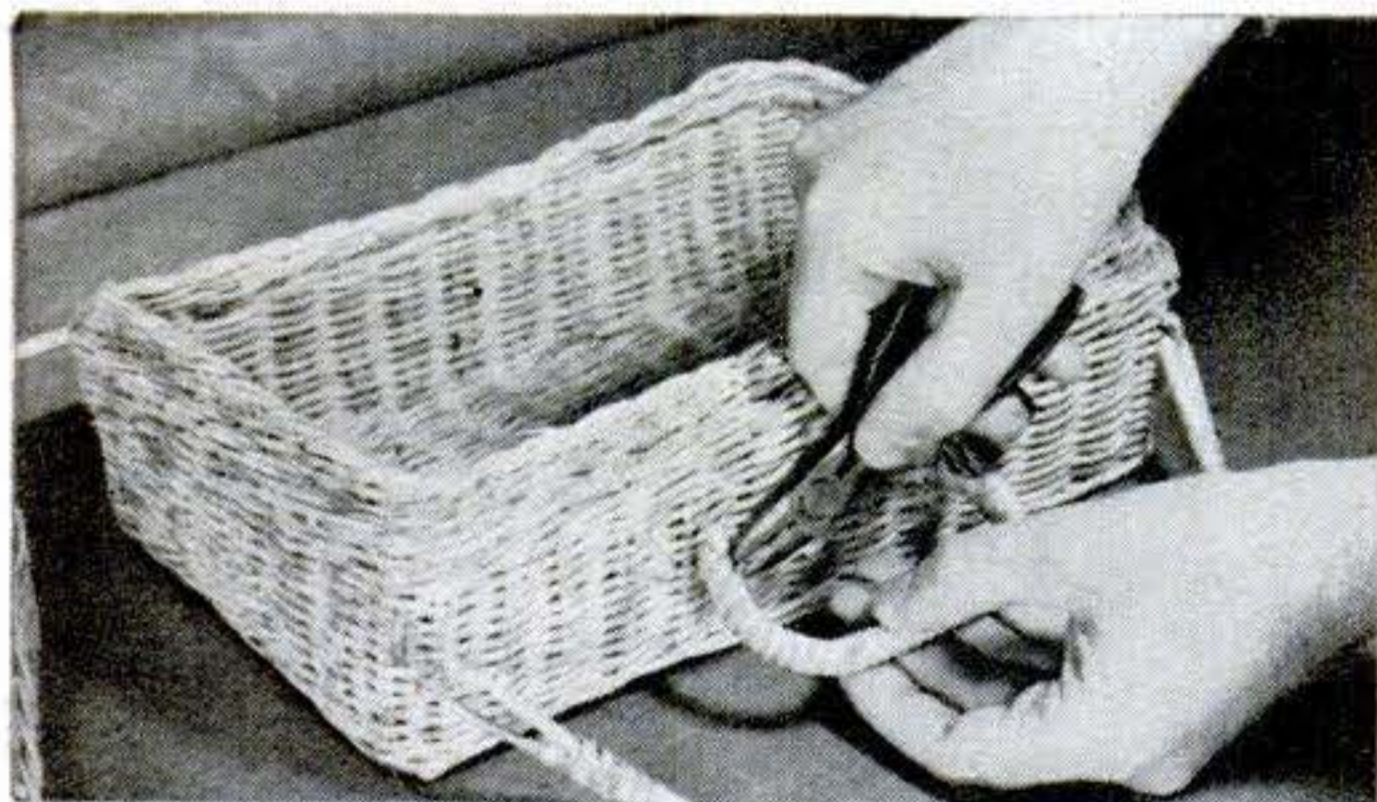
TWO 12" rulers, a small wicker basket, and a bread pan are the main parts of this illuminated flowerbox. Used as a centerpiece or as an addition to an occasional table, the pair of 25-watt showcase bulbs throws a subdued light. The basket pictured here cost \$2. It measures 5¼" by 7½" by 12". A bread pan that holds the soil just fits the bottom.

First step is to remove all excess parts—handles, hinges, and latch. The wiring runs up one of the rulers—or a wooden strip the same size—through a 9" section of metal curtain rod. Two small strips cut from a tin can clamp the rod to the ruler. Both rulers are painted yellow to match the basket.

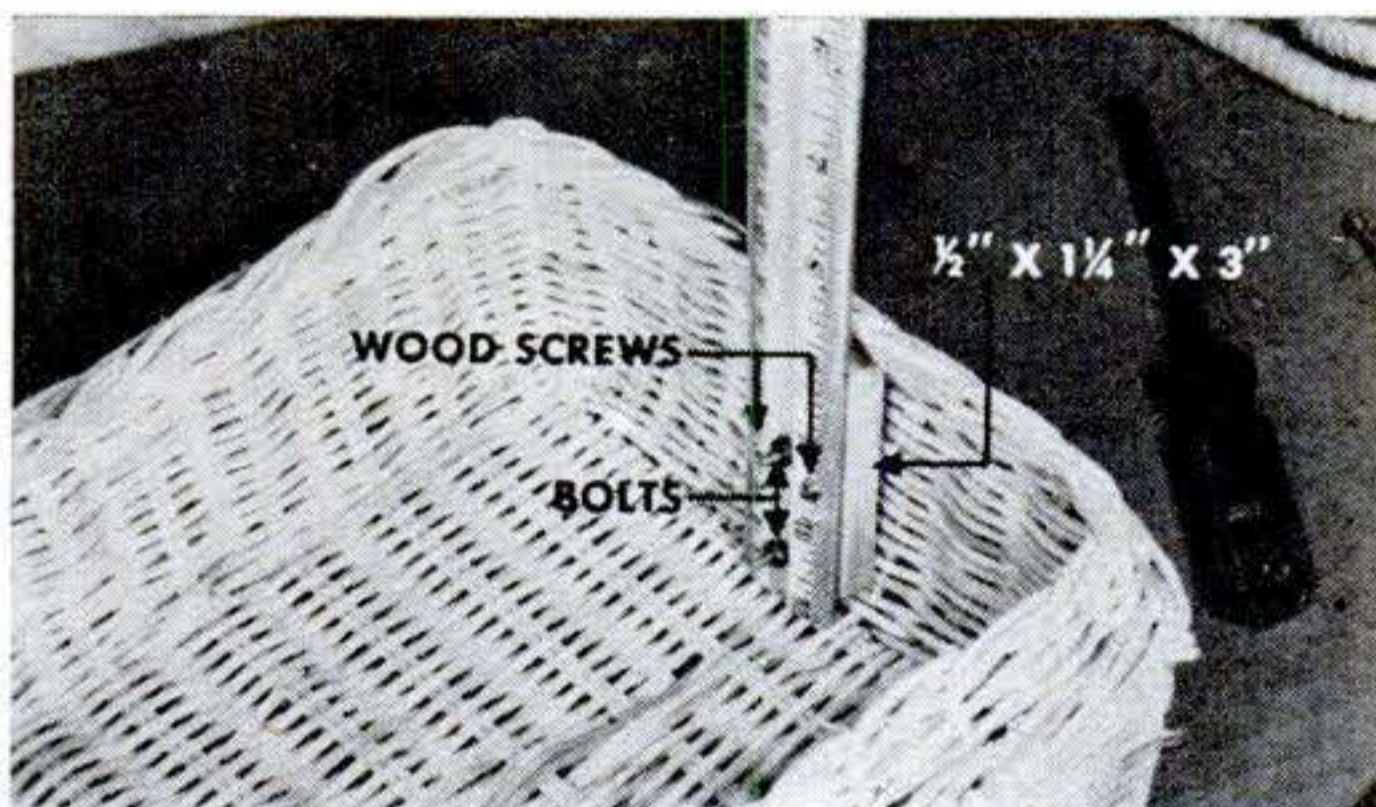
Machine screws hold the wooden blocks and rulers to the ends. Use washers under the heads of the screws on the outside of the basket. Otherwise, the heads may slip through the wicker when the nuts are tightened. Intermediate-size receptacles are



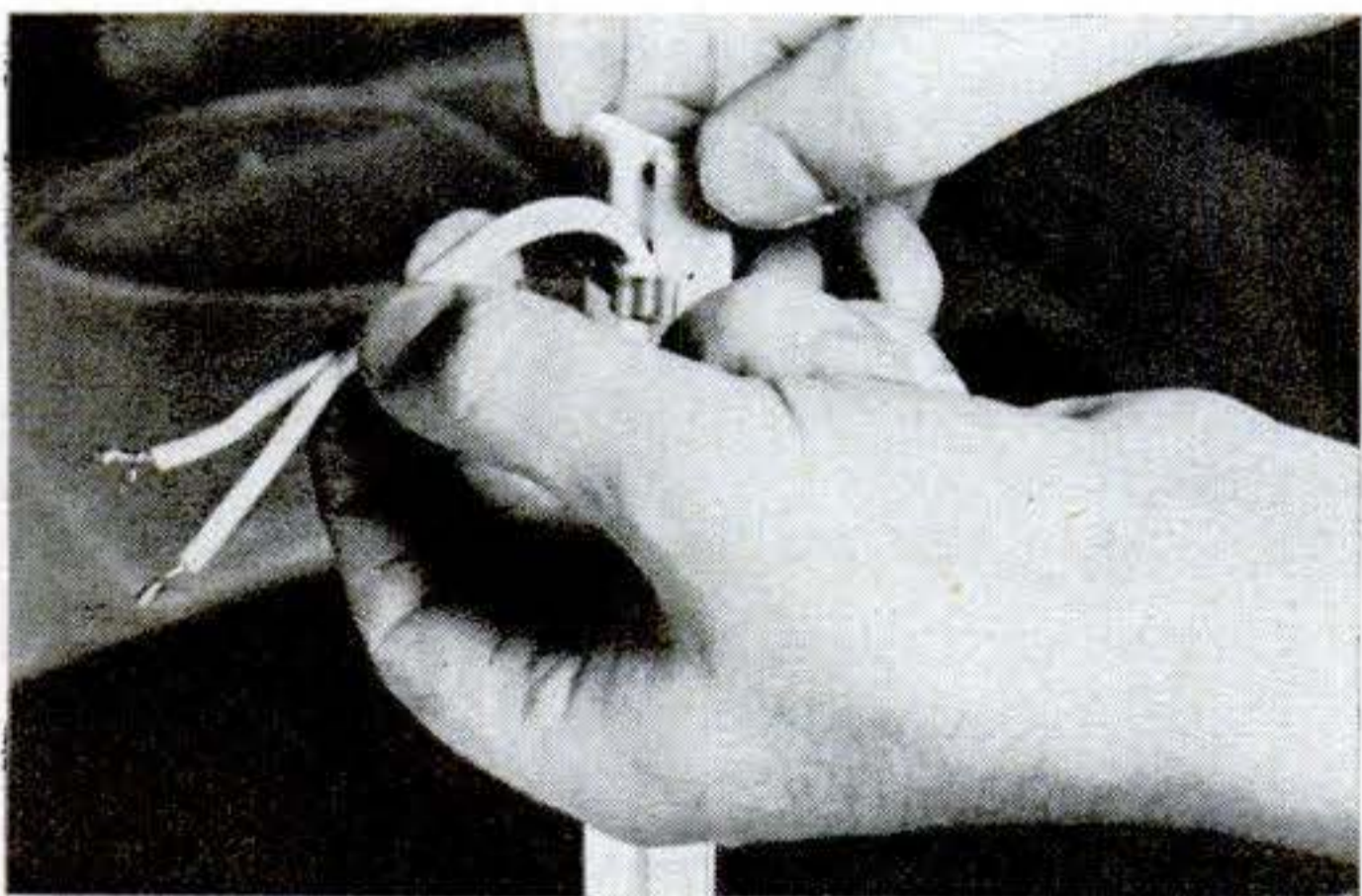
mounted on a wooden crosspiece. Two small angle brackets and machine screws through the wicker hold the crosspiece in the top. A small feed-through switch on the cord completes the wiring. Ivy, cactus, or philodendron will look well in the basket.—Arthur C. Miller, Manhattan, N.Y.



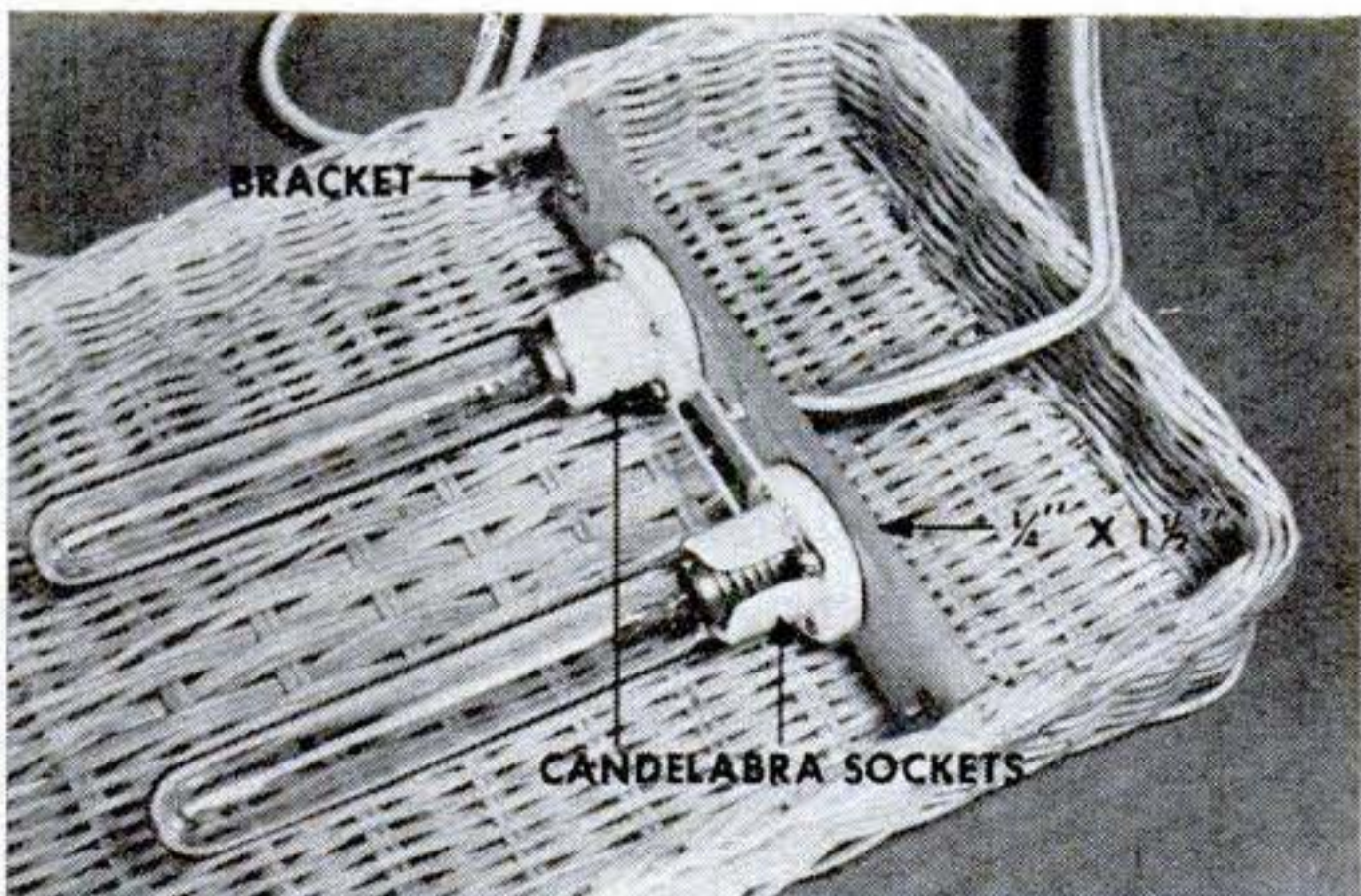
All unused parts such as hinges, clasps, and handle were removed by snipping the wicker bindings with wire cutters.



Rulers and small blocks of wood are fastened to sides of basket with machine screws. Heads of screws and washers are on outside of basket.



Lamp cord was passed through piece of metal curtain rod that was then clamped to ruler. Two 12" rulers support top of basket.



Two 25-watt showcase bulbs provide light. Sockets are mounted on wooden crosspiece that's held by angle brackets and screws.

Lazy Susan Spins on Ball Bearing

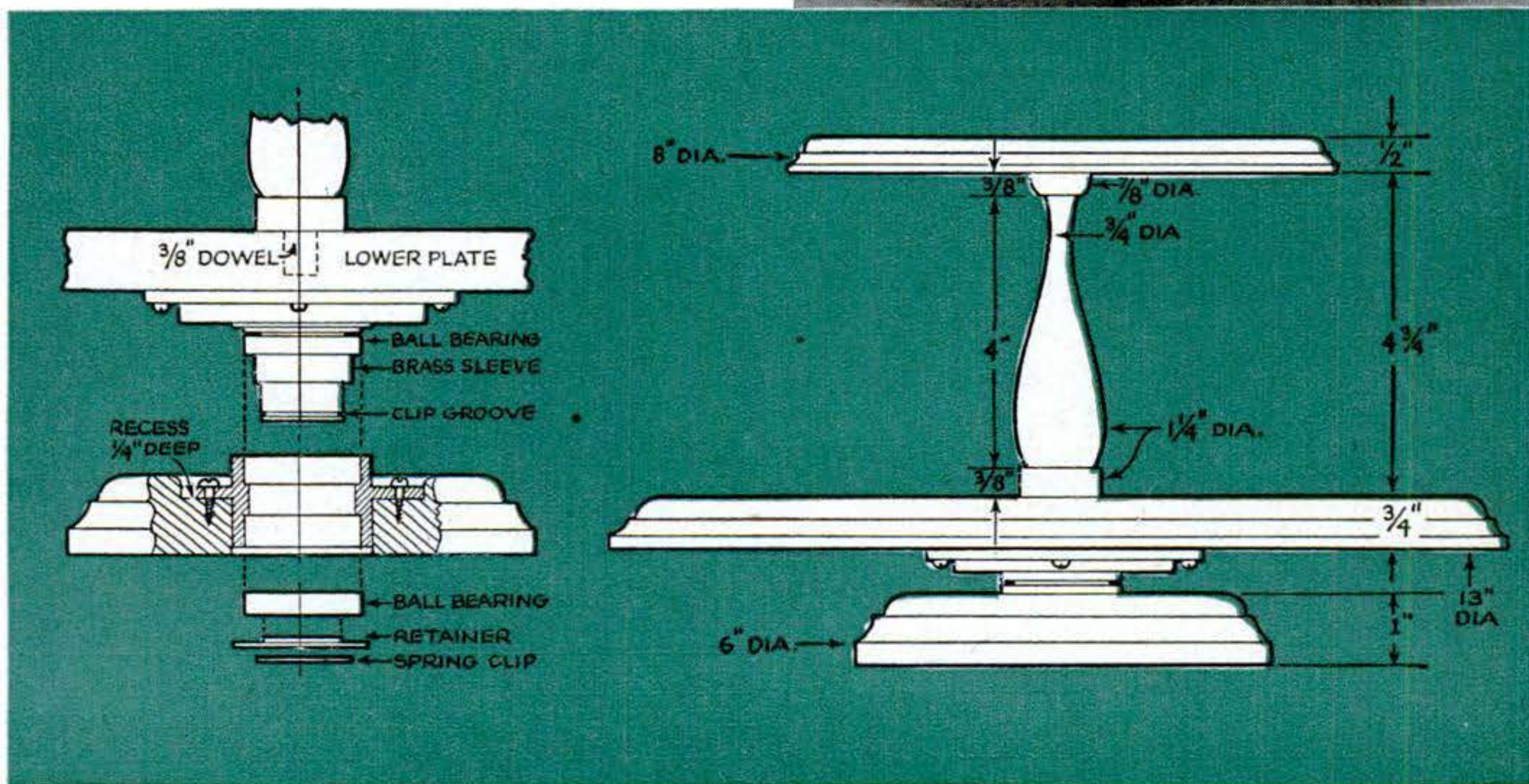
NICELY balanced, this Lazy Susan whirls at the touch of your finger. Set into its base is a high-grade ball bearing I picked up in a war-surplus store for 75 cents. Supposedly, it came from a dismantled range finder. However, you can use any kind of bearing you happen to have on hand. If there's nothing better around, a roller skate wheel will serve adequately.

Wood of three different thicknesses was used for the table—1" for the base, $\frac{3}{4}$ " for the lower plate, and $\frac{1}{2}$ " for the upper. Chances are you'll have to glue up stock for the 13" lower plate. Rounded and smoothed on a lathe, this has a decorative edge turned on it, as does the 8" upper plate. The post that connects the two plates is turned with a short $\frac{3}{8}$ " dowel on each end.

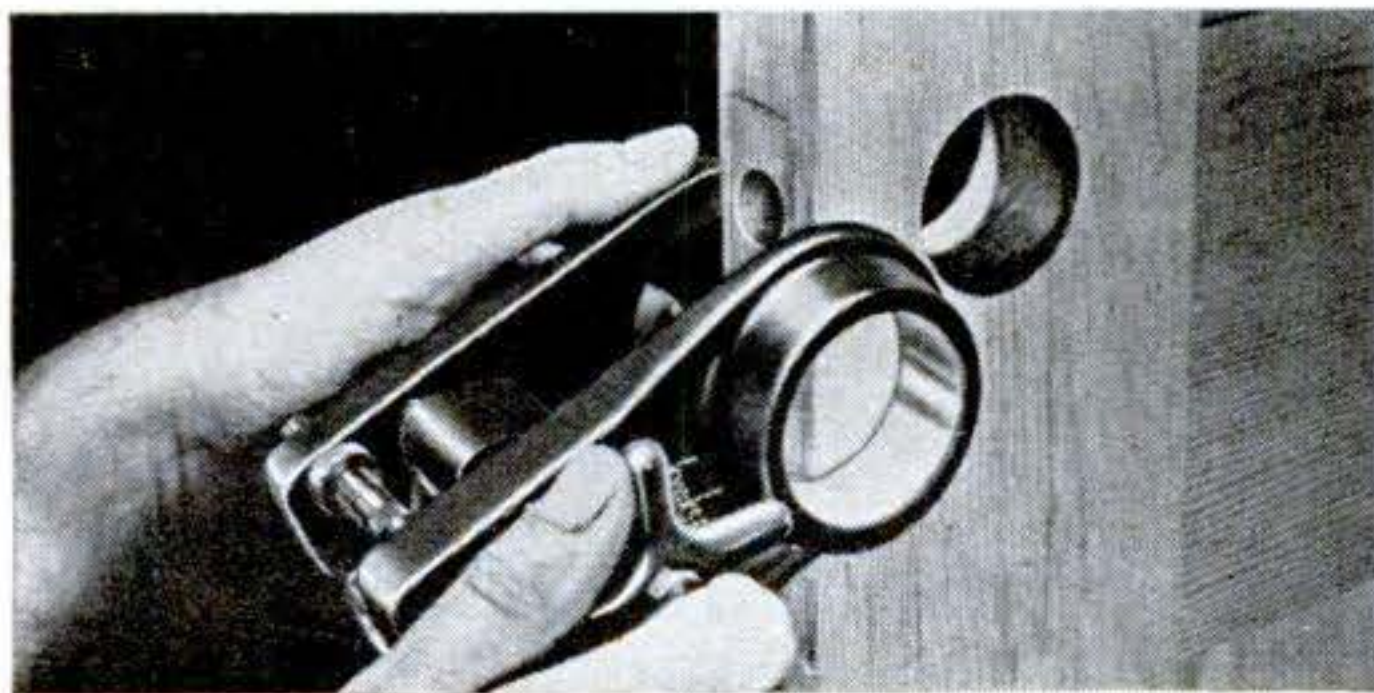
The bearing was taken apart for mounting. After boring a hole through the wood base, I dished out a depression in the top face and seated the bearing casing with

screws. The bearing shaft was screwed to the bottom of the lower plate.

Before final assembly, I gave the table a triple coat of diluted shellac, followed by wax.—Norbert Engels, South Bend, Ind.

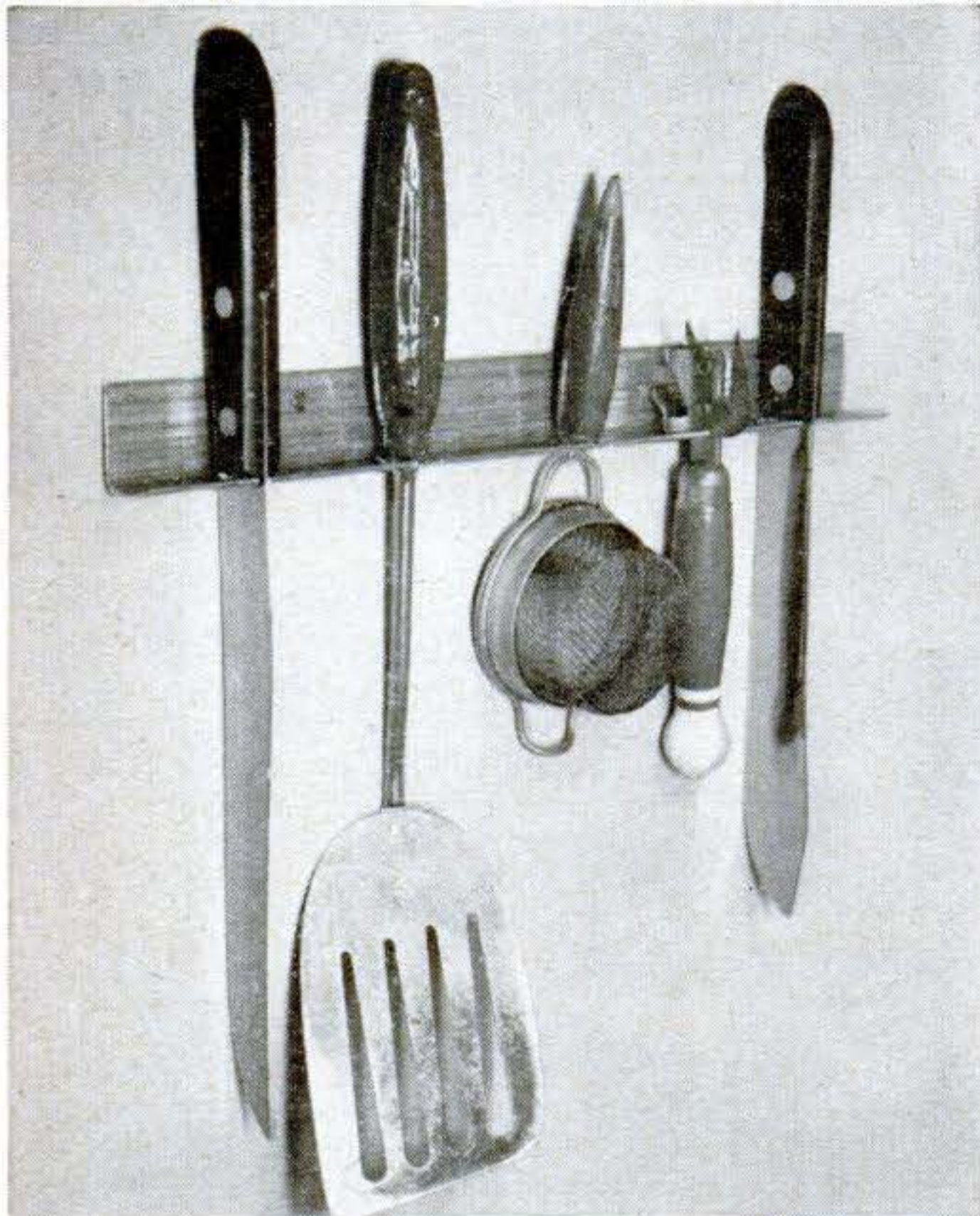


Drill Jig Reduces Door-Lock Installation Time



CLAMPED to a door, this drill jig is said to assure a perfect lock fit and to speed up installation. A product of Kwikset Locks, Inc., of Anaheim, Calif., it's designed especially for door locks made by this company. A spacing screw permits accurate adjustment on doors ranging from $1\frac{1}{4}$ " to 2" thick. Made chiefly of aluminum, the jig weighs $2\frac{1}{2}$ lb. It's priced at about \$4.

Offbeat Jobs for Metal Molding



Kitchen utensil rack is a section of stair nosing. Hacksaw the slots in curved edge to take utensils, and then nail or screw to wall.

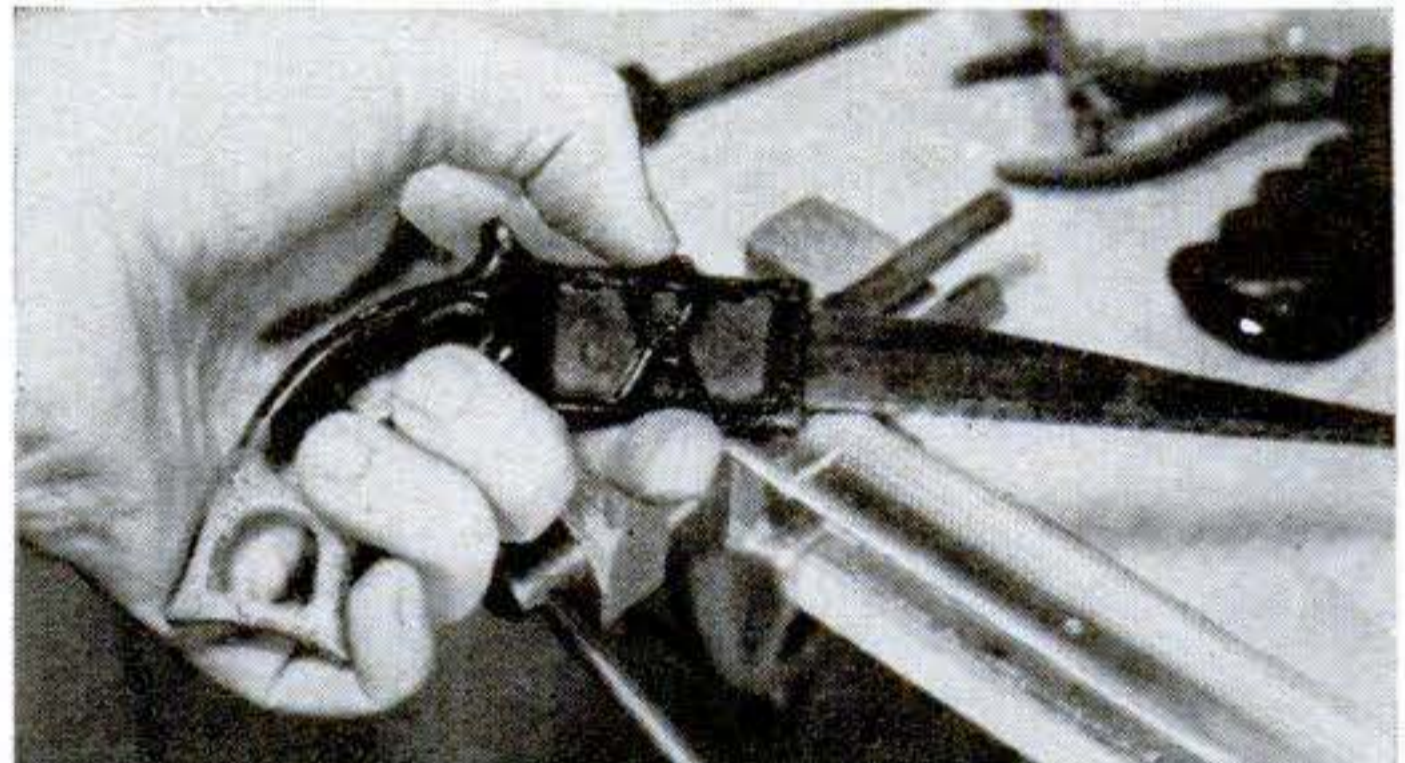
THE metal moldings and strippings sold in most hardware stores have scores of additional uses around the home. Besides those shown here, your own needs undoubtedly will suggest others.

Aside from the zinc linoleum binding that's been around for years, moldings now generally available are aluminum alloy or stainless steel. The former is a bit less expensive and is easier to work; the latter is stronger and can be soldered or brazed. A hacksaw, hand drill, and files are all the tools you need.

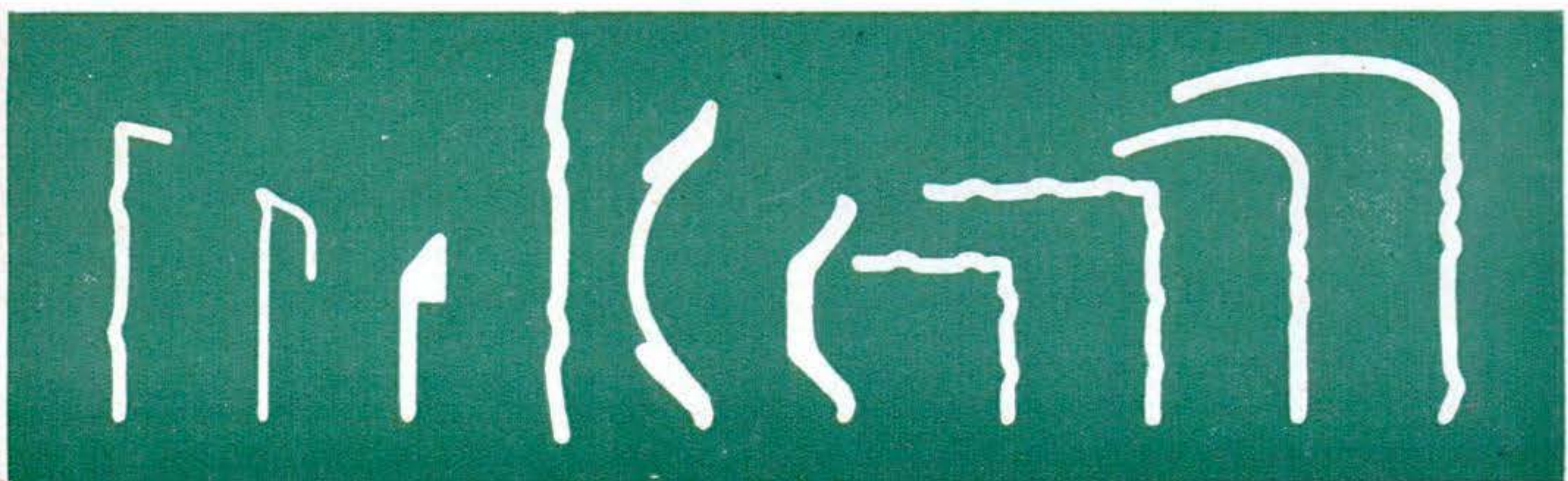
Make 90° bends in L-shaped molding by first filing a V-notch in the flange. Curves can be bent freehand but it's usually best to bend them around a solid object of about the right radius. In designing complex projects, give some advance thought to assembly and what holes need to be drilled. Otherwise, you might find yourself in a situation where a bend prevents drilling. The moldings in sectional views below are aluminum alloy, made by R. D. Werner Co., Inc., New York City.—A. C. Miller, Manhattan, N. Y.



Bracket for wall lamp is bent of 1¼" flat decorative strip. Socket is attached through a ⅜" hole at the top of the straight section.

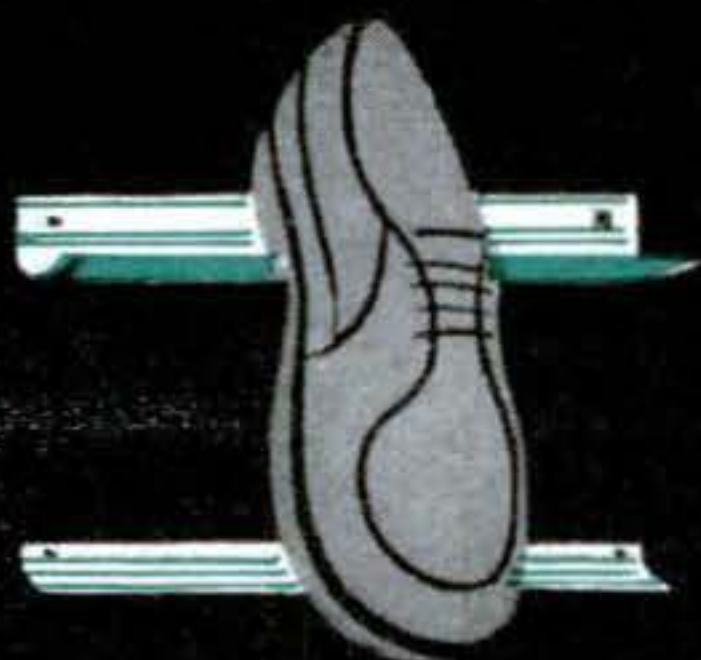


Molding is cut with hacksaw. File also may be used. For greatest accuracy in making cuts, a simple miter box to guide saw is desirable.





Tie rack is made by bending flat molding and screwing or nailing it to a door.



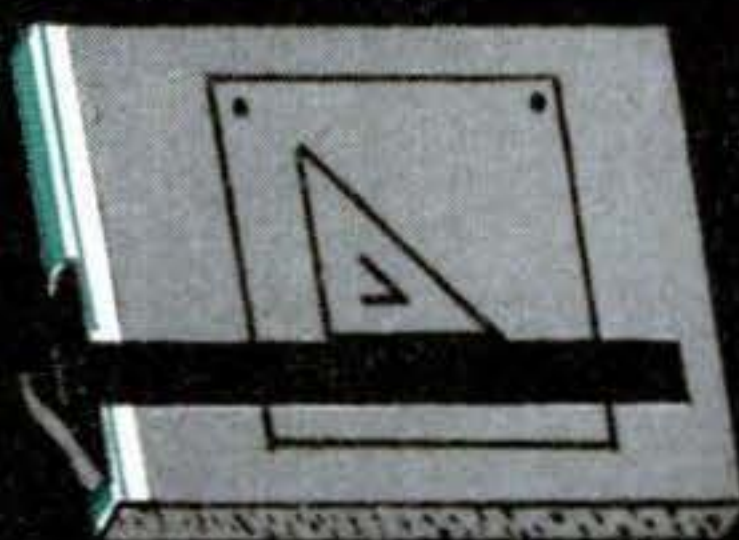
Stair nosing reversed is a shoe rack. Piece of cove section helps support shoes.



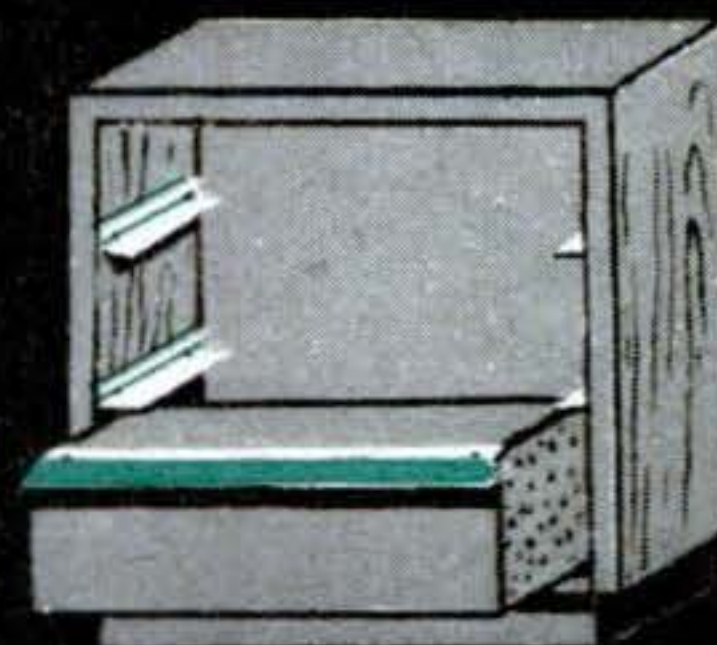
Telescoping book ends are made with stair nosing sliding in slots in plywood ends.



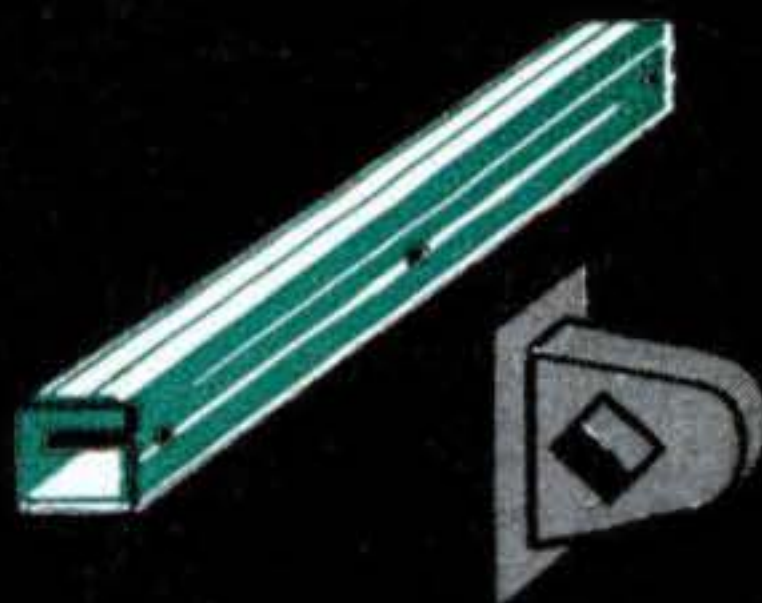
Pep up drinking glasses with two flat strips bolted to plywood handles.



Use angle piece as straight-edge on a drawing board. Countersink the screwheads.



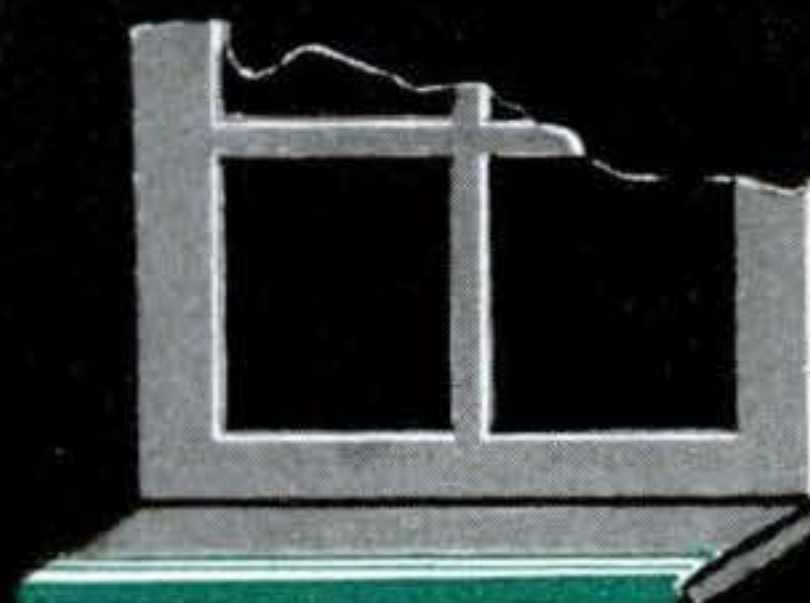
Chest has drawer slides of angles while strips of nosing are used as drawer pulls.



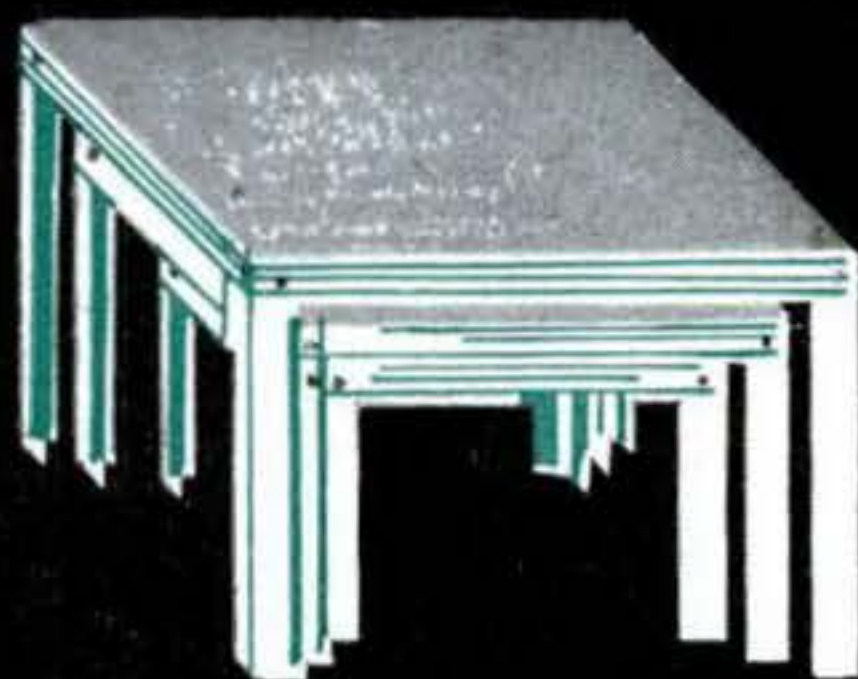
Two lengths of angle, bolted together and fitted in wooden fixtures, make towel rack.



Cove sections serve as guide rails for sliding doors of wood or glass on shelves.



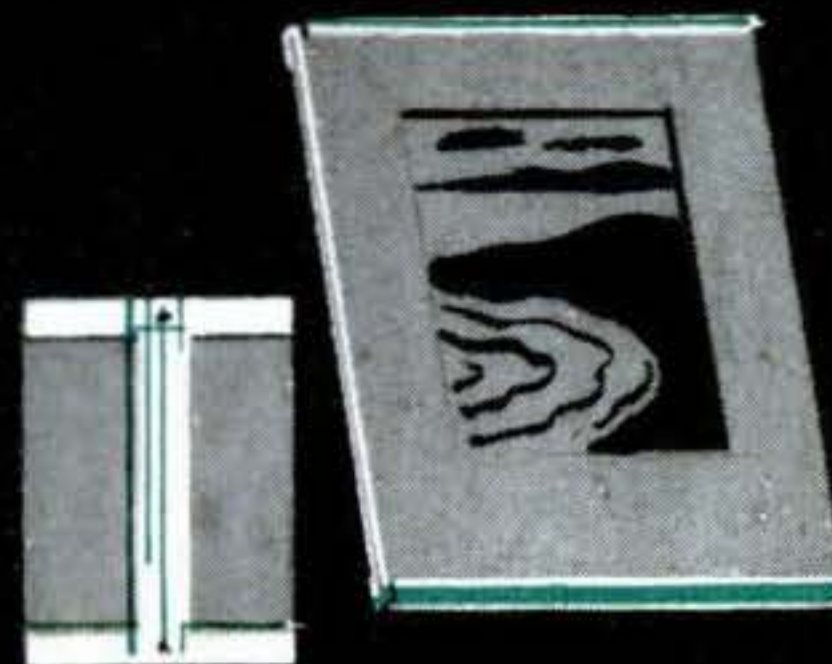
Dress up window sills by covering with linoleum and edging with stair nosing.



Nest of small tables has angles for legs. Nail edging around the tops.



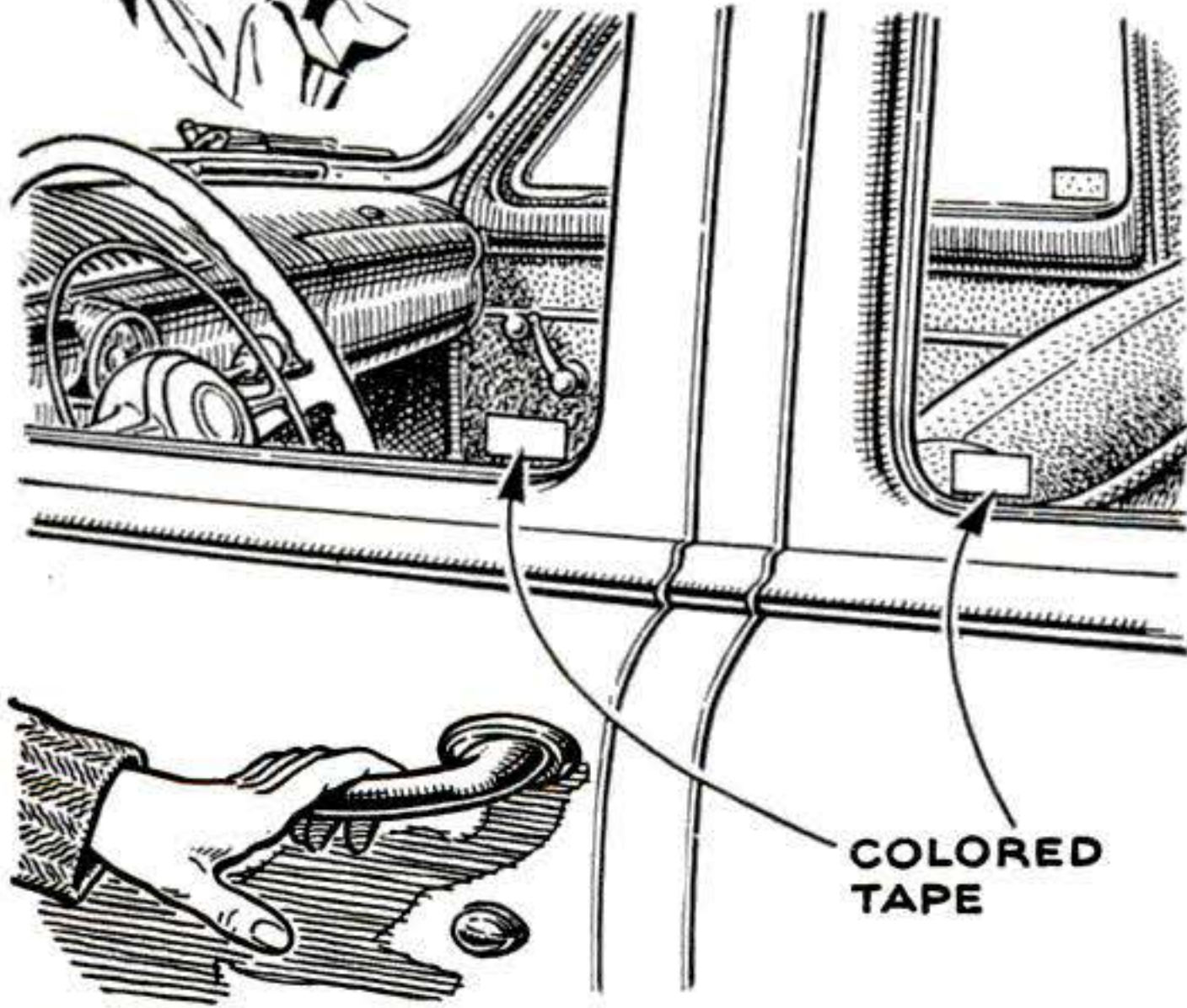
Bracket for wall lamp is bent from length of flat molding and screwed to wall.



Top and bottom of picture frame is cap molding. Flat strip joins them in back.

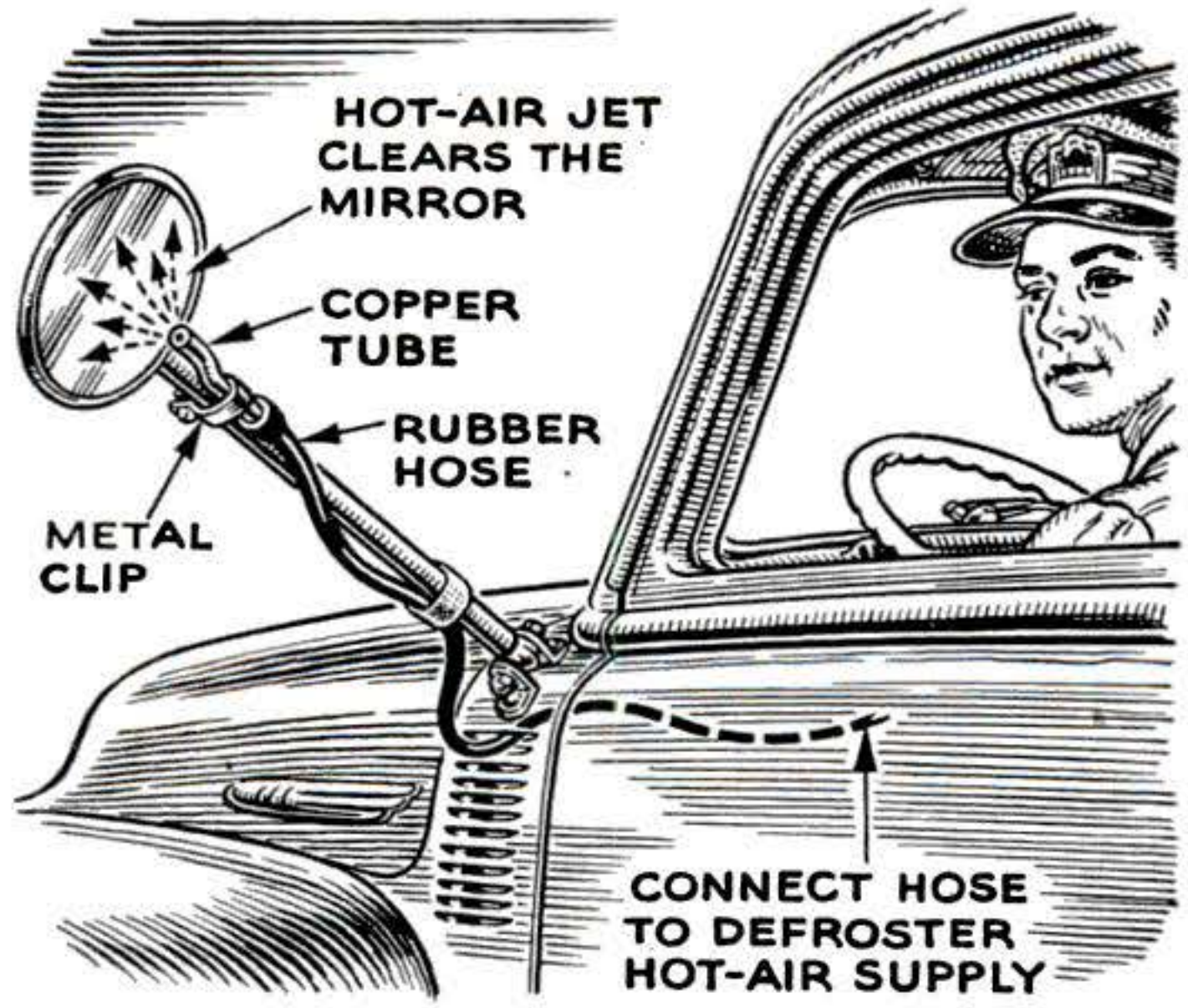


Hints from the Model Garage



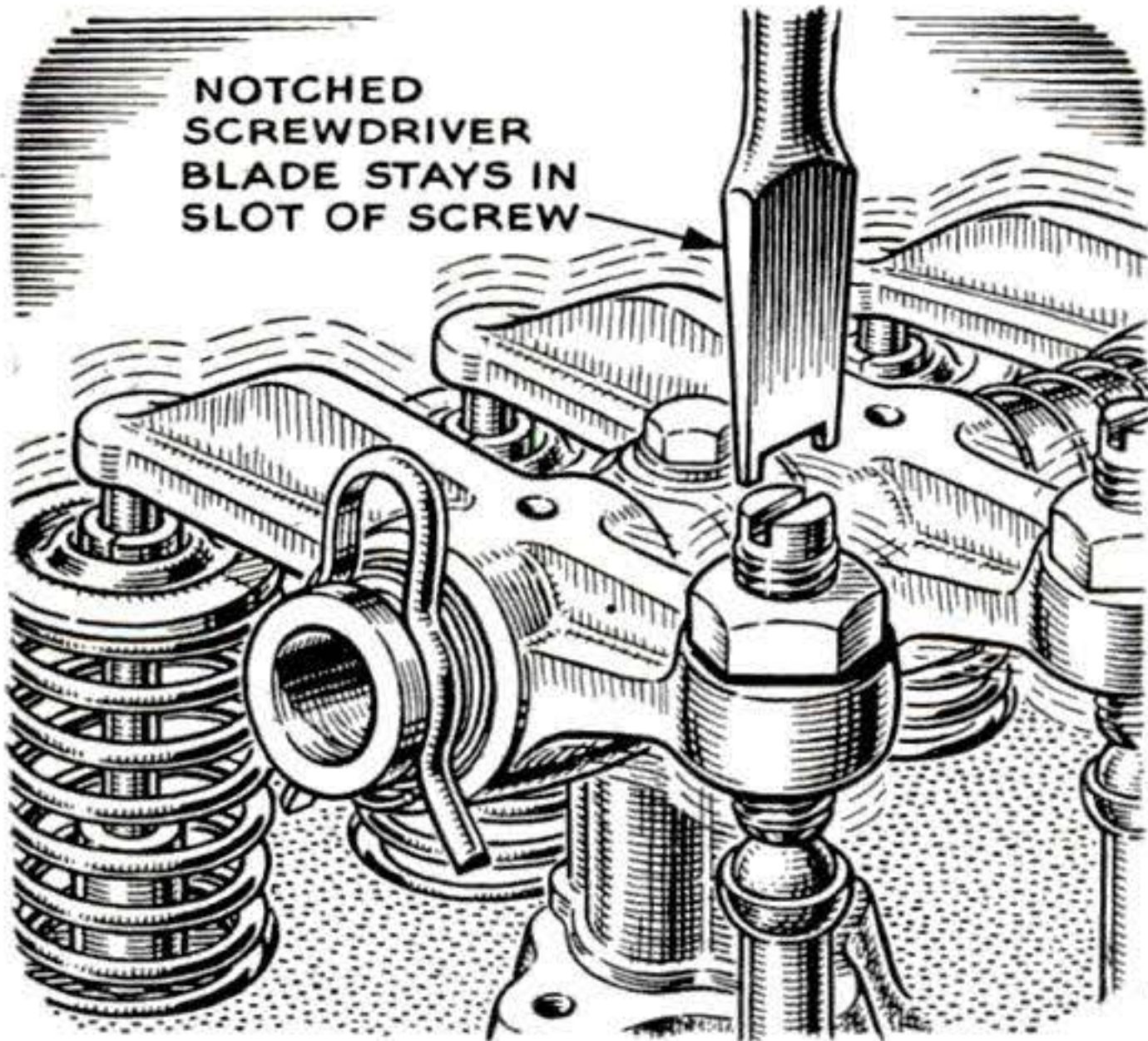
Tape Shows Windows Are Up.

If you keep your car windows clean, it may be difficult to tell that they are up when you're locking the car. Small spots of colored tape applied to the inside near the bottom will show you at a glance.



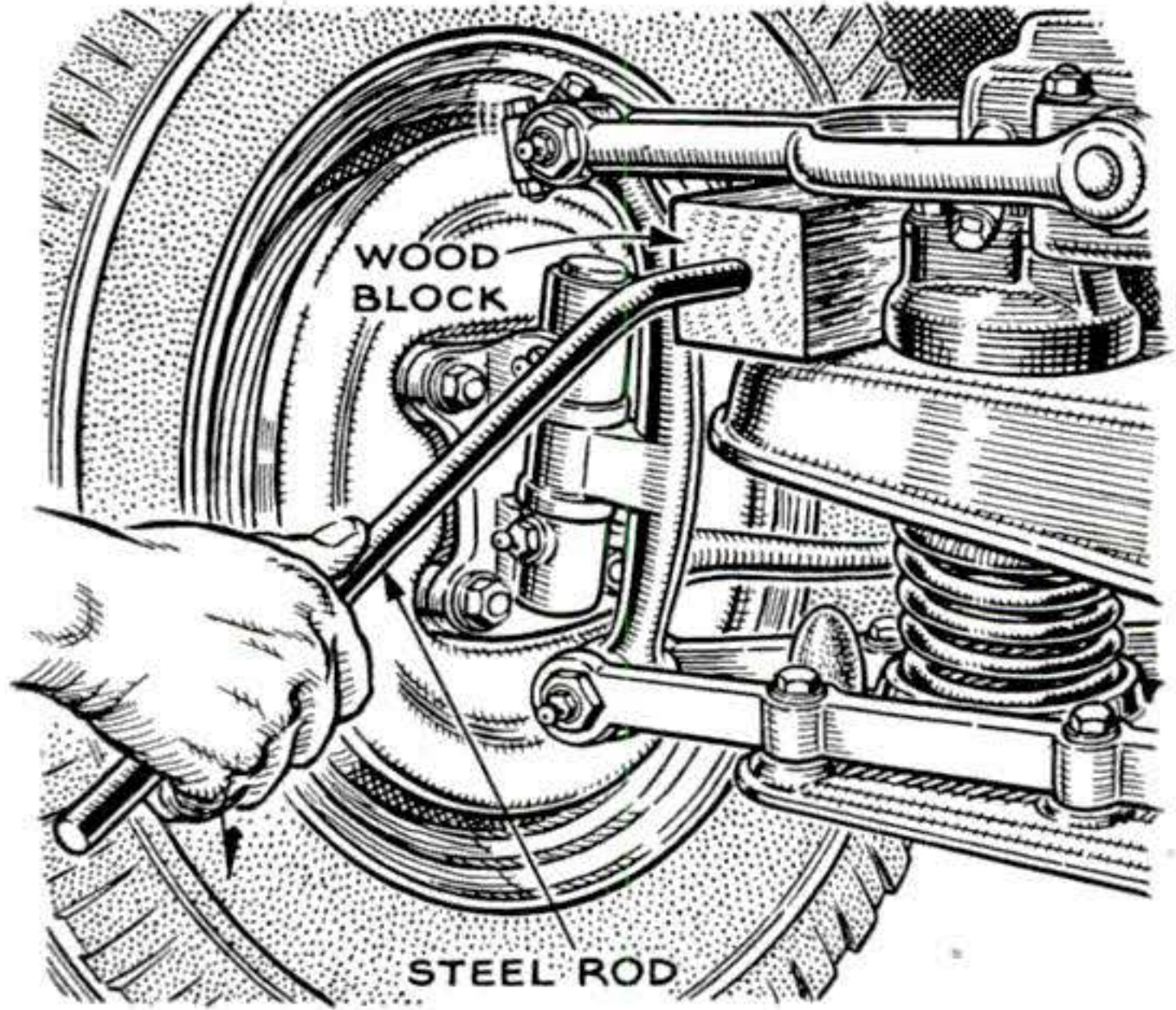
Defroster Clears Mirror.

In sleety weather, Ronald Weller, of Jerseyville, Ill., found that the rear-view mirror on his truck frequently became coated with ice. To keep the mirror clear, he ran a rubber hose from the defroster out to the mirror.



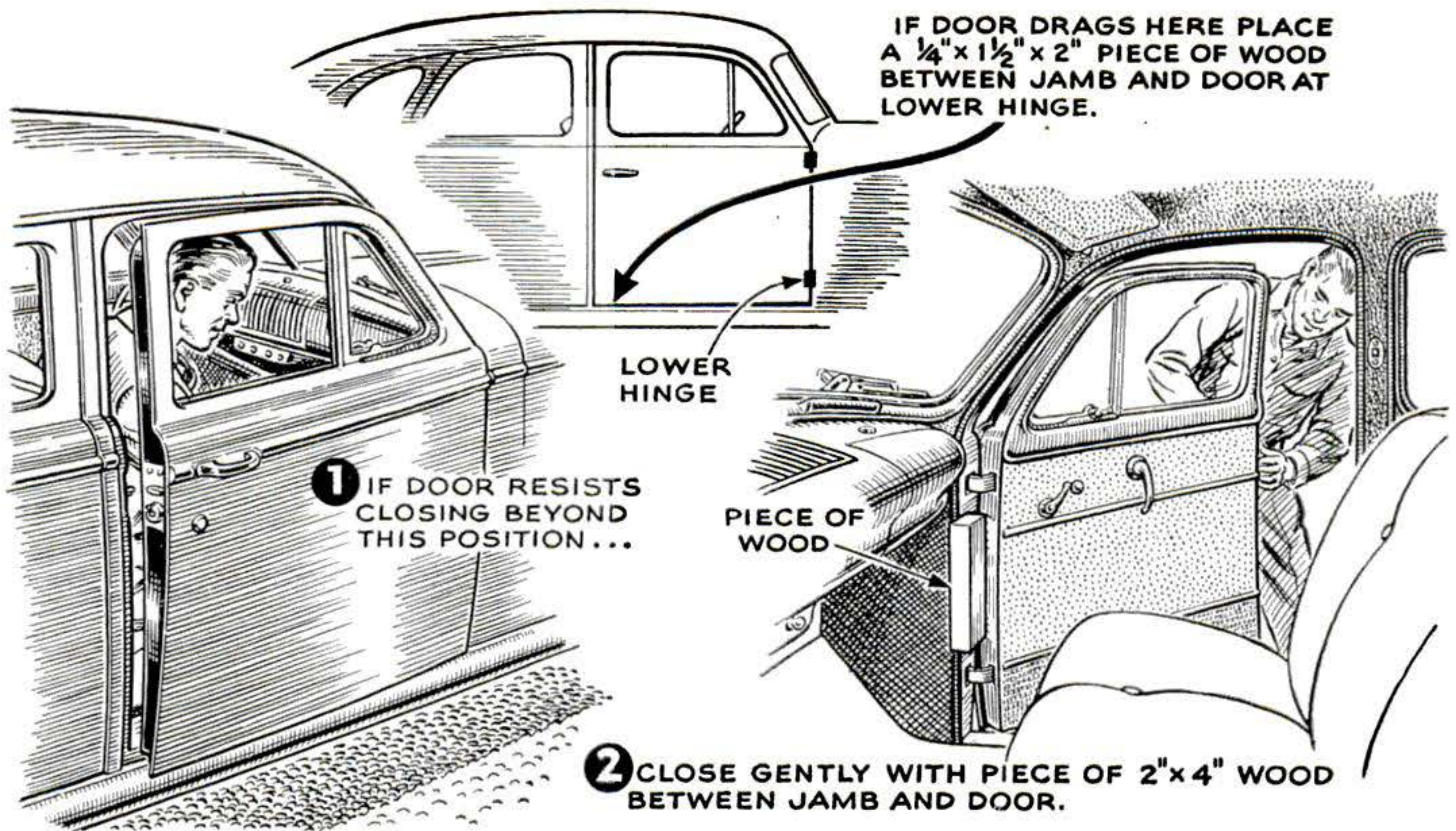
Tappet Adjustment Is Easier.

It is usually recommended that the tappets of an overhead-valve engine be adjusted while the engine is warm and idling. However, you've probably found that it's hard to keep the screwdriver in position on the bouncing adjusting screw. To simplify the task, W. M. Dierks, of Chicago, filed a wide notch in a screwdriver blade. This keeps the blade in the slot while adjustments are made.



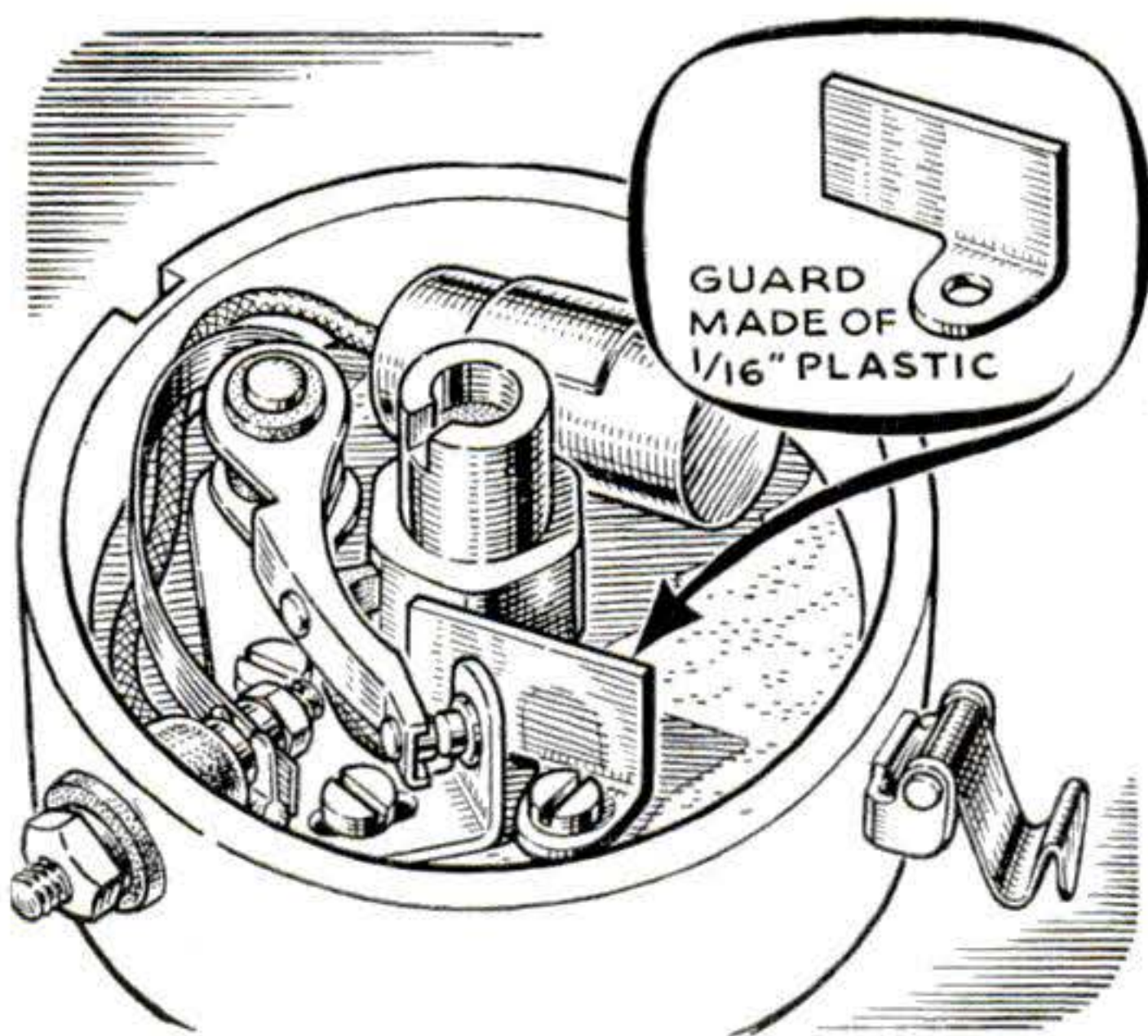
Block Stops Wheel Sag.

If you've ever used a bumper jack, you've probably noticed that the front of a car must be raised quite high before the tire is free. This is because the suspension arms allow the wheel to sag. You can overcome this by thrusting a block of wood between the frame and upper wishbone. A block cut from 3" by 3" stock will do the job. To position the block, fit a steel-rod handle into it.

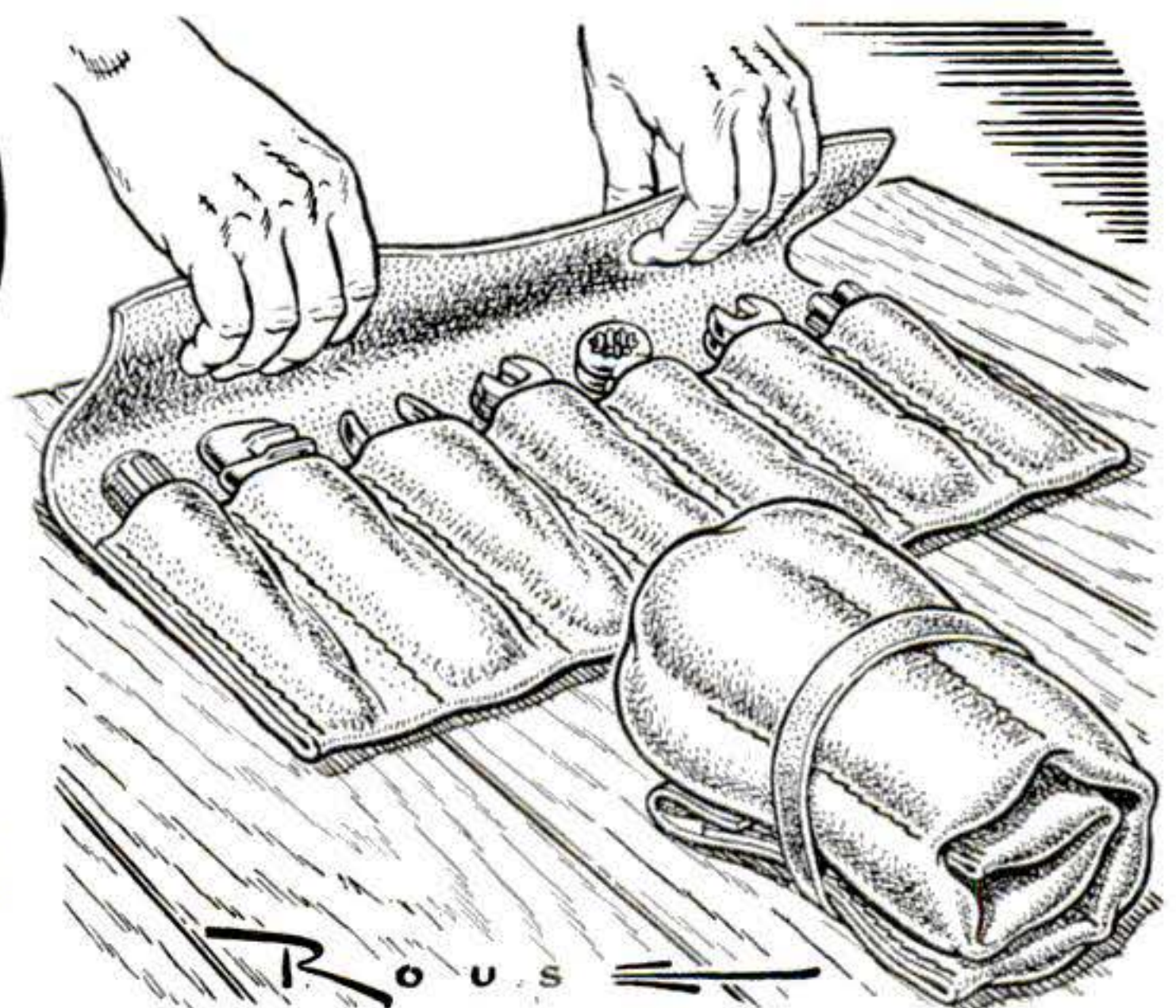


Repairing Sprung Doors. Unless they are too badly damaged, doors with sprung hinges can sometimes be put back into working condition by deliberately jamming them against a piece of wood. Burk Jagers, Rushville, Ind., writes that he has

used the method above. In closing the door, always proceed gently and keep testing—or you may have the problem of correcting an overcorrection. Should the door rub at the upper rear corner, place your block of wood between jamb and door at the top hinge.



Guard Prolongs Point Life. Ira S. Nelson, of Chicago, reports that he has experienced considerable difficulty with burned and pitted breaker points on his '49 Ford V-8 because oil worked up the distributor shaft. As a solution, he installed a small plastic shield between the cam and breaker arm, mounting it with a 6-32 screw as seen above. The shield helps keep oil from being thrown on the points.



Rubber Kit Stops Rattles. This tool kit, made from an old inner tube by Robert R. Leist, of New Albany, Ind., keeps small tools from rattling around while carried in the car. Cut a piece from the tube large enough to suit the tools you want to have at hand. Pockets to suit them can be sewn with strong cord. Cut a rubber band from the same tube to put around the kit after it has been rolled up.



Working Wood in the Round

By Edwin M. Love

ALTHOUGH a lathe ranks as one of the most useful pieces of equipment in any shop, it isn't the only means of shaping wood in the round. You can often fall back on other machines—or even hand tools. Results may not always equal turned work, but nine times out of ten no one will know the difference.

Obviously, you could use a lathe to advantage for projects like those at the top of the page. But they can be completed without turning—a fact that it's well to remember if you have been in the habit of shying away from good craft projects simply because the plans call for a turned member.

And even though you own a lathe, it will pay you to know the alternate procedures. Suppose, for instance, you need a 1½" pole longer than the maximum length your lathe will accept. You can, of course, turn it in sections and join them with dowels and glue. But if you'd rather have the pole in one piece, get a two-by-four and cut it to length, squaring the ends. One edge probably is already square, smooth, and comparatively straight. Using this as a base for gauging, rip a square-sectioned strip that measures slightly more than the desired diameter of the pole.

You can now round the strip either by hand or machine. For hand work you need only a drawknife and a jack plane.

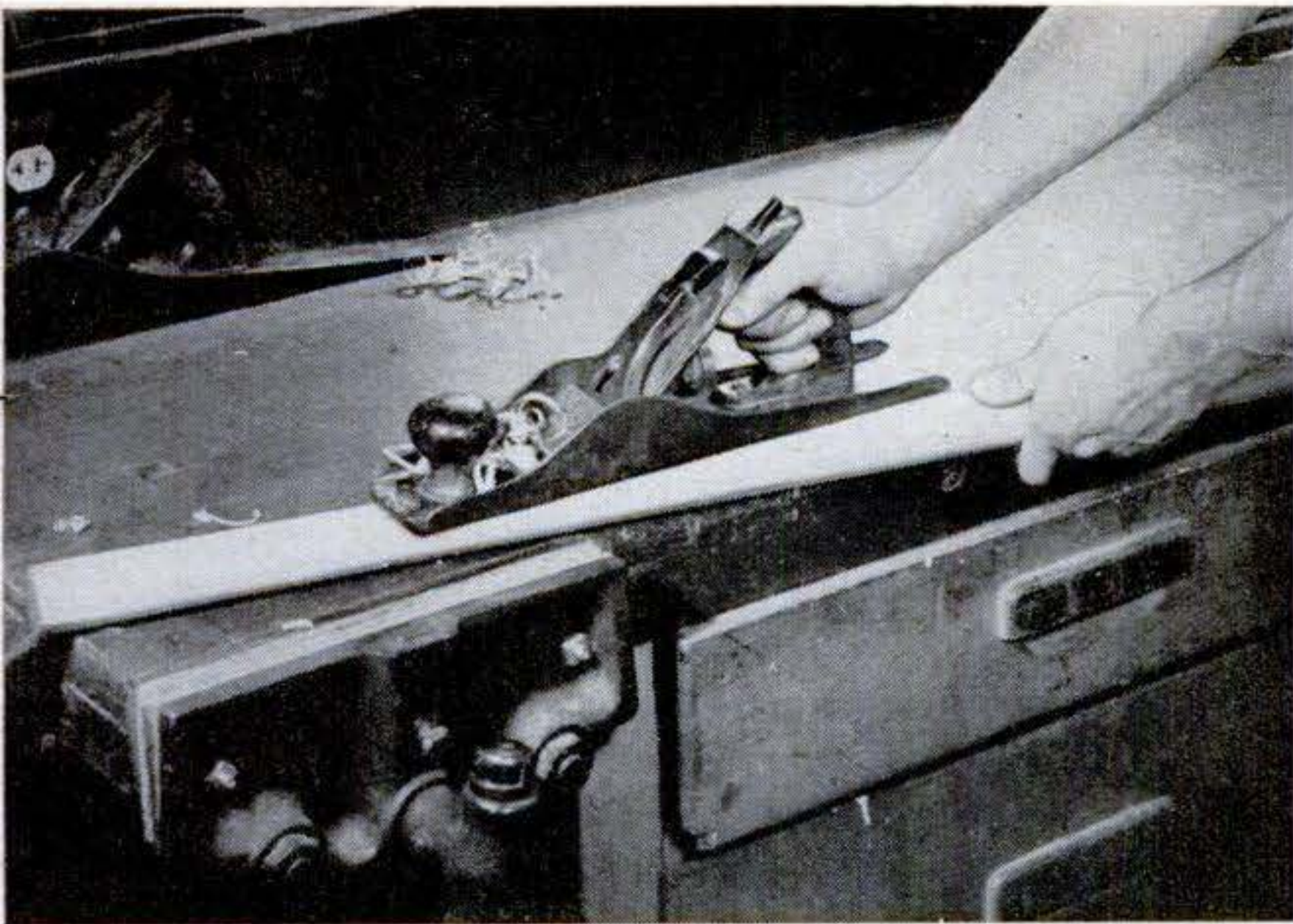
Once the stock has been squared, get out a compass and draw an octagon on one end. See Fig. 1 on page 213. Then gauge chamfers along the edges with a pencil.

Holding the work in a vise, pare off the corners with the drawknife—or any other tool that will get the wood down quickly. Finally, plane the new sides straight. For true roundness be sure that all eight sides are equal in width.

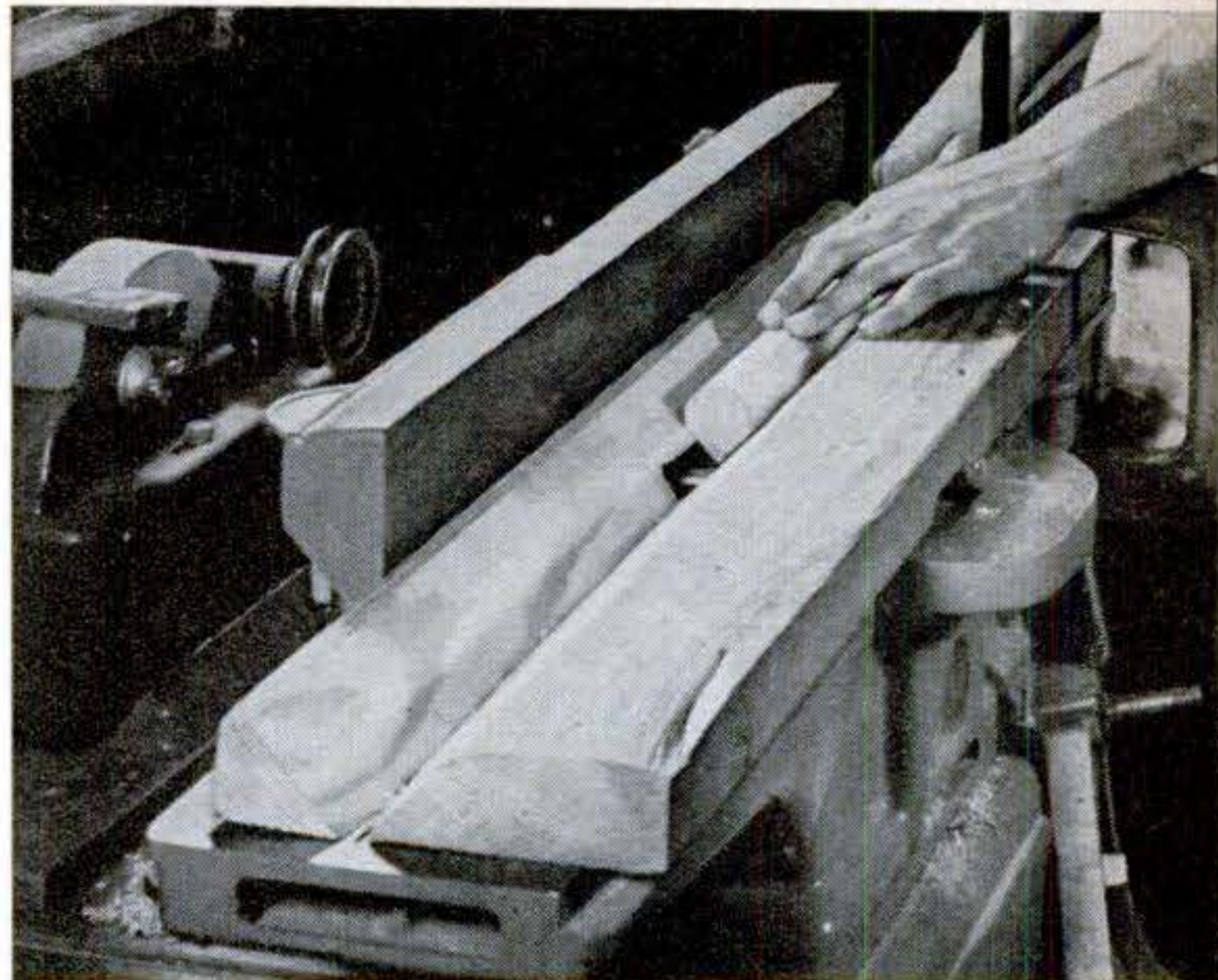
Now grasp the piece with the left hand, butt it against the bench stop, and make three passes on each arris (the sharp corner) with the jack plane, being careful to hold to the same angle for all cuts. Turn the stock end for end to finish the length. If the faces are not equal in width, take off another shaving or two from the narrow ones. Then plane off the new arrises and trim the remaining corners.

Again clamp the pole in a vise. Loop a half sheet of coarse sandpaper around it, grasp the ends with the hands, and pull the paper up and down. Shift position constantly to round the work uniformly. Turn the work and repeat on the other side. This will reduce the corners in a hurry. Finally, sand the piece lengthwise to take off the cross scratches.

Dowels for glue joints are generally purchased ready-made, but if the size wanted is not in stock they can be made in the shop by planing as already described. Or you can save yourself work by driving octagon-



With a plane and a few other hand tools, you can often do jobs that will pass for turned work. Principle here is to cut and plane off successive arrises. Then finally sand smooth.



V jig cuts square stock to octagonal section with one pass of jointer at each corner. The two parts of jig are notched and arch over the jointer head. The jig guides and supports the work.

shaped sticks through a hole in a steel plate.

Almost any old iron will do, but the plate will cut better and last longer if made of tool steel. Harden the plate after drilling it by heating to cherry red and plunging in water. Temper by heating until a light brown or straw color shows on a brightened spot, and re-quench the piece. For small dowels, you can hold the plate in a vise. Heavy driving, however, should be done on the bench top over a bench-pin hole.

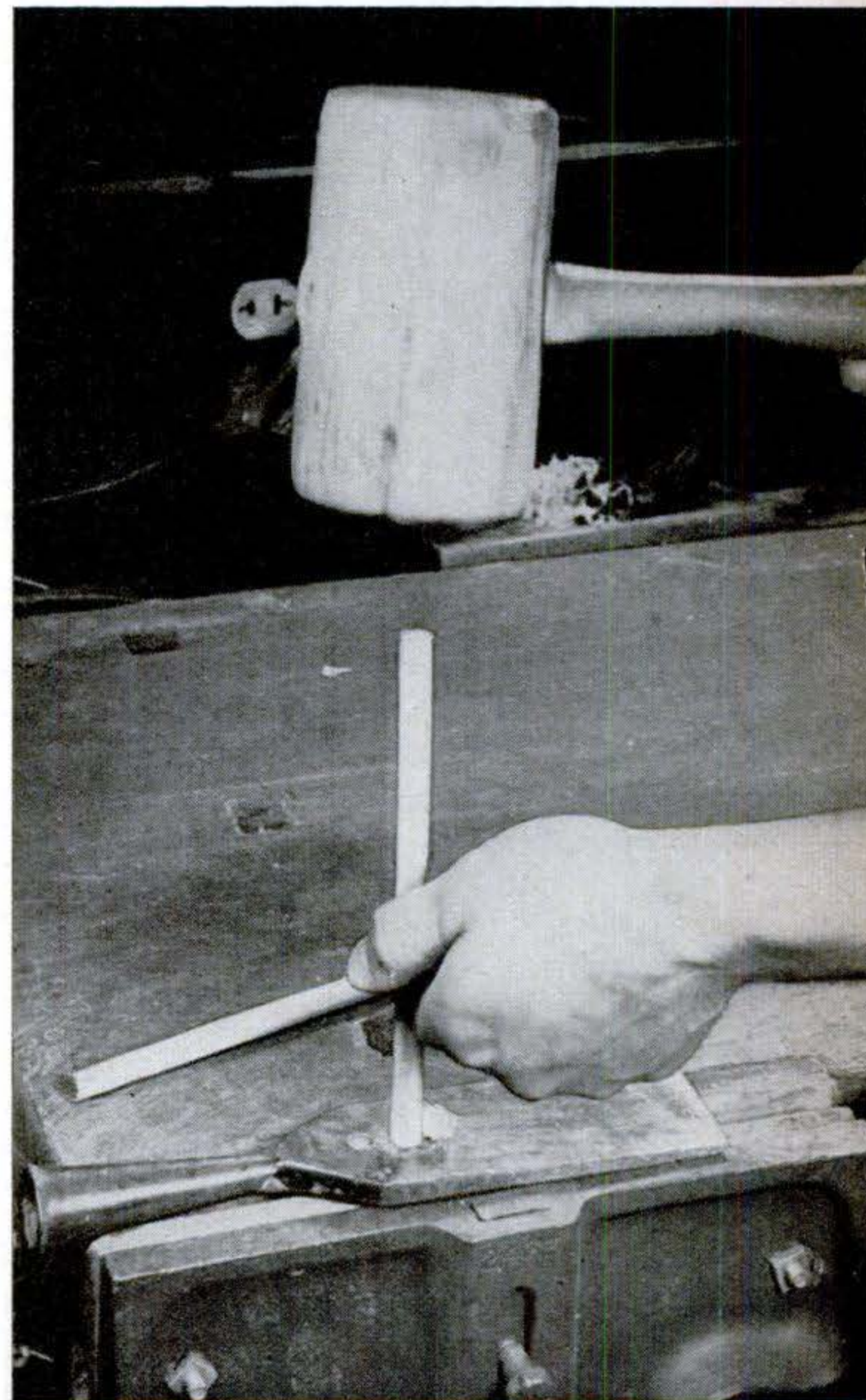
Shaper and Jointer Round Work

Shop machines that lend themselves well to round work include the jointer and shaper. A jointer rig for reducing a square strip to octagon form is seen in the photo at the top right on this page. It consists of two pieces made by miter-ripping (45°) a two-by-four or two-by-six and notching them to bridge the jointer head.

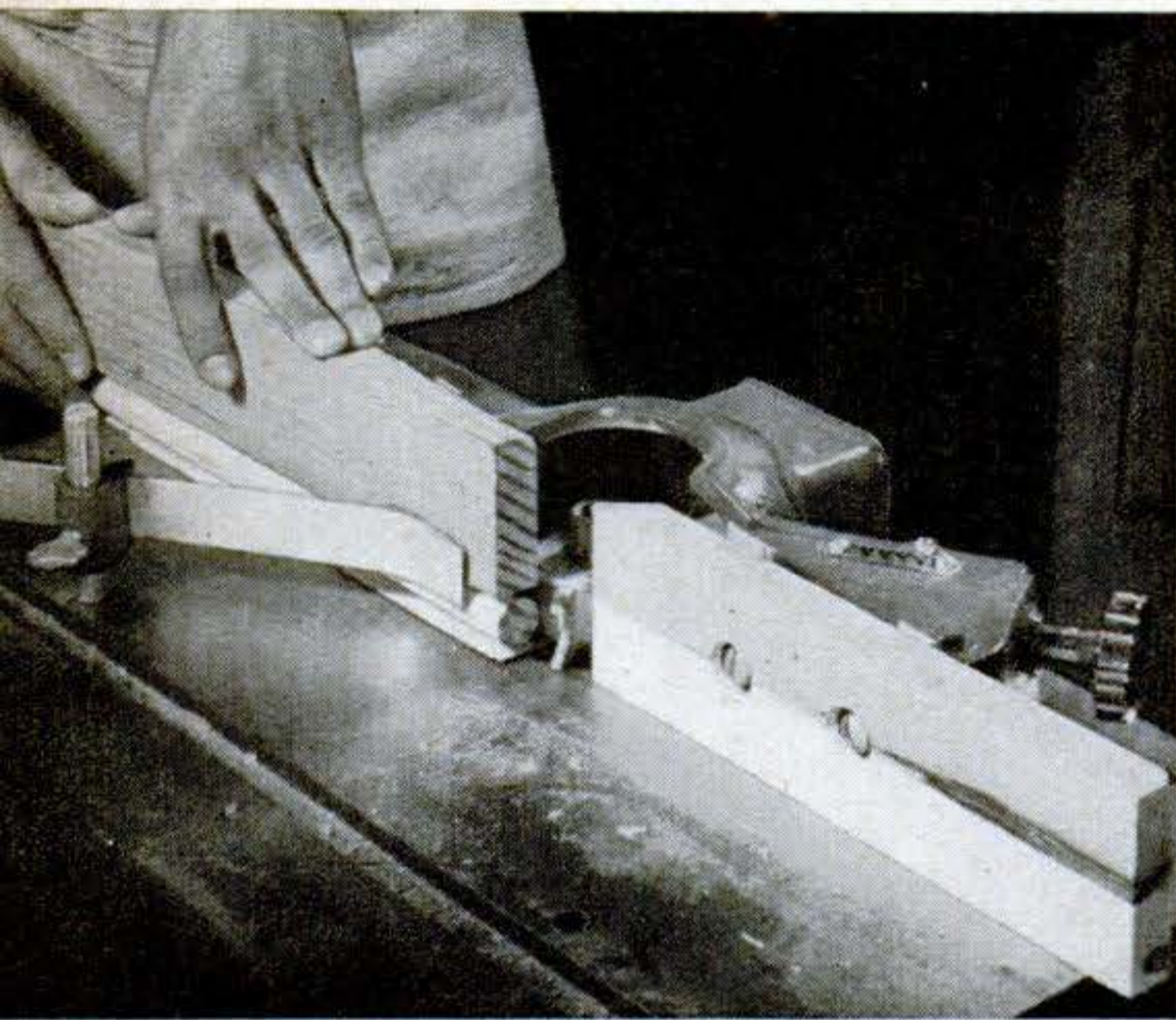
One piece is placed against the fence, the second against the first to form a complete V in which the square stick is supported without rocking. Lower both tables enough to finish a corner in one pass.

Still using the jointer, you can round short, thick work further by pivoting it on nails between two blocks. Fig. 2 on page 213 shows the setup.

Lower the infeed table below the out-feed table equal to the desired depth of cut. Mount the work on the pivots so it is parallel to both tables, although higher above the infeed than the other. This is important. If the axis of the work inclines to one end,



Dowels are shaped in a hurry by pounding octagonal-section stock through hole in a steel plate. Sharp edge of the hole acts like a plane, stripping off the wood corners.



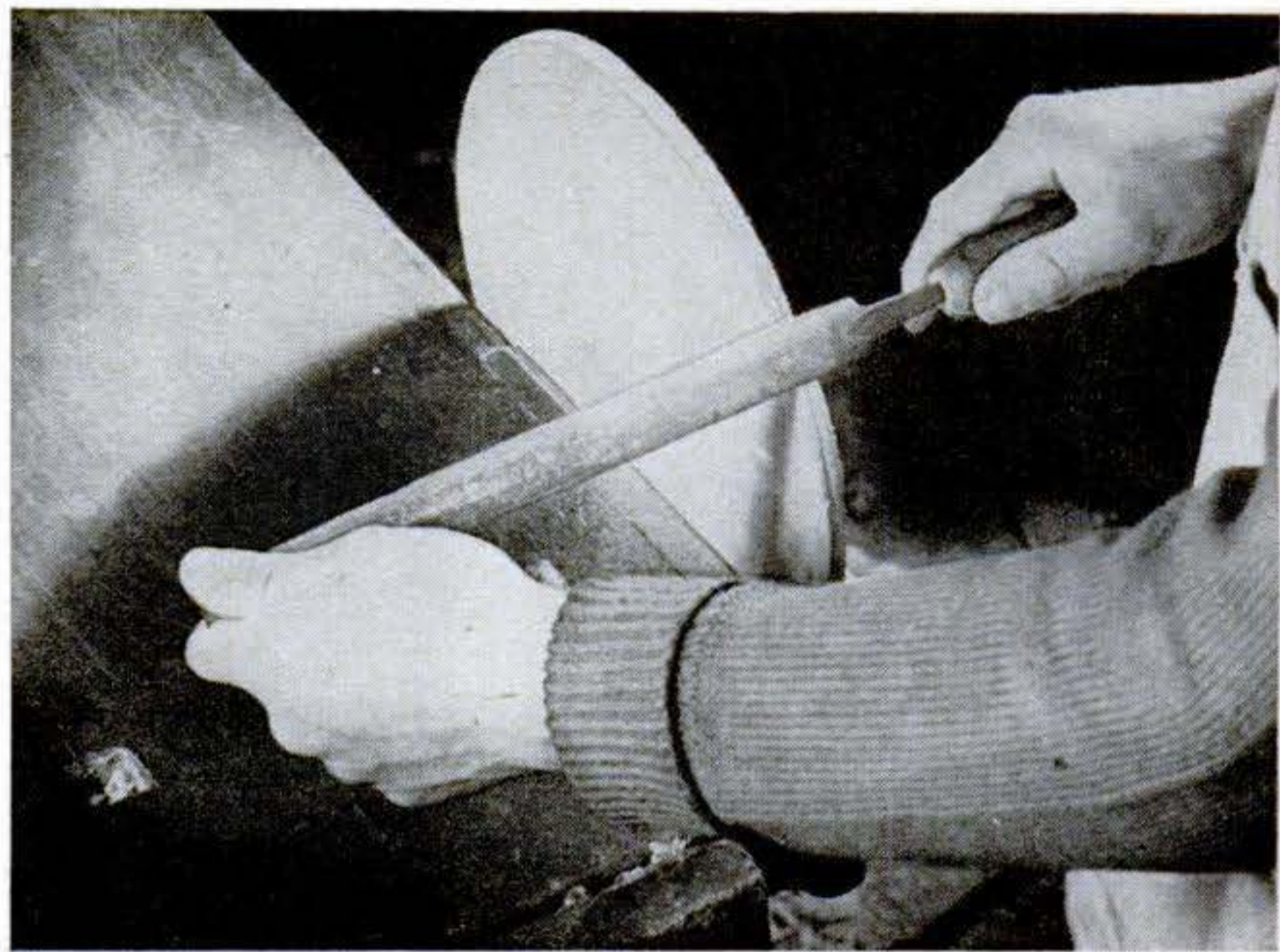
A half-round bead cutter mounted on the shaper cuts a dowel in two passes—one on one side of the work, one opposite. Align fence sections; use stock as thick as desired diameter.

you'll wind up with a cone-shaped or tapered piece—a good point to remember in case you should ever want to taper a piece in the round. In making the cuts, take repeated passes, turning the work a little each time until well rounded. Remove from the jig for hand sanding.

The shaper setup shown in the photo above cuts a dowel in two passes. Mount a half-round bead cutter on the spindle and align the fences. The stock should be just as thick as the diameter of the dowel you want, and the lower edge accurately jointed.

Half the dowel is cut in the first pass. Reverse the piece to put the other face against the fence for the second pass. If the depth of cut has been nicely gauged, the web above and below will be severed and the dowel will fall free with little, if any, offset or ridge appearing. Since all support is lost at the end of the cut, the dowel should be made extra long. Because this setup takes a little time, you'll probably prefer to cut a number of dowels and put them by for future use.

A shaper offers one of the best methods of producing round molded items such as porch-column bases and picture frames. As in all freehand shaping, you need a substantial guide for the depth collar to bear against. In many cases the work itself furnishes the guide. But when the entire edge is to be cut away, make a separate guide and tack it to the work. Fig. 3 on the opposite page illustrates a safe means of shaping the inside of a ring. Scrollsaw the inside only,



Diagonal strokes of cabinet file smooth edge of disk before final sanding. You can do the work faster on a lathe or sander, but filing will serve in lack of such equipment.

leaving the outer corners for finger holds. When the inside is finished, saw and mold the outside.

By working carefully, you can make perfectly acceptable disks by first cutting them out with a compass or keyhole saw, a coping saw, or a bandsaw. Smoothing by hand can be tedious, but the method shown in the photo above will get it done quickly. To take off the worst roughness, stroke forward and sidewise with a cabinet file. Finish smoothing by rocking a sandpaper block around the circumference. If the block is shaped to fit the curve, so much the better.

If you'd like to try your hand at actual turning, you can improvise a lathe quite easily, as suggested in Fig. 4 on the facing page. Screw two blocks to a length of two-by-four and pivot the work on nail centers passed through the blocks. Stiffen the assembly with a tool rest nailed or clamped on.

If necessary, you can borrow a motor from your washing machine to drive the assembly. Cut a groove near one end of the work for the belt or whittle down the end and force a pulley over it. The assembly must be spiked or clamped firmly to the bench or other solid support.

Another makeshift assembly (Fig. 5) will enable you to turn a wheel concentric. The illustration shows how you might proceed if you wanted to undertake such a turning project as a spinning wheel. After being cut with a saw, the wheel—and its double belt groove and ornamental side bead—will round to shape if turned by hand. **END**

LAYING OUT AN OCTAGON

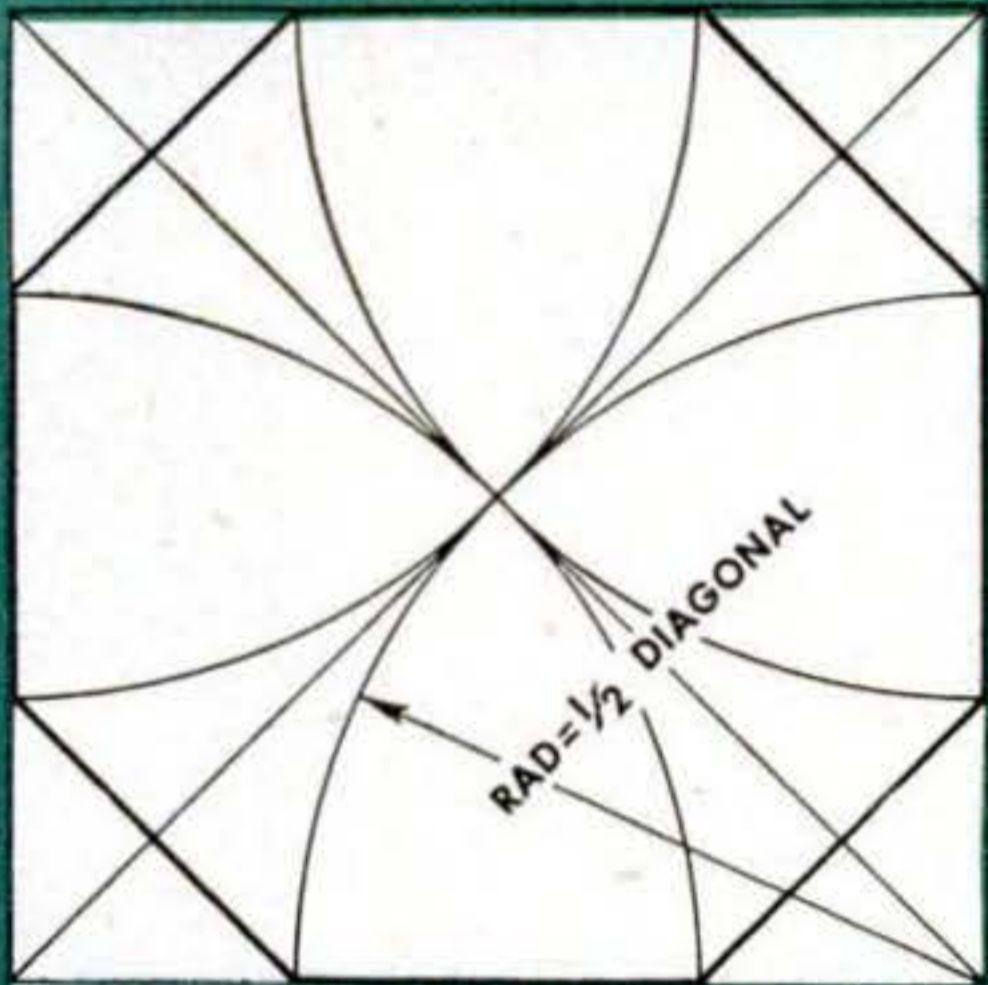


FIG.1

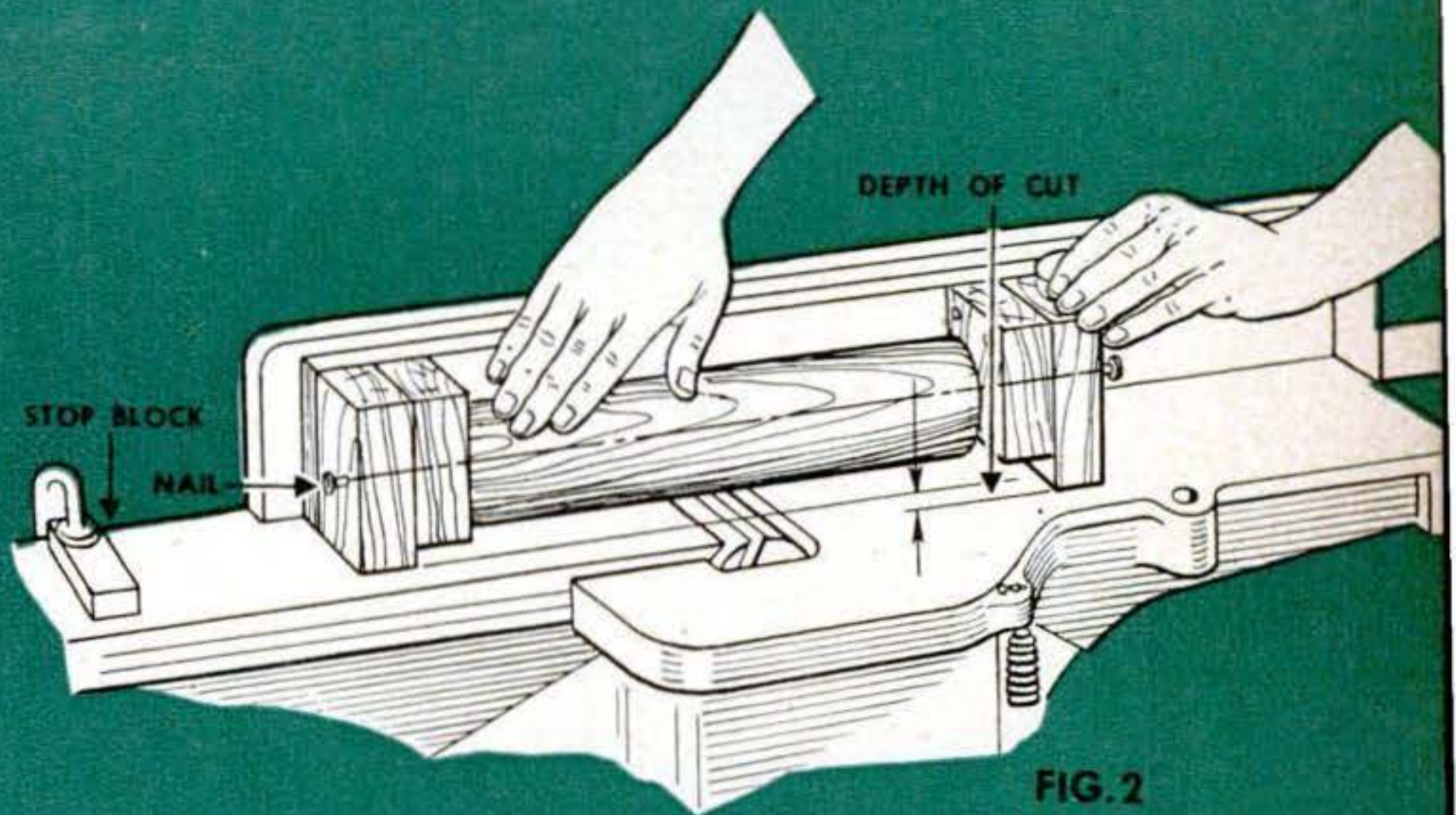


FIG.2
JOINTING IN ROUND

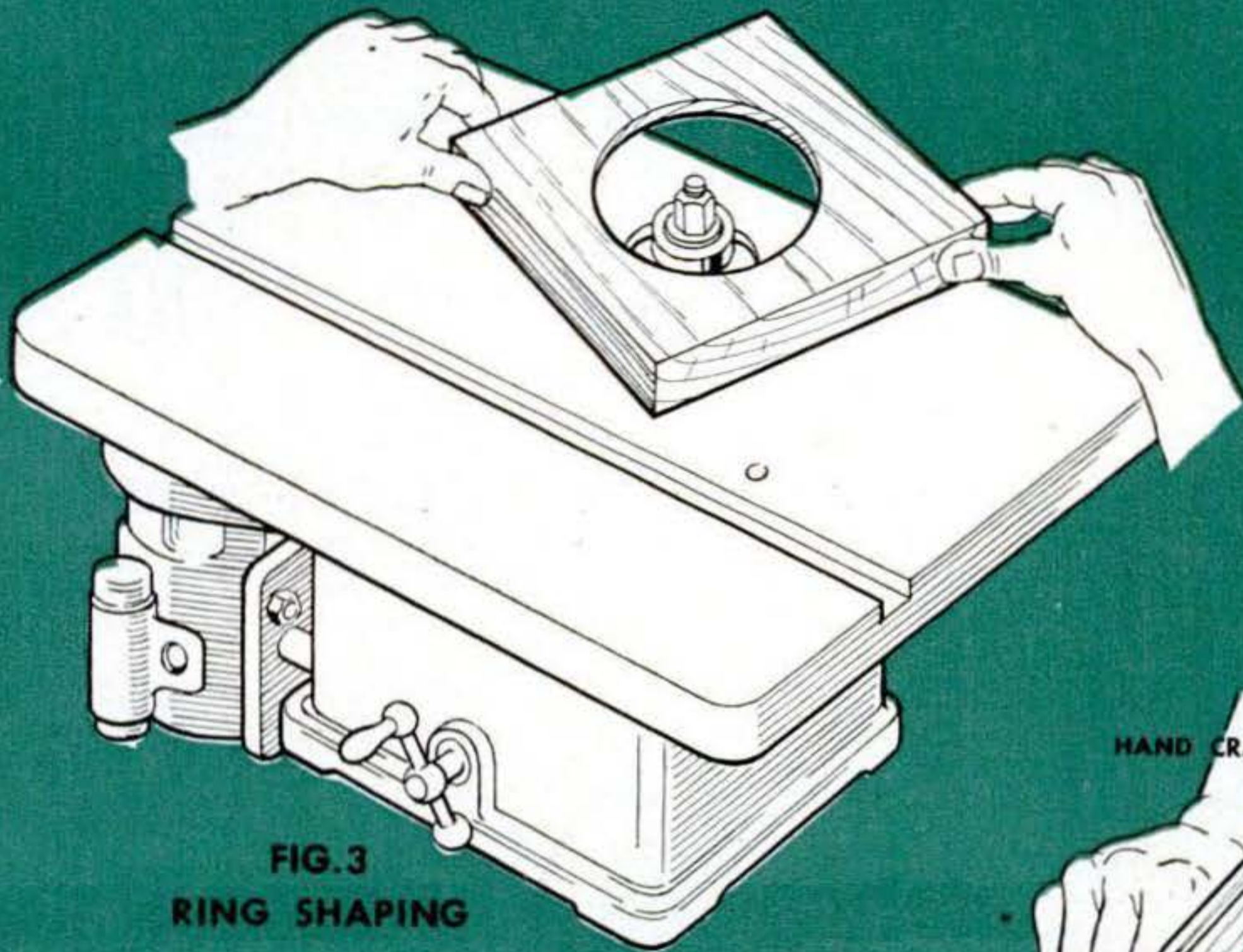


FIG.3
RING SHAPING

TURNING SPINNING WHEEL
FIG.5

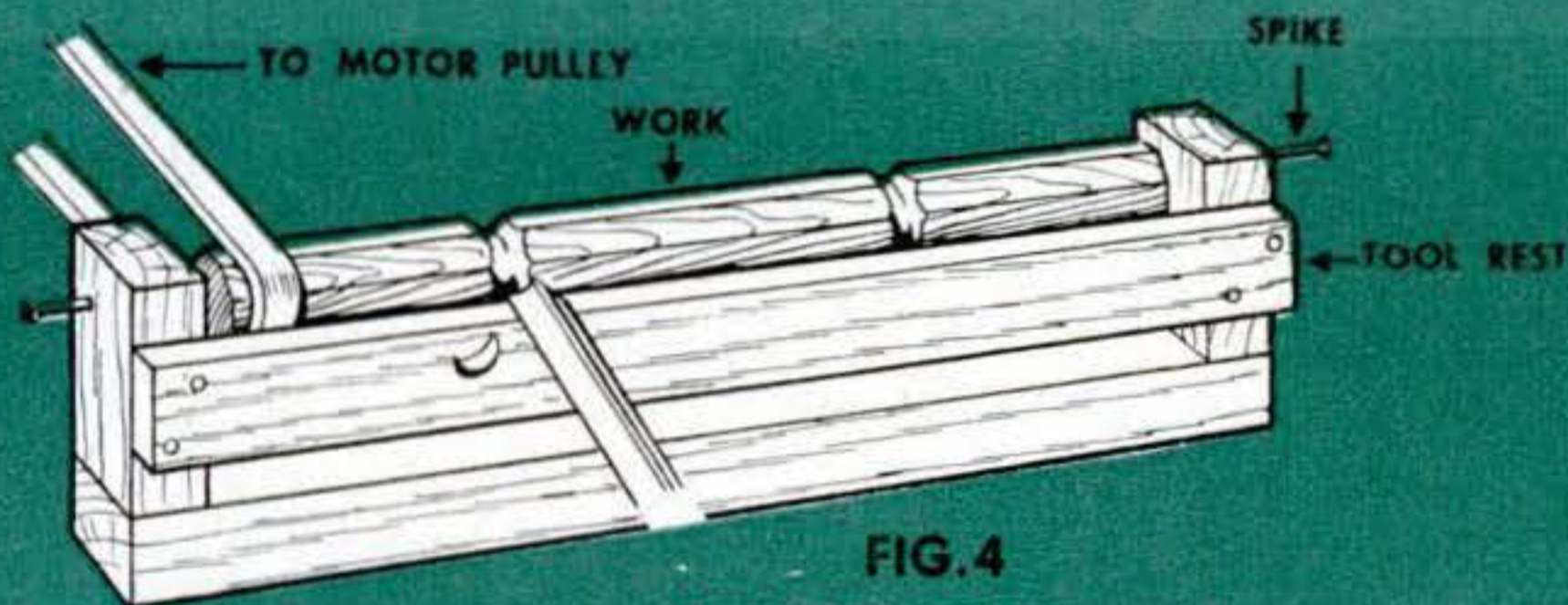
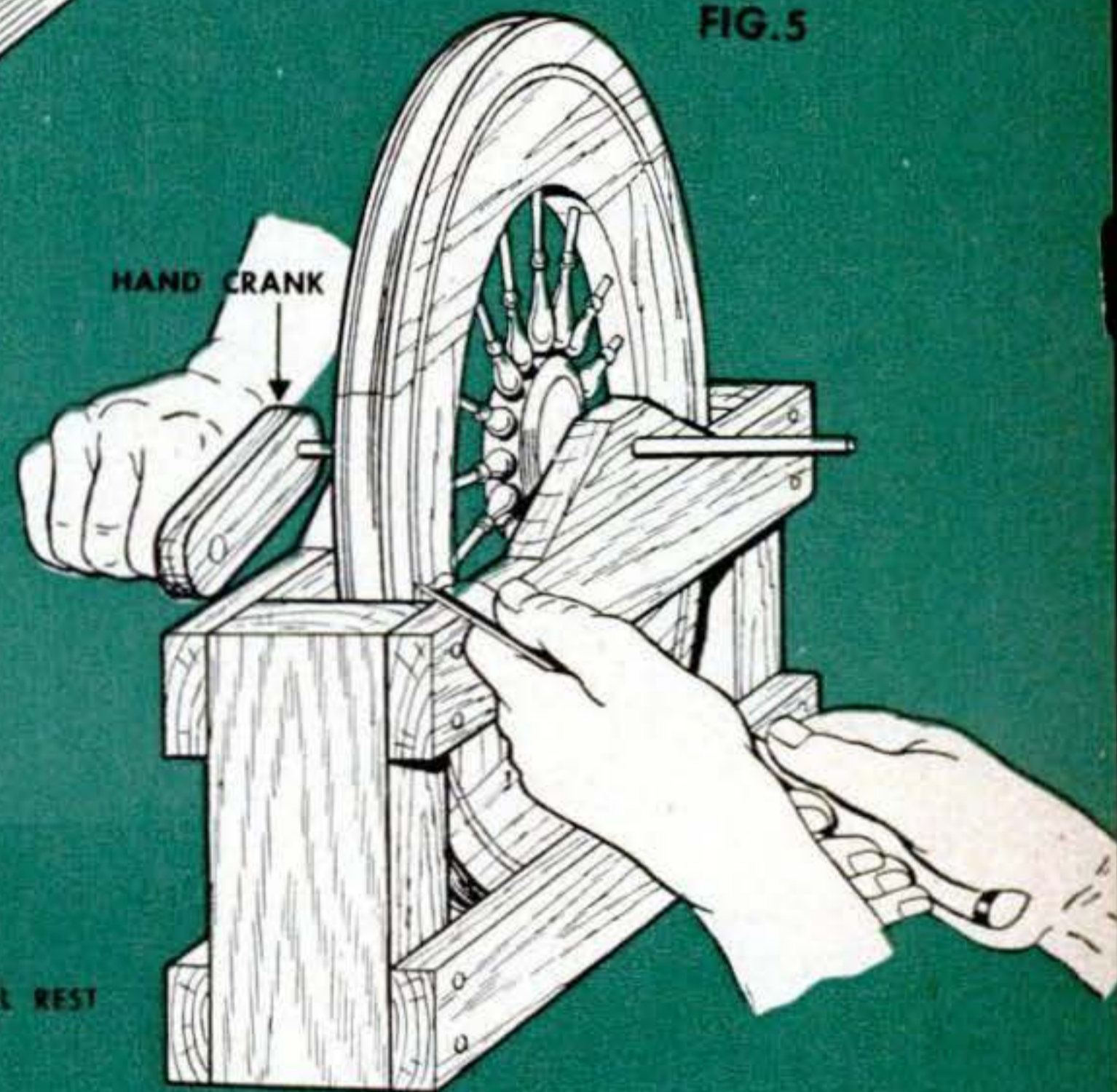
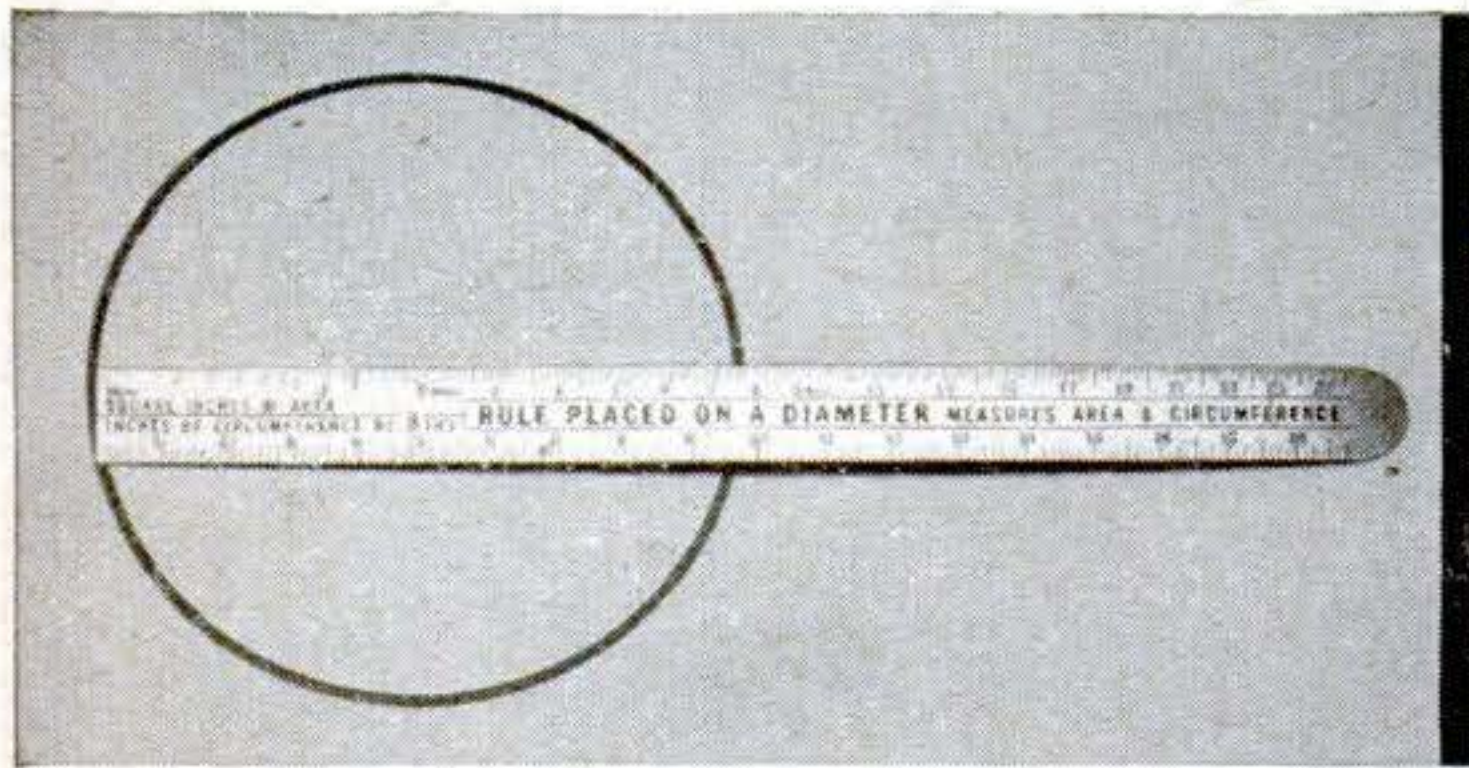


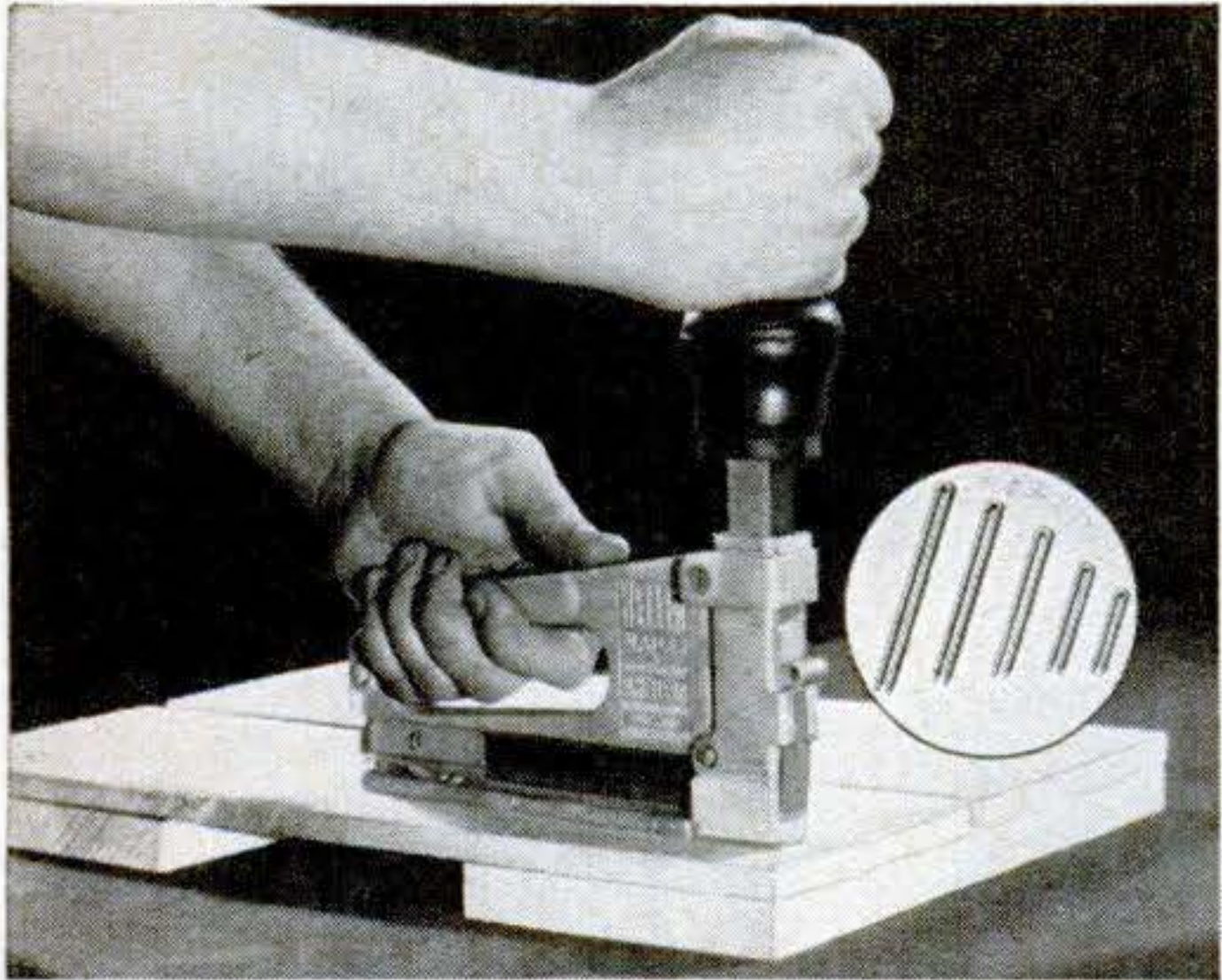
FIG.4
IMPROVED LATHE

 **NEW TOOLS**



Pocket Rule Does Many Jobs. Besides measuring straight lines, this new pocket rule gives direct readings when you need the circumference or area of a circle. For this, it's placed on the diameter of the

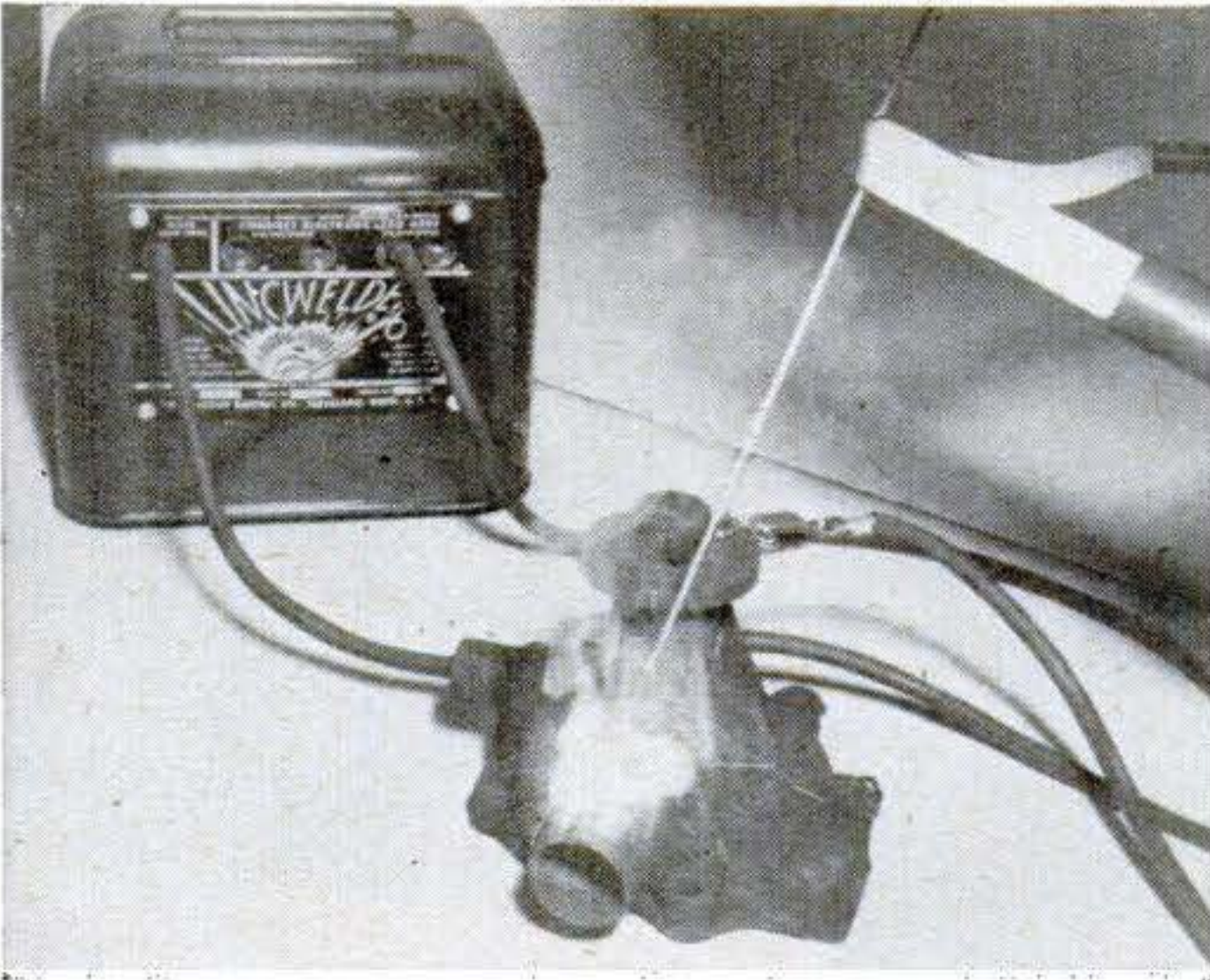
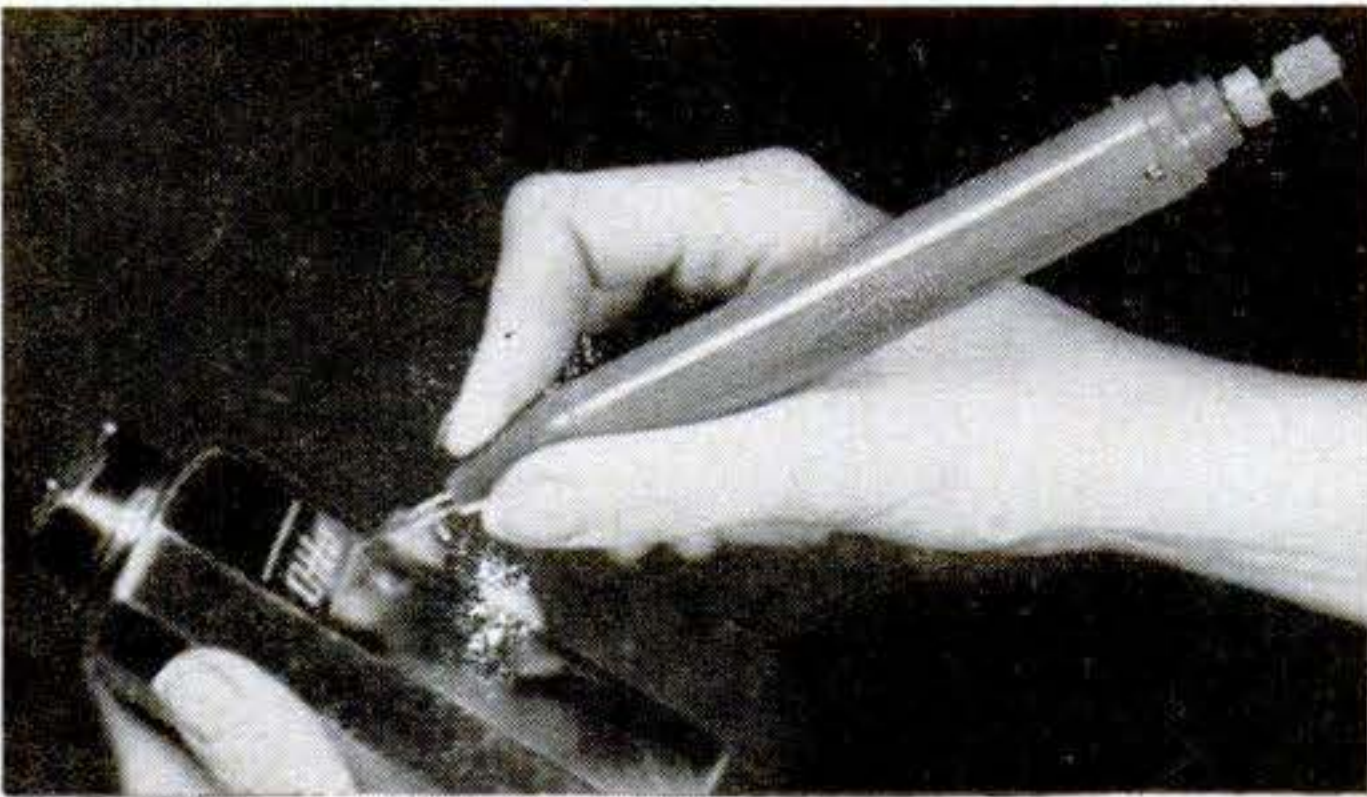
Tool Etches Glass. Shaped like a large fountain pen, the Murray Electro-Stylus[®], at right, can be used to cut stencil designs or carve, engrave, and etch other materials. Electrically operated, it delivers 7,200 cutting strokes a minute. It's made by Murray Industries, Colorado Springs, Colo., and sells for about \$10 with four points. A diamond-tipped point for etching glass is available for an additional \$6.



Hammer with Your Fist. The new hand-operated Heller Nailer[®] above works like a paper stapler and is said to enable you to make assemblies four times as fast as with an ordinary hammer and nails. It drives through wood, composition board, and light metal. Heavy-duty staples feed automatically, the device holding 100 or more. Heller Co., Cleveland, makes it.



circle as pictured at the left above. A sliding clip secures the ruler in your pocket and also serves as a stop when the tool is used as a depth gauge. It's made by Technical Development, Port Washington, N. Y.



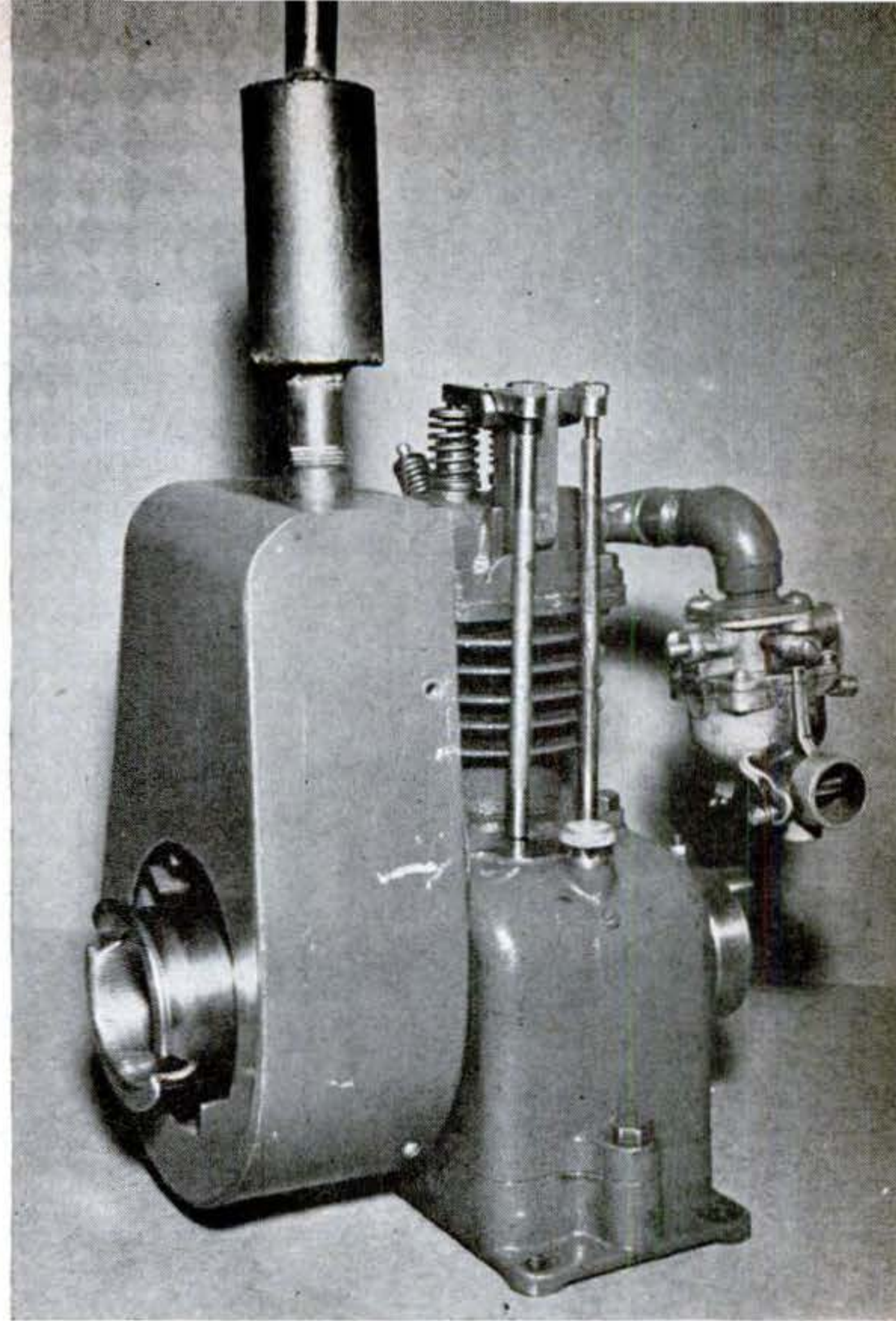
Arc Welder for Home Shop. A small transformer-type arc welder introduced by Lincoln Electric Co., Cleveland, operates from any 115-volt line fused for 30 amp. It delivers up to 60 amp. and handles 5/64" electrodes. Weighing 50 lb., it can be carried to any spot where you want to weld, solder, or braze. It sells for about \$45 complete with necessary equipment.

Machining a 2-Hp. Engine From Castings

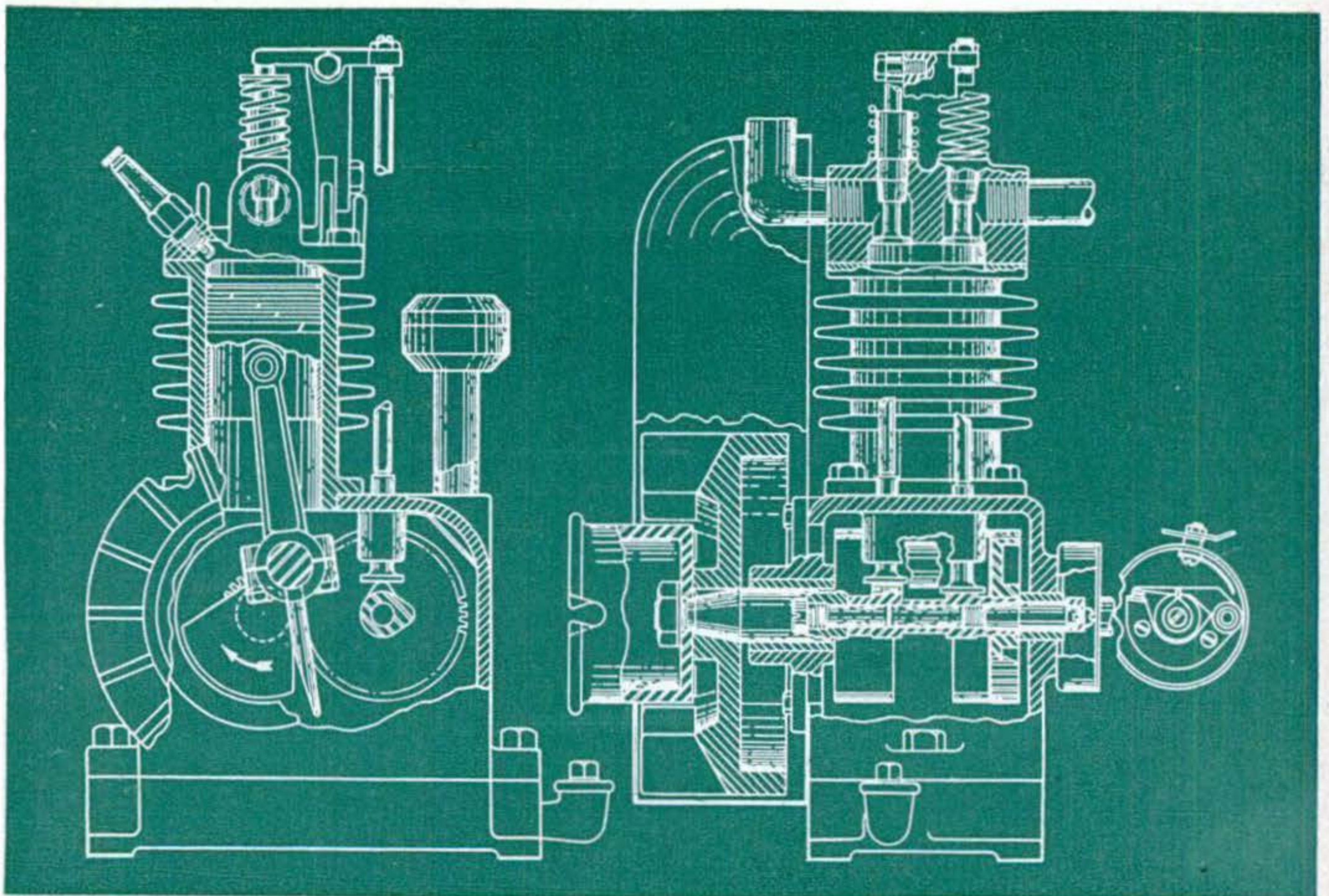
With workshop lathe and drill press, you can transform eight castings into a handy little 4-cycle power plant.

NO TOY, this husky little gasoline engine is a natural for running a lawnmower or powering an air compressor or pump. A 4-cycle engine with overhead valves, it starts easily, delivers about 2 hp. at 3,500 r.p.m., and can be run up to 5,000 r.p.m. for brief periods. It has a 2" bore and 1 $\frac{7}{8}$ " stroke, and is only 14" high, excluding the muffler.

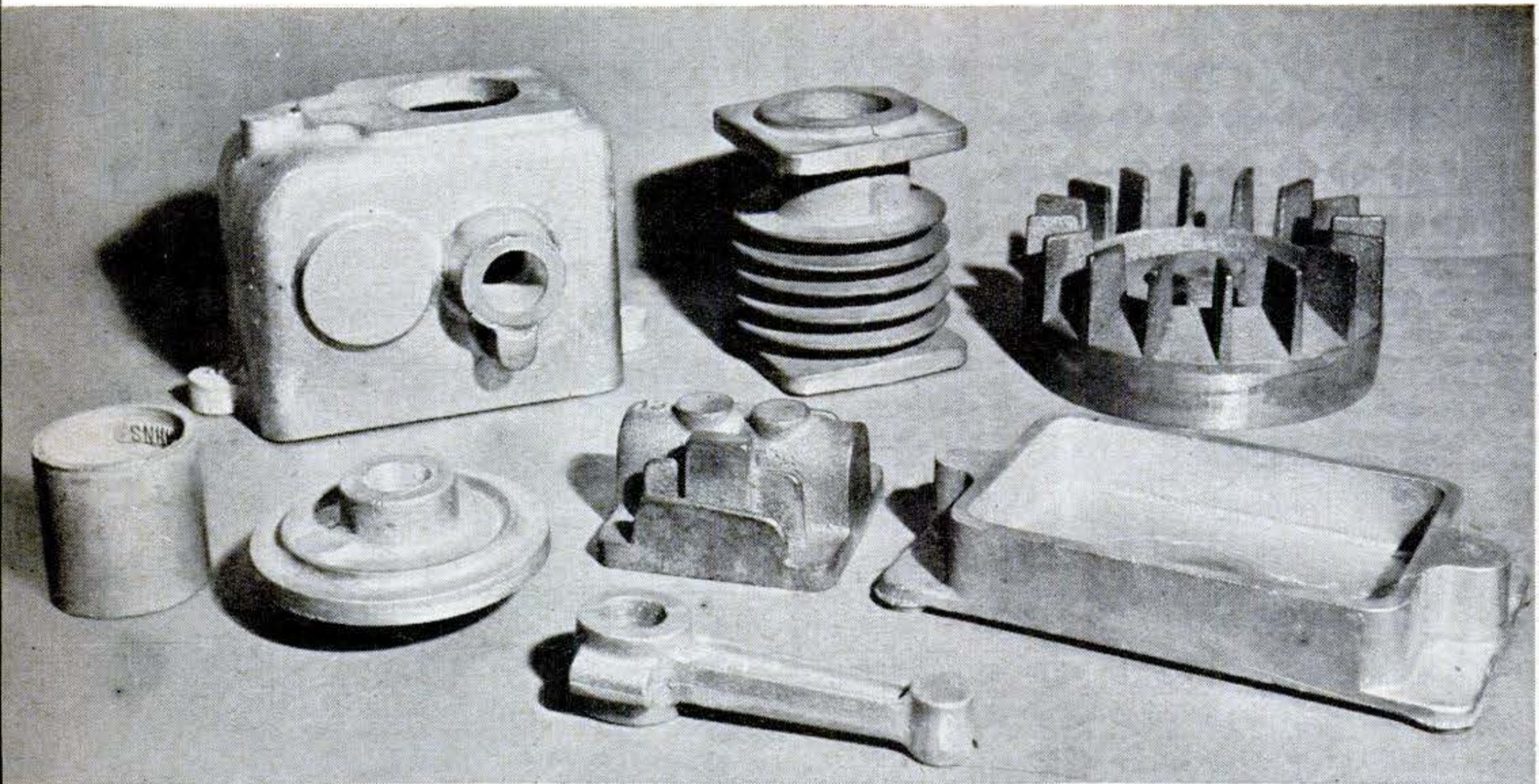
What's exceptional about it is that you can build it yourself for around \$20, using



Finished engine looks like a factory-built job. Not shown are gravity-feed gas tank, spark coil from car, and 6-volt ignition battery. ▶



Elevation views show clean simplicity of engine. Crankcase lubrication is by splash system.



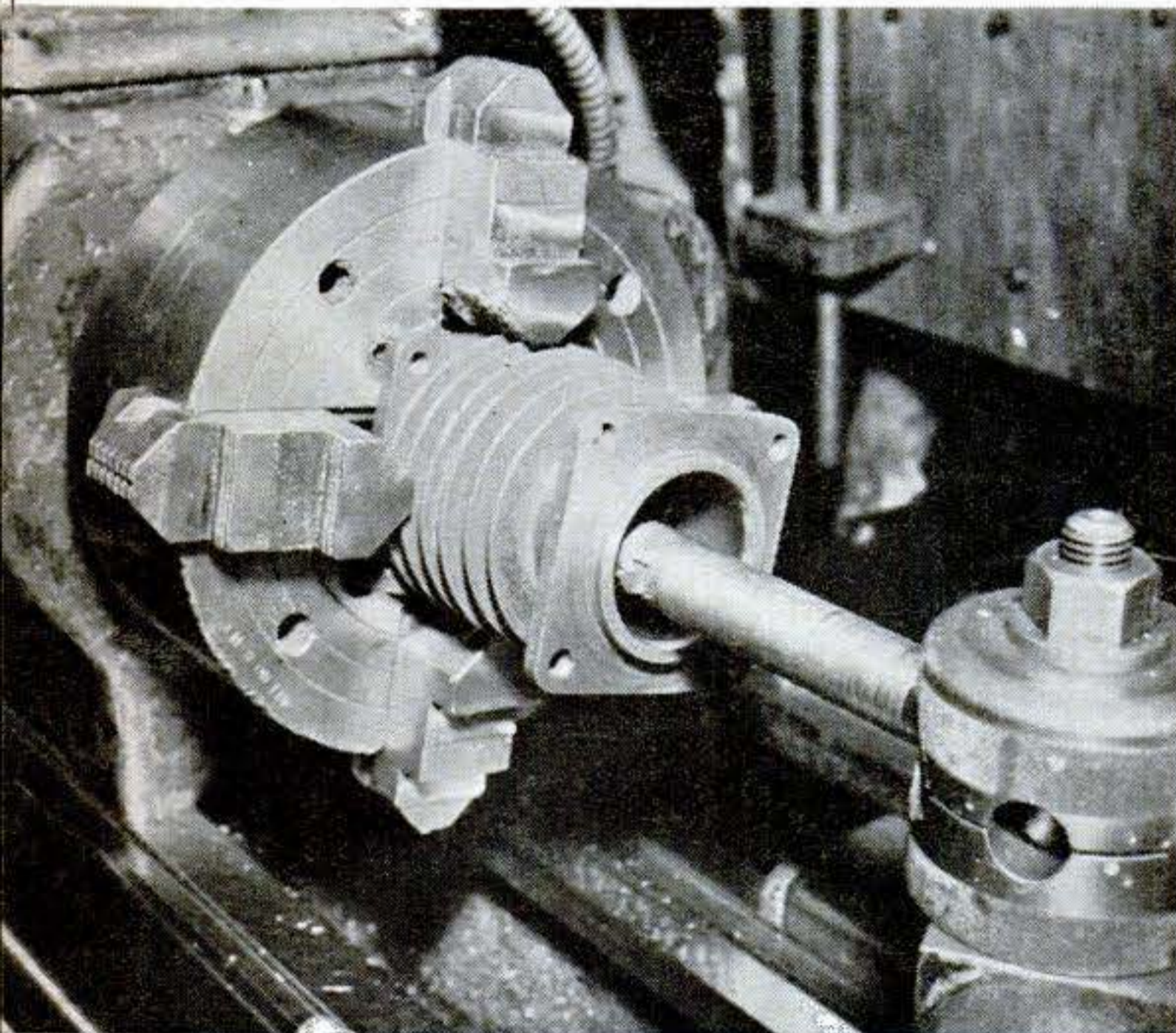
1 These are the castings provided. The three darker ones are cast iron; the others are aluminum. In center row, left to right, are the piston, end plate, cylinder head, and oil

pan. In back are the crankcase, cylinder, and flywheel. Con rod is in front. First cuts on the iron castings should be fairly heavy to get under the foundry scale as fast as possible.

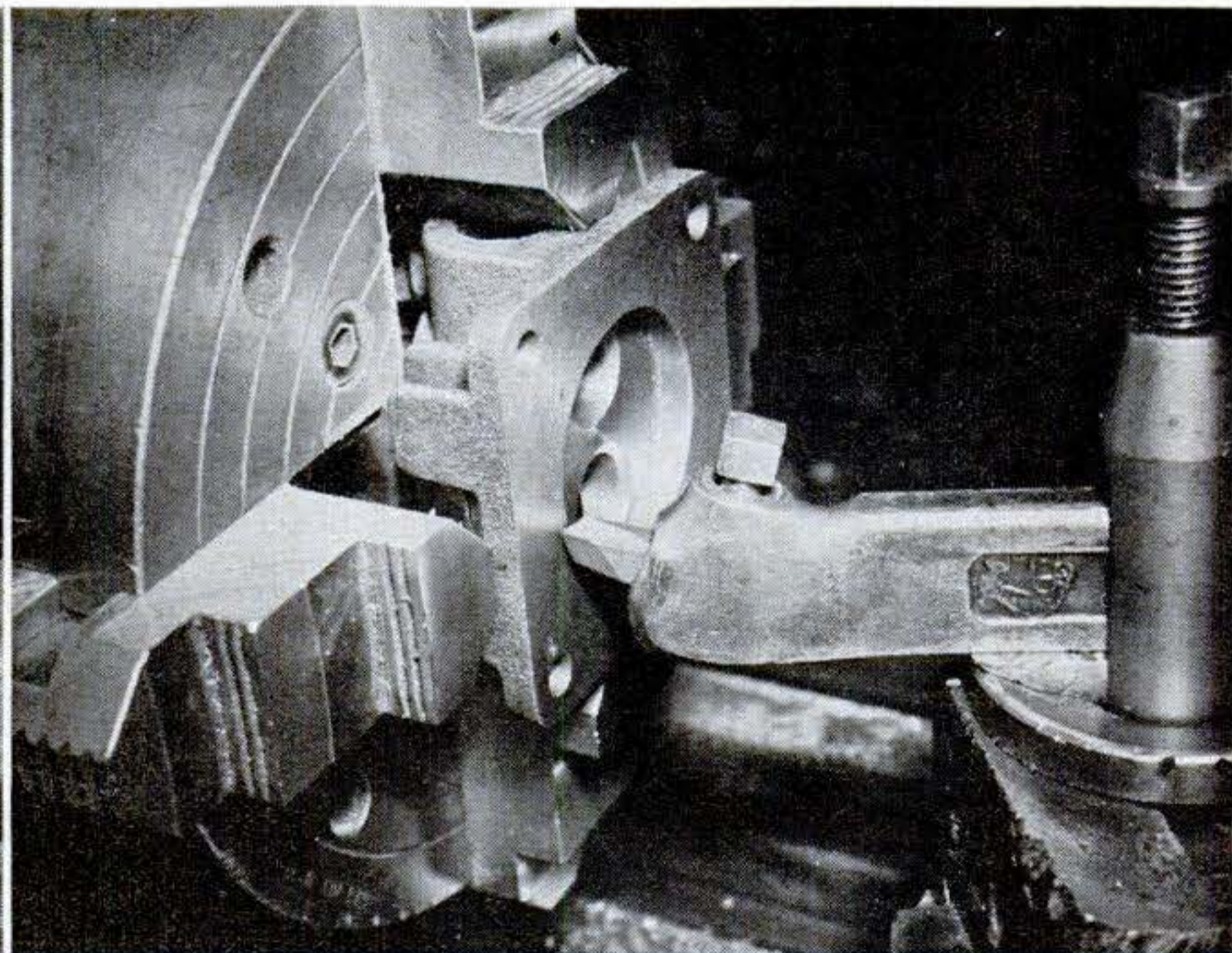
only a 9" lathe and drill press. The engine was originally designed as a class project by W. L. Nasht, instructor at the Glendale High School, Glendale, Calif. For \$15.50 f.o.b. Glendale, he'll ship anyone all required castings, plus piston rings and job-sheet prints. Bar stock and blanks for shafts and gears cost an additional \$3. Prospective

builders will have to provide themselves with a carburetor (a secondhand motor-scooter one will do), distributor points and coil, and miscellaneous stock and fittings.

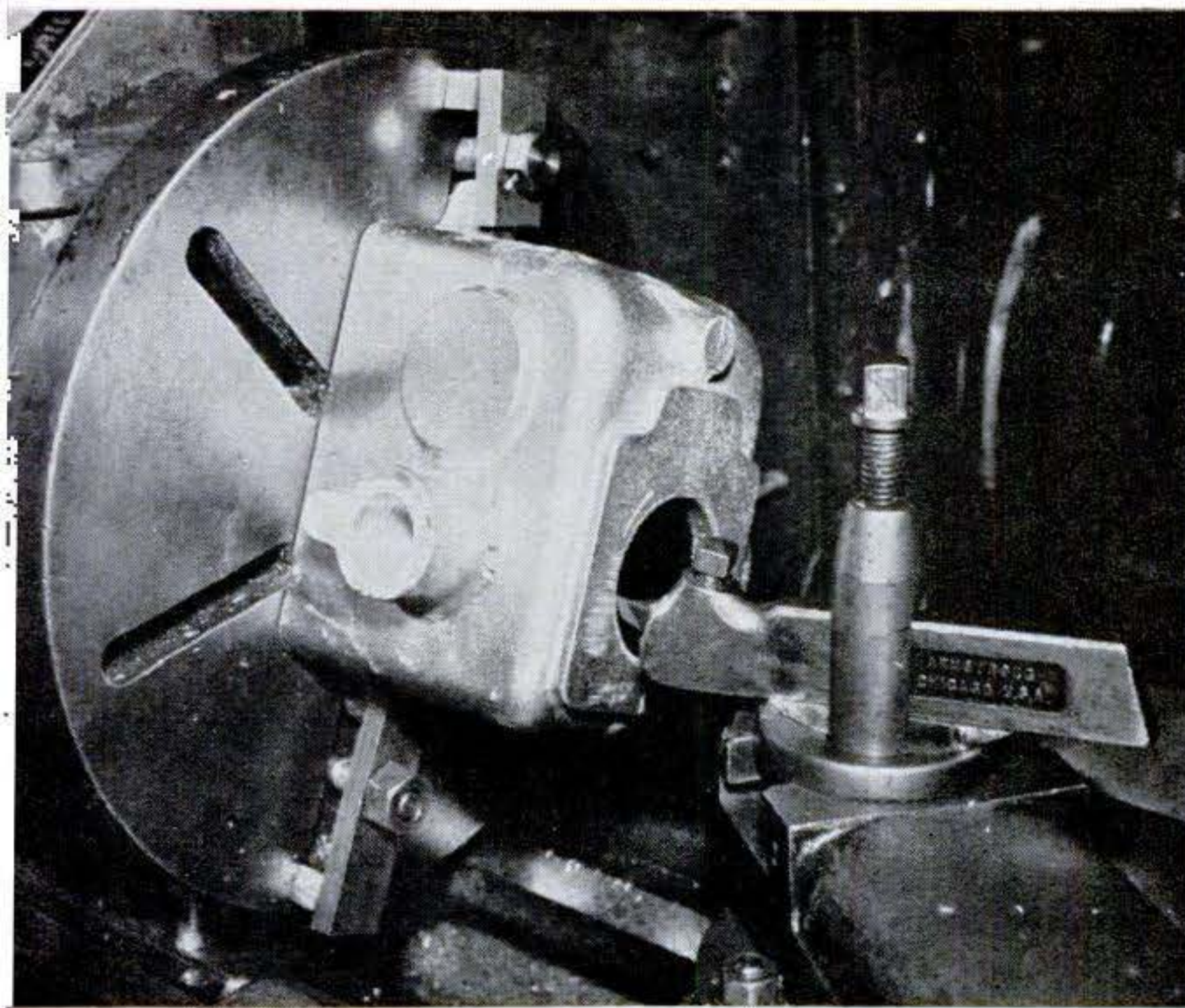
Building the engine isn't hard, although a beginner at the lathe shouldn't try it. A milling attachment is desirable but not indispensable so long as you have an "arm-strong



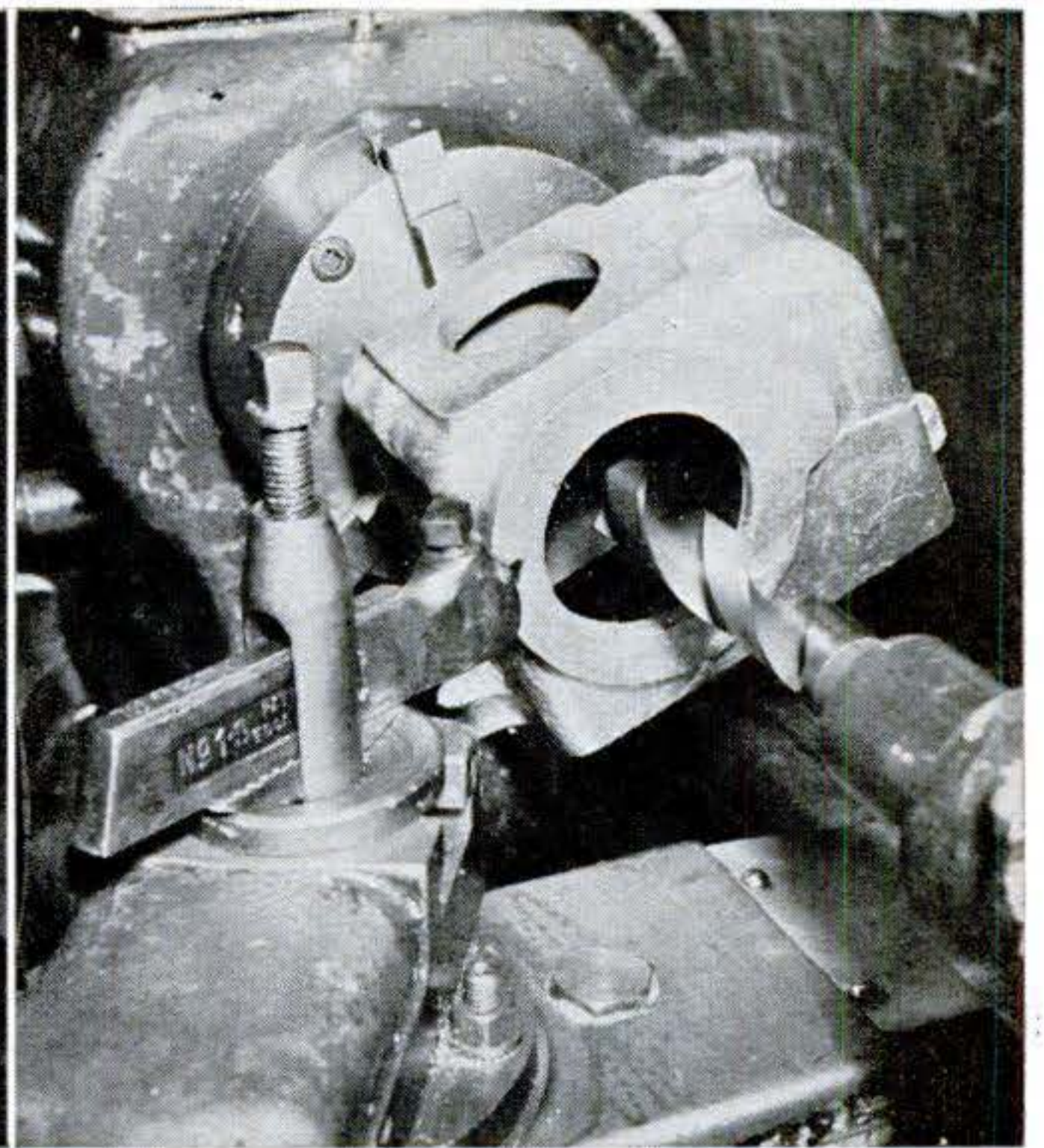
4 Cylinder is faced and bored with care. Resharpen boring bit and use a light cut and slow feed as diameter approaches 2.000". Watch out for "bell mouth" or taper in bore.



5 Bottom of head is faced and combustion chamber turned out with casting gripped in the 4-jaw chuck. Then head is reversed, faced, and valve holes accurately located and drilled.

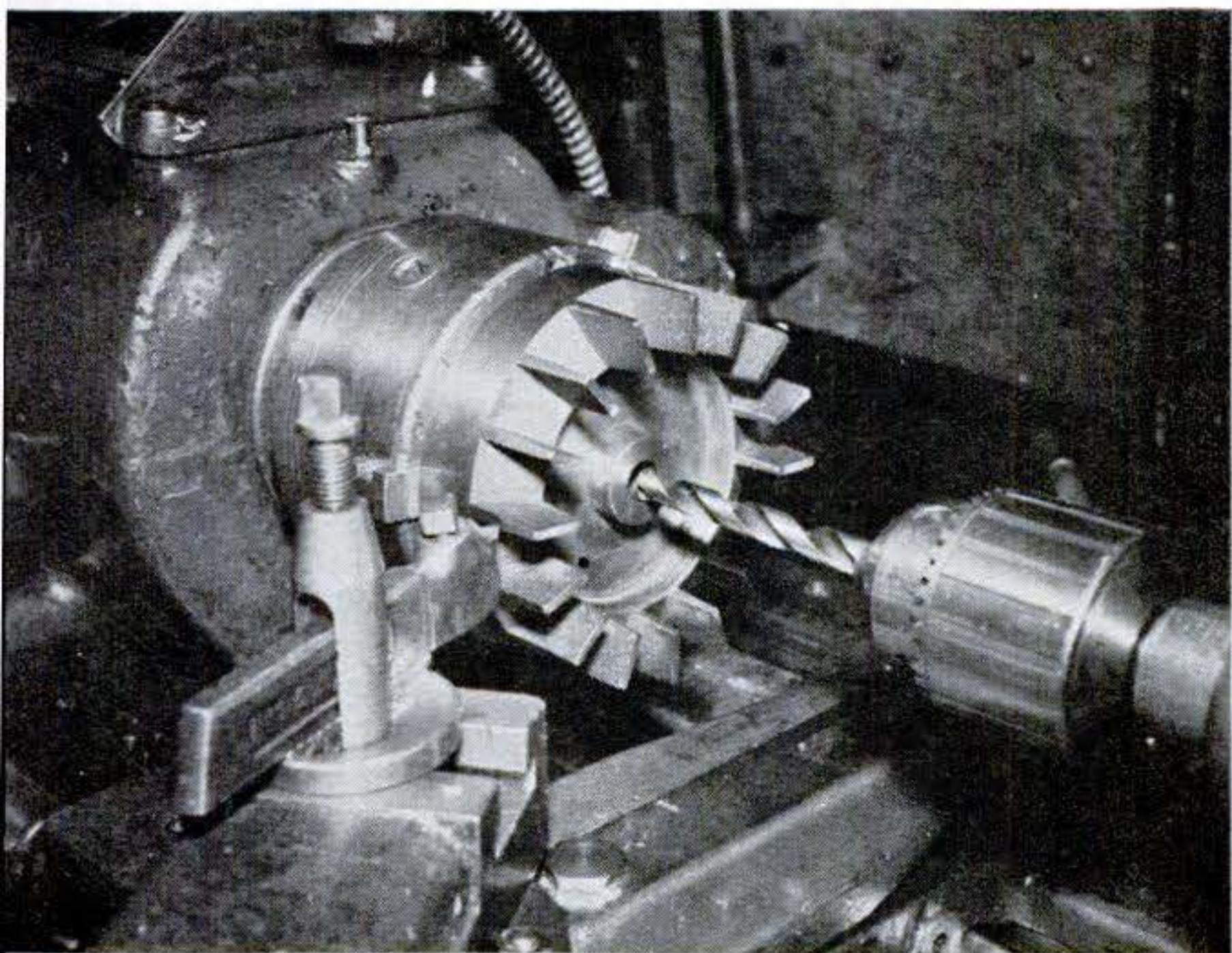


2 After bottom of the crankcase has been faced flat and smooth (surface must later seal in oil), casting is clamped to faceplate as above, and bored and faced for the cylinder.

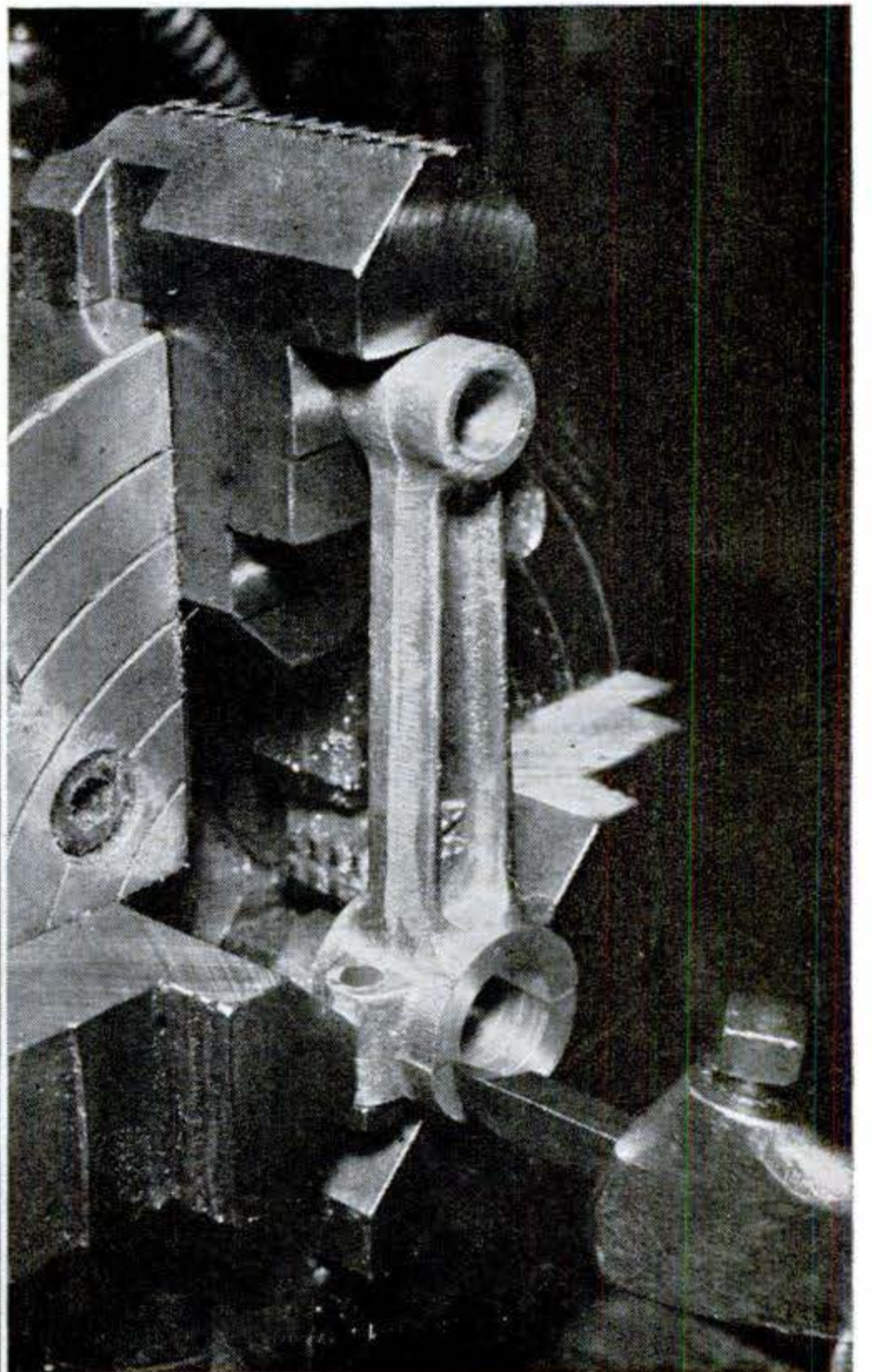


3 Given a quarter turn and chucked by bearing boss, the crankcase side is faced. A 1" drill is also run through the boss, which is later opened out to 1 3/16" for crankshaft bearing.

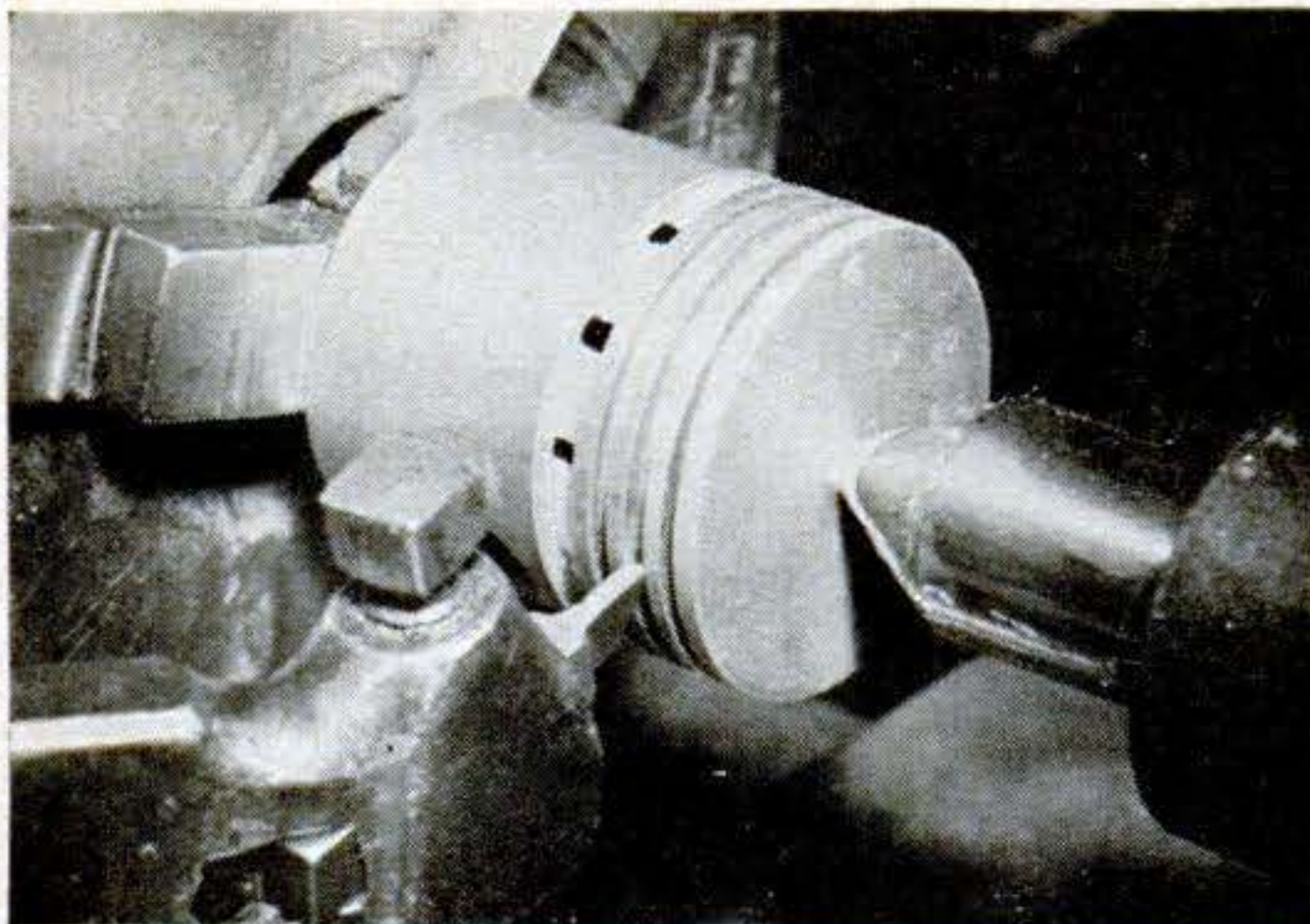
shaper"—that is, some files. Nasht's job sheets, planned with his students in mind, call for cutting the gear from blanks; most builders will prefer to fit ready-cut gears. Accurate machining is important, especially on the piston and cylinder, and construction shouldn't be done in a hurried or slapdash way if you expect best results. END



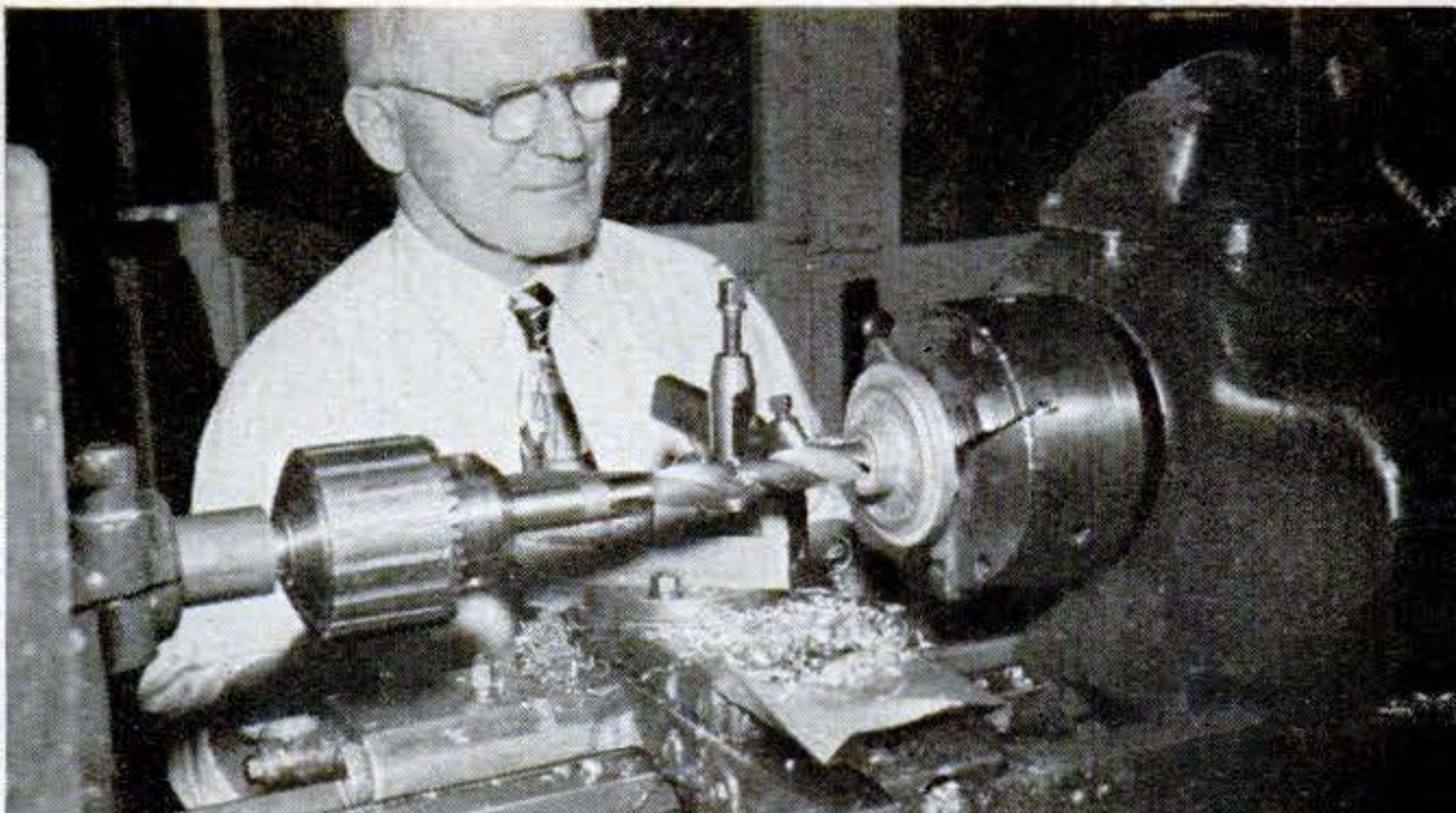
6 The flywheel is a simple turning and drilling job. Here it's held by inside chucking on back. Next it is reversed, chucked on the trued boss, and bored out to final diameter.



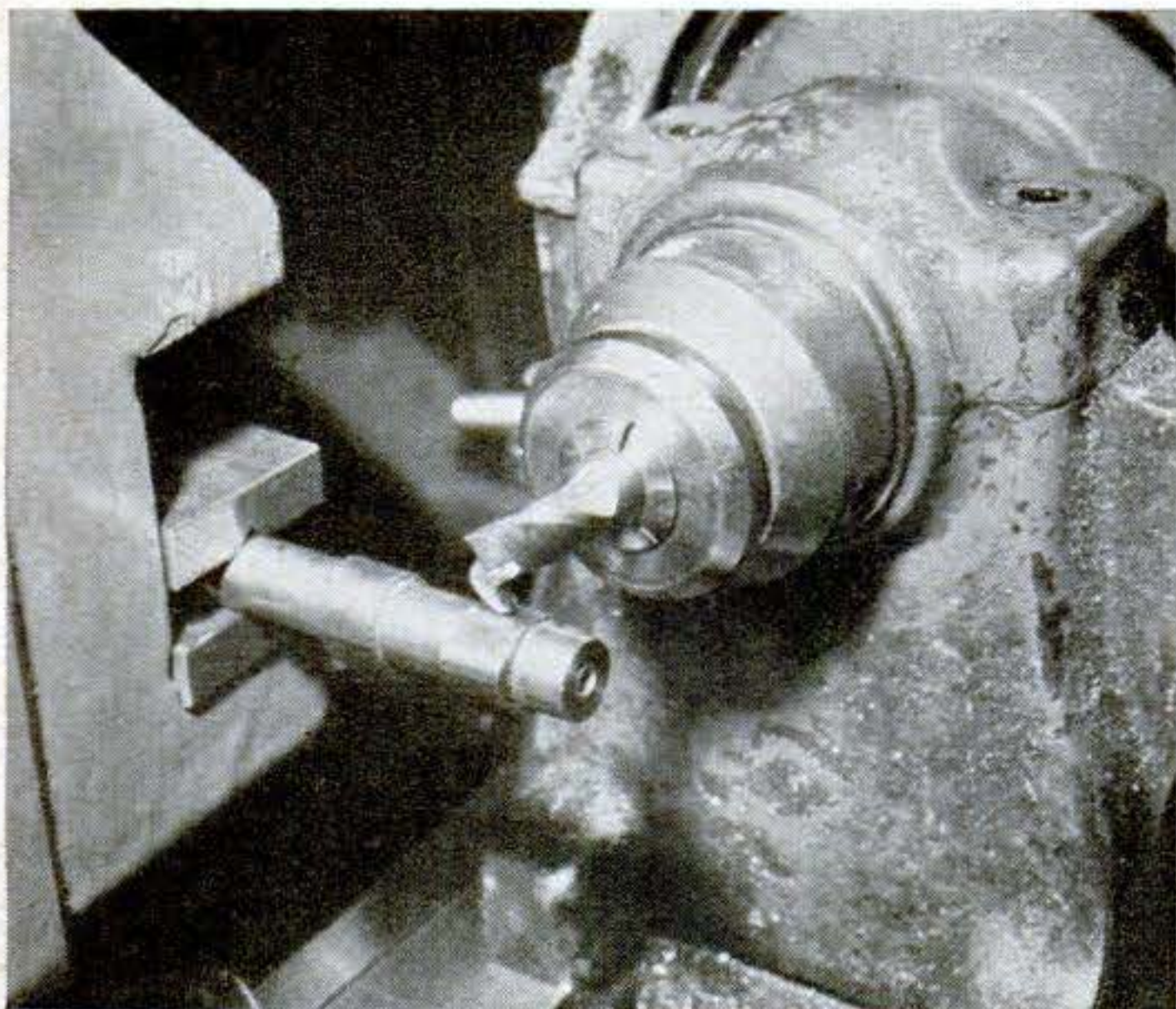
7 Con rod is finish-machined only after the big end has been drilled for cap screws, cut apart, tapped, and reassembled. The wrist-pin hole, made on drill press, is reamed to 1/2".



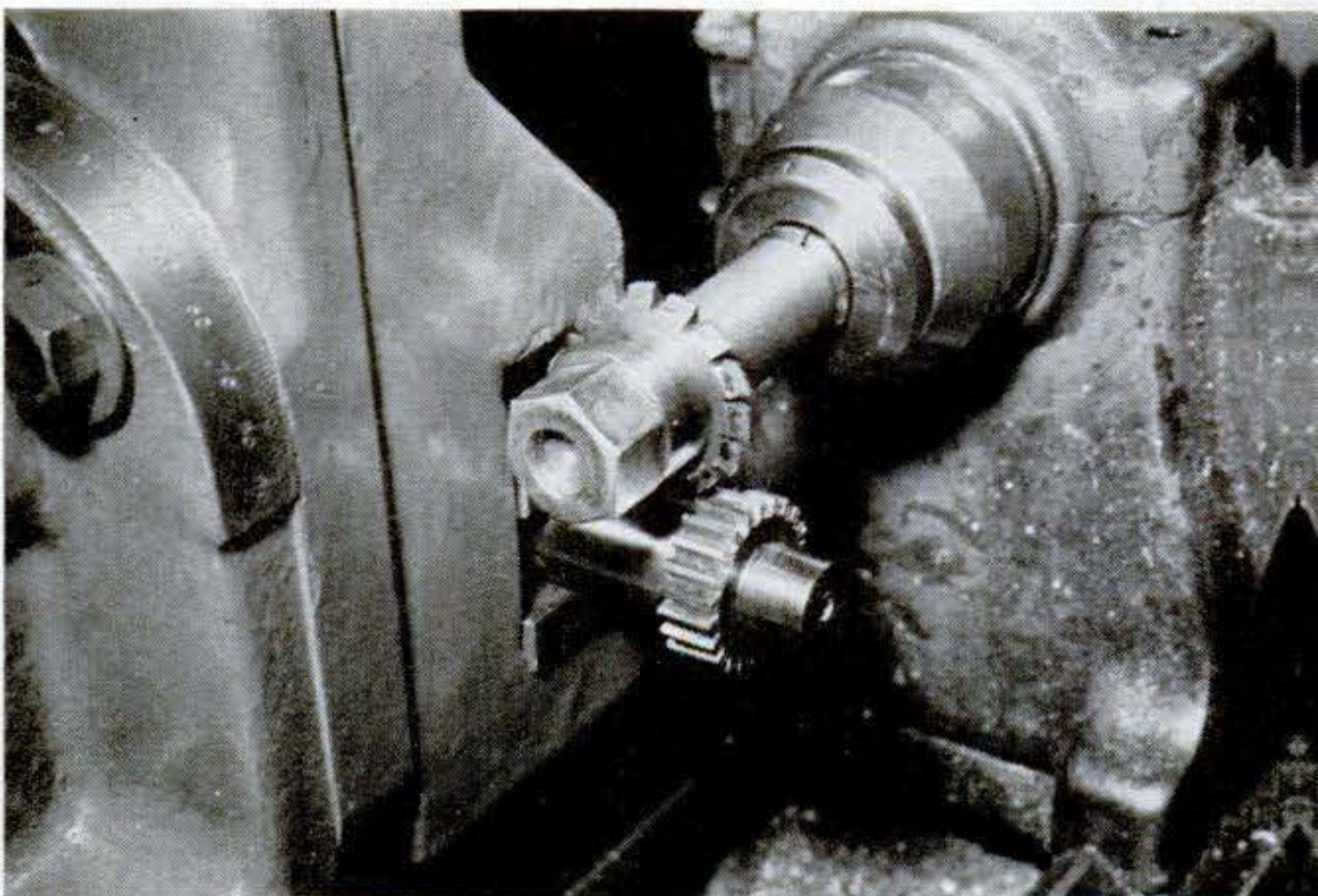
8 Piston can be chucked directly as shown, but it is better to mount it on a stub arbor, which gives greater tool clearance and lessens likelihood of skirt distortion from the chuck.



9 Crankcase end plate, here being faced and drilled by W. L. Nasht, is a simple setup. On large, through holes, practice is to run in a pilot drill, then large drill, then bore out.



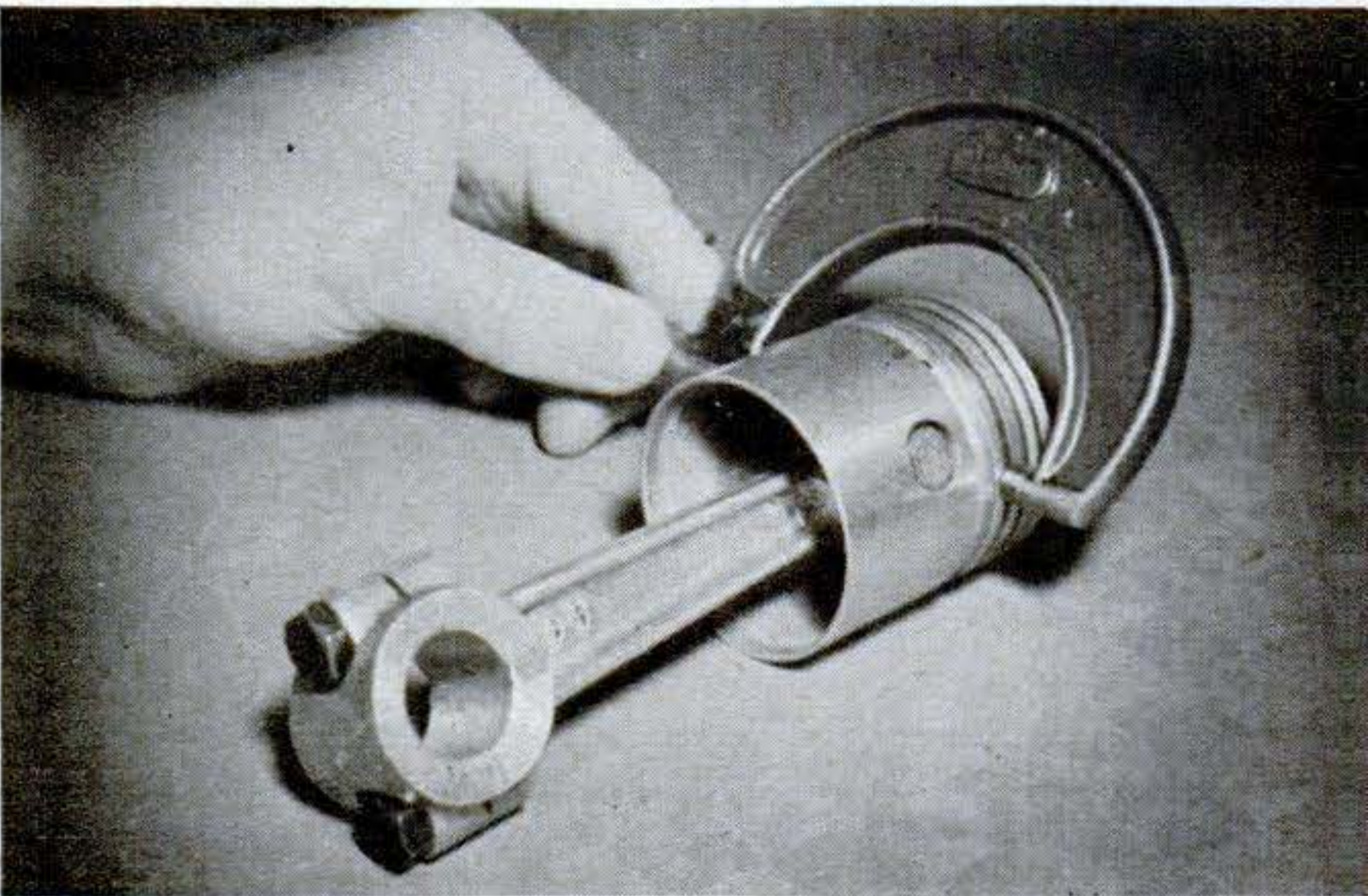
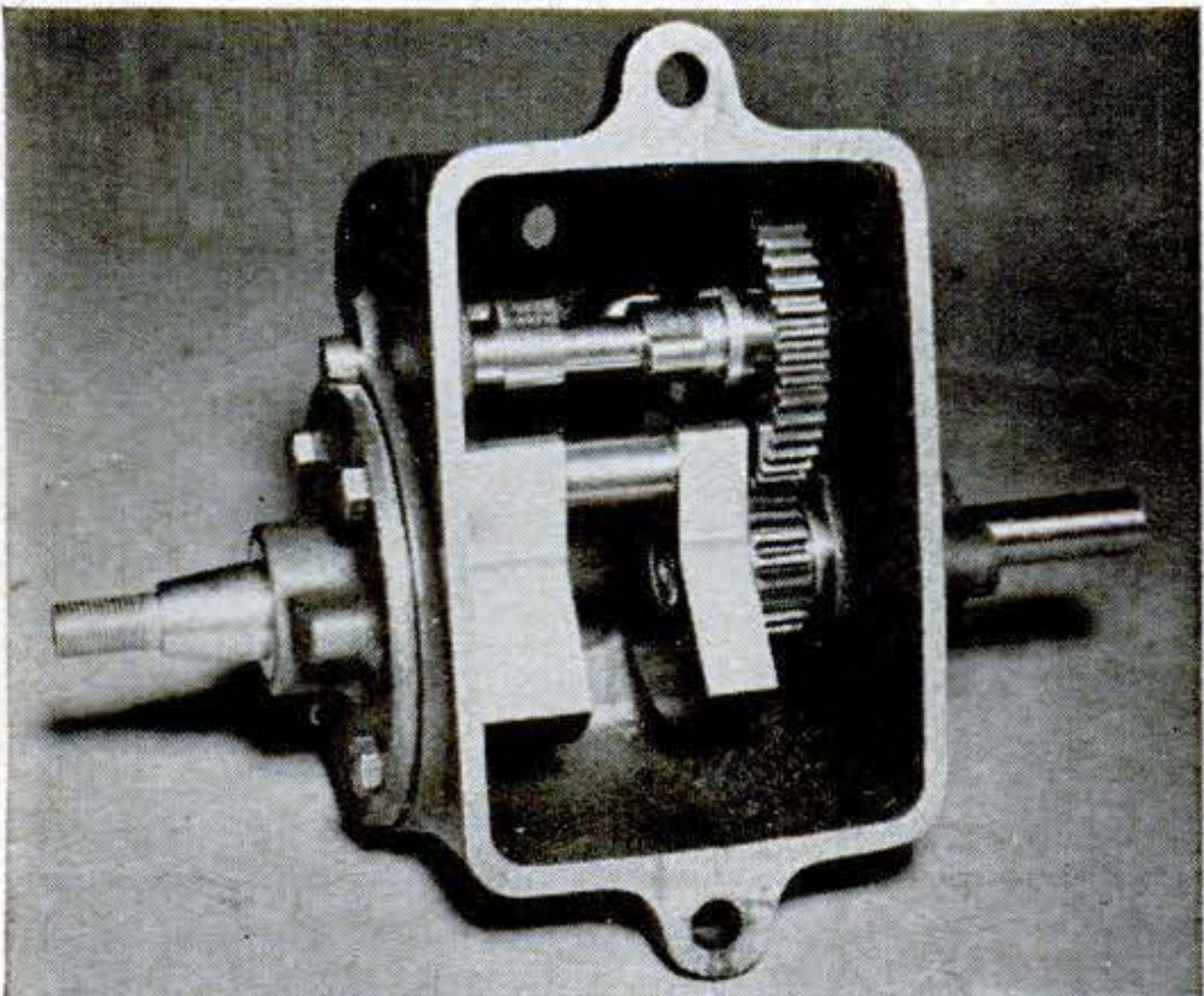
12 Camshaft is rough-turned, cam lobes laid out in scribed profile, and excess metal milled away. Lobes are finished with a file and emery. The camshaft here is already done.

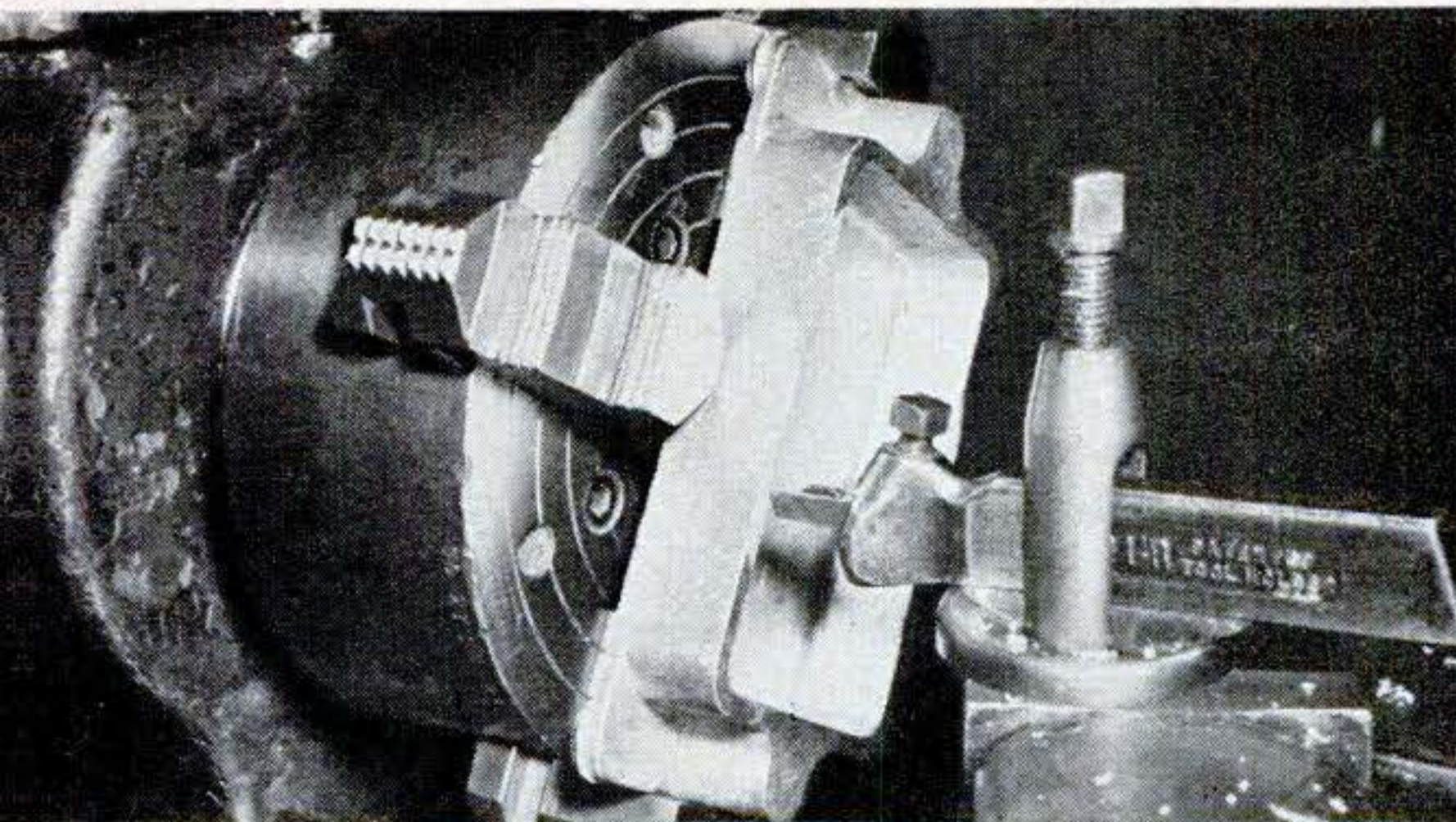


13 Crankshaft gear, which has 22 teeth, can be cut in milling attachment. Index head or punch marks through paper pattern locate teeth. Existing gears may also be adapted.

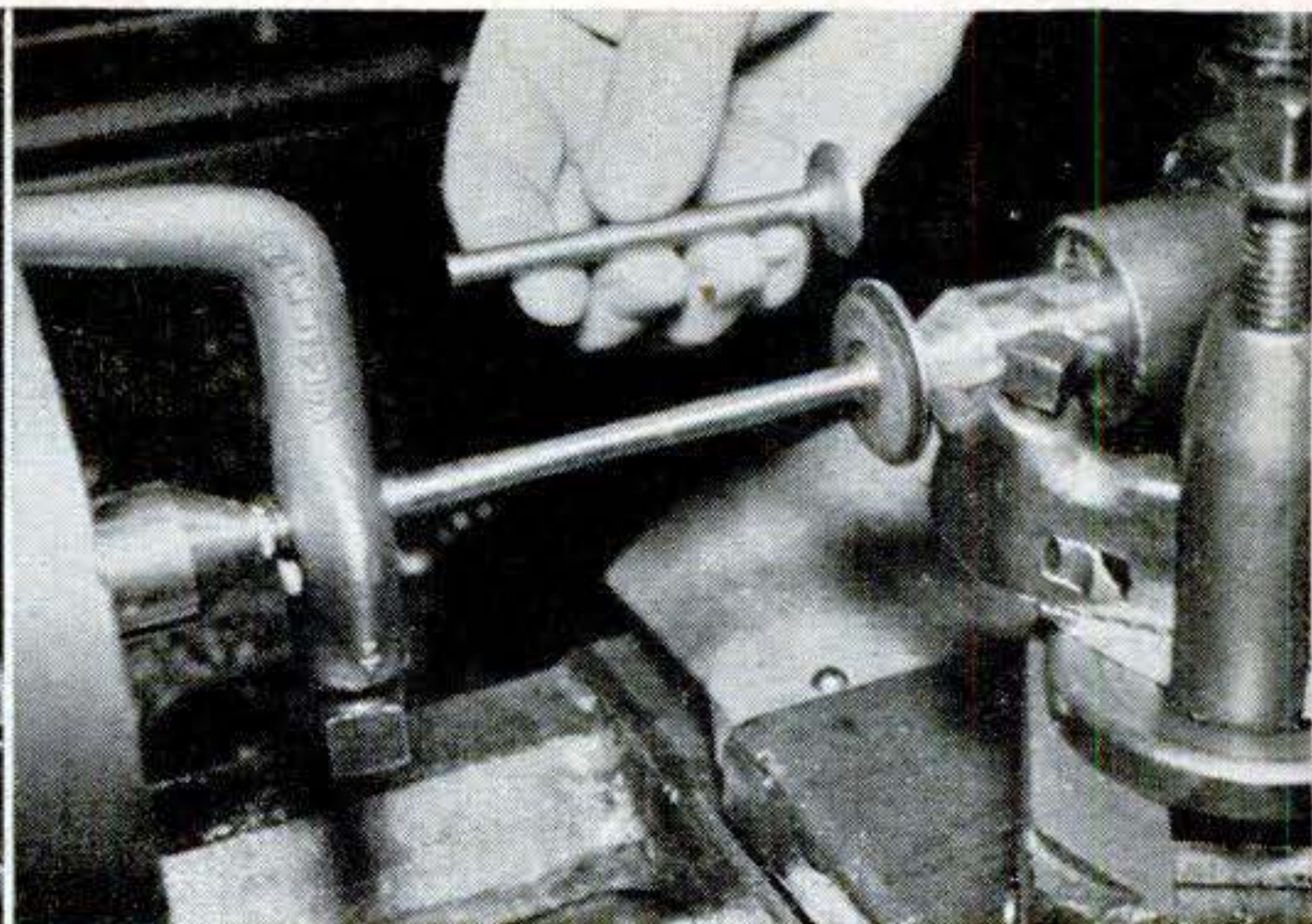
16 Assembled this far, engine is mounted in the lathe, bottom up and with shaft chucked. Shaft is then driven for an hour at 750 r.p.m. in a liberal bath of light motor oil.

17 Check dimensions carefully before final run-in with rod, piston, and rings. Leave out spark plug to prevent compression. Watch for roughness, binding, or overheating.

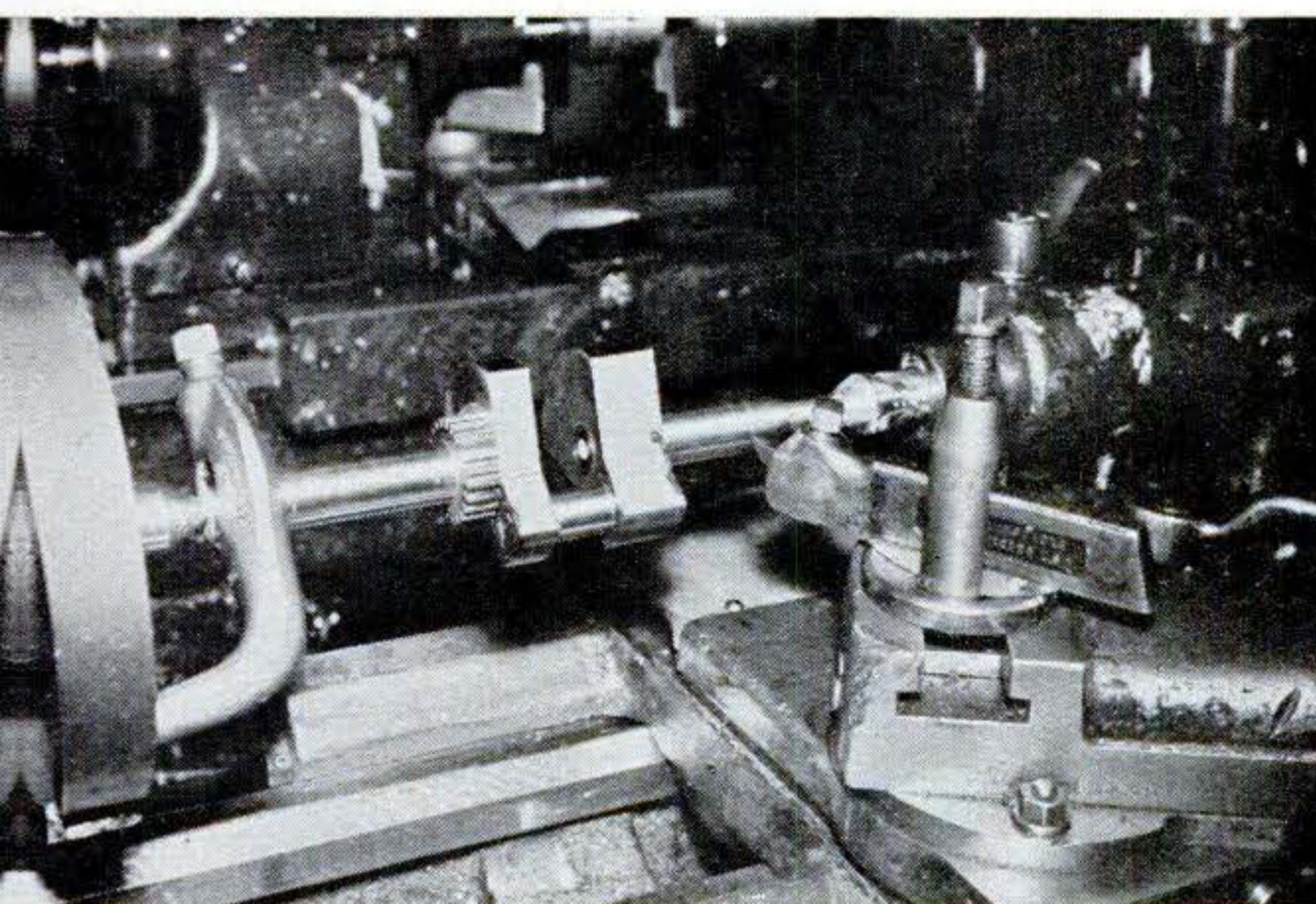




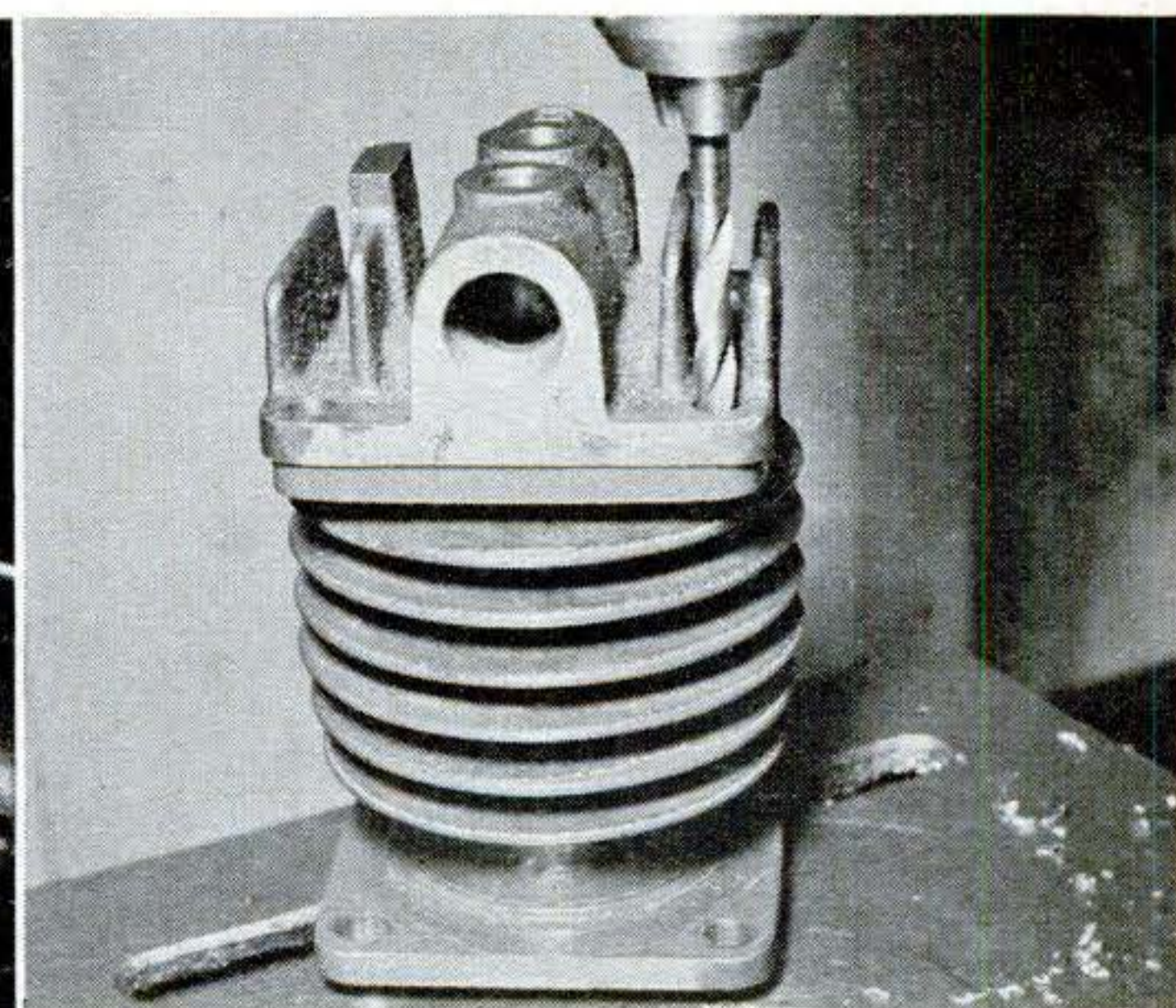
10 Oil pan is faced absolutely flat to make tight joint with crankcase. Toolpost and gibs must be pulled up tight to prevent ripples on edge. Six holes are then drilled in the pan.



11 Old valves from a Ford or Chevrolet are turned down after careful centerdrilling. Use a carbide bit if available; the stock is tough. Later, stem is crossdrilled for a retaining pin.



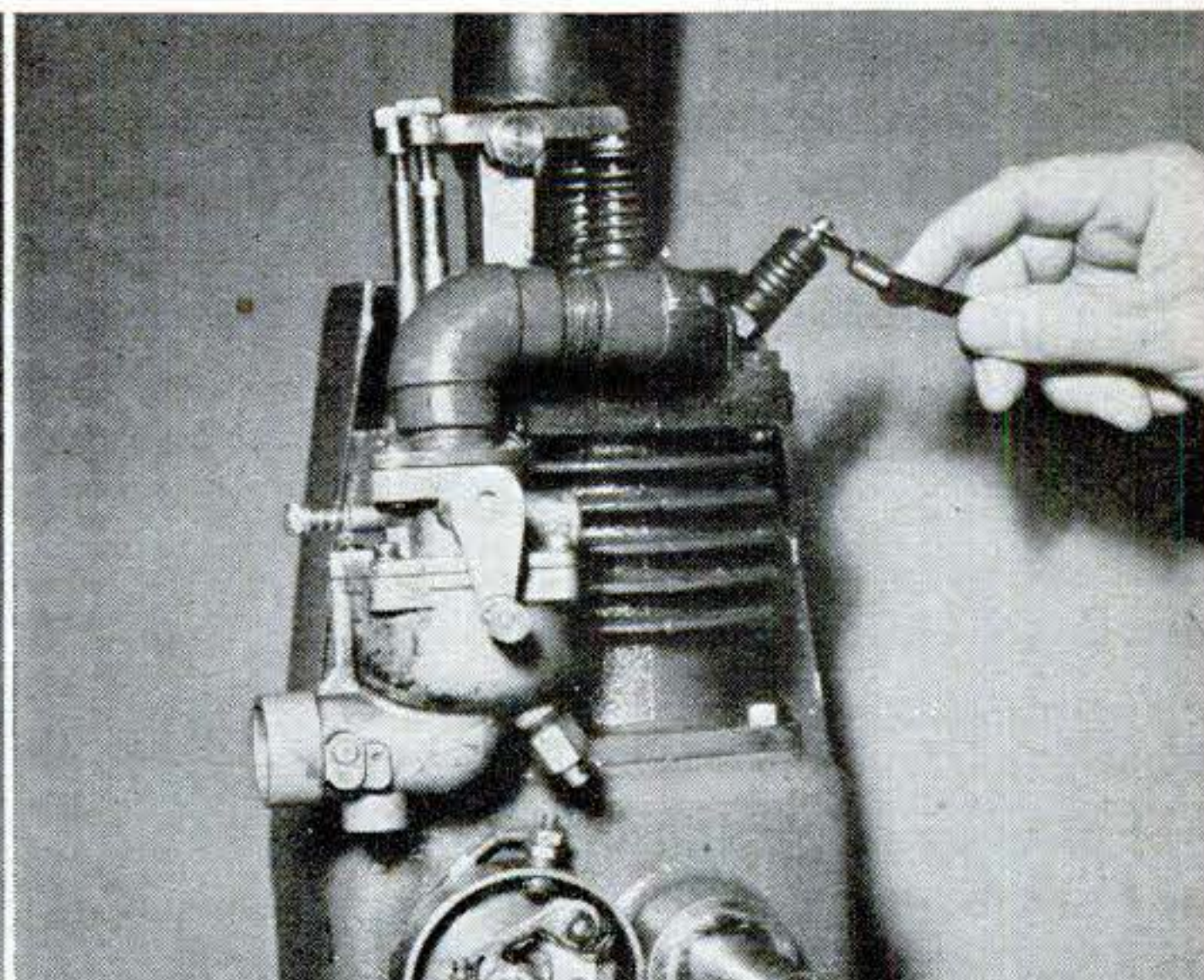
14 Crankshaft is assembled from five pieces and gear, using drive fits and pins. Spacer is temporarily placed between counterweights. Here a crankshaft journal is finish-turned.



15 Four holes in the top of the cylinder are located with the head in place; holes in the bottom of the cylinder have already been drilled for the bolts to the crankcase.

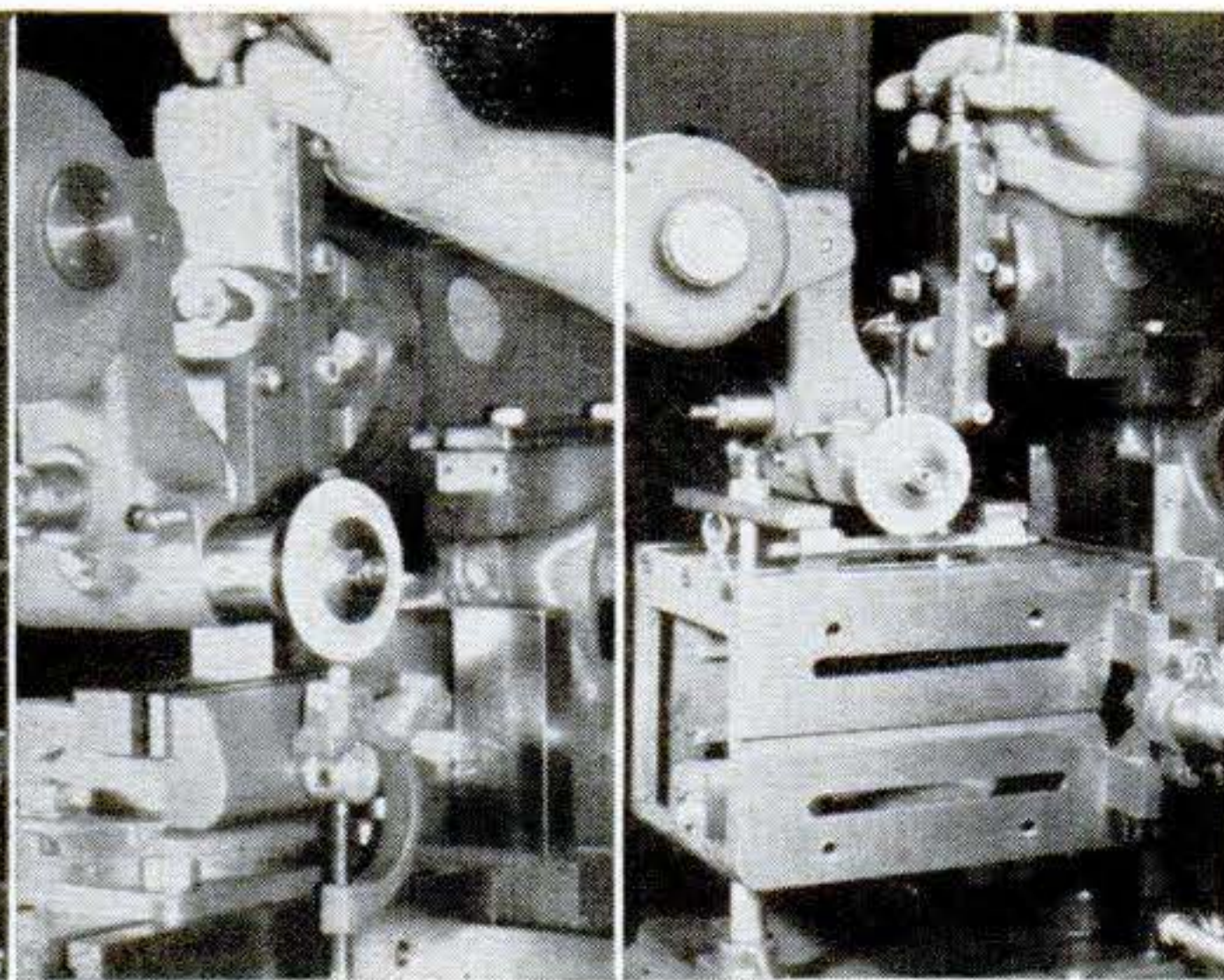
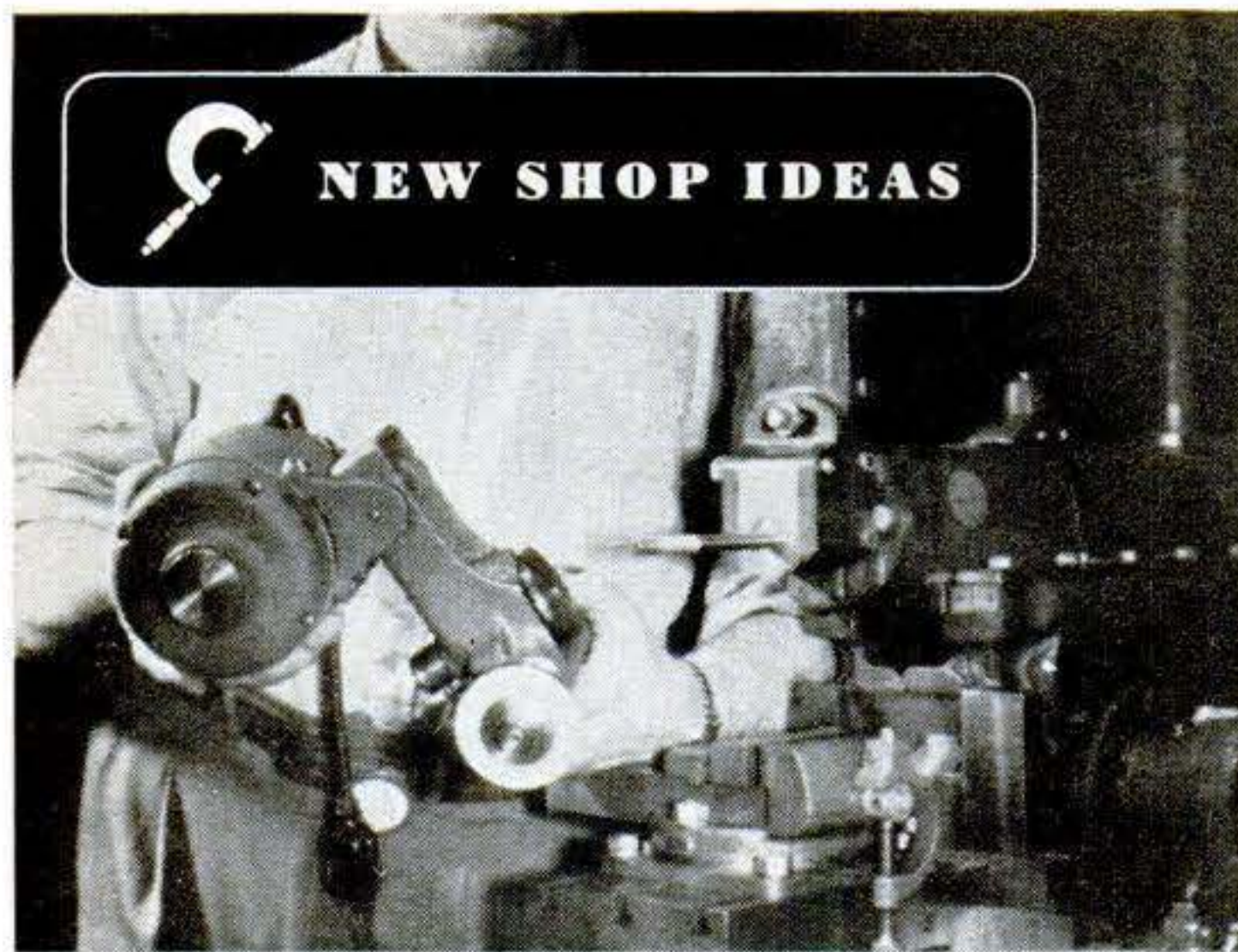
18 Pushrods, guides, and rockers are all straightforward machining jobs, starting from bar or flat cold-rolled stock. Springs are wound from .062" and .080" music wire.

19 This completed engine has a 14-mm. spark plug, a secondhand Briggs & Stratton carburetor, and auto distributor points. Cooling shroud and muffler are sheet metal.





NEW SHOP IDEAS



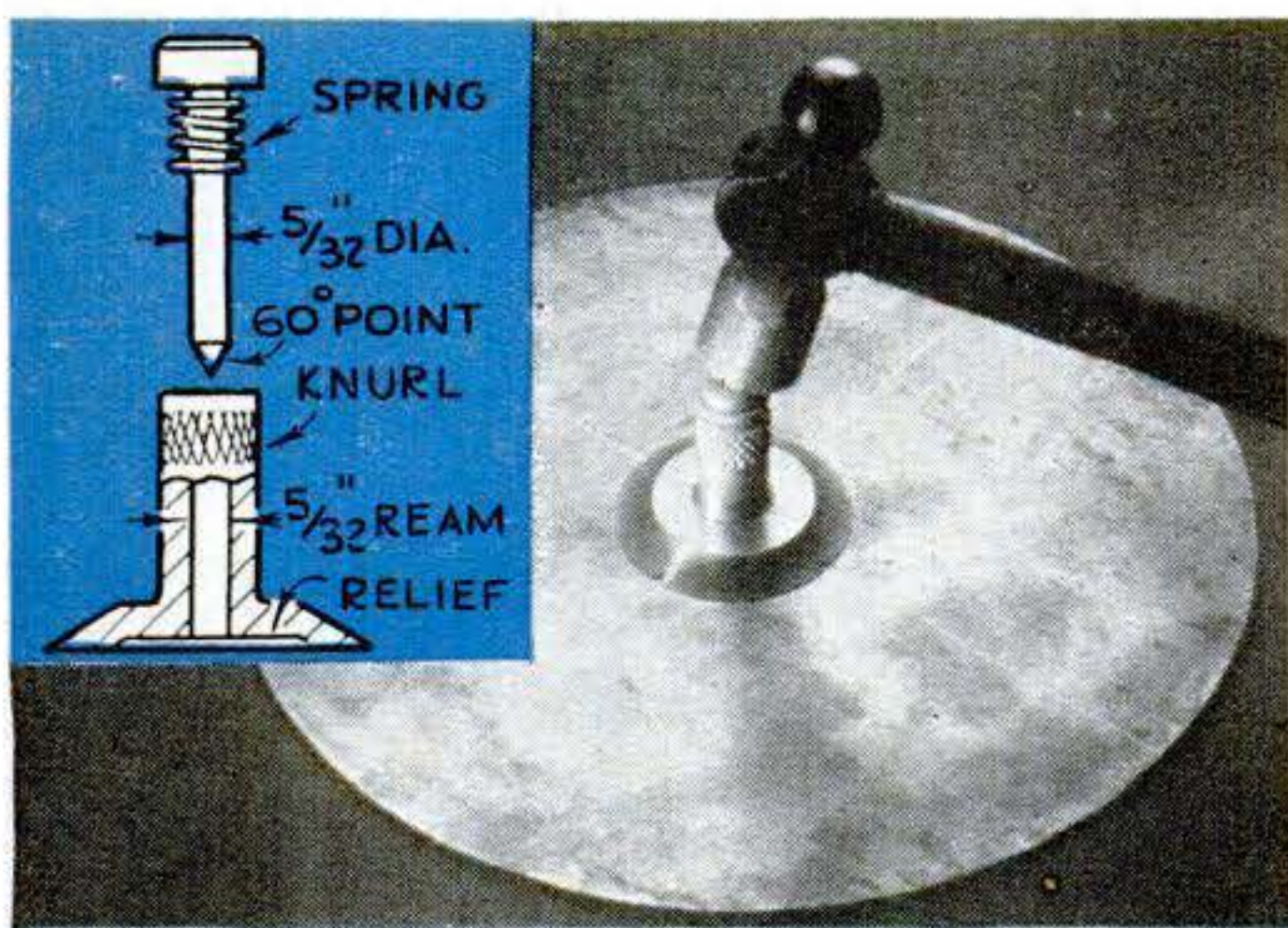
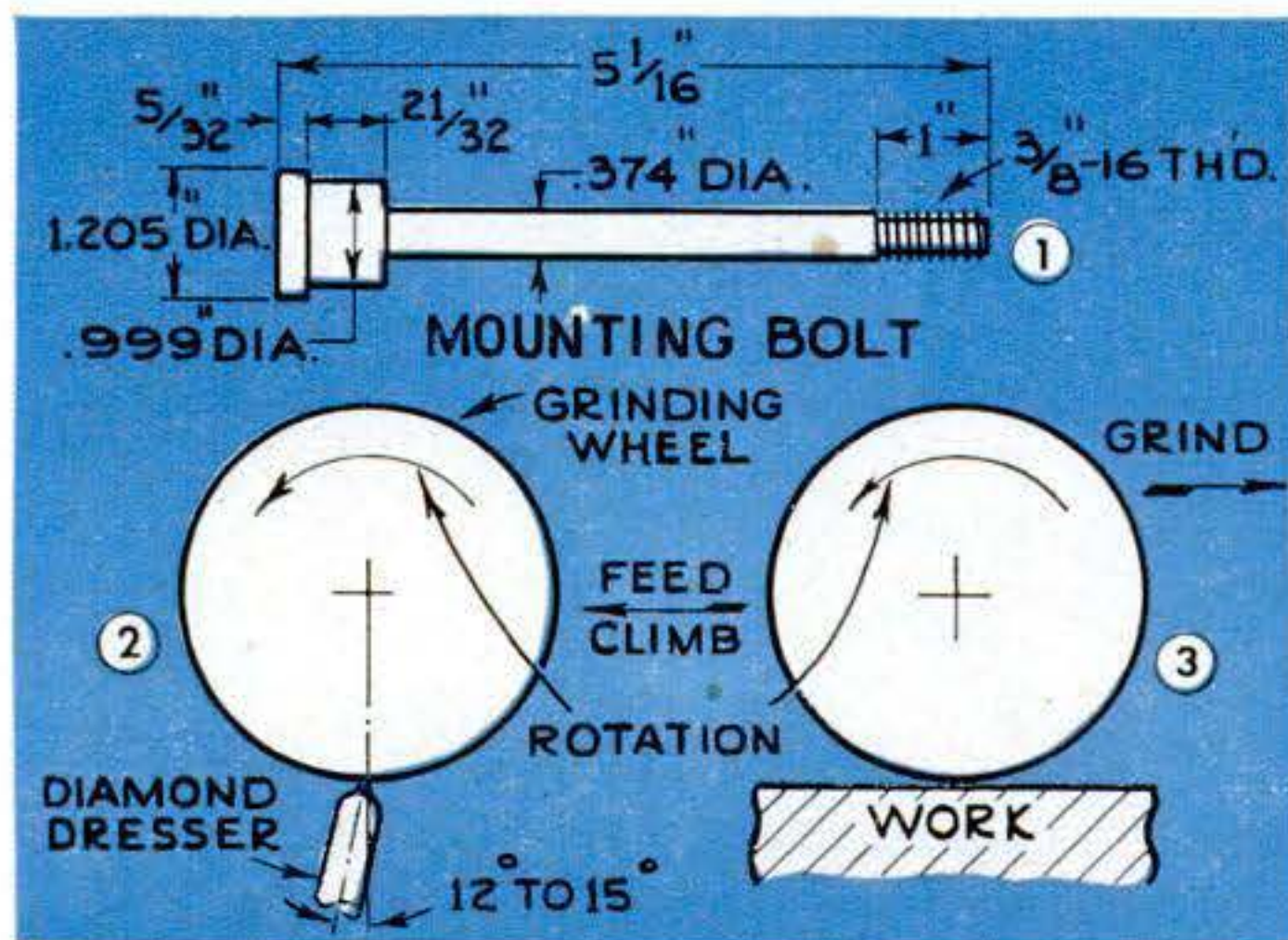
Shaper Is Surface Grinder. An ordinary shaper and a lathe tool-post grinder can be combined for precision surface grinding. Mount the grinder on the shaper as above with a special bolt (Fig. 1). Work can be secured to the knee, clamped in the vise, or held with a magnetic chuck.

Dress the grinding wheel by clamping the dresser in the vise as in the center photo. Feed the rotating wheel into the diamond with the clapper feed and across the diamond with the knee feed. Set the diamond on the wheel centerline (Fig. 2).

On work, set the shaper to feed as in Fig. 3. Take light cuts of .0005" to .001" and make the last one without an advance. Tie down the clapper to prevent skipping. Fol-

low the manufacturer's recommendations as to the type of grinding wheel.

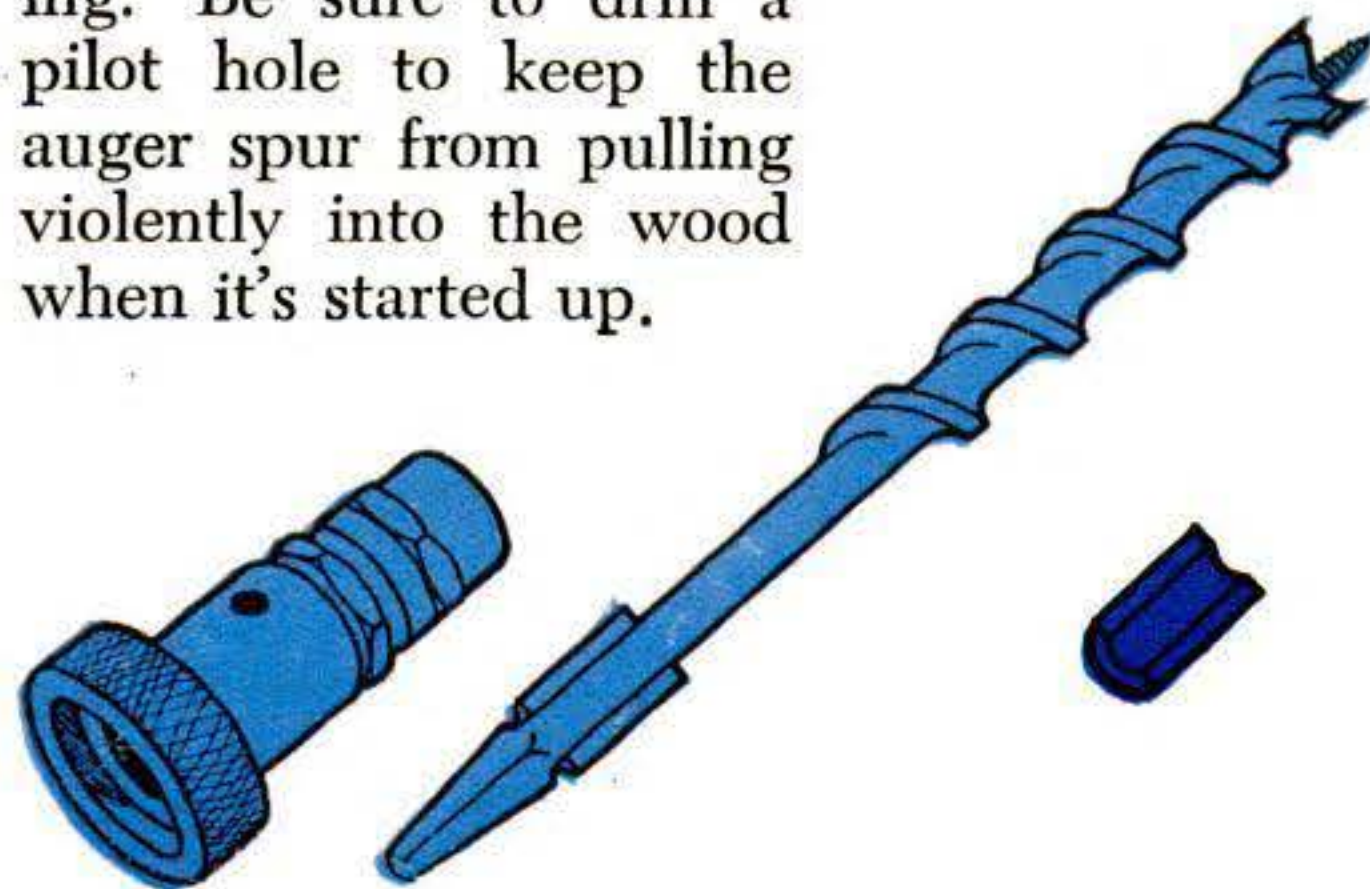
Be sure to wear goggles and use a wheel guard.—L. W. Bonnell, San Diego, Calif.

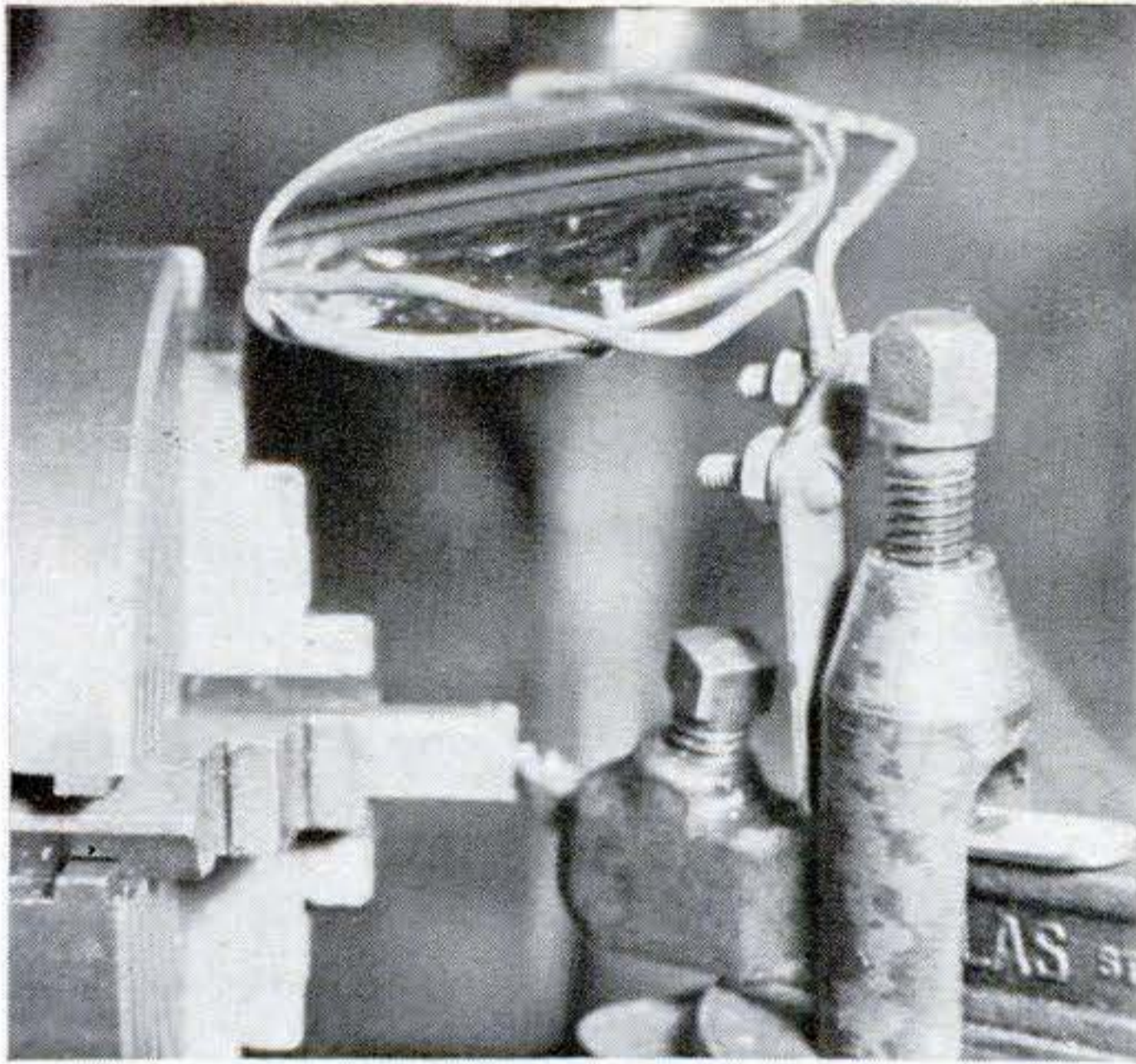


Punch Hits Exact Center. After you have laid out two right-angle centerlines to locate a hole, this punch enables you to start the hole precisely where the lines cross. Around its rim are four notches 90° apart. When these are lined up visually on the four lines, the punch is automatically centered. Turn the base from brass and ream it so the punch will be an easy sliding fit.—Joseph Tracy, Manhattan, N. Y.

Auger Bit Used in Drill Press.

A split bushing made by drilling a short length of 1/2" drill rod lengthwise and cutting it in half with a hacksaw will enable you to mount a standard wood auger bit in a drill-press collet chuck. The rod should of course be drilled the same diameter as the shank of the bit. If the drill shank is not quite round where it merges into the square taper, dress it slightly with a file so it will seat firmly in the split bushing. Be sure to drill a pilot hole to keep the auger spur from pulling violently into the wood when it's started up.

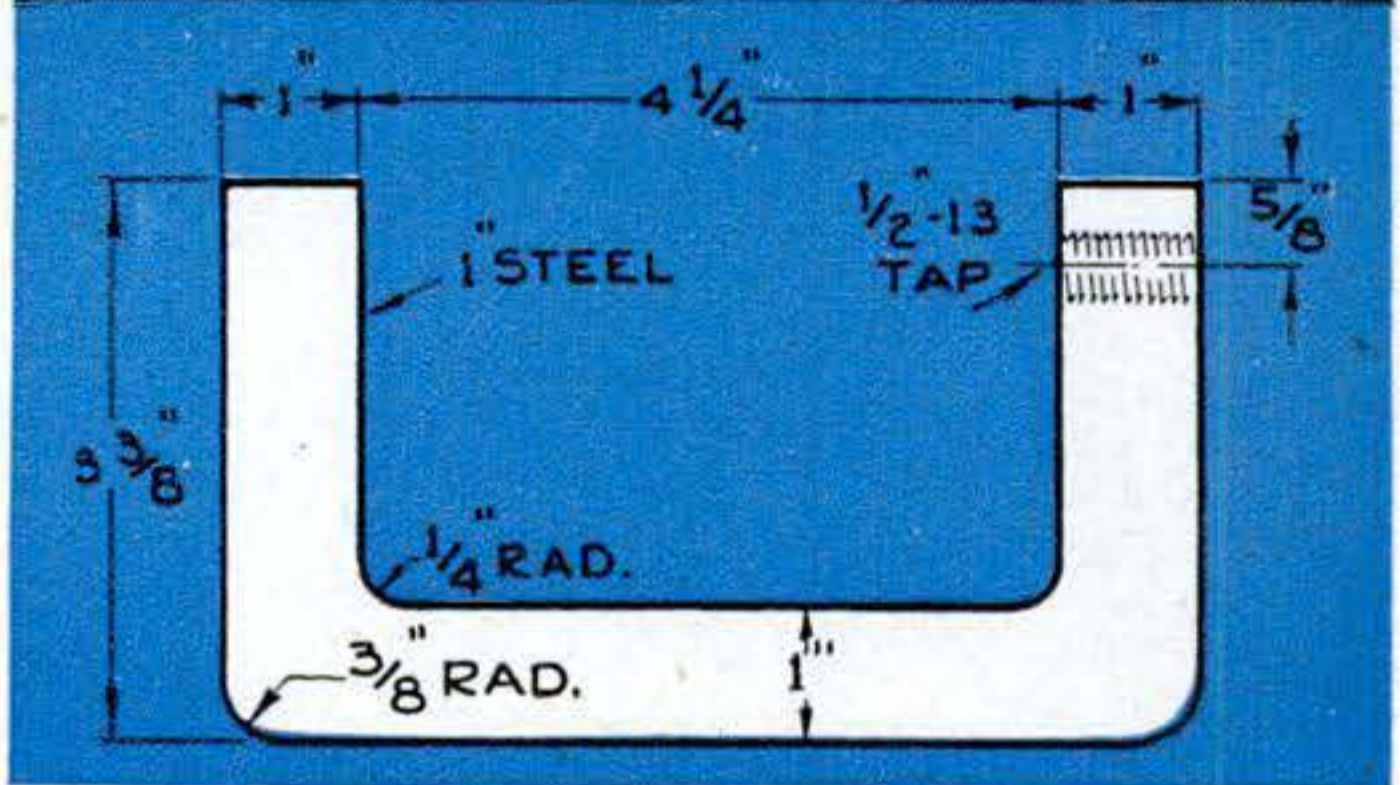
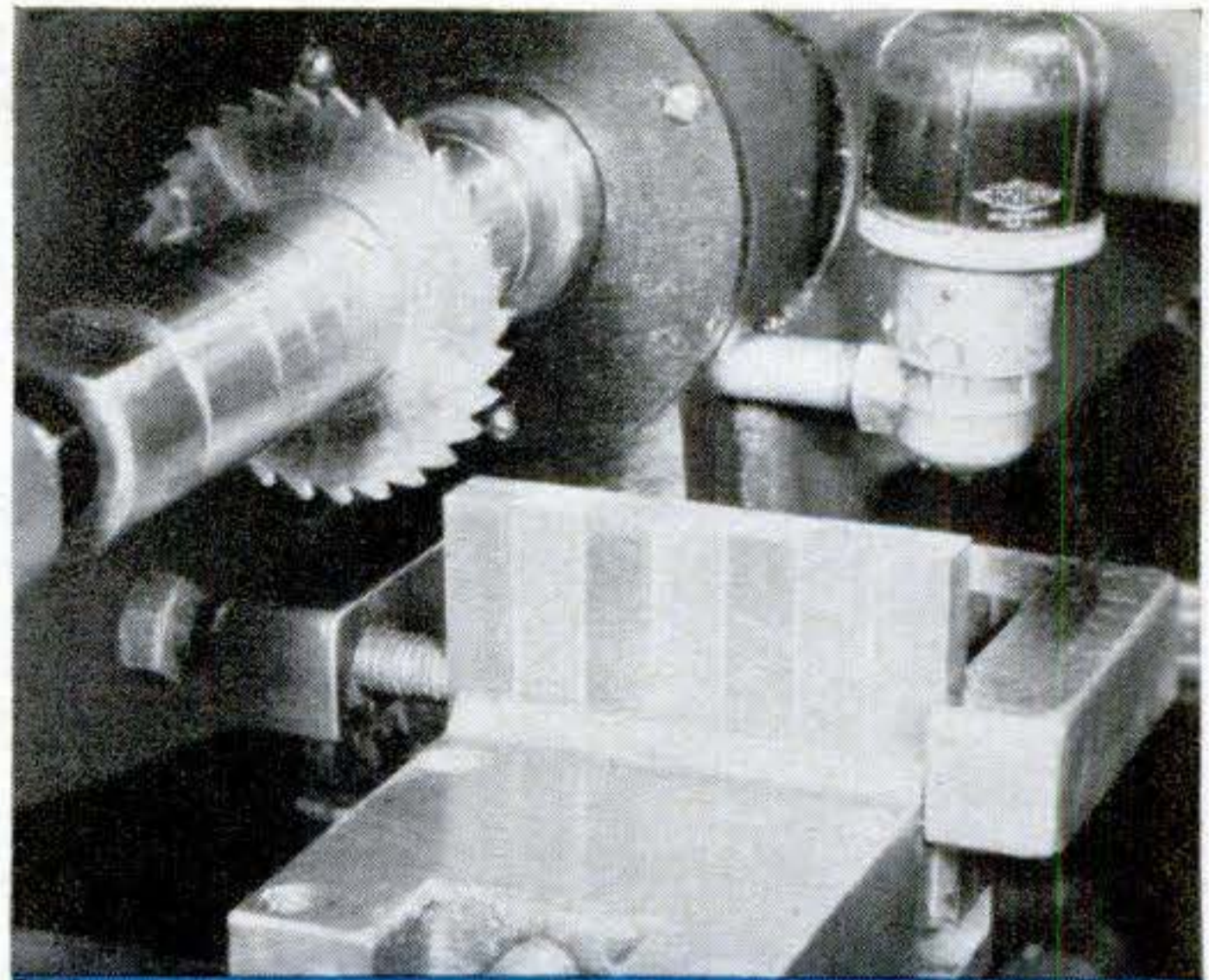




Shield Magnifies Work. An inexpensive magnifying glass mounted on a lathe as above will serve two purposes—give you better vision while doing close work and protect you from flying chips.

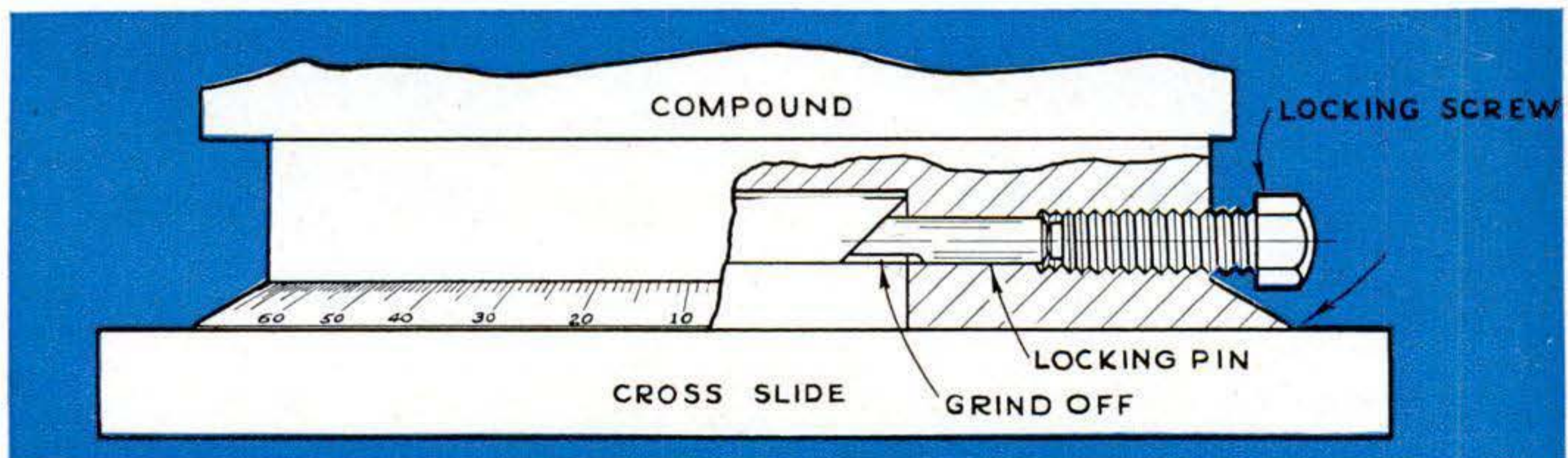
It's best to use a wire clip to hold the glass. Frequent cleaning is necessary and a rim would make this more difficult. An L-shaped bracket clamped under the tool-post screw supports the assembly. A pivoted extension on top permits adjustment.

Roll Your Own Too. Cigarette papers are often useful around the shop. To pick up a cut with a milling cutter or tool bit, hold a paper between cutter and work. You'll feel the cutter just as it contacts the work. Use as shims to true up work in a slightly eccentric three-jaw chuck, and in vise jaws to prevent marring. Once you have the habit you'll find many other uses.



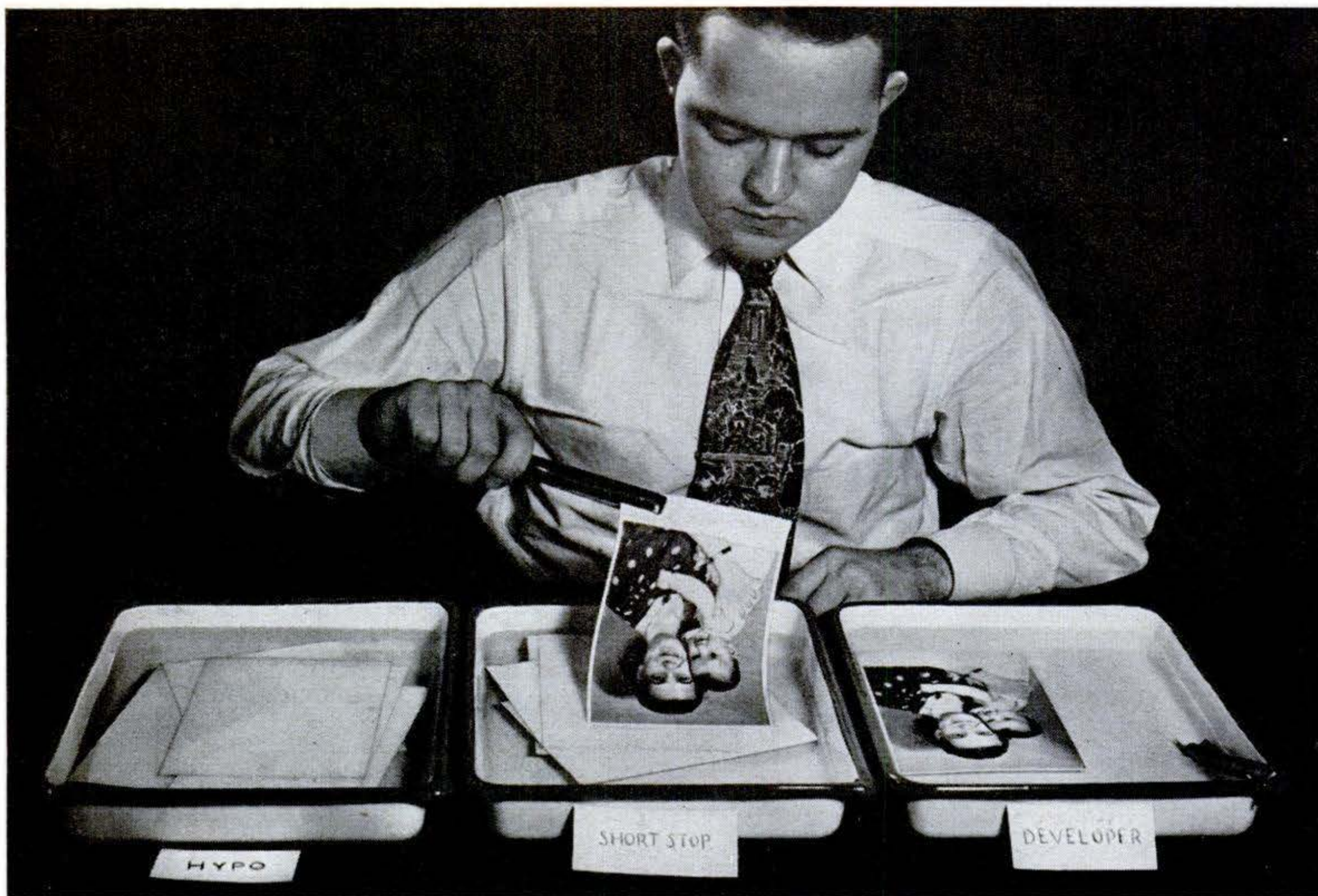
Work Ganged for Milling. It's often advantageous to stack work parallel to the milling cutter and do the job with one pass. For this, the vise usually is not satisfactory, since stock variations and uneven clamping may leave some pieces loose.

The husky clamp illustrated above overcomes this difficulty. The dimensions suit it to a 3 1/2" milling vise. It's used as shown in the photo. While the vise jaws exert pressure in one direction, the clamp works in another. This two-way clamping prevents movement.—*J. C. Magee, Schenectady, N. Y.*



Stopping Lathe Chatter. In small lathes, the pins that lock the compound rest on the cross slide may cause chatter if they ride on the collar below the inverted cone. To check for this, take off the compound, clean carefully, coat with a film of oil, re-

store it, and draw up the locking screws. If the oil is drawn in instead of being pushed out, it's a sure sign the pins are riding. The remedy is simple: grind .010" to .015" from the lower edge of each of the pins.—*L. L. Sevebeck, Westfield, N. J.*



Acetic acid shortstop helps prevent developer stain and doubles life of fixing bath. Prints

can be left temporarily in shortstop and then be transferred in batches to the fixing bath.

Print Your Pictures for a Lifetime

They'll last practically forever if you fix, wash, and mount them carefully. Here's how to do it.

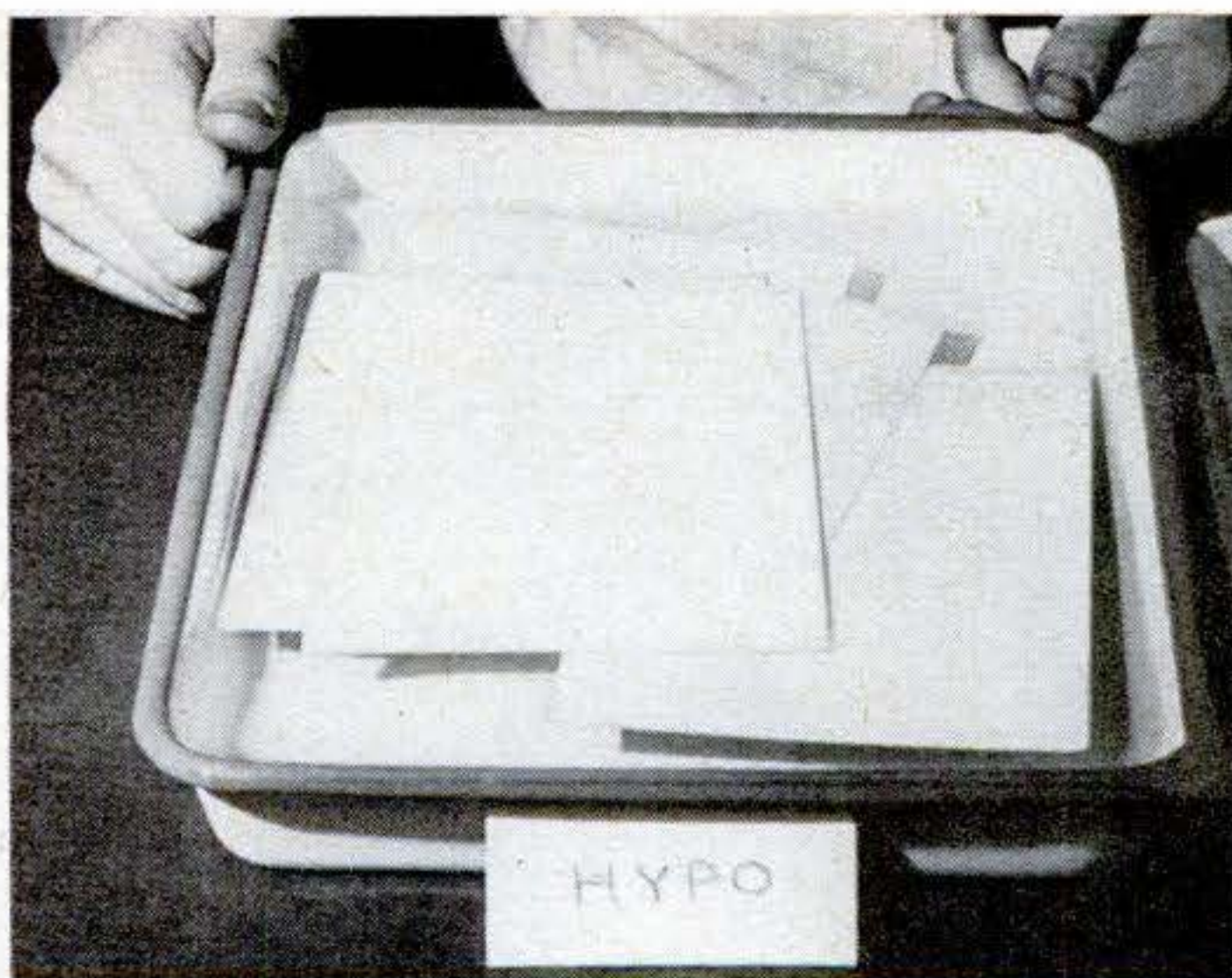
By Kenneth M. Swezey

SOME rainy day half a century from now, your grandchildren may start rooting around in the attic. Chances are, they'll dig out an old album or dusty box of photos, among them several you proudly pulled from the developer away back in 1949.

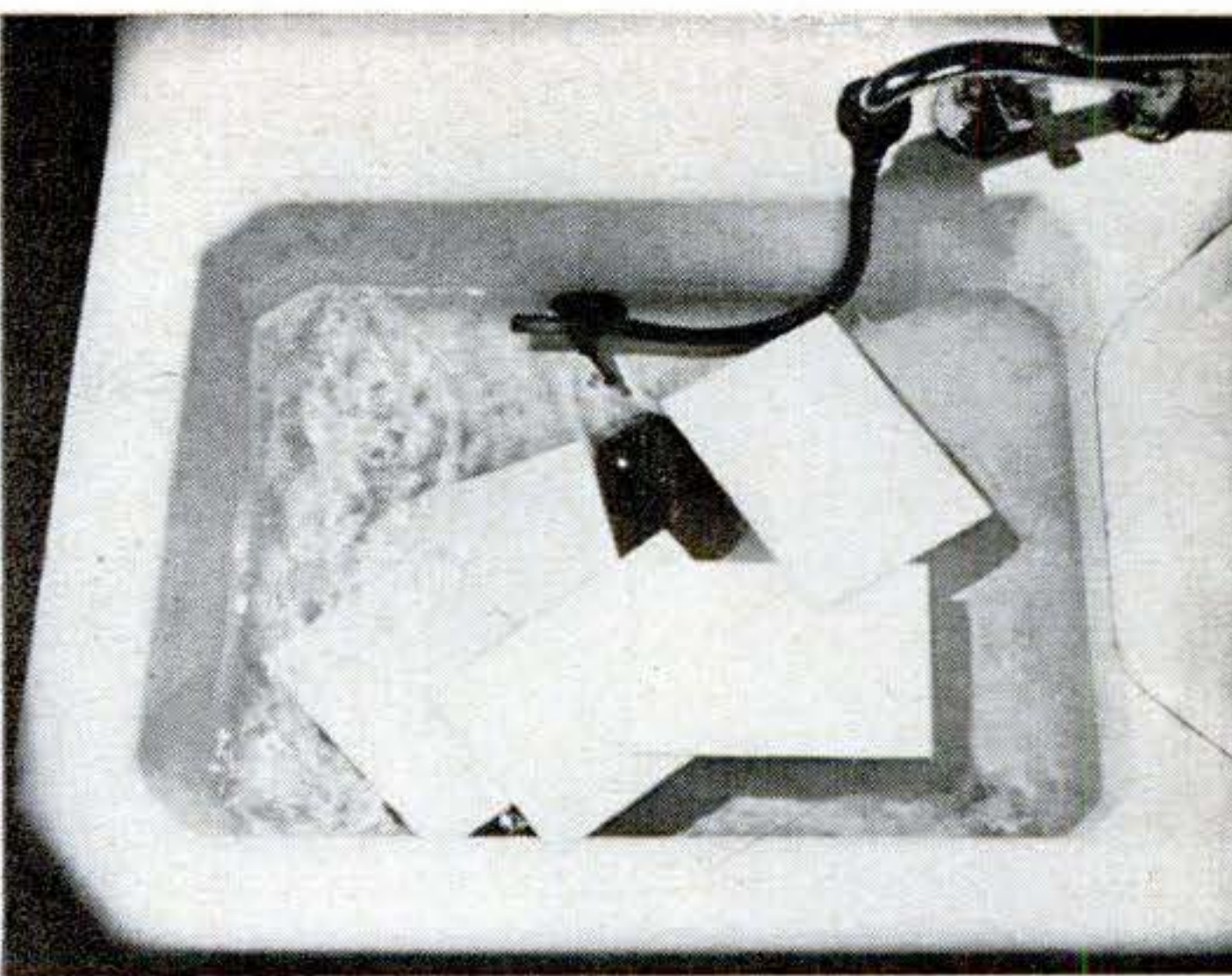
The youngsters will grin, perhaps laugh aloud, at the strange costumes. But what about the photos? Will they be stained and faded—like those you've probably seen in your own grandpop's attic? Or will they still be bright and crisp?

It depends on you. With care, you can make prints that will last as long as the paper on which they're printed. But you must pay exacting attention to the drab jobs of fixing, washing, and mounting.

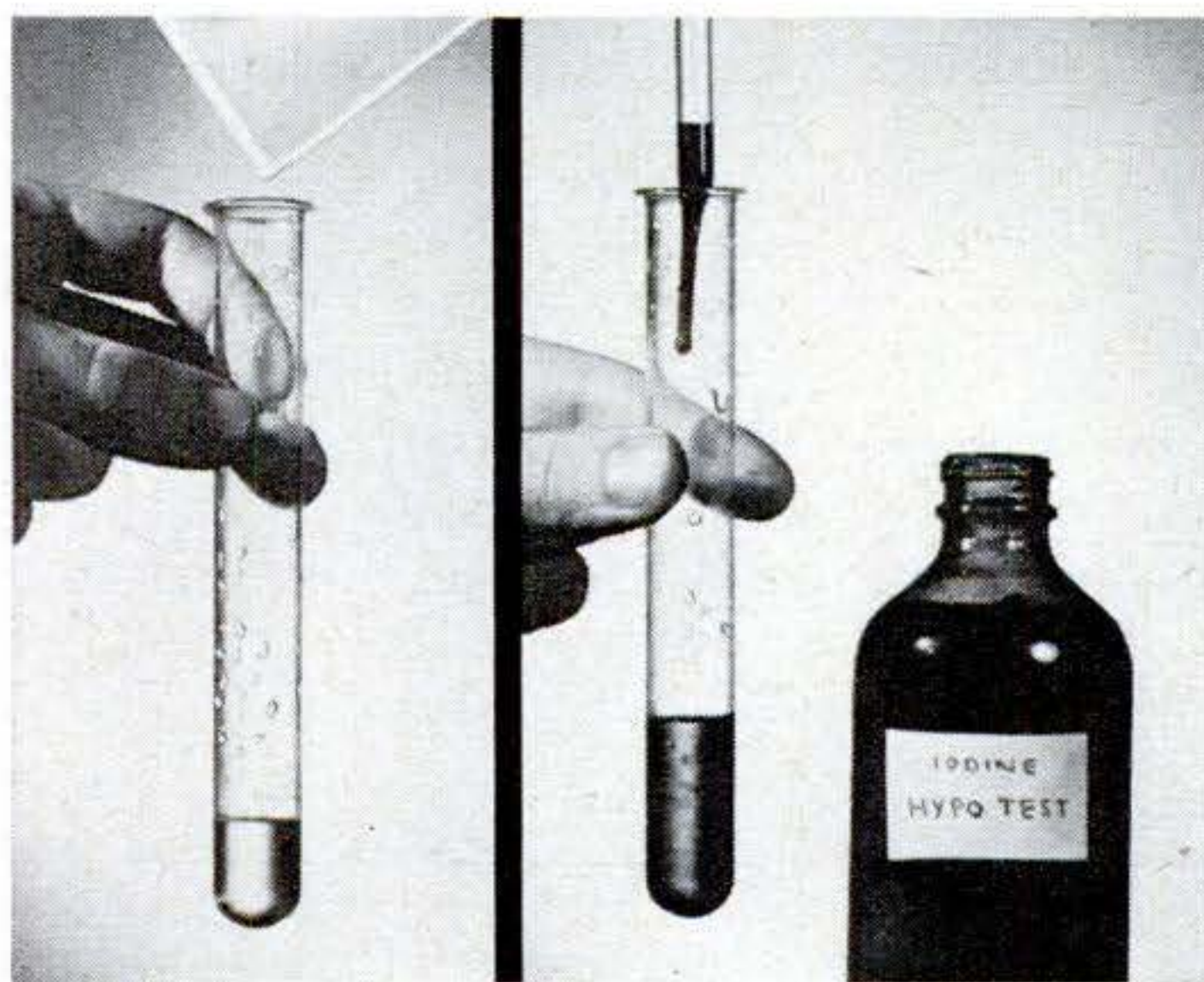
When you watch a print in the fixing bath, nothing seems to happen. But don't let that fool you. The hypo must dissolve all undeveloped silver salts, or they'll eventually cause overall darkening of the print. In turn, thorough washing is required to carry away the hypo. If any remains, sulphur in it will react with the silver image, producing yellowing and fading.



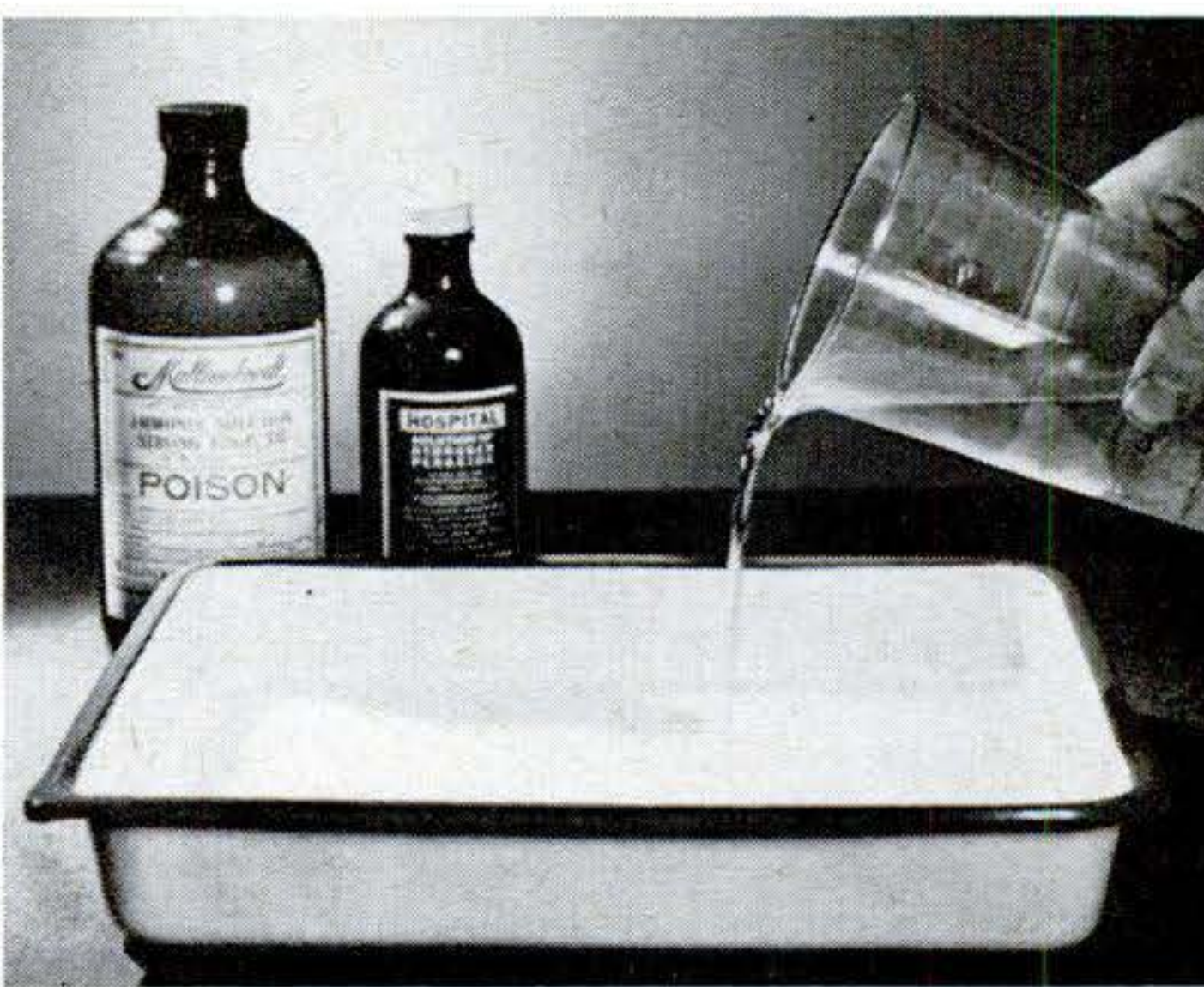
Rock the fixing tray frequently and manipulate prints occasionally with tongs. Make sure the solution reaches the surface of each print.



Washing carries away hypo and soluble silver compounds from paper. The circulating system must keep fresh water in contact with prints.



Iodine-starch test detects hypo remaining on prints. Drip water from print into tube, add solution. If it loses blue color, hypo remains.



Ammonia solution, used as described in text, removes last trace of hypo. This will help you keep valued prints bright indefinitely.

If agitated constantly, a single print should fix in about a minute in fresh hypo. But under ordinary conditions, it's best to leave prints in the fixer about ten minutes.

Unfortunately, there's no easy test to tell when hypo has reached the end of its useful life. The best you can do is remember that the conservative life of typical acid hardening solutions, such as Kodak F-1 and Ansco 201, has been determined by experiment. Under normal conditions, a gallon should fix about 60 eight-by-tens (or their equivalent) that have been rinsed in plain water, or 120 such prints if acid shortstop is used. Make this shortstop by adding 1½ oz. 28-percent acetic acid to 32 oz. water. Swish prints in it for at least five seconds.

A rapid flow of water doesn't greatly speed up the washing time of prints. But be sure a supply of fresh water constantly

circulates around the prints. Wash single-weight prints at least 30 minutes, double-weight at least an hour.

One of several chemical tests will tell you when a print has been safely washed. The iodine-starch test, for instance, detects 1 part hypo in 2,500 parts of water. A formula recommended by Defender consists of three solutions that are mixed just before using. The separate solutions will keep indefinitely in well-stoppered bottles. An amber bottle preserves the mixture briefly.

Make solution A by dissolving ¼ oz. potassium iodide and 50 grains iodine crystals in ¼ oz. water; add water to make 4 oz. Make solution B by dissolving 10 grains soluble starch in 4 oz. water; heat to boiling and cool. Solution C consists of ¼ oz. concentrated hydrochloric acid diluted with 3¼ oz. water. To make the test solution, ▶

add 18 drops of solution A and an equal amount of solution C to $\frac{1}{2}$ oz. of solution B; add water to make 4 oz.

Use by letting water drip from a print into a tube and adding an equal amount of test solution. If the blue test solution loses its color, hypo remains in the print.

Even with prolonged washing, a minute amount of hypo inevitably clings to a print. Ordinarily, you needn't worry about this. For valued prints, you can remove this last trace with a solution that changes the hypo to a compound that washes out more readily.

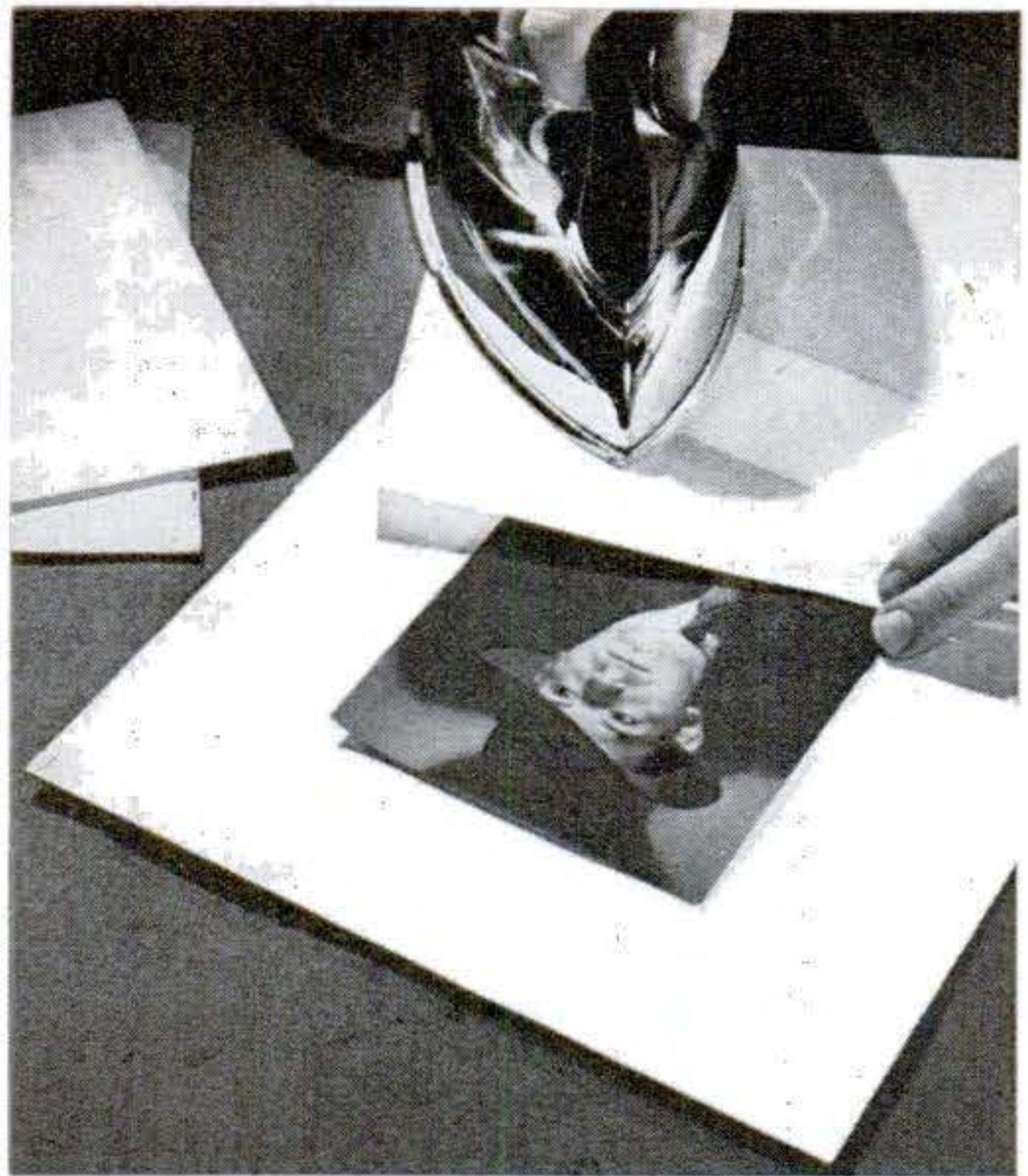
Make this by mixing 4 fl. oz. hydrogen peroxide and $3\frac{1}{4}$ fl. oz. of 3-percent ammonium hydroxide (ammonia water) with 25 oz. water. After washing the prints for the usual time, immerse for six minutes in this solution. Wash ten minutes longer.

To make a very delicate check on the existence of traces of hypo in your prints, process a blank piece of photographic paper along with the prints. After washing has been completed, cut a strip from this paper and immerse it in a 1-percent solution of silver nitrate. (Be careful: this is corrosive and poisonous.) After immersion of the strip for several minutes, compare with the wet paper from which it was cut. A yellow-brown tint indicates the presence of hypo.

Even when prints are well fixed and washed, hydrogen sulphide in the air may cause them to yellow and fade. This can largely be prevented by treating the print in a solution that coats the silver with gold.

Make the solution by adding $2\frac{1}{2}$ fl. drams

Silver nitrate solution gives a very delicate check on hypo in prints. Immerse a piece cut from blank photo paper processed and washed



Dry mounting tissue is safest way of mounting prints. Most pastes contain a certain amount of sulphur. This will cause prints to fade.

(about $\frac{1}{3}$ fl. oz.) of 1-percent gold chloride stock solution (made by dissolving contents of 15-grain tube in $3\frac{1}{4}$ oz. water) to 24 oz. water. Dissolve 145 grains of either sodium or potassium thiocyanate in 4 oz. water. Add slowly to the first solution while stirring rapidly.

Immerse the washed print in this solution for ten minutes at 68° F., or until a faint change in image tone (toward bluish-black) takes place. Wash ten minutes. **END**

along with prints. If the immersed strip shows a yellow-brown tint, as indicated below, the prints all should be given further washing.

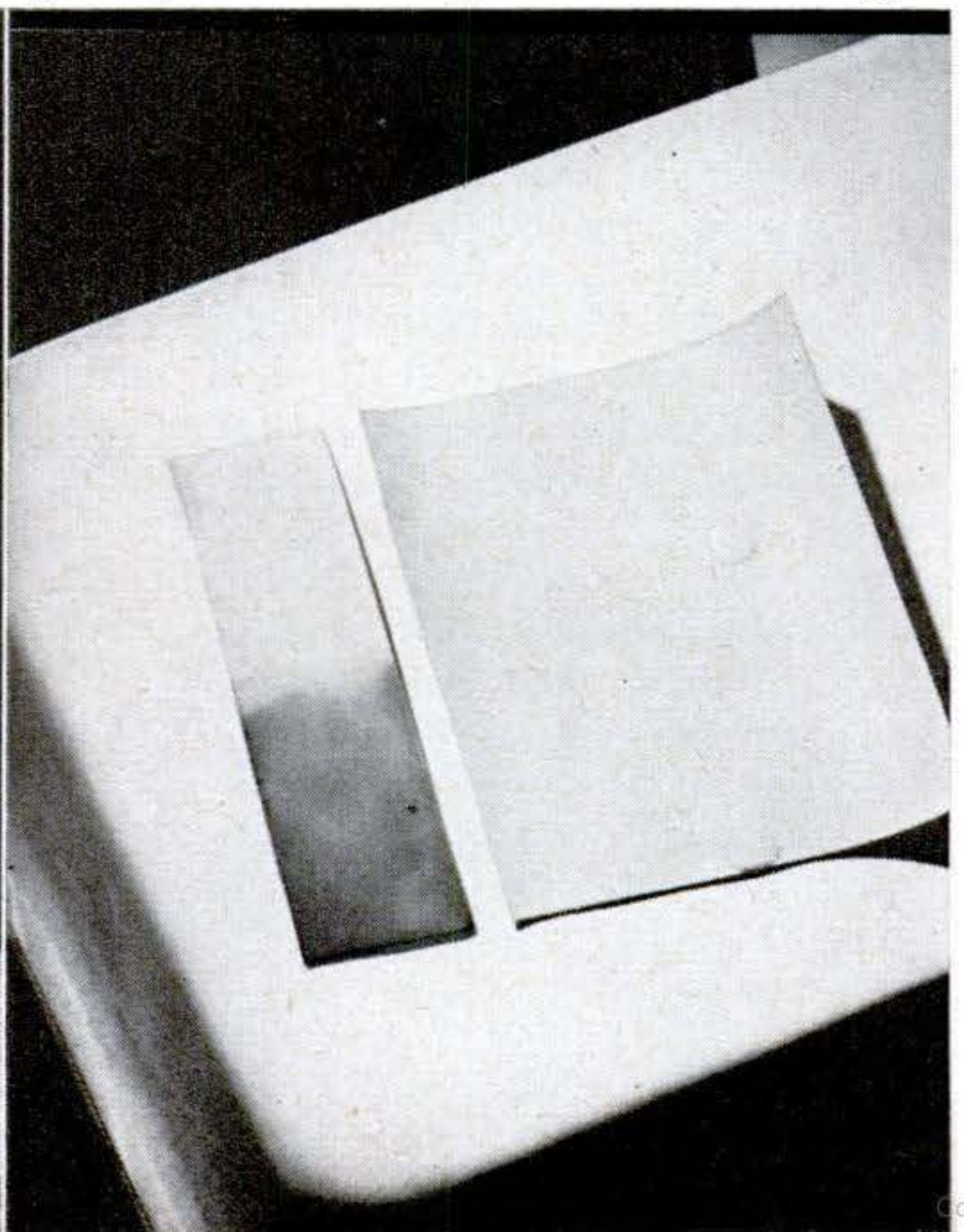
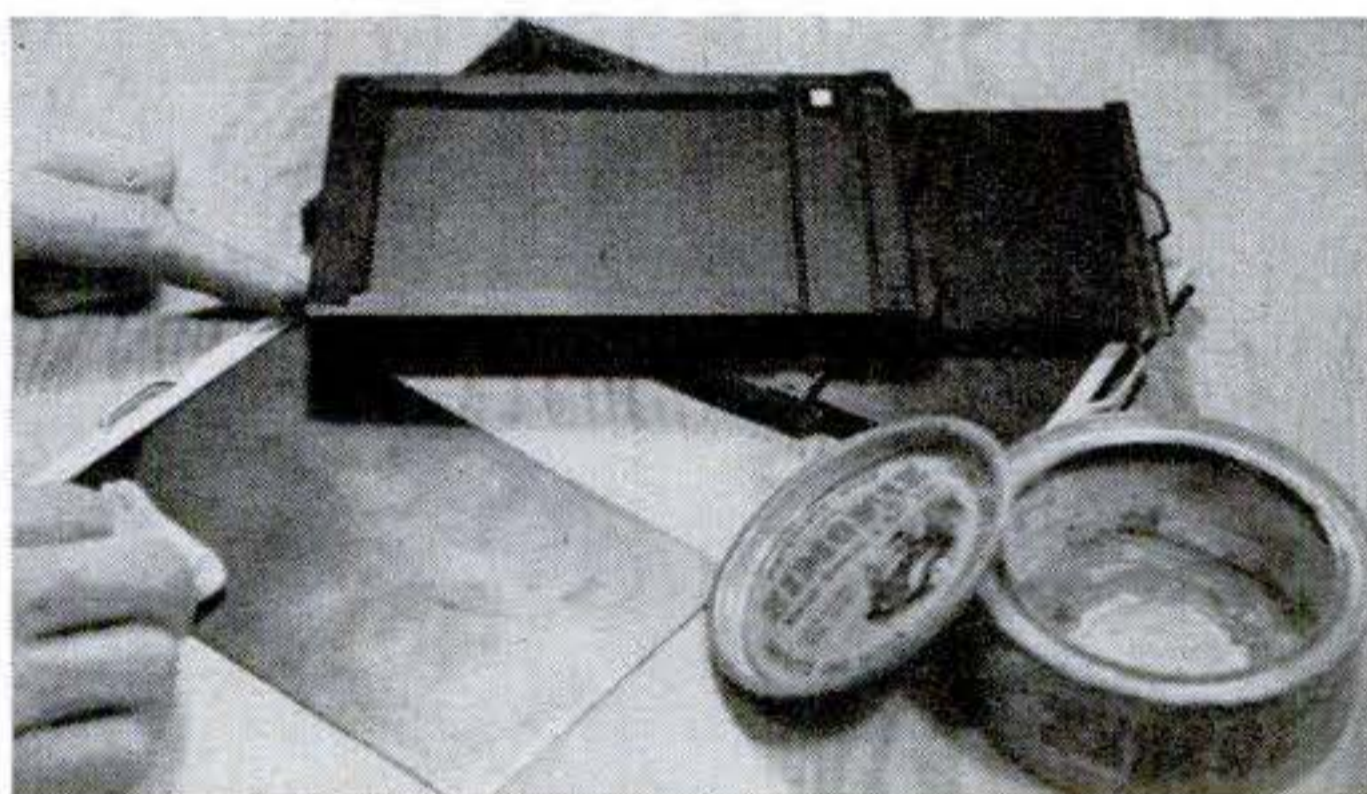




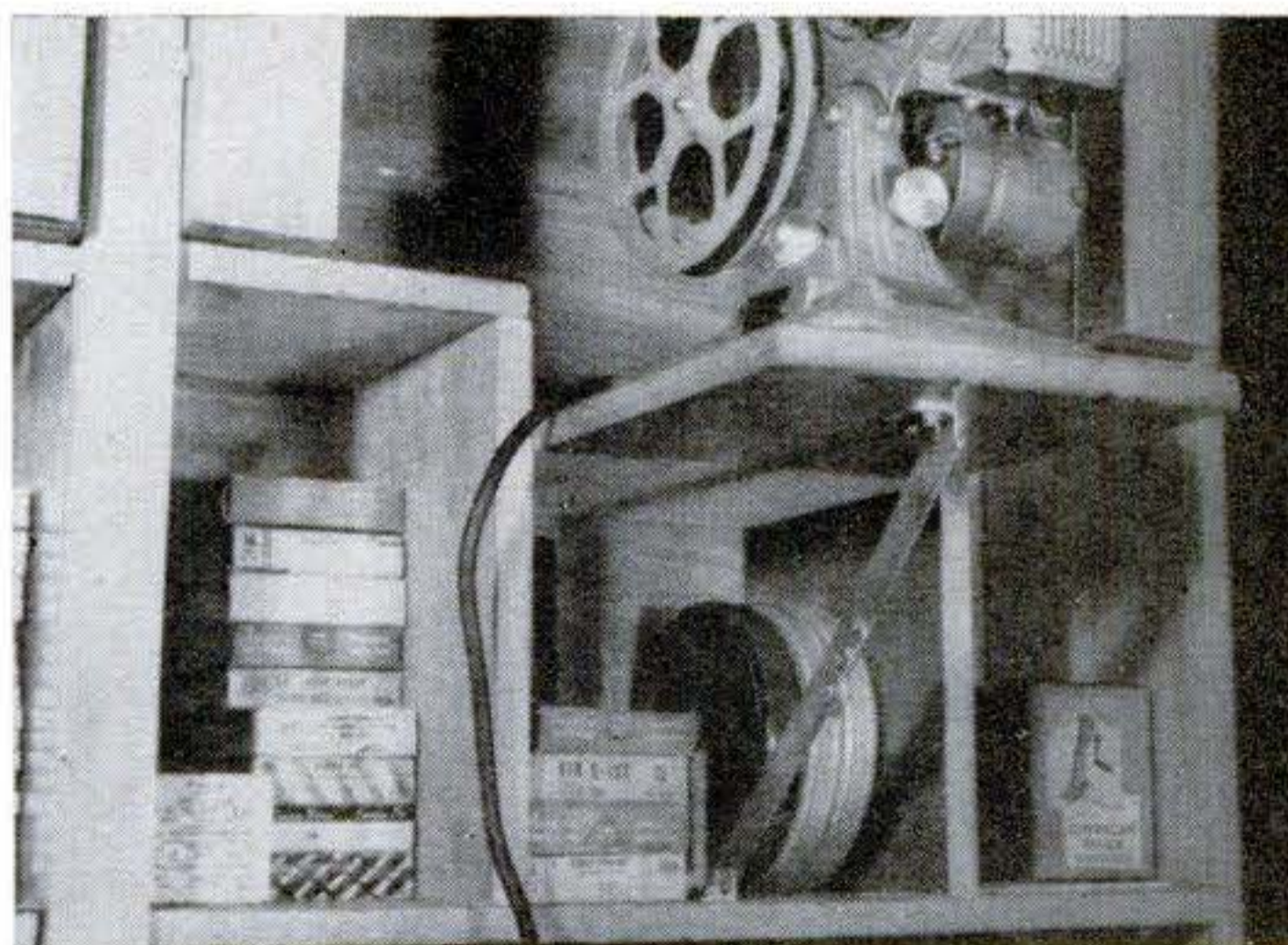
PHOTO IDEAS AND EQUIPMENT

Gives Choice of Neg Size. An adapter kit offered by Eastman enables the owner of a Kodak Tourist® camera to take pictures in four negative sizes—8, 12, or 16 on 620 film, or 8 on 828 black and white or Kodachrome®. For the latter, the kit includes spool adapters as well as a mask. A special back meters the film for the different neg sizes, and view-finder masks cut down the image as necessary.

Movie "Box Camera." The new 8-mm. Cine-Kodak Reliant Camera® was especially designed to be as easy to use as a box camera. There are no sprockets to worry about while loading the roll film, and a prefocused 13-mm. f/2.7 Kodak Cine Ektanon® lens requires no adjustment for subject distance. Taking speeds are adjustable from 16 to 48 frames per second, and the finder indicates parallax correction.



Keep Dust Out of Holders. Do your negatives look as if they have measles? If so, dust in the film holders may be the cause. To avoid this, dust the holders occasionally with a cloth or a soft-bristled brush, making sure you get dust out of the thin metal film guides. At the same time, wax the dark slide and wood portions of the holder. Wax helps keep the slide free of dust.—C. W. Hamilton, Seattle, Wash.



Projector Fits into Bookcase. In most bookcases, the shelves are too closely spaced to allow room for a movie projector. However, you can cut out a section of one shelf and lower it as at right above.

A hinged door under the shelf swings up and is held by a spring-lock bracket to provide a platform for the projector in use. Reels and other items are stored behind the door.—Donald B. Terrana, Brooklyn, N. Y.

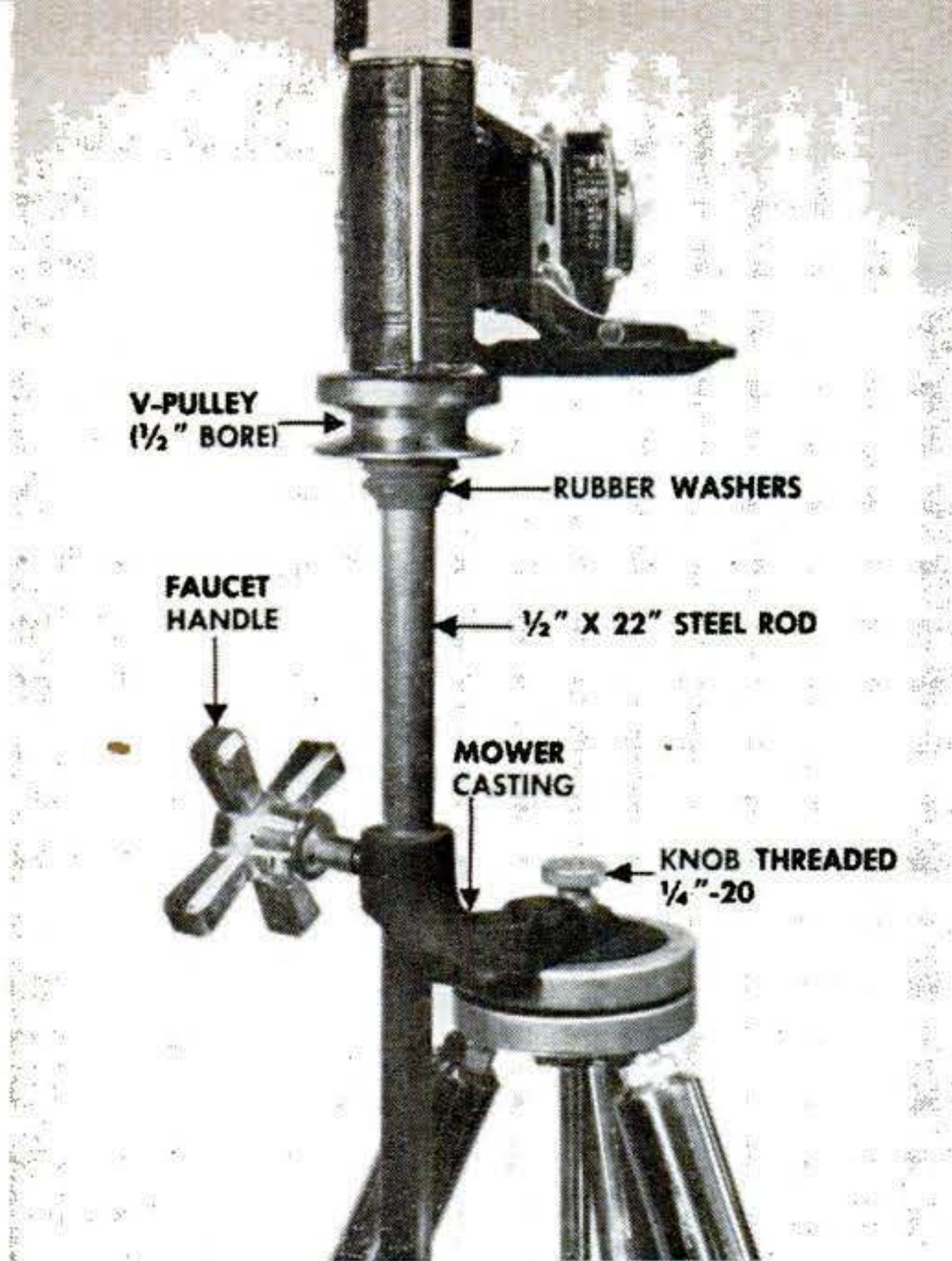
Elevating Head Improves Tripod

ORDINARILY you turn to a camera store for photo accessories. But this elevating tripod head is different. Its parts all came from a hardware store.

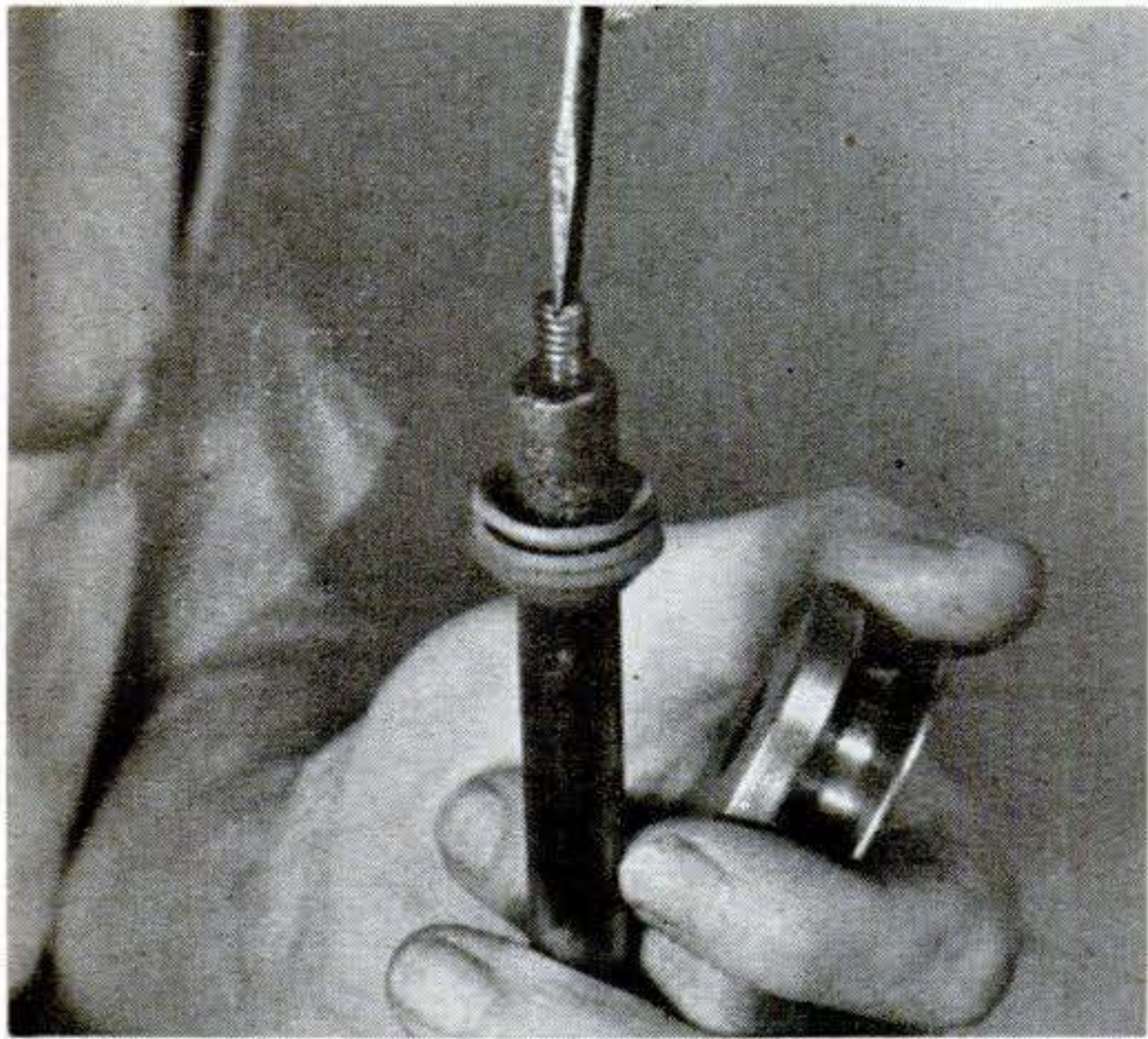
A search of your home and shop may turn up most of them—or at least satisfactory substitutes. Besides the items shown at the left, you need only a couple of $\frac{1}{4}$ "-20 machine screws. Cut the heads off these. One goes in a hole drilled and tapped in the end of the elevator rod, and the other in the faucet handle. Setscrews secure the one in the faucet handle.

A discarded lawn mower is the source of the casting that offsets the elevator rod. It originally held one end of the roller. Drill and tap the sidewall of the large hole for the machine screw that you've fitted into the faucet handle.

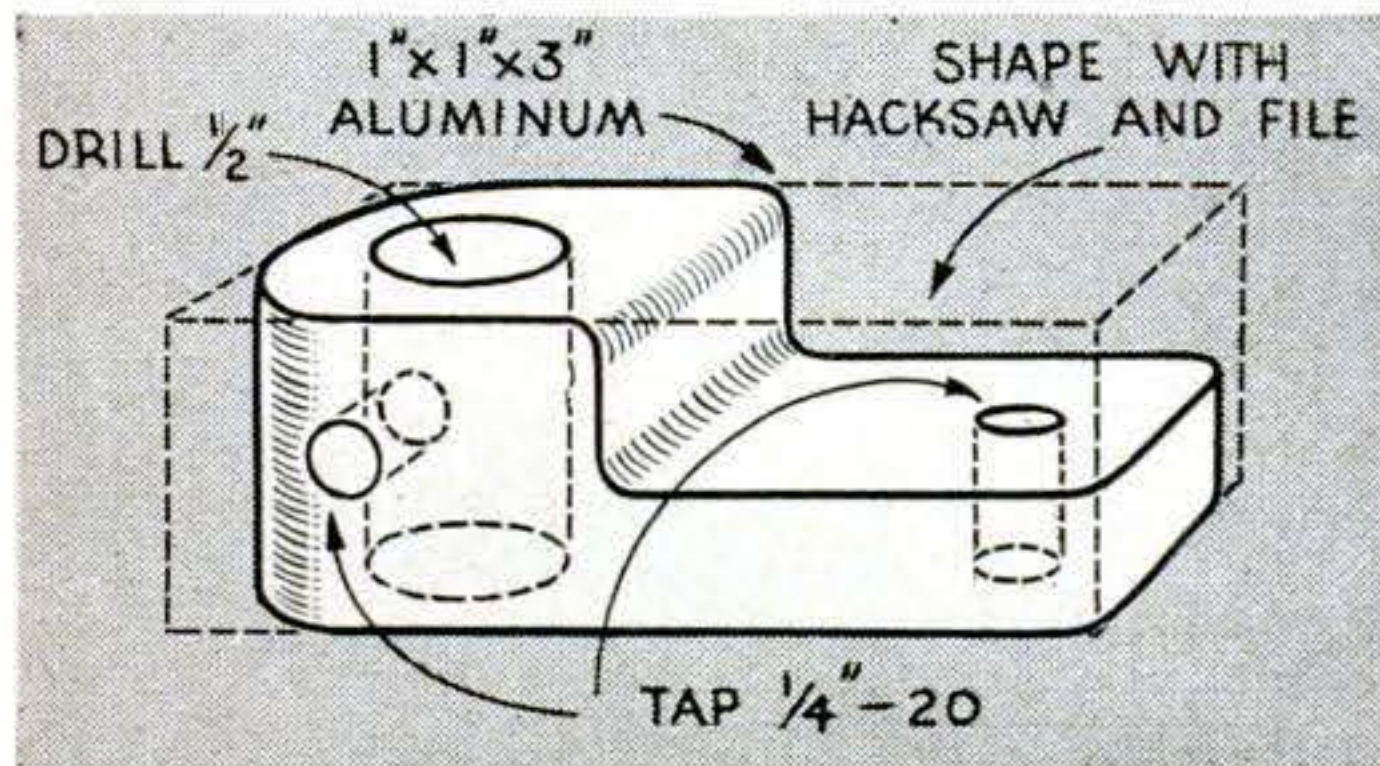
If you wish, you can place a pulley and tripod screw at both ends of the elevating rod as shown below. This allows a wide range of camera positions up and down. On occasions, the elevator is handy as a light stand.—*John P. Arnold, Doylestown, Pa.*



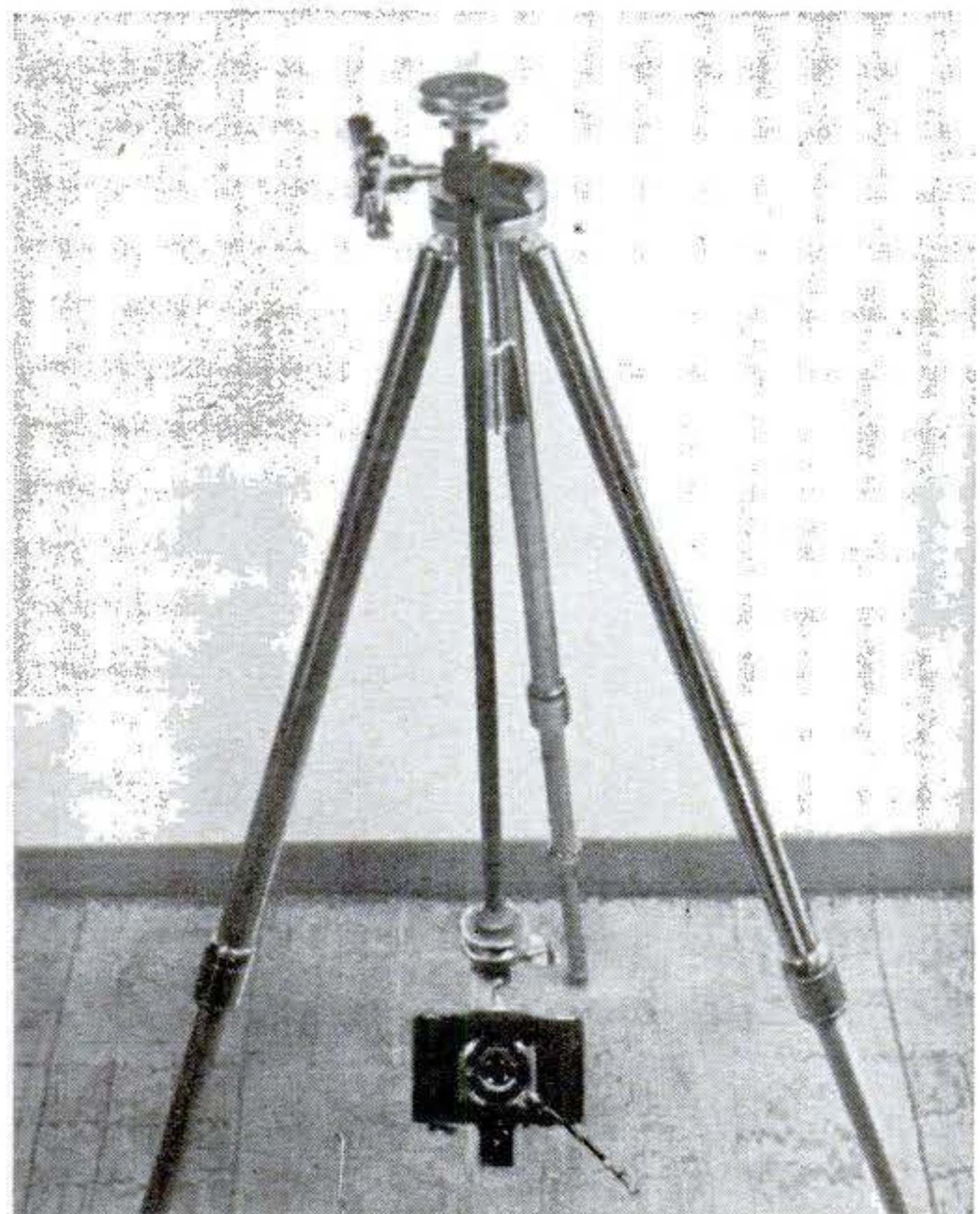
Pulley serves as platform for camera or conventional pan-tilt head. Put the pulley on the end of the rod and secure it with setscrew.



Turn $\frac{1}{4}$ "-20 screw into hole drilled and tapped in end of rod, letting it project $\frac{1}{2}$ ". Rubber washers cushion head if it falls accidentally.



Offset bracket can be shaped from aluminum or other metal if mower casting isn't available. Faucet handle locks rod in desired position.

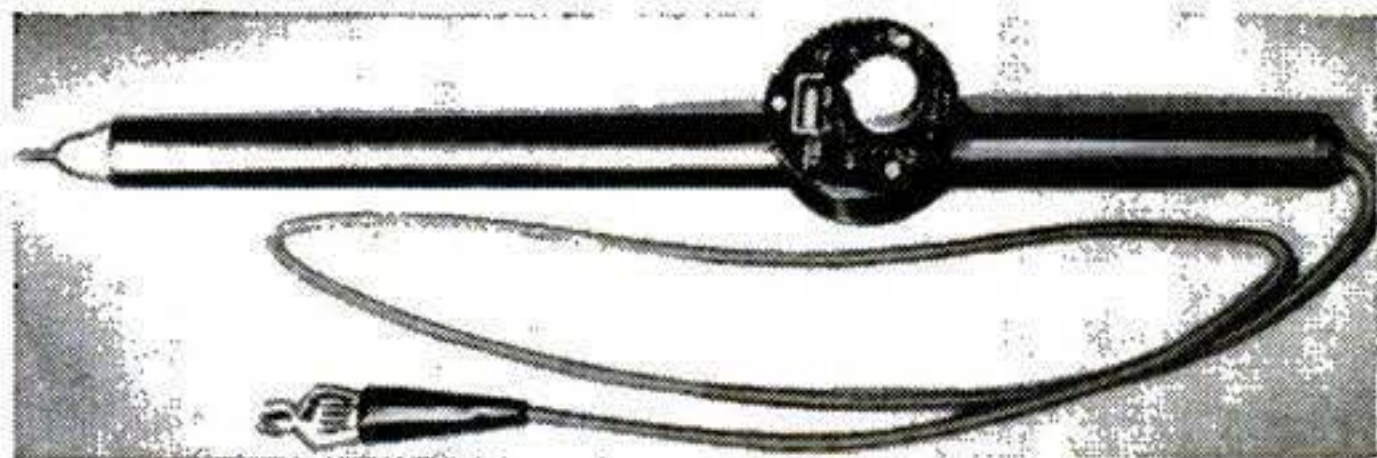


Off-the-floor shots are taken with ease. Just drop the elevating rod and fit a pan-tilt head to a similar mounting on the bottom end.



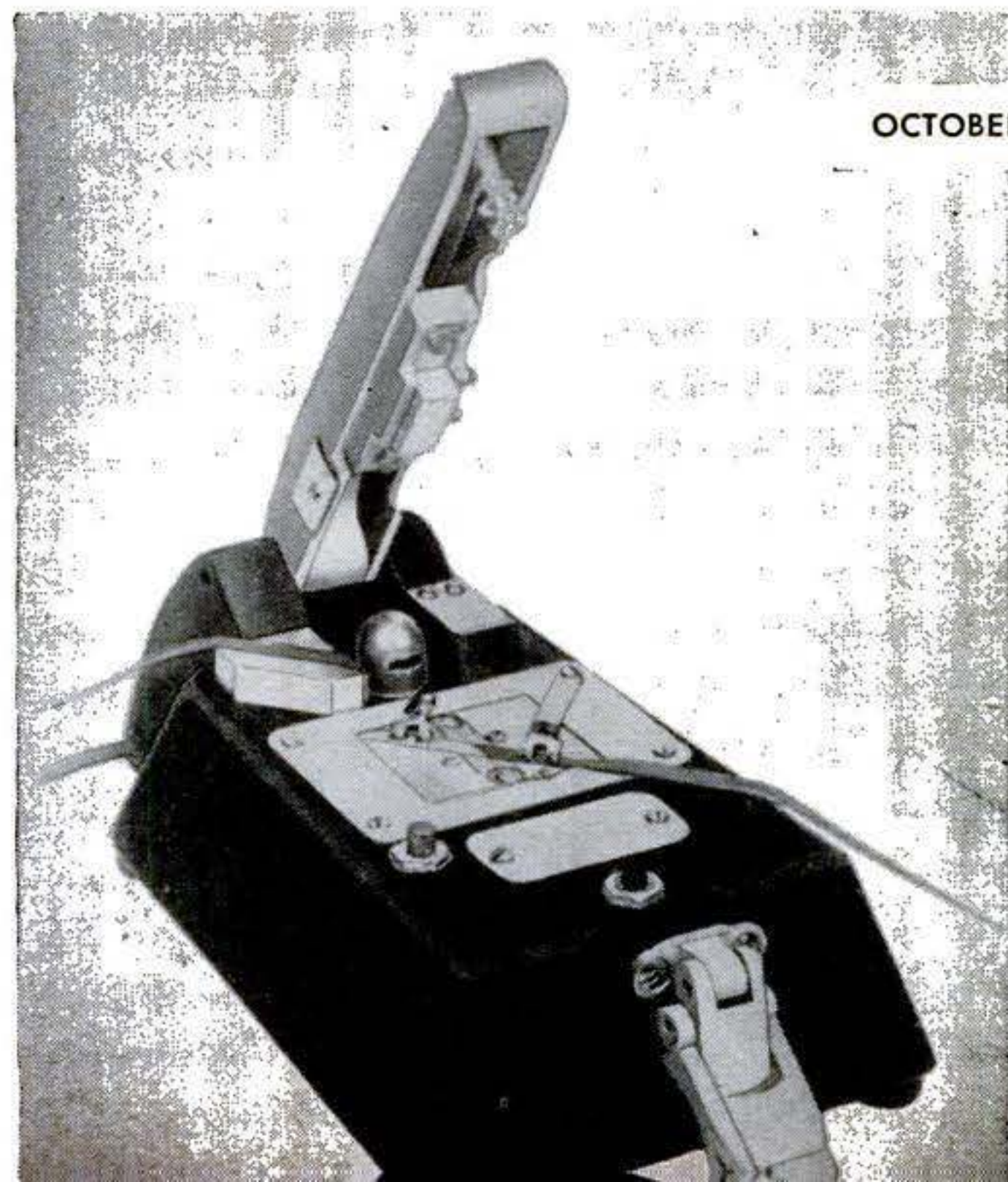
Transformer Matches Lead-in.

A small transformer made by Workshop Associates, Newton Highlands, Mass., feeds from 72 ohms at one side to 300 ohms at the other. With it TV set owners can match coaxial cable to 300-ohm input terminals. It also can be used in reverse to match 300-ohm twin-lead to a 72-ohm input. Mismatching between antenna and receiver often accounts for weak signals or interference.

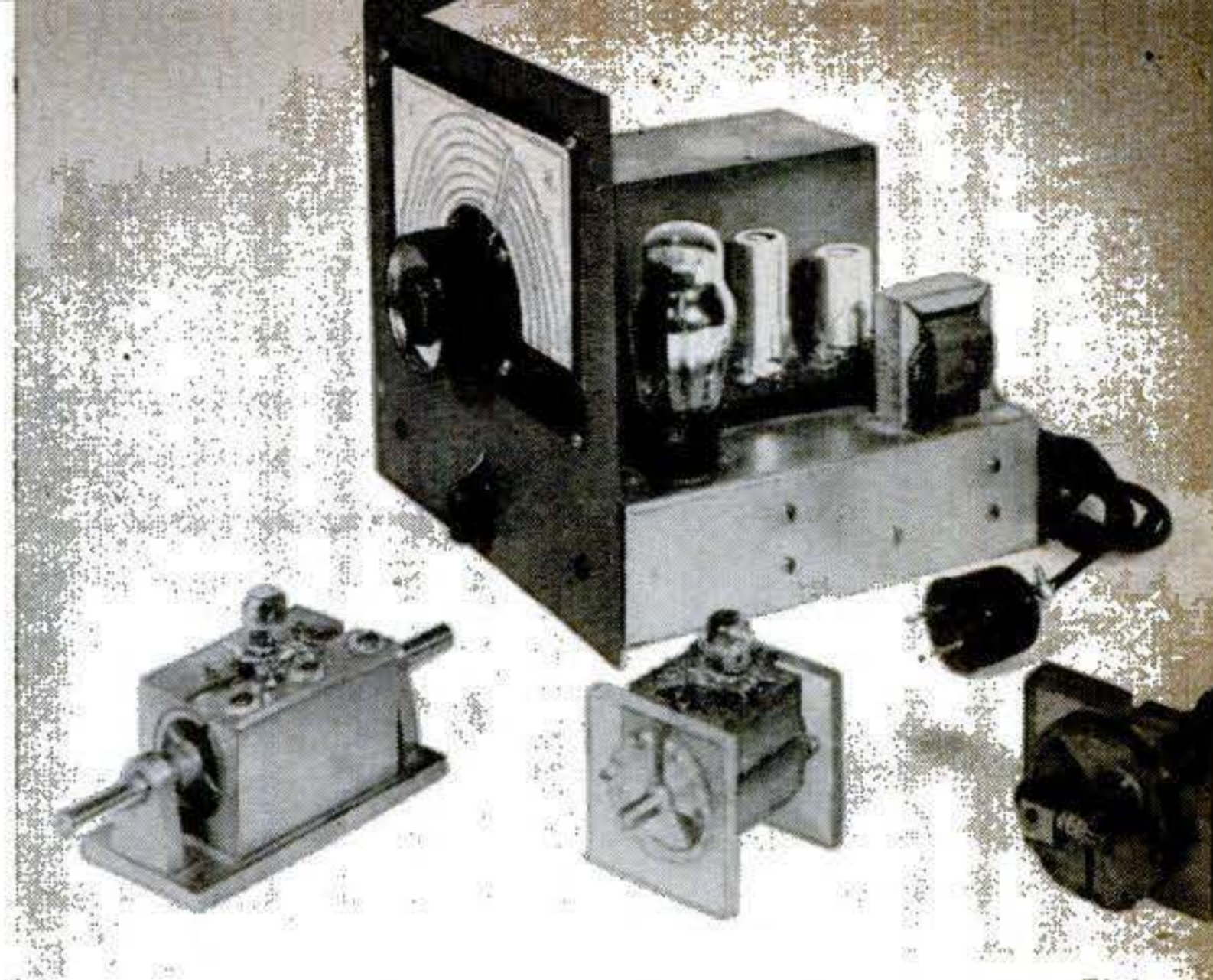


Splicer Joins Recording Tape.

Editing of magnetically recorded tapes may be made easier through the use of the splicer shown below. It cuts and rejoins tape ends by means of a plastic weld without adding to the thickness of the tape. Prestoseal Manufacturing Corp., Long Island City, N. Y., makes the unit to sell at \$65.



OCTOBER 1949 227



Converter Receives UHF.

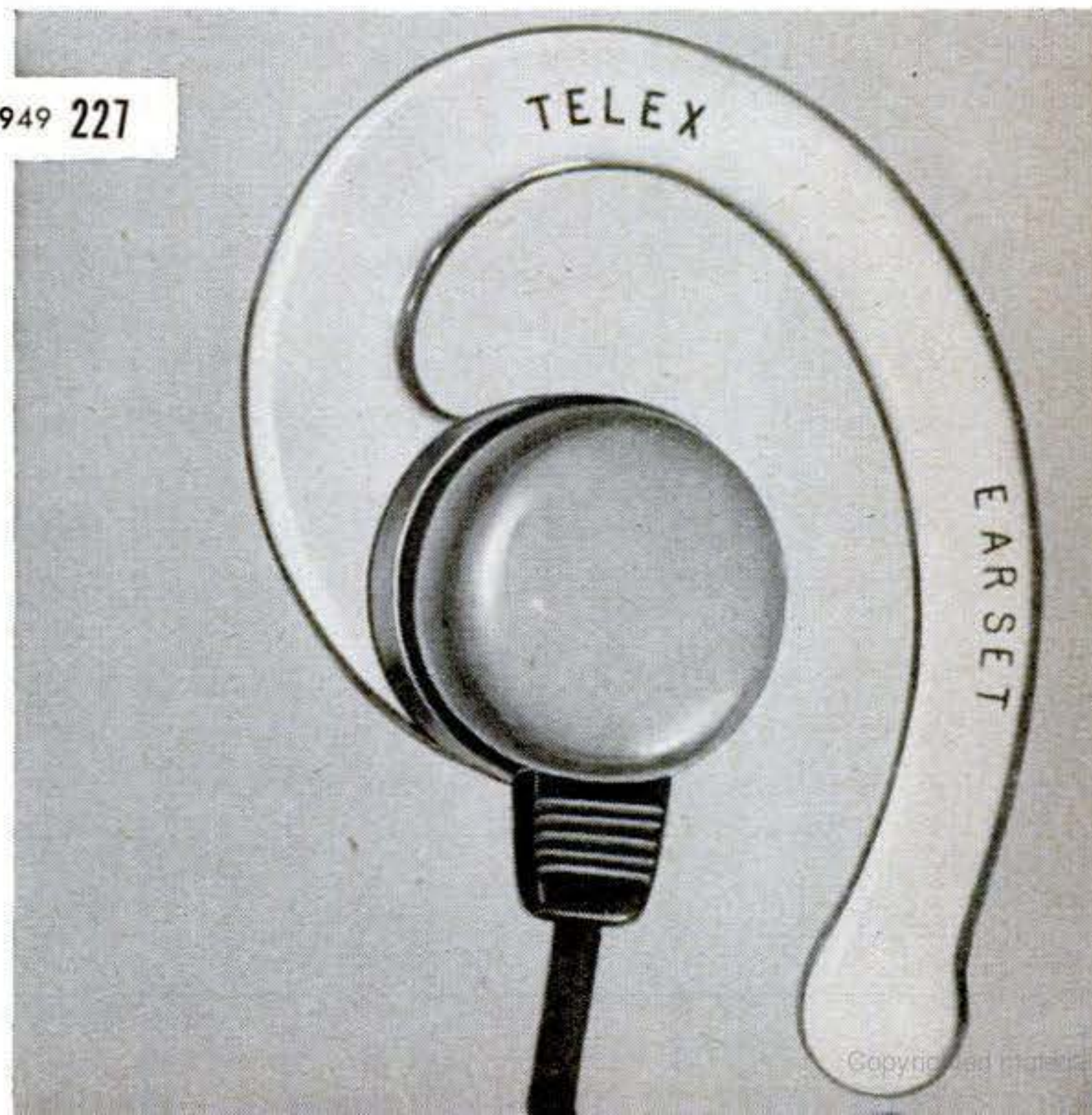
Television sets need not be made obsolete when new ultra-high frequency channels are opened for video broadcasting. A converter developed by Stanford Research Institute steps down transmissions in the 475 to 890-mc. spectrum to the lower frequencies that present-day sets can receive. The converter is connected between the antenna and the antenna-input terminals of the receiver.

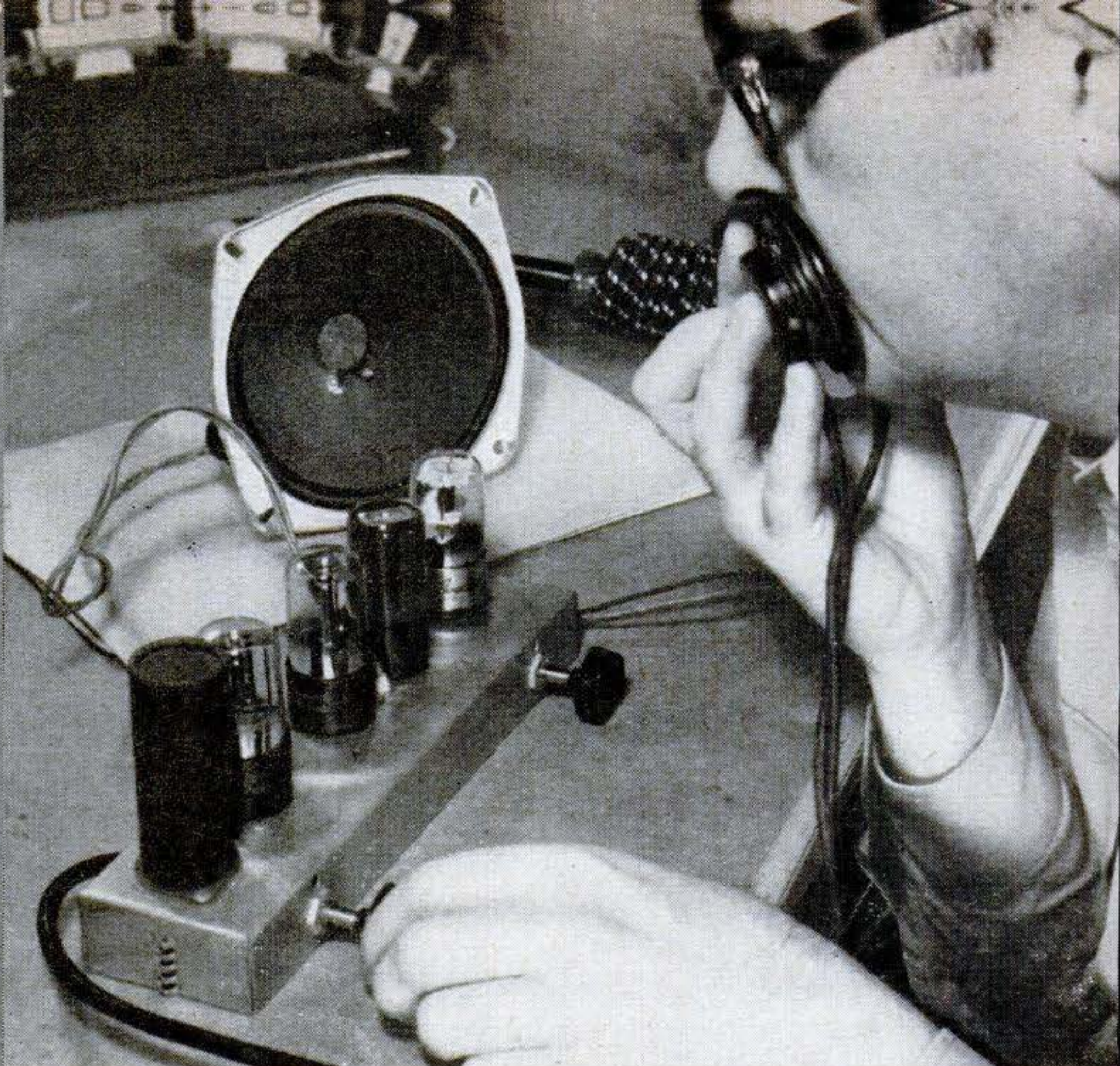
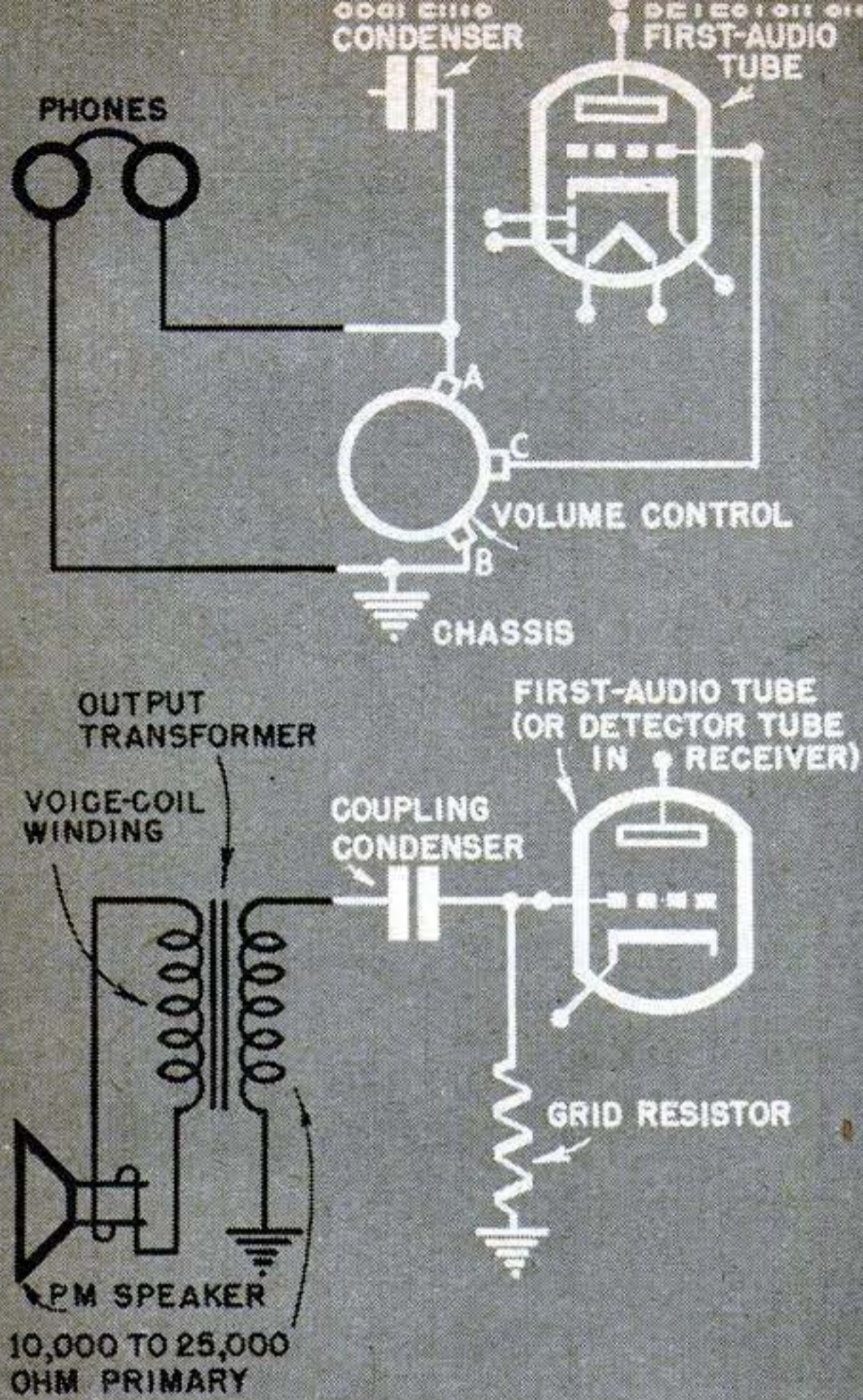
Neon Lamp Checks 30 KV.

An inexpensive voltage checker using a neon lamp instead of a meter has now been adapted for high-voltage applications by Industrial Devices, Inc., Edgewater, N. J. It will read up to 30,000 volts.

Earset Eliminates Headband.

No band or strap is needed to keep the new Telex Earset® in place. A plastic frame slips onto either ear to hold the earpiece in position. The single-cord connection also allows the user greater freedom of movement. Telex Inc., Minneapolis, manufactures the device. The 5' cord is removable.





1. Headphones or even a loudspeaker will often replace a crystal microphone. Drawings at

the left show connection to common radio circuits. Above, phone is used to test amplifier.

Radio Parts from Your Scrap Box

Though most components are designed for particular jobs, you can make many of them double up in a pinch.

By Frank Tobin

IF YOU'RE a typical radio experimenter, you know what it means to be stuck for a vital part when the stores are closed. Since many amateurs do their work nights and holidays, it happens to a lot of people. Next time you run into that situation, take a look in your spare-parts box. You may not see what you're looking for, but perhaps you'll find at least a temporary substitute for the part you need.

The first rule for making spare parts work for you is to keep them in good order. Separate components by type and value, and never, never toss in a defective part without marking it. If you know a condenser is shorted or open, throw it away. A transformer with one winding open is worth saving,

however, if you tape on a note that tells what's wrong with it.

With a fair selection of resistors you should never be too badly stuck for a particular value. Connect smaller ones in series to add up to the total you want, or in parallel to get a lower value. The same is true of condensers, but in reverse.

Headphones and loudspeakers are usually thought of as reproducers but they will also operate as microphones in a pinch. A single phone will give fair volume with two stages of amplification, as in an AC-DC receiver; both phones will do even better. For such use, connect it as shown in the upper sketch. In some cases it may be necessary to make the connection at terminal C of the volume control instead of terminal A. If the amplifier has a microphone-input jack, you'll use that, of course. As you can see in the diagram, no special coupling is needed; the condenser and volume control are already in the set.

To use a permanent-magnet speaker as a microphone you need a transformer to match the voice-coil impedance to that of the amplifier grid. The best bet is to use a regular intercom transformer which has a secondary winding in the neighborhood of 70,000 ohms. Lacking this, try an ordinary output transformer, selecting the highest primary impedance available. Wire them as shown in the lower sketch of Fig. 1; black lines represent the parts added to those already in the set.

The humble wafer socket has the makings of a test-point adapter (Fig. 2). The wafer socket must be of the same base type as the tube to be checked. Invert the socket, push in the tube, and plug both tube and test socket into the socket on the chassis. It may be necessary to clip the prong sleeves on the wafer socket to allow the tube pins to extend through. Bend back the soldering lugs.

You may find yourself short of test prods at a bad time. That's nothing to worry about if you have two mechanical pencils around the shop. These pencils make good substitutes for prods (Fig. 3). They should have plastic barrels, or you may find yourself holding a piece of high voltage. Make sure that a good contact exists between the metal ferrule on top of the pencil and the metal tip. Wedge the wire from the meter under the eraser cap or solder it on.

Coil Forms from Spools

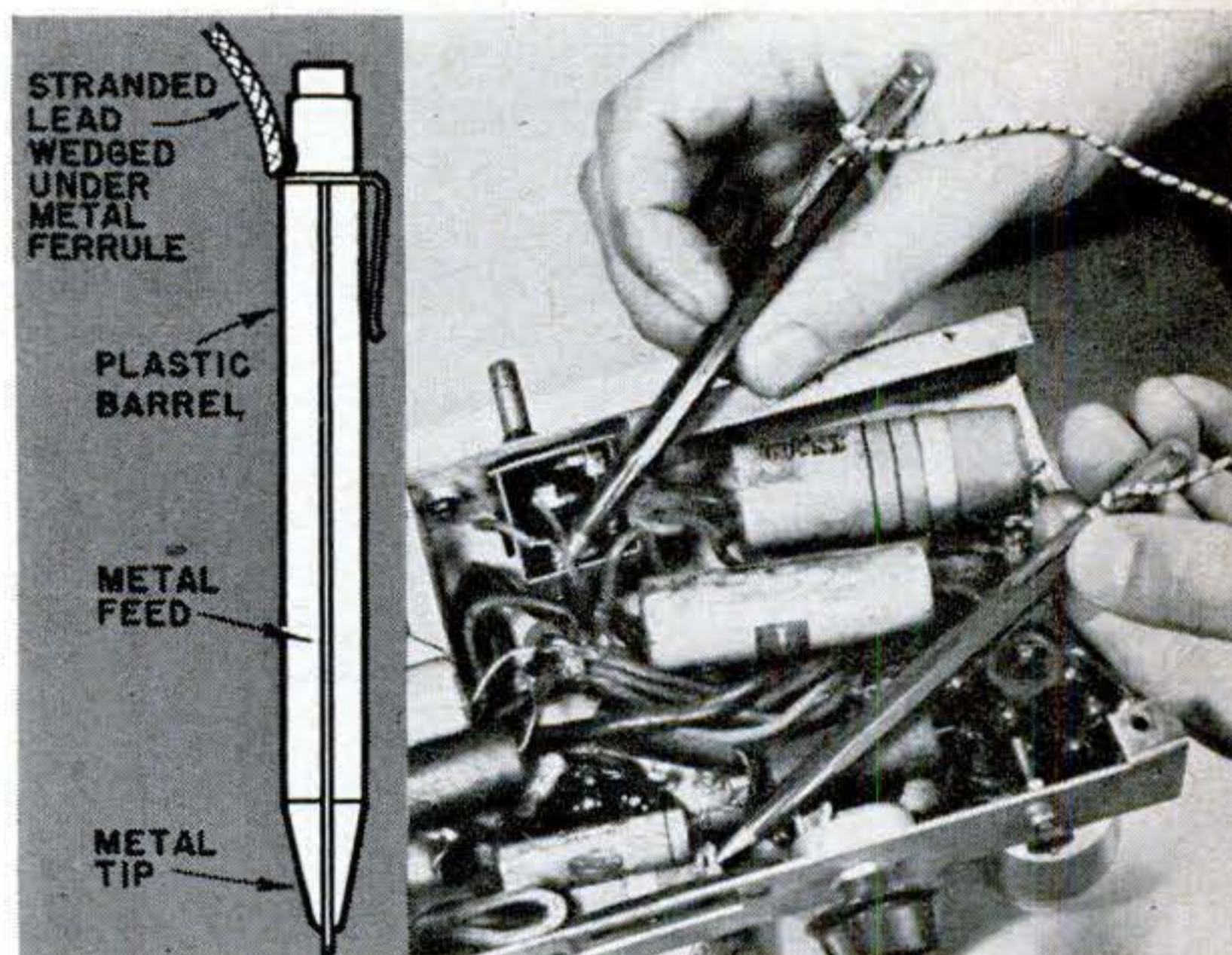
An ordinary wooden pencil, by the way, will make a fine core for a high-frequency choke. Such chokes are widely used in FM and TV receivers and in other high-frequency equipment. Leave the graphite in the pencil; it takes the place of a powdered metal core. Saw off a 1" piece and wind the coil around it.

Other substitute coil forms can be salvaged from flashlight batteries or a sewing box (Fig. 4). In the former case, slip the cardboard sleeve off the cell; in the latter, use a wooden spool from which the thread has been removed. Finished coils will stay neat longer if they are coated with liquid coil dope.

Have you ever thought of employing a power transformer as an output transformer? Even a defective unit can be used at times. In Fig. 5 a fairly common transformer type is shown in this unconventional application. Using half the high-voltage winding between the plate and B plus, and em-



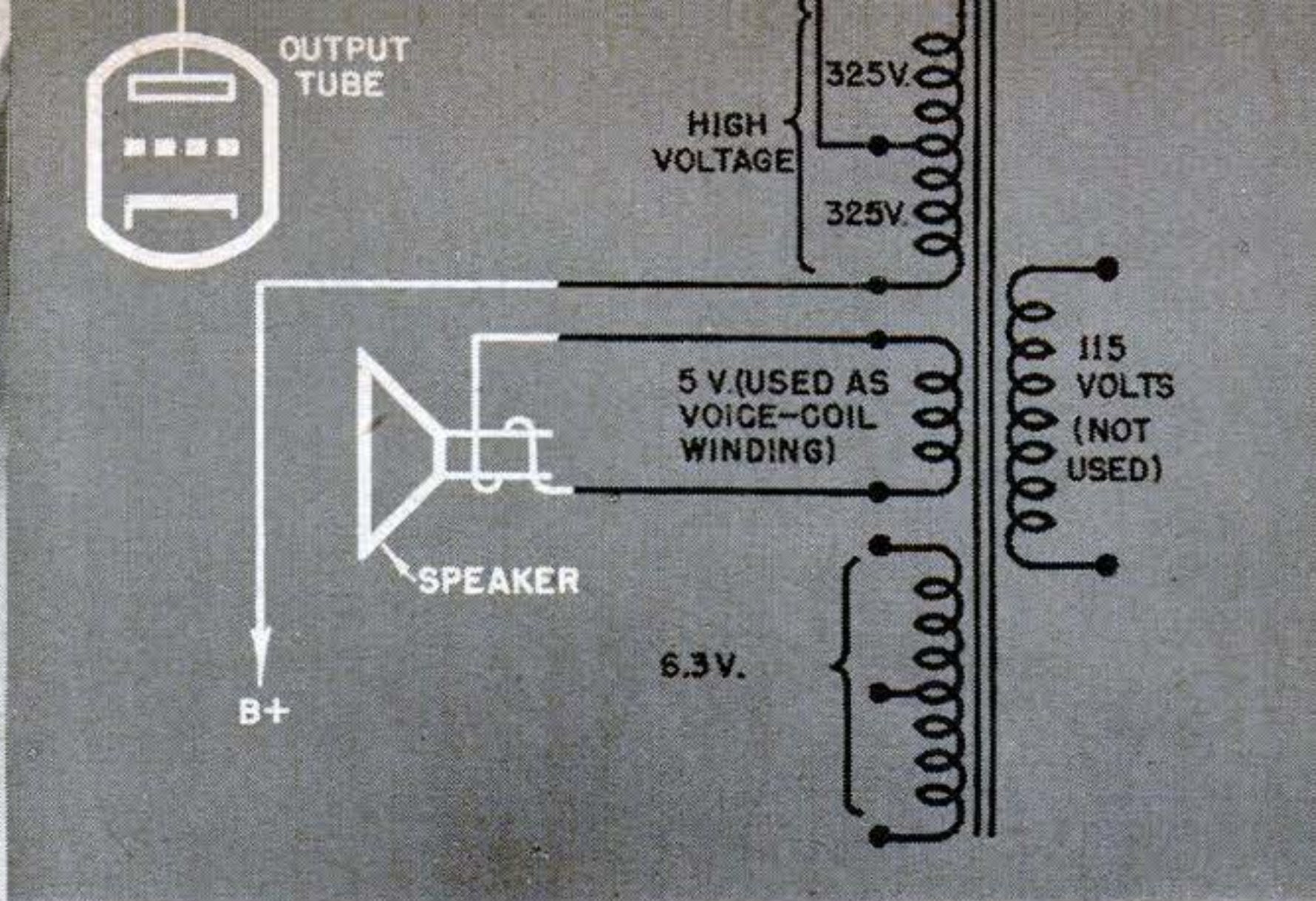
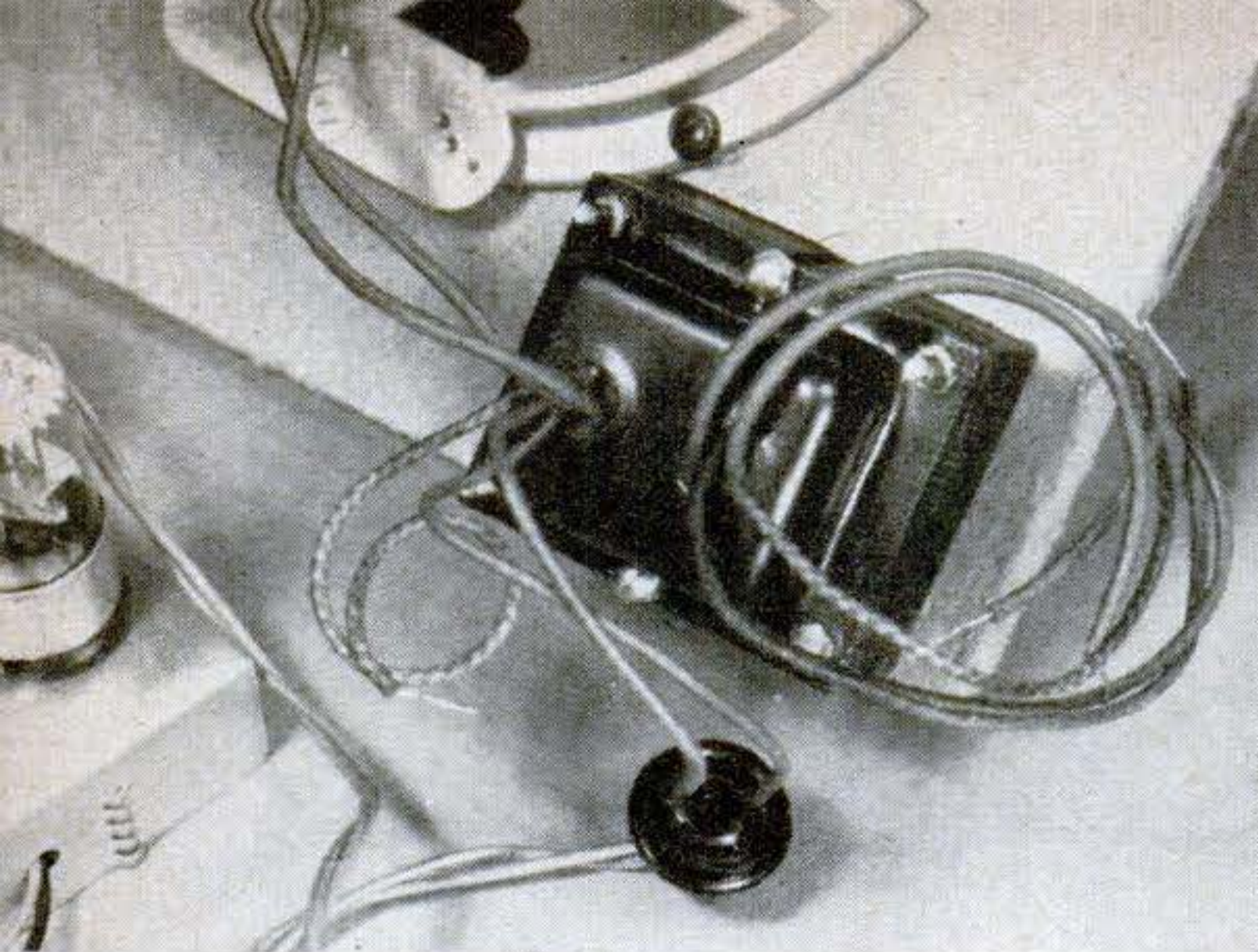
2. Test-point adapter, easily made from wafer tube socket, allows you to check voltages at the tube instead of turning chassis over.



3. Need a pair of test prods? Try using mechanical pencils. Be sure they have plastic barrels, for the metal parts may be "hot."



4. Coil forms can be improvised from many common objects. Windings must, of course, be figured in relation to diameter of the form. ➔



5. A power transformer can be used in place of an output transformer. It's an expensive sub-

stitute, but it will work nicely until you get a chance to put in the correct replacement unit.

ploying the 5-volt rectifier winding for the voice coil gave a surprisingly good match between a 35L6 power tube and the speaker. For other tubes and speakers you can try a number of other combinations. The 6.3-volt secondary, for example may be used in place of the 5-volt one. Also try the entire high-voltage side, or half the 6.3-volt winding.

6.3-volt tube heaters. This won't work in all cases, but by trying the various taps on both primary and secondary you may be able to find a combination that steps down 115 volts to a value very close to 6.3. Test the voltage on an AC meter before risking the tubes. The transformer should be rated at 8 to 10 watts or higher; smaller ones will overheat. The voice-coil winding goes to the tube filaments while the primary is connected to the 115-volt line.

A push-pull audio transformer can be made from two single-tube transformers if they're wired in series as shown in Fig. 6. First try connecting one grid and one ground lead together at the center tap. This may not be the best arrangement, however, so experiment with others.

Selector Switches

By juggling the filament windings on an old power transformer made for 5-volt and 2.5-volt tubes, you can obtain 6.25 volts. This means you can use the transformer in a circuit employing modern 6.3-volt tubes. Note, however, that you no longer have a 5-volt tap for the rectifier, so you'll have to use a 6X5 or similar 6.3-volt rectifier, heating all tubes off one winding.

If it's a low-voltage switch you want, you don't have to hunt very far. A few nickel-plated wood or machine screws will do the job nicely, as pictured in Fig. 10. The setup shown is a test circuit in which a universal output transformer is used to feed a number of different speakers. Instead of soldering and unsoldering a number of connections to find the best match, make a selector switch by driving the required number of screws into a scrap of wood. Place them in an arc arrangement so that the moving arm—which can be a flat brass or plated bracket about 1½" long—will make contact with each screw head. A small wooden knob can be attached at the end opposite the pivot screw.

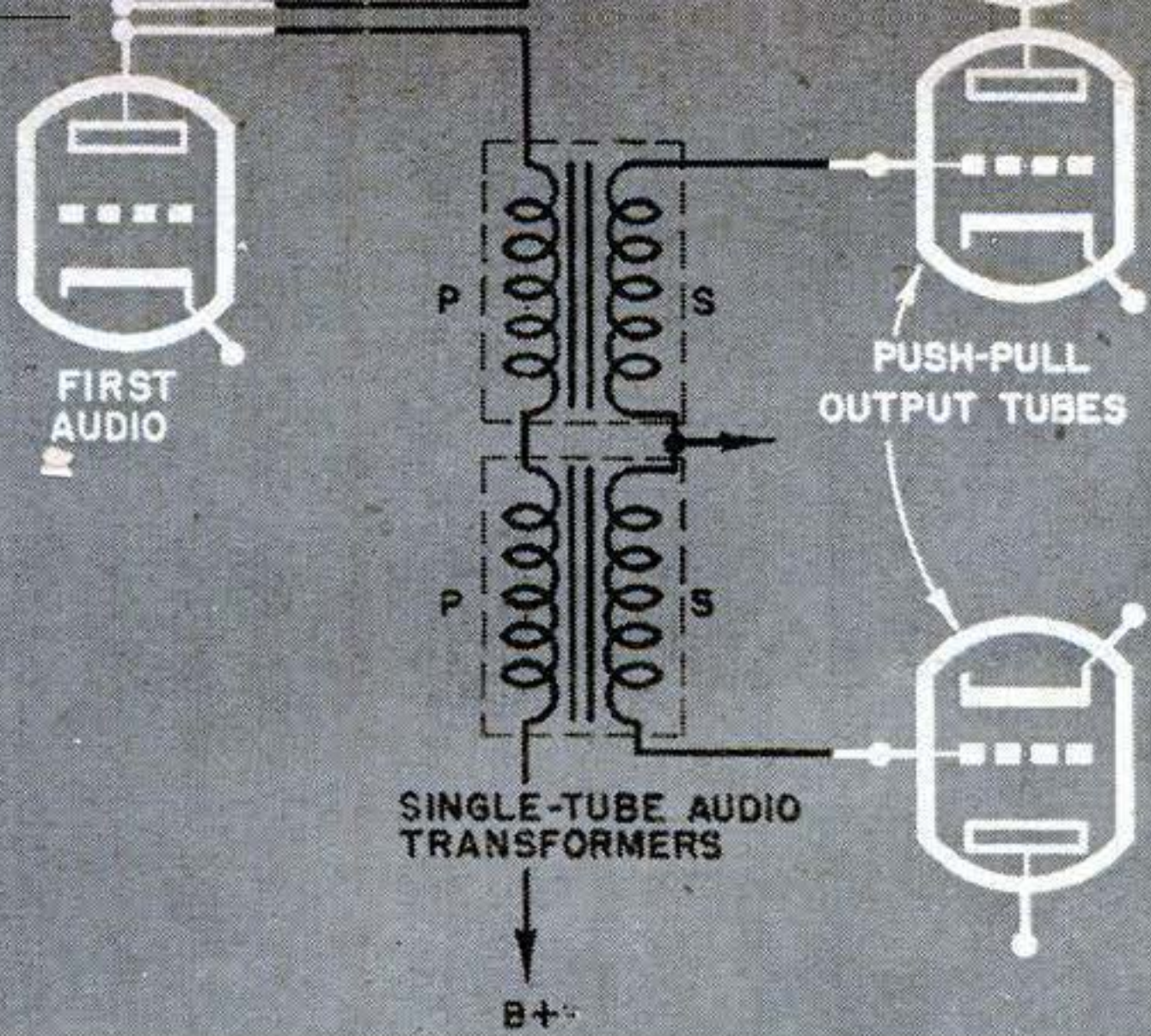
Subs for Filter Chokes

It often happens that a serviceman or experimenter is stuck for a filter choke. It may occur when you replace a field-coil speaker with a permanent-magnet one, for the field coil frequently doubles up as a choke. In a pinch you'll find a filament transformer is a pretty good substitute. Lacking a filament transformer, try using the primary winding of an output transformer in place of the missing choke. Both applications are pictured in Fig. 8.

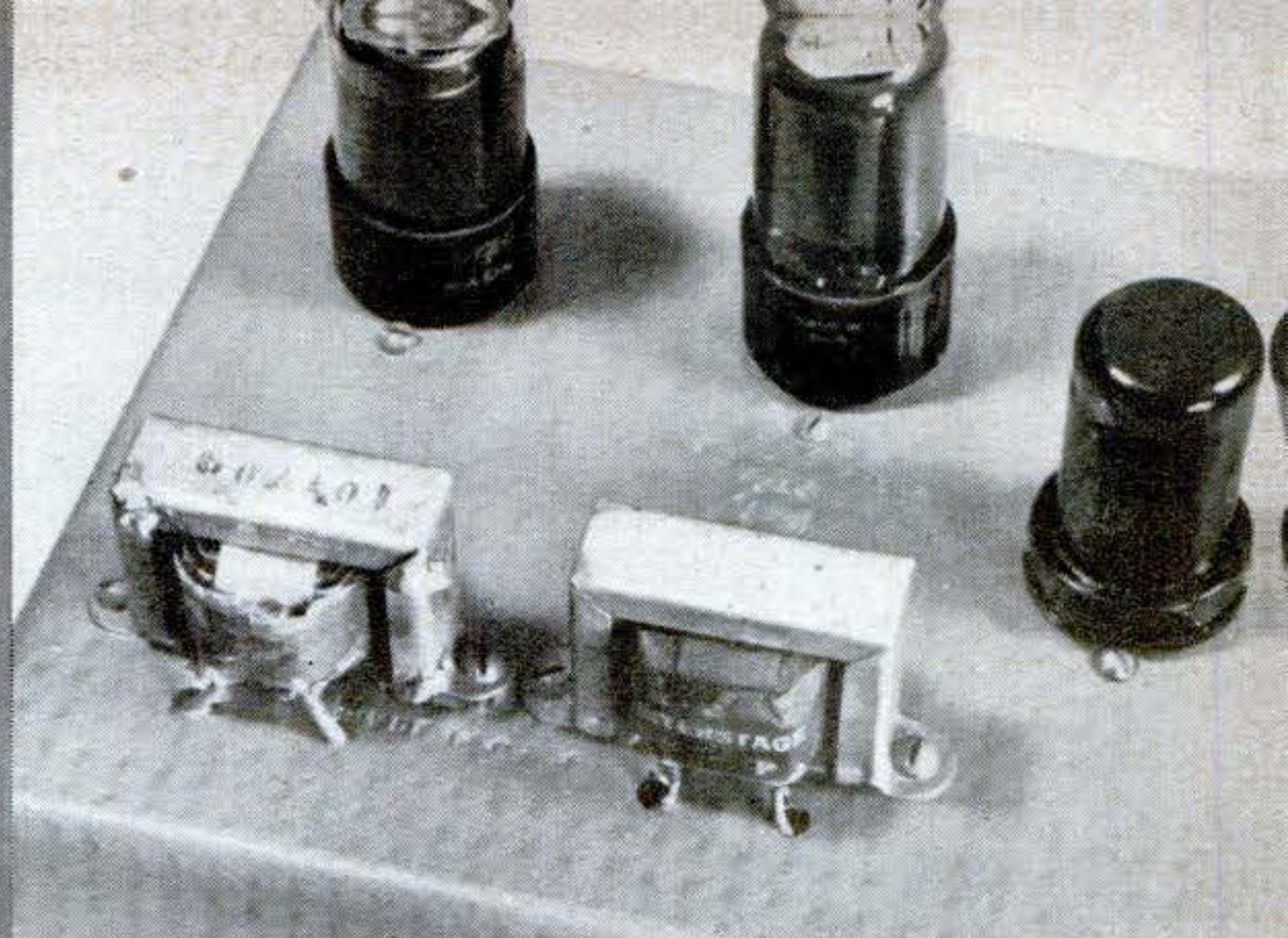
Parts substitution of the kind described above may not save you much money, but it will save a lot of time and energy. Obviously it doesn't make sense to buy a \$3 power transformer in order to replace a filament transformer that costs half as much. But if you happen to have the more expensive unit gathering dust, you won't lose anything by putting it to work. If this makes it possible to finish the building or repair job you're doing, it will often put you ahead of the game.

Figure 9 illustrates another possible transformer dodge. The photo shows a universal output transformer being used to feed

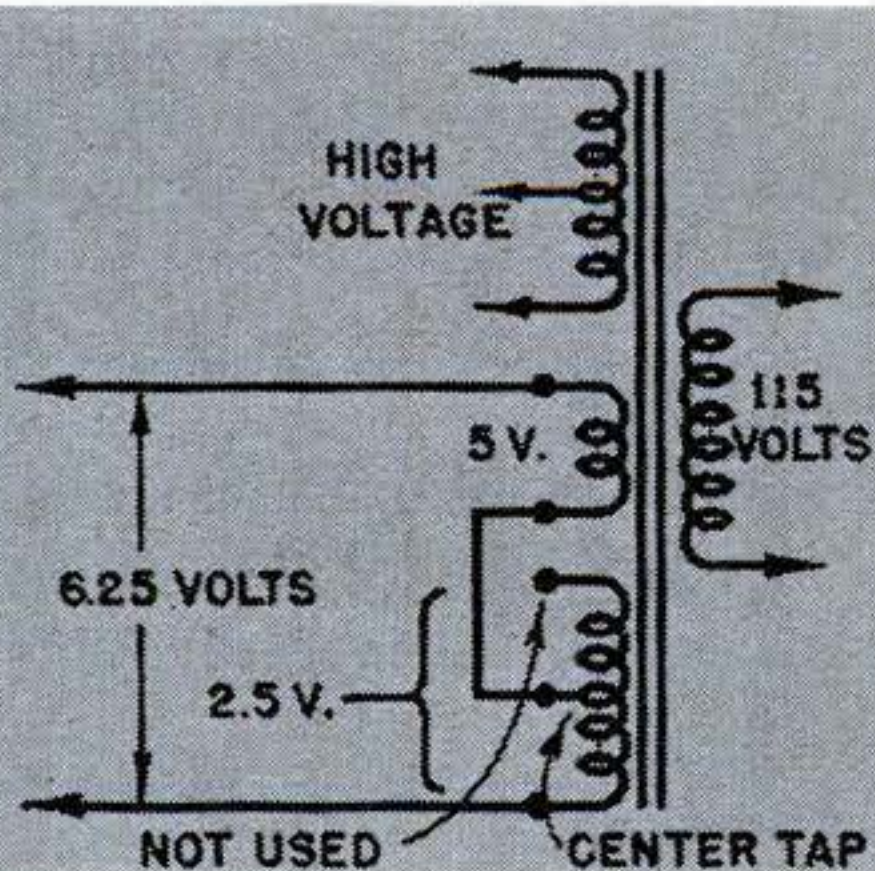
END



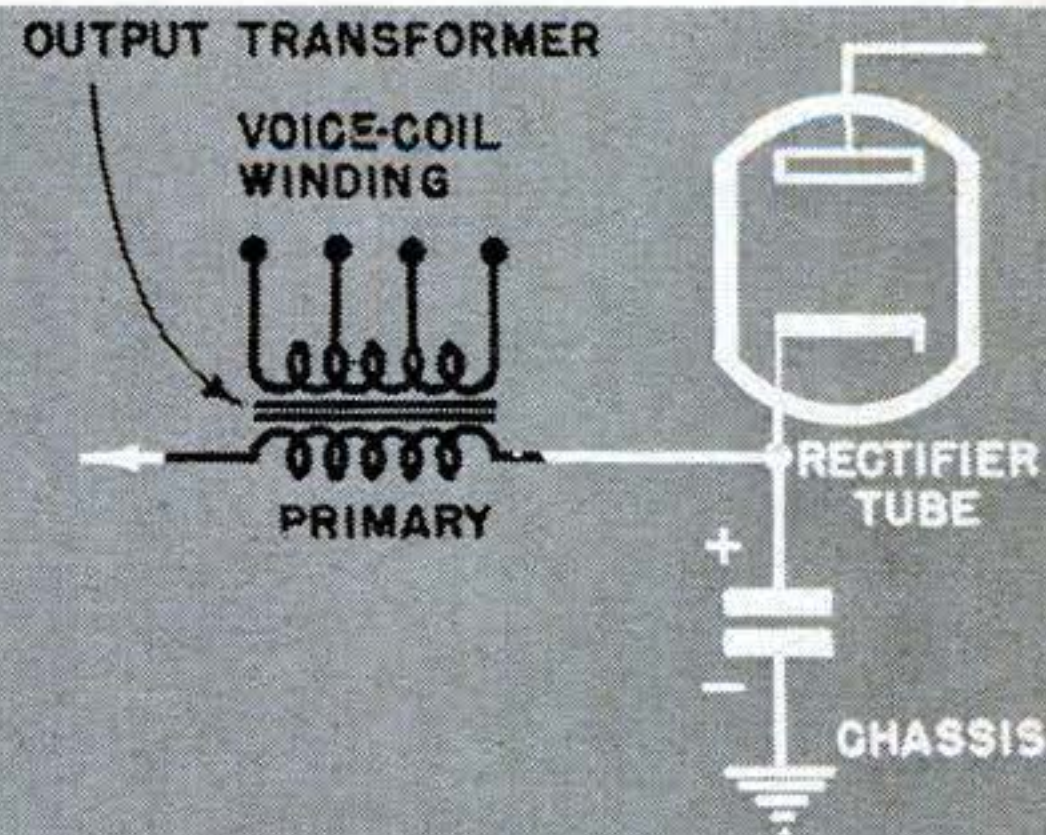
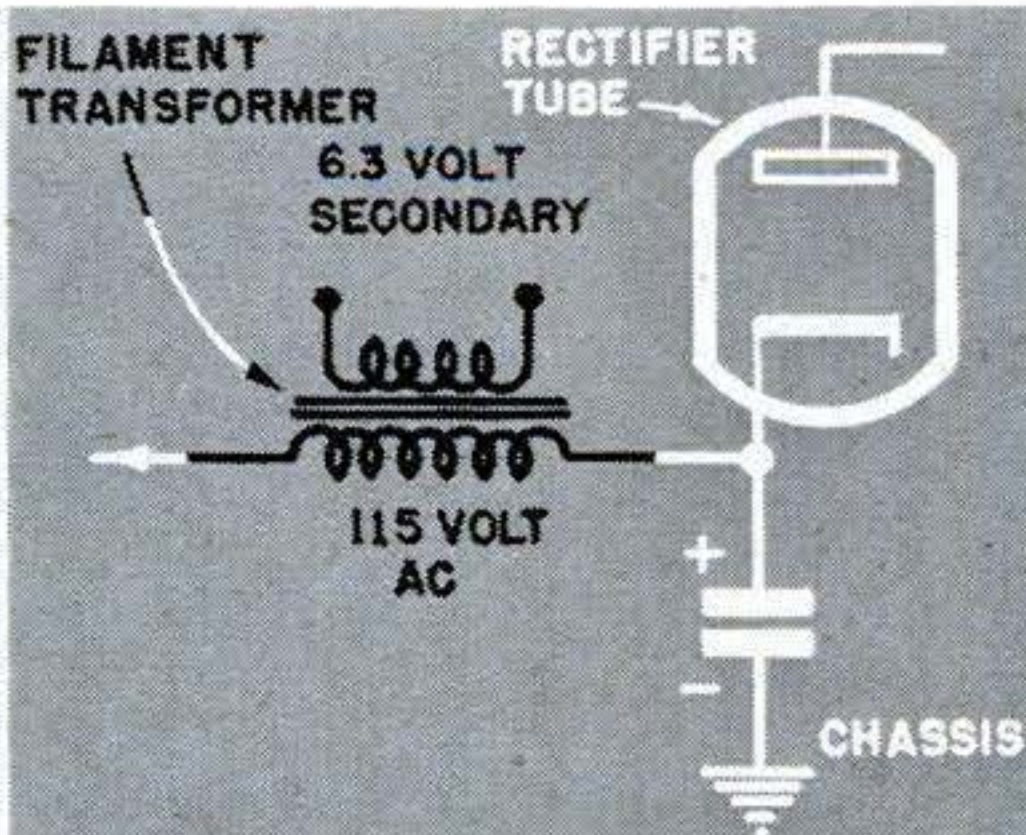
6. Two single-tube audio transformers make a neat replacement for a push-pull transformer.



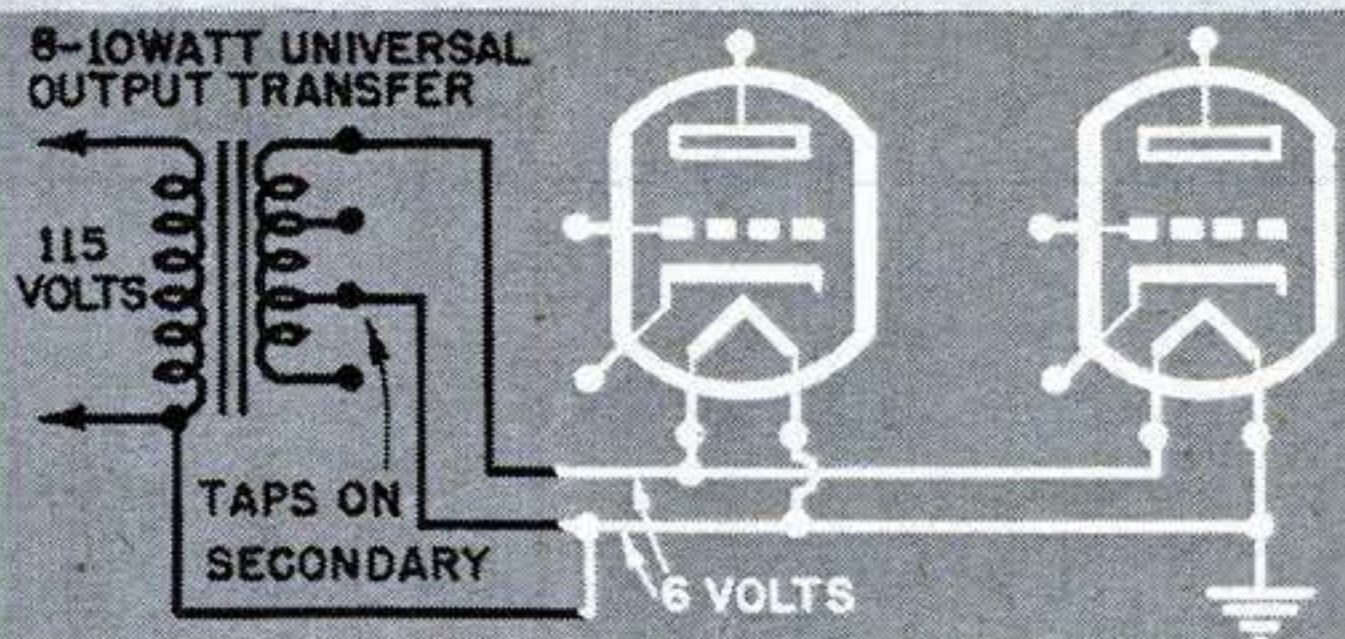
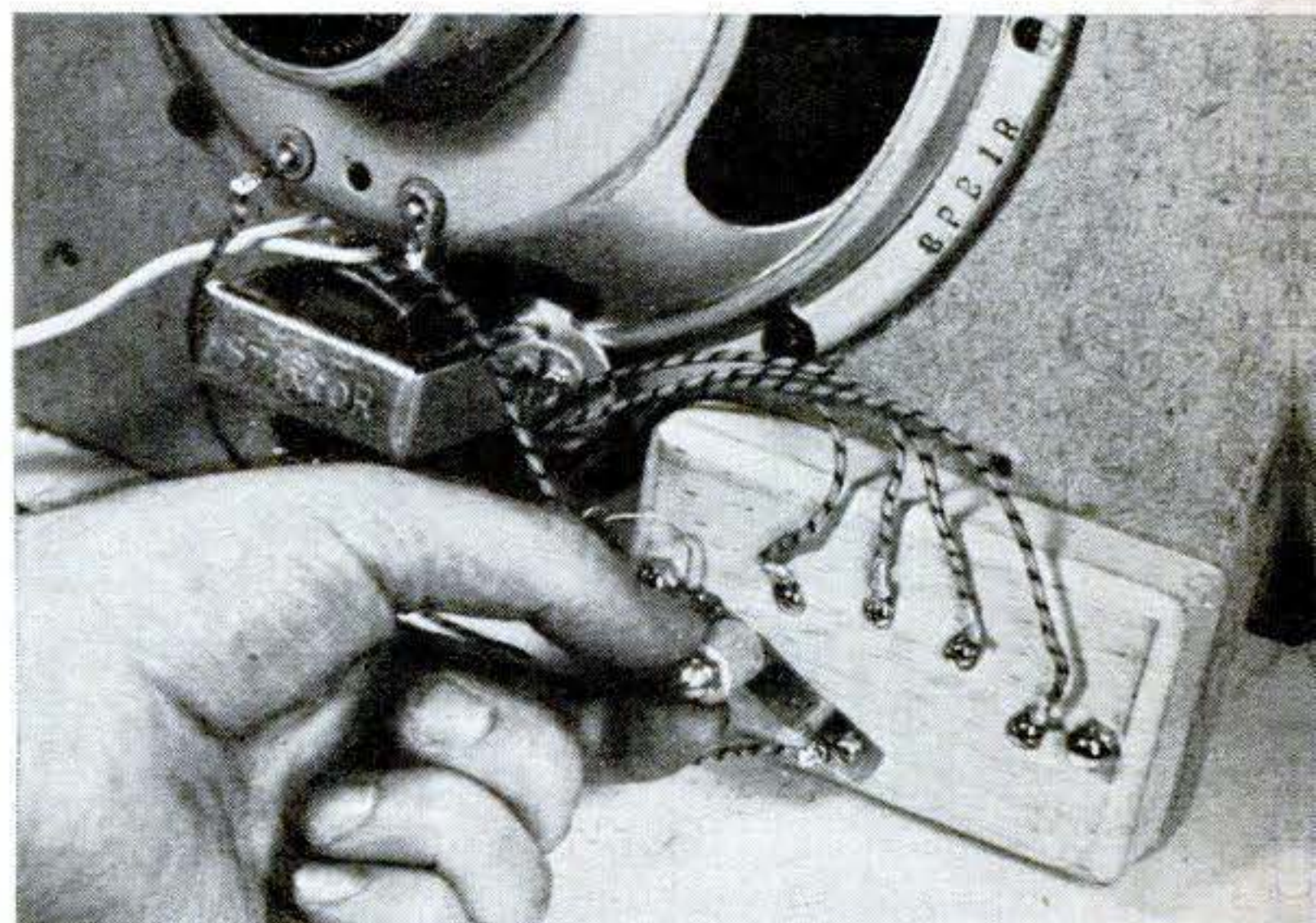
Depending on transformer make, method of connection may vary; try different combinations.



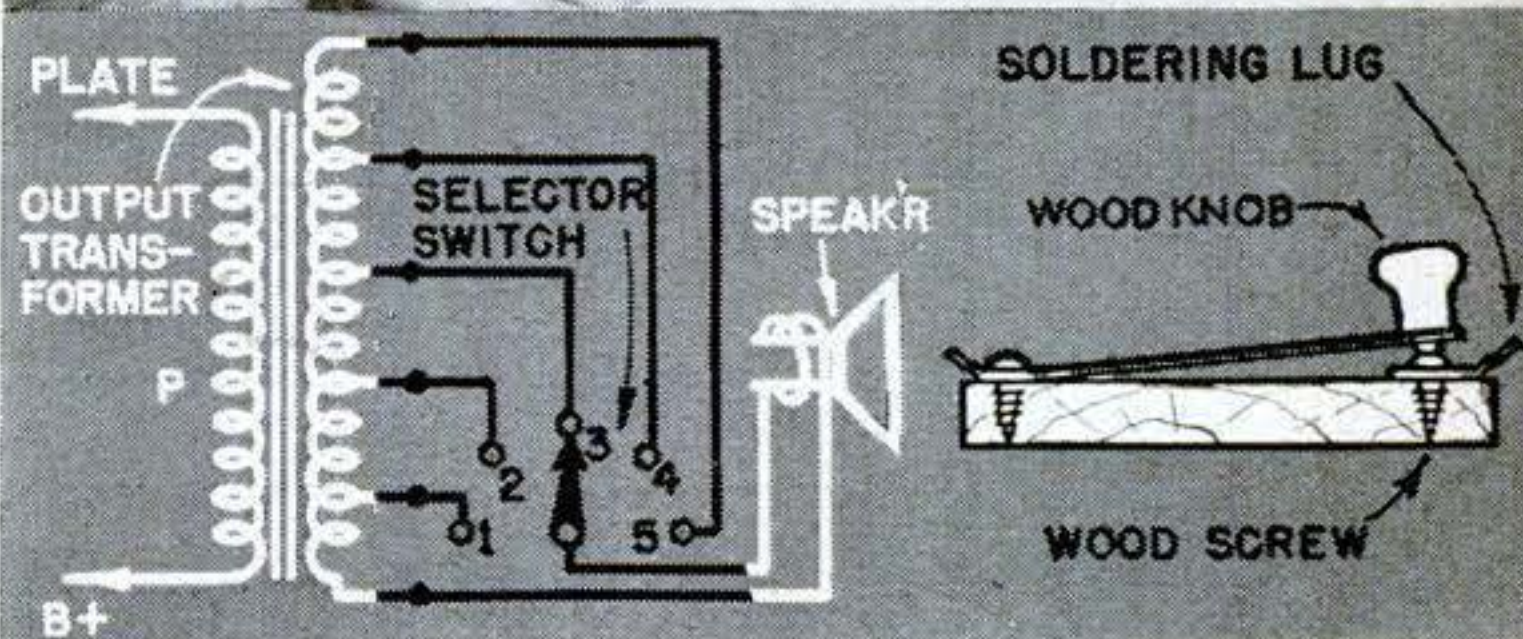
7. Old transformers for 2.5 and 5-volt tubes can be used in modern circuits with 6.3-volt heaters. This arrangement gives 6.25 volts.



8. Filter chokes may be improvised from either filament or output transformers. One winding isn't used; it can even be open or shorted.



9. Heater voltage can be furnished in many ways; one of the more unusual ones is to use an output transformer. Test tap combinations.



10. Selector switches are a cinch to make. A couple of screws and a flat metal arm do the trick. Use soldering lugs for the contacts.



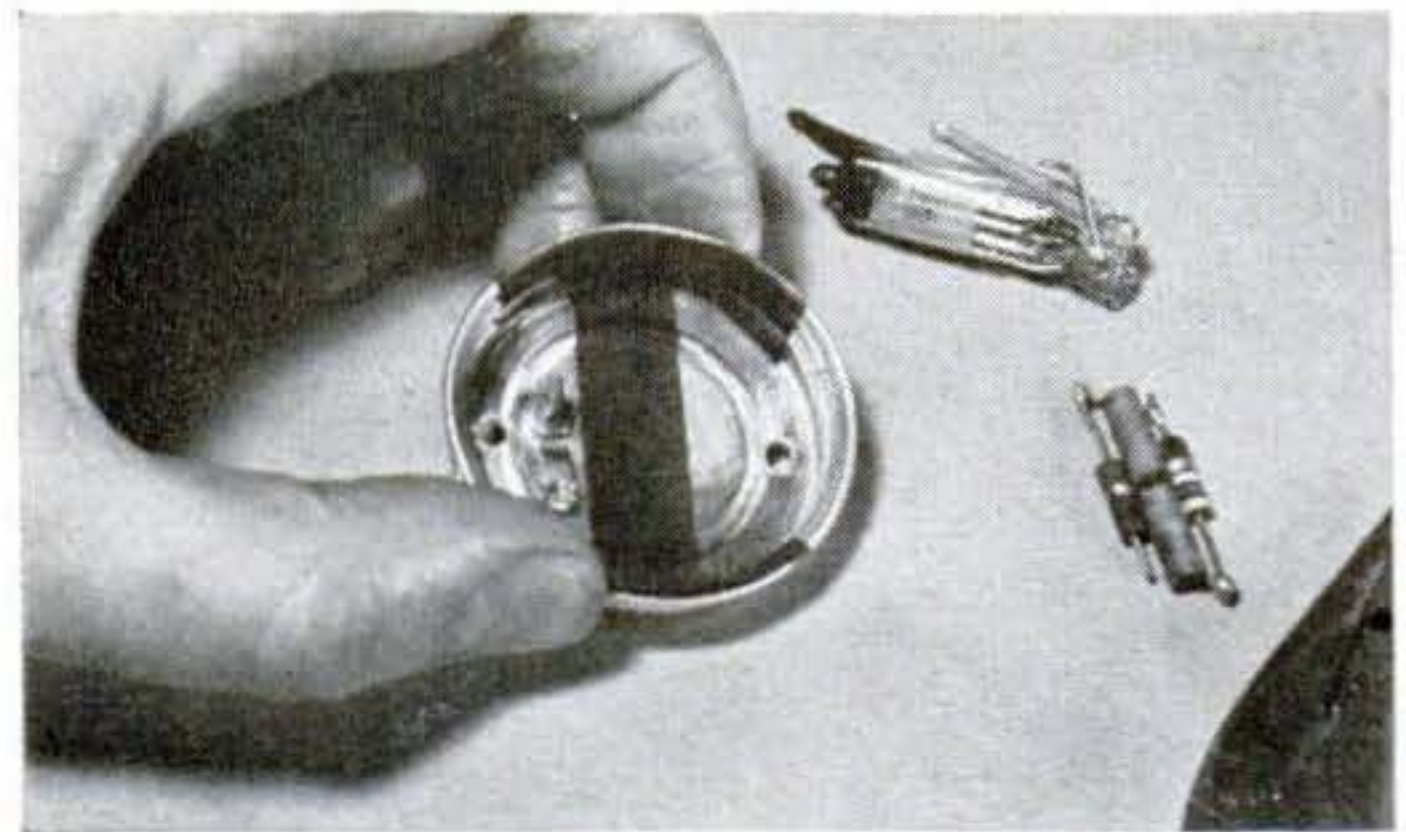
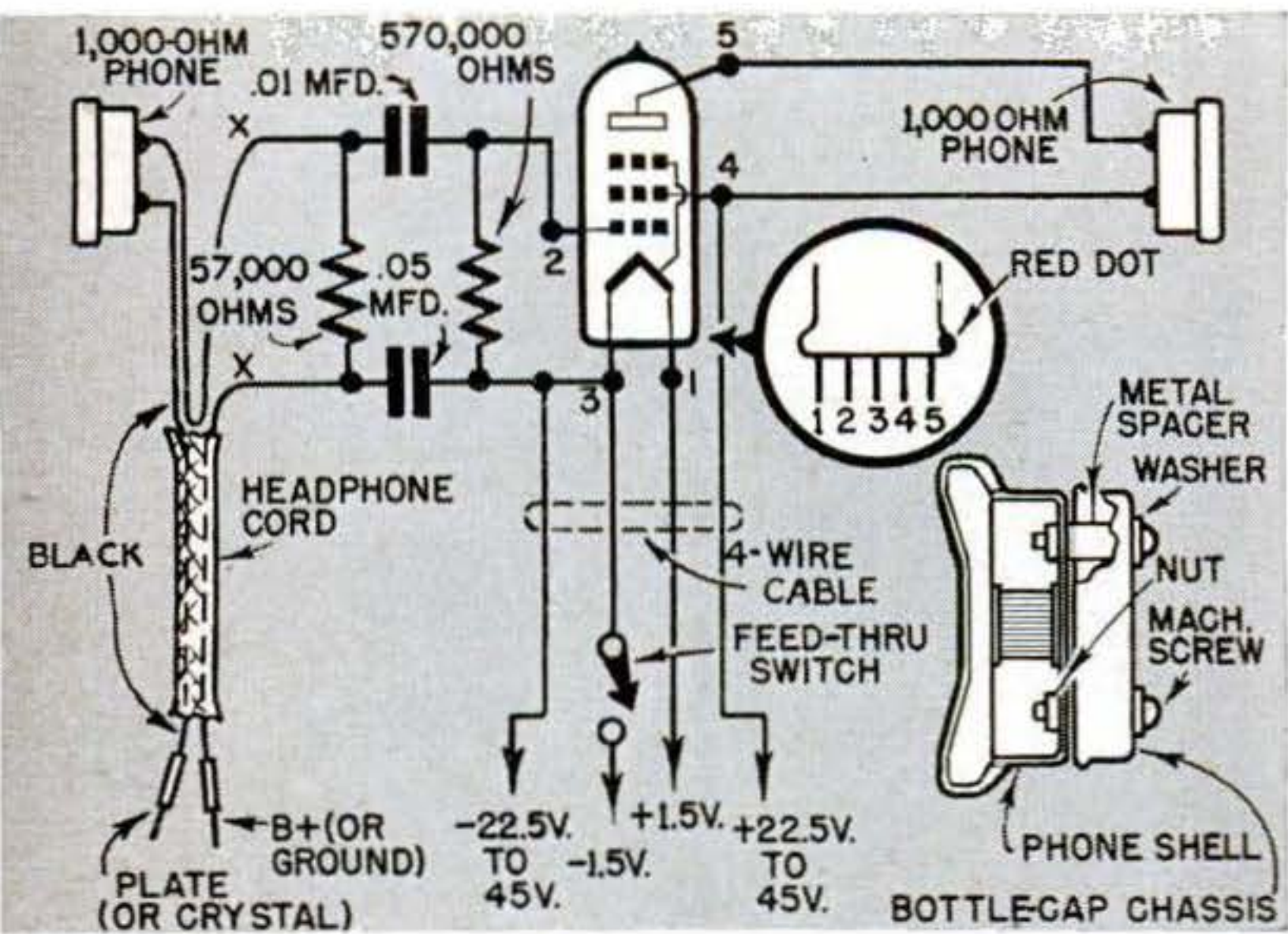
Amplifier Fits On Headphone

YOU'LL listen more comfortably to your crystal and one-tube receivers with a pair of amplifying headphones. And you'll also find them helpful for signal tracing, checking phono cartridges, and the like.

This amplifier, built on an ordinary pair of 2,000-ohm phones (each phone is 1,000 ohms) will work with any type of set. The whole amplifier, less batteries, fits into a metal bottle cap measuring $1\frac{5}{8}$ " across by only $\frac{1}{2}$ " deep. This bottle-cap chassis is bolted to the back of one phone. Since the cap is in effect grounded, you'll lessen the chance of shorts if you line it with cellulose tape. Also tape the bolts and spacers.

Initially the two sides of a pair of headphones are wired in series, with the common wire running down to the yoke and back up the other side. To connect the amplifier, remove the leads from the phone carrying the bottle cap and connect them to the points marked X in the diagram. The two phone terminals are then wired to pins 4 and 5 of the tube.—*Albert Rowley, Manhattan, N. Y.*

Get more stations at better volume on your crystal and one-tube receivers by using amplifying phones. They'll work with any set.



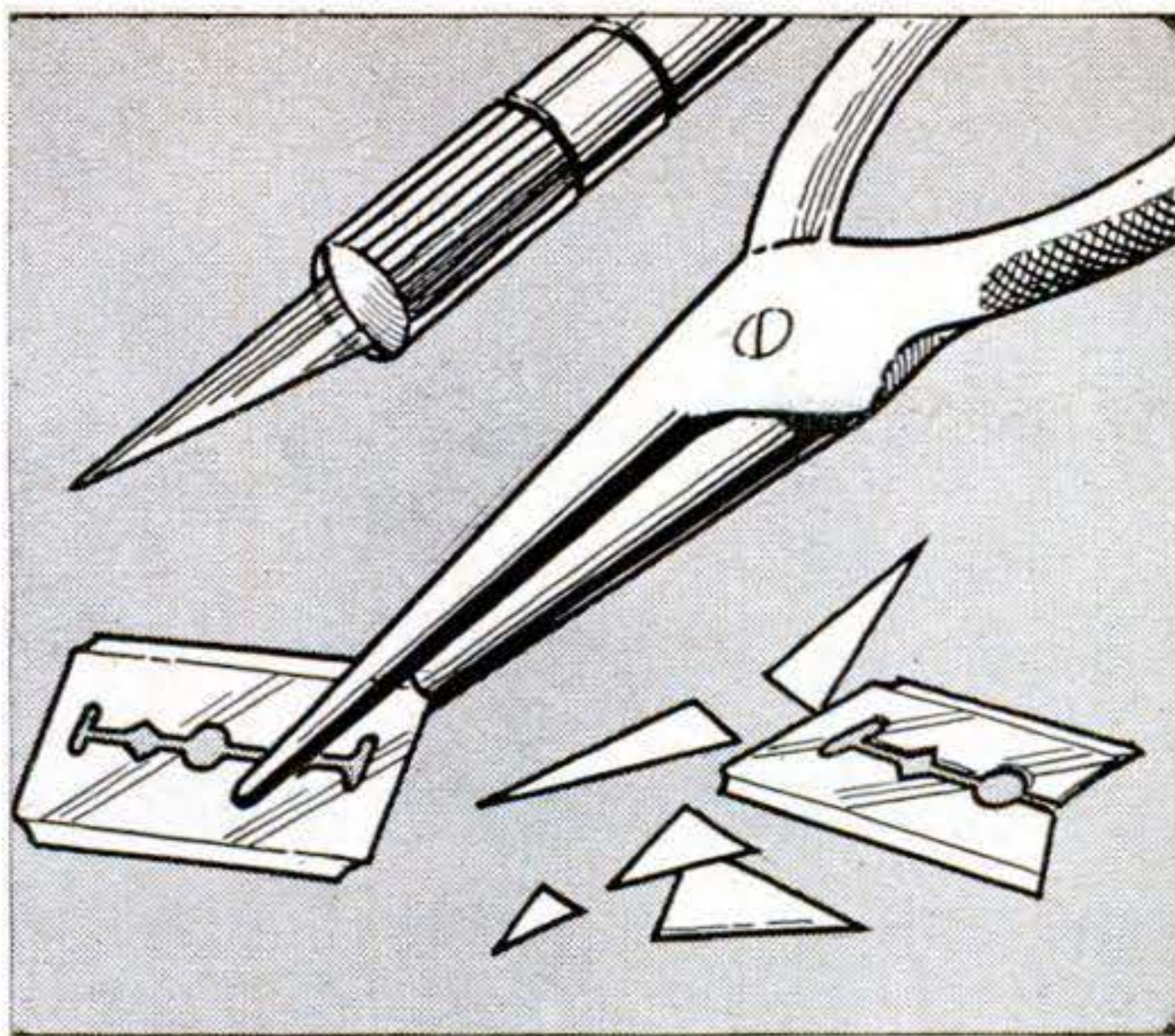
Tube connections are soldered directly to the pins. Use a small iron and try to solder each joint quickly; too much heat may cause damage.

Insulate the bottle-cap chassis with tape. The holes in back are for mounting; drill two more in the rim to clear battery and phone cables.

All parts, including tube, are mounted inside the bottle cap. Battery and phone wires are taped together to keep them from snarling.

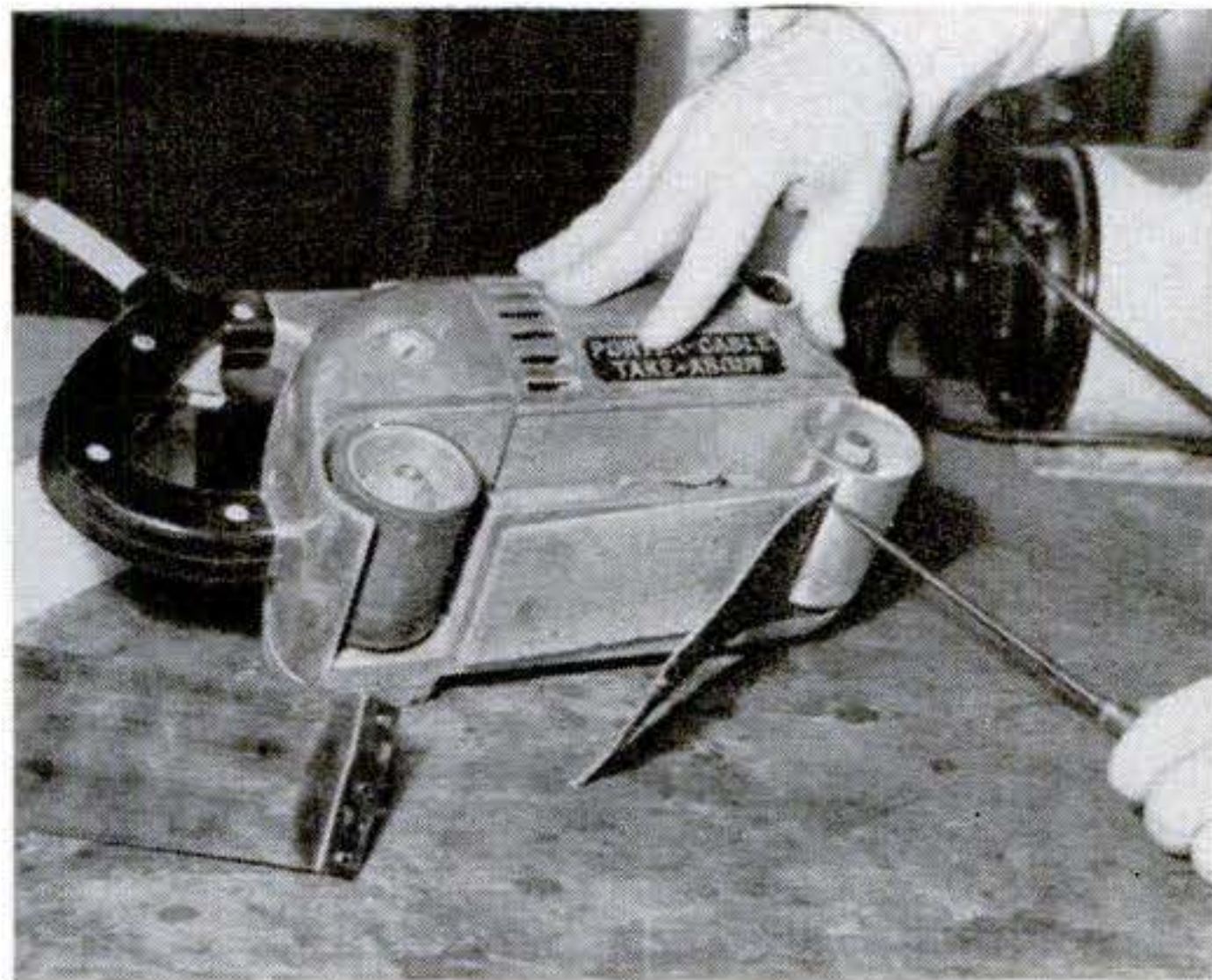
Amplifying headphones complete except for the batteries. Use a 1.5-volt flashlight cell and a 22½- or 45-volt hearing-aid B battery.





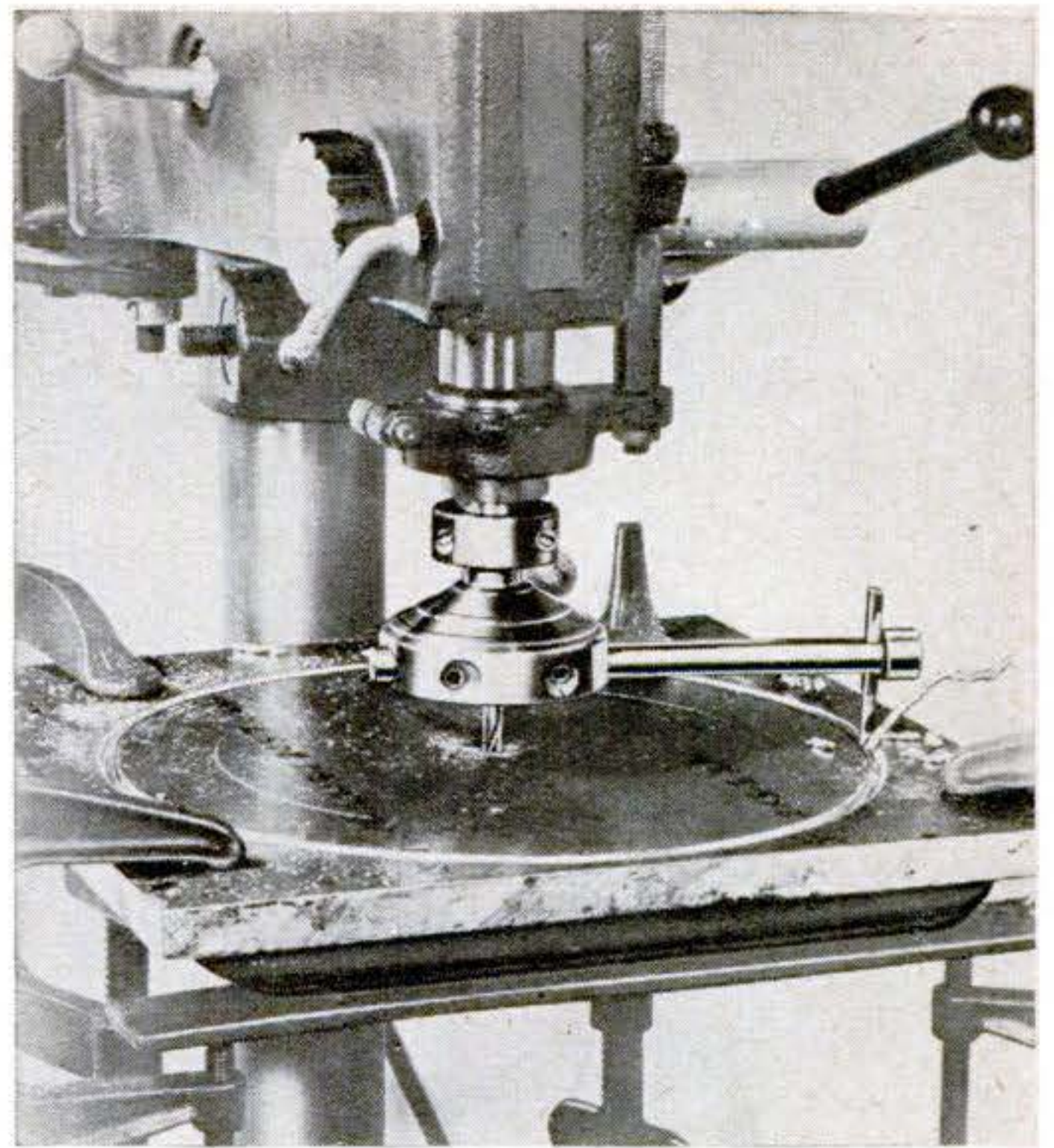
New Knives from Old Blades

FOR collet-type knives, such as the one pictured above, you can make yourself a supply of new cutters by breaking old razor blades. Hold the blade with pliers and snap off pieces with needle-nosed pliers. By careful breaking, you can get a variety of shapes. —G. E. Harrington, Manhattan, N. Y.



Soft Shoe for Final Sanding

ON FINAL sanding jobs, portable belt sanders tend to leave fine dents in the surface unless the metal shoe is replaced by a woven asbestos shoe. The extra thickness of the belt at the lap causes the dents. An asbestos shoe, sold by the manufacturers of the sanders, absorbs the shock when the extra thickness strikes. A temporary soft shoe can be made from heavy cloth such as furniture webbing. Cut it to the length and width of the metal shoe it replaces. Either a temporary or a factory-made soft shoe should be used only for finishing work after the rough sanding has been done with the metal shoe in place. —James B. Leeth, Cullman, Ala.

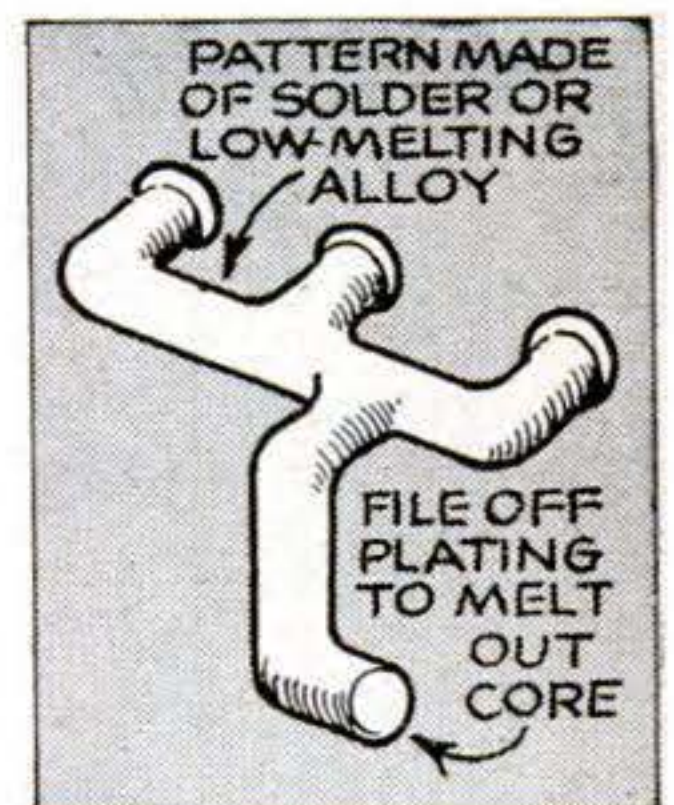


Cuts Circles from 3/4" to 12"

THE McKelvey hole and circle cutter handles metal up to 1/2" thick and fiber, wood, and plastic up to 1 1/2". By adjusting the rake of the cutter, noise and chatter are minimized when working on materials of varying hardness. Flat-tip screws secure the various parts, the pilot drill being pressed firmly against the side of the cutting arm. It takes any 1/4" cutter and has a height of 2 1/4". The attachment fits any standard drill press and is priced at about \$8 by the Sunset Equipment Company, of Los Angeles.

Solder Subs for Tubing

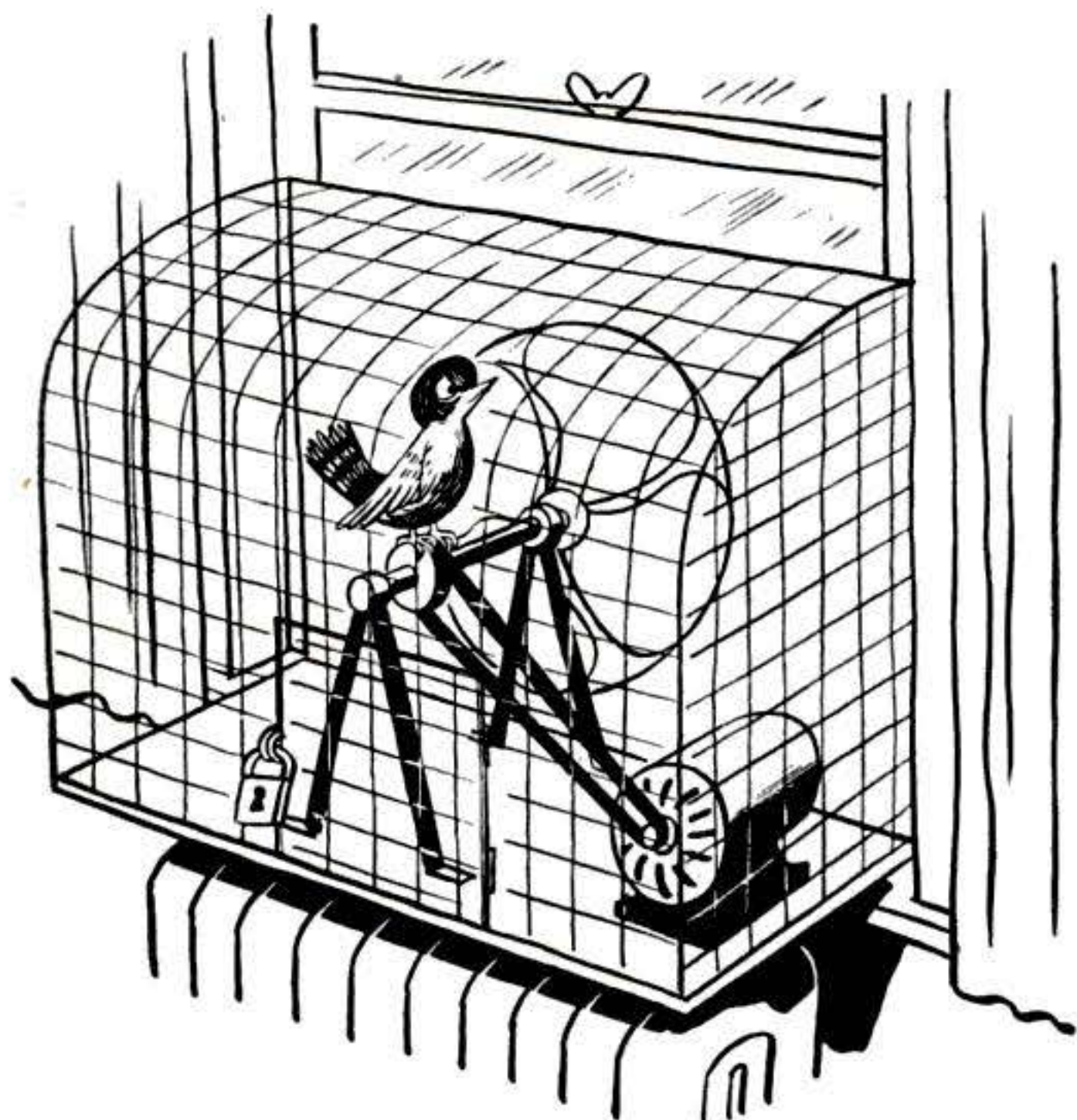
I NEEDED a pair of manifolds for a model of a World War I airplane engine and couldn't get copper tubing of the proper size. Using wire solder, I bent it to the shape shown here. Then it was carefully coated with graphite and copperplated (PS, Dec. '47, p. 213). After filing through the copper at one end, I melted out the solder core by heating it in a gas flame. Before copperplating, it's necessary to coat lead-base metals with graphite. Otherwise, a soft, spongy coating of copper is likely to result. If the tubing you want to simulate needn't be hollow, you can carve it of wood and then copperplate it. —Freddy Mitchell, Simsboro, La.



What's Your Ingenuity Quotient?



Be Kind to the Little Wife. If your wife is short, this rig will enable her to reach the clothes line and at the same time hang clothes high off the ground. Install the cross bar so it pivots easily, and drill a series of holes in the diagonal brace. Mrs. Four-by-Five can then lock the line at the desired height with a pin through the brace.—*Hattie H. Holt, Springfield, Ill.*



Fan Gets the Bird. Now that winter is coming on, I've sublet the window-fan cage to the canary, after first cutting a door in the screen. He likes the new accommodations so much that I'm wondering what will happen when his lease expires next spring and he must return to smaller quarters.—*M. H. Bates, Montgomery, Ala.*



It's Oil Right. To keep from running out of fuel oil, I tapped a hole in my tank 7" above the original feed line. Then I put in a pipe nipple and ran $\frac{1}{2}$ " copper tubing to the regular feed line beyond the valve. With the valve shut off, my furnace gives me several days' warning before I really run out of oil.—*E. LaCross, Iron River, Wash.*

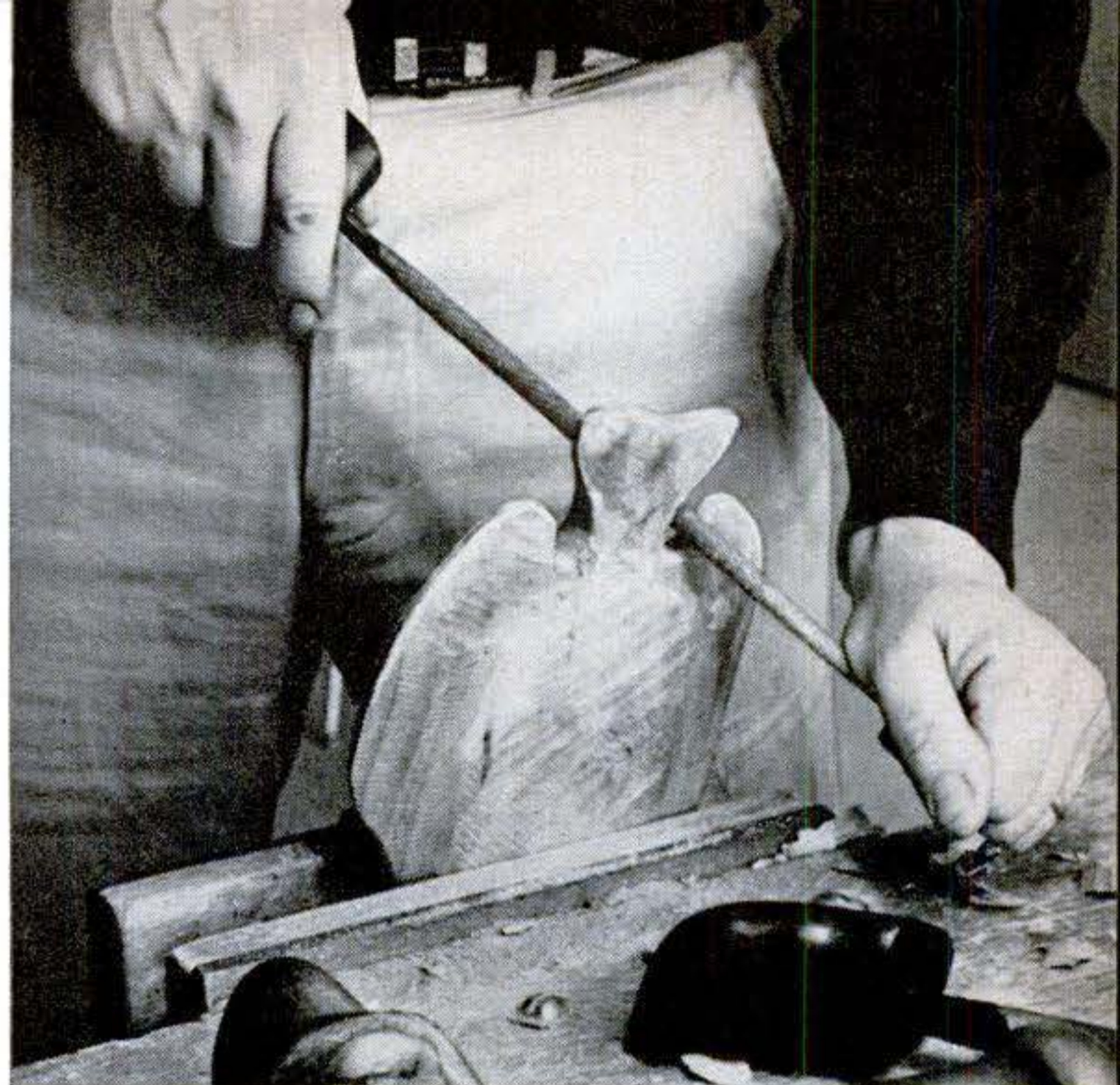


Shelling peas for our deep freeze is a production-line operation now. We use a clothes wringer. The peas are packed in ice to make them firm. Then they're fed into the rollers blossom ends first. As the rollers take hold, the other end of the pod is pinched, and the peas come popping out.—*Ruth R. Smith, Brookline, Mass.*

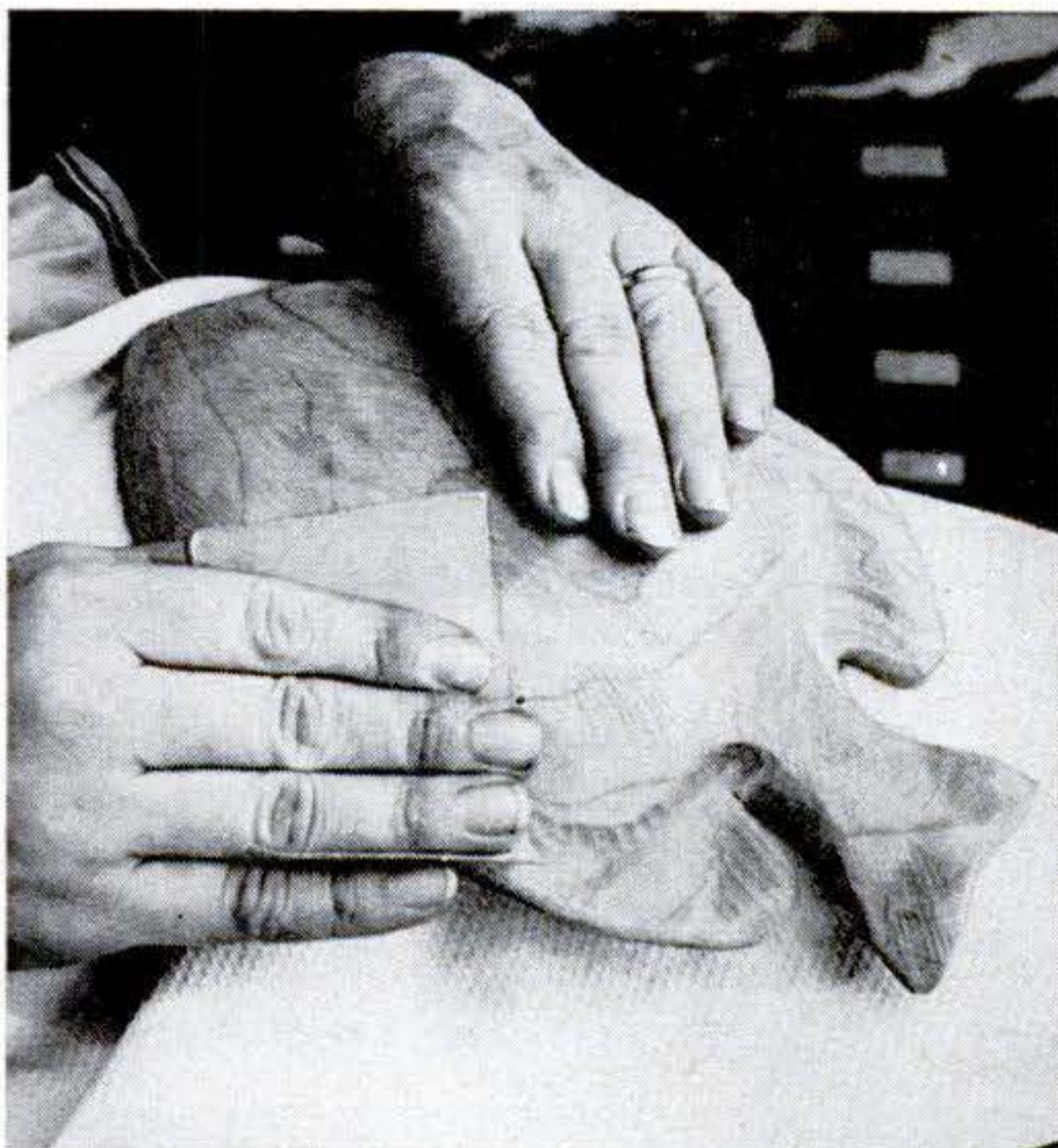
Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky—if it works. Use government postcards only. Contributions cannot be acknowledged or returned.



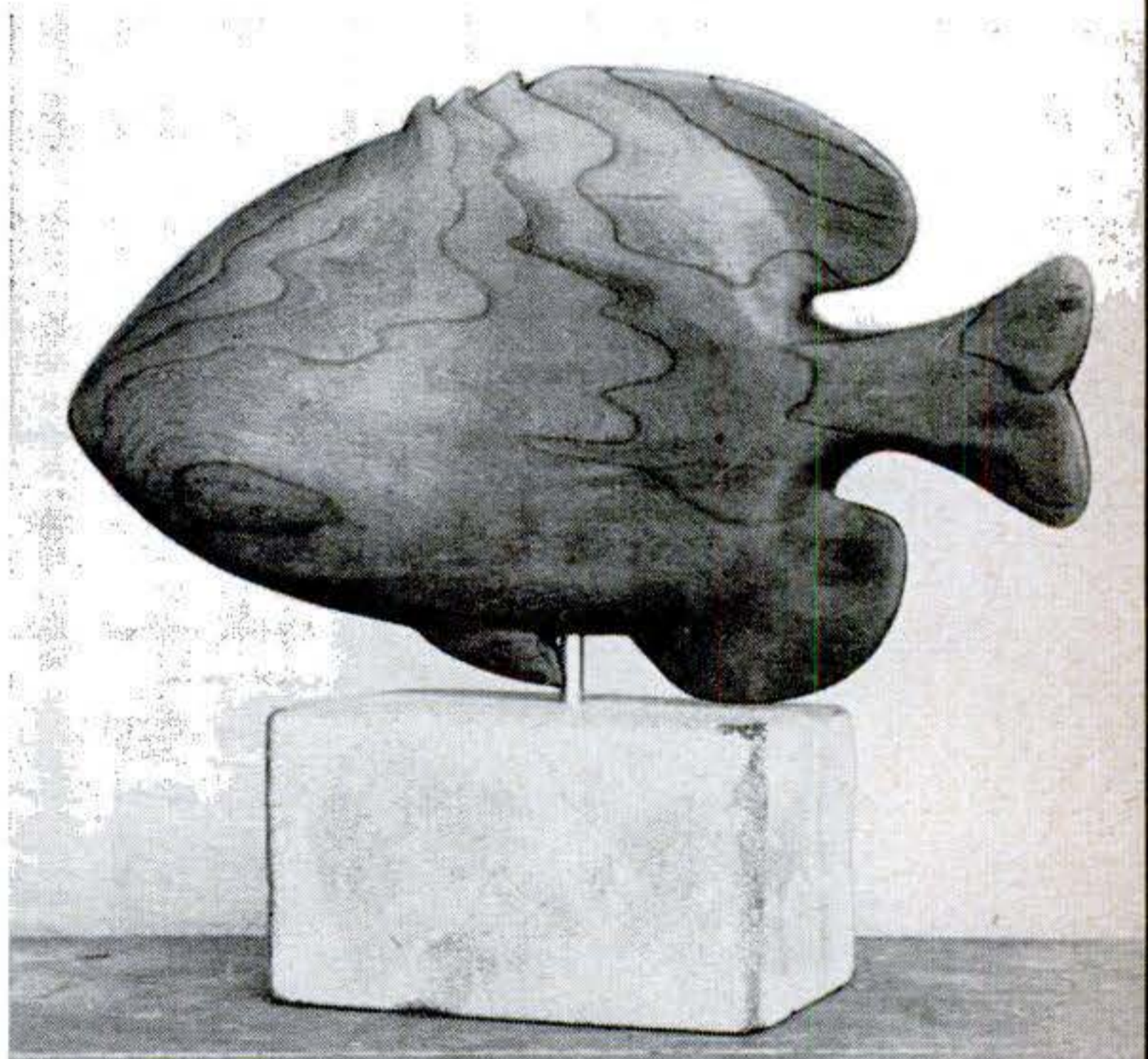
After fish is sketched on block of wood, waste stock is cut away with a saw. First shaping of the body is done with large gouge. Cuts are made partly across and partly with grain.



Body is chiseled to a rough shape and then finished with gouges and rasps. Tail and fins are separated with a rattail file. Note the hand-fitting tool handles Fitz-Gerald made himself.



Starting with coarse-grained paper, tool marks are worked out. Final sanding is with 3/0 paper. Strokes follow line of object and are not necessarily with the grain.



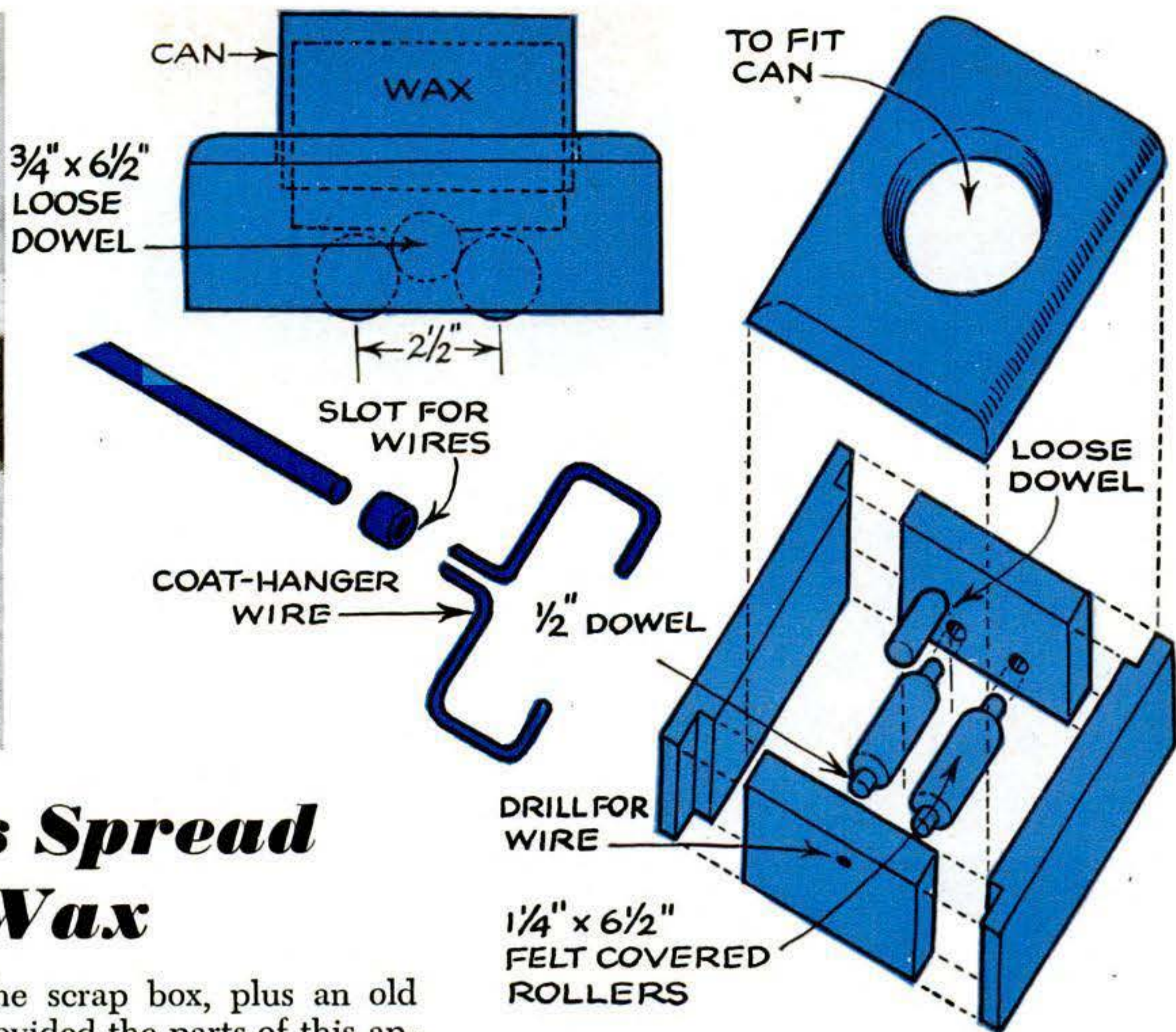
Finished work is mounted on an aluminum peg set in a block of stone. Wood is finished with two coats of shellac cut 50 percent with alcohol. Wax polishing completes the job.

Cherry Grain Forms Fish Fins

RIPPLING as though viewed underwater, the wood grain in this carving is a basic part of the design. Note how the grain lines end in the spines of the dorsal fin. Clark Battle Fitz-Gerald, Kirkwood, Mo., commercial artist who carved this perch from cherry wood, says he sometimes spends as much time studying grain structure as he does in

carving. His favorite woods are walnut, cherry, and osage orange.

He uses the usual woodworking tools—saws, chisels, gouges, rasps, and files to do his carving. Fitz-Gerald also made the mallet and the handles of the other tools. The mallet, of osage orange, is so tough that nails can be driven with it.



Rollers Spread Floor Wax

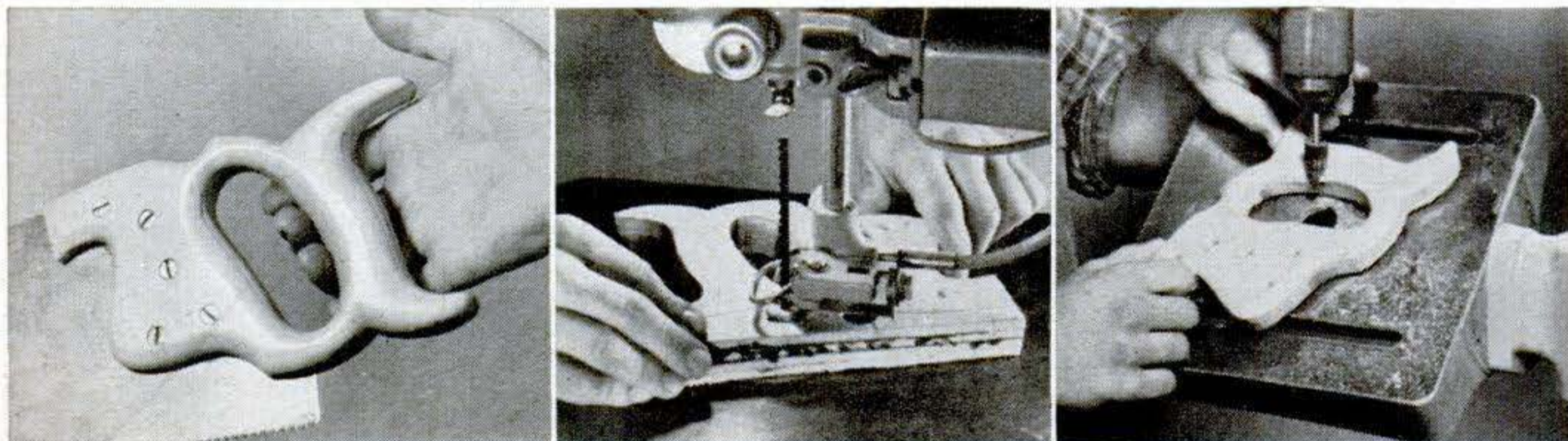
PIECES from the scrap box, plus an old broom handle, provided the parts of this applicator that holds a can of paste wax.

Dimensions for the rollers are given in the drawing. Build the box to conform to them. Cut the hole in the top for a loose fit around the can. The two larger rollers are covered with felt while the smaller one is left bare. This free roller acts as a stabilizer, bearing most of the weight of the wax and preventing the felt-covered rollers from taking up too much wax. Loosen the wax from the

can before placing the inverted can in the top of the applicator. Leave the can in place as a protective covering for the wax.

I turned the rollers on a lathe. However, dowels or lengths cut from a rolling pin will do just as well. The wire bracket was bent from a heavy wire coat-hanger and the ferule taken from an old mop.—Bernard Cohen, Toronto, Canada.

Replacement Saw Handles Cut from Plywood



You can duplicate a favorite saw handle by cutting a blank from glued-up scraps of $\frac{1}{4}$ " plywood. After gluing four pieces of hardwood plywood face to face, trace the outline of the new handle from the old one. Scrollsaw to the outline (center photo above)

and then use rotary files chucked in a drill press to round the edges. Tilt the table at various angles to shape the edges. Smooth the work with sandpaper. Use a rip saw to cut a slot for the blade and drill for mounting screws.—E. M. Love, Palmdale, Calif.

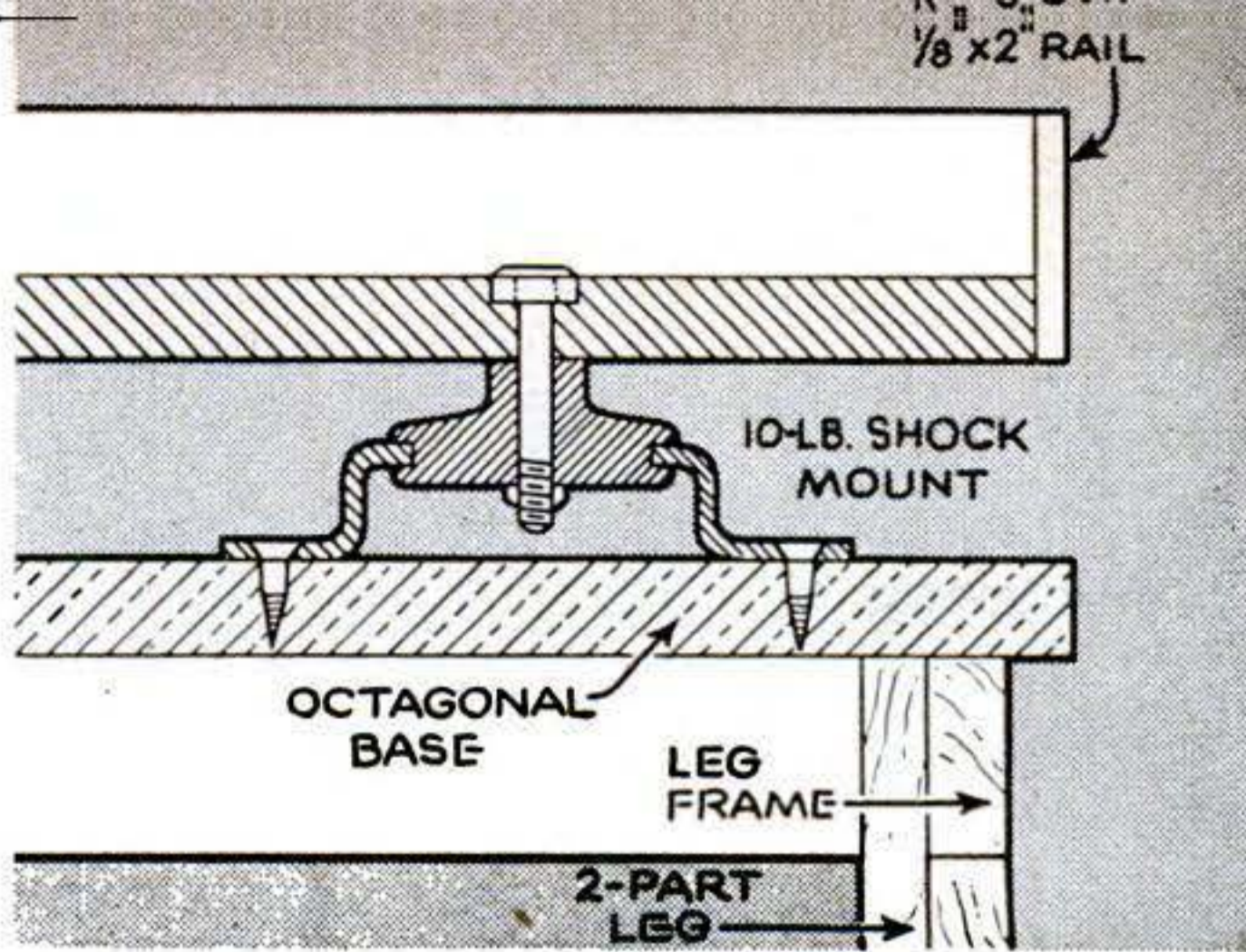
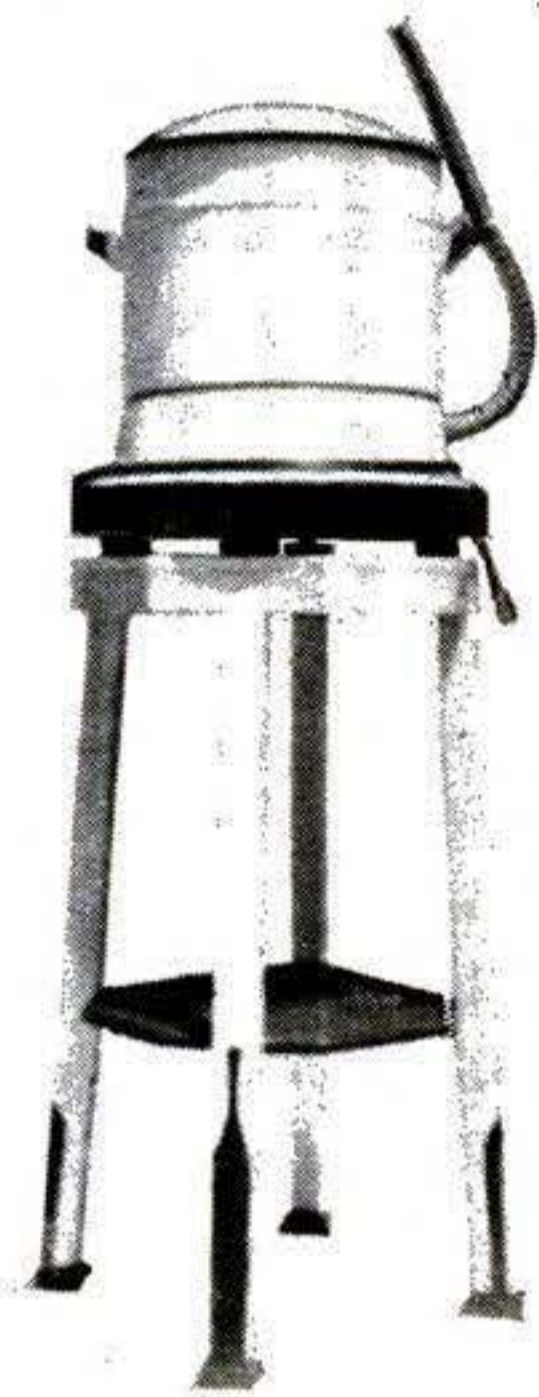


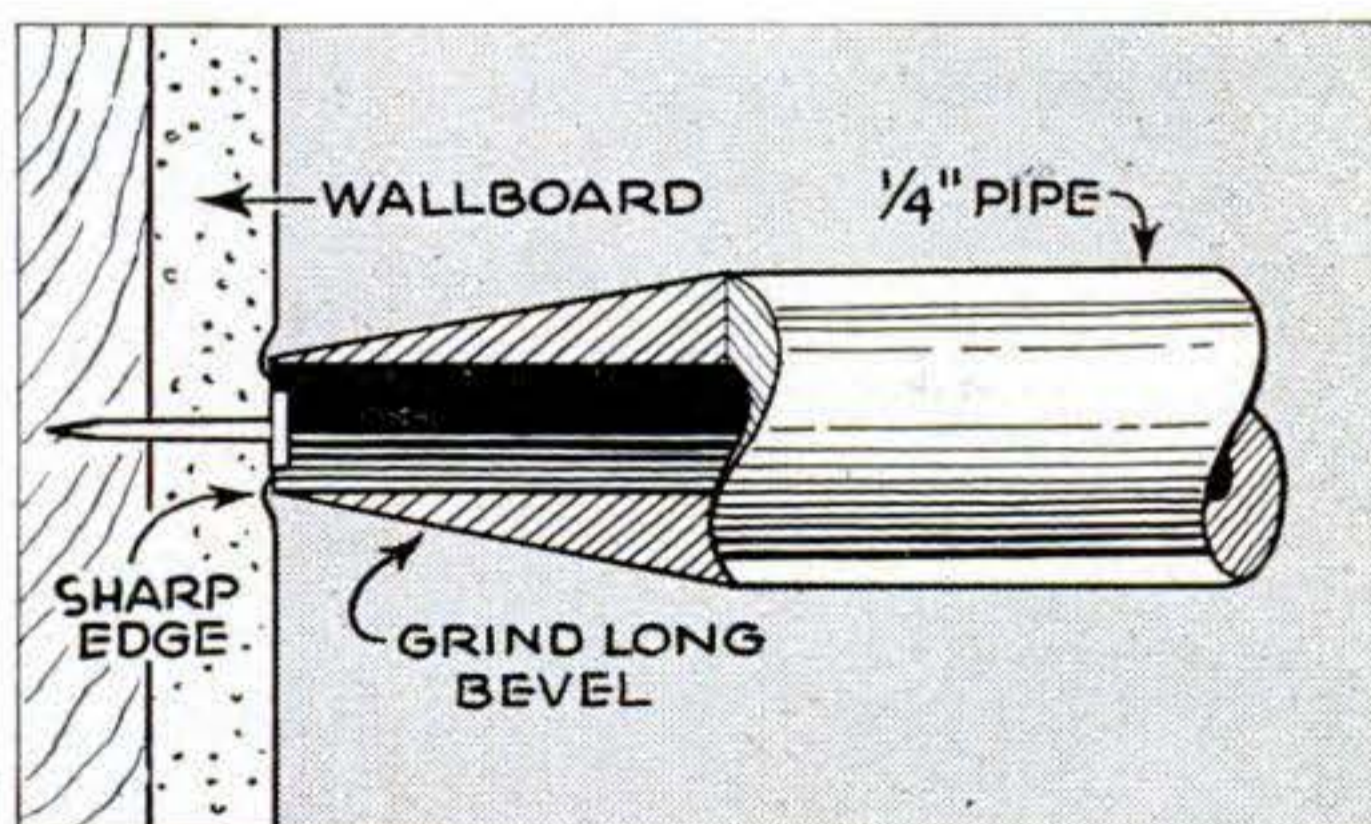
Table Holds Portable Washer



AFTER repeated efforts to buy a suitable table for my portable washing machine, I decided to build one to my own specifications. Here it is.

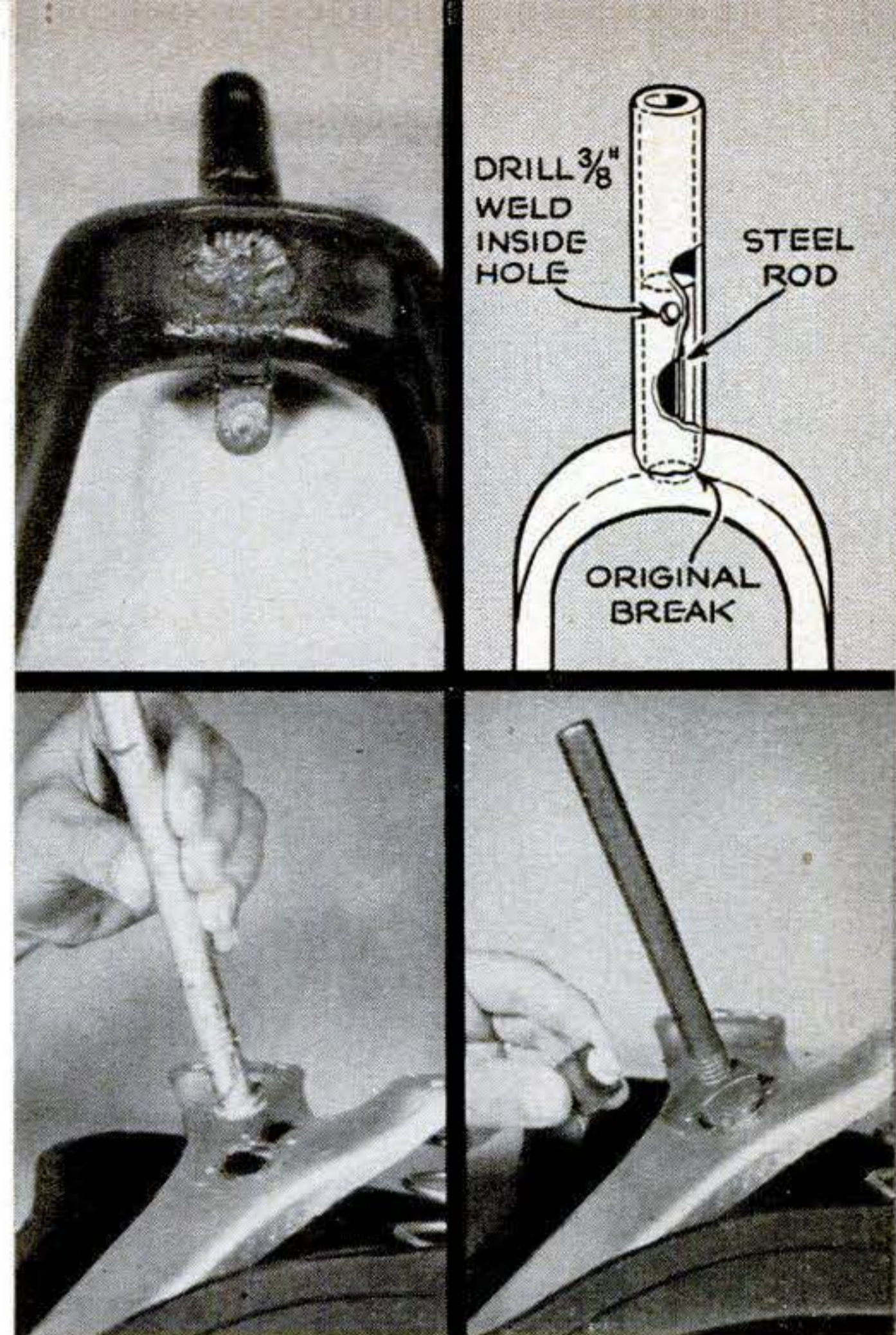
An octagon shape was adopted to save space and avoid sharp corners. Legs were built up of two pieces. This made it unnecessary to cut a rabbet for the leg frame. An octagonal shelf mortised into the legs provides rigidity for the structure.

Shock mounts under the table face eliminate vibration and rubber pads on all the legs reduce the "walking" action. Instead of forming $\frac{1}{8}$ " wood around the top as a rail to retain the washer, you could use sheet metal.—*W. L. Taylor, Washington, D. C.*



Tool Cuts Wallboard Free

THIS tool makes it easy to remove wallboard. It's made by grinding a long bevel on one end of a short piece of $\frac{1}{4}$ " pipe. When the tool is set over a nail and hammered, the sharp edge cuts through the wallboard, freeing it from the nail. The board can be nailed back at a different spot.—*John H. Dunnewin, Grand Rapids, Mich.*



Hints on Repairing a Tricycle

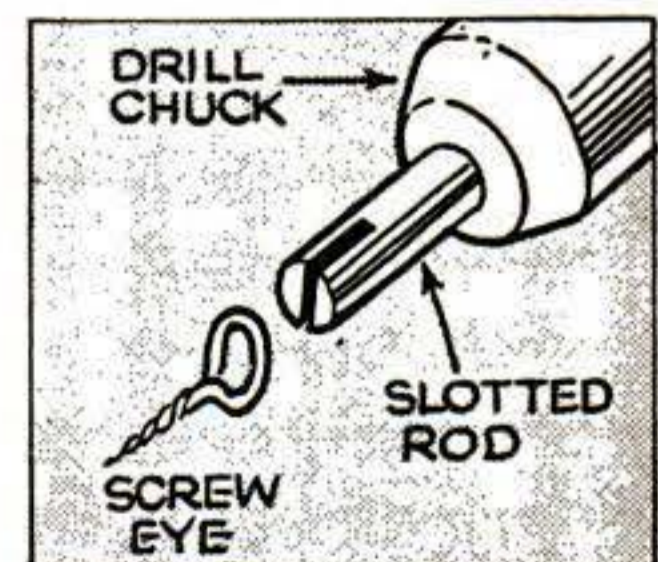
SOME tricycles aren't as well built as they might be. As a result repairs are often necessary. The procedures I followed in two such jobs may help others.

First, the fork broke at the point where the neck joins the wheel arms. Since the neck is just tubing, it soon broke loose again when welded. To strengthen it, I pushed a length of close-fitting steel rod into the tubing. Then I welded inside two $\frac{3}{8}$ " holes drilled in the tubing, around the original break, and also underneath.

When the seat column broke loose from its metal plate, as in the lower left photo, I decided against welding. Instead, I cut the head from a carriage bolt of the proper diameter and clamped the plate between nuts.—*A. C. Kubitz, Millbrae, Calif.*

Slotted Tool Sets Screw Eyes

THIS handy tool saves time and work in driving all kinds of screw eyes and hooks into wood. Make it by cutting a 5" length from $\frac{1}{4}$ " steel rod. Slot the end with a hacksaw and widen the slot by forcing the legs apart with a screwdriver. Chuck the solid end of the tool in a brace or drill.

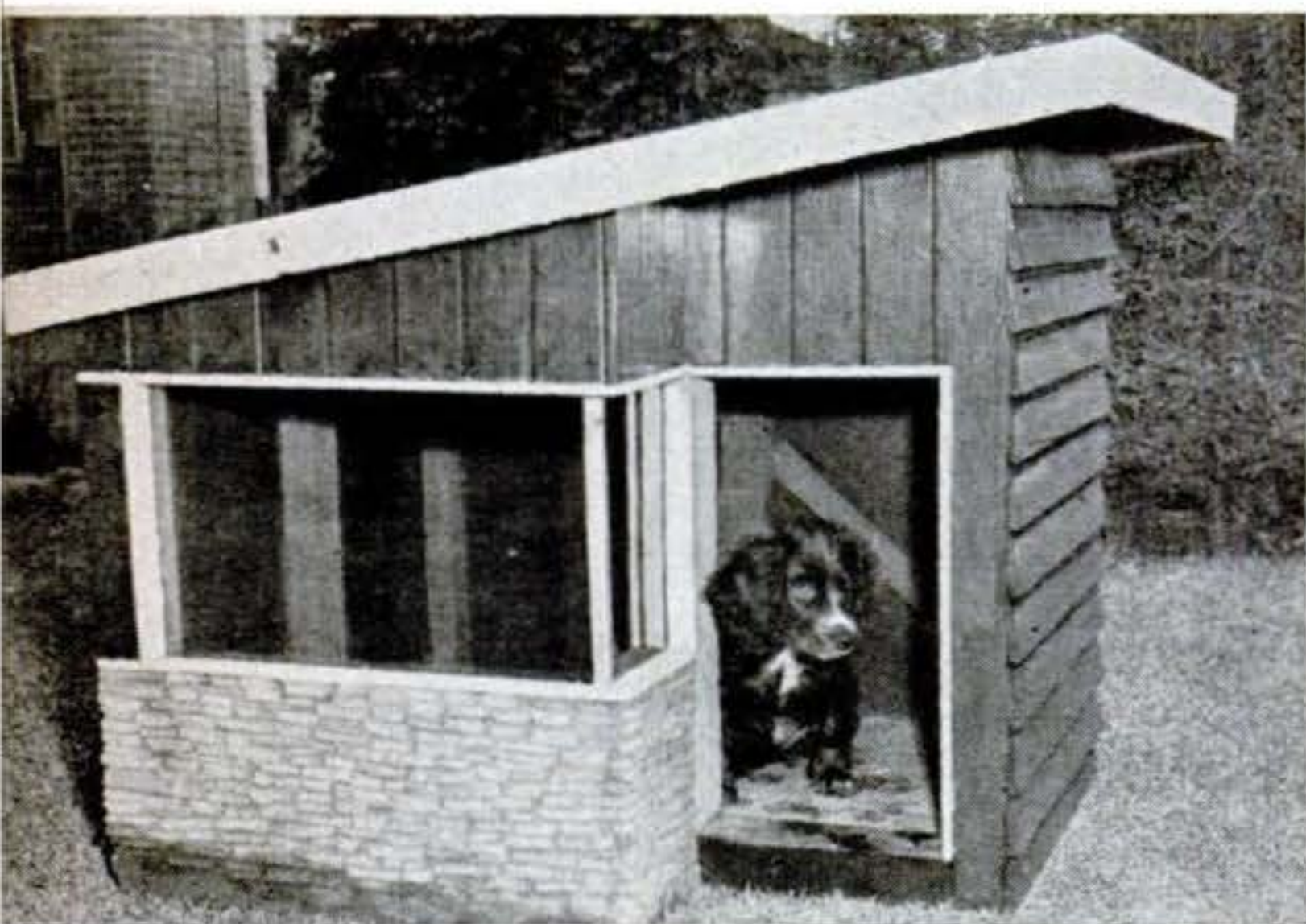




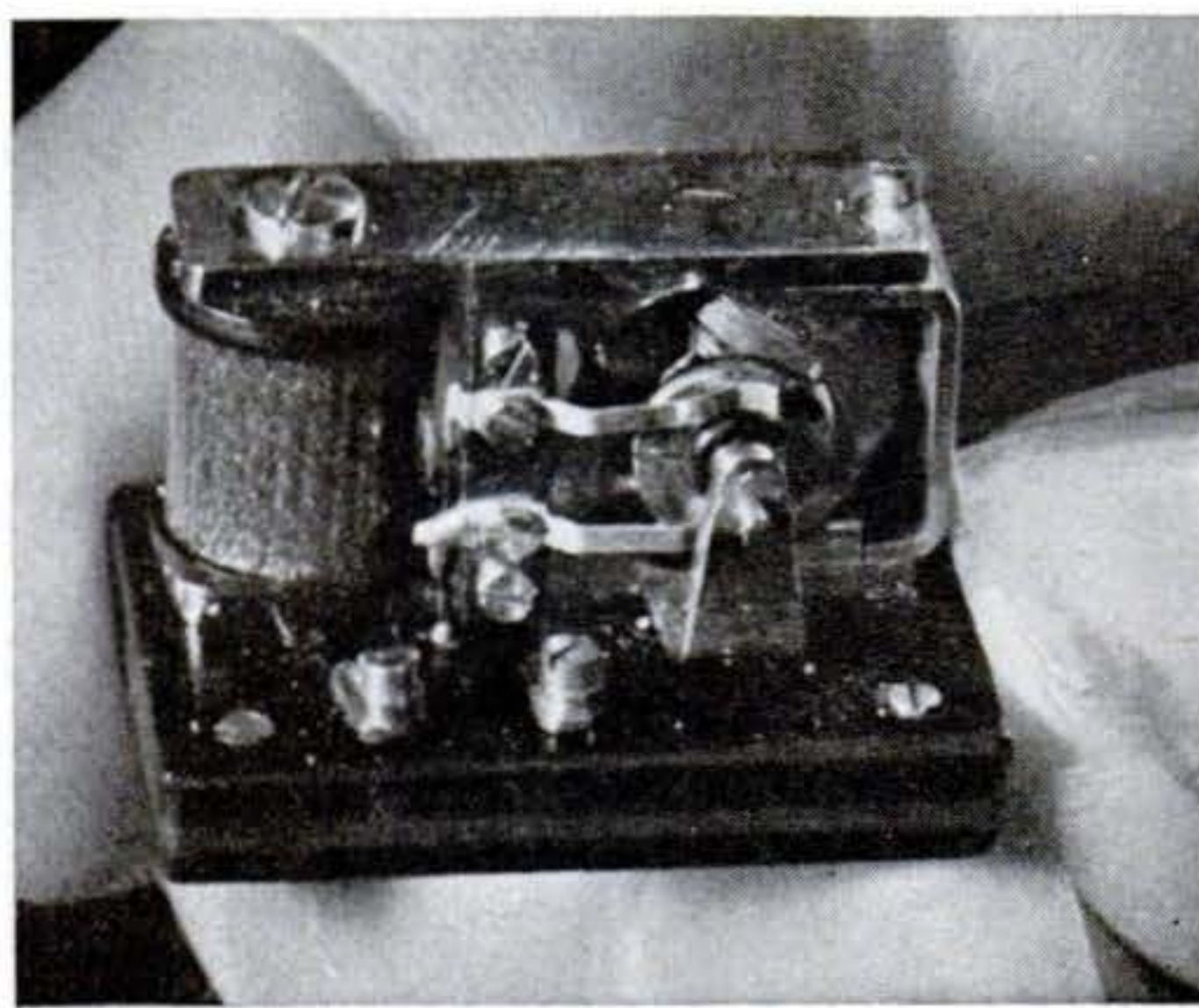
CRAFTSMEN AT WORK

Hot Rod, 1911 Model. The prototype of this miniature, a Ford Model T Torpedo roadster, was a snappy number

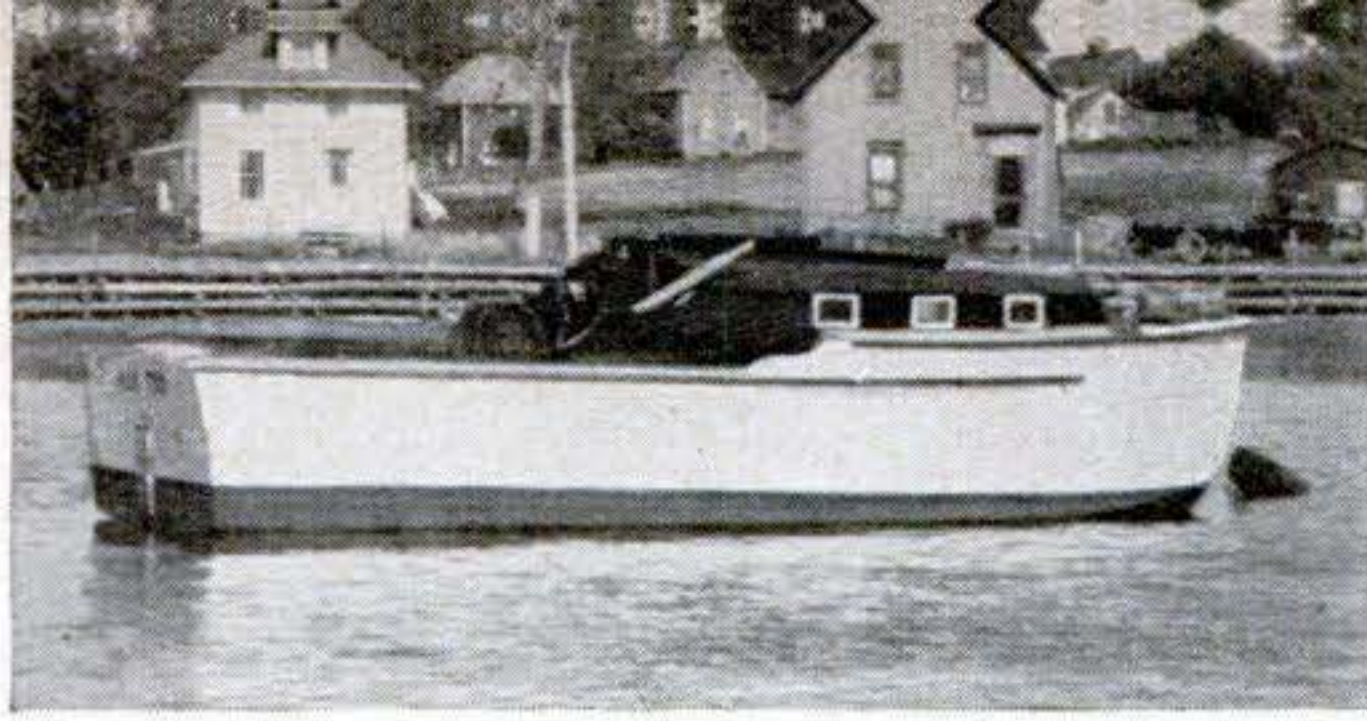
when it bounced over the roads of those days. Built by Arthur Salmons, of Hynes, Calif., the model has a dummy engine.



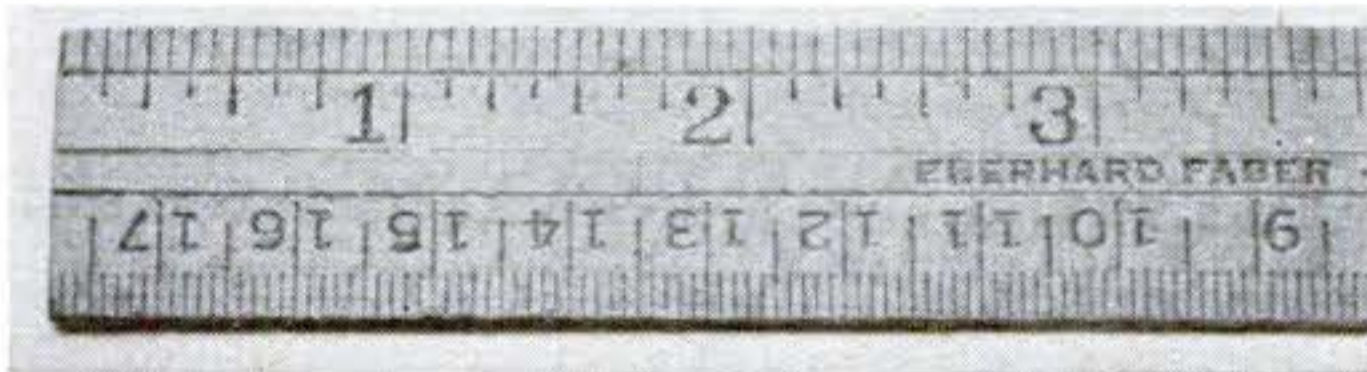
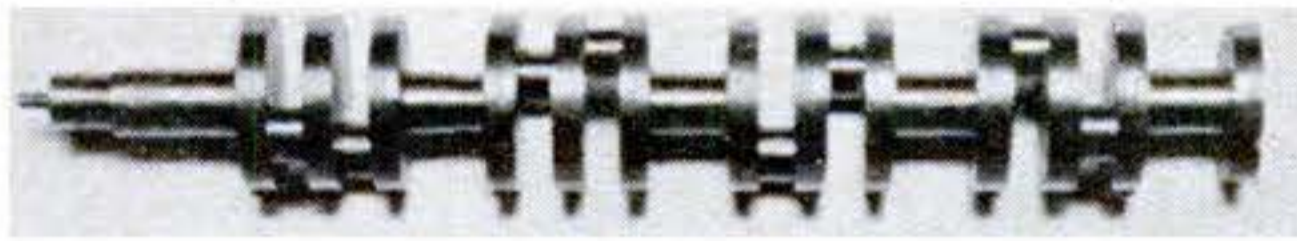
No Housing Shortage Here. A young Cocker spaniel poses in the doorway of a modern doghouse designed and built by Reginald Odegaard, of Burbank, Calif. Windows are heavy, shatterproof glass. The stonework consists of small flagstone chips laid individually in cement. Redwood siding makes up the remainder of the kennel.



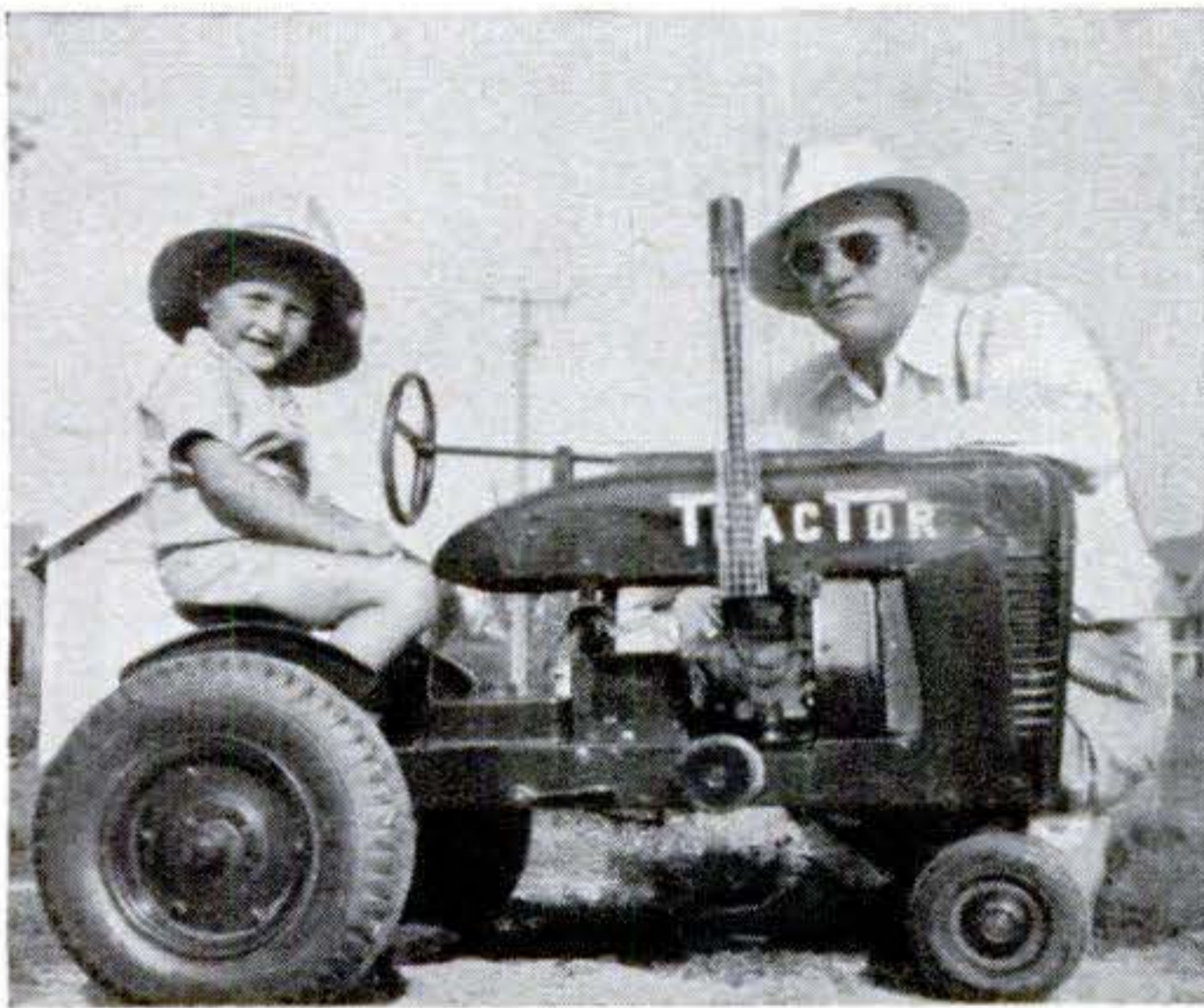
Builds Lathe to Build Motor. M. F. Shea, a retired telephone maintenance man of Drexel Hill, Pa., first built a watchmaker's lathe and then used it to turn all the screws for this three-pole motor. The thumbnail-sized midget whizzes on 3 volts. Commutator segments are German silver, brushes real silver.



Boat Built from PS Plans. This 17' cabin cruiser was built by C. A. Sherwood, a dental technician of Moncton, N. B., Canada. Spruce planking was used on the hull and marine plywood for the cabin roof. A 6-hp. inboard engine powers the craft. About seven months of spare-time work went into building the cruiser.



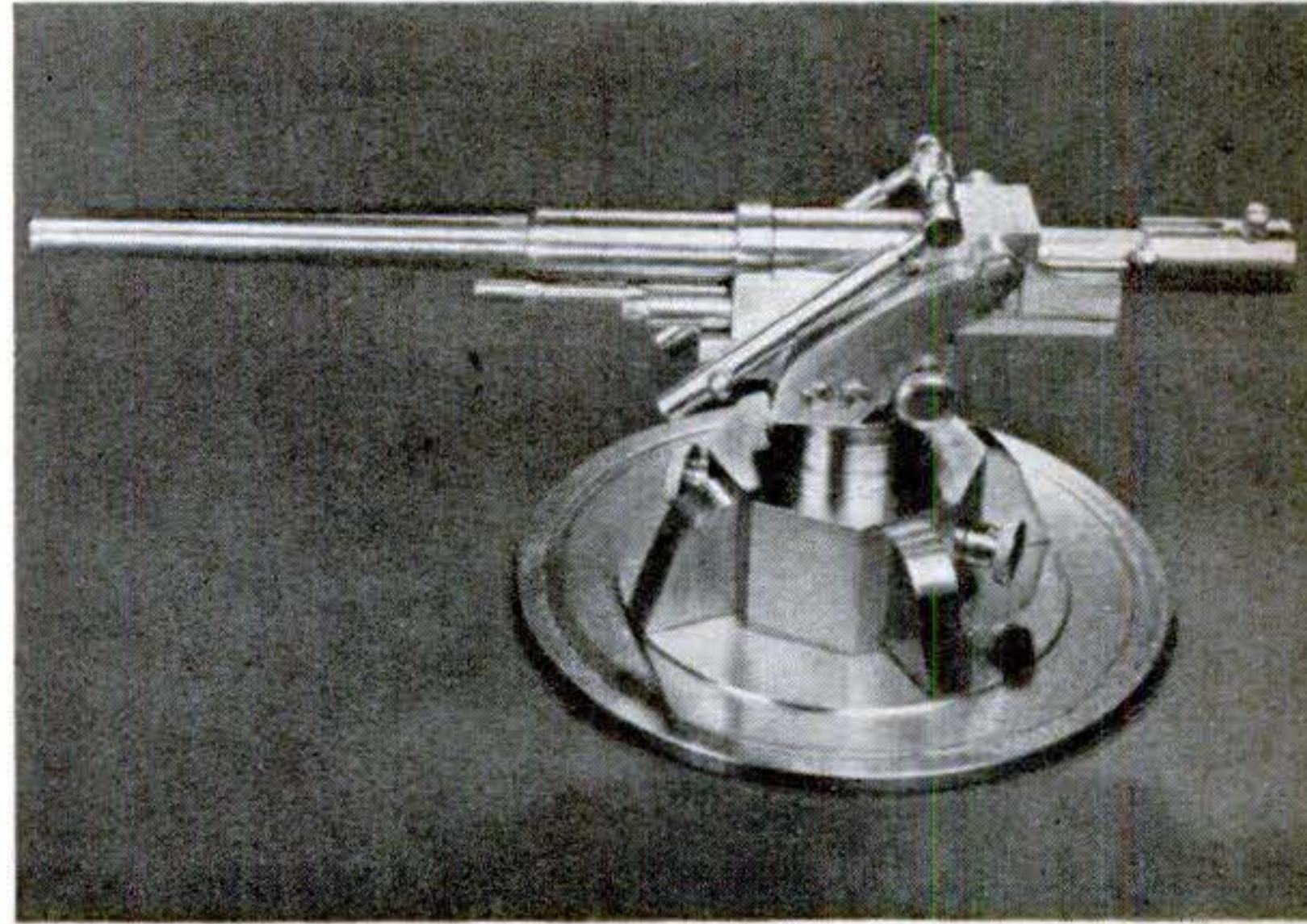
Crankshaft 3½" Long. From a piece of steel ½" in diameter, Henry Juerin, of Elberon, N. J., turned this tiny crankshaft. It has five main bearings and is designed for an eight-in-line engine that Juerin built. The ruler shows how small it is.



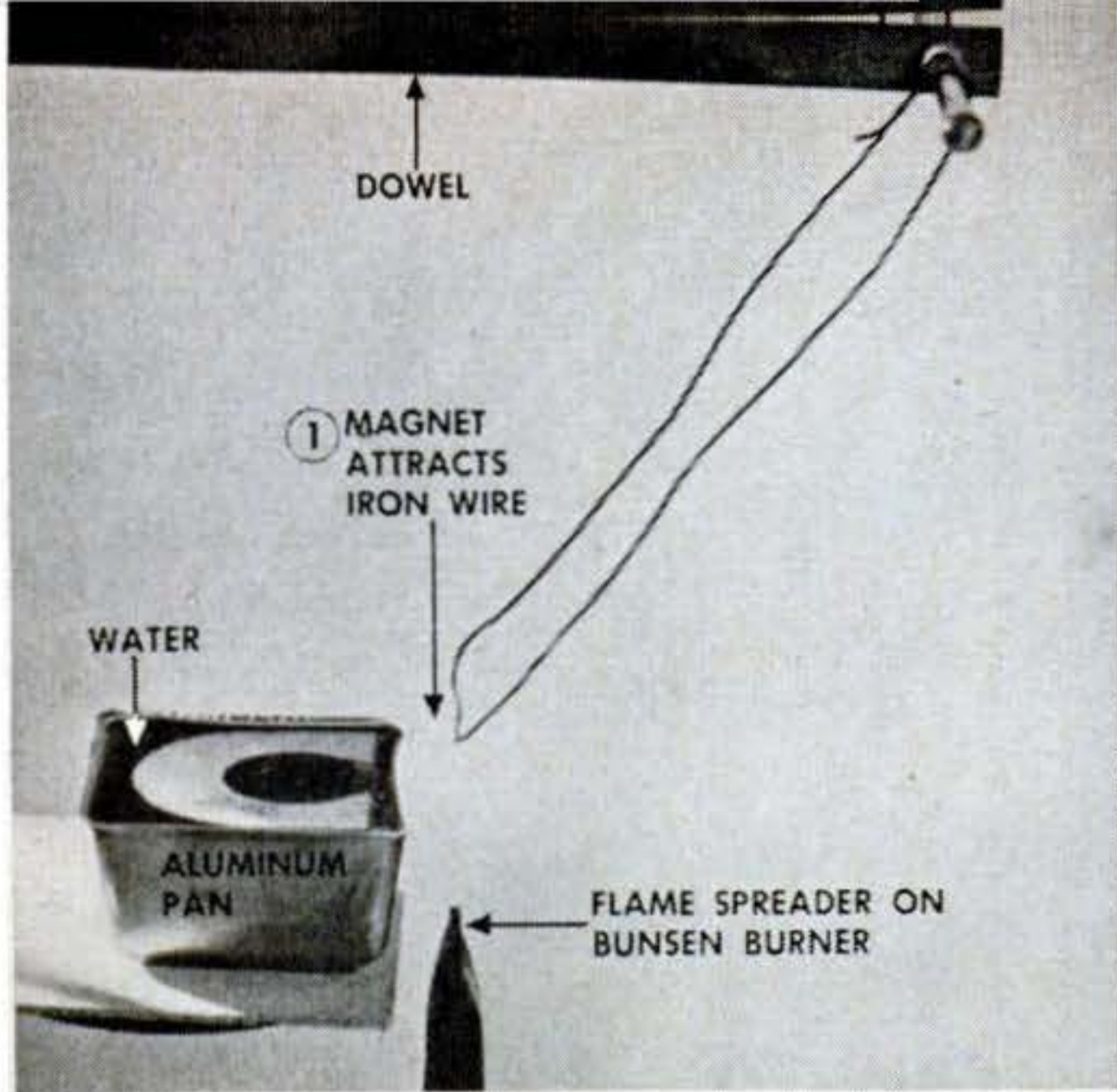
Tractor for Kids. A 2/3-hp. engine powers this miniature tractor that S. C. Matula, of Boyceville, Wis., built for his youngsters. Since the tractor doesn't have any farm work to do, it's used principally to tow the coaster wagons of neighbors' children. It'll pull four wagons loaded with 12 kids.



Engine Displaces .05 cu. in. Designed as power plants for free-flight model planes, these little Diesels turn up 11,000 r.p.m. with a propeller and 20,000 r.p.m. if the prop is replaced by a small flywheel. Elmer Larsen, of Seattle, Wash., a Boeing Airplane Company machinist, builds them in his spare time and sells them for \$10 each. They burn a mixture of methanol-alcohol and castor oil, the latter furnishing the lubrication. A teaspoonful of fuel runs the engine about a minute. With the exception of the glow plug, Larsen makes all the parts of the engines in his basement.



Model AA Gun Fires Blanks. No castings were used in this model 75-mm. anti-aircraft gun. James Marini, of Brooklyn, N. Y., used a lathe, shaper, and drill press to fashion the parts of steel. It fires .22-cal. blanks. The barrel measures 13" and can be elevated 80°. When fully elevated, the gun measures 14" high.



Iron loses magnetism if heated to 740° C., but regains it on cooling slightly. Simple magneto



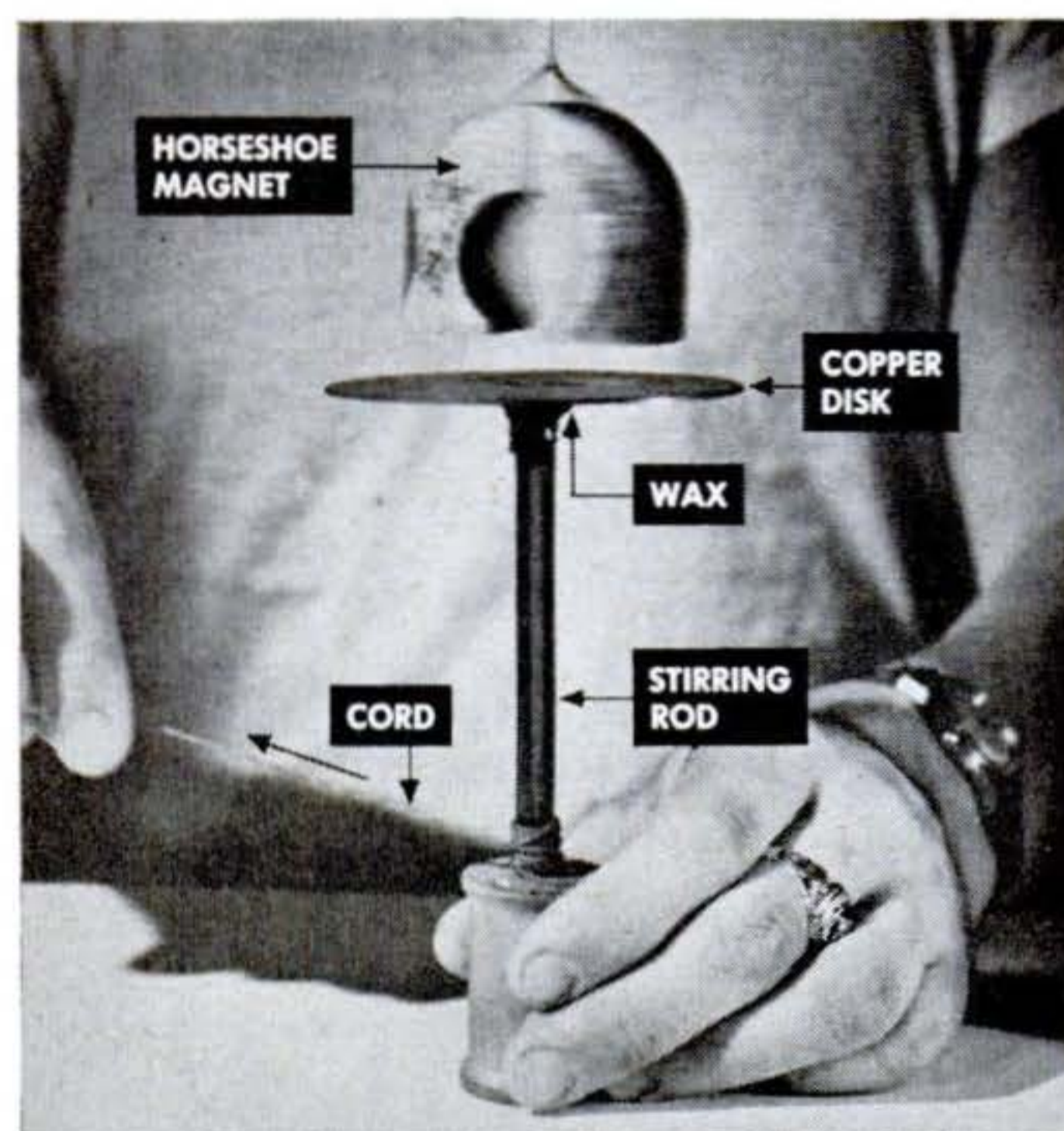
heat engine above makes use of this. The wire swings back and forth as it heats and cools.

Magnet Magic

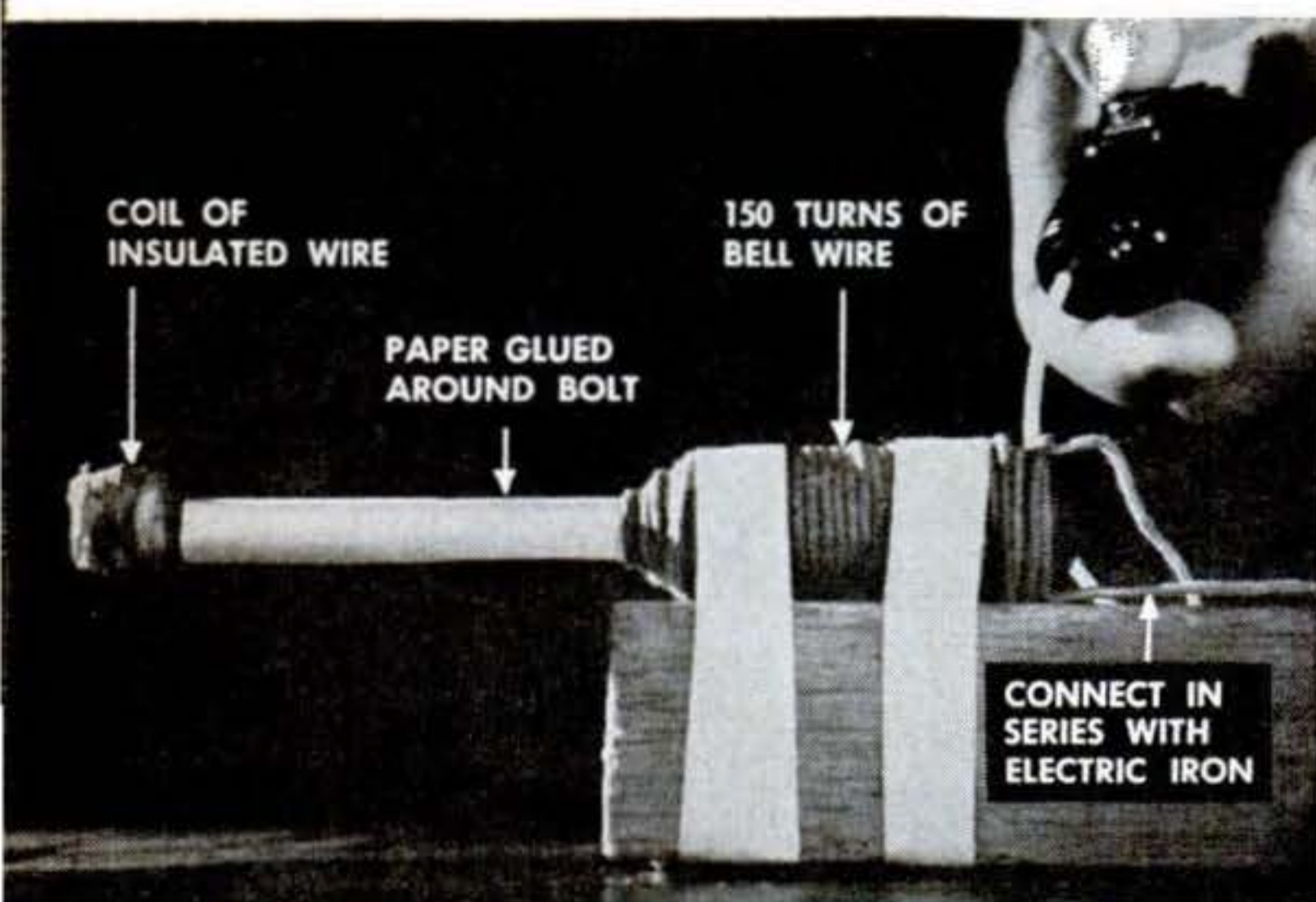
MAGNETIC materials sometimes act in unexpected ways. Extreme heat, for instance, robs iron of magnetic response, as you can see above. Submerge the magnet in water to prevent overheating.

Copper isn't usually considered magnetic, but glance to the right. Here, the spinning disk acts as a sort of electric generator. Eddy currents set up in it produce a corresponding magnetic field that drags the magnet around with the disk.

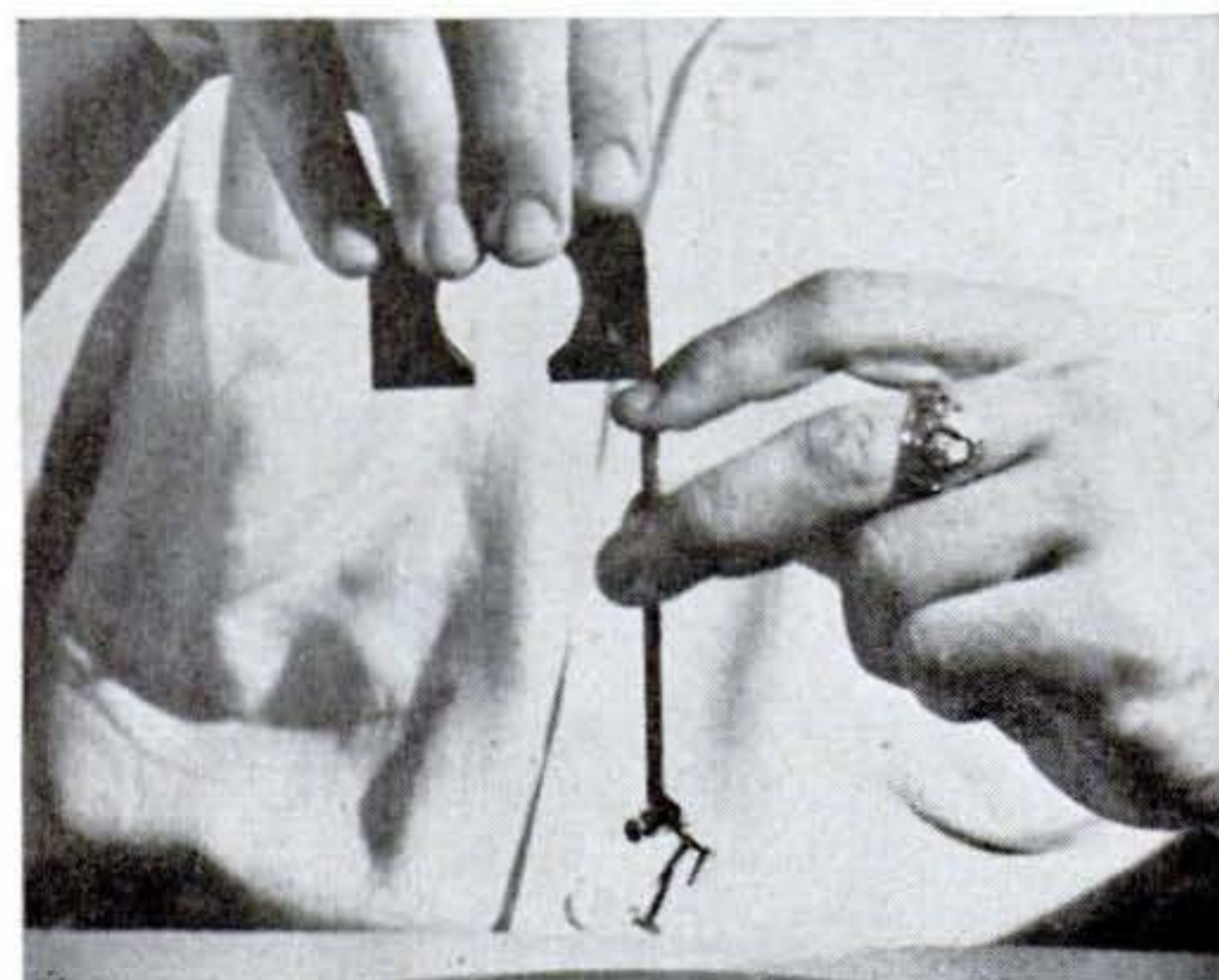
In setting up the "gun" below, anneal the bolt before winding. Join together the ends of the coil projectile. AC passing through the gun winding sets up a magnetic field in the bolt, and this in turn creates a field in the projectile. Since like poles face each other, the coil is thrown off the bolt.



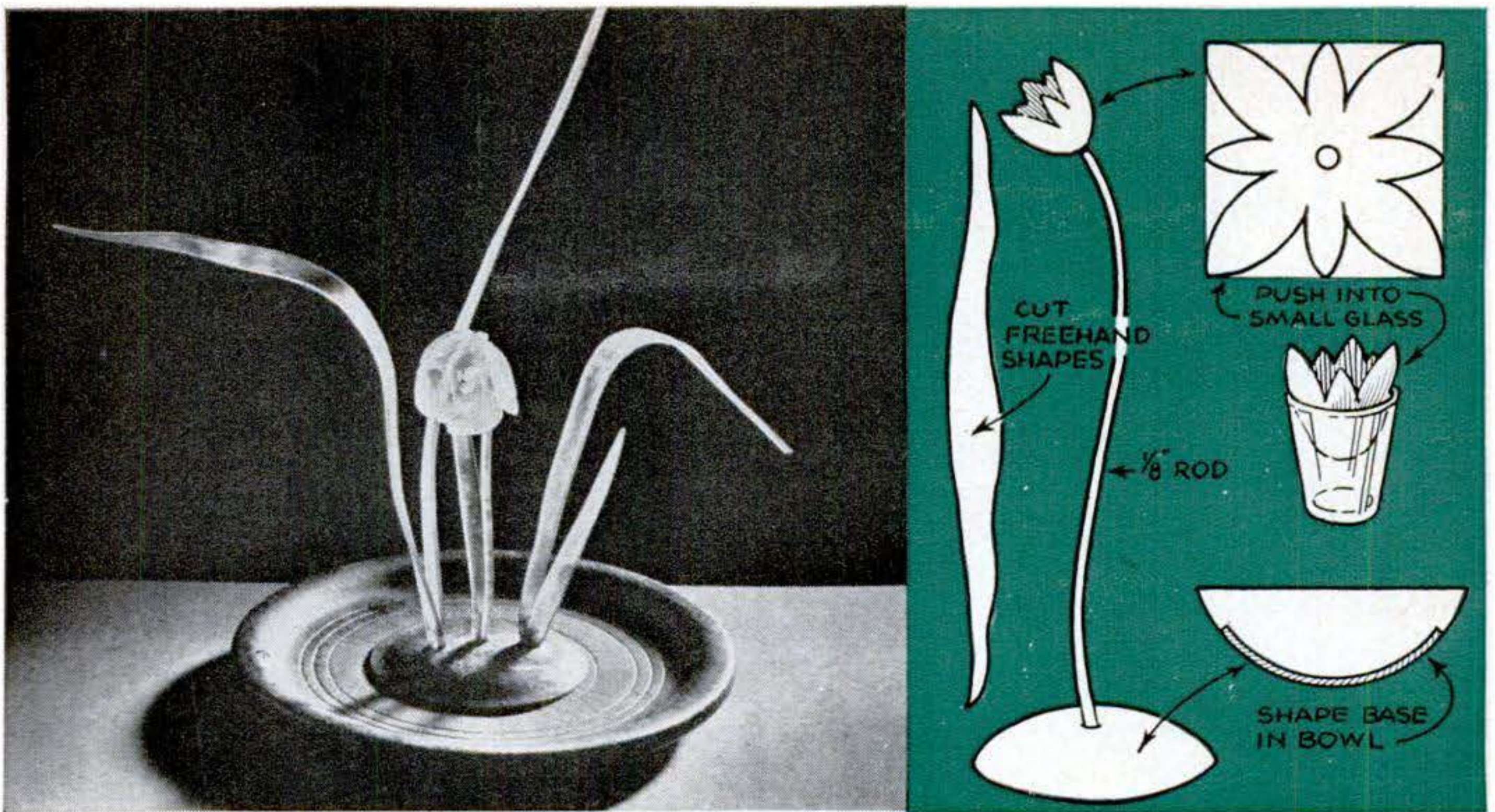
Electric currents set up in copper disk cause horseshoe magnet to turn same way as disk.



Magnetic gun "fires" coil projectile by repulsion. Coil consists of 75 turns of No. 24 insulated wire. It slips freely over bolt barrel. Switch on current and coil flies off as above.



Nail is magnetized temporarily even though it doesn't touch magnet. This is called magnetization by induction. Move the nail slowly away and tacks will fall off as it loses magnetism.



Plastic Flowers Won't Wilt

THE floral group pictured above was cut and bent from scraps of Lucite®. The stem is a section of 1/8" rod and the leaves are random cuts of 1/16" stock. Follow the

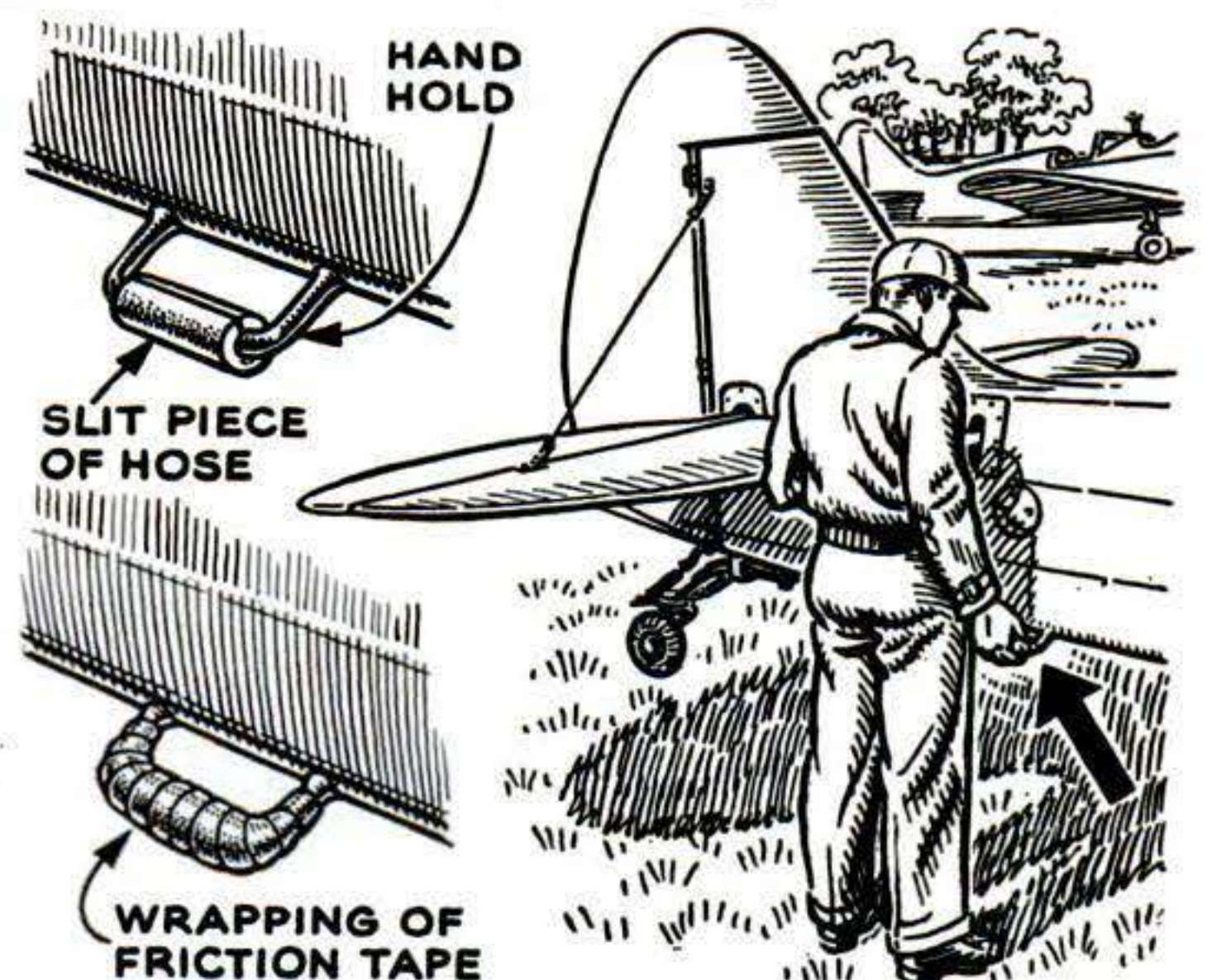
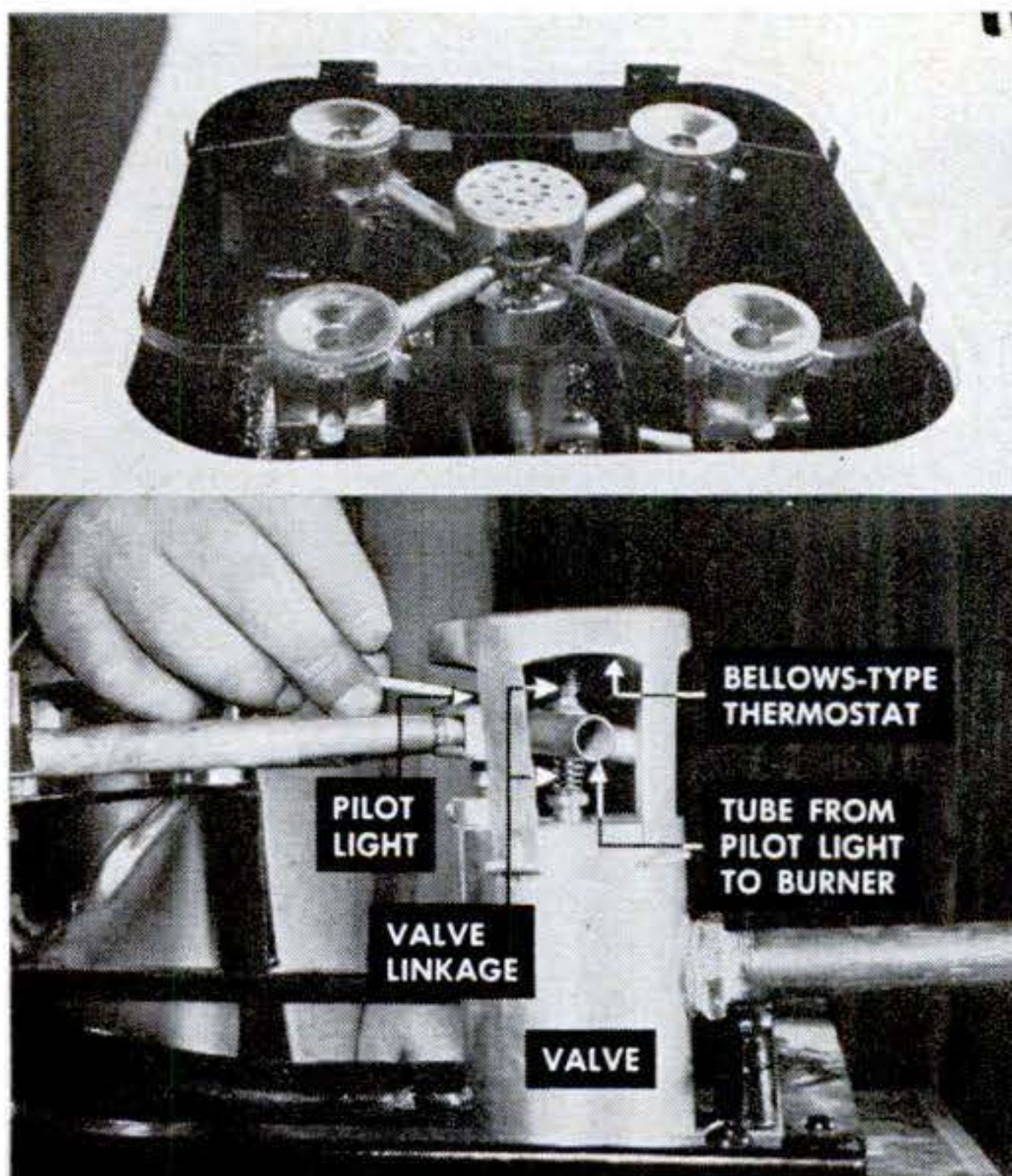
pattern for the flower, cutting it from the same stock as the leaves. Then heat it, lay it over the top of a small glass, and push the center down. The base is a disk, heated and formed in a shallow bowl. Cement all parts together.—P. E. Hart, Manhattan, N. Y.

Gas Shut Off Automatically

ALL gas used in this stove, including that for the oven and pilot light, passes through a central valve. This valve is controlled by a bellows-type thermostat just below the pilot light. As long as the pilot light burns, the master valve remains open. If the pilot is accidentally blown out, or if gas pressure temporarily fails, the thermostat shuts off gas to all burners. A match is held under the thermostat to relight the pilot. The inventors are Lewis R. Kinsey and Henry F. Klein, both of New York City.

Rubber Cushions Plane Lift

THEY'RE called light planes but they can get to be heavy when you have to lift the tail around. This is especially noticeable if you have to move the ship any distance, since the metal lift will cut into your hand. I padded the one on my plane with garden hose. After slitting a short piece of hose, I coated the inside of it with gasket shellac. A good glue would do just as well. Then I slipped it on the lift and finished the job with a couple of wrappings of friction tape. —Stewart Rouse, Knightstown, Ind.



Concrete Mixer Cooks a Meal Too

FROM mixing concrete to cooking a meal isn't so far fetched when you consider what else this versatile machine does. It'll also sift fertilizers, soils, or aggregates, and spray paint or insecticide.

The 90-lb. Whirl Barrow® is a multipurpose unit designed for yard and farm work. Slip a screening attachment into the barrel and it becomes a sifter. Another attachment is a ¼-hp. motor and a pump, enabling you to spray paint or to cover trees and shrubs with chemical solutions. Then there's the cooking. A grated pan for coals and a spit can be fitted in place. A screen rack may be laid over the coals to keep food warm and meats can be roasted on the spit.

By pressing the U-shaped stirrup with your foot, the bowl can be tilted to any of five positions. When pressure on the stir-



Rotating offset handle turns bowl on a ball-bearing shaft that extends from the base. No other support is required.

rup is released, a spring-loaded pin locks the barrel in position. For stability in rolling the barrow and for accuracy in pouring, the barrel is locked to prevent rotation by pressing a lever in the base. Twenty-five gallons of liquid or 1½ cu. ft. of concrete may be mixed. The mixer is made by Magna Engineering Corp., San Francisco.



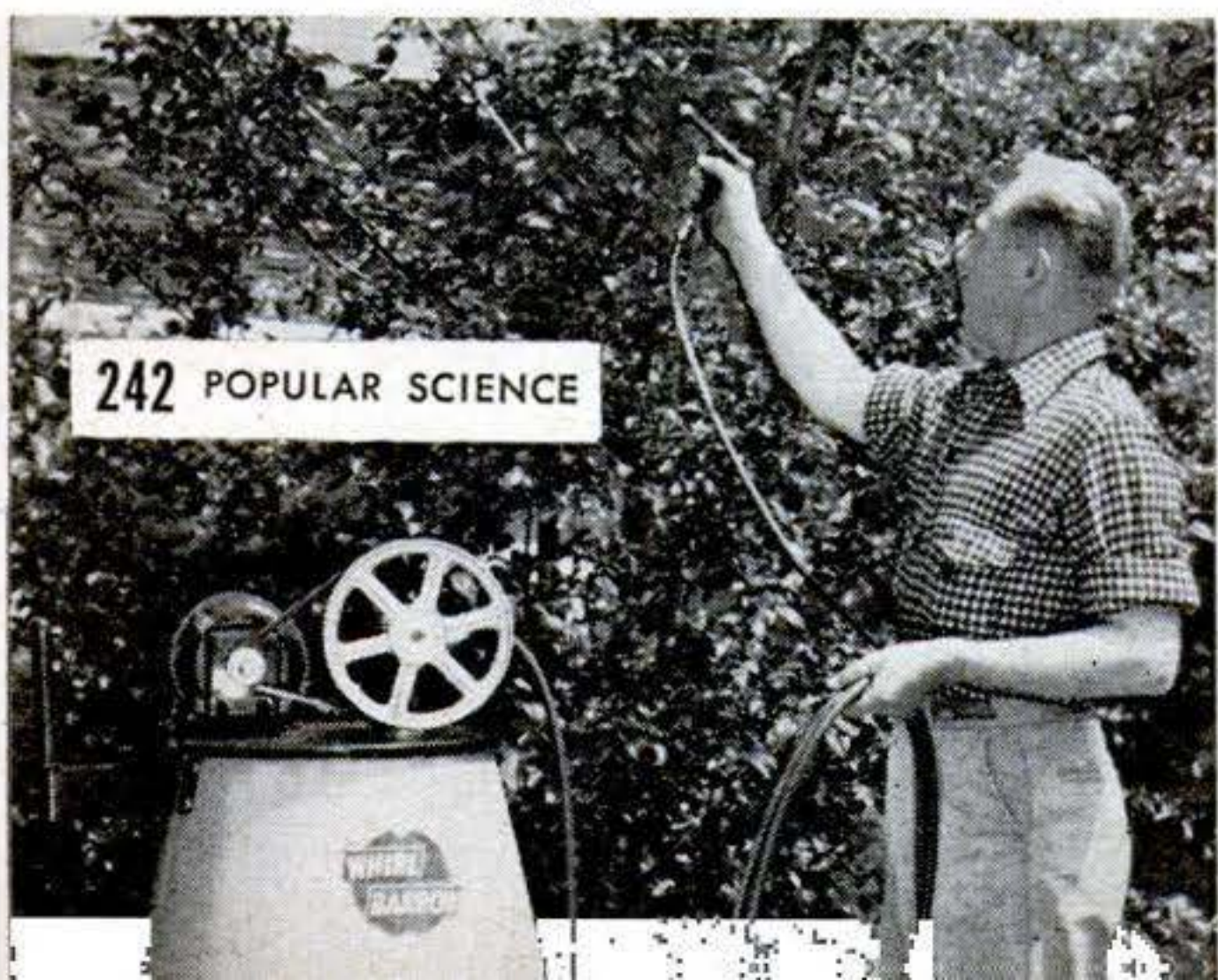
Frame is lightweight welded tubing. Large tire permits easy rolling over soft or rough ground. Bowl holds 1½ cu. ft. of concrete.

Now it's a sprayer. A ¼-hp. motor drives pump that raises insecticide or paint from the tank. Metal cover fits snugly over rim of bowl.

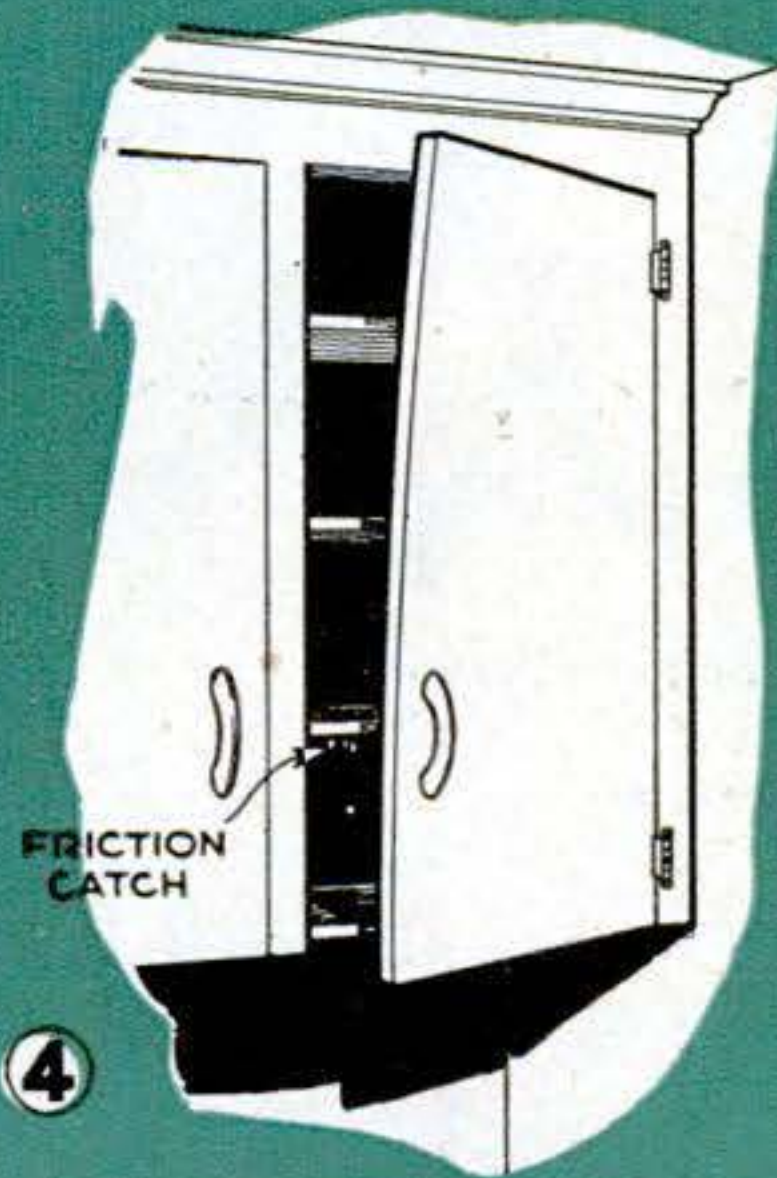
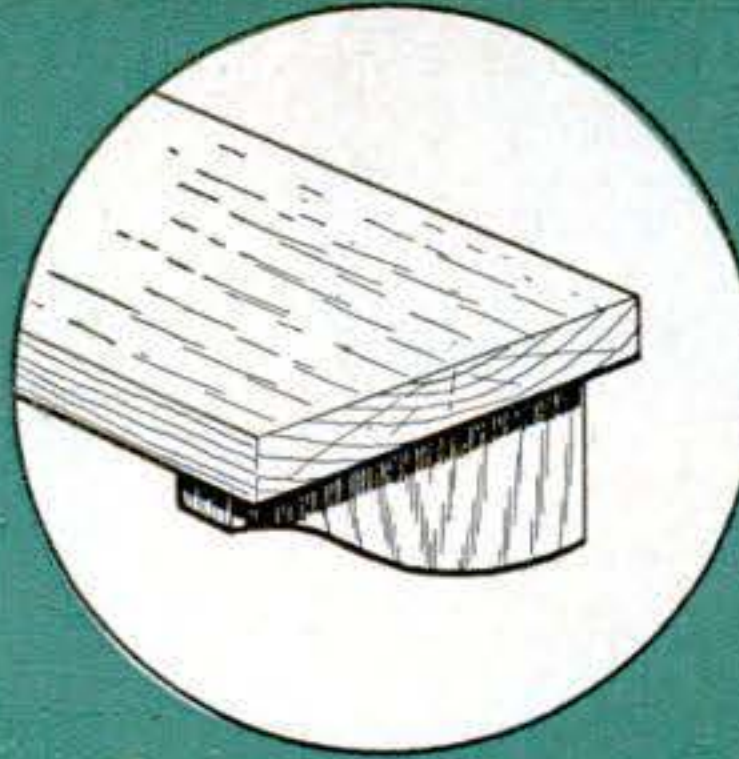
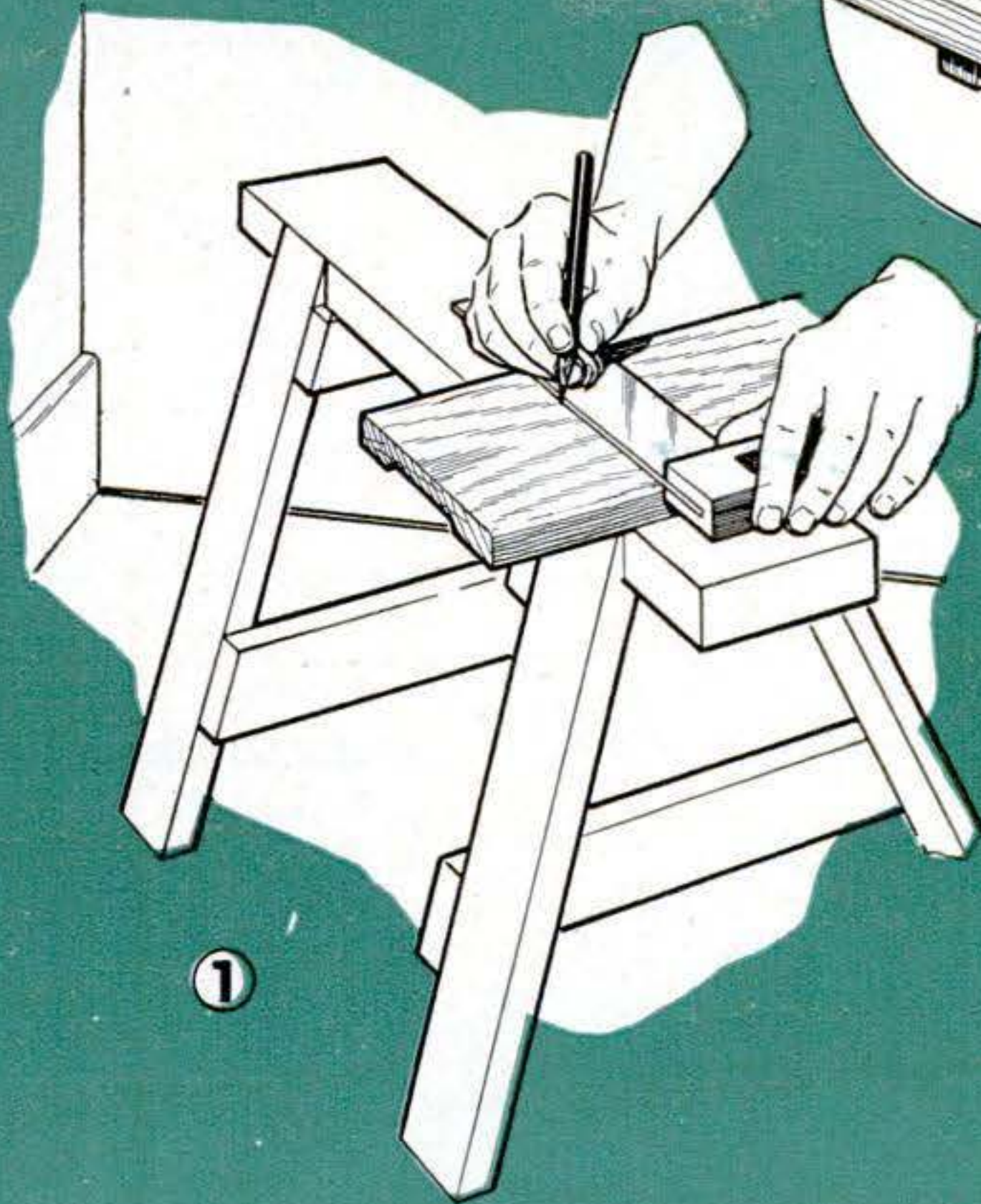


Whirl Barrow® also sifts soil, fertilizer, and other materials. Circular screen first is inserted in mixing bowl and handle turned.

When day's work is done, mixer quickly becomes a charcoal broiler. Spit also may be slipped into place and used to roast meats.



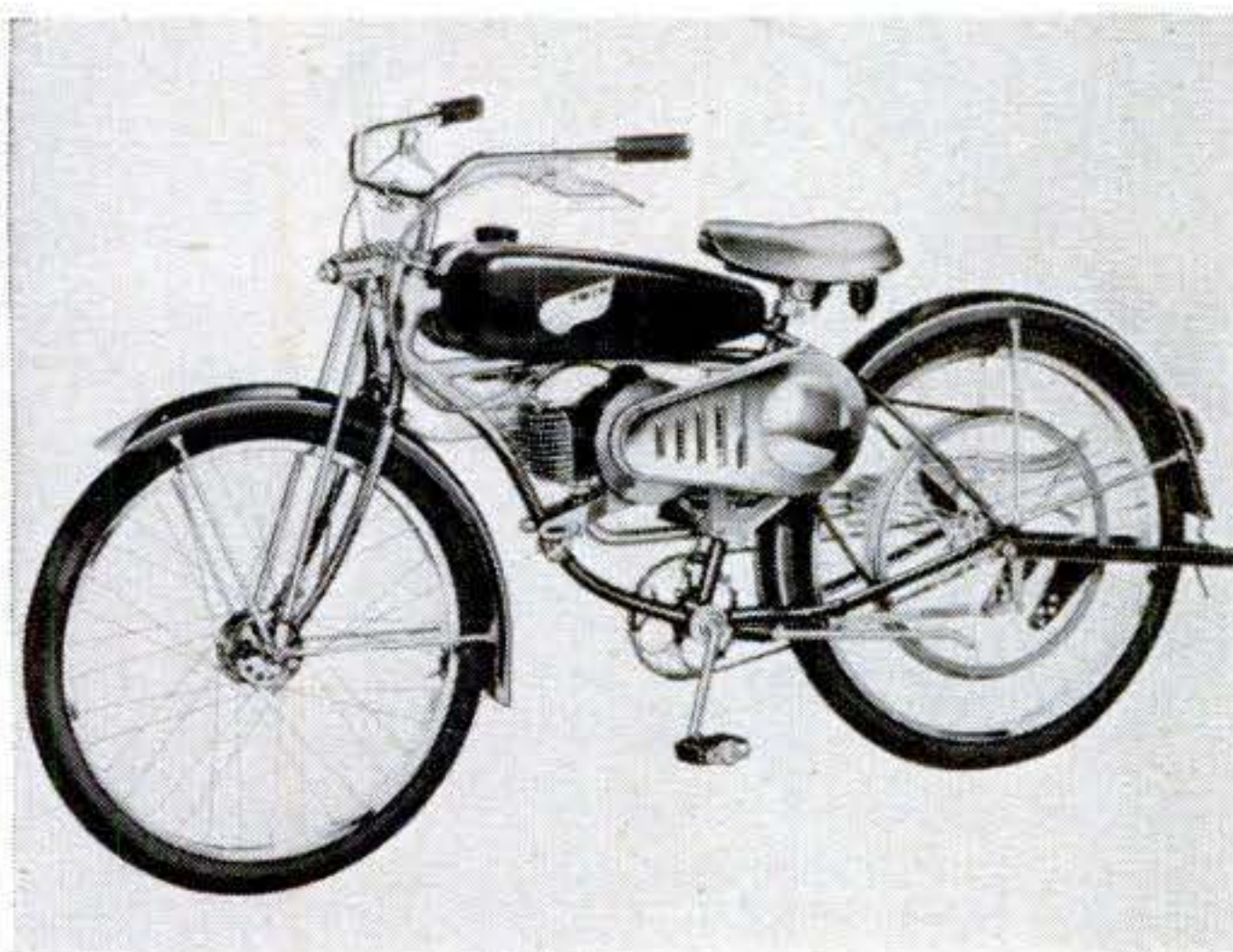
WHAT'S WRONG ?



Would you square a baseboard as in Fig. 1 to fit it in a corner against one already in place, build a shelf as in Fig. 2, and use a marking gauge as in Fig. 3 to locate the casing on a door jamb? And what about the door in Fig. 4? Would you mount it as shown? How would you overcome the warping? Check yourself against the answers at right.

Answers
 1. The board should be scribed against the one already in place or it may not fit.
 2. The grain of the bracket should run horizontally. As shown, tip may split off.
 3. After the casing is in place, the groove made by the gauge will give the appearance of an open joint. Use a pencil.
 4. By standard practice, the bottom hinge should be set at a greater distance from the bottom of the door than the upper is from top. To pull in door, place catch higher.

Twin-Cylinder, 2-Cycle Engine Drives Bike

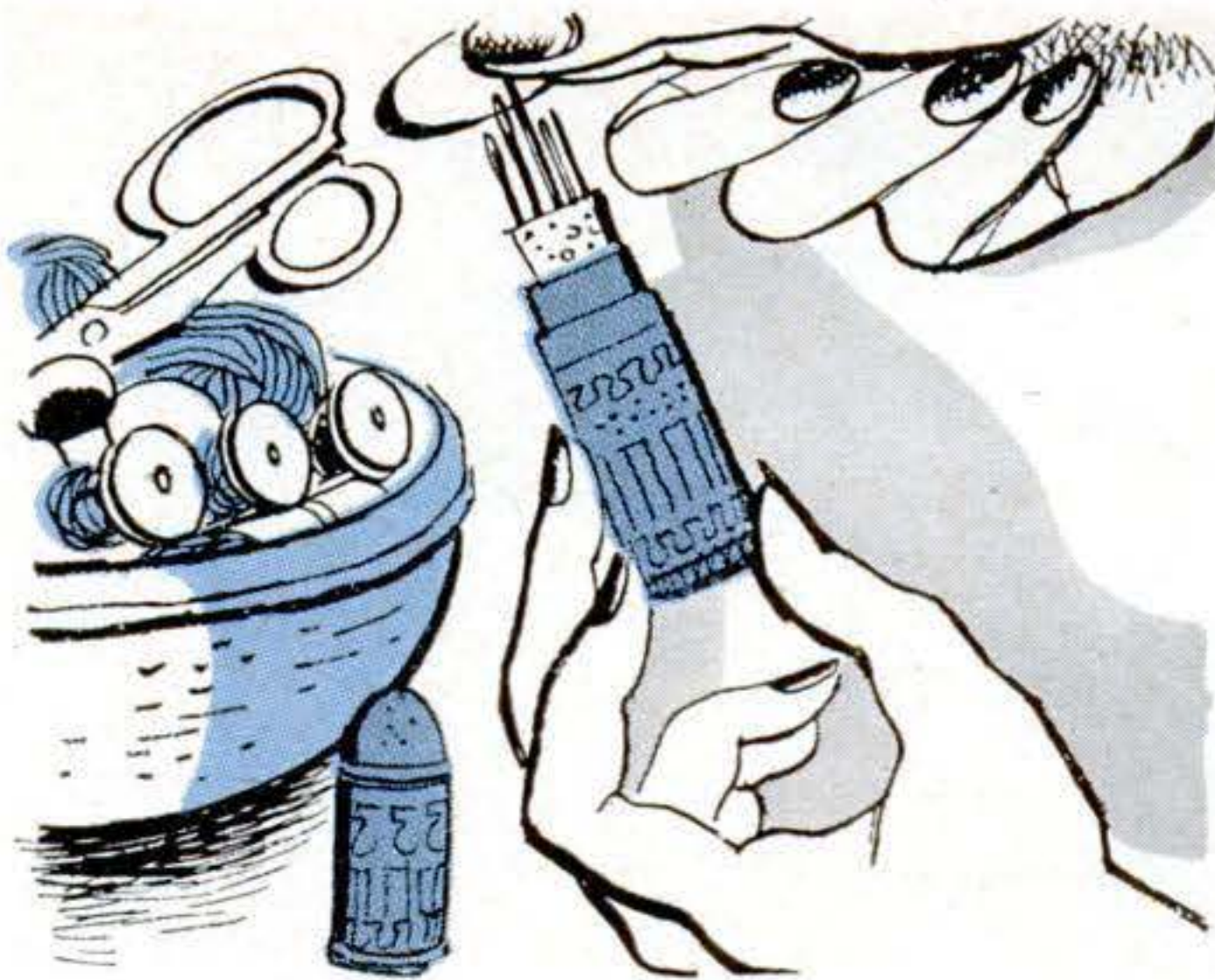


PLENTY of power on hills plus economical operation are two of the features claimed for this twin-cylinder bike engine by the makers, Jack & Heintz Precision Industries, Inc., of Cleveland, Ohio. The unit includes an auto-type, multiple dry-disk clutch, twist-grip controls, and a large combination fuel tank and utility compartment. Deep finning permits the engine to idle safely without overheating. Center-flow carburetion assures a steady flow of fuel even when the engine is tilted. A compression release contributes to starting ease and rapid deceleration. The unit comes complete, ready for installation.

Keeping the Home Shipshape



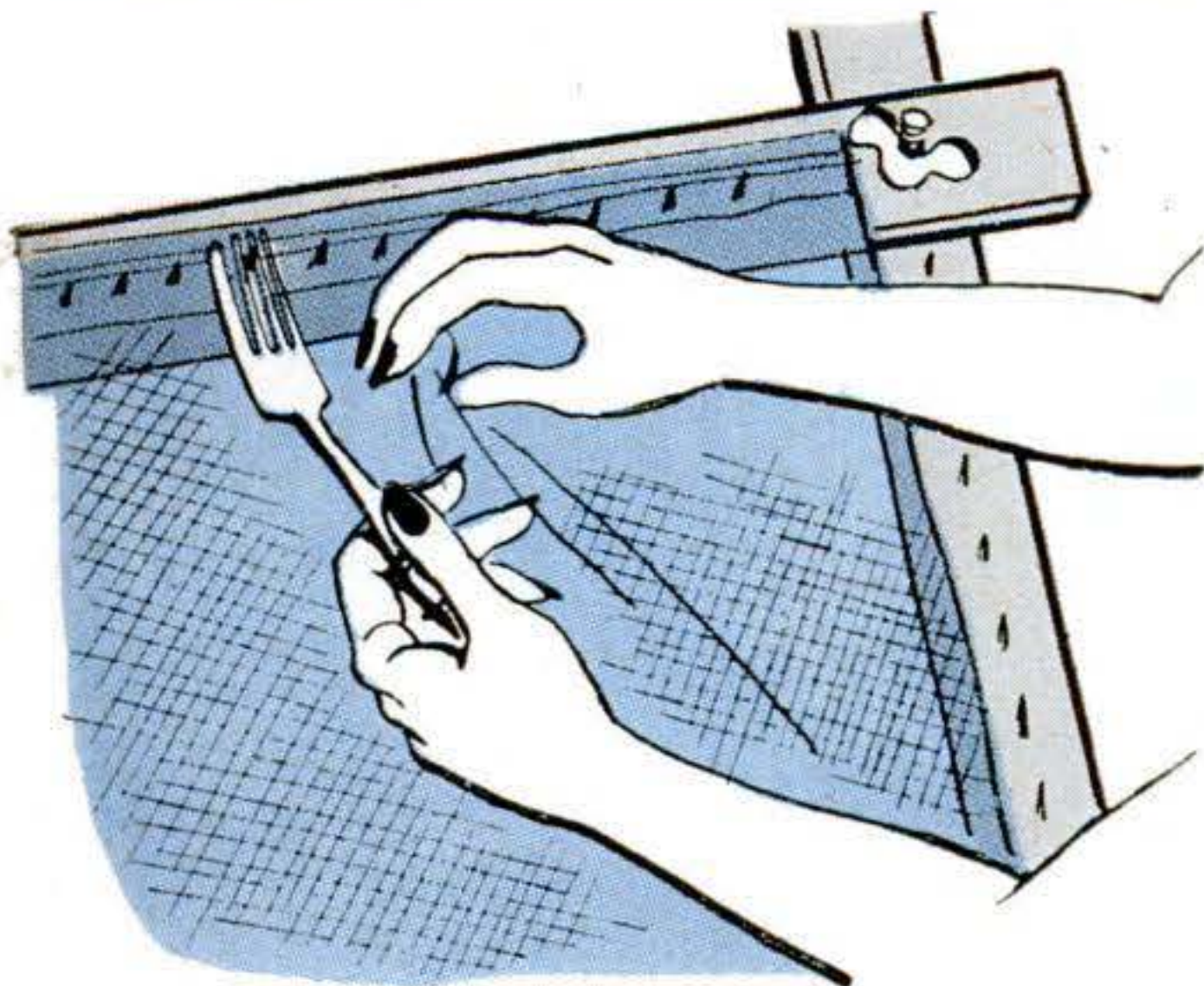
Store bath toys in net bags, the kind citrus fruits come in. The bags can be hung up out of the way and the toys will dry quicker because air can circulate around them.



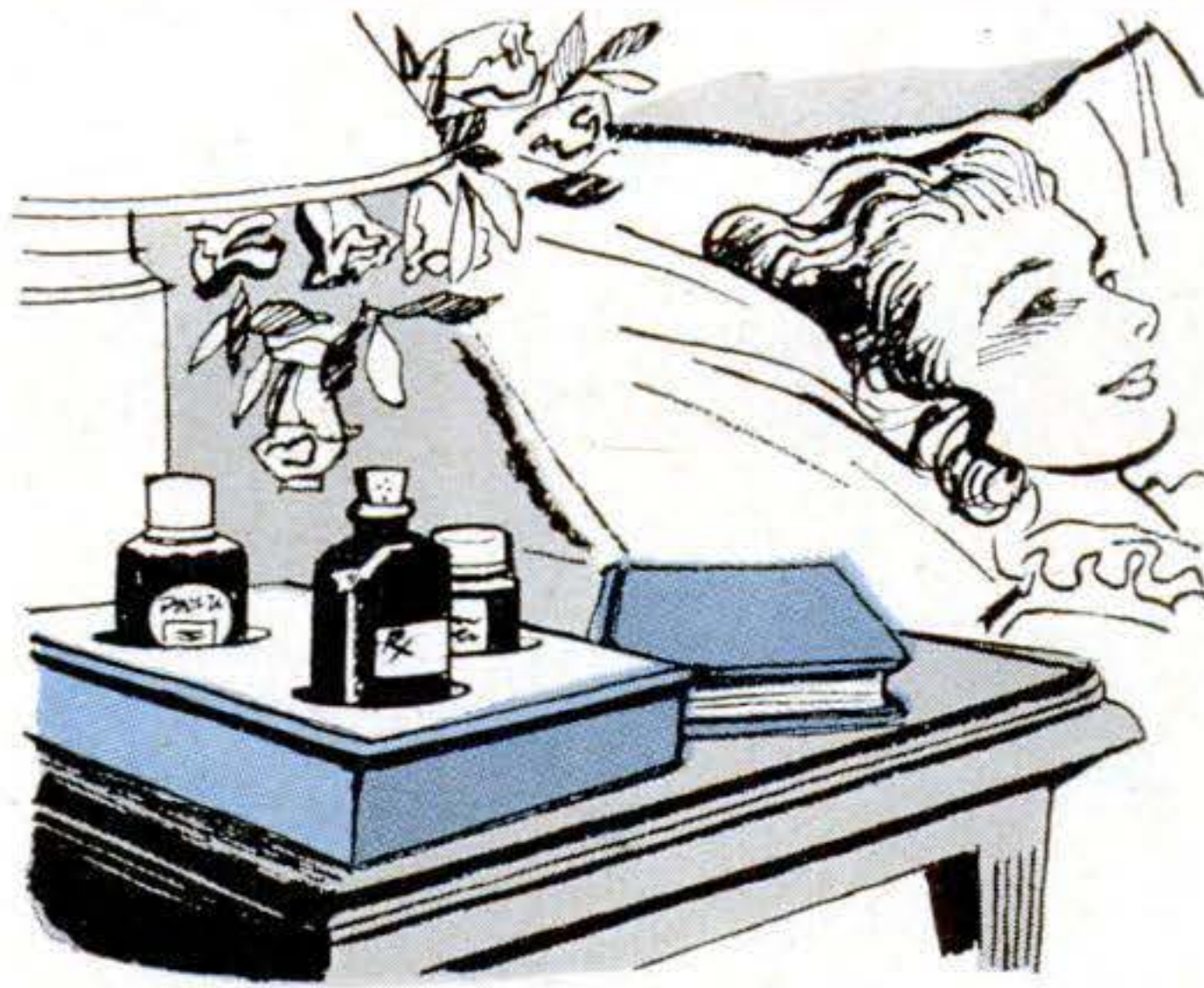
Needles may be stored in a lipstick case. Stick the needles in a cork that has been pressed into the case. Turning the bottom lowers the needles so the cap may be put on.



Valuable papers that must be held temporarily in the home while awaiting transfer to a safe-deposit box may be stored in the refrigerator. It affords some fire protection.



When mounting curtains on a stretcher, you won't risk pricking your fingers if you use a fork to press each section of curtain into place on the pins of the frame.



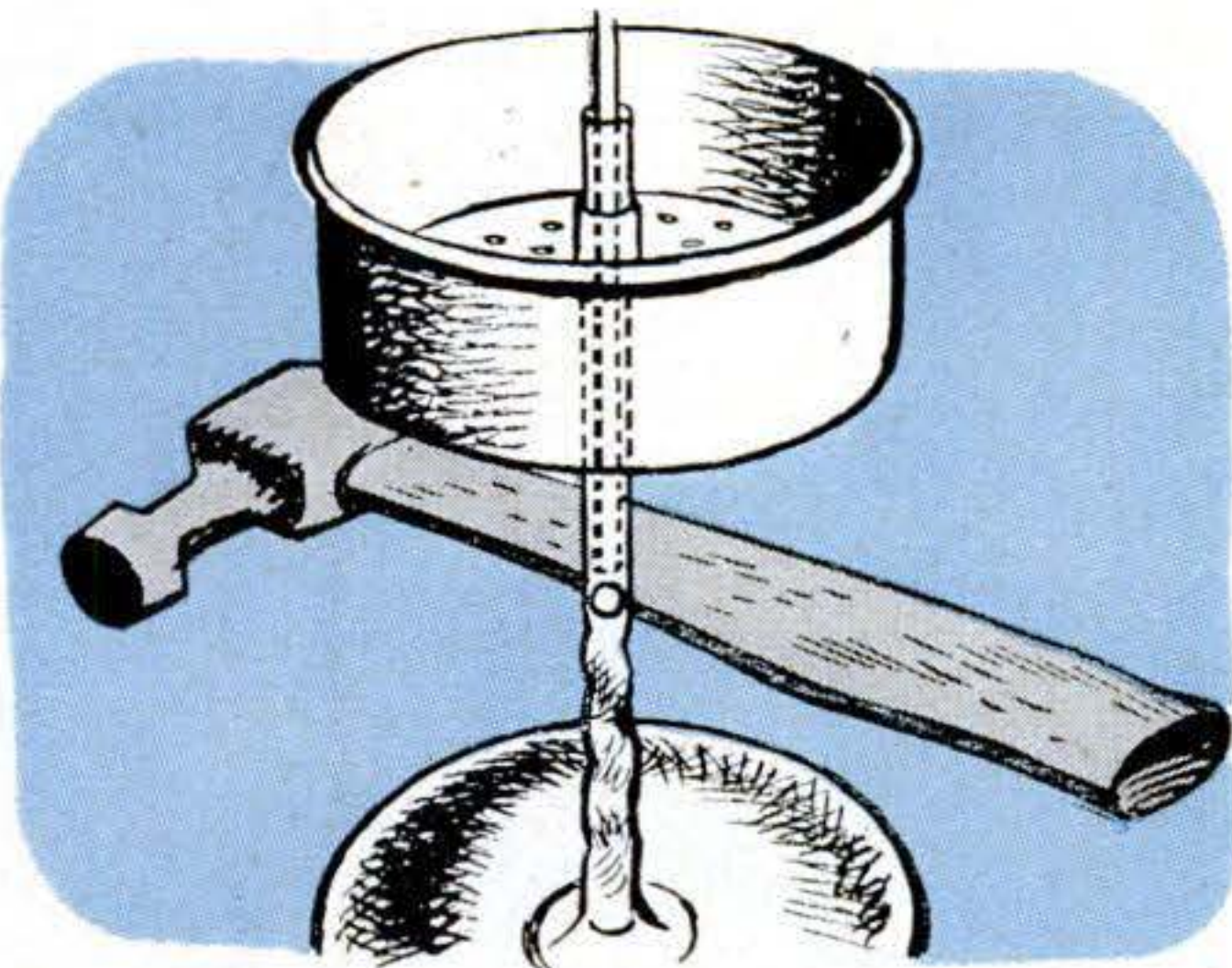
For a sickroom table, cut holes in the top of a small cardboard box and sit bottles of medicine in them. It'll prevent bottles from being upset and will keep the table neater.



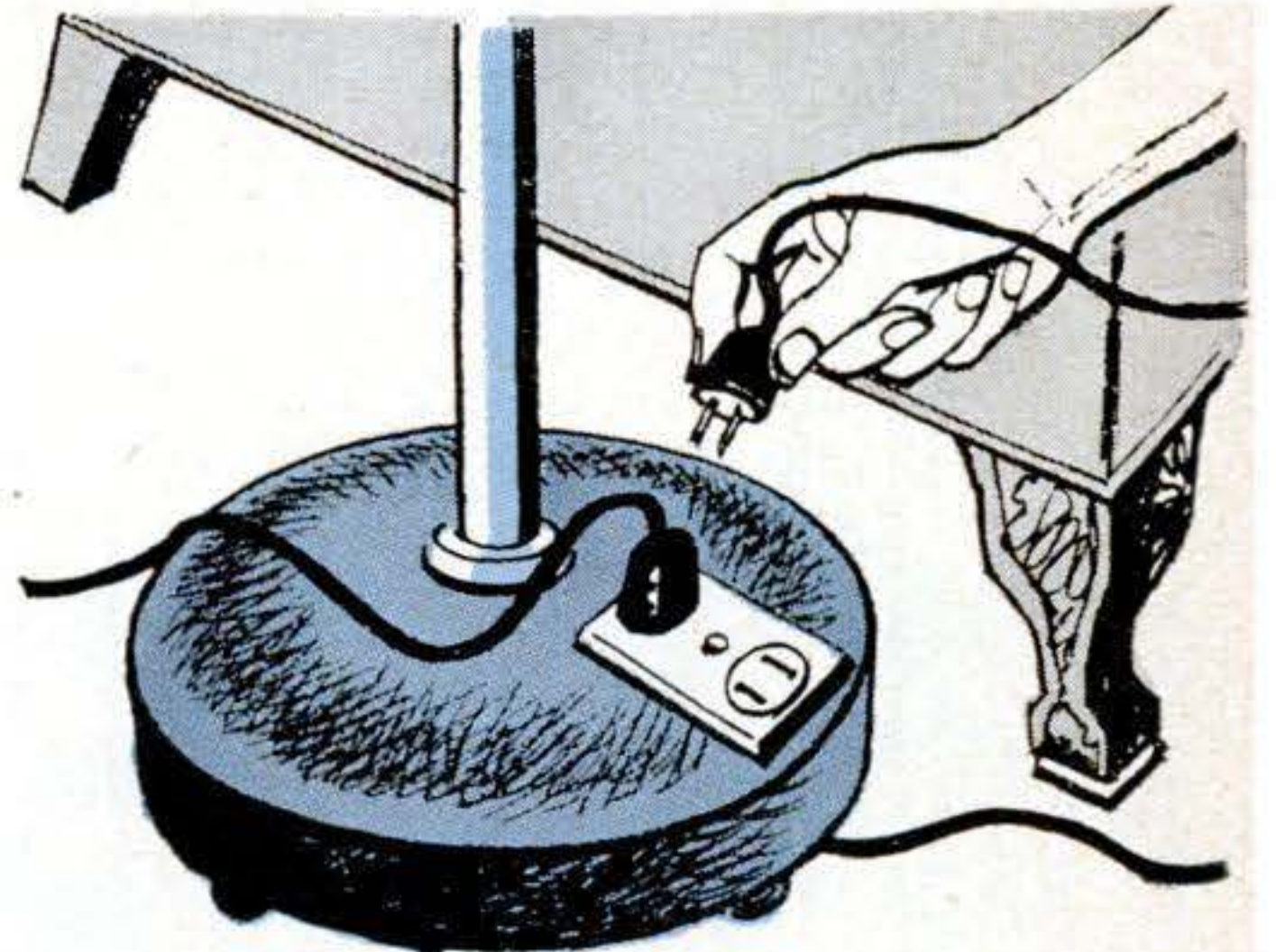
Wrapped individually in aluminum foil and cooked in a bed of coals, wieners retain their juice and remain perfectly clean. Skins are not pierced as on a stick or fork.



To keep dust out of closets, tack felt weatherstripping to the sill or inside the bottom of the door. If tacked to the door, be sure the stripping touches the floor.



Bent or kinked percolator tubes can be straightened by inserting a tight-fitting bearing ball and forcing it through with a dowel. Tap the end of the dowel lightly.

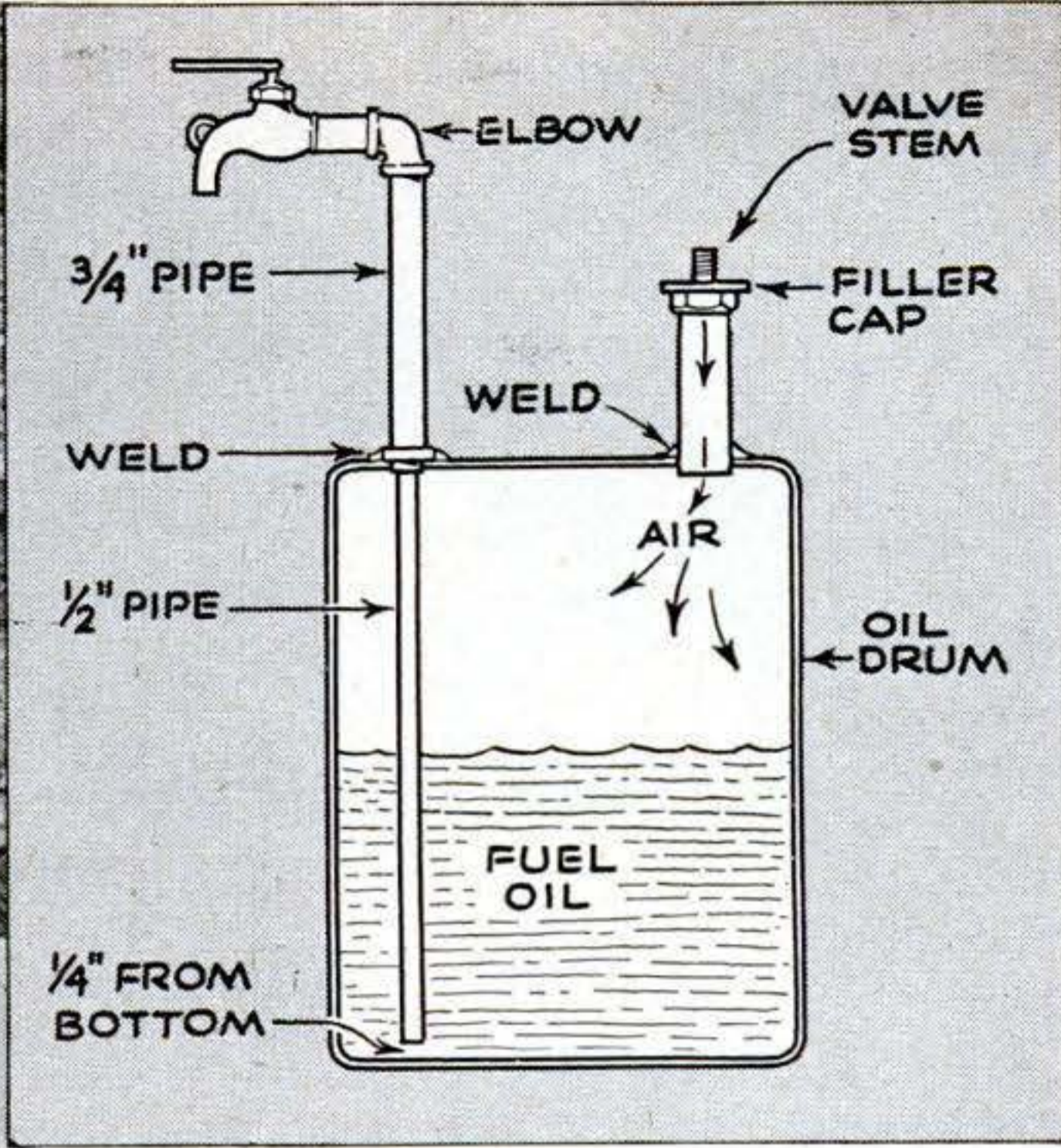


You can add to the usefulness of table and floor lamps by mounting an outlet on them so other appliances may be connected. The outlet may be set in if the base is of wood.



When moving, pack small amounts of staples in a separate box. In your new location, you'll

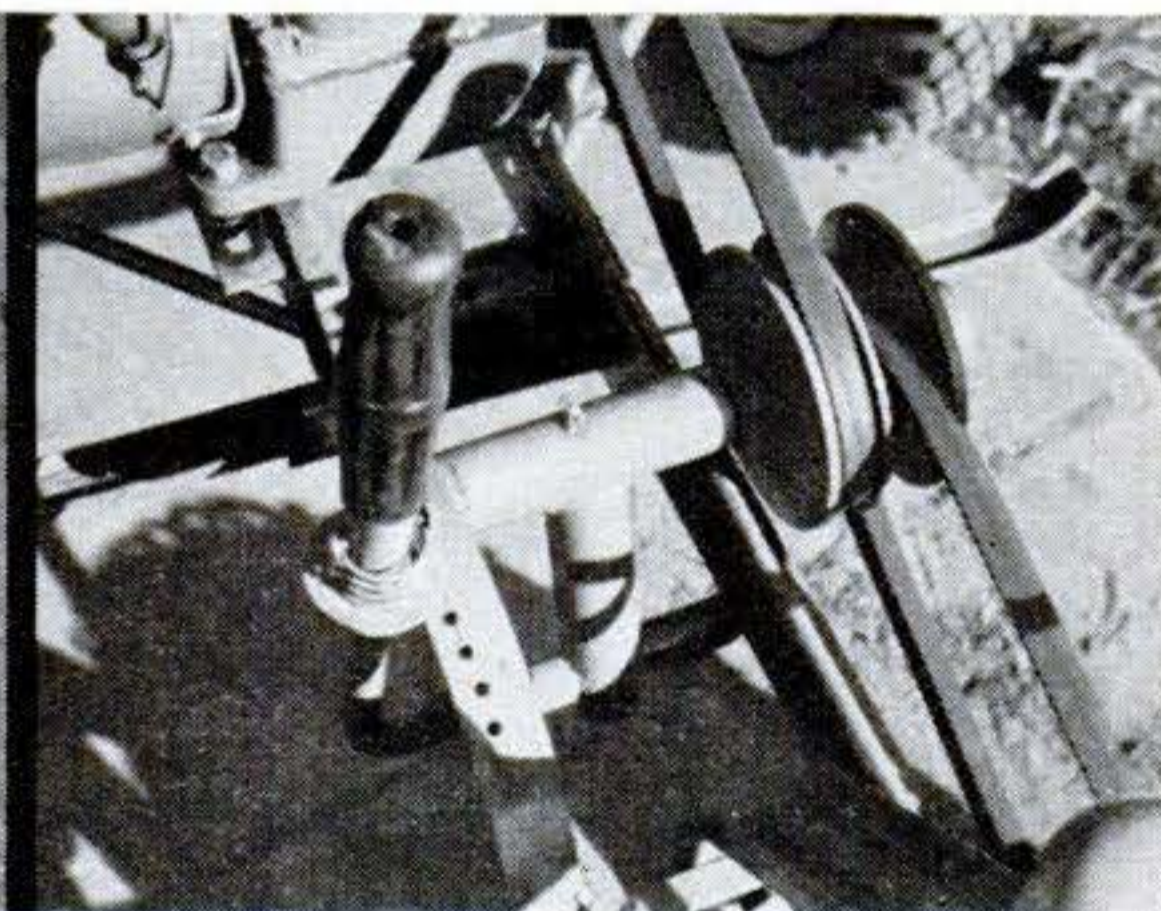
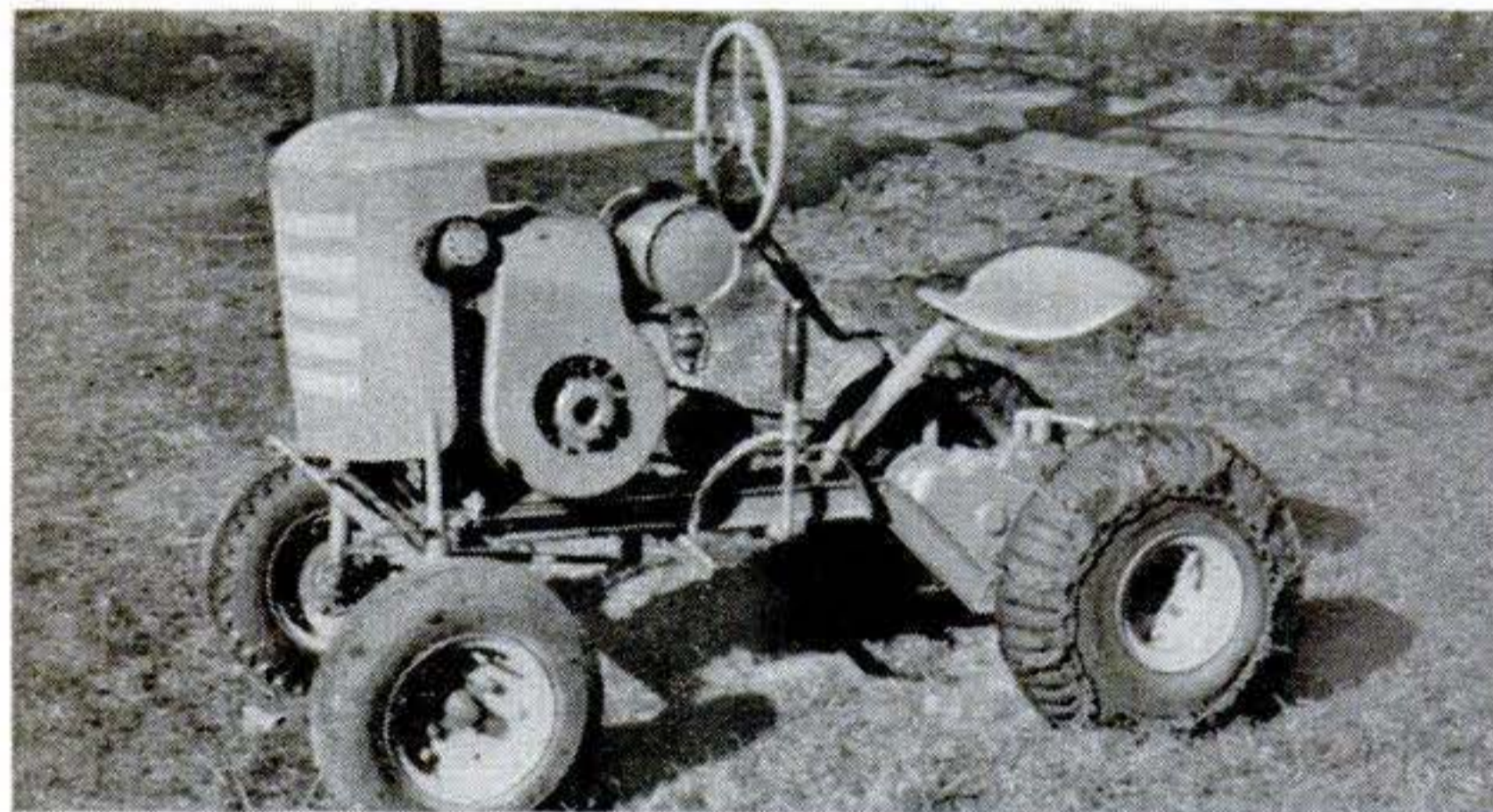
have supplies for the first few meals in the small box without unpacking large containers.



Air Lifts Fuel from Tank

AN UNDERGROUND storage tank, operated by air, can be made from a seamless, galvanized oil drum. Use one of 50- to 200-gal. capacity, with both openings at one end. Replace the filler cap with a pipe 6" longer

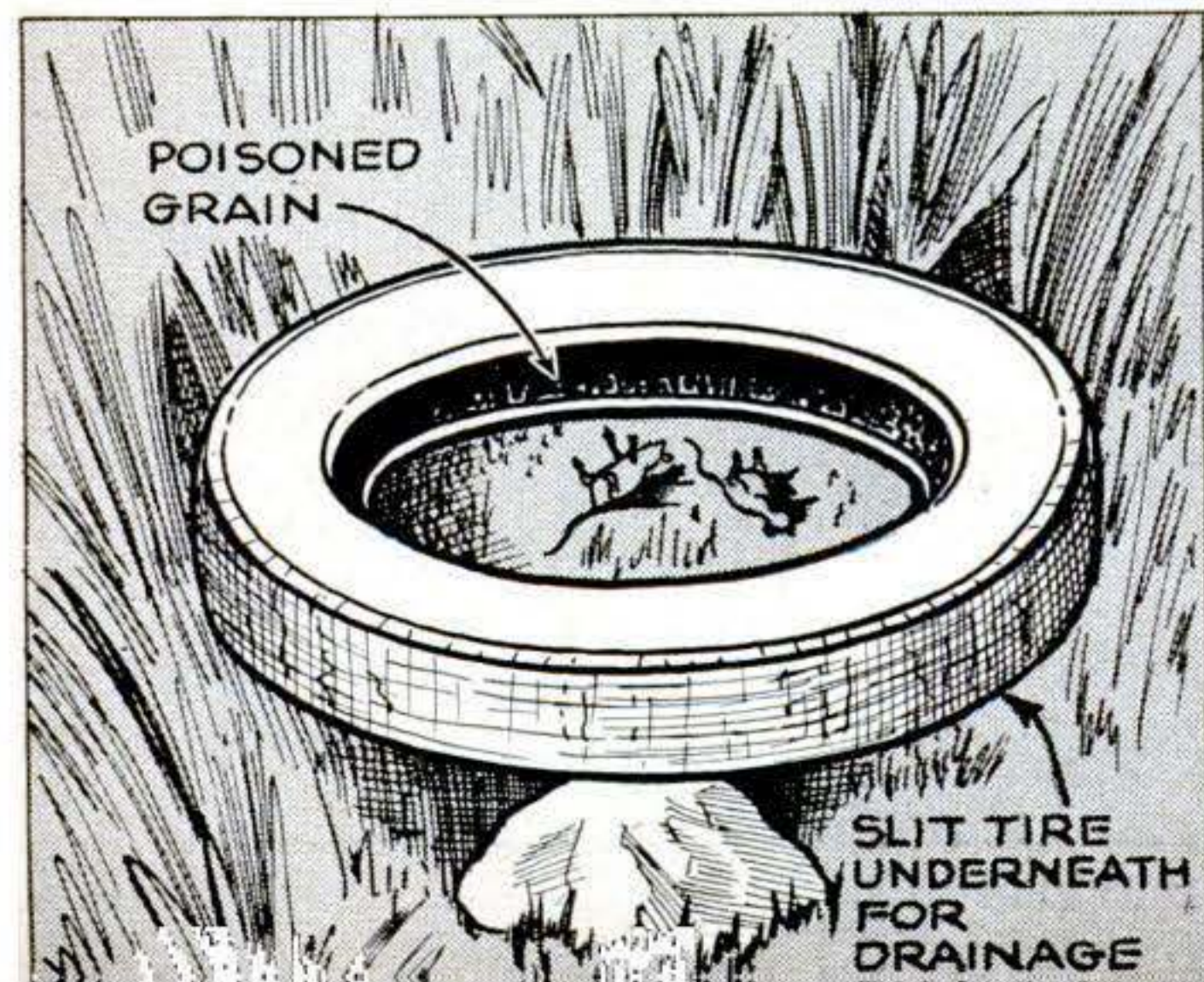
than the depth the drum will be buried. Other connections are shown in the sketch. Solder a tire valve stem into the filler cap, but remove the valve core. A few strokes of a tire pump forces liquid out of the tank. To prevent rust, coat the tank with asphaltum paint.—Clinton R. Hull, Costa Mesa, Calif.



Scooter Parts Make Tractor

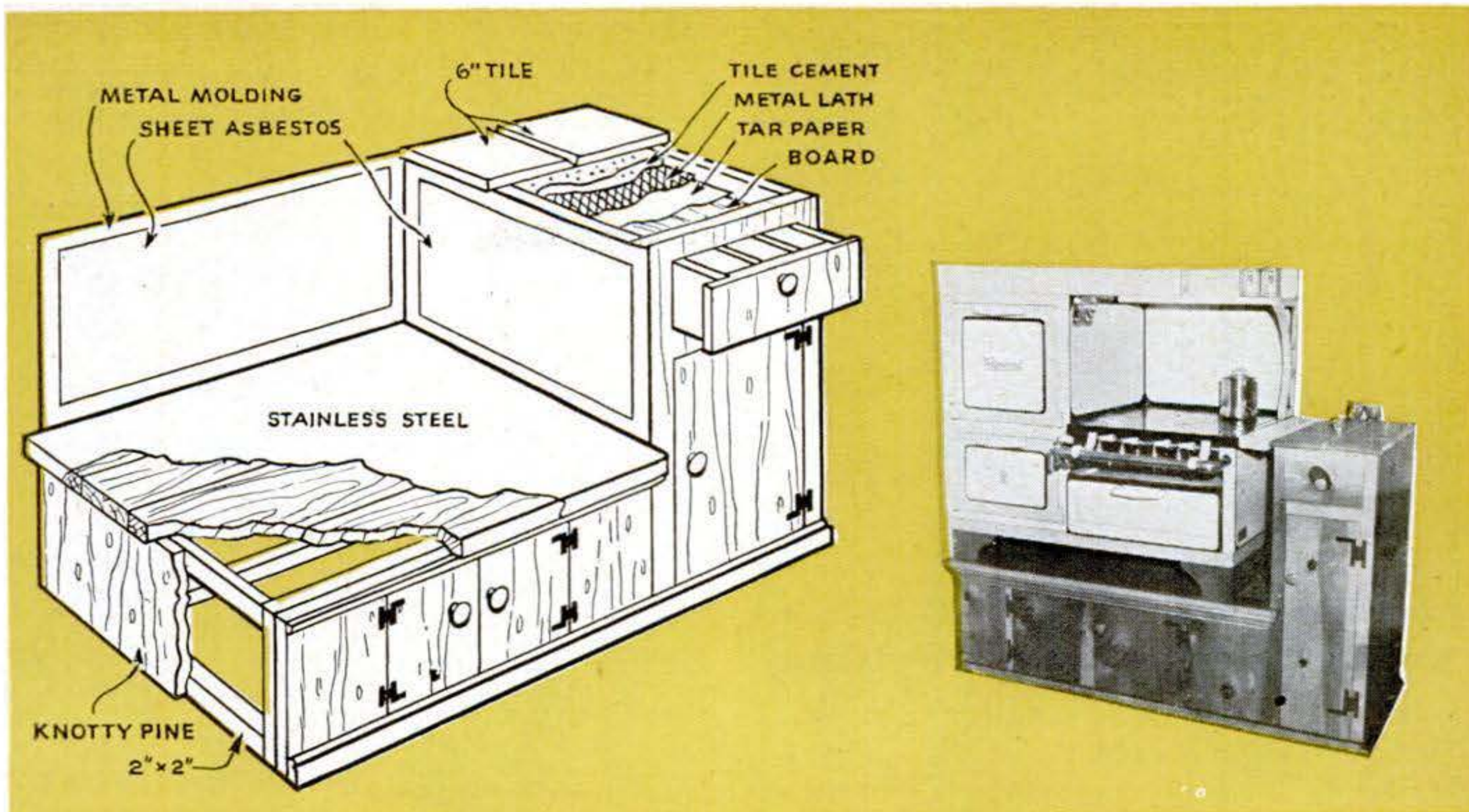
PICTURED above is a small garden tractor that I built from parts of an old motor scooter and other pieces of scrap metal. It will pull an 8" plow in heavy soil and does

a lot of other odd jobs. The variable-speed V-belt transmission, shown in the photo at right, can be shifted while the tractor's in motion. The final drive is through a 24-to-1 transmission that I bought at a war-surplus sale.—Clyde Clymer, Lincoln, Nebr.



Old Tire Holds Pest Poison

POISONED grain may be safely set out in old auto tires. Pets and birds can't get to the grain, yet field mice can. Slit the side of the tire that'll be next to the ground so any rain water may drain out. Spread the grain around inside the casing and raise one side with a small rock to give mice an entrance.—John Krill, North Lima, Ohio.



Cabinet Utilizes Waste Space Under Old Range

THE cat won't like it, but here's a way to make better use of the space below one of those old stilt-type kitchen ranges.

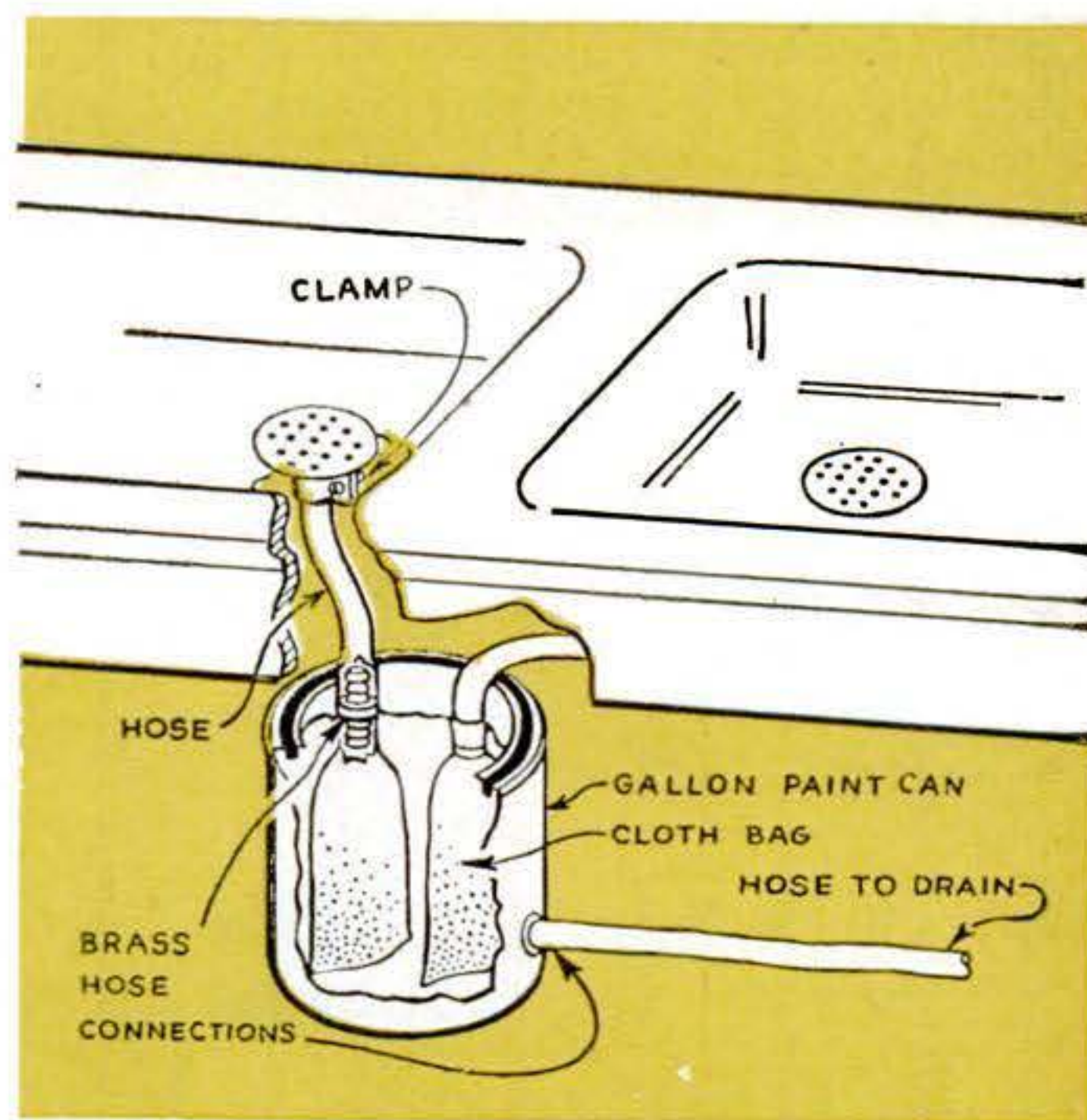
Cut off the legs and set the range on a neat cabinet like the one above, which was

made of knotty pine on a 2" by 2" frame. There's plenty of space below for pots and pans, while long-handled utensils can be hung in the tall cabinet. Cutlery goes in the drawer at top.—*Hi Sibley, Nuevo, Calif.*



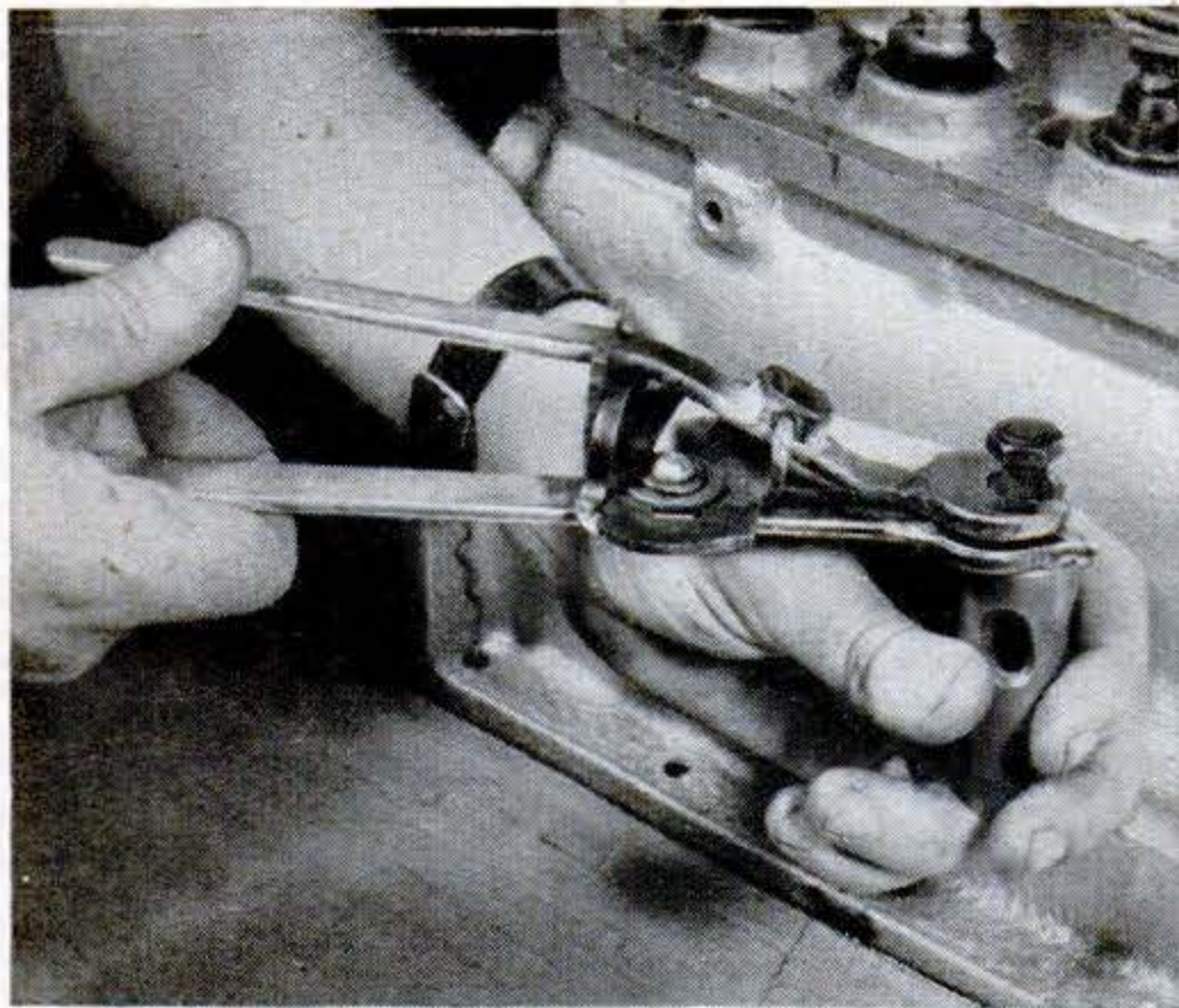
Vanity Chair Has Own Drawer

A THREE-SECTION sliding compartment in the vanity chair above provides storage space for hose or handkerchiefs. The chair and vanity in the background are part of a new line of Monogram® furniture offered by the Mengel Company, of Louisville, Ky. The drawer pulls are designed so that your initials, in gold, can be slipped in.



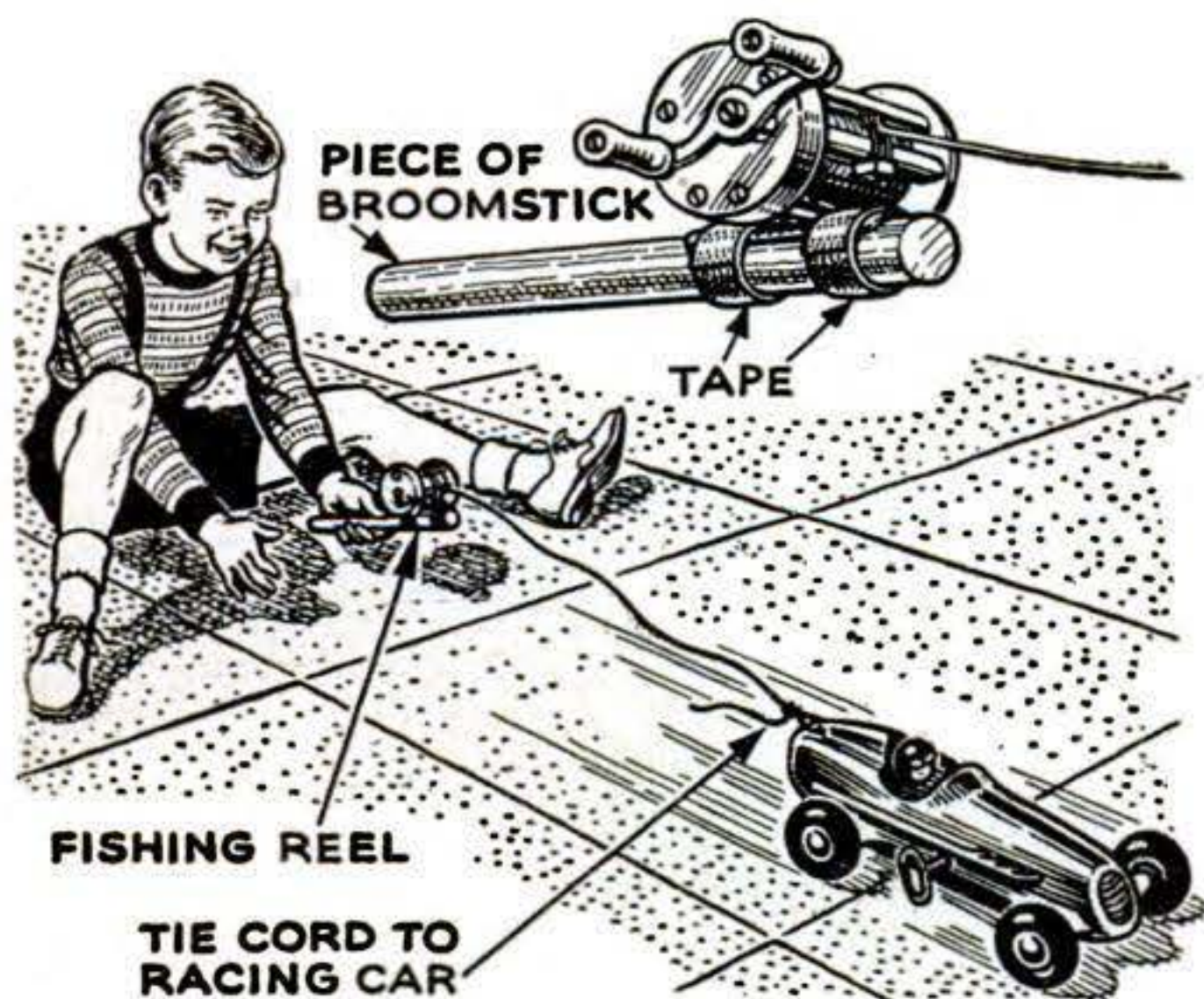
Trap Keeps Sink Drain Clear

IN USE for a year on my house trailer, the improvised drain trap above has worked like a charm. Two brass hose connectors were soldered to holes in the can lid and a third in the side. Cleaned regularly by prying off the can lid and putting on new cloth bags, the trap keeps the drain from clogging.—*F. H. Loudon, Bellflower, Calif.*



Tool Speeds Tappet Setting

THIS combination tool, designed by W. C. Herst, a master mechanic of Dubuque, Ia., is said to halve the time required to adjust auto-engine tappets. As shown in the photo, the tool holds the tappet body and the lock nut. The lower leg of the tool has a feeler gauge held to it by metal straps so the gauge may be pushed forward. With one wrench holding and with the feeler gauge in place, the other wrench is used to adjust the tappet. Once set on a tappet, the tool will remain there. Engine vibration can't shake it off. In the photo, a dummy tappet is being used for demonstration.

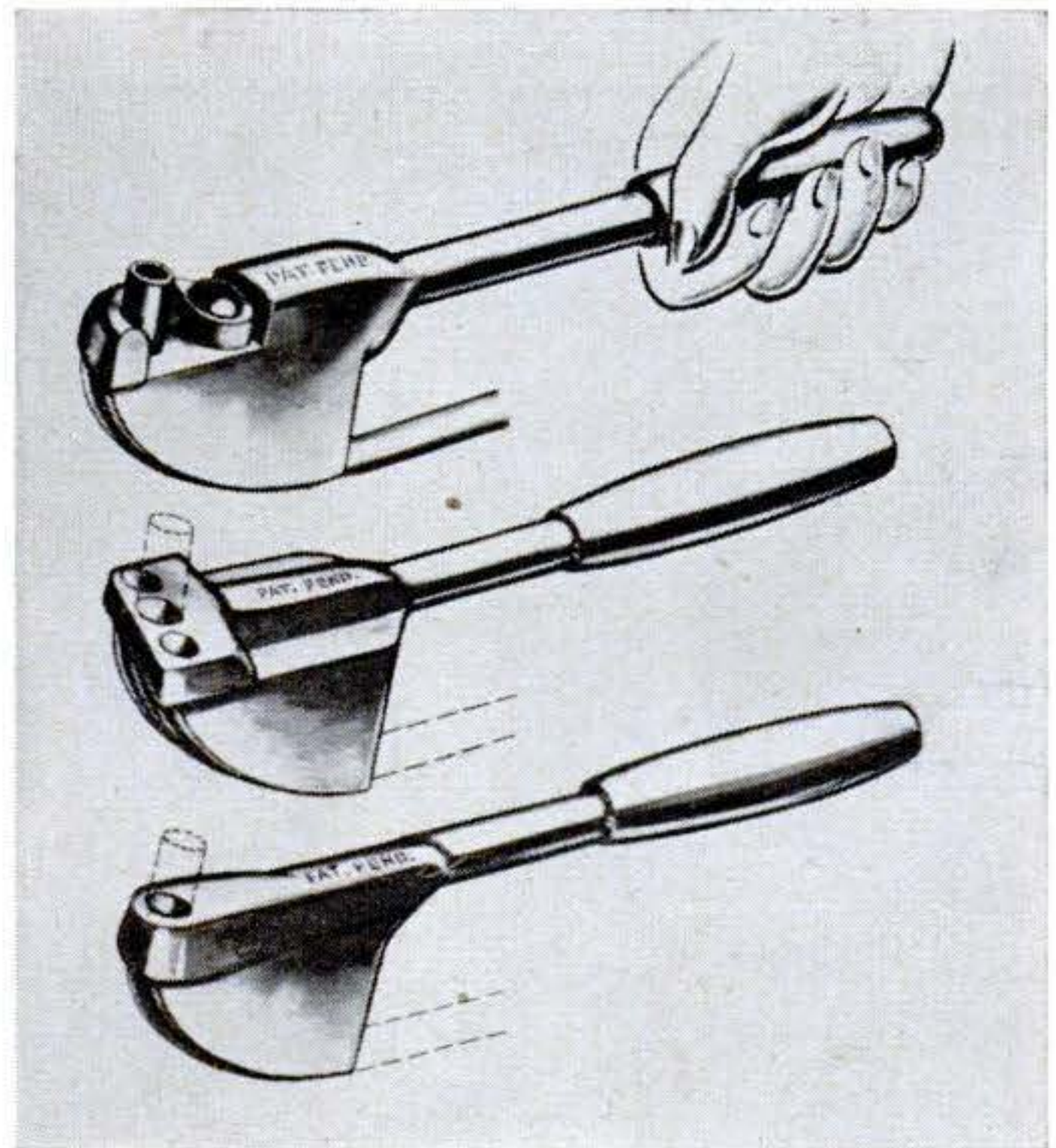
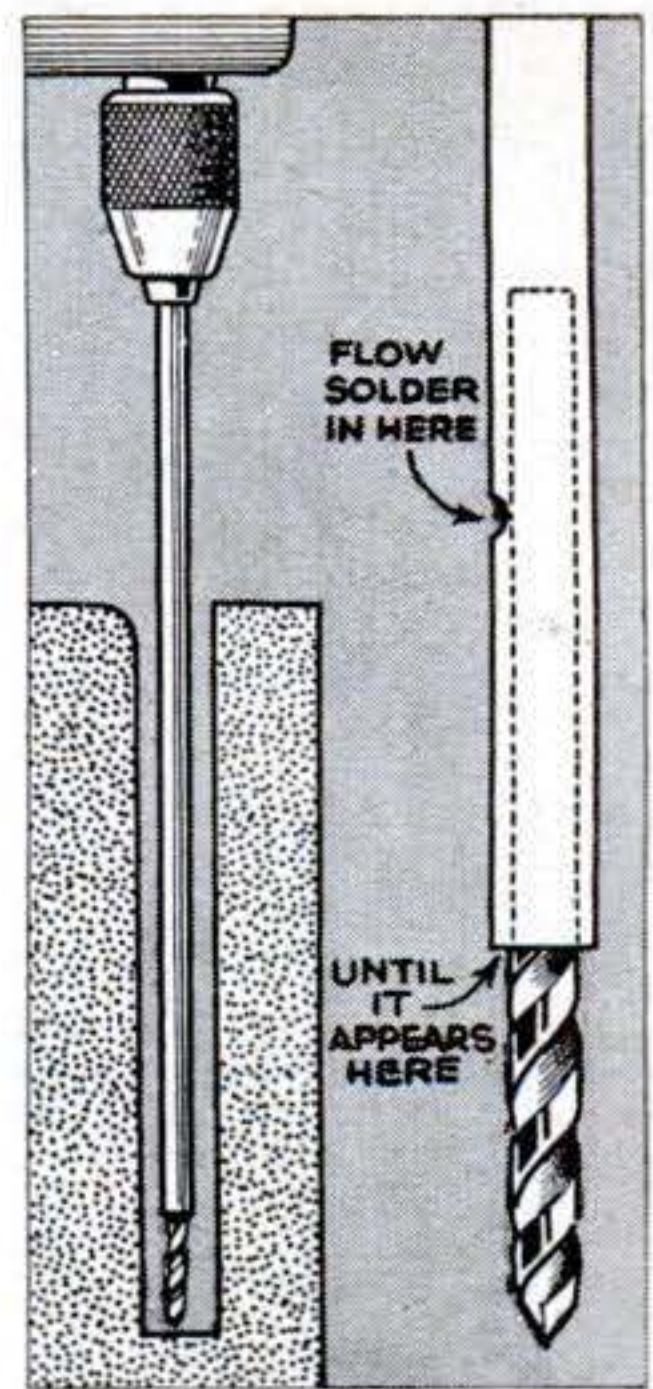


Old Reel Retrieves Toy Auto

AN OLD fishing reel, taped to a section of broomstick, is a quick retriever for rolling wind-up toys. After the toy has run its distance, the child can reel it in. If you don't have an old reel, some surplus-property stores sell the small, low-priced reels that were included in survival kits during the war.—Walter B. Weber, Angola, N. Y.

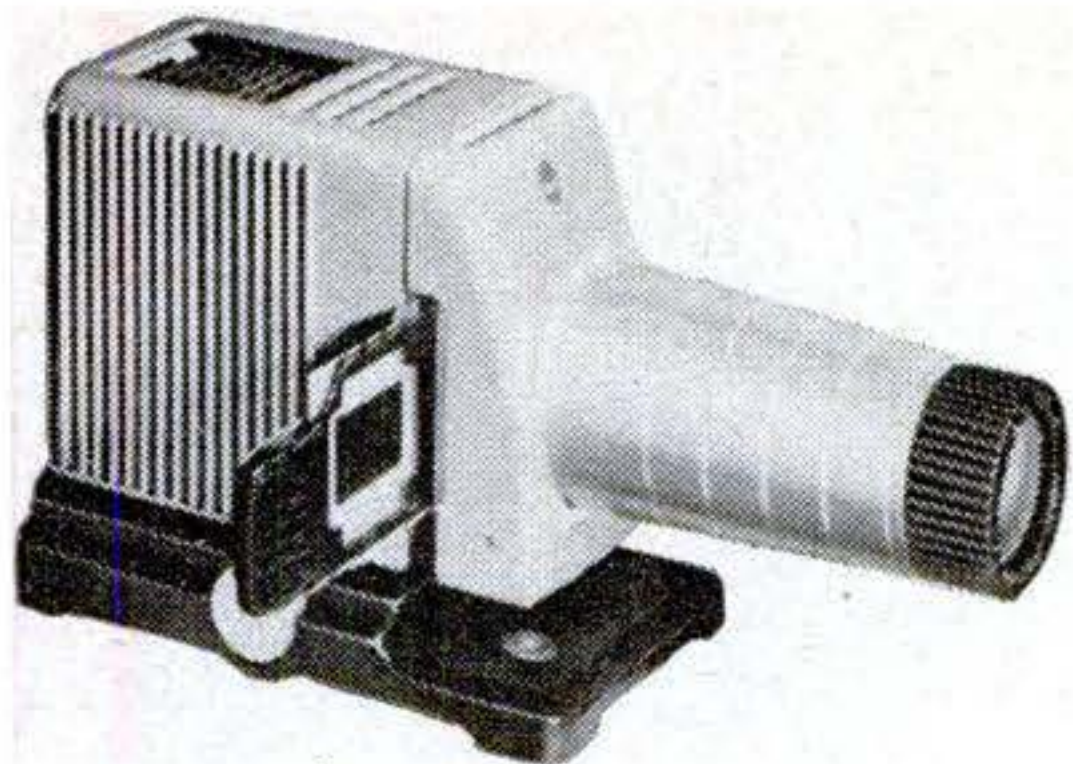
Brass Rod Extends Drill

HERE'S a kink I use to get a drill into spots where there's no room for the chuck. As an example, say a No. 50 hole has to be drilled in a valley about 5" deep, as shown in the sketch. In one end of a 6" length of brass rod, drill a No. 50 hole deep enough to take about three-fourths of the drill. File a notch $\frac{1}{2}$ " from the end of the rod. Put the shank of the drill in the hole and flow solder in the notch until it appears at the end of the rod. You can save these extensions until you have a set, or you can remove the drills by heating the rod until the drill can be pulled out. Fine sandpaper will clean bits of solder off the shank of the drill. —Herbert Pfister, Bronx, N. Y.



Tools Bend Small Tubing

KNOWN as Bob's Tu-Benders®, these three tools handle bending jobs on tubing from $\frac{3}{8}$ " to $\frac{7}{8}$ " o.d. They're priced from \$2.50 to \$4.50, depending on the type, by the distributor, Keiner Machine Products, of Los Angeles. According to the company, the tools can quickly be slipped on or off tubing and there is no chance of kinking.



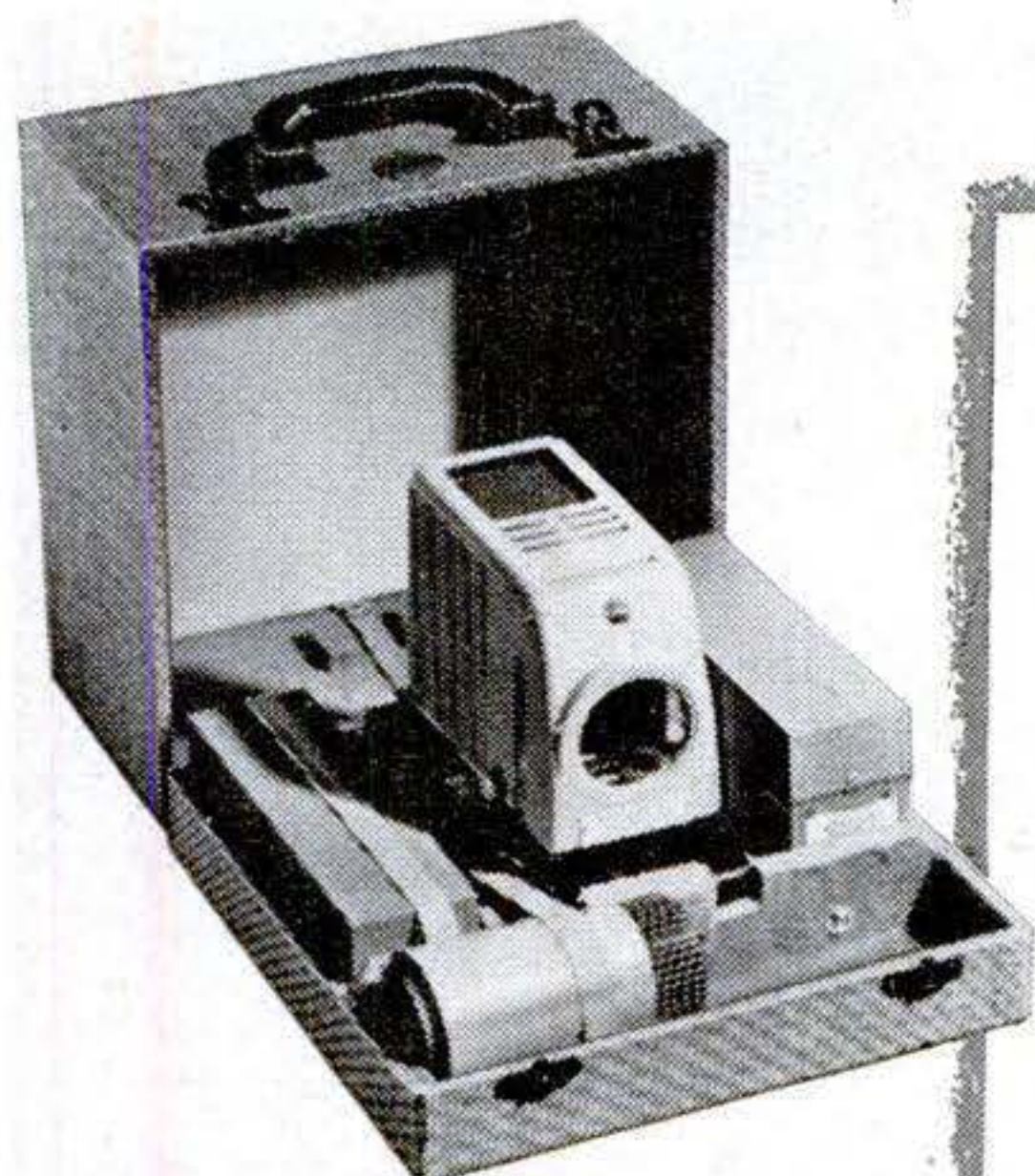
Kodaslide Projector, Model 2A—Lumenized Kodak Ektanon 5-inch $f/3.5$ Lens. Adjustable tilt control. \$47.50.



Kodaslide Projector, Master Model—1000-watt lamp. Superb optical system. \$181 to \$295, depending on lens choice.



Kodaslide Projector, Model 1A—Projects bright images up to 7 feet wide. Efficient, yet inexpensive. \$27.50.



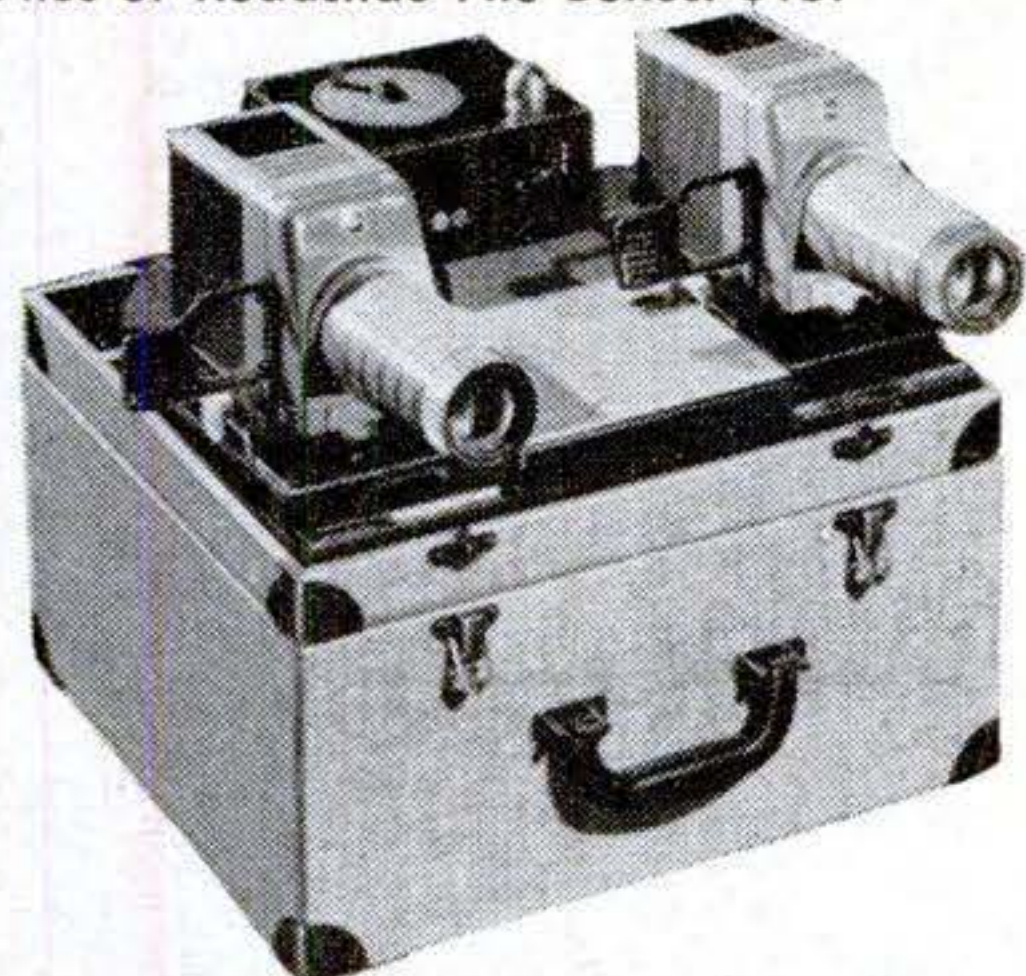
Combination Case (for Model 2A)—Holds Kodaslide Projector, Kodaslide Changer, lens, Kodaslide Sequence Files or Kodaslide File Boxes. \$15.

IT'S KODAK FOR BRILLIANT COLOR SHOWS

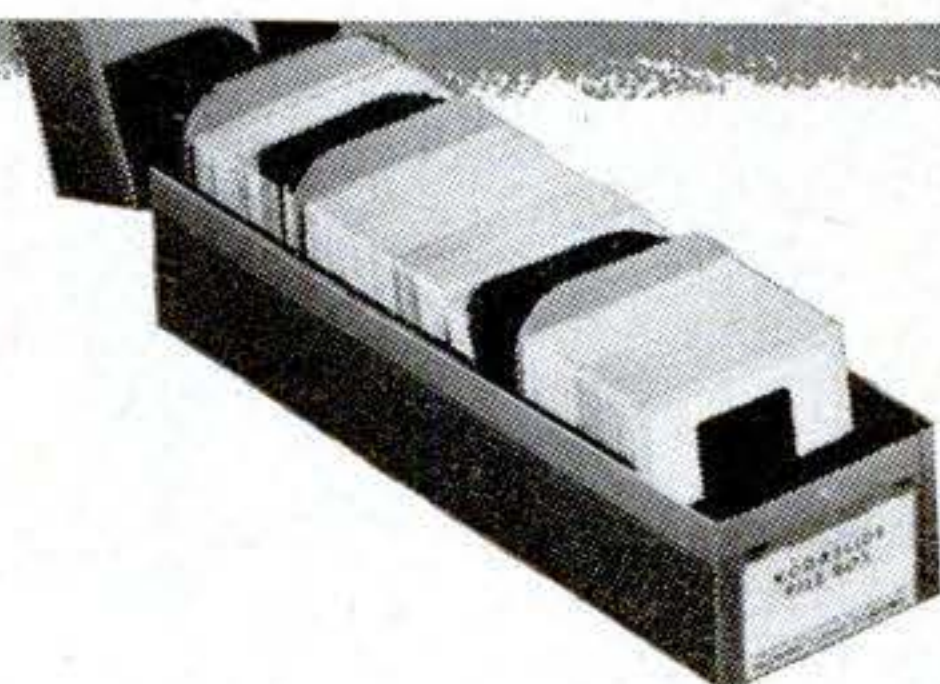
*... everything you need for
miniature-slide projection*



Projecto Case (for Model 1A)—For carrying, storage, and projection. \$10.



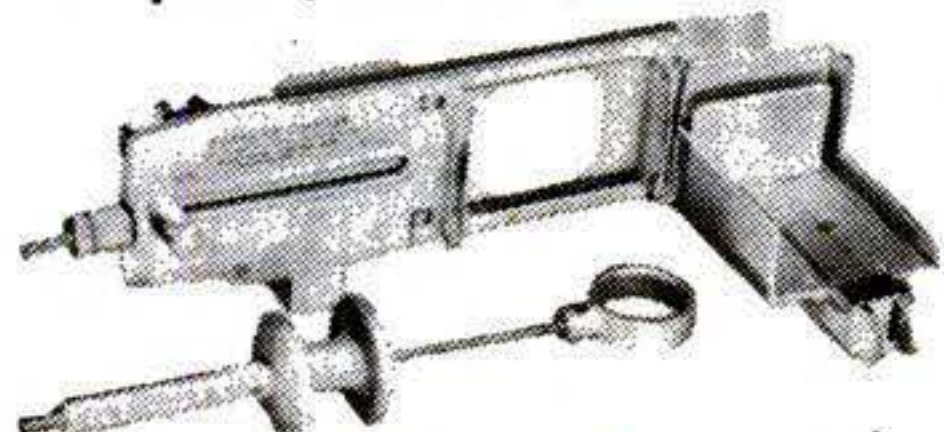
Kodaslide Dissolve Control Outfit—For "fade-in-fade-out" effects with Kodaslide Projectors, Models 1, 2, 2A. \$50.



Kodaslide File Box—Protects 140 cardboard slides, 55 glass slides, keeps them organized. \$1.15.



Kodaslide Table Viewer—Screen, projector, and slide changer all in one unit. \$95.



Kodaslide Changer—Simplifies changing slides. Gives a smooth show. \$17.50.



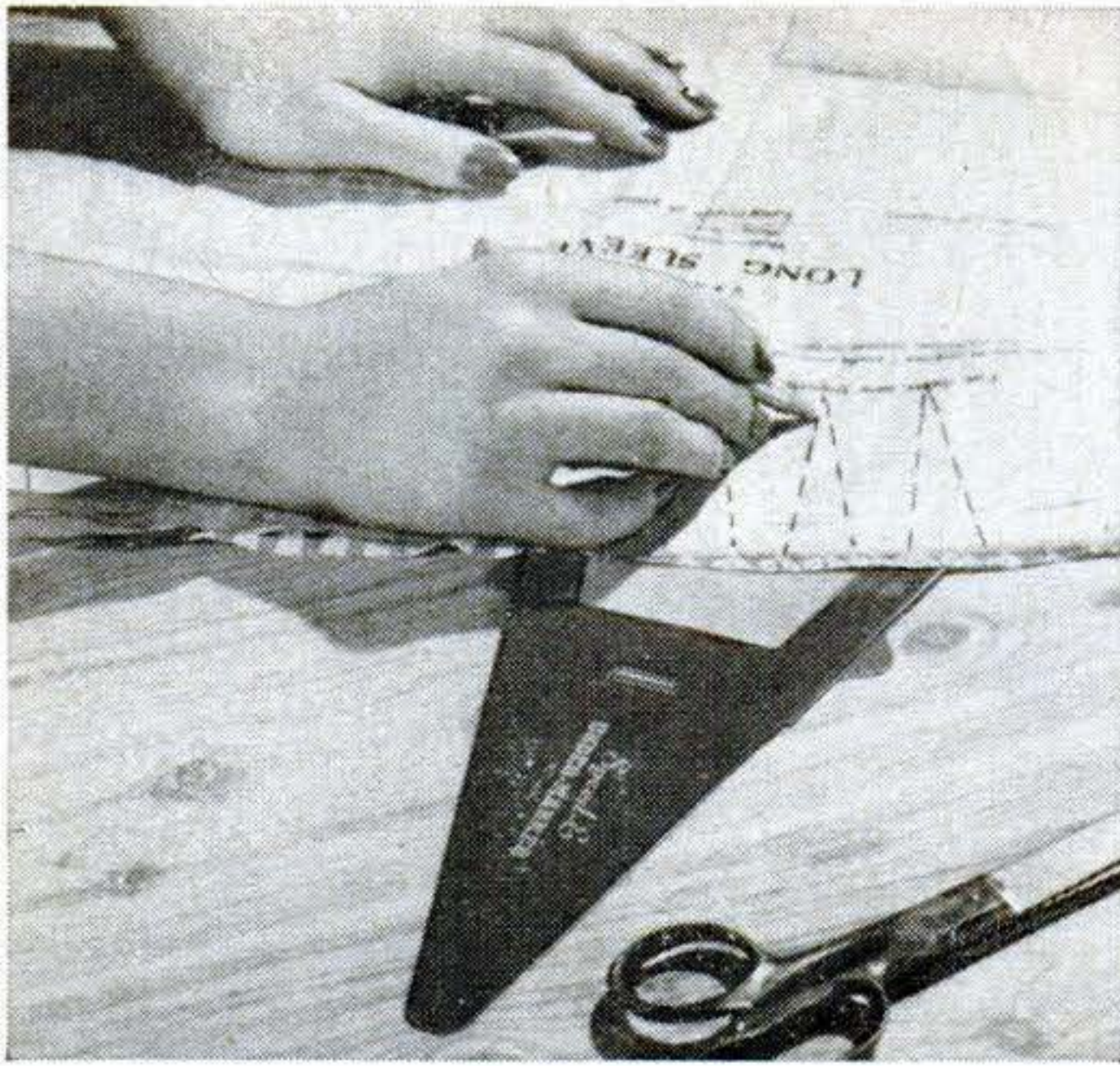
Kodak Slide Kit—Glass, masks, and binding tape for 50 slides. \$2.90.



Kodaslide Compartment File—Slide compartments swing out. Holds 240 cardboard slides. \$3.75.

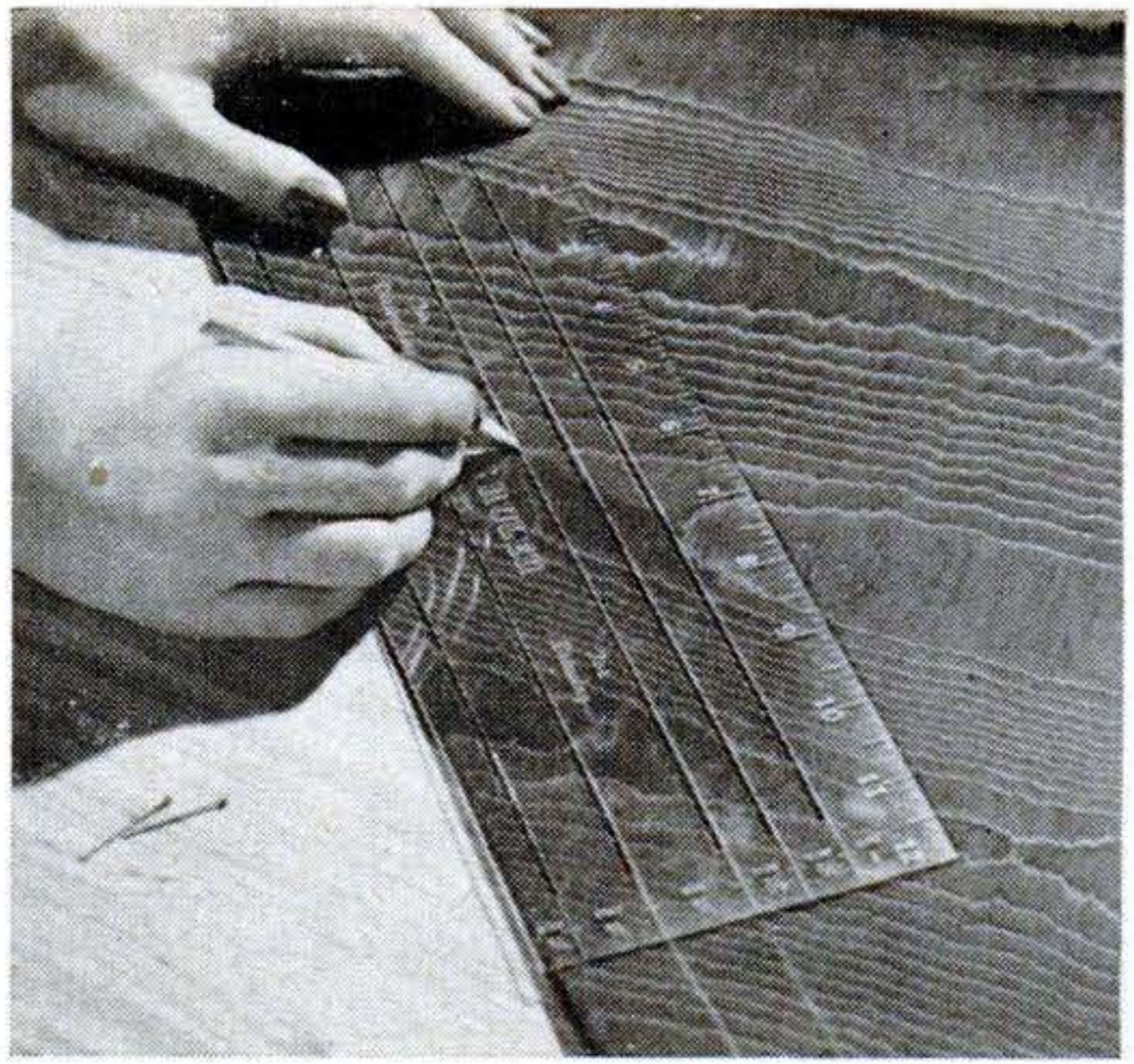
Your Kodak dealer has everything you need for color shows—visit him today.
EASTMAN KODAK COMPANY, ROCHESTER 4, NEW YORK

Kodak
TRADE-MARK



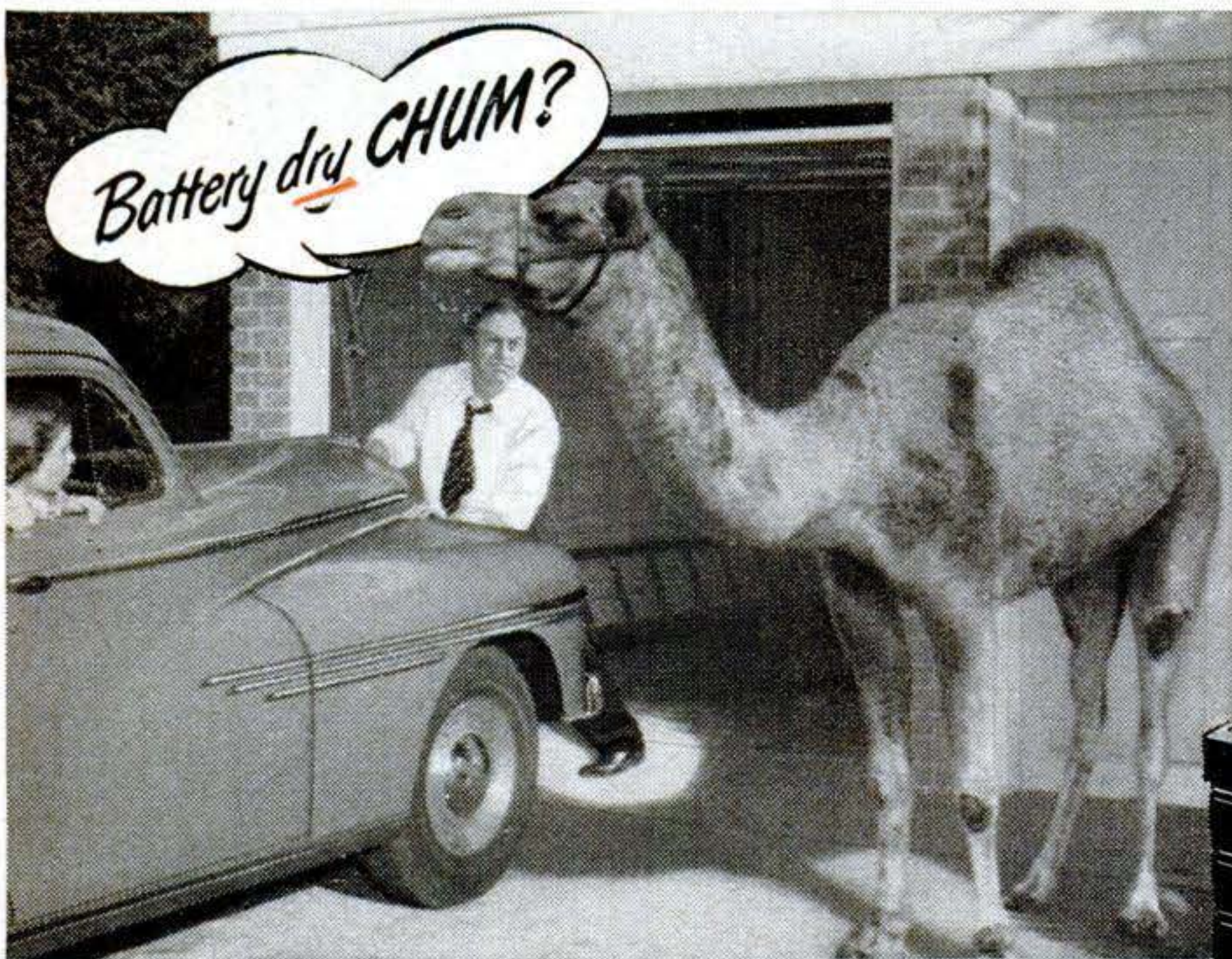
Device Doubles Pattern Guides

To PUT dressmaker's marks on two pieces of cloth at a time, just slip this new plastic device under the second layer. When you mark with a pencil through the regular pattern perforations onto the top layer of cloth, the bottom layer is pressed against a coated transfer sheet, contained in the device, and is marked by it. Sewing Products Co., of Cincinnati, Ohio., makes the marker.



Ruler Simplifies Sewing

You can mark guide lines on fabric right through this new ruler, made of transparent, rigid, Vinylite® plastic. It has parallel slits at varying intervals, giving different widths for cutting bias strips, belts, and buttonholes. Manufactured by Sewing Products Co., of Cincinnati, O., the ruler is available at department and notion stores, and sewing centers. It costs \$1.00.



Avoid battery troubles—buy a Prest-O-Lite Hi-Level Battery. Gives up to 70% longer average life as shown in tests conducted in accordance with S.A.E. life cycle standards. See your Prest-O-Lite Hi-Level dealer today.

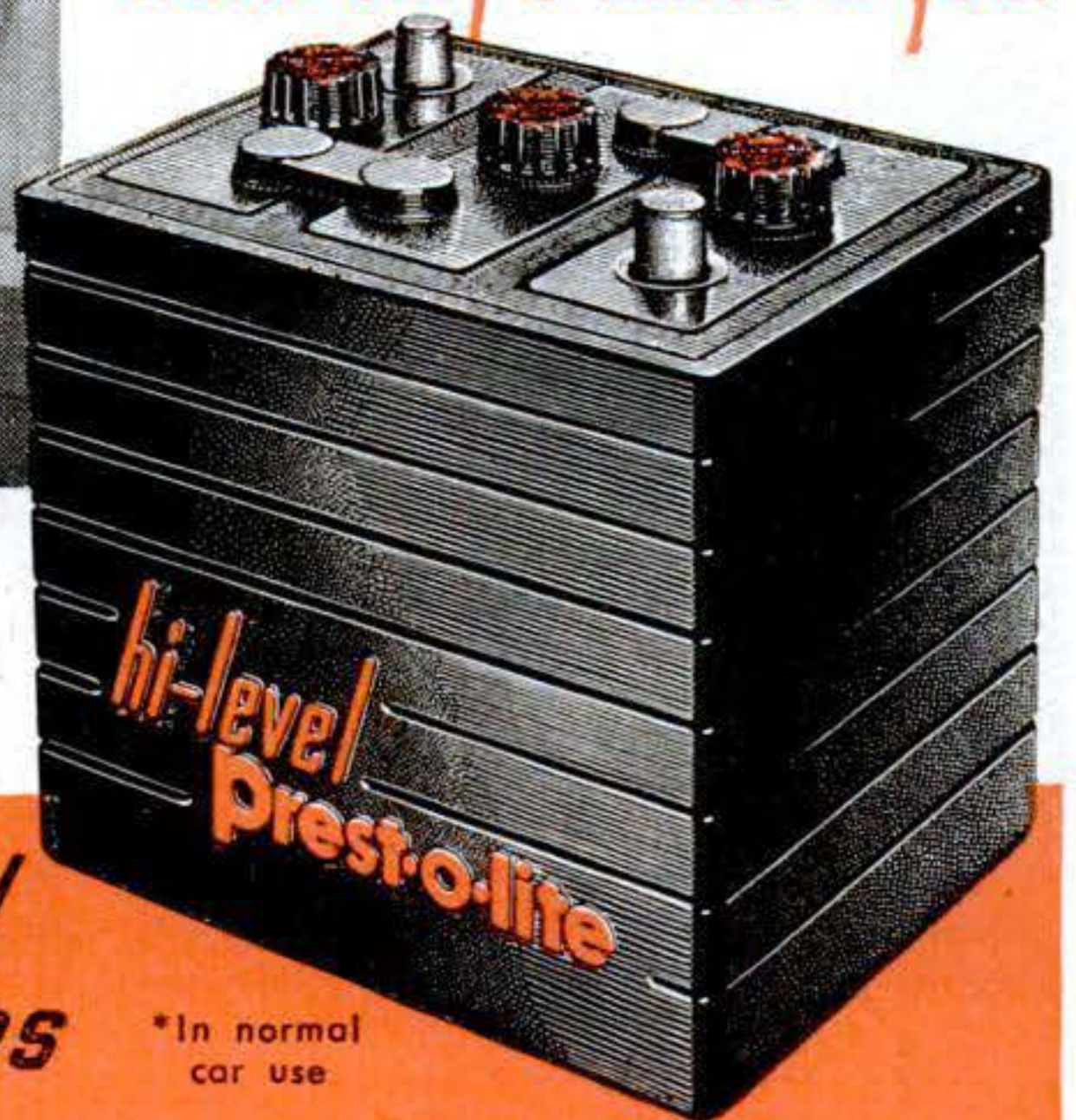
Toledo 1

PREST-O-LITE BATTERY COMPANY, INC.

Ohio

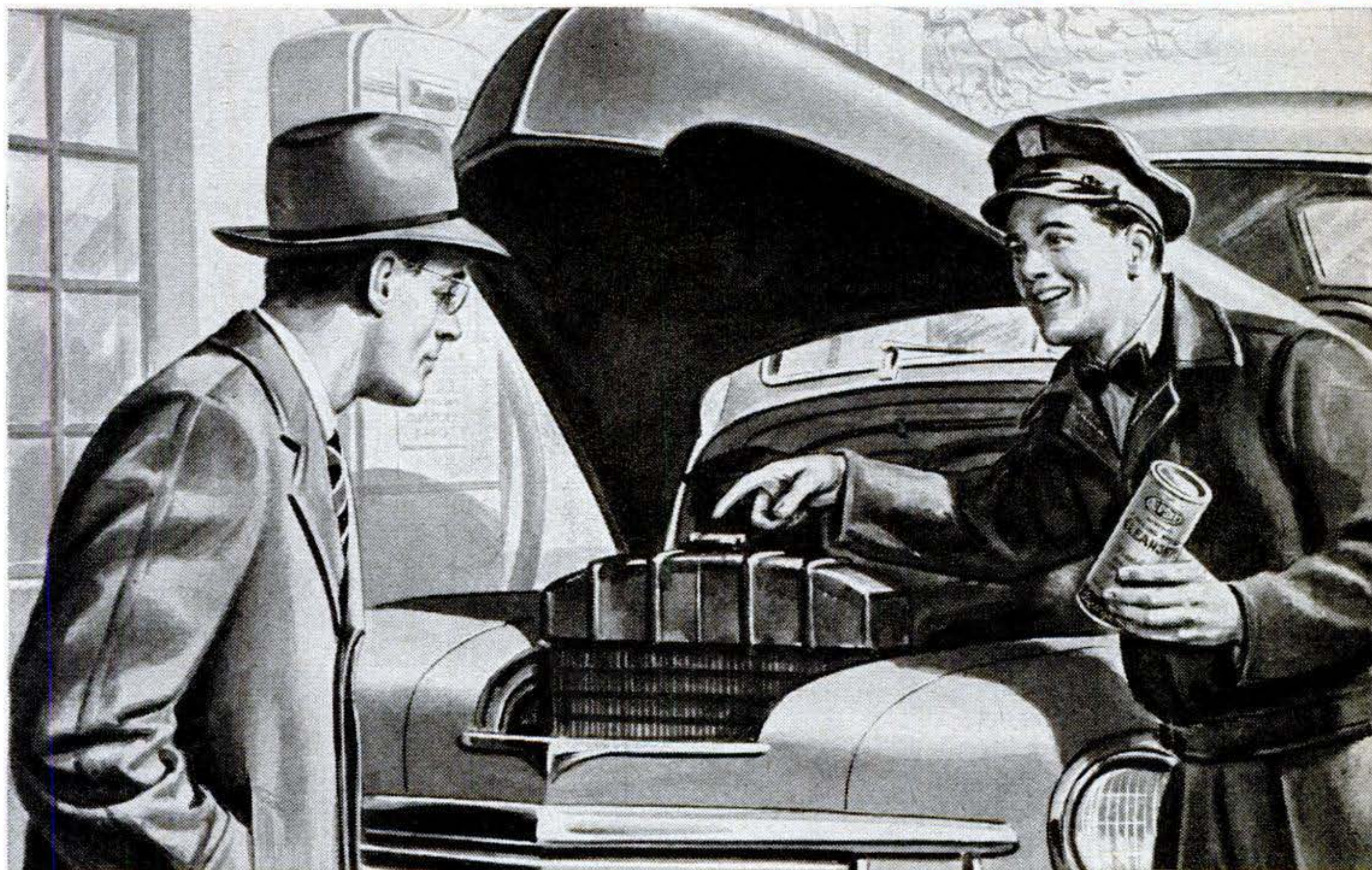
prest-o-lite *hi-level batteries*

*In normal car use



BUY
Prest-o-lite
hi-level batteries... need
water only 3 times a year*

Before anti-freeze goes in clean out rust and scum



**Rust-clogged
radiators
waste anti-freeze
... cause trouble
and expense**



Better Things for Better Living
... Through Chemistry

Clean out rust with

DU PONT COOLING SYSTEM CLEANSER

Don't put anti-freeze into a rust-clogged radiator. Clean out the rust, scale and scum *now* before winter sets in. Just pour a can of DU PONT CLEANSER into your radiator, run the engine for 30 minutes or more, then drain. That's all! It cleans thoroughly without reverse flushing. It's safe, sure, and easy to use.

Keep out rust with

DU PONT ACID AND RUST INHIBITOR

After cleaning out the radiator, you can keep it free from rust all season by pouring in a can of DU PONT ACID AND RUST INHIBITOR. It retards rust formation, and keeps out acid, too.

Avoid leaks and loss of anti-freeze

DU PONT COOLING SYSTEM SEALER

You can stop leaks quickly and securely—and help to prevent radiator leaks in the future—by pouring in DU PONT COOLING SYSTEM SEALER. It will not clog the radiator or harm hose or metal parts.



OCTOBER 1949 251

PLUMB TOOLS



Do Better Jobs With Ease and Speed

Get a Plumb Hammer. You'll feel the difference immediately. The non-slip handle fits your hand comfortably, absorbs the shocks. Perfect balance lets you strike quick, hard blows with ease and little effort—makes light work of your heavy jobs.

Made of special analysis steel, Plumb hammers are tempered to withstand constant, heavy pounding. For pulling nails, even headless ones don't slip through the spring-tempered claws.

You'll discover quickly why more people choose Plumb than all others combined.

The red handle with the black head — exclusively Plumb.

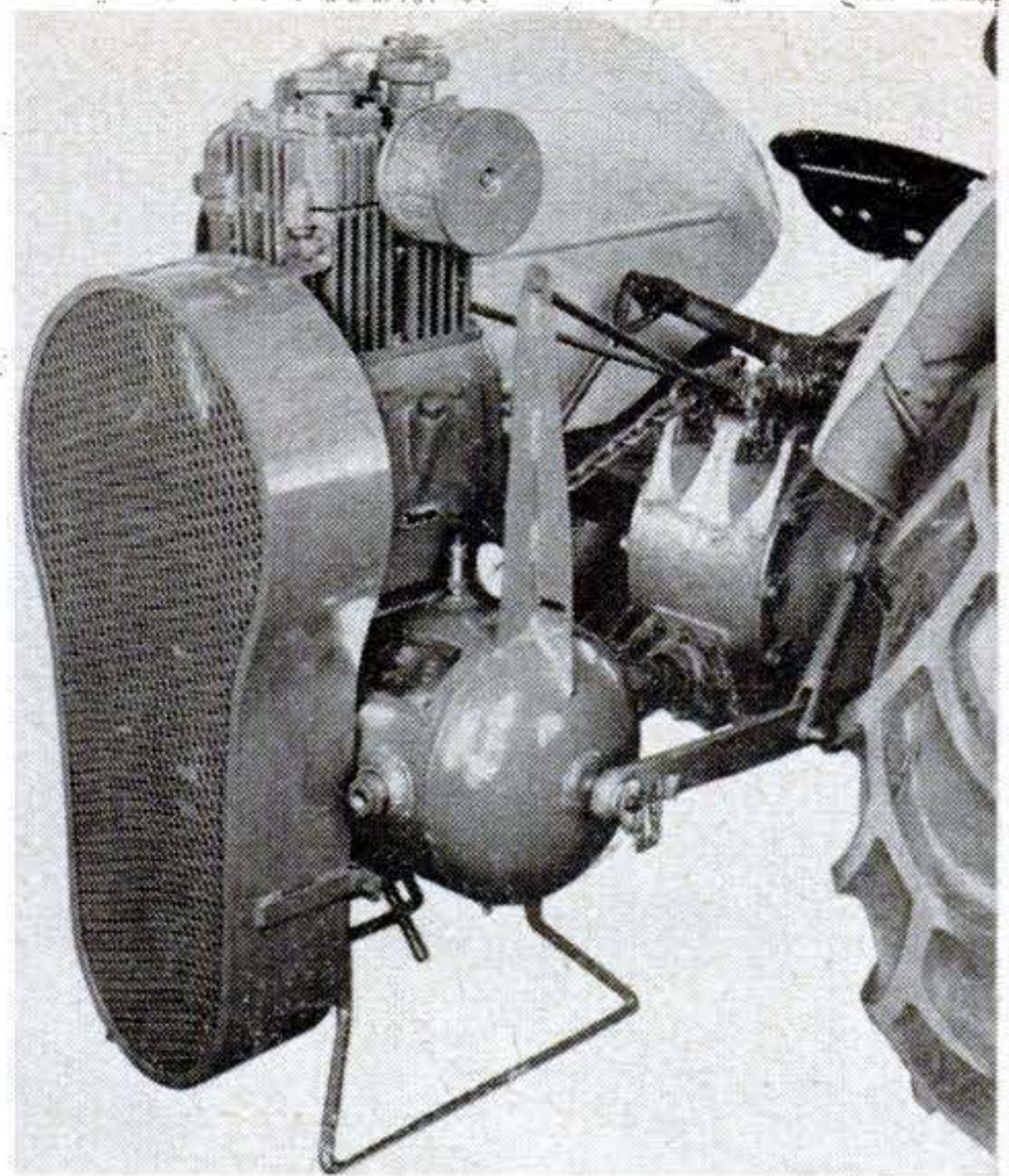
Quality Comes First

PLUMB

—is First in Quality

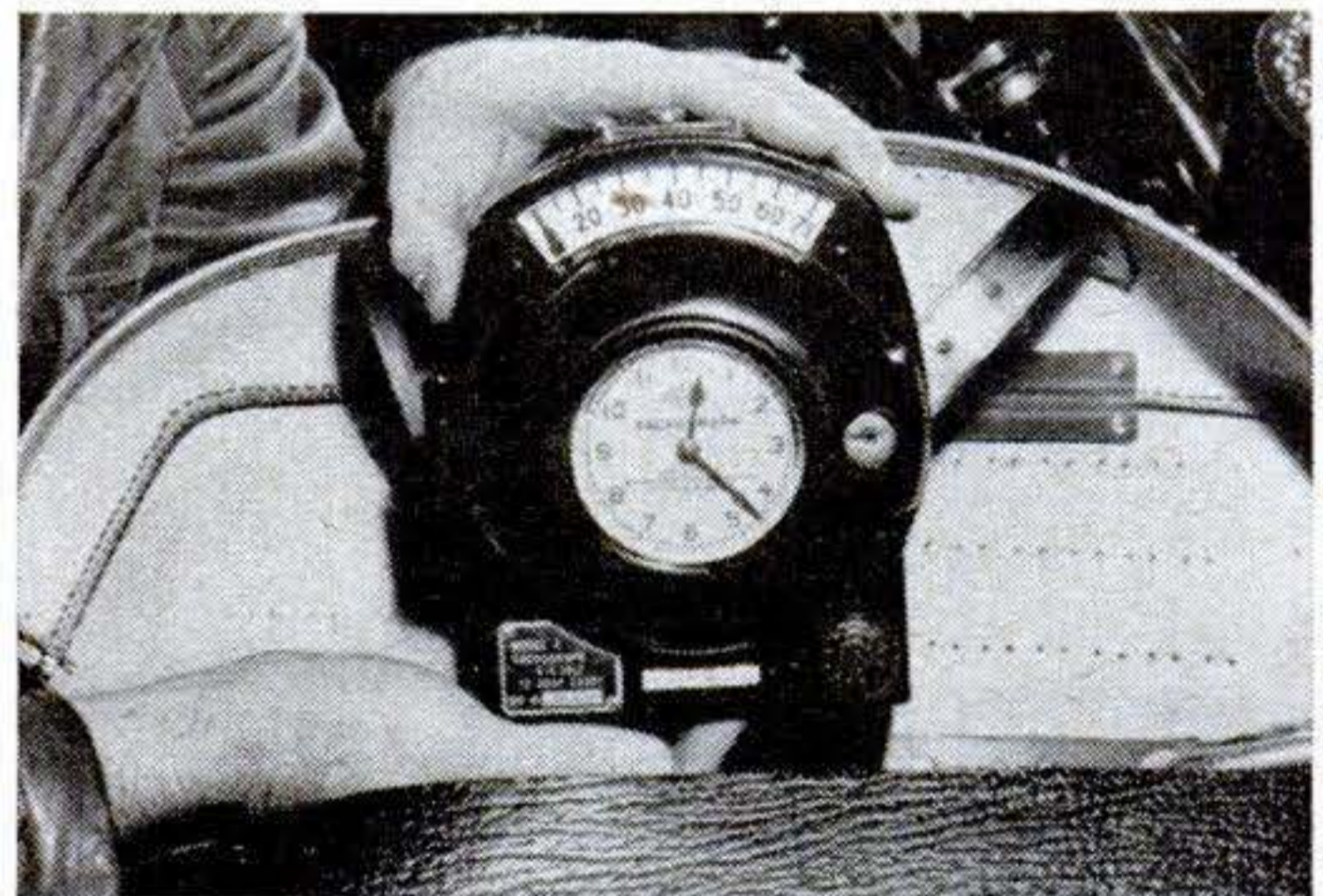
PLUMB

HAMMERS • HATCHETS • AXES • FILES



Tractor Runs Compressor

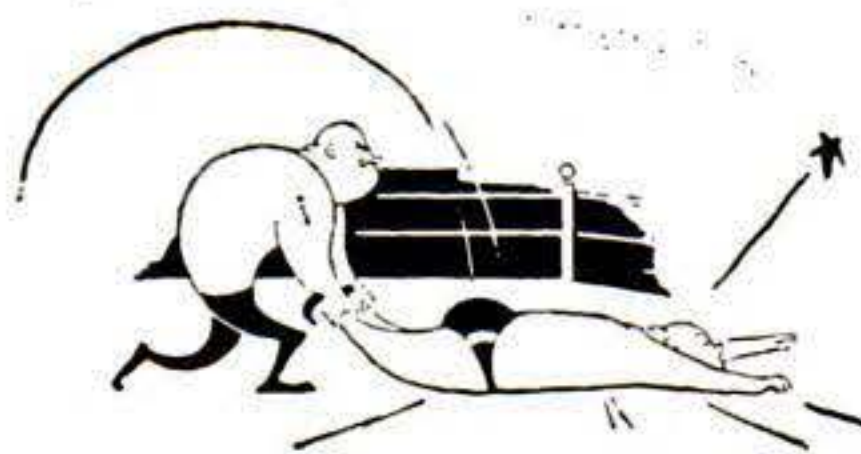
Just hitch this portable air compressor to the power take-off of a tractor or a jeep, and you'll get the compressed air you need at a working site without bringing in a heavy machine requiring its own engine. Used to run air-operated equipment, such as lifts, hoes, and shovels, or for painting and spraying, the easily attached compressor comes in two sizes. It is made by Miller-Robinson Co., of Los Angeles.



Device Records 'Cycle Test

A HELPING hand for motorcycle test riders, this tachograph automatically records the speed, time, and distance a vehicle travels. Thus it lets the rider pay more attention to the motorcycle's actual performance. Test conditions are continuously recorded as wavy red lines on an enclosed chart. An engineer of Harley-Davidson Motor Co. used this method of experimenting with a motorcycle in recent tests.

grand slam...



● Grand slam in performance.

Because of AC's patented CORALOX Insulator,* AC Spark Plugs perform better than spark plugs ever did before.

They start better . . . idle better . . . fire better under all conditions.

They offer more resistance to oxide coating.

They give you a grand slam in spark plug performance.

That's a big order . . . but it's true. A set will prove it.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION



SPARK PLUGS

BUY WHERE YOU SEE THIS SIGN



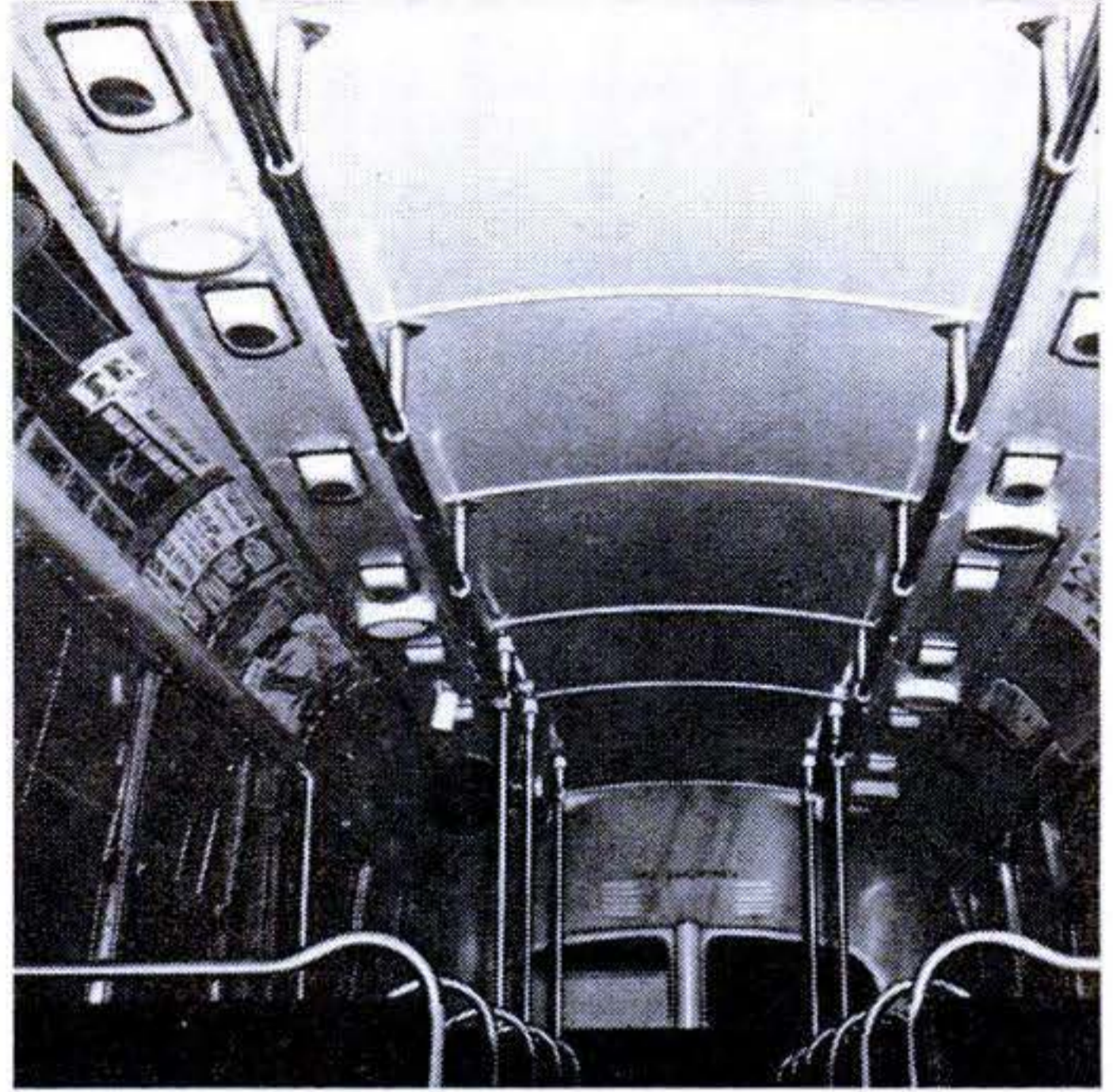
MORE NEW CARS AND TRUCKS
ARE EQUIPPED WITH AC SPARK PLUGS
THAN WITH ANY OTHER MAKE

* AC's patented processes make Coralox the finest insulator in spark plug history. Improved electrical insulation, no matter how high the temperature. Better heat conduction. Maximum resistance to heat shock. Less fouling. Stronger, longer-lived.



Cutouts Dramatize Records

MEMBERS of the bedtime-story set can now act out such favorites as "Goldilocks" and "The Three Little Pigs" as they hear them on records. Each dramatization, on 12-in., durable Vinylite® records, is accompanied by colored cardboard cutouts of the characters and stage props. Made by Family Games, San Francisco, they sell for \$2.95.



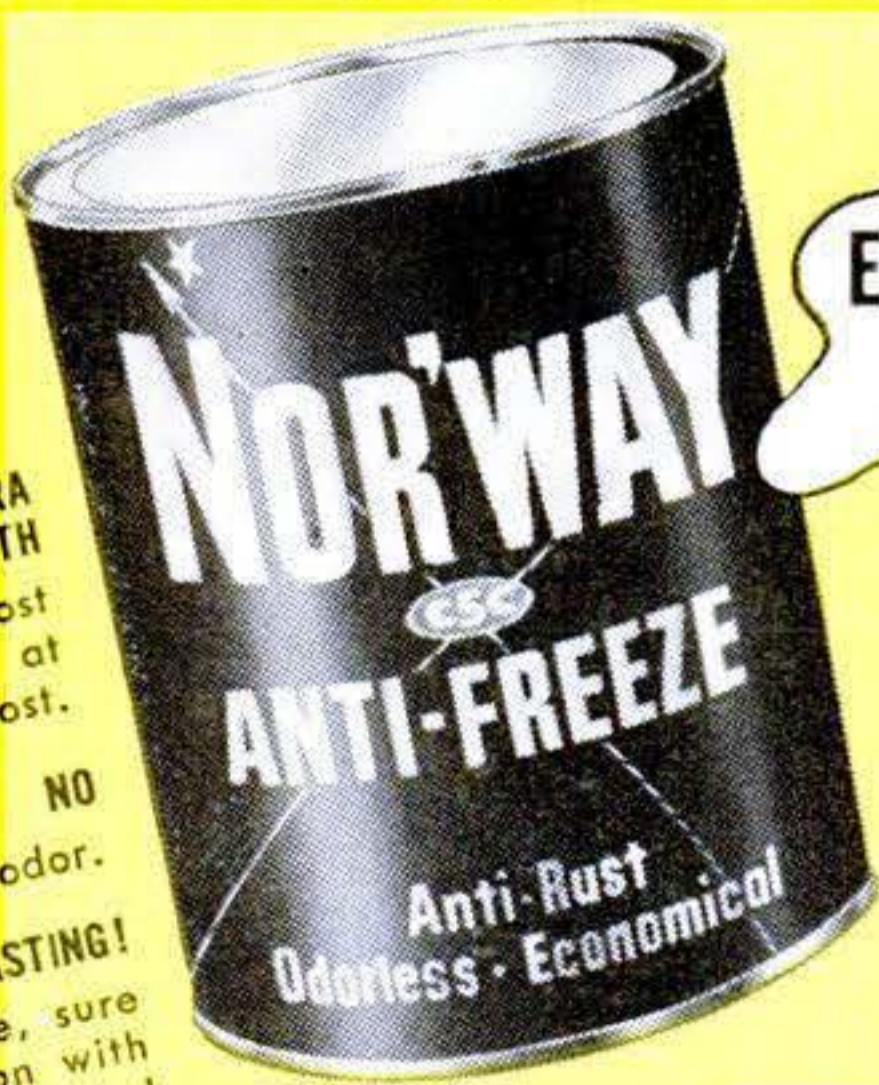
Music Soothes Commuters

THE circular fixtures on the ceiling of this trackless trolley in Cincinnati are radio loudspeakers. Eight of them in each trolley are connected with an FM set under one of the seats. The system was installed free by Transit Radio, Inc., as an extra outlet for regular programs sold to advertisers. It carries no soap operas or singing commercials.

choose your

ANTI-FREEZE

now!



EXTRA STRENGTH
gives the most protection at the lowest cost.

NO
disagreeable odor.

LONG LASTING!

Safe, sure protection with only an occasional check-up.

PREVENTS CORROSION of all cooling system metals!

ECONOMY TYPE

PERMANENT TYPE



WILL NOT BOIL AWAY!
Guaranteed protection for a full winter driving season.

NON-CORROSIVE!
PEAK is fully inhibited to prevent cooling system corrosion.

WILL NOT LEAK from any cooling system tight enough to hold water.

HARMLESS if spilled! Will not injure automobile finish.

NORWAY® PEAK®

PRODUCTS OF COMMERCIAL SOLVENTS CORPORATION



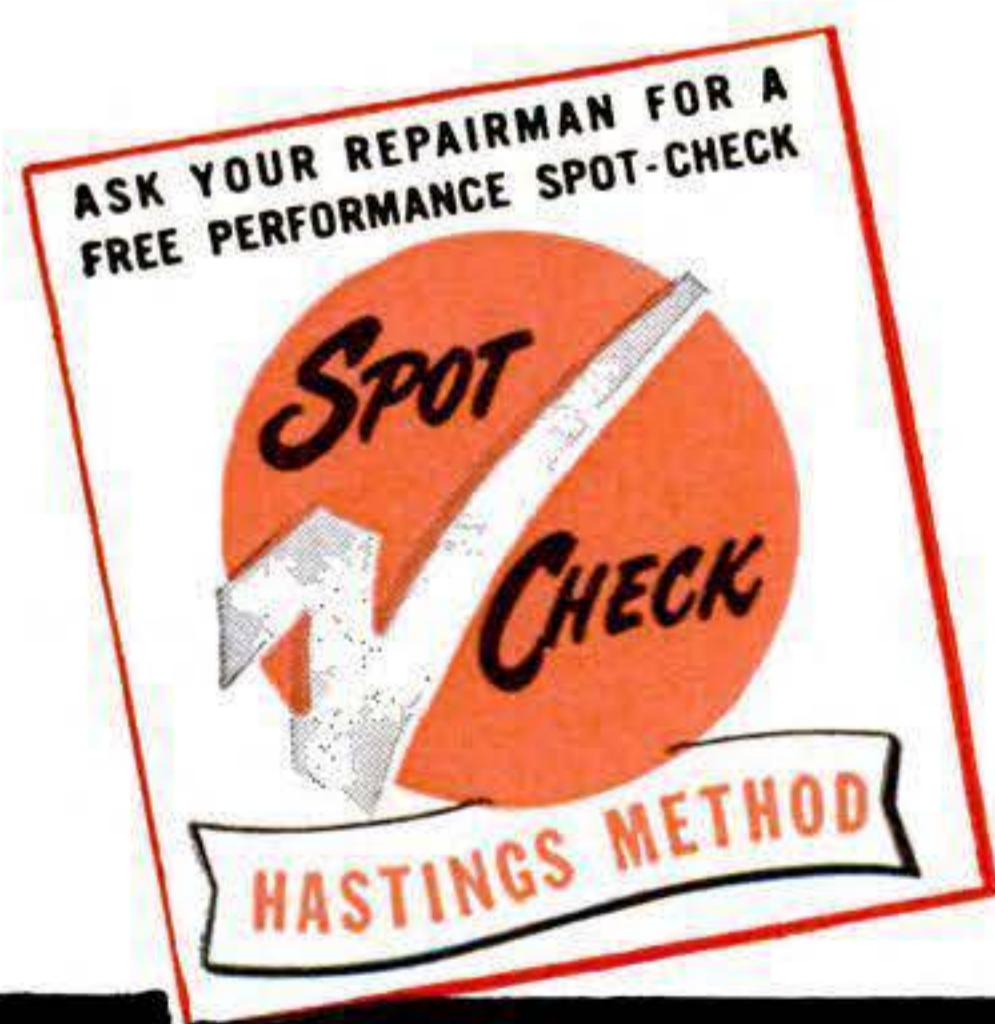
*Piston Rings
need replacing,
too!*

OIL-PUMPING is a symptom of piston ring wear. And by the time you notice it, your rings will be pretty badly worn. They should be replaced immediately.

Hastings Piston Rings are designed especially for replacement service ... So ask for

Hastings—the replacement ring that *stops* oil-pumping, *checks* cylinder wear and *restores* performance. It's the best money you can spend on your car.

HASTINGS MANUFACTURING COMPANY
HASTINGS, MICHIGAN
Hastings Ltd., Toronto



HASTINGS

STEEL-VENT PISTON RINGS

"TOUGH... BUT OH SO GENTLE"

TOUGH on oil-pumping — **GENTLE** on cylinder walls

*Standard for
Home and
Industry*

SINCE 1899



Kester Flux-Core Solder — the home and hobbycraft worker's choice for fast, reliable soldering . . . Kester Metal Mender and Kester Acid-Core Solder for general work . . . Kester Radio Solder and Kester Plastic Rosin-Core Solder for radio and electrical work.

Kester Solder makes all metal repair jobs easier



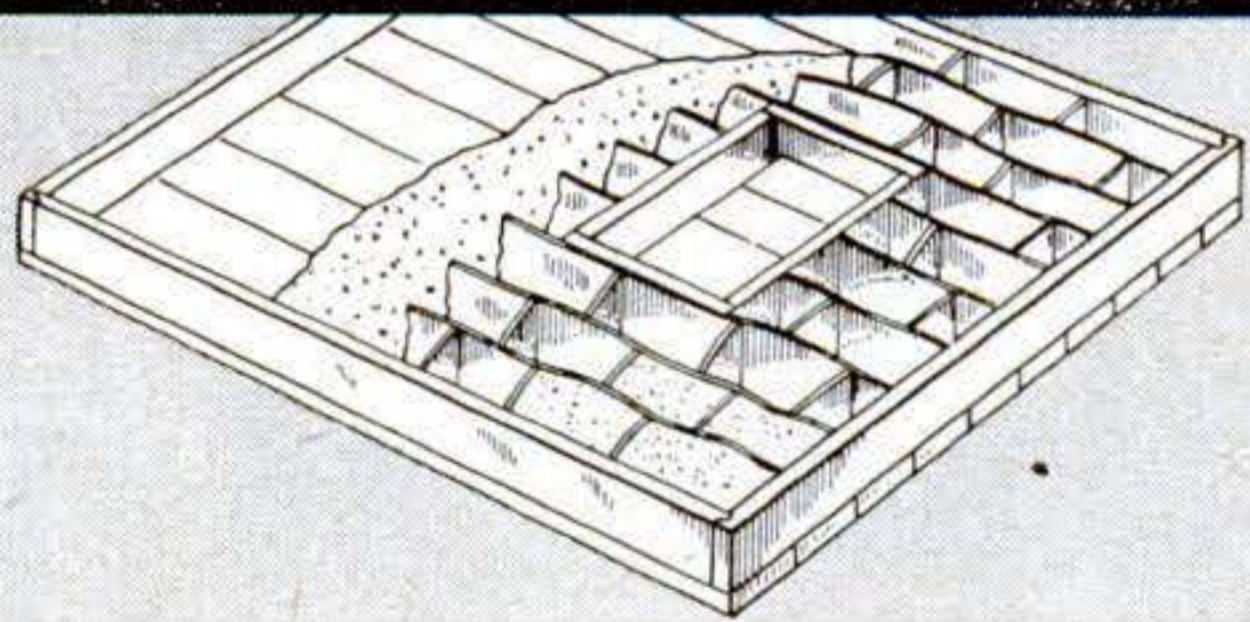
**KESTER
SOLDER**

KESTER SOLDER COMPANY
4201 Wrightwood Avenue, Chicago 39, Ill.
Factories also at
Newark, New Jersey • Brantford, Canada



Magnetic Roller Sweeps Metal

PICKING up stray bits of metal from floors and roads or out of liquids and powders is simple with this sweeperlike magnetic roller. Called the Magnetool®, it has 50 percent more pick-up power than previous models. The inset shows how particles are removed by a wiper ring that pushes them to a non-magnetic spot where they fall off.



Cement Blocks Look Like Stone

Now you can make concrete building blocks that look like natural cut stone. They are cast in irregular shapes that fit together. Partitioned wall forms are first laid out with spaces for doors and windows (lower picture). Then concrete is poured in and covered with crushed Imistone®. When hard, the blocks are cemented together.

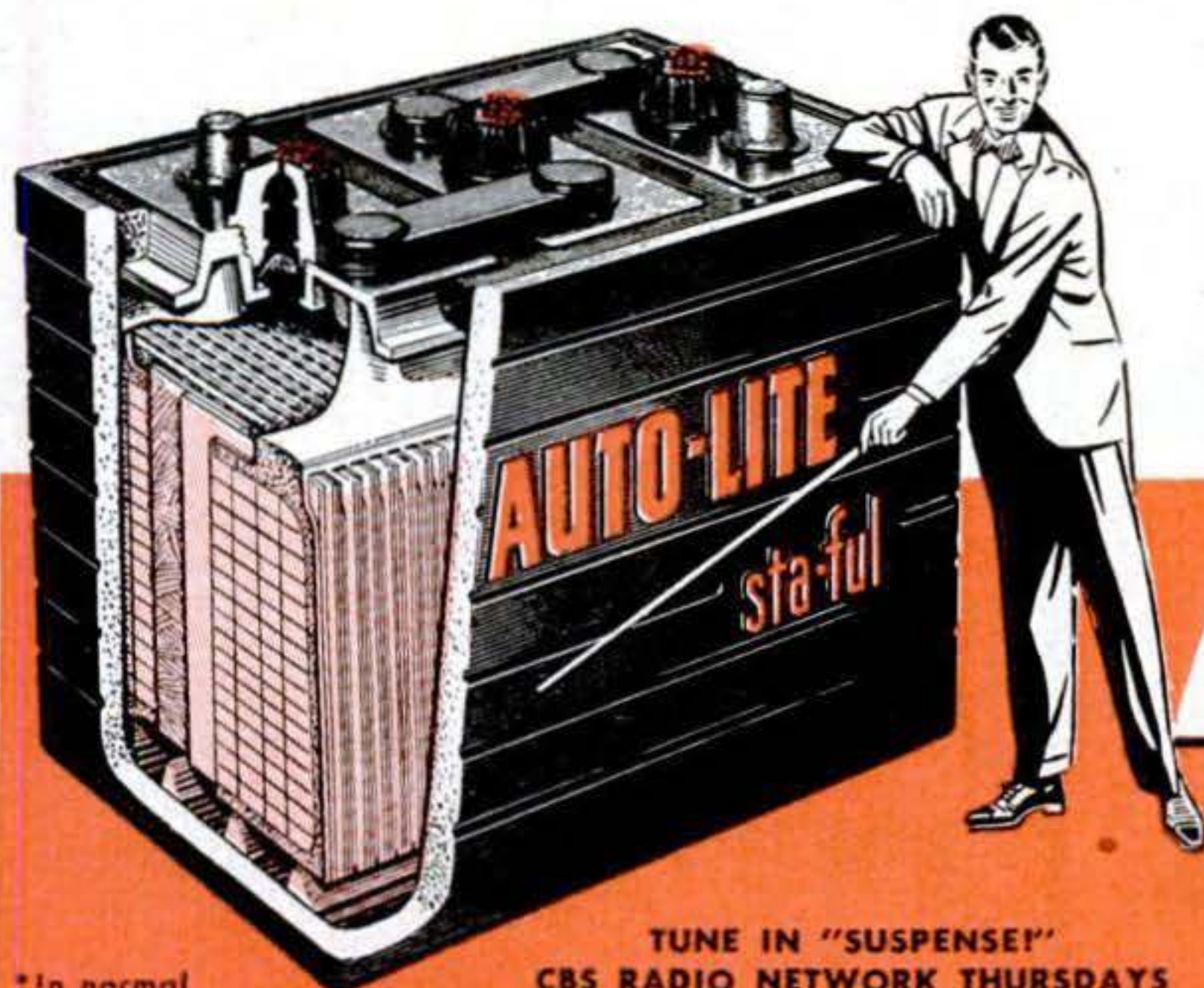
What's **NEW**
in Batteries?

AUTO-LITE **Sta-ful** BATTERY...needs water only 3 times a year*

A revolutionary new development, the Auto-Lite "Sta-ful" Battery, protects you against a major cause of battery failure . . . damage to plates due to liquid loss. This new "Sta-ful" Battery design permits a liquid reservoir with 3 times the capacity of ordinary batteries . . . keeps plates fully covered and active months longer in normal car use.

In addition, "Sta-ful" has Fibre-glass mats to hold the power-producing material in the plates for longer battery life. To get more for your battery dollars, replace with an Auto-Lite "Sta-ful". Money cannot buy a better battery.

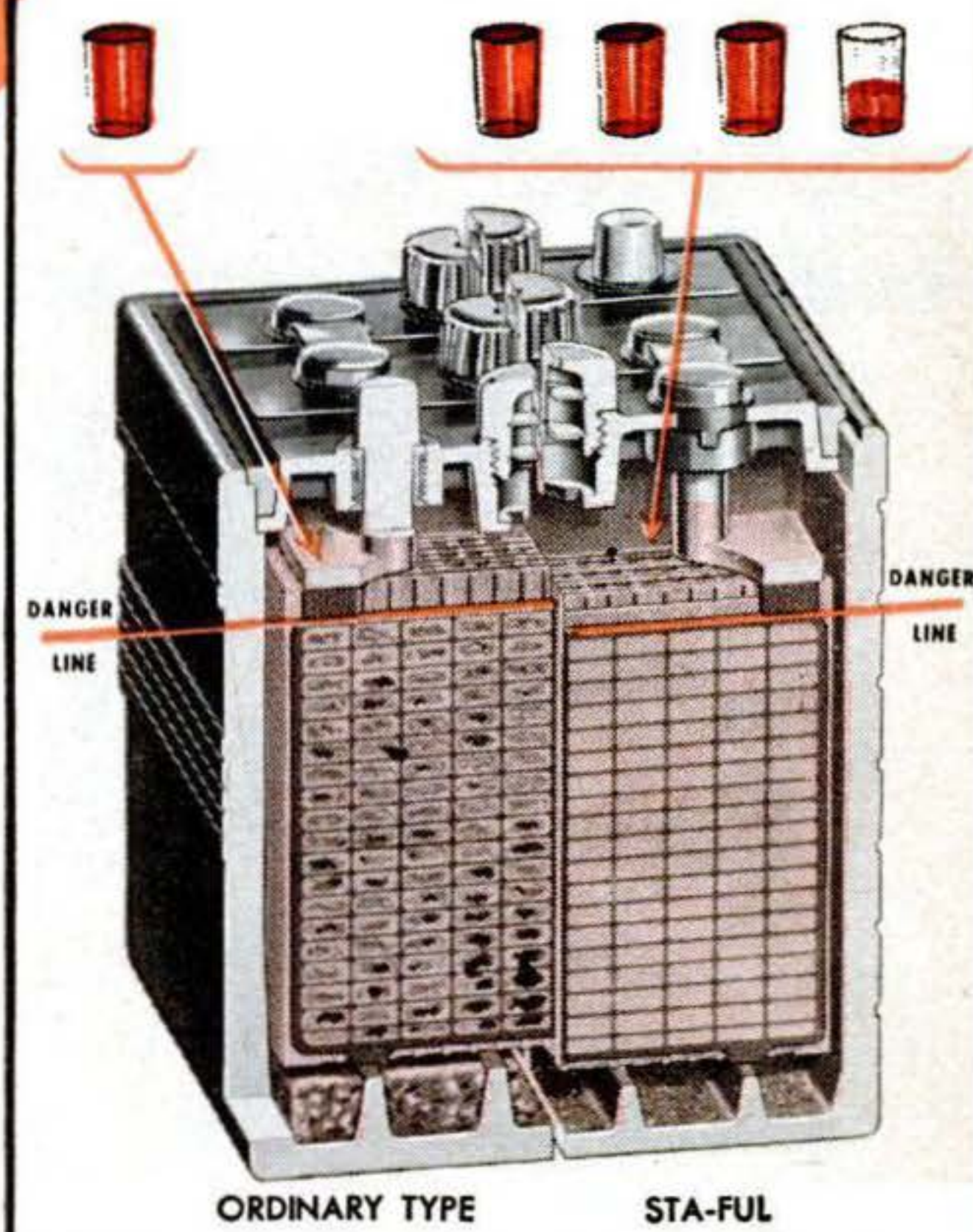
AUTO-LITE BATTERY CORPORATION
Toledo 1 Ohio



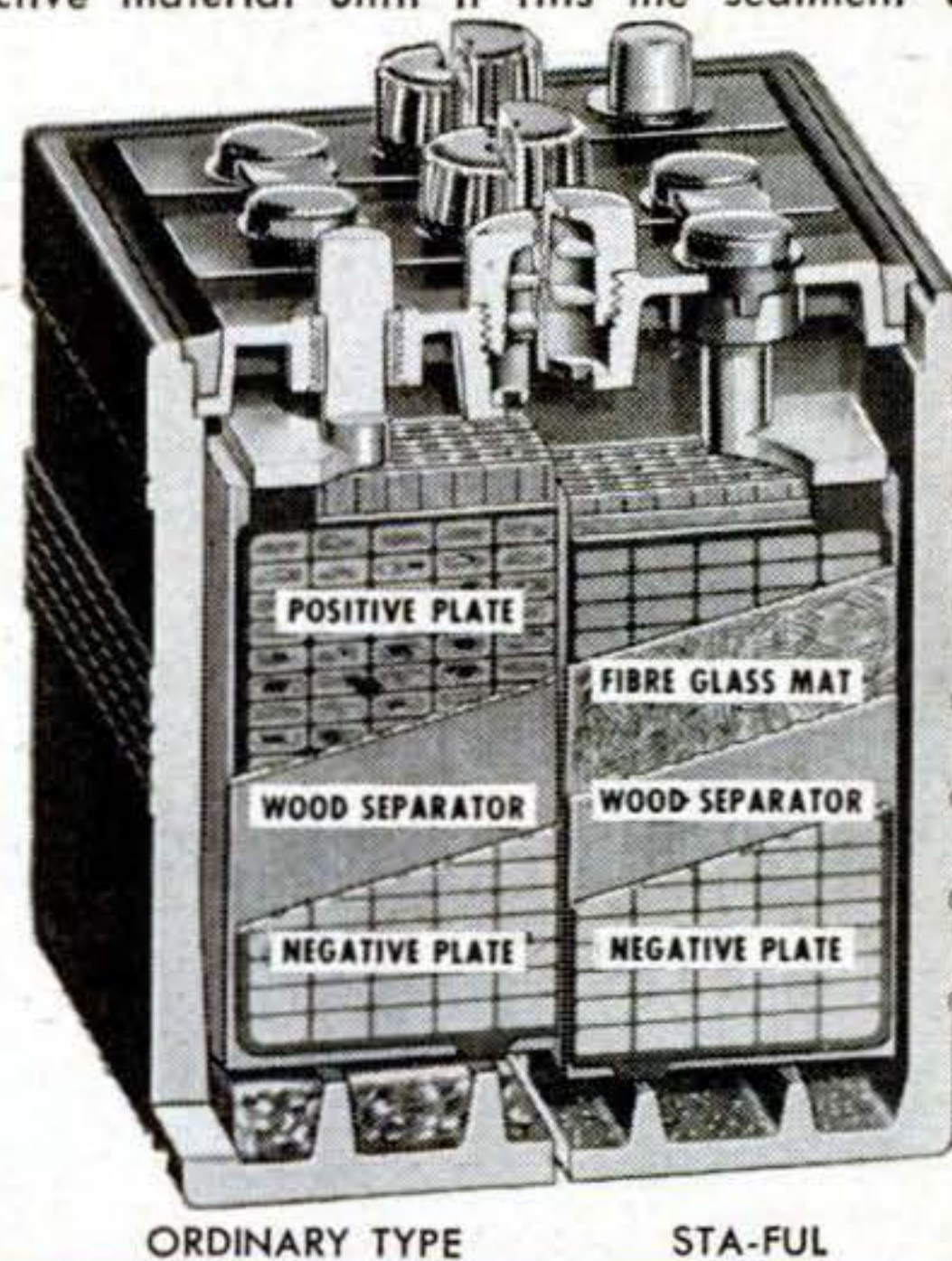
*In normal car use

TUNE IN "SUSPENSE!"
CBS RADIO NETWORK THURSDAYS
CBS TELEVISION TUESDAYS

Because of a unique construction, the new Auto-Lite "Sta-ful" Battery holds more than 3 times the liquid reserve of ordinary batteries.



Note how the protective Fibre-glass mat retains the power-producing material in the positive plate while ordinary battery plates shed the active material until it fills the sediment well.

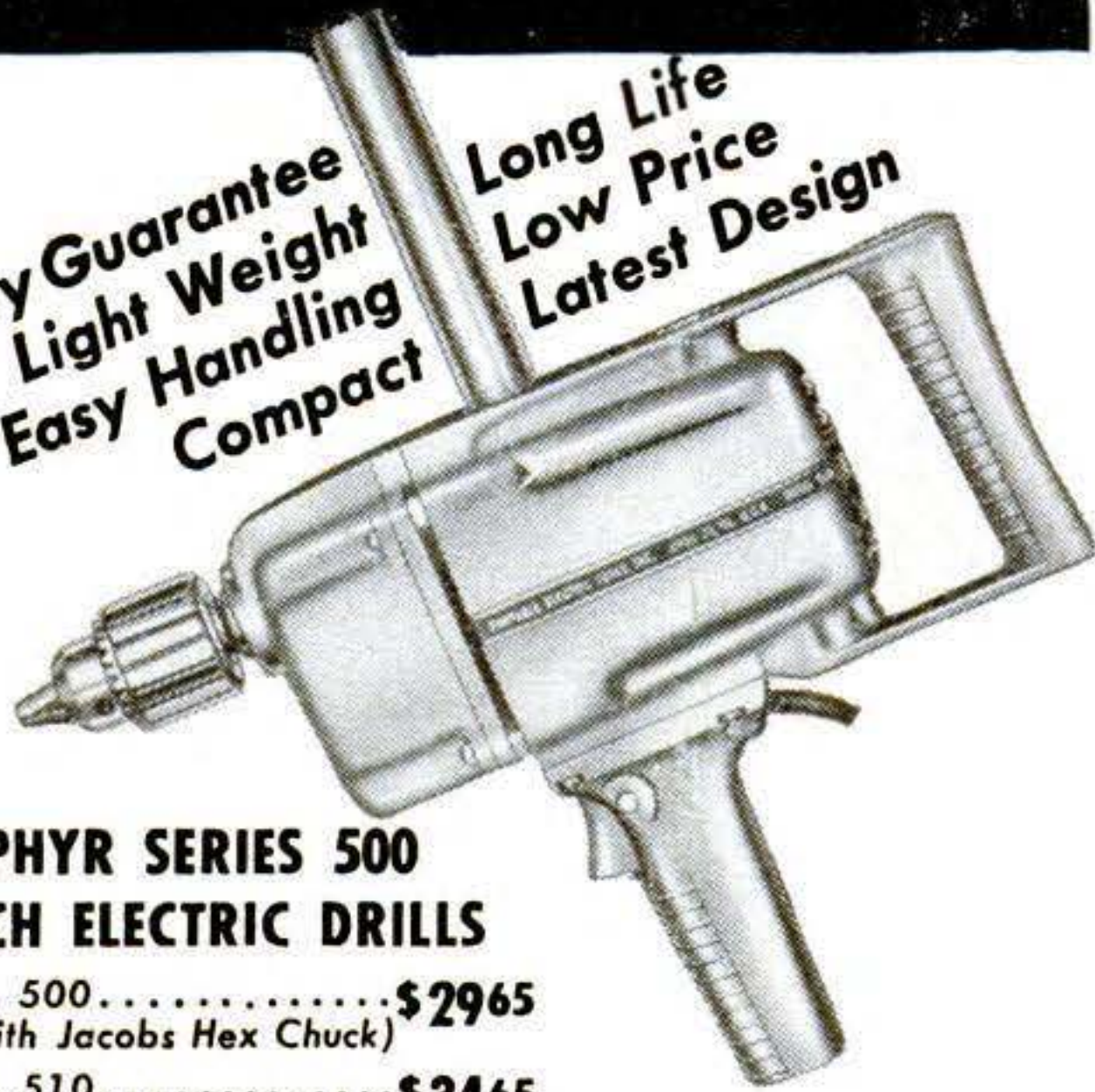


AUTO-LITE Sta-ful BATTERIES

New Values **ZEPHYR MODELS** Portable Electric Tools

Factory Guarantee
Light Weight
Easy Handling
Compact

Long Life
Low Price
Latest Design



ZEPHYR SERIES 500 1/2-INCH ELECTRIC DRILLS

Model No. 500.....\$2965
(with Jacobs Hex Chuck)

Model No. 510.....\$3465
(with Jacobs Gear Chuck)

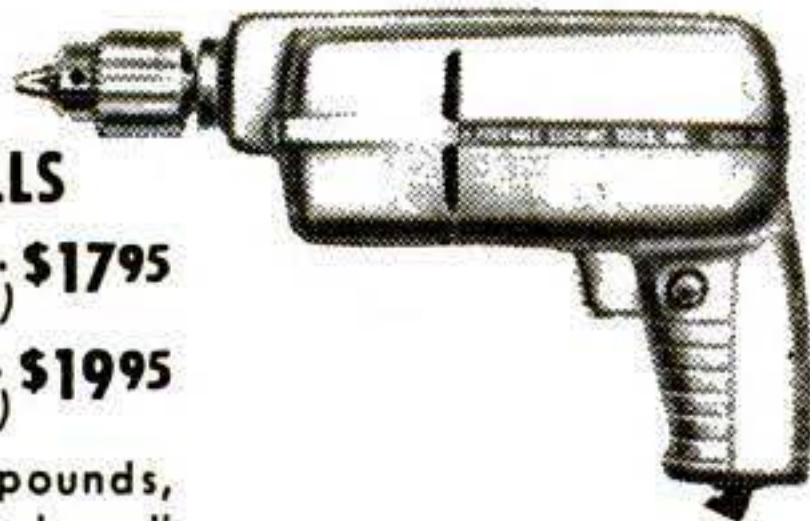
Full 1/2-inch drill capacity; removable side handle for close-quarter drilling; weight complete only 9 pounds. U. L. listed.

ZEPHYR SERIES 1950 1/4-INCH ELECTRIC DRILLS

Model No. 1950-H.....\$1795
(with Jacobs Hand-Tite Chuck)

Model No. 1950-G.....\$1995
(with Jacobs Gear Chuck)

Weight complete, only 3 pounds, 2 ounces. The speed, power, and small size make it the ideal power tool; handy to use as source of power for driving drill attachments for disc sanding and polishing, cleaning paint brushes, grinding and sharpening tools, buffing, removing rust and paint with wire wheel brushes, etc. A real money saver around the house, farm and home shop. U. L. listed.



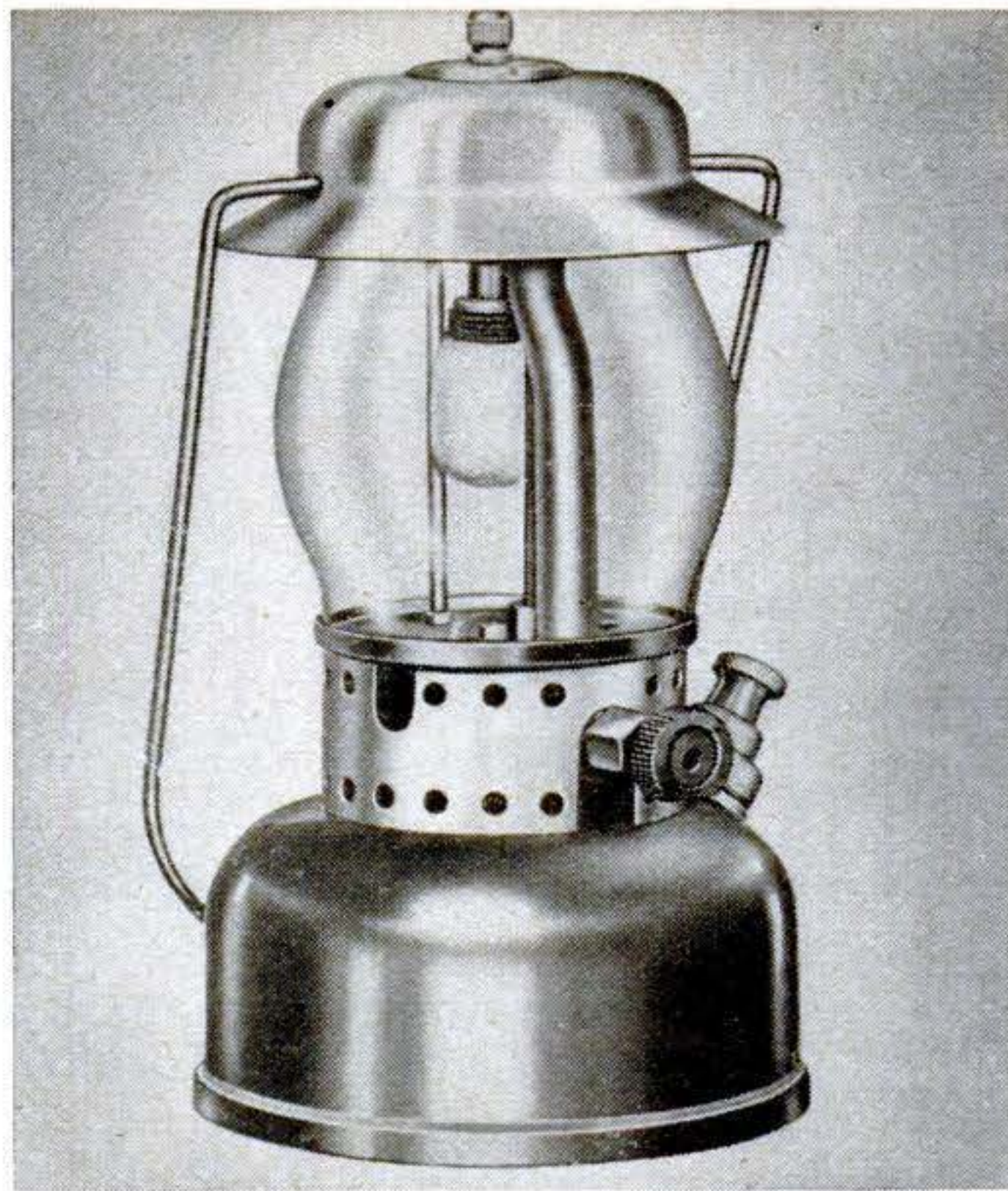
SPRAYMASTER ZEPHYR MODEL SM-25 \$24.95

A complete electric sprayer unit with electric motor, two-cylinder air compressor, pressure equalizer storage tank, 25 to 30 pounds pressure. Sprays paint, enamel, lacquer, insecticides, and mothproofing solutions. Easy to use—no spraying experience necessary for fine job on furniture, cars, radiators, etc. Full instructions with every unit.

See these tools at your dealer, or write direct for full information. Dealer inquiries invited.

GET THIS FREE BOOKLET—16 pages of detail information on Portable's complete line of top-value electric tools, tool kits, and work-saving attachments.

PET PORTABLE ELECTRIC TOOLS, Inc.
326 W. 83rd St., Chicago 20, Ill.



Lantern Has One Control

THERE'S only one control handle to adjust when lighting the new Ready-Lite® gasoline lantern above. The knob combines starting air mix, cleaning needle, and gas-line valve and is shaped so it can be set at the right point by feel in the dark. Thanks to a burner plate that deflects heat in a sideways direction instead of up, the lantern is cool to carry. A combination pump and filler plug provides a 3/4-inch fuel opening for the lamp, which is manufactured by American Gas Machine Co., of Albert Lea, Minn.

Sundial Time

SUN time, as shown on the sundial, starts getting earlier after December 22. In November the sundial is more than 15 min. ahead of our clocks, while in mid-February it is nearly 15 min. slow. In January the difference between sun time and clock time is rapidly changing—which makes the sun seem to rise earlier.

CHAMPION V-GLOW PLUGS

for model engines only



● **CHAMPION TERMINAL**—assures better center electrode seal and provides sturdier electrical connection.

● **CHAMPION-CERAMIC INSULATORS**—proved dependable in millions of Champion Spark Plugs.

● **CHAMPION SILLMENT SEAL**—prevents excessive compression leakage between insulator and shell.

● **CHAMPION "THERM-O-FLEX" CONSTRUCTION**—longer element life, more dependable performance.

Follow recommendations of plug types and fuels approved by engine manufacturer.

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, O.

DEPENDABLE

CHAMPION

SPARK PLUGS

America's Favorite



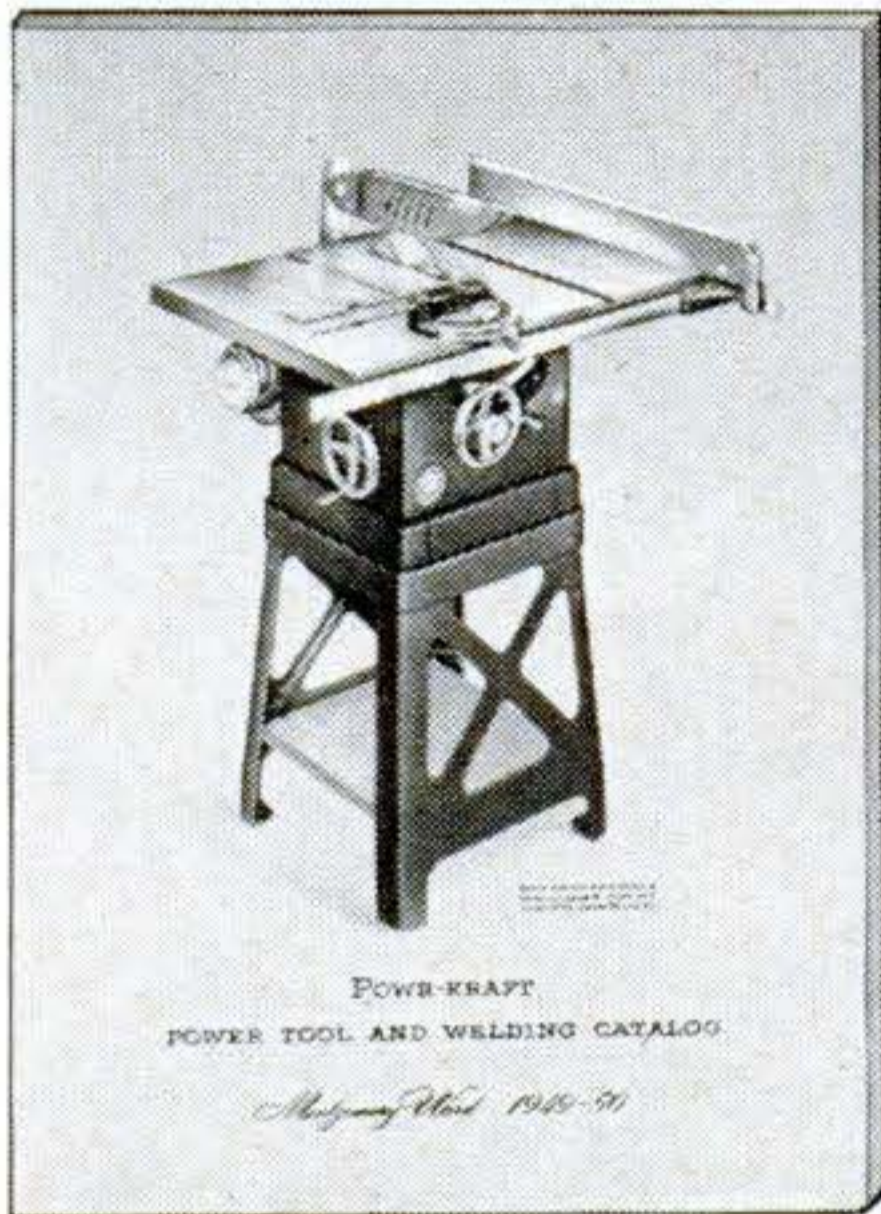
**FOLLOW
THE EXPERTS**
use the spark plugs
champions use

These first crisp days of the football season should remind you that hard starting weather is just ahead, and to have your Champion dealer check your spark plugs. There's nothing like a new set of dependable Champion Spark Plugs to revitalize a sluggish and gas wasting engine. Perhaps they'll only need cleaning and adjusting—but if you find you need new ones, be sure you get Champion, America's Favorite Spark Plug for over a quarter century. CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO.

Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

OCTOBER 1949 259

Free...



NEW POWER TOOL AND WELDING EQUIPMENT BOOK

Beautiful rotogravure 52-page book contains hundreds of illustrations, descriptions and specifications of Wards well-known Powr-Kraft line of tools for wood and metal, and motors. Also shows the nationally-known Logan Metal Lathes, Mail Electric Saws, Burke Milling Machines, Burgess Hand Tool Kits, deluxe quality Beaver Power Tools, etc. Book features the popular Shopsmith, a complete 5-tool-in-1 workshop. All tools may be purchased on convenient monthly payments at Wards Mail Order Houses, Catalog Order Offices or Retail stores.

Every power tool beginner, advanced hobbyist and production shop should have a copy of this money-saving catalog. Use coupon for your free copy now!

Montgomery Ward

Chicago • Albany • Baltimore • Denver • Ft. Worth
 Kansas City • Oakland • Portland, Ore. • St. Paul
 Mail Coupon to Your Nearest Ward house—NOW.

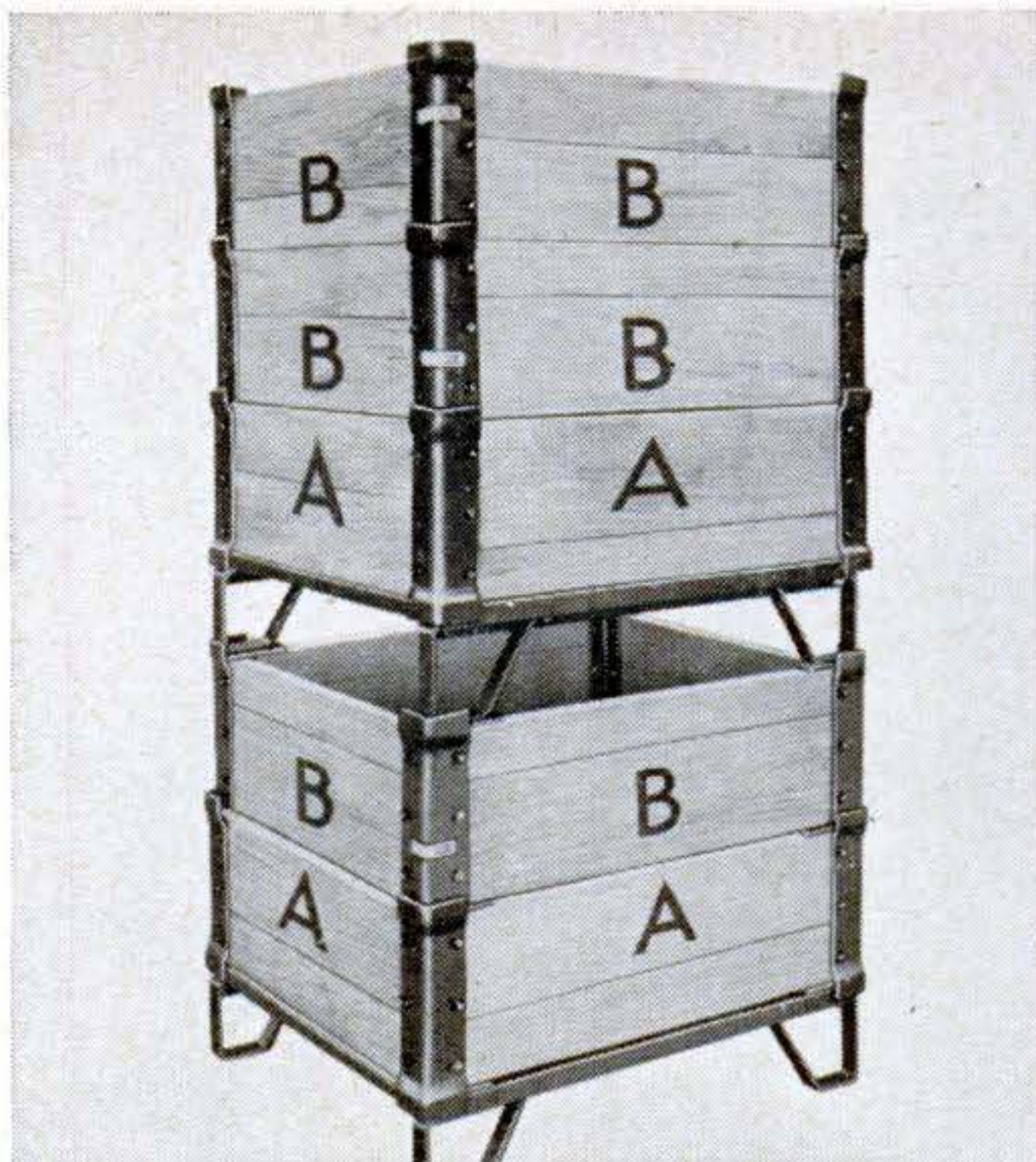
MONTGOMERY WARD, Dept. 84PS-10
 Please send me free Power Tool and
 Welding Catalog.

Name _____
 (Print Plainly)

Street Address,
 Route, Box _____

Post Office _____ State _____

Phone _____



Units Increase Box Depth

You can have either deep or shallow boxes for holding factory materials on skids with the bottomless, hardwood units above. Unit "A," with flanged metal corners that extend beyond both its ends, fits snugly over a skid, which serves as the bottom of a container. Piling Unit "Bs," which are flanged on one end only, on top of an "A" increases a box's depth. Ironbound Box & Lumber Co., of Hillside, N. J., is maker.

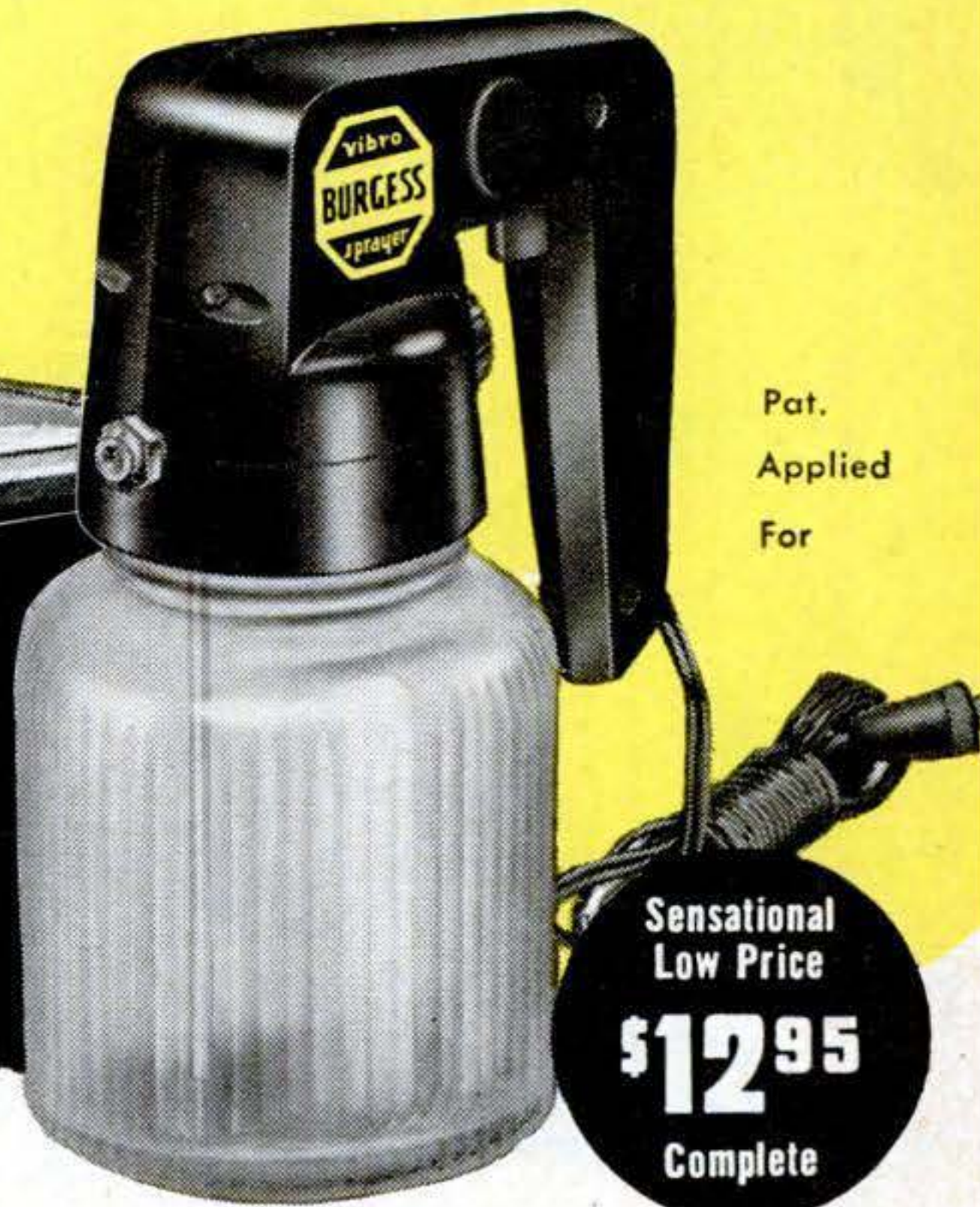
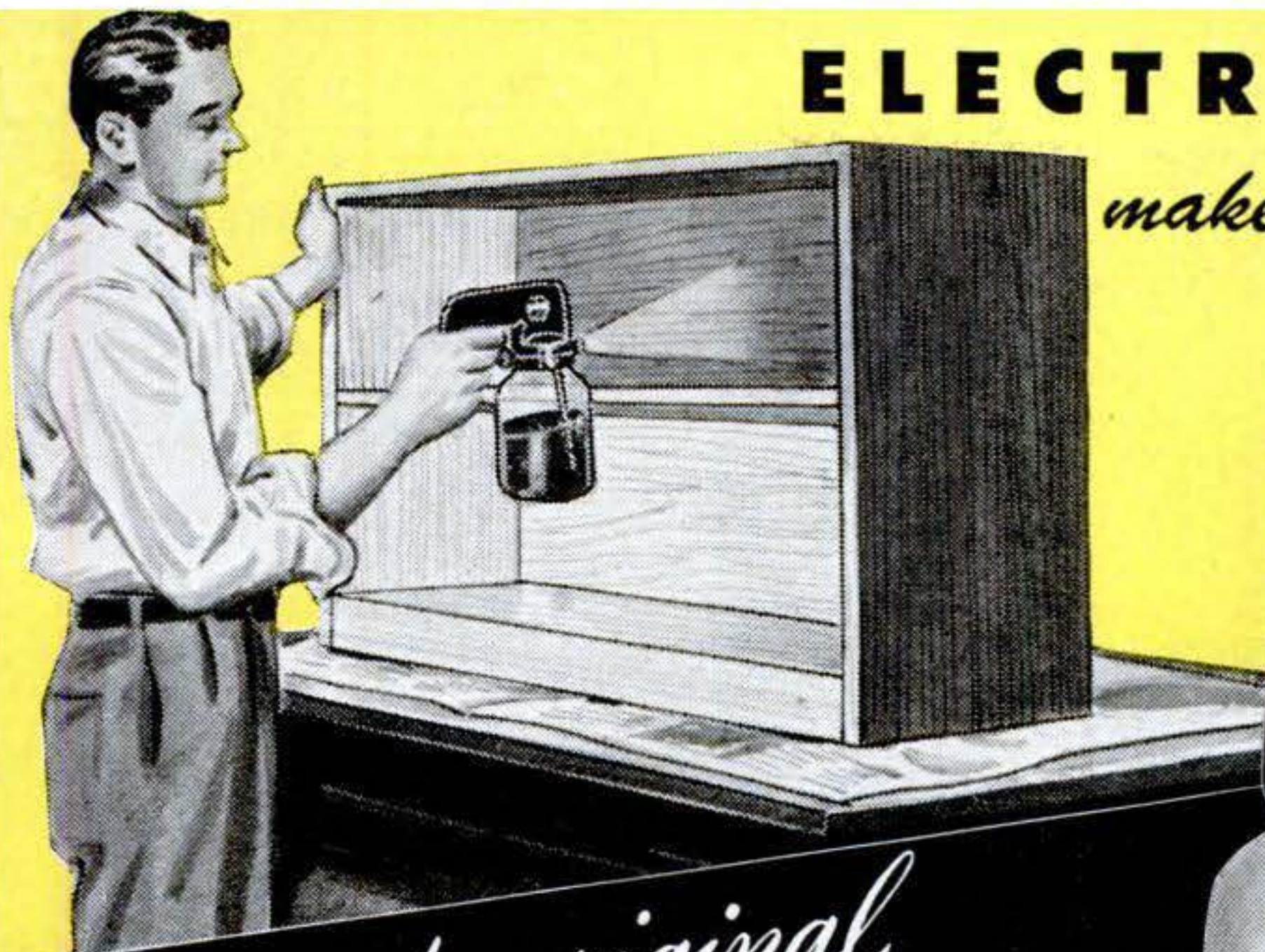


"Mike" Gauges Glass Tubes

THE thickness of a glass tube—or any curved, closed, transparent material—can be measured with Opti-Mike® above. Thickness is found by placing the surface to be measured against a measuring head. Then a graduated dial is twisted until a lamp image is seen sharply focused through the eyepiece. Developed by Instrument Development Laboratories, the device measures to an accuracy of .001 of an inch.

AMAZING NEW LOW-PRICED ELECTRIC SPRAYER

makes painting **EASY!**



Pat.
Applied
For

the original
BURGESS
vibro-sprayer

NO MOTOR...NO COMPRESSOR...
NO "EXTRAS" TO BUY

Sensational
Low Price
\$12.95
Complete

Just Plug In and Spray!

Easy, economical paint spraying is now as convenient as your nearest electrical outlet. Just plug the sensational Burgess Vibro-Sprayer into any 110 volt A.C. socket, press the trigger and spray. You get a beautiful, smooth finish on tables, chairs, bookcases, toys, fences, screens, floors...almost anything around the home or shop... in minutes instead of hours. Refinishes car bodies and fenders, too. And Vibro-Sprayer handles enamel, lacquer, varnish, shellac...plus light oils, insecticides. Weighs only 2½ lbs. Comes complete with 25 oz. Mason-type jar and 8 ft. cord. Fully guaranteed.

Write for **FREE Literature**

Unique **BURGESS**
vibro-tool
adds **POWER**
to hand skills!



This revolutionary marking tool delivers 7200 vertical strokes per minute to write like a pencil on hardest steel, mark tools, decorate glass, engrave plastics, tool leather, chisel wood or linoleum blocks, emboss metal foil, cut balsa wood, cork and cardboard. Specially designed kits for general use, leather tooling, and simple marking and engraving. All-purpose Master Craft Kit with 9 attachments shown, only... **\$9.95**
Leather Craft Kit plus 9 attachments... **\$9.95**
Marking Kit including Vibro-Tool and hard tantalum carbide point... **\$7.50**
3 different kits... each packed in sturdy, attractive storage case

BURGESS
BURGESS BATTERY COMPANY, Handicraft Division
165 RAND ROAD, LAKE ZURICH, ILLINOIS

Please send me full information on: Vibro-Sprayer,
 Master Craft Kit, Leather Craft Kit, Vibro-Tool and Point.

My Name _____

Street Address _____

City _____

Zone _____

State _____

BURGESS BATTERY COMPANY HANDICRAFT DIVISION
LAKE ZURICH, ILLINOIS



SANTA SAYS:
"A WONDERFUL HOBBY
WORKSHOP GIFT!"

Just dial ANY WIDTH CUT
ON YOUR SAW



WITH

Warren

DADO SAWING WASHERS

Cut clean, accurate, parallel grooves—12 widths, any angle. No chatter, burning, chewing—or sanding! No more blade vibration—no screws to fuss with—just four balanced washers. Simply dial desired width with Micro-matic adjustment. Can be left on blade for straight cuts. Available in 5 sizes— $\frac{1}{2}$ ", $\frac{3}{4}$ ", $\frac{5}{8}$ ", 1", $1\frac{1}{8}$ ". A perfect gift for woodworkers. See your dealer or write—

YOUR
SAW
IN ACTION

\$4.95
SET

WARREN WASHERS CO.
Dept. 50 • 70 Medbury • Detroit 2, Mich.

BUILD YOUR OWN TILTING ARBOR SAW!

SAVE
\$50
OR MORE

Exclusive GIL-BILT Build-It-Yourself Features

- No machining—build easily with hand tools only
- No blueprint reading—step-by-step pictorial plans, full scale patterns, actual photographs
- Sturdy wood, aluminum, and steel construction
- Capacity and performance of commercial saws selling for \$60 and up

GIL-BILT 10-INCH TILTING ARBOR SAW

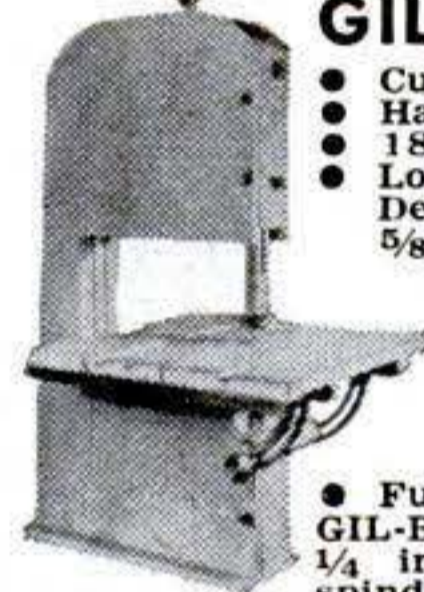


- 27x28 in. table, 13 $\frac{1}{2}$ in. capacity in front of blade
- 10 in. blade cuts $3\frac{1}{4}$ in. deep, tilts full 45 degrees
- Floor model 34" high table always stays level

- New Departure ball bearing arbor, $\frac{3}{4}$ " precision shaft turned down for $\frac{5}{8}$ " bore blades, alum. housing, shipped ready to run
- Jackscrew and 4 $\frac{1}{2}$ in. dia. handwheel lowers and raises blade
- Cast aluminum miter gauge and self-aligning rip fence guide

GIL-BILT Metal Parts Kit includes Plans, ball bearing arbor, miter gauge and bar, rip fence guide, dado insert, lock knobs, jack screw mechanism and handwheel, and all other metal parts (less blade) \$20.95
Same Kit with 10" Combination Blade . . . \$24.90
Same Kit with 8" Combination Blade . . . \$23.90

GIL-BILT 12-INCH BAND SAW



- Cuts to center of 24 inch circle
- Handles stock up to 6 inch thick
- 18x18 inch table tilts 45 degrees
- Lower wheel and drive pulley runs on sealed New Departure Ball Bearings; Upper wheel runs on two $\frac{5}{8}$ " bore Oilite Bronze bearings.

- Upper and lower blade guides. Each has ball thrust bearing, self-lub bronze jaws.
- Rubber tired wheels. Choice of cast aluminum or make-your-own wood wheels on metal hubs.
- Uses standard 78 inch blades up to $3\frac{3}{8}$ inch wide.

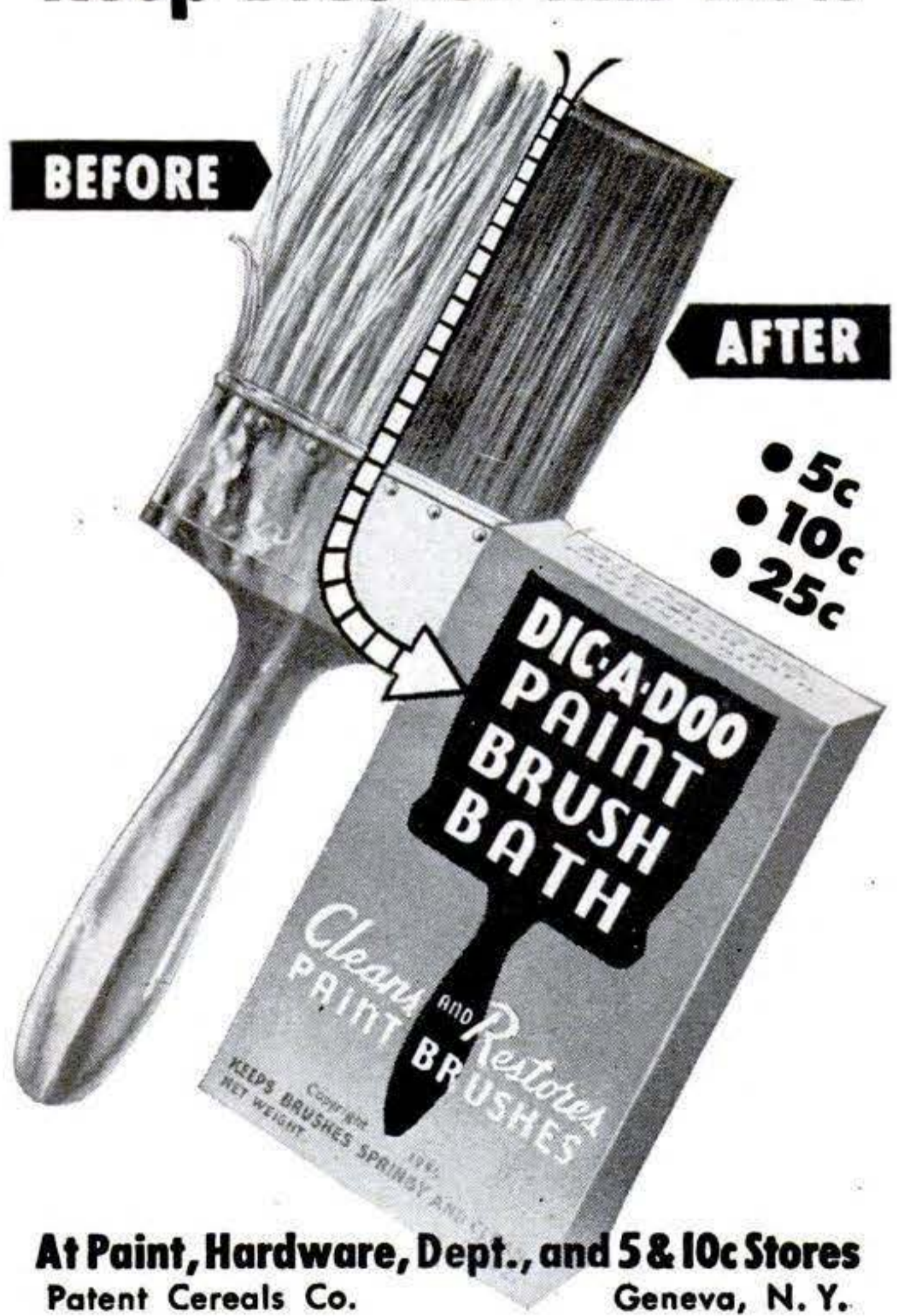
GIL-BILT Metal Parts Kit includes Plans, rubber tires, $\frac{1}{4}$ inch blade, hubs for wood wheels, ball bearing spindle, tilt mechanism, guides, table tilt segments and all other metal parts \$16.95
Same Kit with two machined ready-to-install 12" cast aluminum wheels \$20.95

Return in 10 days for full refund if not satisfied.
(Prices include postage within 600 miles. Over 600 add 5%)

Also available—Plans and Parts Kit for 8" Tilt/Table saw. Order Plans at \$1.00 each—sent postpaid anywhere in the world or write for FREE descriptive catalog.

GILLIOM POWER TOOLS P. O. Box 1-VK, Lambert Field
St. Louis 21, Missouri

Keep Brushes like New

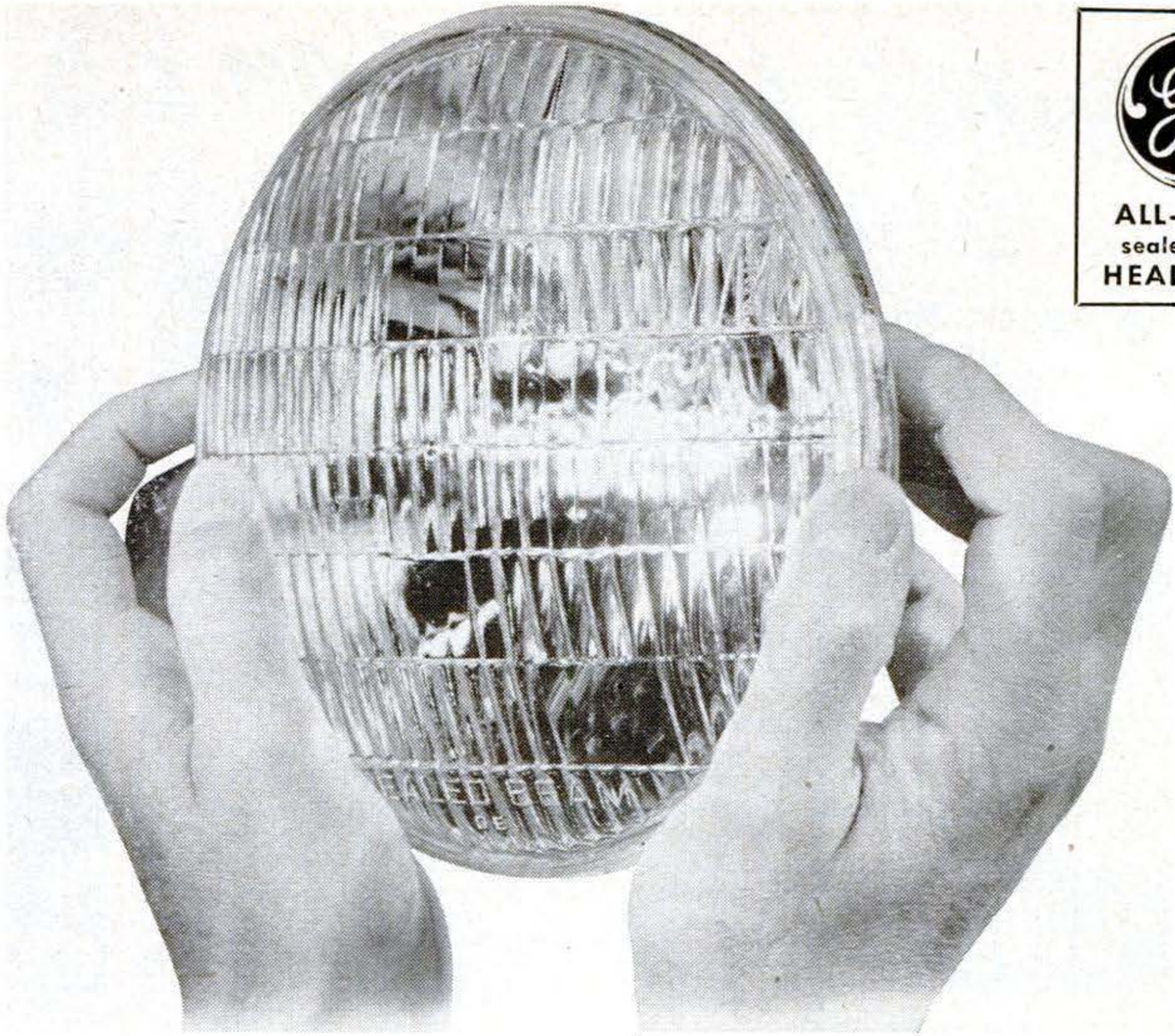


BEFORE

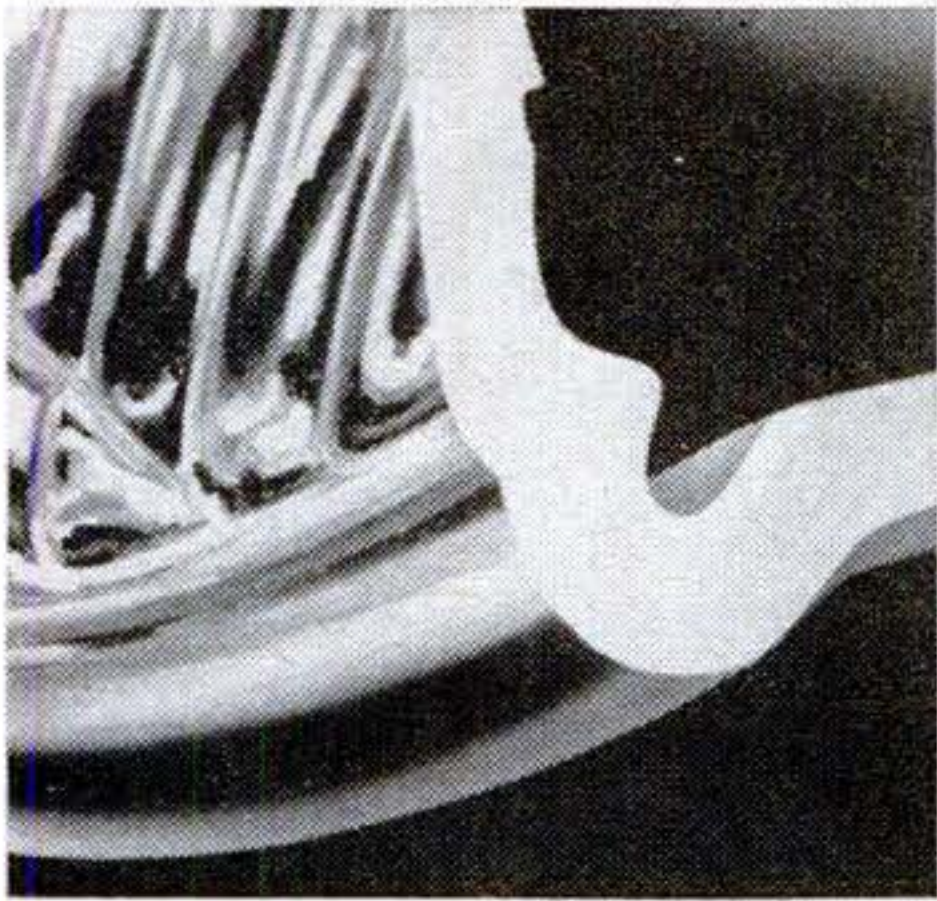
AFTER

• 5c
• 10c
• 25c

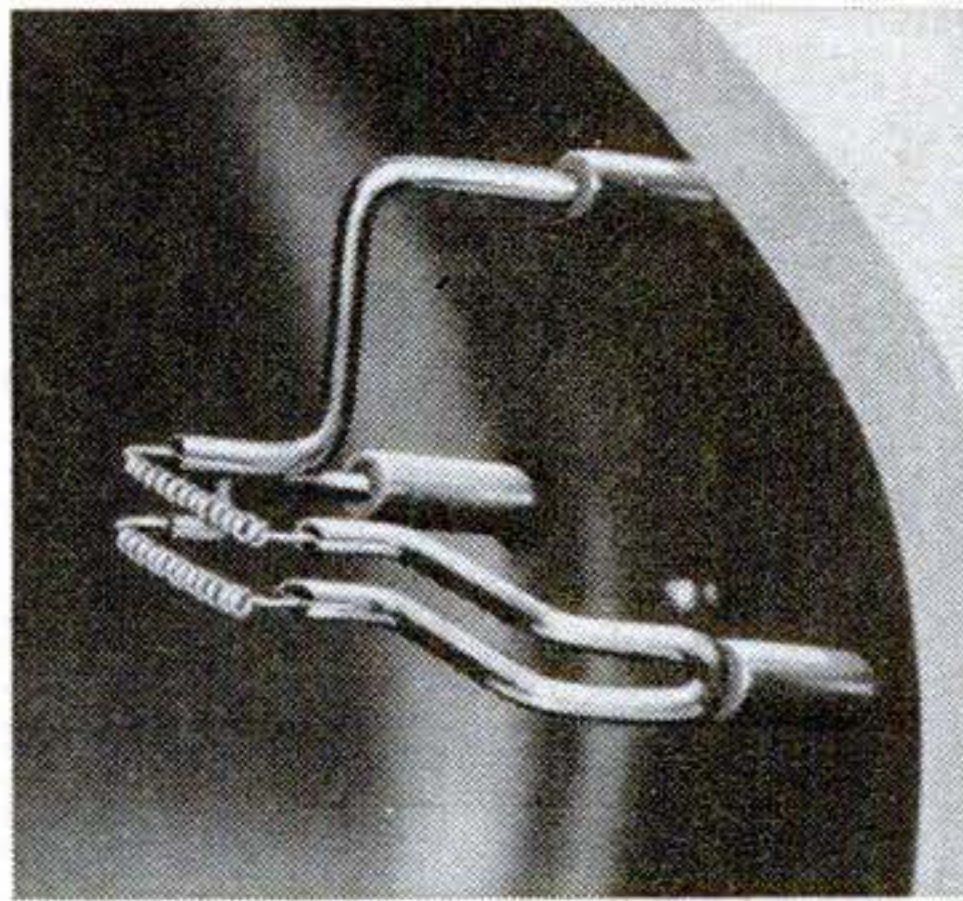
At Paint, Hardware, Dept., and 5 & 10c Stores
Patent Cereals Co. Geneva, N. Y.



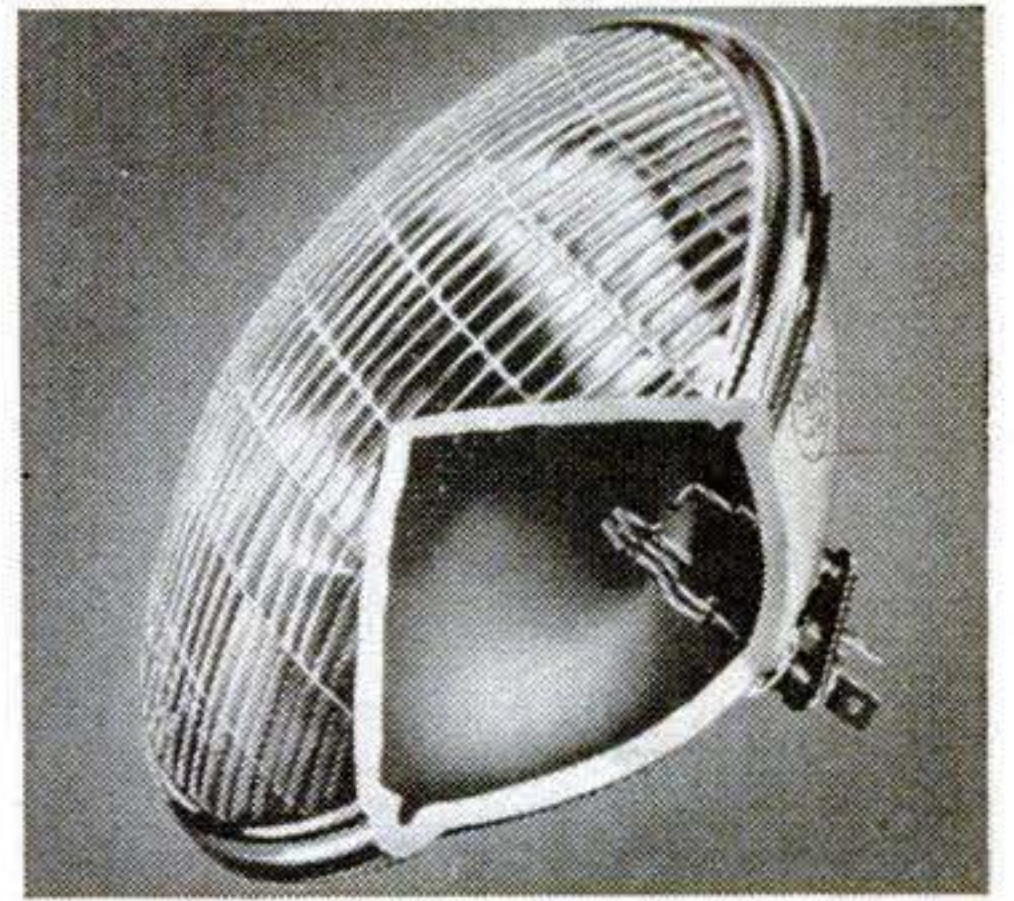
Why this headlamp does not grow dim



1. DIRT AND MOISTURE can't get in to steal the light, because the General Electric headlamp is a one-piece "all-glass" unit. Lens is shock-resistant hard glass, precision-made to throw maximum light on road.



2. RUGGED FILAMENTS give 12% more light on the road for driving, 16% more light for passing. Clamped in a vise-like grip, they won't shake loose. And the reflector stays mirror-bright for life.



3. ONE-PIECE CONSTRUCTION means G-E headlamps average 99% of original brightness at end of life . . . *do not grow dim!* Have lights checked when car is serviced. Get G-E lamps for replacement.

You can put your confidence in—

GENERAL  **ELECTRIC**

FOR YOUR CAR'S ENGINE

Scientific Lubrication begins here

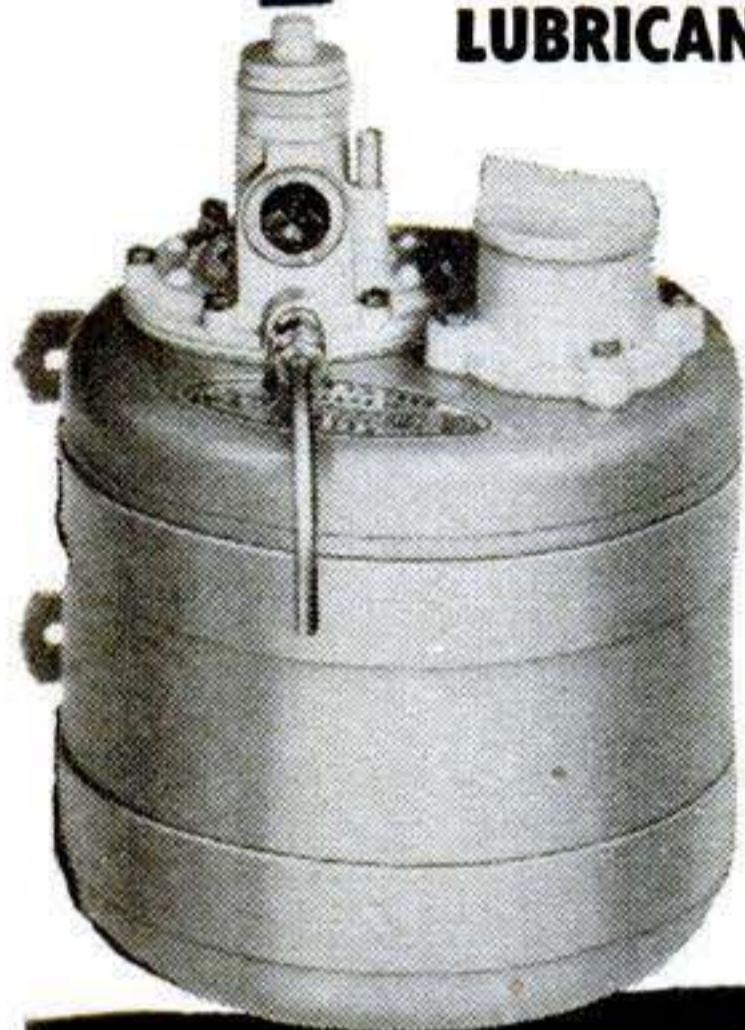
THE MARVEL INVERSE OILER ASSURES LUBRICANT PROTECTION FOR EVERY ENGINE PART

The upper cylinder area of your car's engine is the hottest, most critical spot in the operating motor. Here, ordinary lubricants fold up, causing rapid wear of pistons and cylinder walls. You can keep wear down and performance up with the MARVEL INVERSE OILER! Shown above is the operating head (without dust cap) of this famous, low cost device that meters MARVEL MYSTERY OIL to the engine, precisely in accordance with the demands of the engine under load. When used with MARVEL MYSTERY OIL, it's guaranteed for TWO YEARS!

MARVEL MYSTERY OIL is not just an oil but the famous Additive that produces a slow idle, faster engine pick up, easier starting and an even, power pull. Thousands of economy-minded car owners have used it enthusiastically for years. Learn what MARVEL can do for you to make your car do more and last longer.

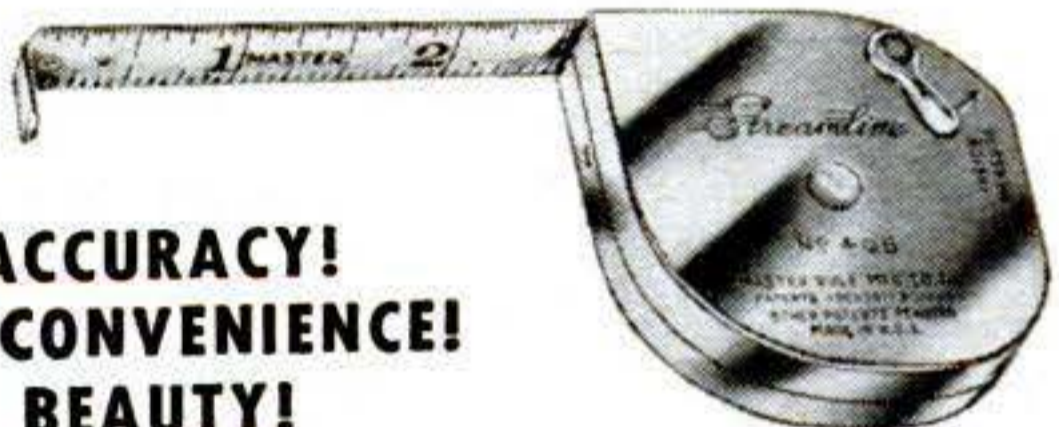
Easily Installed on All Engines

**EMEROL MANUFACTURING CO., INC.
242 W. 69th ST., NEW YORK 23, N. Y.**



WRITE FOR THE FACTS-NOW!

**ACCURACY!
CONVENIENCE!
BEAUTY!**



Next time you're near your hardware or building supply dealer, try MASTER STREAMLINE. You'll know you're handling a superbly precise measuring instrument . . . worthy of the professional man and the highly skilled craftsman!

Note the extra-long 7/16" tip: STAYS PUT ALMOST ANYWHERE! . . . the positive Lever Tape Lock: HOLDS READING AUTOMATICALLY! . . . fine tempered steel blade graduated on both sides: ALWAYS RIGHT FOR ANY MEASUREMENT! . . . direct reading inside measure: QUICK AND EASY TO USE! . . . mirror-chromed case: STREAMLINE'S FUNCTIONAL BEAUTY LASTS!

MASTER STREAMLINE HAS EVERYTHING!
See, try and buy one now. If you prefer, mail coupon with remittance for your STREAMLINE today!

MASTER

REG. U.S. PAT. OFF.

WOOD AND STEEL TAPE RULES

Master Rule Mfg. Co., Inc. PS-10
201 Main Street, White Plains, N. Y.

I enclose \$2.25 for the 6 ft. Streamline
\$2.50 for the 8 ft. Streamline
Engrave my name (75c extra). Please print clearly.

NAME.....

ADDRESS.....

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

If you like fine tools

. . . then you'll really enjoy the smooth, fast action of the "GREENLEE 22" Solid-Center Auger Bit. And you know it reaches you "factory sharp," for each is Plastic-Sealed with a special protective coating. Ask your hardware dealer for "GREENLEE 22."



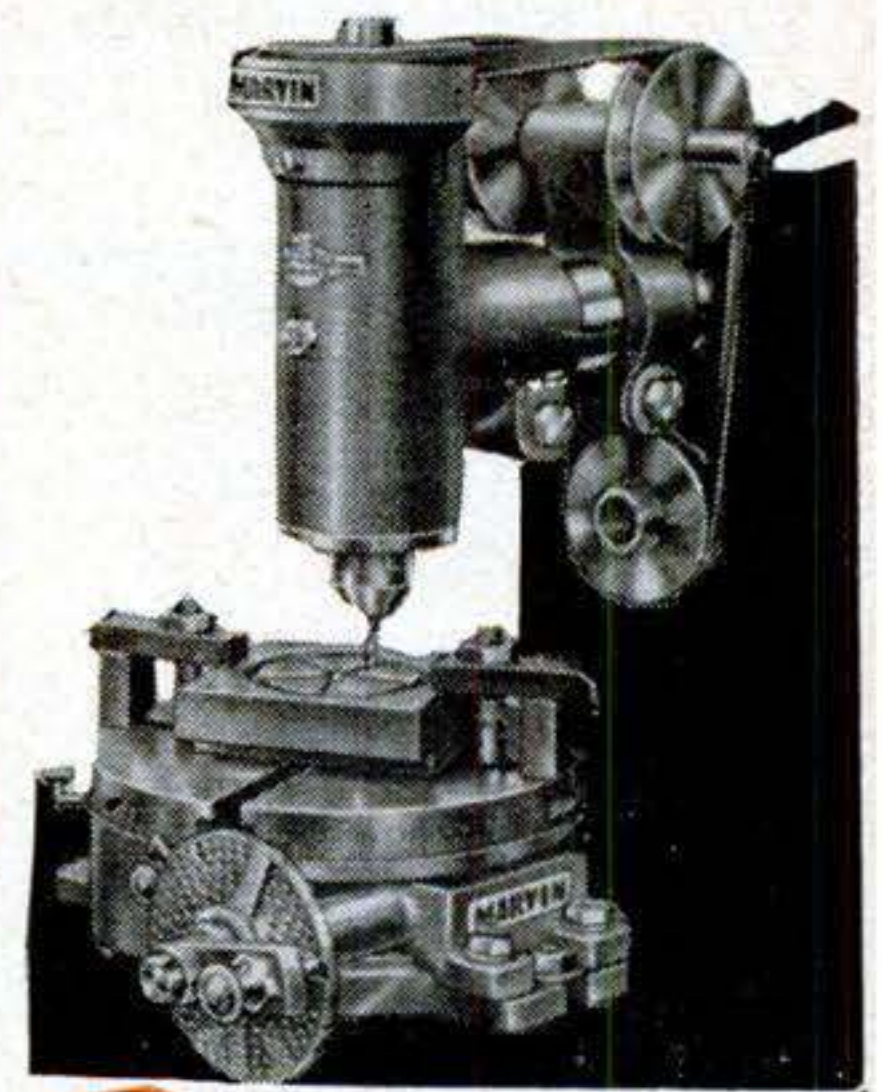
SPECIAL OFFER . . . WOODWORKING CALCULATOR... 10¢. Quick solutions to countless problems... converting linear to board feet, nail and bit sizes, etc. Send 10c to Greenlee Tool Co., 2130 Columbia Ave., Rockford, Ill.

Increase the
Versatility of Your
ATLAS Bench Mills

With the
MARVIN
VERTICAL MILL ATTACHMENT
and **ROTARY TABLE**

400%

NEW!



"HERE IT IS, PAL, ALL SET TO GO — ATTACHED TO THE SPINDLE IN A HURRY."

"YEAH, AND NO EXTRA MOTOR NEEDED. IT'S VERSATILE — LOOKIT ALL THE TOOLS YOU CAN USE."



"SET THE HEAD AT AN ANGLE — OR PULL IT OUT PAST THE TRAVEL OF THE TABLE, IF YOU'VE GOT OVERHANGING WORK TO HANDLE — AND WHAT A VARIETY OF WORK YOU CAN DO NOW."



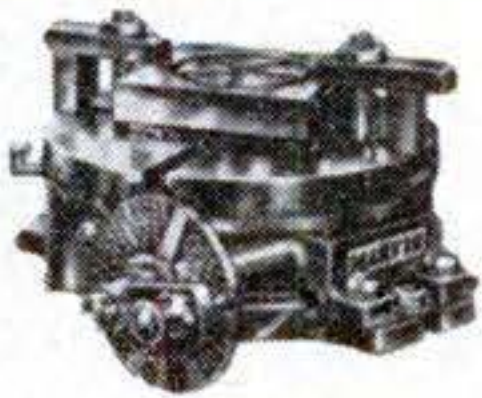
"YOUR BENCH MILL CAN TURN OUT MOLDS LIKE THIS, OR PUNCHES, DIE SHOES AND A LOT OF STUFF YOU NEVER COULD MAKE BEFORE."



"AN' THE BEST THING IS, THE COST — YOU JUST CANT AFFORD NOT TO HAVE THIS ATTACHMENT."



"YESSIR, WE'VE REALLY GOT SOMETHING FOR YOU — ASK US FOR THE FULL DOPE — SEND US THAT COUPON TODAY."



The 6" MARVIN Rotary Table cannot be matched for price — extremely rigid, furnished with index plates and hand wheel.

MARVIN R-1102 ROTARY TABLE
\$9300 F.O.B. FACTORY

Marv and Vin really do have something to interest you bench mill owners. The Marvin V-1200 Vertical Mill Attachment is the most valuable addition you can make to your present mill. *Simplicity, quick job change-overs, ease of attachment, and high performance characteristics* give you all the benefits of a new and expensive machine tool at *extremely low cost* — without taking additional space. Mail coupon today for literature and prices on the full Marvin line of Bench Mill Attachments, including Slotting Attachment and Rotary Table.

MARVIN V-1200
VERTICAL MILL ATTACHMENT

\$6500

F.O.B.
FACTORY

Copyrighted 1949 by H. B. Hazerodt

MARVIN
MACHINE PRODUCTS, INC.

SALES OFFICE • 414 FORD BLDG.
DETROIT 26, MICHIGAN

MARVIN MACHINE PRODUCTS, INC.
414 Ford Bldg. • Dept. 100 PS • Detroit 26, Mich.

Please send me literature

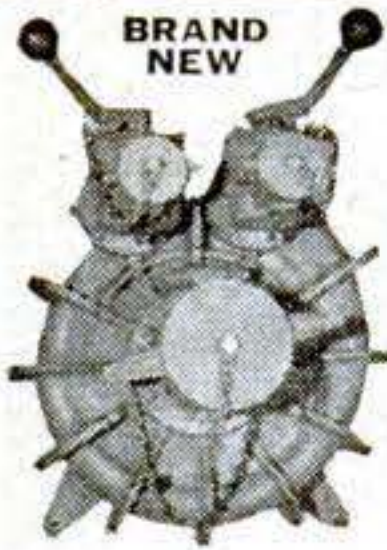
Name _____

Company _____

Address _____

City _____ Zone _____ State _____

2 Pages of GROBAN'S WAR SURPLUS SPECIALS!



HALE FIRE and IRRIGATION High Volume CENTRIFUGAL PUMP

For Fire Protection, Irrigation, De-Watering, Industrial Uses, Farm Uses, Etc.
Pumps Rated 500 Gallons Per Minute at 275 Ft. Head Pressure

Equipped with 1 1/2" diameter straight splined shaft for direct coupling drive; 4 1/2" threaded suction intake; two-2 1/2" threaded discharge outlets; Hale Pump Co. Model CF volute type; use any 4 or 6 cylinder gas engine or couple directly to front of truck or auto; or use 25 H.P. electric motor; dimensions 21" x 24" x 28". Complete with full accessory kit including suction and pressure gauges, priming equipment, and instruction book. Ship. wt. 415 lbs.

NOW
\$149.50

GOV'T ACQUISITION COST \$425.00 (ITEM #48) F.O.B. Chicago

WATEROUS PUMP

Rated 500 GPM at 120 P.S.I.

This high efficiency pump is designed for front end mounting on General Motors, Dodge and Ford trucks. Comes complete with gear box for speed step-up; easily mounted for drive from crank shaft. Net wt. 500 lbs. Ship. wt. 1200 lbs. A REAL BUY...

\$149.50
F.O.B. Chicago

Hydraulic Cylinders-Air or Oil



Use hydraulics on arbor presses, hydraulic presses, hay lifts, manure loaders, lift trucks—push or pull, tilt or turn, press or squeeze, open or close, lift or lower—and other hydraulic and industrial applications. Use with either air or oil . . . of finest precision workmanship. BRAND NEW.

ITEM #4—Double action, 1" bore, 3" stroke, will lift 770 lbs. in 1/10 of a second using Logan Pump. All steel barrel. Ideal for controls, door openers, positioning, etc. An \$18.00 value. . . . **postpaid \$4.95**

ITEM #32—Double action, 1 1/2" bore, 9" stroke, will lift 1760 lbs. in one second with Logan Pump. Wt. 4 lbs. A \$45.00 value. . . . **postpaid \$10.95**

ITEM #16—Use these cylinders on farm trucks, bulldozers, hay lifts, manure loaders, etc. Double action, 1 1/2" bore, 27" stroke. (Will lift 1760 lbs. in 2 seconds with Logan Pump.) Wt. 8 lbs. A \$55.00 hydraulic cylinder value for only. . . . **postpaid \$12.95**

ITEM #17—Double action, 2 3/8" bore, 8" stroke. (Will lift 4400 lbs. in one second with Logan Pump.) Will withstand 1500 P.S.I. against wall. Wt. 7 lbs. A \$65.00 value. . . . **postpaid \$14.50**

ITEM #20—Double action 2 3/8" bore, 4" stroke, two-way solid 5/8" alloy steel shaft (will lift 4400 lbs. in one second with Logan Pump). A \$73.00 value. . . . **postpaid \$16.50**

ITEM #15—Double action, 3" bore, 8 1/2" stroke. All steel hydraulic cylinder, will lift up to 12,000 lbs. (7000 lbs. in 3 seconds with Logan Pump). Complete with fittings. Wt. 12 lbs. A \$78.00 value. . . . **postpaid \$19.50**

Item # 31. Double action, 3 1/2" bore, 11" stroke. (Will lift 9600 lbs. in 7 seconds using Logan Pump.) Complete with fittings. Wt. 15 lbs. A \$92.00 value. . . . **postpaid \$22.50**

Item # 6. Double action, 3" bore, 23" stroke, hydraulic cylinder will lift 7070 lbs. in 5 1/2 seconds using Logan Hydraulic Pump. Especially suited for farm and construction machinery. Clevis mounting for easy use. Wt. 22 lbs. A \$145.00 value. . . . **\$27.50**
F.O.B. Chicago

ITEM #42—Double action hydraulic cylinder, 4" bore, 18" stroke. Rated lift capacity with 1000 P.S.I. input is 12,560 lbs. using Logan Pump. Ship. wt. 30 lbs. AN EXCELLENT VALUE for. . . . **\$32.50**
F.O.B. Chicago

HI-PRESSURE FITTINGS for cylinders and valves available at 35c ea. for 3/8" pipe and 50c ea. for 1/2" pipe.

CENTRIFUGAL PUMP

BELT DRIVEN READY FOR USE ON ANY LIQUID PUMPING NEED

A super value for all types of intermittent service in pumping large volumes of liquid in home, farm and industrial service. Ideal for home water systems, draining basements, fire protection, etc. On the farm for watering stock, draining ponds, sprinkling, etc. In shops and factories for all types of pumping service.

Use it for

- Draining Basements
- Home Water Systems
- Irrigation
- Stock Watering
- Fire Protection
- Draining Ponds, Tanks, etc.
- Industrial Pumping

MOVE LARGE VOLUME QUICKLY. When operated at 1750 RPM, will pump 42 gallons per minute on a 23 foot head; at 3600 RPM on 52 foot head will pump 88 gallons per minute. May be run with electric motor, gas engine or power take-off on tractor.

COMPLETE ENGINEERING REPORTS AND OPERATING INSTRUCTIONS FREE WITH PUMP

Pump has cast aluminum housing—accurately machined bronze impeller vanes. Complete with mounting bracket and 3 1/2" V belt pulley. Shaft rotates on sealed ball bearings with grease gun fitting. Has 1 1/2" threaded intake flange, two 1 inch outlets. Use one or both, as necessary. Made for Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft engines.

Greatest Pump Value In Years Complete with Pulley and Mounting Bracket—Ready for Use.

Shipping weight 23 lbs. You can't beat this value at anywhere near this price. Satisfaction guaranteed.

Original Cost Approx. \$147.00. (Item #64) F.O.B. Chicago



Brand New

\$29.75

Be Prepared with an Auxiliary AC LIGHT PLANT GENERATOR

Ideal For:

- Home Lighting • Hunting Lodges • Stand-by electricity
- Running all AC electrical appliances incl. fans, motors, electric razors, refrigerators, incubators, etc.



(ITEM #67).

Protection for emergencies to operate oil burner, stoker, freezer, water pump and lights. These units built to exacting Signal Corps specifications are the answer to your lighting needs. Drive it with a 2 1/2 H.P. gasoline engine at 1800 R.P.M.

• 800 watts • 0-150 voltmeter with regulator • 110 volts-60 cycle, AC. Ship. wt. 60 lbs.

AN OUTSTANDING VALUE for

\$59.50

F.O.B. Chicago

HYDRAULIC CONTROL VALVES

LOGAN HEAVY DUTY OIL

Hydraulic Control Valve



(Item #37)

BRAND NEW control valve with built-in adjustable relief valve, will operate one double-acting hydraulic cylinder or two cylinders as one or a reversible hydraulic motor. Valve handle latches in neutral position. Made of rugged cast aluminum alloy. Open center unloads the pump in neutral position. Throttling control allows operator to regulate the speed of movement of the hydraulic cylinder or motor. Has removable mounting brackets with 4 bolt holes, 3/8" pipe thread connections. Overall dimen.: 12 1/2" Hx8 1/2" Dx8" W. Ship. wt. 17 lbs. Govt. Acquisition Cost over \$100.00. An Excellent Buy. F.O.B. Chicago

\$21.95

BRAND NEW



Item # 24. Four-way control valve for use with double action hydraulic cylinder, may be used with 1500 P.S.I. hydraulic system to open and close hydraulic cylinders. Brand new. Ship. wt. 4 lbs. A \$38.00 value. . . . **postpaid \$7.95**

Item #26. Four-way control valve for use with two hydraulic double action cylinders. Each cylinder may be operated independently of the other or in conjunction with the other. Oil may be locked in any of the cylinders to hold the piston at any required position. Brand New. Ship. wt. 6 lbs. A \$60 value **postpaid \$10.95**

Item #28. A two cylinder double action valve with a unique arrangement, allowing the operator to raise both cylinders simultaneously, to lower them simultaneously or to raise one and lower the other at any predetermined rate and speed. Brand New. Ship. wt. 8 lbs. A \$75.00 value. . . . **postpaid \$14.95**

ADJUSTABLE RELIEF VALVE. (ITEM #34) **\$2.95 post-paid**

HYDRAULIC FLUID. (ITEM #53.) Per gallon F.O.B. Chicago **\$1.75**

10 ft. length of Hi-Pressure HYDRAULIC HOSE, with 1/4" female pipe thread fittings. (ITEM #27). F.O.B. Chicago **\$3.95**

Brand New HYDRAULIC TANK, 3 gallon capacity with oil-indicator cap. 4" x 12" x 13 1/2". Ship. wt. 13 lbs. NOW AT THIS LOWEST PRICE. (ITEM #58.) F.O.B. Chicago **\$4.95**

BRAND NEW GEAR TYPE INSECTICIDE PUMP



All Manganese Bronze for spraying D.D.T., 2-4D, Sulphur Compounds, Etc. Pressures up to 150 lbs. to 14 gallons per minute—1500 RPM. Will not rust, pit, foul or freeze up. Use rubber hose inlet, port. Wt. 10 lbs. Dimen.: 8" x 5" x 6 1/2". Standard 1" manganese bronze shaft with keyway. U. S. Gov't Acquisition Cost \$62.00. **NOW ONLY \$15.00**
(Item #50) F.O.B. Chicago

Self-Priming ELECTRIC PUMP



APPLICATIONS: oil burners, aquariums, fluid metering, fuel pump, tool post grinder, coolant pump, pressure lubricating pump, general industrial, etc.

MOTOR MFD. BY BLACK & DECKER; double ball bearing series wound, continuous duty, 1/30 H.P. electric motor, rated 12,000 R.P.M. Transformer included for use on 110 V AC current. Also applicable for 24-32 V DC.

PUMP MFD by WELDON TOOL CO. with standard 1/4" tubing ports: rated 2 G.P.H.; remove pump and use motor as high speed grinder.

OVERALL DIMENSIONS: 7 3/4" long x 3 1/4" wide x 3 1/4" high. Approx. wt. 5 lbs. \$51.00 value (Item #1) **\$12.95** postpaid

SHOP by MAIL - SAVE at GROBAN'S - Buy Direct from ad!

All Merchandise Brand New - Order Today - Satisfaction Guaranteed!

LOGAN HEAVY DUTY OIL HYDRAULIC PUMP

BRAND NEW . . . for operating hydraulic cylinders and hydraulic motors on tractors, bulldozers, construction machinery, lift trucks, industrial applications, etc. Delivers 8 GPM at 1200 RPM at 1000 P.S.I. using 5 H.P. Has 1/2" pipe thread inlet, 3/8" pipe thread outlet. 3/4" shaft with flat and keyway for direct or pulley drive. Has flange with 4 bolt holes for convenient mounting. Ship. wt. 22 lbs. Overall dimen.: 7" L x 5 1/2" H x 5 1/2" W. A \$105.00 value. FOR ONLY

\$22.50



F.O.B. Chicago (Item #29)

HANNA AIR CYLINDER

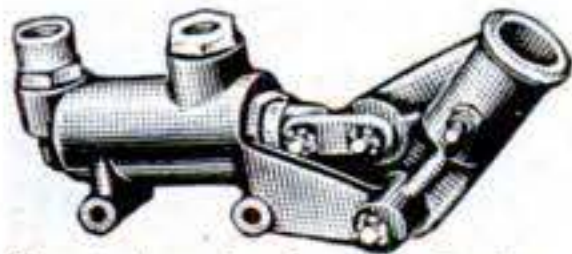
Brand New

Used for heavy duty industrial applications on shop air lines or with low pressure systems. With 100 lbs. of air pressure, will deliver 1900 lbs. pressure at the ram shaft. All steel construction. Adjustable cushions at both ends of cylinder. Shaft dia. 1 1/2". Foot mounting with clevis on ram shaft. 26 1/2" double-acting stroke; 5" bore, 40 1/2" overall length closed, 7" overall width. 89 1/2 lbs. net wt. Gov't. acq. cost \$101.85.



(ITEM #61) AN EXCELLENT VALUE for F.O.B. Chicago **\$39.50**

HAND HYDRAULIC PUMP



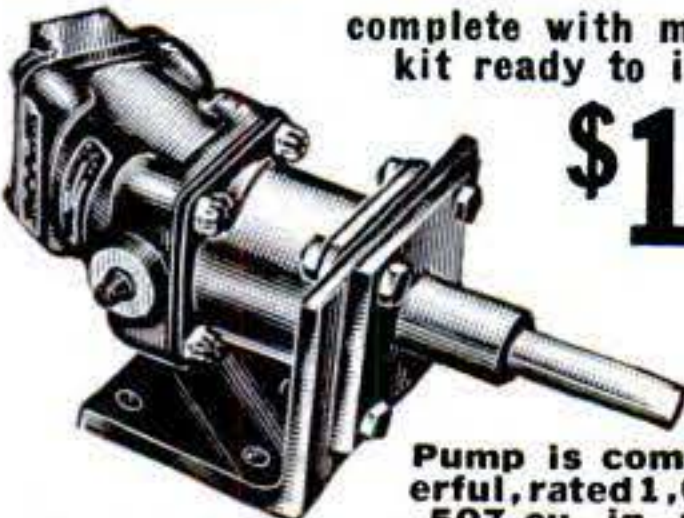
BRAND NEW

Used for hydraulic jacks, presses, hoists and other hydraulic applications. For operating hydraulic cylinders to pump oil or hydraulic fluid under pressure. Hand pump has built-in check valve and is capable of delivering 1000 lbs. of pressure. Has alloy aluminum housing. Dimen.: 8" long x 3 1/2" high x 2 3/4" wide. Ship. wt. 3 lbs. A \$45.00 value. (Item #11) Now

\$8.95 postpaid

Vickers MF9 Hydraulic PUMP or MOTOR

complete with mounting kit ready to install



\$19.90 postpaid
\$75.00 value

Pump is compact, powerful, rated 1,000 P.S.I., .507 cu. in. per revolution. 8 gal. per min. at 3750 RPM. Change rotation by reversing flow. Delivers up to 6 H.P. Requires 1/3 to 6 H.P. to drive directly or by pulley. BRAND NEW. Mounting kit has been especially designed to provide maximum utility and ease of mounting MF Series Vickers Pumps. Brackets are constructed of heavy steel plate; shaft is made of 1/2" steel with one end splined to fit pump; other end of shaft has machined flat for mounting a standard pulley with 1/2" hole. Shaft runs in oilite bronze bearings.

(Item #18) Pump only \$14.95 postpaid
(Item #38) Mounting kit only \$ 4.95 postpaid
(Item #39) Both as complete unit \$19.90 postpaid

SCREW JACK

Ideal for raising, lowering, leveling and adjusting. Use on tables, machine tools, toys, etc. Overall length closed 9 inches, open 14 inches. Worm gear box with 54 to 1 reduction, with double end drive shaft. Use either end or both. Extension screw shaft 30 to 1 reduction. \$35.00 value. (Item #45) AN OUTSTANDING BUY



BRAND NEW **\$3.95** POSTPAID

SHOCK ABSORBERS

Use them to spring suspend vehicles, hoists, pumps, heavy and light machinery, compressors, etc. 11" x 2" dia. Welded steel construction for extra strength—U. S. Air Force bought them for bomber gas tank shock absorbers. Rated 2500 lb. Ship. wt. of 4—11 lbs. (Item #21) Each. \$1.50 F.O.B. CHICAGO

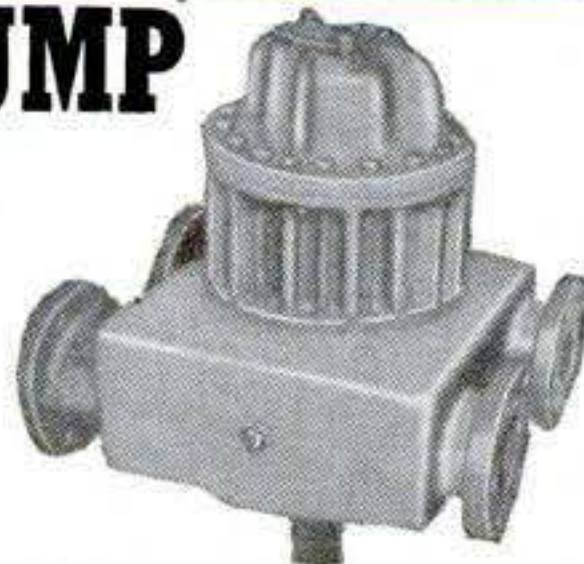
4 for \$5.00 F.O.B. Chicago

ROPER LUBE PUMP

Model C-75

This reversible pump is especially designed for delivering at least 50 GPM of lubricating oil, diesel fuel, molasses, tar, pitch, lacquer and similar fluids at 80 P.S.I. using 4 1/2 H.P., at 400 R.P.M. 1 3/4" keyed shaft. Select any two of the four flanges for inlet and outlet. Ship. wt. 200 lbs. A \$377.00 value—NOW offered at

\$39.50 F.O.B. Chicago



NOW . . . It's Easy to Weld with this handy **ELECTRIC ARC WELDER**

250 Amp.



Model 252

For Any Welding job, light or heavy

Designed for many years of trouble-free service! Handles anything from light gauge sheet metal to 1/2" plate. This precision-engineered direct current ELECTRIC ARC WELDER is offered at but a fraction of its original value. It can be mounted permanently or easily transported for portable use. Does the job instantly, where and when you need it. The War Surplus generators for these Arc Welders were built by General Electric, Westinghouse, and Delco-Remy at a cost of over \$300.00. They are light in weight; have oversized lifetime grease-sealed ball bearings; air-cooled commutator; dial type rheostat for easy pinpoint control; high-low range switch; reactor coil for even arc; handles 1/16 to 3/16" rods. Run welder at 2500 R.P.M. from drive pulley or power take-off of tractor, a 7 1/2 H.P. electric motor or a 10 H.P. gas engine. Use one or two V-belts, or flat belts (on pulley). Continuous welding rating—200 amps.; intermittent rating—250 amps.; 0-40 volts. Now . . . AT A FRACTION OF ITS VALUE. Price includes double V or flat belt pulley and instruction book. Ship. wt. 95 lbs. Only one or two jobs will pay for entire welder. (Item #65) F.O.B. Chicago **\$99.50**
ACCESSORY KIT including welding helmet, electrode holder, two 10 ft. cables with clamp, and 5 lbs. of assorted welding rods. (Item #66) F.O.B. Chicago **\$10.50**
Remember, Satisfaction is Guaranteed

FREE CATALOG!

Write for free copy of our 40 page catalog including Hydraulic Manual featuring diagrams, photographs and instructions. Catalog lists excellent war surplus values: pumps, valves, hydraulics, lights, motors, etc.

ROSS 4-Way Foot Operated AIR VALVE MODEL 398



BRAND NEW. For double-acting pneumatic devices. Fine for operating presses, air vises, air machinery of many types. Heavy duty cast construction. No neutral position. Maintains pressure against the piston when the foot control is in the "Up" position. Threaded for 1/2" pipe. Dimensions of valve body: 7 3/4" L x 4 1/4" W x 7 1/2" H. Net wt. 28 lbs. A \$64.00 value for only

\$19.50 (ITEM #60) F.O.B. Chicago

LOGAN 4-Way Foot Operated AIR VALVE Model 6520

BRAND NEW. For double-acting pneumatic devices. Fine for operating air vises, presses, air machinery of many types. Heavy cast construction. Threaded for 1/2" pipe. Dimensions of valve body: 8 1/2" L x 5 3/4" W x 7 1/2" H. Net Wt. 28 lbs. Gov't acquisition cost \$42.00. AN OUTSTANDING BUY AT



(ITEM #59) F.O.B. Chicago **\$15.00**

G-1 Stainless Tank

Use these tanks on compressors, for tire inflators, pulsation chambers, floats, buoys, hydraulic reservoirs, fluid and milk containers, fuel containers, etc. Tough, light, 450 lbs. P.S.I. Aviators Breathing Oxygen bottles, type G1. 2100 cu. in. (approx. 9 gallons) int. vol. 24" x 12". 1/4" threaded openings at ea. end. Wt. 19 lbs. .051" thick. (Item #63) F.O.B. Chicago **\$4.95**



BRAND NEW GENERAL ELECTRIC 8" SEALED BEAM UTILITY SPOTLIGHT 300 Watts, 110 Volts, A.C.-D.C.

Has countless uses for: • Homes • Garages • Workshops • Driveways • Outdoor advertising • Displays • Beach lighting • Private air ports • Photography. Wherever you need flood-lighting! Bought by the U. S. Army for signal use. This is the greatest surplus bargain ever offered. Lens, reflector and electrode vacuum sealed in one dustproof, air tight unit. 300 Watts, 110 Volts. Weighs only 2 1/2 lbs. List price \$10.50 (Lamp only) A TREMENDOUS VALUE for 12 or more \$2.50 ea. postpaid (Item #8)



\$2.75 ea. postpaid

MINIATURE HIGH SPEED Electric Motor

Ideal for Model Builders, Model Railroaders, Experimenters, Hobbyists.

AC or DC. Reversible, speed may be regulated by varying voltage. Has miniature Klaxon thermostatic switch. All connections are external and accessible. Has 3 mounting feet for easy installation. Double-end ball bearing supported shaft with small gear on one end. Die-cast housing with laminated field. Overall Dimen.: 3 1/4" long x 2 3/8" wide x 1 3/8" high. Net wt. 12 oz. A \$22.00 VALUE. (Item #5)



Brand New **\$2.95** postpaid

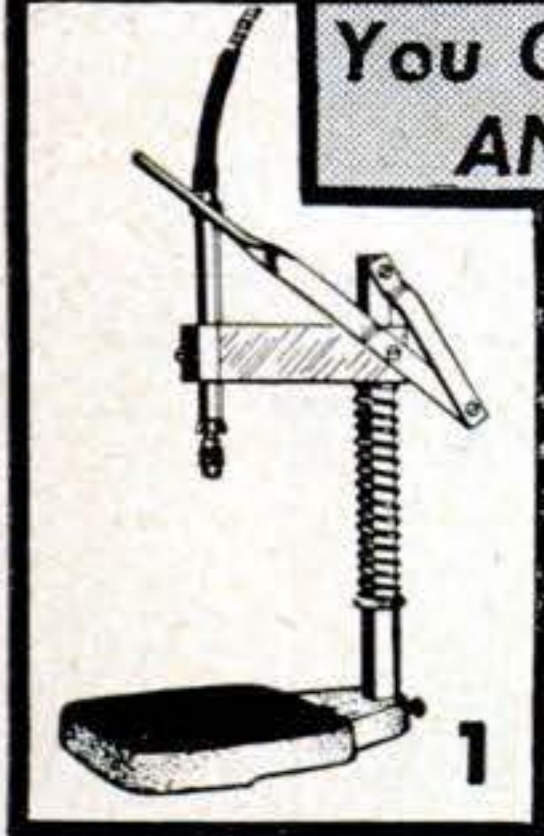
18" Wire Spoke Wheel

BRAND NEW. For use on motorcycle or adaptable for midget cars, trailers, small trucks, any wheeled vehicle. With bearing races and gear. Takes 18" tire. Wt. 19 lbs. (Item #57) A REAL VALUE at **\$3.95** each F.O.B. Chicago



Now! FOREDOM offers 2 NEW ATTACHMENTS

You Get Unexcelled **UTILITY AND VERSATILITY ...**
AT SMALL COST!



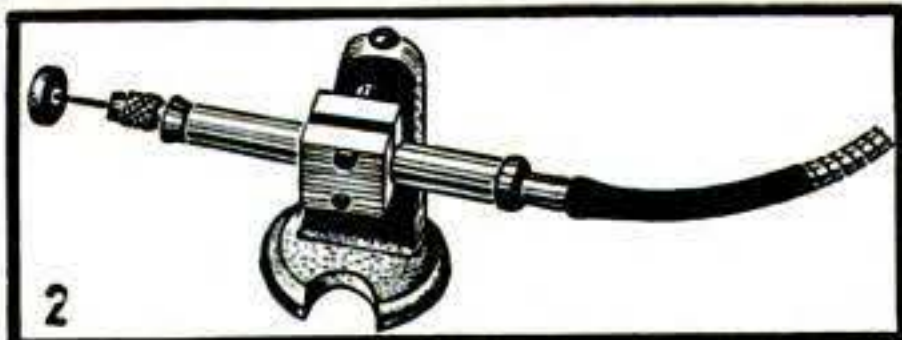
DRILL PRESS ATTACHMENT

1. Now Foredom offers you a **DRILL PRESS ATTACHMENT** for use with Model 100 (see below) and for the many thousands of Foredoms already in use. Handpiece quickly clamps in place and drill press is ready for use, ready to pay for itself over and over again! **PRICED AT A MERE \$4.95.**

—but there's more!

B-R-S ATTACHMENT

2. The new Foredom **B-R-S ATTACHMENT** (Bench Stand, Router, Shaper). Speedily clamp handpiece in place and magically you have one unit which serves as a bench grinder with angular adjustment, a router (complete with detachable guide for routing borders) and shaper. Can be used with Model 100 and thousands of Foredoms now in use, providing endless hours of fun and profit. **TRIPLE UTILITY FOR ONLY \$3.50.**



And there's still more—

FOREDOM'S NEW MODEL 100 FLEXIBLE SHAFT MACHINE

Model 100 Flexible Shaft Machine with all-metal **PENCIL SIZE HANDPIECE** equipped with **CHUCK GUARD** to **PROTECT YOUR FINGERS** and provide **SENSITIVE, POSITIVE, FINGER-TIP CONTROL** for the most delicate tasks. Husky little high-speed universal motor. Foredom's quarter-century reputation for precision workmanship goes with each machine. Other heavier duty models at proportionately reasonable prices. No. 25 Accessory Set (a truly versatile assortment) \$5.50 extra. Also No. 1000 Kit, comprises No. 100 Machine illustrated and set of 12 accessories, all in wooden case for only \$21.50. 6-step Foot Rheostat \$4.85. **USE IT to GRIND, POLISH, DRILL, SAW, SAND, CARVE, MILL, CLEAN, ETCH, ENGRAVE, ETC.** on all metals, wood, plastics, glass, leather, linoleum, etc.

35" Flexible Shaft

\$16.95

COMPLETE WITH MOTOR



And here's another Amazing

Foredom Product

FOREDOM PRESTO-FLEX with PENCIL-SIZE handpiece

Quickly Converts Motors or Drills into Flexible Shaft Tools **\$5.95**

Now turn your old motor, drill press or electric drill into a Flexible Shaft Tool. Simply attach it and presto—a flexible shaft machine! Off again in a jiffy! Pencil-Size handpiece gets into tight places. Handy 35" overall length. And—only \$5.95 complete! Precision made. Order NOW. If ordered for use on motor, specify motor shaft diameter and add 50c for coupling (Available for 1/4, 5/16, 3/8, and 1/2" shafts). No. 50 Accessory Set available \$1.50 extra. Order TODAY, at your dealer's or use coupon below.



SEND NO MONEY

FOREDOM ELECTRIC CO., Dept. 1022-E Mail Coupon
27 Park Place, New York 7, N. Y. Now!
Please send me FOREDOMS checked below on 10-day trial.

<input type="checkbox"/> Drill Press Attachment (\$4.95)	<input type="checkbox"/> No. 50 Accessory Set (\$1.50)
<input type="checkbox"/> Presto-Flex Tool (\$5.95)	<input type="checkbox"/> No. 25 Accessory Set (\$5.50)
<input type="checkbox"/> Motor Coupling (50c)	<input type="checkbox"/> Foot Rheostat (\$4.85)
<input type="checkbox"/> Specify motor shaft dia. _____	<input type="checkbox"/> No. 1000 Kit (\$21.50)
<input type="checkbox"/> No. 100 Machine (\$16.95)	<input type="checkbox"/> Free Catalog
<input type="checkbox"/> B-R-S Attachment (\$3.50)	

Send C.O.D. plus postage. I will pay postman.
 I enclose payment. Send postpaid.
(Money back either way if not delighted)

Name.....
Address.....
City & Zone..... State.....



1-minute angle set-ups! Tilt it for the angle and lock it. You're set up for any operation, machine or bench. Two sizes, 2" and 2 3/4" jaws, with or without swivel base. Write for Vise

Folder and "Yankee" Tool Book.

YANKEE TOOLS NOW PART OF

STANLEY

THE TOOL BOX OF THE WORLD
NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

Only \$498

OTTAWA

Mule Team Tractor

Finest low-cost tractor. Costs too little to do without. Engines burn gasoline or kerosene. Starter and lights available. Other larger Models to choose from. Over 4,000 in world-wide use. Time-proved and tested. At low cost they easily mow, plow, disc, harrow, plant, cultivate, etc. Sold only direct to user. Write for FREE details.

OTTAWA MFG. CO., 2-901 Garden St., Ottawa, Kansas

SAVE MILES TIME WORRY MONEY

with a HULL AUTOMOBILE COMPASS

Beaconlite Illuminated\$5.95
Streamline Standard.....\$3.95
At your dealer's. Write for literature.

HULL MFG. CO.
P. O. Box 246-E10, Warren, Ohio

INCREASE SAW SHARPENING PROFITS!

Sharpens Saws 5"—30"

REYNOLDS CIRCULAR SAW GRINDER

Produces top quality results in fraction of time usually necessary for sharpening, jointing, gumming and tooth forming. Any hook or pitch of tooth and depth of cut is quickly adjusted. Both hands are free to control position of saw while grinding. Write now for free circular!

PROVIDENCE SAW & KNIFE COMPANY
303 Eddy Street Providence 3, R. I.

MYSTERIOUS DEVICE WELDS BRAZES SOLDERS & CUTS

ANYONE CAN OPERATE

ONLY \$9.95

FOUR-WAY WELDER

This newly invented **FOUR-WAY PORTABLE ELECTRIC WELDER** will do brazing, soldering, welding and cutting on brass, bronze, iron, steel, cast iron and other metals. It's easy to use. **WORKS INSTANTLY** off any properly wired 110 VOLT A.C. OR D.C. LINE. Does a thousand and one professional type repair jobs. **SAVES TIME AND MONEY** on auto, home appliance, farm and shop repairs. Ideal for maintenance men, farmers, repair shops, engineers, tin smiths, home and auto owners, bicycle and fix-it shops. **10 DAY TRIAL OFFER. COMES COMPLETE WITH ALL SUPPLIES READY TO OPERATE** including instructions. **FULLY GUARANTEED.** Order today for 10 DAY TRIAL or write for FREE particulars.

FOUR-WAY WELDER CO. Dept. PSF-109
2326 S. Michigan Ave., Chicago 16, Ill.

3 NOVEL ELECTRICAL GIFTS

For WORKSHOP and KITCHEN!



ONLY
\$10.50

1. Brand New All-Purpose HONE SHARPENER

What a Gift—something to sharpen not just knives but hundreds of other articles safely, quickly! It's the new, superior, electric HONING Sharpener made *only* by SYNCRO—giving you 14,400 gentle, rapid HONING strokes a minute! A NECESSITY for kitchen, home, workshop, wherever professional "grindless" honing is necessary to SAVE precious edges! No belts, gears or wheels. 60 Cycle, 110-120 Volt AC. Insist on SYNCRO—the only ALL PURPOSE Hone Sharpener! The perfect Gift! Complete with 3 Honing Stones, cord, plug, switch, only..... **\$10.50**



2. Safe Electric Jig Saw!

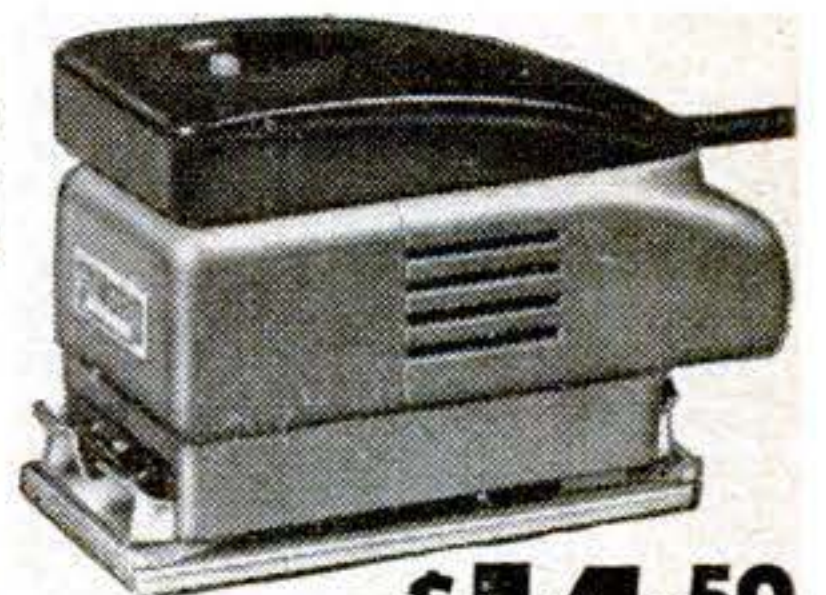
Only SAFE jig saw—largest selling in world! Perfect for adult workshops, safe for children. Portable. Adjustable arm permits cutting ANY length wood, plywood, thin metal, plastic. NOTHING LIKE IT. No belts, gears or wheels. Motor built in. Swell "Family" Gift! Complete,

\$17.50

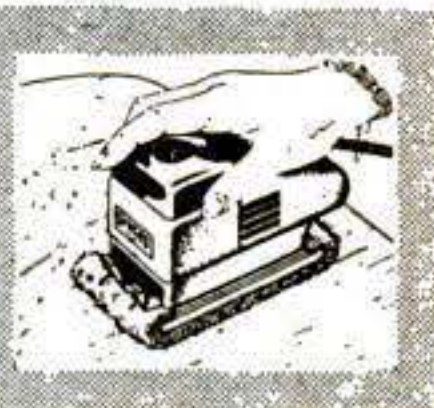
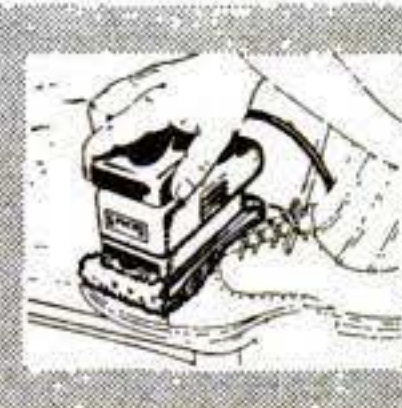
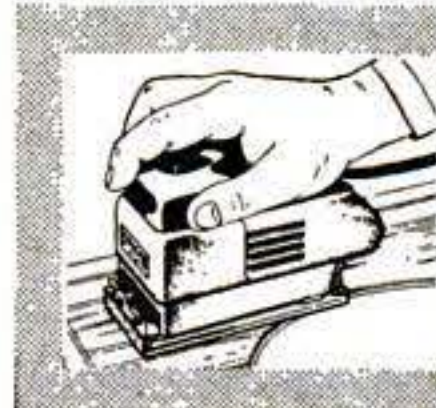


3. NEW and BETTER Electric SANDER POLISHER!

New SYNCRO does better, faster job. Light. More efficient! Light sanding, refinishing, finishing. Polishes autos, shoes, furniture, etc. 14,400 exclusive "POWER" Motion strokes a minute! Perfect Gift. 60 cycle, 110-120 volt AC. With 9 sheets sandpaper, felt and lambs-wool pads, 8 ft. cord, plug, **\$14.50.**



Only **\$14.50**



YOU CAN DO IT BETTER WITH

SYNCRO

QUALITY *Electric* PRODUCTS

HOW TO GET YOUR SYNCRO:

Buy at Dealers. If he hasn't SYNCRO, order direct. Send full amount—we'll ship PREPAID.

DEALERS! Write for new SYNCRO "BIG 3" PROFIT FACTS.

SYNCRO CORPORATION, DEPT. M-109, ROCHESTER, MICHIGAN

World's Largest Makers of Safe Electric Jig Saws

OCTOBER 1949 269

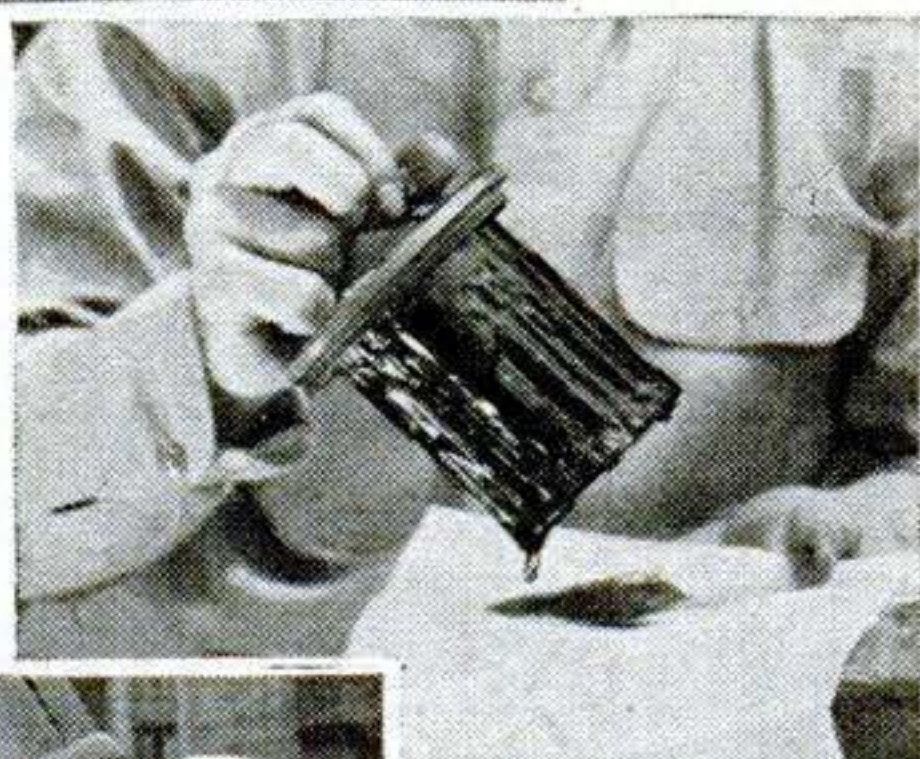
It's FALL...Time to Change your Oil Filter!

A refill now cuts repair bills later



MONEY-SAVING TEAM
New oil and a Purolator Micronic Refill to keep it free from abrasives. Result, top engine performance, lower repair bills.

DON'T TAKE A CHANCE, TAKE A LOOK. Sludge and abrasives play hob with engines, lead to expensive repairs. Replace that choked-up oil filter now!



QUICK-CHANGE, SMALL-CHANGE JOB. Your favorite serviceman inserts a Purolator Micronic Refill in a few minutes. Traps all the abrasives; costs only \$1.38 to \$3.*

If your car is not equipped with an oil filter, \$6.50 or a bit more* buys the best there is, a Purolator Oil Filter. See your service man soon. Purolator Products, Inc., Newark 2, N. J., and Windsor, Canada.

*Depending on make of car.

Purolator

MICRONIC OIL FILTER

*Clean oil - a clean engine -
lower repair bills*



**THERE'S GOLD in
GOOD IDEAS!**



• Rochester, New York, with its nationally known industries and progressive business community, is constantly seeking new ideas which can be converted into profitable products or enterprises. If you have something worth talking about,—something for which there is a market at a minimum price,—then write for details to Division of Public Relations, Rochester Department of Commerce, 54 Court St., Rochester 4, N. Y.

IN ROCHESTER, GOVERNMENT HELPS BUSINESS

FOR FASTER WORK IN HOME OR SHOP...

HOLD-E-ZEE

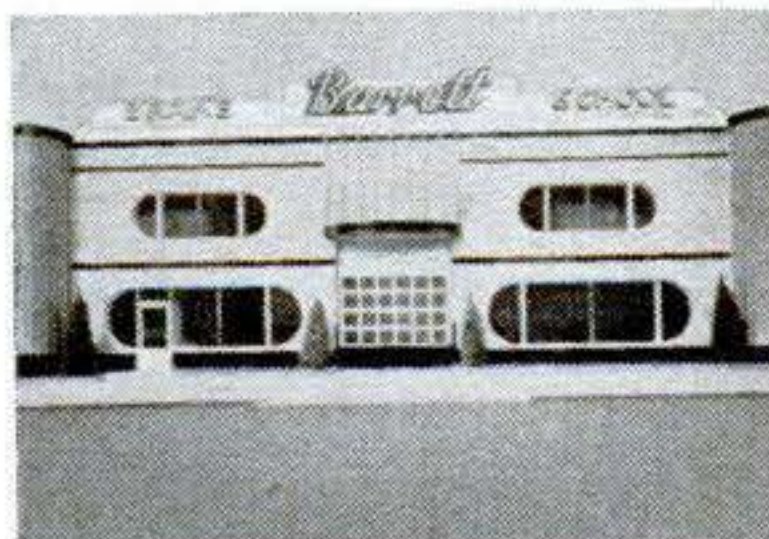
The Original AUTOMATIC GRIP SCREWDRIVERS

Pat'd. See these popular, high-quality drivers with the exclusive Gripper that holds, starts and sets up screws in unhandy places!

New Models FOR RECESSED HEAD SCREWS ➡ ⊕ ⊕

At Leading Dealers Everywhere
UPSON BROS., INC., ROCHESTER 4, N. Y.

BRAKE SERVICE TRAINING



Learn Scientific Brake Service at home in your spare time.

Internationally known manufacturer now offers world's only specialized extension course in precision brake service. Start training immediately. Write for complete details. No obligation.

BARRETT BRAKE SCHOOL

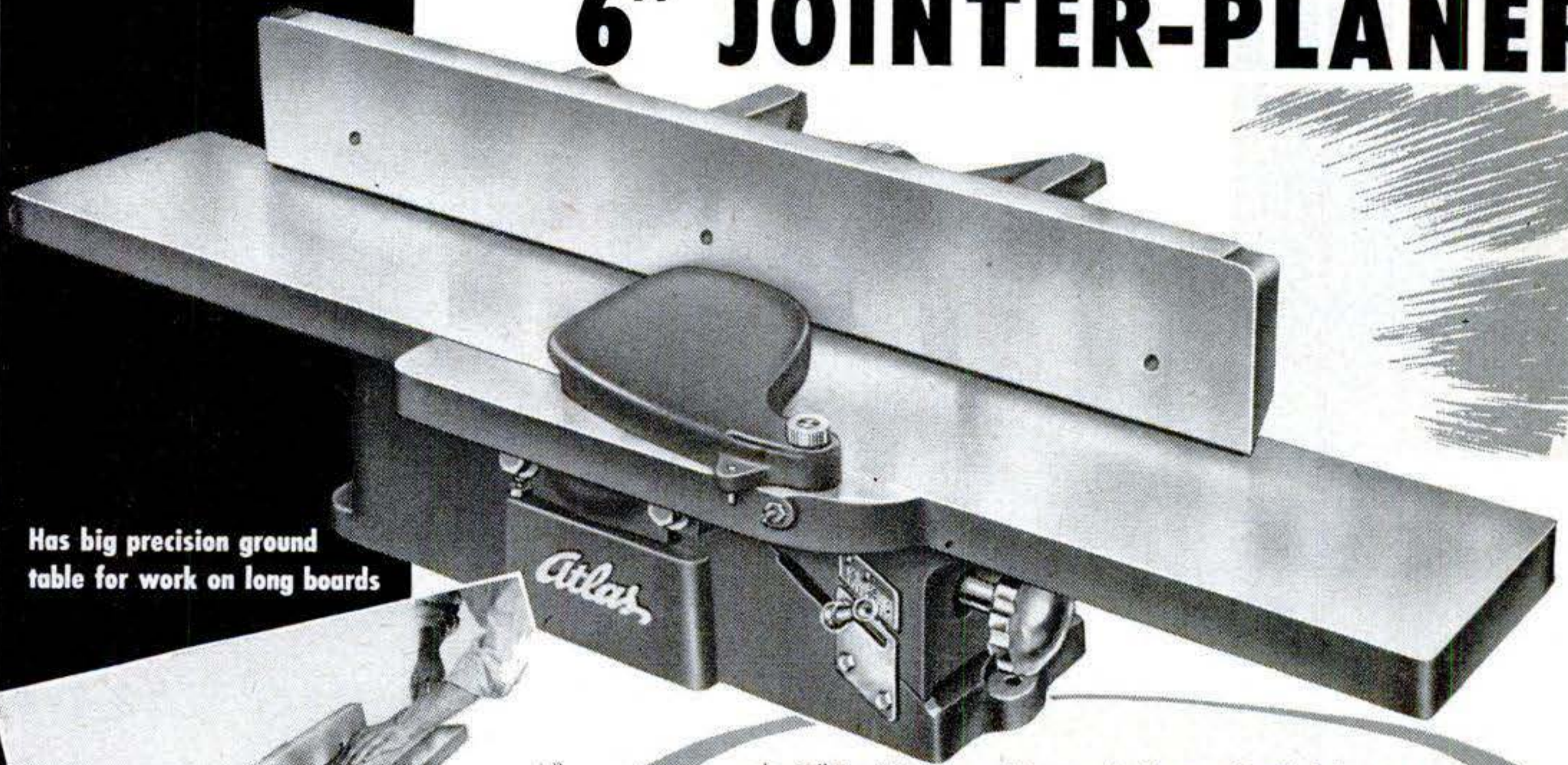
Division of Barrett Equipment Co.

2017 Cass Ave.

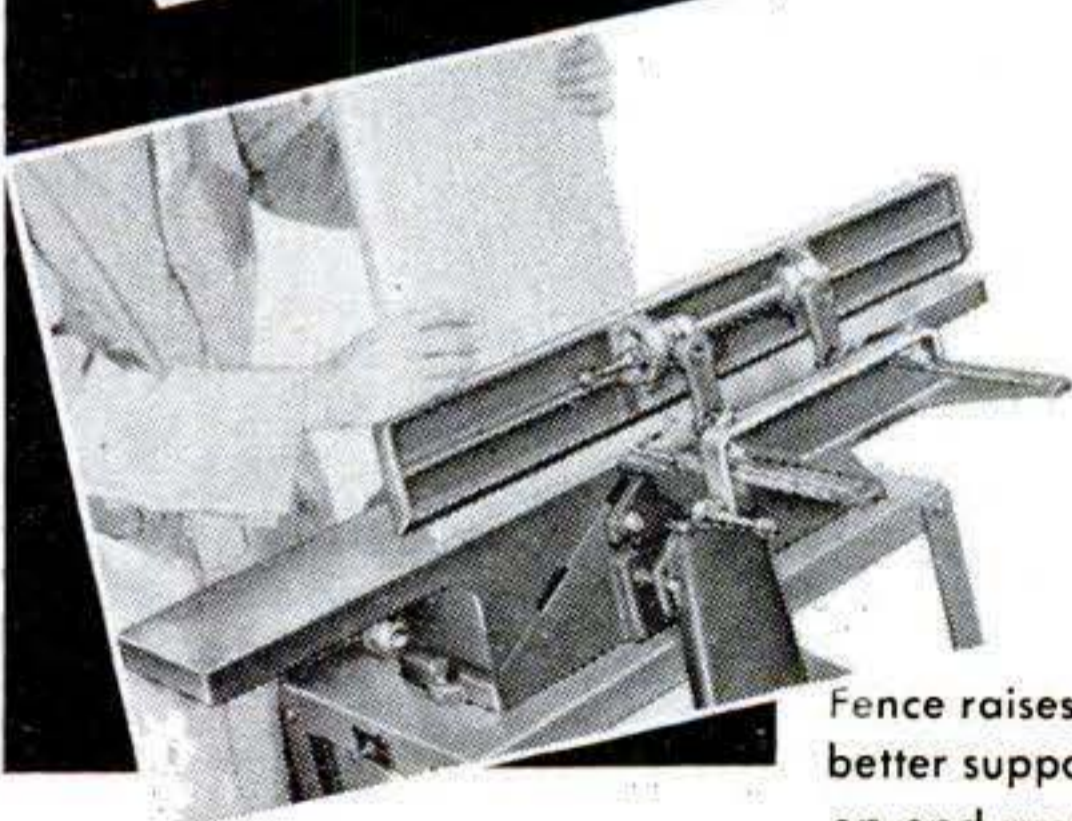
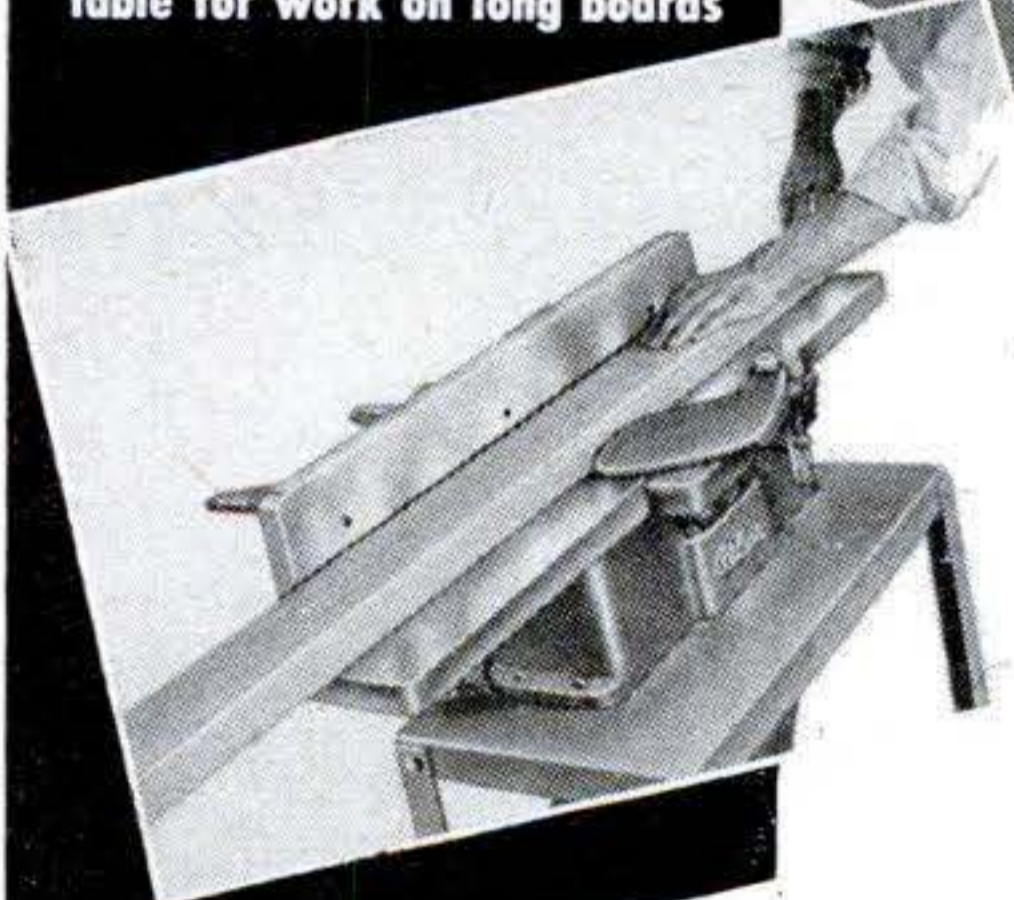
St. Louis 6, Mo.

ANNOUNCING

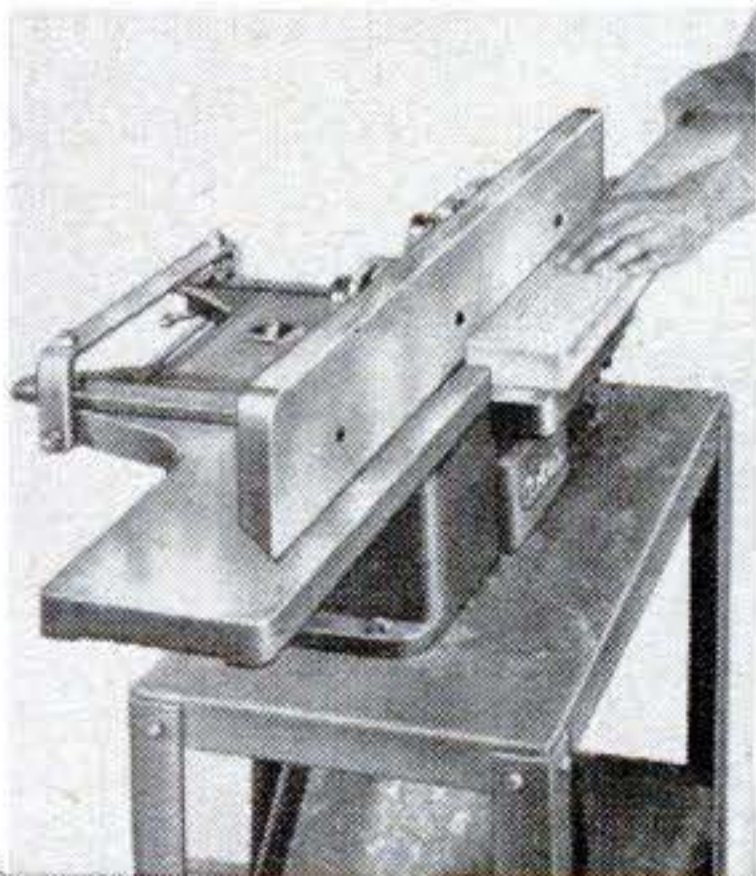
THE NEW Atlas 6" JOINTER-PLANER



Has big precision ground table for work on long boards



Fence raises for better support on end work

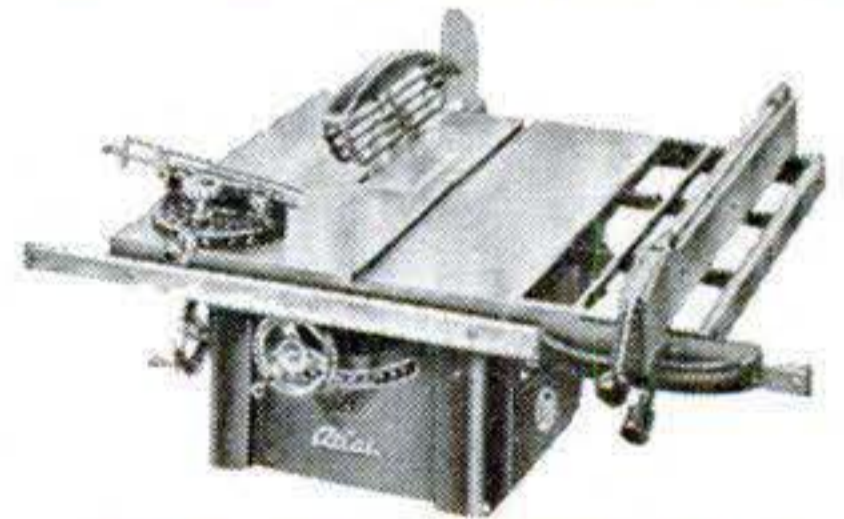


The only Jointer-Planer with a scale to set table widths. Saves time — promotes more accurate workmanship

- ★ 42" Precision-Ground Grey-Iron Table
- ★ 32" Two-Way Tilting Fence Rigidly Supported at Two Points Close to Cutter Head
- ★ Removable Cutter Head
- ★ Stationary Rear Table for Greater Accuracy
- ★ Cutter Head Raises or Lowers for Simultaneous Blade-Height Control
- ★ Exclusive Rabbeting Scale
- ★ Sealed for Life Ball Bearings
- ★ Extra Heavy Construction Throughout — Big Capacity

Atlas engineers stepped far out ahead of the field for you in developing this new 6" jointer-planer. Precision-built, ruggedly built — *it includes features never before provided in a 6" jointer.* On all your fine furniture and cabinet work it brings you new ease and speed on planing, beveling, tonguing, rabbeting, end-joining, and edging. Gives you a professional "factory job" on everything you undertake.

In the Atlas, for the first time, you get *simultaneous blade positioning.* The whole cutter head raises or lowers for alignment, or comes out for resharpening blades without disturbing their setting. That's but one of many features to save you time and improve workmanship. Send a postcard for latest literature with all the facts.



8" TILT / ARBOR SAW

The *lifetime* saw for big or small projects. Ask your Atlas dealer.

ATLAS PRESS COMPANY

1055 N. Pitcher St., Kalamazoo, Mich.



MATCHED PRECISION TOOLS FOR WOODWORKING AND METALWORKING

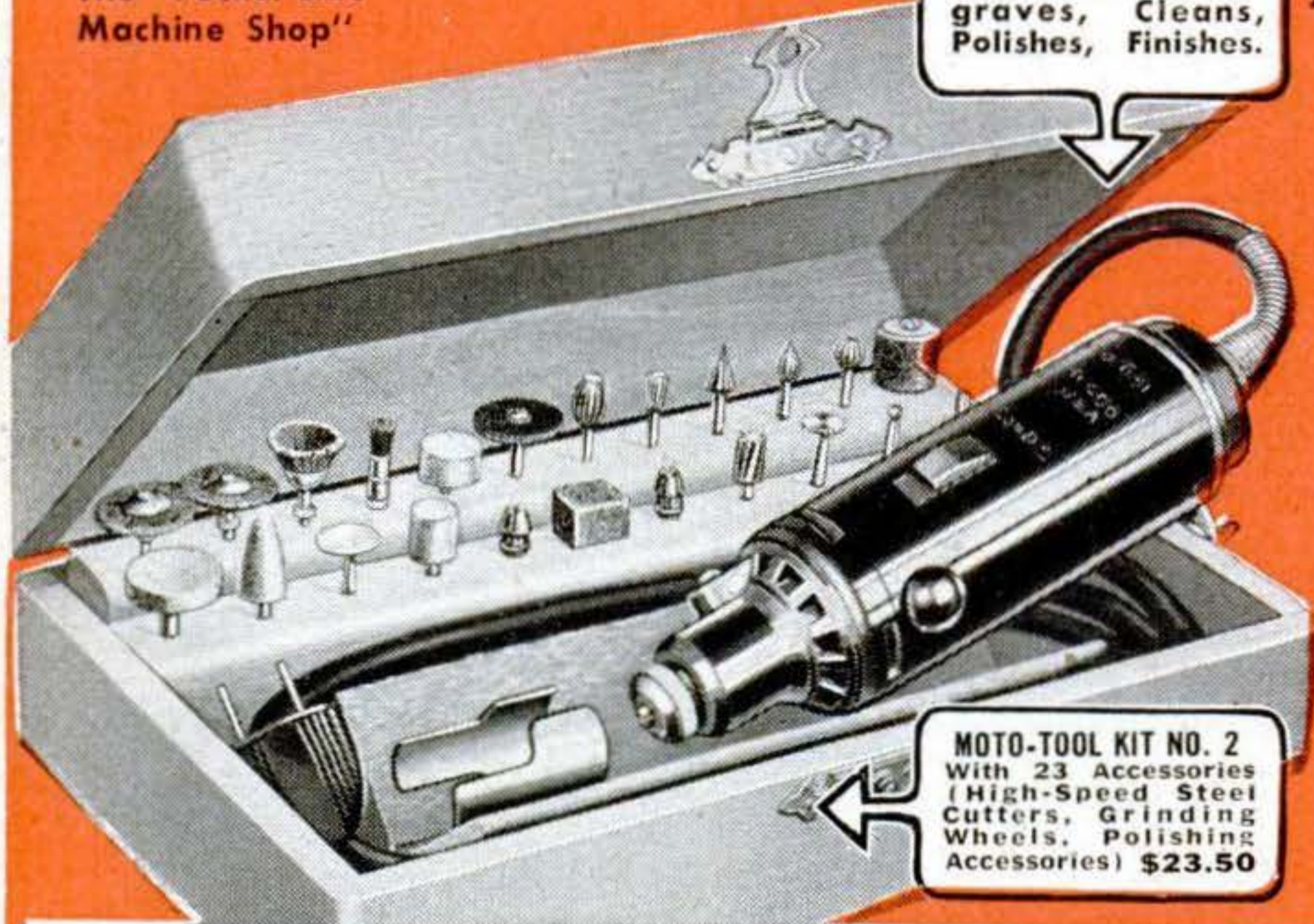
The Most Versatile Tool A Man Can Own

DREMEL *Electric* MOTO-TOOL

The "Pocket Size Machine Shop"

Grinds, Routs, Drills, Carves, Engraves, Cleans, Polishes, Finishes.

Approx. 27,000 R.P.M.



MOTO-TOOL KIT NO. 2
With 23 Accessories (High-Speed Steel Cutters, Grinding Wheels, Polishing Accessories) **\$23.50**



MOTO-TOOL NO. 2
with one emery wheel point **\$16.50**



Great for Hobbyists



Saves Time and Labor

10 Reasons Why Moto-Tool is a Better Buy

Here's what you get in a Dremel No. 2 Moto-Tool: Oil-less, sealed bearings • Patented automatic chuck lock pin • Oversize armature shaft, hardened, ground, polished • Shockproof, bakelite housing • Dust filtered air cooling system • Dynamically balanced armature (for vibrationless operation) • Exclusive hanger hook • Sturdy 110-120 Volt AC-DC motor • Weight only 13 oz. • Cutters in Kit No. 2 are made of high speed steel (not common high carbon steel) for longer life, faster cutting.

Moto-Tools, Kits and Accessories should not be confused with "bargain offers." We invite you to compare Dremel Products feature for feature with other similar equipment. If you are not fully convinced ours are far superior in quality, design and performance, we don't want you to buy.

WIDELY USED IN INDUSTRY—Moto-Tool is a precision-built electric tool, backed by over 13 years of industrial use in such plants as: GENERAL ELECTRIC • FORD • REMINGTON ARMS • NASH-KELVINATOR • WESTINGHOUSE • DOUGLAS AIRCRAFT, etc.

PRE-WAR PRICES STILL PREVAIL

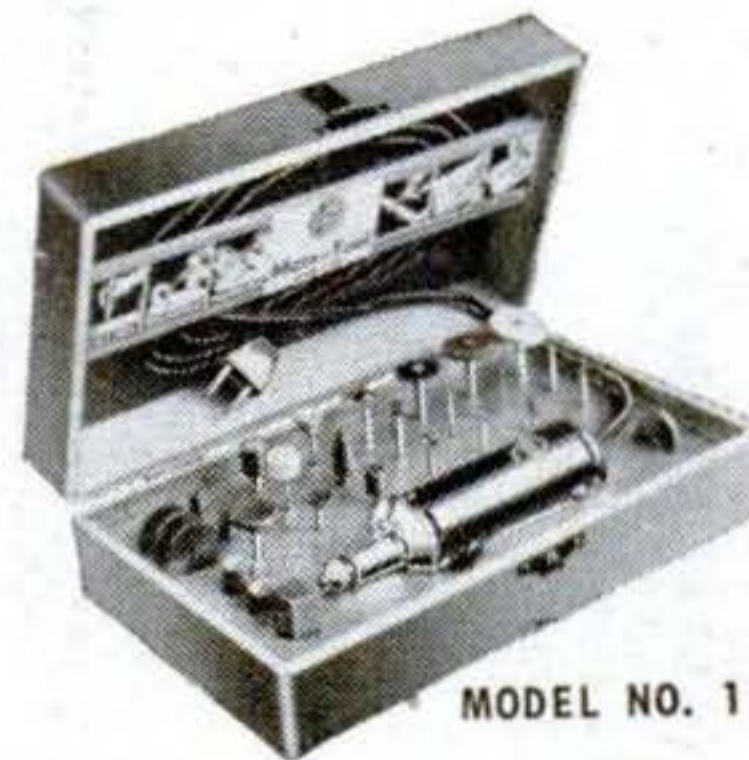
MOTO-TOOL KIT NO. 2 with 23 accessories including high-speed steel cutters and Model 2 Moto-Tool in natural finish hardwood case **\$23.50**

MOTO-TOOL NO. 2 with one emery wheel point. **\$16.50**

WHERE TO BUY—Buy Moto-Tool from your dealer. If he cannot supply you, send check or M.O. for items desired and we will ship postpaid. Or, send only \$2 now and pay postman balance plus postage on delivery. **MONEY-BACK** if not delighted after 5 days' trial. Catalog of Dremel Tools **FREE**.

Dremel Mfg. Co. • Dept. 129-K • Racine, Wis.

BIG VALUE!



MODEL NO. 1

MOTO-TOOL KIT
Only **\$17.50**

Moto-Tool Kit No. 1 contains the lighter Model No. 1 Moto-Tool and 34 practical accessories (steel cutters, grinding wheels, etc.) in an attractive, lacquer-finish wood case. It's the biggest bargain in the field. **\$17.50**
MOTO-TOOL NO. 1 with one emery wheel point. **\$9.85**

Portable DRILL PRESS

Add all-around versatility to your Moto-Tool with this 12" high drill press. Just the thing for creating costume jewelry, model making, carving, routing, drilling, etc. Utilizes No. 2 Moto-Tool, which can be raised, lowered or swung in any direction. Weighs 3½ lbs.



Only **\$9.95**

(Less Moto-Tool)

Turn Your Electric Drill into a POWERFUL HAMMER



WITH POW'R-HAM'R DRILL ATTACHMENT

Easy-to-operate POW'R-HAM'R turns your Electric Drill into a sturdy, powerful hammer in a matter of seconds. A mechanics' and hobbyists' tool attachment—ideal for hammering, chiseling, riveting, chipping and many other uses. Takes masonry drill bits from smallest size up to 5/8". Inexpensive accessories available. Strong and Sturdy—Lightweight (one lb., 6 oz.) A necessity for Electricians, Plumbers, Maintenance Men and Hobbyists. With sturdy handle for easier operation. \$1.25 extra. Immediate delivery—remit with order and we pay postage or C.O.D. plus postage.

- Drills quickly and cleanly through tile, brick, stone, cement, etc.
- Chucks into your electric drill (1/4" or larger)
- Sturdy — Practical — Inexpensive — Fully Guaranteed

ONLY **\$9.50**

add 50c west of Mississippi

AGENTS WANTED

ROTO-POWER CORP., 283 Greene Ave., Dept. "M", Brooklyn 5, N. Y.

THREE TOOLS IN ONE



Patented

Only
\$14.85
POSTPAID



Son, you'll have to wait to sand your boat until I polish some furniture.

A Dremel Sander sure takes the work out of sanding.

DREMEL *Electric* SANDER

Popular Labor Saver for the HOME and SHOP



and POLISHER

Makes play of wax polishing



and MASSAGER

Soothes tired muscles by massage

The popular Dremel Electric Sander is more than a sander . . . it's also a polisher and massager. This miracle machine is so easy to handle, a child can use it. It delivers 14,400 strokes per minute. (1) As a sander, it gets into tight corners, takes the effort out of sanding walls, woodwork, furniture, workshop projects, etc. **Its straightline (non-rotary) action will not burn or scratch surfaces.** (2) As a polisher, it does a professional job on waxed surfaces of cars, furniture, refrigerator cabinets, etc. (3) As a massager, it's ideal for tired or sore muscles of the back, legs or arms. Users testify it is more effective than machines made expressly for this purpose.

LOOK AT THESE DREMEL FEATURES

Dremel Electric Sander does all the work . . . you merely guide it. It weighs only 2 1/2 lbs.; it's foolproof (has only two moving parts . . . never needs oiling). Quick-change clamps firmly hold abrasives and pads. Dremel Sander is sturdily built to give long, trouble-free service. Operates on 110-120 Volt, 60 Cycle, AC. Thousands and thousands of satisfied users **prove its outstanding value.**

WHERE TO BUY IT—Dremel Electric Sander comes complete with 6 sheets assorted grade Garnet Paper for sanding, plus felt pad and sheepskin for polishing. Buy it from your dealer. If he cannot supply you, use coupon below to order direct from factory. We ship **postpaid** if you send check or money order in full. Or, send **\$2** now and pay postman balance plus postage, on delivery. **Money back** if not delighted after 5 days' trial.

If Your Dealer Cannot Supply You

USE THIS HANDY COUPON ORDER FORM

DREMEL MFG. CO. • Dept. S129-K • Racine, Wisconsin

- Enclosed find \$..... (Check or M. O.) in full payment for items checked below. Ship **postpaid** at once.
- Enclosed find **\$2.00** in part payment for items checked below. I agree to pay postman balance plus postage, on delivery.
- Dremel Electric Sander..... **\$14.85**
- Dremel Electric Coping Saw..... **\$5.85**
- Free catalog of Dremel Electric Tools.

Name.....

Address.....

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

FUN FOR BOYS FROM 8 TO 80 DREMEL *Electric* COPING SAW

CUTS SCROLLS LIKE MAGIC—SANDS AS IT SAWS



BLADE
FACES
4 WAYS

Only
\$5.85
with 3 saw blades

SAFE!
AS A
HANDSAW

**JUST
GUIDE IT!**



For men who harbor a hobby or do their own repair work . . . for boys who like to make things . . . no other tool will give as much pleasure and satisfaction in the home or workshop for the small amount of money invested as a Dremel Electric Coping Saw. It works in any direction . . . delivers 7,200 strokes per minute . . . so easily, there is no effort . . . so smoothly, work needs no sanding. Makes child's play of tricky scroll designs . . . saws through 3/4" medium hard wood at a foot-a-minute speed. Touch-of-the-trigger, foolproof action. Saw has only two moving parts . . . never needs oiling. Operates on AC current. Thousands and thousands of satisfied users.

WHERE TO BUY IT—Buy Dremel Electric Coping Saw from your dealer. If he cannot supply you, use the coupon to order direct from factory. We ship **postpaid** if you send check or money order in full. Or, send **\$2** now and pay postman balance plus postage, on delivery. **Money back** if not delighted after 5 days' trial.
DREMEL MFG. CO. • Dept. S129-K • Racine, Wis.

Plans for making six useful, decorative projects packed with each Dremel Electric Coping Saw.

FREE ALLIED'S NEW 1950 RADIO CATALOG!



SEND FOR THIS
196-PAGE BOOK

Save on Everything in Radio



Get Radio's Leading Buying Guide!

Get everything you need from the world's largest radio supply house—and save money on every purchase! ALLIED's new 196-page 1950 Buying Guide offers widest selections of top quality equipment—ready for speedy, dependable shipment at lowest prices. Have the advantages of expert, friendly service, and guaranteed satisfaction on every purchase. To get more for your radio dollar, send today for your FREE 1950 ALLIED Catalog, the preferred Buying Guide to everything in radio and electronics.



**BUILDERS' KITS
TELEVISION SETS
HI-FIDELITY SOUND
AMATEUR GEAR
THOUSANDS OF PARTS
TUBES, TOOLS, TESTERS
BOOKS & DIAGRAMS**

Everything for
Servicemen, Engineers,
Experimenters, Builders,
Soundmen, Amateurs

ALLIED RADIO

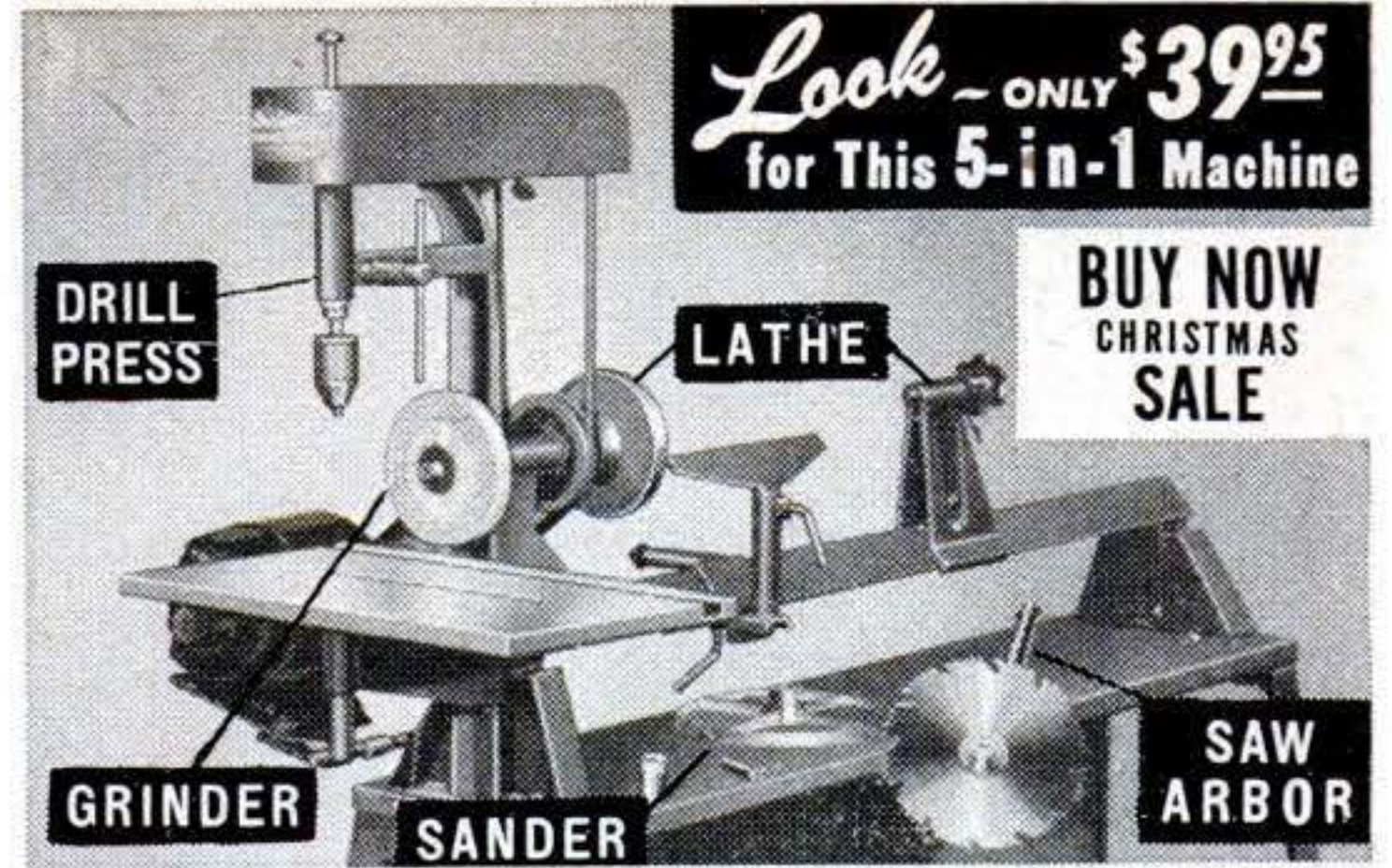
ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-K-9
Chicago 7, Illinois

Rush FREE 196-Page Catalog

Name.....

Address.....

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



Look - ONLY \$39.95
for This 5-in-1 Machine

BUY NOW
CHRISTMAS
SALE

POWER TOOL COSTS DOWN 75%

With an EMRICK 5-in-1 Machine you can work in wood, metals or plastics. Make first-class storm windows, cabinets, scores of furniture items, adorable presents — handle hundreds of home repairs. Fun for entire family. Save money. Operate profitable business. An EMRICK includes Lathe, Drill Press, Saw Arbor, Grinder, Sander — all in ONE machine, using ONE motor. Direct Factory price only \$39.95 cash, or on Easy Payments. 10-Day Free Trial. MONEY-BACK GUARANTEE. Write for FREE Catalog, and learn about our Big 15-Day Pre-Christmas Sale. **EMRICK, INC., 1852 Clinton, Kalamazoo, Mich.**

SHIP MODELS FOR EVERYONE



Authentic kits for both novice and experienced builders
New "Clipper-Bilt" Kits at only \$3.95 each, have carved balsa hulls, die-cut wood parts, tapered masts, finished fittings and simple plans. Send for your kit today. Select Schooner, Clipper, Barque or all three. Each **\$3.95**

Big catalog describes over 30 beautiful ship models, 600 fittings and several authentic, fascinating gun models. Only 35c. Send for yours at once.
MARINE MODEL CO., Dept. F, Halesite, Long Island, N. Y.



Plastic Everguard Cover for Your Convertible Top

Protects against snow, rain, road dirt, cold. Keeps top looking like new for years. Tailored for your convertible of heavy Vinylite plastic. New metal clips assure snug fit, lasting tightness. Full rear window visibility. \$18.95 last year. NOW only \$12.95 by mail post-paid. Save \$6. Send money today. Satisfaction guaranteed or money refunded. Postage extra if C.O.D. SPECIFY model no. and year of your car; also choice of color: clear, black, gray or tan.
EVERGUARD PLASTICS INC., 163 Colgate Ave., Buffalo 20, N. Y.

Play GUITAR in 10 DAYS

or Get Your Money Back!

Let Ed Sale teach you to play with his famous diagram-photo system. Book contains 53 photos, 43 diagrams showing exactly how to place your fingers. Gives you 110 popular songs, words and music—along with complete, easy to learn instructions. Imagine your joy when you find after only two weeks you are playing beautiful music! Amaze your friends! Be the life of the party! **SEND NO MONEY. Pay postman \$1.95 Plus Postage. INSTRUMENTS SUPPLIED on cash or credit, ask for Price List and Credit Plan.**
ED SALE DEPT. I POINT PLEASANT, N. J.

Sand Casting—Forging—Heat Treating—Case Hardening BRONZE FOUNDRY



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRY DRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum, copper, brass, etc., \$22.50, \$29.50, \$42.00 f.o.b. Kansas City. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.
KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. S-9 Kansas City, Mo.

Value

FIRST IN THE FIELD



STEVENS
MODEL
820

STEVENS
MODEL
124

TWO NEW REPEATING SHOTGUNS

Now Savage offers you two new 12 gauge repeating shotguns — two new "first in the field" values. But, you'll find *more* than sensationally low price tags on these two new Stevens models. They're *rugged . . . well balanced . . . natural pointing . . .* built to give you dependable service and top shooting satisfaction.

WRITE FOR FREE CATALOG — SEE THE COMPLETE LINE OF SAVAGE BUILT SHOTGUNS AND RIFLES AT YOUR DEALERS.

SAVAGE ARMS CORPORATION
Firearms Division
Chicopee Falls, Mass.

STEVENS MODEL 820 Slide Action Repeating Shotgun. 12 ga. only. Hammerless . . . side ejection . . . independent safety . . . solid frame. Stock and slide handle of beautiful, durable, service proven Tenite.

STEVENS MODEL 124 Repeating Shotgun. 12 ga. only. Features a newly designed, compactly efficient, cross bolt action. Rugged — simple to operate. Stock and fore-end of Tenite.

STEVENS

PIONEERING BETTER GUNS
AND GREATER VALUES SINCE 1864

SAVAGE

WORLD FAMOUS FOR DEPENDABILITY
AND ACCURACY

*Small down payment starts you
in a highly profitable*
WELDING BUSINESS!

Low monthly payments
**"Pay-out-of-
profits" TERMS**
You deal directly with
factory. No red tape. No
third party involved.

FREE particulars
on "How to Start and Operate
an Arc Welding Business"

**LET HOBART HELP YOU
GET STARTED AT ONCE**

MAKE BIG MONEY

Cash in now on the terrific demand
for arc welding. Opportunity awaits
in almost every locality.

EASY TO START

Average mechanical ability and a
little practice lets you do good weld-
ing quickly. Latest developments in
Hobart exclusive features make top
quality welding easy.

USE EITHER A.C. OR D.C.

Equip for either shop or field weld-
ing. Complete Hobart welder line
lets you pick welder to suit needs.

"BUILD-YOUR-OWN" AND SAVE \$\$\$\$

Generator only used with your own
gas engine saves \$\$\$ and gives you
money making portable welder.

HOBART WELDING SCHOOL

Complete or partial courses on
every phase of welding taught
by experienced instructors.

Low cost. G. I. approved.

HOBART Brothers Company
Box P-109, Troy, Ohio

HOBART

Hobart A.C. Trans-
former Welders are
made in 180 to
500 ampere size.



"one of the world's largest builders of arc welders"

HOBART BROTHERS CO., BOX P-109, TROY, OHIO

Please send information on how I can make big money
with welding, pay for equipment out of profits. Also
information on items checked:

- Hobart A. C. Welders "Build-Your-Own" Welders
 Hobart D. C. Welders Hobart Welding School

NAME _____

ADDRESS _____

NEW RUBBER SUITS

\$50.00 VALUE
PRICE **\$10.00**

WE PAY
POSTAGE
ON THIS ITEM



**FIGHT
COLD**

**KEEP
DRY**

New government surplus made by Goodrich. Protects
you from cold, dampness and wind, from the top of your
head to the tip of your toes. FOR Duck hunters—tractor
drivers—miners—flagmen—police—firemen—equipment op-
erators—farmers—watchmen—seamen—plumbers—truck-
ers. Good for rescue work on ice or in cold waters. With
belt released a life jacket can be worn inside of suit.
These suits are built similar to regular hip boots or
waders. The shoes and gloves have a sure grip surface.
The suit is waterproof up to the neck; it has sleeves and
a hood. The rubber is vulcanized to a fabric lining. This
suit is easy to slip on over your regular clothes and shoes.
Sizes are all large. They have a waist belt for taking up
slack. If suit is used in or near deep water use a standard
life jacket inside of suit. These are the famous overboard
suits made for seamen who were forced to abandon ship
in freezing waters. All suits are in perfectly new condi-
tion. Color black.

DARKROOM VENTILATORS

13 1/2"
D
I
A
M
E
T
E
R



4 1/2"
T
H
I
C
K
•
S
T
E
E
L

VENTILATE YOUR DARKROOM

\$25.00 Value—PRICE **\$7.50** set or \$4.00 Each

New government surplus. Air flows through these steel
louvers freely due to the arrangement of baffle plates.
Light does not show through these ventilators. Hundreds
of these vents have been installed in darkrooms. You will
need two for your darkroom. Install one in or near the
ceiling and one near the floor. \$7.50 for set of two or
\$4.00 each.

ARMY SURPLUS SALES OF FRESNO
1820 Tulare Street Fresno, Calif.

NEW SHERRILL COMPASS

\$25.00 VALUE PRICE **\$5.95** Postage Paid



ARMY TANK COMPASS

These compasses were built to rigid government specifications for modern army tanks, and are known for their high degree of efficiency and ruggedness. It is a very useful instrument for universal installations, such as boats, planes, cars, trucks, tractors, etc.

These compasses are new in original cases with compensators for horizontal corrections, magnetism correctors, calculator, adjustable mounting brackets, and instruction book. Compass size 5" high by 3 1/2" dia., weight 1 lb. 6 oz. This is truly a fine compass and a real value for only \$5.95.

ARMY SURPLUS SPECIALS

Twin beds—hardwood 2 beds, 2 springs, 2 new mattresses, 2 feather pillows.	Value \$50.00	Our Price \$19.50
Mattresses, new 23 lb.—size 30"x74"	Value \$9.50	Our Price \$5.25
Blankets, new, 64"x84", grey or O. D.	Value \$7.50	Our Price \$3.95
Oxfords, black & brown, Military type	Value \$7.95	Our Price \$4.95
Jackets, all sizes, waterproof, sheep-skin lined.	Value \$29.00	Our Price \$17.50
8,000 candlepower, carbide flood lights.	Value \$51.00	Our Price \$9.50
Rifle covers, waterproof, size 10"x56"	Value \$2.00	Our Price 4 for \$1.00
Hunting knife & sheath—polished chrome.	Value \$4.50	Our Price \$1.95
5 gal. jeep gas can, galvanized with spout.	Value \$3.95	Our Price \$1.95
Rigid screw extractor set, No. 10, a mechanics friend.	Value \$12.00	Our Price \$5.95
1" drive, Snap-on, socket set with ratchet, 13 pieces	Value \$75.00	Our Price \$37.50
3/8" drive ratchet—plated.	Value \$3.50	Our Price \$1.95
1/2" drive ratchet plomb—plated.	Value \$6.50	Our Price \$2.95

Send for catalog on home utility power hand tools, electric drills, portable electric saws, etc. The best medium-priced electric tools for less. We pay all postage on power hand tools.

All orders are filled the day they arrive. Pay by check or money order. 25% dep. on C.O.D.'s. Prices are F.O.B. Fresno, except for rubber suits and compasses on which we pay postage. All items listed are new, except for bunk beds and jeep cans.

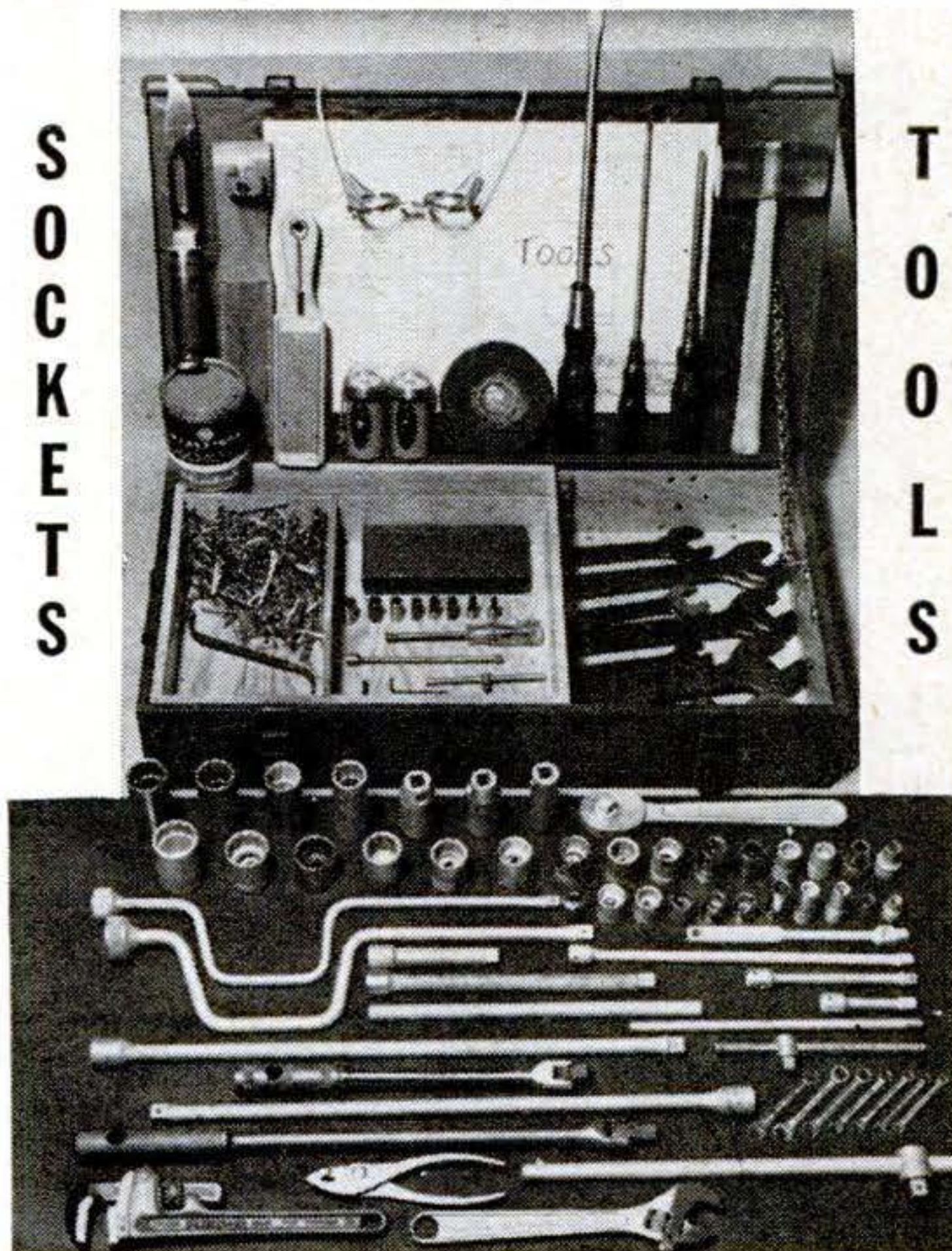
ARMY SURPLUS SALES OF FRESNO

1820 TULARE ST., FRESNO, CALIF.

SUPER 100 PIECE SOCKET-TOOL SET

S
O
C
K
E
T
S

T
O
O
L
S



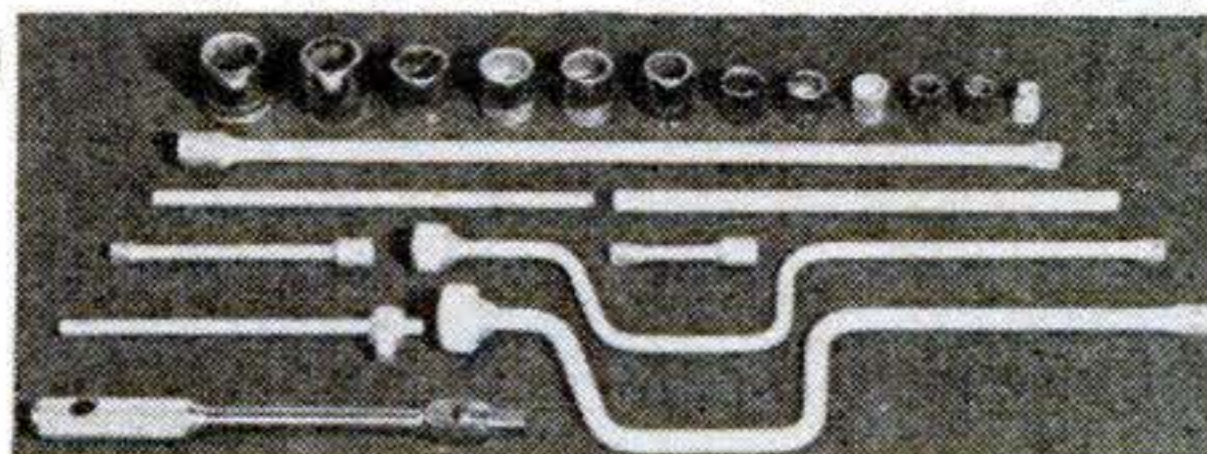
\$85.00 VALUE for ONLY \$43.25

Our purchase of over 200,000 wrenches as unused U. S. Airforce surplus makes this low price possible. All tools are NEW, all sockets are plated. They are well-known popular standard makes such as Plomb, Snap-On, etc. Set consists of over 100 tools and a husky tool chest that will last you a lifetime. This is what you get—

1/2" DRIVE SOCKETS & ACCESSORIES	1 4" Extension	1 Speed Handle
7 Deep Sockets 3/4" to 1 1/8"	1 10" Pipe Wrench	1 Flex Handle
1-7/16" socket	1 10" Adjustable Wrench	1 T-Handle
1-1/2" socket	1 Pair Pliers	1 Bar Handle
1-9/16" socket	1 Chrome Hunting Knife	1 10" Extension
1-5/8" socket	1 Plastic Mallet	1 4" Extension
1-11/16" socket	8 Box Open-End Wrenches for Carburetors, Ignitions, and Radios.	1 2" Extension
1-3/4" socket	1000 Cotter Keys, 25 sizes	1/4" DRIVE SOCKETS & ACCESSORIES
1-Adapter 1/2" to 3/8" Drive	1 Cotter Key Puller	The 1/4" drive is a 12-piece set with steel box
1-13/16" socket	3/8" DRIVE SOCKETS & ACCESSORIES	1 10" screw driver
1-7/8" socket	1-1/4" socket	1 Cabinet Screw driver
1-15/16" socket	1-5/16" socket	1 Cross point screw driver
1-1" socket	1-3/8" D-socket	2 Cans plastic water proof glue
1-1-1/16" socket	1-7/16" D-socket	1 File Card & brush
1-1-1/8" socket	1-1/2" D-socket	1 pair safety goggles
1-1-3/16" socket	1-1/2" socket	2 one-cell trouble lights
1-1-1/4" socket	1-9/16" socket	1 large roll friction tape
1 Ratchet Handle	1-9/16" D-socket	4 Allen wrenches
1 Speed Handle	1-5/8" socket	10 End wrenches 7/16" to 1 1/2"
1 18" Flex Handle	1-11/16" socket	
1 10" Flex Handle	1-3/4" socket	
1 T-Handle		
1 Bar Handle		
1 18" Extension		
1 10" Extension		

23 PIECE SOCKET SET

\$20
V
A
L
U
E



P
R
I
C
E
\$9.50

Set consists of 23 pieces. 1/2" and 3/8" drive. Same quality as above set. Shipping weight 10 pounds. This is what you get.

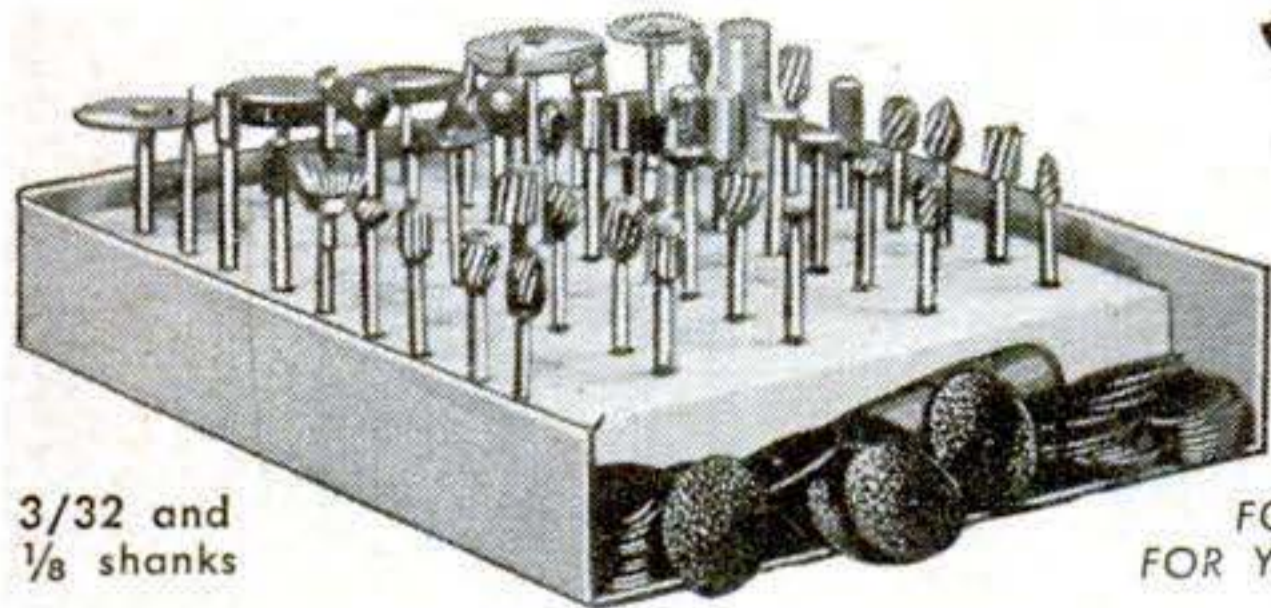
1-1/4" Socket	1-13/16" Socket	1-2" Extension
1-5/16" Socket	1-7/8" Socket	1-4" Extension
1-3/8" Socket	1-15/16" Socket	1-18" Extension
1-1/2" Socket	1-1" Socket	1-T-Handle
1-9/16" Socket	1-1-1/16" Socket	1-1/2" Flex Handle
1-5/8" Socket	1-1-1/8" Socket	1-3/8" Speed Handle
1-11/16" Socket	2-Bar Handles	1-1/2" Speed Handle
1-3/4" Socket		

ARMY SURPLUS SALES OF FRESNO

1820 Tulare Street

Fresno, Calif.

MASTER HOBBY ARBOR TOOL KIT AT THE GIVE-AWAY PRICE \$5.95



3/32 and
1/8 shanks

FOR GIFTS
FOR YOURSELF

A \$.50 FOUNTAIN PEN FREE WITH ORDER. The best gift you can give to the hobby worker. We give you saws, drills, routers, carvers, emery disks, polishing compound, reamers, borers, shapers, stone points, grinding points. About 150 pieces that we went out and priced in other stores for over \$20.00 for half of what we sell for \$5.95. In addition to the above we are including a dozen saws and a 60c heavy duty mandrel. After receiving set, if you don't think it worth what we say, send it back. Your money refunded.



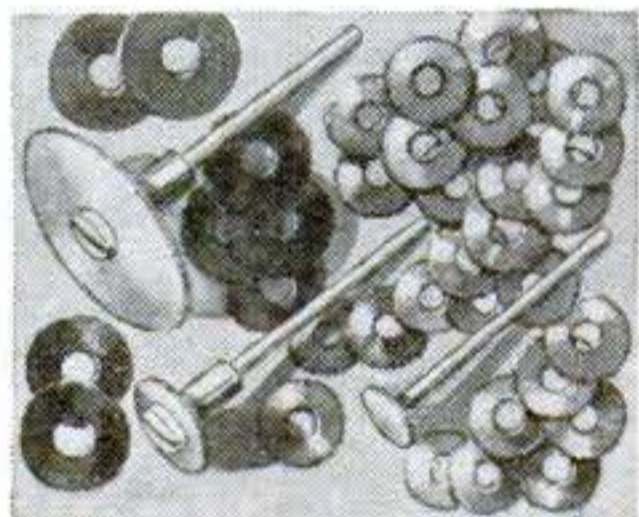
BURGESS ELECTRIC SPRAYER (Complete)

Just plug in and spray. 24 oz. capacity, guaranteed. Fast, economical for paint, varnish, oils, insecticides, etc. **\$12.95**

25

ASSORTED SAWS

Some slightly off color, but all new and perfect. With 2 mandrels worth 60c each. Total value \$15.00 all this for only **\$1.95**



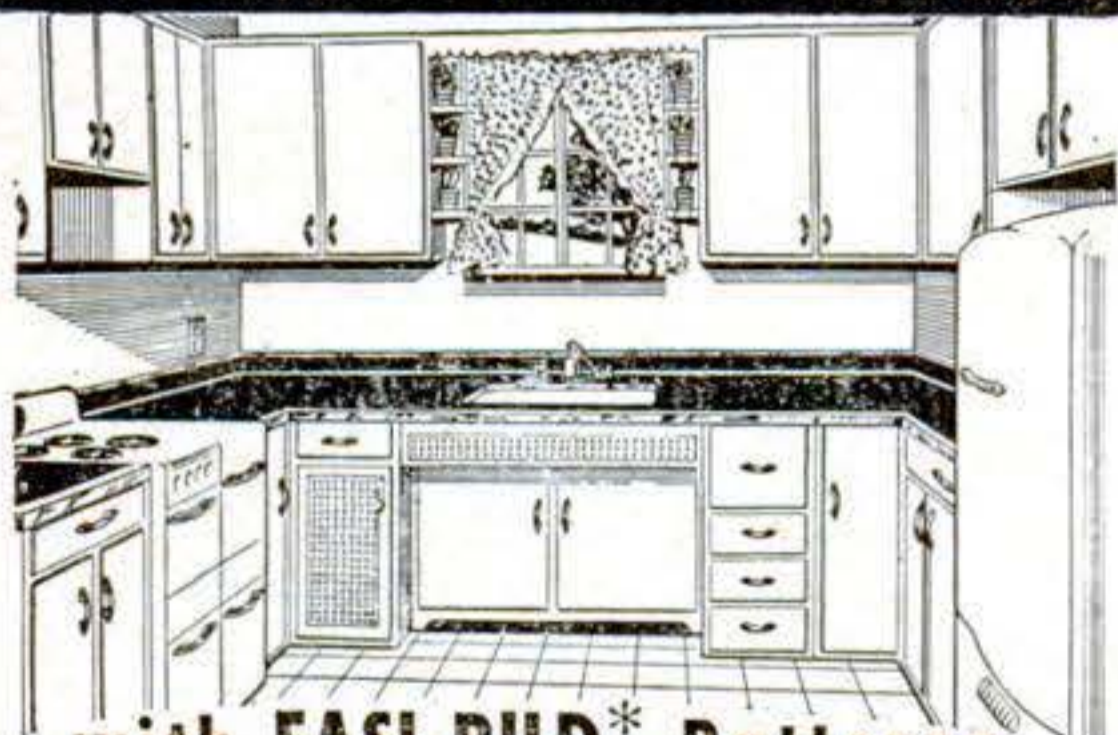
All orders shipped P.P. prepaid. Send check, Money order or C.O.D. to Dept. P.S.
Get our 100 page catalog. Send 25c, money refunded with first order.

GENERAL AIRE CO.

447 W. Norris St.

Phila. 22, Pa.

SAVE 1/2 ... BUILD Modern Kitchen Cabinets YOURSELF



with EASI-BILD* Patterns

Now you can have modern, professional looking cabinets with gleaming Stanley Cabinet Hardware in your kitchen, bathroom or playroom. It's easy—and inexpensive—when you use the Easi-Bild "Build-It-Yourself" Pattern Method of construction. Simplifies making base and wall cabinets with hand tools. Complete step-by-step directions, patterns, assembly illustrations explain how to build cabinets to exact size needed. Send only \$1.00 for Easi-Bild Base and Wall Cabinet Pattern, No. 201. EASI-BILD PATTERN CO., Dept. PS, P. O. Box 215, Pleasantville, N. Y. *Copr. 1949, Easi-Bild Pattern Co.



Reg. U.S. Pat. Off.

Amazing Pocket Size! "BESJET" blow torch

6" CONCENTRATED FLAME!

OPERATES 1 1/2 HOURS WITHOUT REFUELING

gives instant flame! \$3.98
intense heat! (1800°F.)
Weights Only 10 oz. Measures 7 1/4".
Completely Automatic **POST PAID**

Here is the amazing and ingenious "Besjet" pocket-size Blow Torch that performs with the efficiency of an expensive, heavy, standard-size blow torch.

Completely automatic, and always ready for use, the "Besjet" requires no priming or pumping. Uses denatured alcohol as a fuel. Just light it and it gives a concentrated 6" flame of 1800°F. in 10 seconds.

Made of sturdy brass with triple plated chrome finish. Absolutely leak-proof, no moving parts to get out of order. Ideal for mechanics or hobbyists!

Unconditionally Guaranteed
SEND CHECK OR MONEY ORDER NOW!

THE EMIL GREINER CO.
20-26 N. Moore St. • New York 13, N. Y.



CARTWRIGHT'S TRU-CUT TIN SNIPS

Easiest cutting tin snip. Handy tool for 1,001 jobs. No pinch feature. Cuts perfect circle, right or left. Also square points, both ways. Special "Cup Tension Washer" retains tight fit. Cuts well with either hand. Will last lifetime.

Write for
Free
Catalog



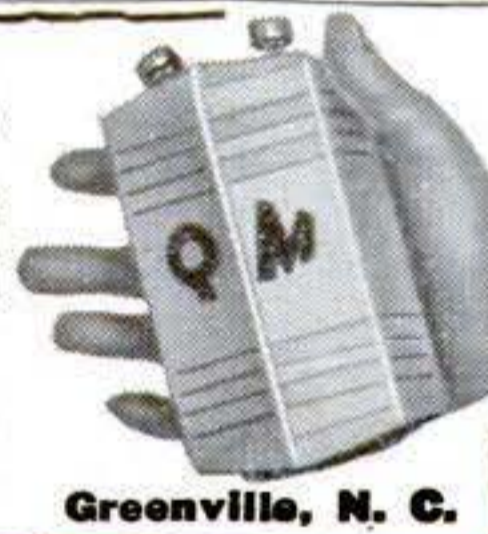
Dealer Inquiries
Invited

See Your Local Dealer
J. CARTWRIGHT & SON,

Dept. SP-10, Malaga, Calif.

POCKET MONITOR RADIO!

Tiny enough to easily slip into jacket pocket . . . features tiny tubes and "Walkie Talkie Type Antenna." All parts, tubes, midget batteries, etc., enclosed within beautiful plastic case. Complete set ready to wire only **\$6.99** postpaid, or send \$1.00 balance C.O.D. **DURA-MITE PRODUCTS**



Greenville, N. C.

Originally \$29.95 CHRONOGRAPH

Sensational genuine STOP WATCH value with 2 button stop and start for accurately timing races, moving objects, etc. Also measures speed and distance. Metal stretch band. Radium dial. Sweep second hand. *Written Guarantee Bond.* FREE handsome plastic gift box given. Send only \$9.95 (Federal Tax included) or order C.O.D. Satisfaction guaranteed.

Only

\$9.95

inc.
tax

MARVEL JEWELRY CO., DEPT. C-24
501 Pine Street, St. Louis 2, Mo.



Money
Back
Guar.

7x50 PRISM BINOCULARS

PRECISION OPTICS-BRAND NEW

\$36*

6x50 Achromatic Field Glasses

\$16*

*20% Federal Tax

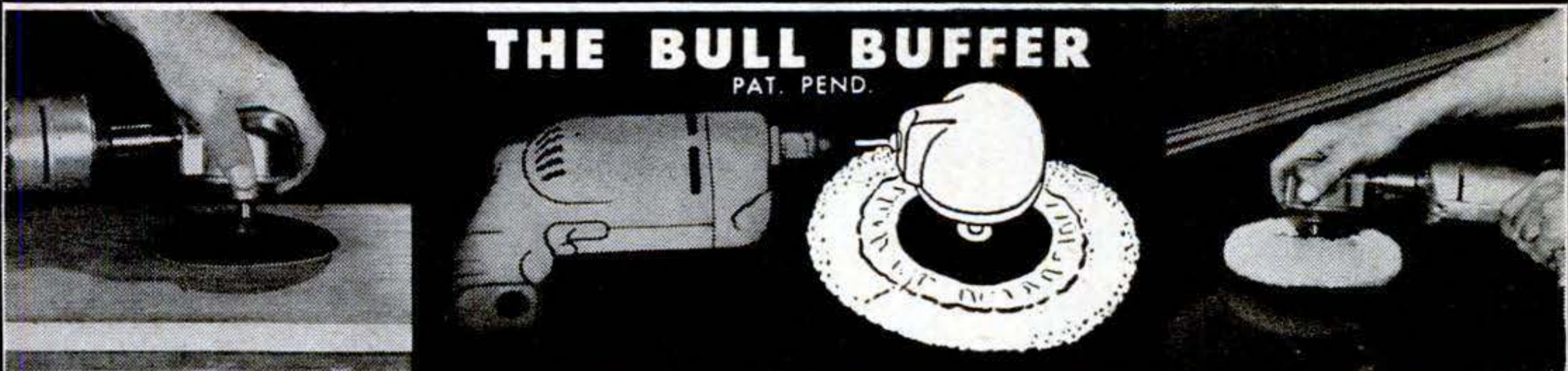
Send for Free
Catalog of Binoculars,
Telescopes & Microscopes
BROWSCOPE CO.
Dept. 10P, 24 W. 45th St.,
New York 19, N. Y.



7x50

\$36

Illustrated



THE BULL BUFFER

PAT. PEND.

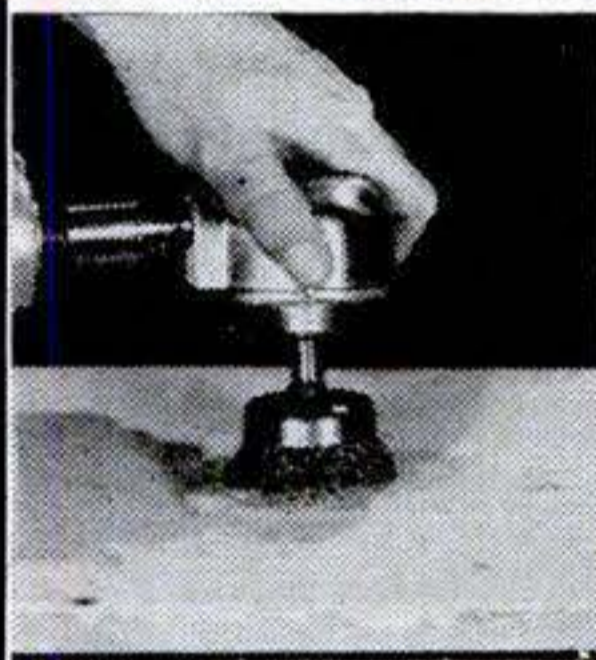
You polish and sand faster, easier—do beautiful, professional work—with this amazing new attachment for your hand drill. And it more than pays for itself *the very first time* you polish and sand your car, floors, woodwork, furniture. The Bull Buffer fits any chuck on an electric drill

(or flexible shaft). It's the only buffer you can turn in a complete circle while you hold your hand drill stationary. Reaches all curved and flat surfaces. It's packed with power, built of lifetime materials and *guaranteed*.

Order today—at your dealer or send cash, check, or money order for your Bull Buffer, complete as pictured below.....

\$9.95

ORDER THESE ACCESSORIES FOR YOUR BULL BUFFER:



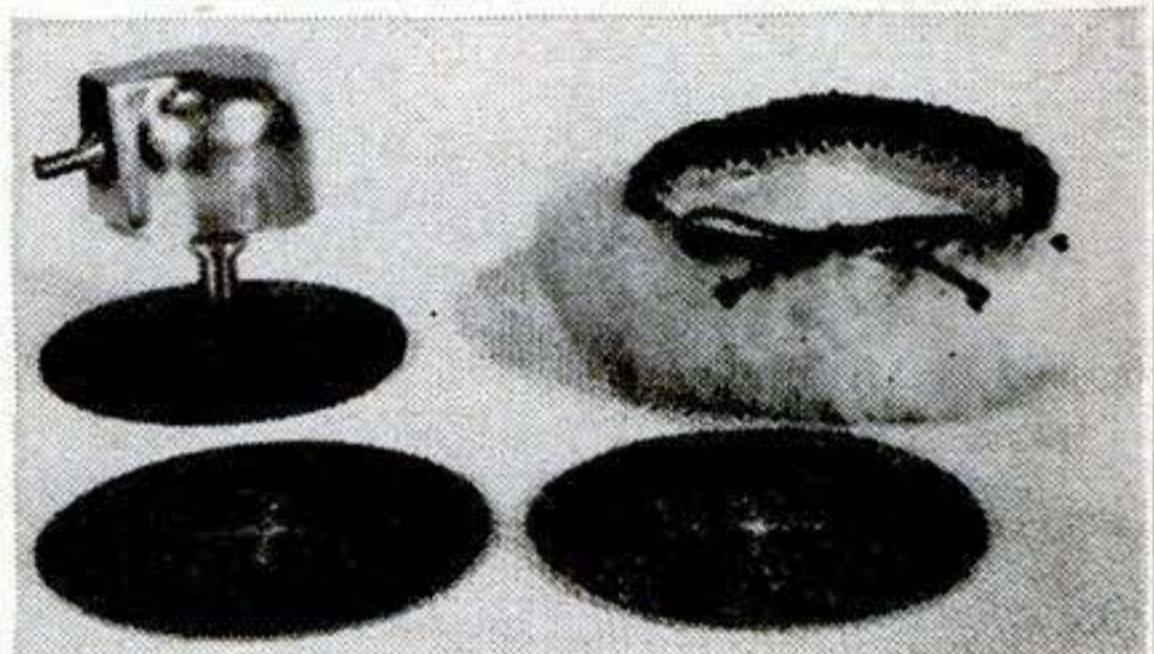
Cup wire brush attachment for removing paint, rust, scale, etc. \$1.75



Jacobs key chuck: When attached to Bull Buffer, increases 1/4" drill to 1/2" capacity—reduces speed, increases power. \$5.00

- Bull Buffer car cleaner \$.50
- Bull Buffer car polish 1.00
- Extra sheepskin bonnet 1.25
- Extra sanding discs (0000-000-00-0-1-2 1/2-3-4) Each 10c
- 1/2" Jacobs No. 6425 key chuck (see photo)... 5.00
- 2 1/2" cup wire brush (see photo) 1.75

Adapter B set for sanding at twice drill speed.....\$2.00



Bull Buffer comes complete with 5-inch rubber disc, sheepskin bonnet, and 2 sanding discs, only \$9.95.

BERTRUM V. ENGINEERING COMPANY
 3121 MAIN ST. Dealers, write for name of nearest wholesaler **KANSAS CITY, MO.**

TOOL USERS

READ ABOUT THIS AMAZING

- Using Standard Attachments it:
- Runs Nuts
 - Taps
 - Reams
 - Drills Masonry
 - Wire Brushes
 - Extracts Broken Studs
 - Drives Screws
 - Drives Studs
 - Saws Holes
 - Drills
 - Bores Wood

- YOU CAN'T STALL AND BURN OUT THE MOTOR—even if you stall the spindle completely
- YOU GET NO KICK, NO TWIST ON TOUGHEST JOBS—no need for jigs or fixtures
- YOU SAVE UP TO 90% ON NUT RUNNING TIME—pays for itself in 30 days or less



ROTARY ELECTRIC IMPACTOOL

Size 4U—3/8" bolt dia.
 Size 8U—5/8" bolt dia.
 110 V or 220 V AC-DC

Complete Metal Kits Available



The Ingersoll-Rand Impactool runs like any other electric tool until it encounters hard work—then automatically converts its power into hundreds of powerful "rotary" impact blows. The Impactool powered with an air motor has been built for over 17 years. Now, for the first time, this tried and proven multi-purpose tool is available to all powered with an electric motor.

Call your distributor or jobber and ask for a free demonstration. . . . Prices from \$110.00.

Ingersoll-Rand 11 Broadway New York 4, N. Y.

451-18

ORIGINATOR OF IMPACTTOOLS—air and electric

Mail to:

INGERSOLL-RAND CO., Dept. ET, 11 Broadway, New York 4, N. Y.

Please send me descriptive literature on your AMAZING IMPACTOOL.

- Form 5030A—A—Automotive Applications
- Form 5030A—G—Industrial Applications
- I would like a demonstration.

Name _____

Company _____

Street _____

City _____ State _____

Speedy Power Tool Does 1000 Jobs In a Jiffy!



Removing
Paint

Polishing
Car



Waxing
Furniture



HOME-UTILITY
5" Electric SANDER-POLISHER
\$29.95

(with sanding-polishing attachments)

No Handier Tool for Your Home-Farm Use!

Polishing cars and silverware; waxing furniture; removing paint—you can speed up a raft of jobs with attachments supplied with this versatile Tool! A 1/4" Jacobs Chuck (only \$3.45) converts it for drilling in metal, wood, plastics. Other low-cost attachments, equip it for sharpening tools, cutlery, mower blades; removing rust; grinding, buffing and burnishing. Quality-built for A.C. or D.C. use by BLACK & DECKER, world-famous maker of electric tools for over 39 years!

Try it at your hardware, electrical or implement dealer. Write today for your free copy of our brand-new "How-To-Do-It" booklet. Gives many helpful hints on building and repair jobs! Write to: THE BLACK & DECKER MFG. CO., Dept. H10S, Towson 4, Maryland.

Products of The BLACK & DECKER Mfg. Co.

ELECTRIC HOME-UTILITY TOOLS



1/4" Drills



1/2" Drills



6" Saws



1/4" Drill Kits

FASTEST PLANER in the WORLD at this Low Price... \$195.00

BELSAW Multi-Duty Planer



Speed up production! Increase your profits! BELSAW power self-feeds at 24 feet per minute...

The lowest-priced surfacer that will handle 12 x 6 in. stock. Planes green or dry sawed lumber into smooth, worked forms. Three high-speed steel knives make 42 cuts per inch. Multi-duty BELSAW takes inexpensive attachments for all planing mill operations—Jointing, Rabbeting, Grooving, Matching. BELSAW is the only 12 in. planer providing attachments for jointing and grinding its own knives. Start planning NOW for BIGGER VALUE and BETTER PERFORMANCE, with BELSAW. Write for FREE specifications, illustrations and low prices.

● LARGER CAPACITY ● FASTER OUTPUT ● KNIFE SHARPENING ATTACHMENT

BELSAW MACHINERY CO B-1029 Field Bldg., 315 Westport Rd., Kansas City, Mo.

YOUR BIG OPPORTUNITY IS IN THE RICH FARM MARKET

Nationally known manufacturer of Farm and Home Equipment offers aggressive men opportunity to share in extensive expansion program.

Corn Pickers, Seed Broadcasters, Wagons, Grain Elevators, Harrows, Rotary Hoes, Manure Spreaders, Washing Machines, Frozen Food Cabinets, Electrical Appliances, Utility Buildings, and many other items provide mammoth profit opportunity for men ready to start in the RICH FARM MARKET right now!

Farmers invested over 20 Million Dollars in GI Farm Equipment last year.

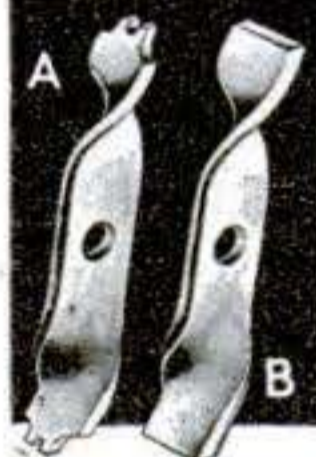
You can start full time or part time. The man with ability to produce can become a supervisor or own a business of his own.

Write for illustrated Farm & Home Equipment Catalog and Income Increasing Kit

GENERAL  IMPLEMENT

1083 Terminal Tower, Cleveland 13, Ohio, U.S.A.

USE YOUR BENCH SAW FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide \$1.75, 1 1/2 in. \$2.25. Jointing cutters, B 1 in. \$1.75, 1 1/2 in. \$2.25. E 1 in. for drop-leaf tables, \$1.75. E 1 1/2 in. Makes 3/4 in. cove & Quarter. \$2.25. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM
Rt. 2-P. Clearwater, Fla.



How to Make Money with Simple Cartoons



A book everyone who likes to draw should have. It is free; no obligation. Simply address

FREE BOOK

CARTOONISTS' EXCHANGE
Dept. 1910 D Pleasant Hill, Ohio



\$295 EACH

NOW! FILE YOUR OWN SAWS

Do expert saw filing at home. Precision filing easy without experience. Two simple adjustments. Keeps any hand saw extra sharp and true-cutting. Complete with file. Money back guarantee. Cash with order, prepaid. (COD postage extra.) Order today.

THE SPEED CORP., Dept. PS
512 N.E. 73 Portland 16, Oregon

D.C. ARC WELDER 200 AMPERES CONTINUOUS DUTY ONLY \$97.50

Easily mounted on tractor or elsewhere. Welding range 0-250 amperes by dial type control. Includes proper pulley for your application. Twelve months guarantee, with money-back 10-day trial period. (A \$300 value) at less than third. Write today for free literature or catalog. Or, send 25c for PLAN "Build Your Own Welder from Surplus Aircraft Generator" and we'll include literature and catalog.

LEJAY MFG. CO.
823 LeJay Bldg., Minneapolis 8, Minn.





PIONEER

MODEL 765

13⁵⁰



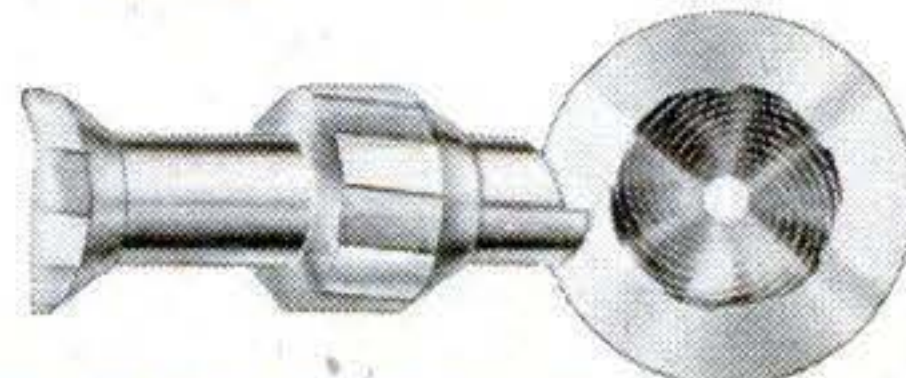
... the *Only* single shot bolt action .22 that gives you these features at this *LOW* price!



LOADING PLATFORM



SELF-COCKING ACTION



"BULL'S-EYE" BROACH RIFLING 6 rifling grooves cut at once — an exclusive H & R feature for greater accuracy.

WHY PAY UP TO \$6.45 MORE for a single shot .22 with comparable features? Why pay several dollars more for single shot rifles *without* these features?

See the H & R "Pioneer" at your gun dealer's. Check its superior features. Throw it to your shoulder and feel that easy, natural balance. Prove to yourself that the H & R "Pioneer" — the lowest priced full-size single shot .22 — is the best buy in its field!

Write today for **FREE** new catalog with complete descriptions, specifications and prices on all H & R rifles, revolvers, shotguns.

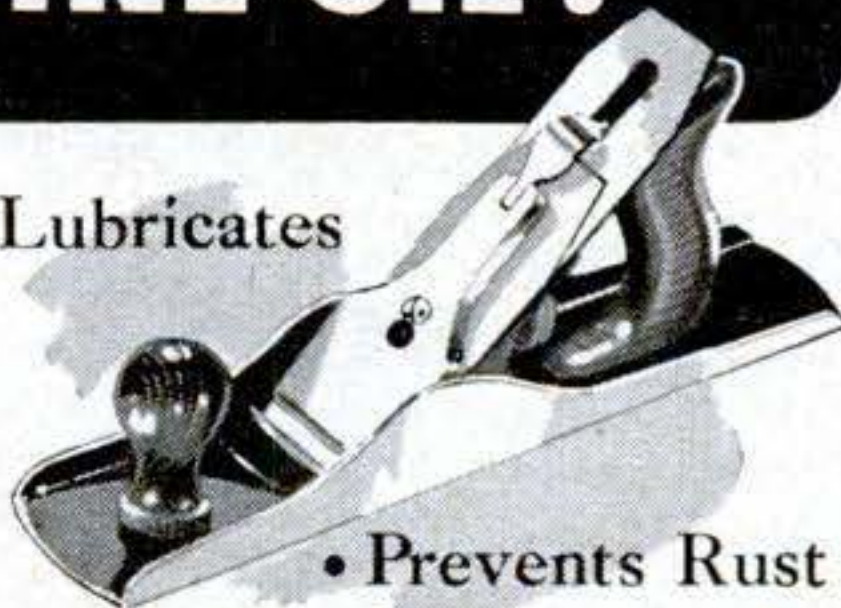
HARRINGTON & RICHARDSON ARMS CO.

430 Park Avenue, Worcester 2, Mass.

FINE TOOLS NEED FINE OIL!



• Lubricates



• Prevents Rust

• Cleans • Polishes

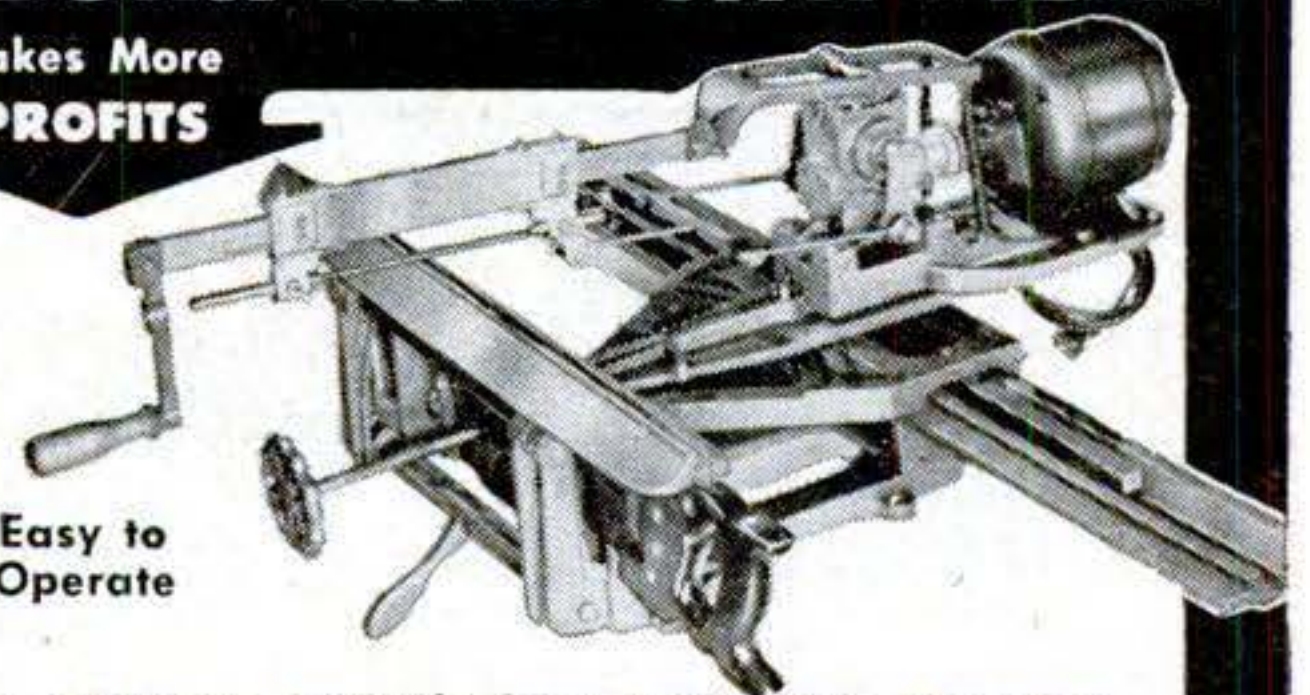
SOLD EVERYWHERE

3-IN-ONE Oil

BURR HAND SAW FILER

Makes More PROFITS

Easy to Operate

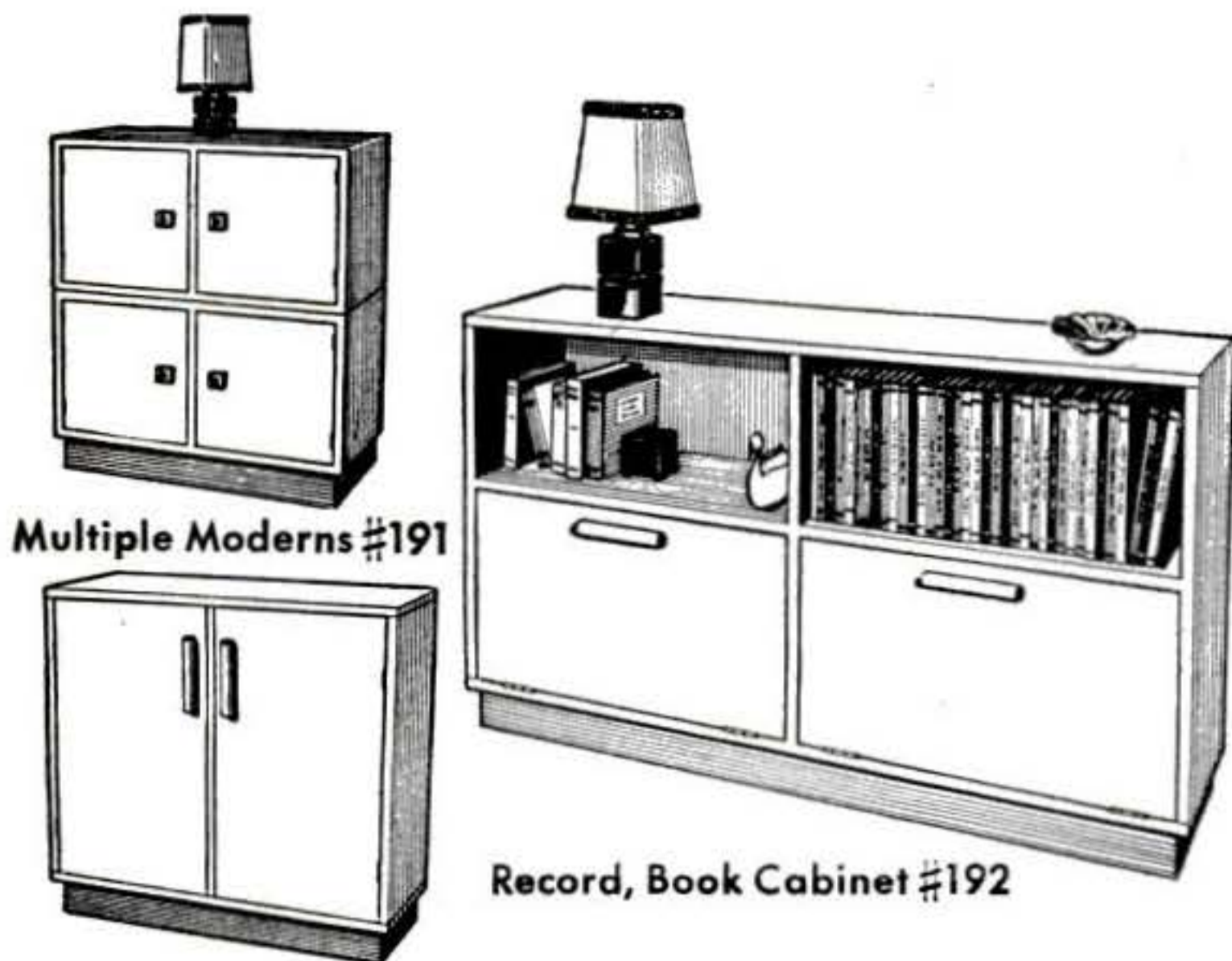


Fast, accurate, will file from both sides. Operator controls file arm. No saw carrier or adjusting screws to fuss with. A money-maker in any shop.

BURR MFG. CO.

8943 Venice Blvd.
Los Angeles 34, Calif.

WRITE TODAY!



Multiple Moderns #191

Record, Book Cabinet #192

Modern Cabinet #193

BUILD MODERN FURNITURE AT 1/2 STORE COST OR LESS!

The Easi-Bild* Pattern Method takes the mystery out of making modern, professional looking furniture. Tells what materials to buy... when and where to use each... specifies the right Casco Glue.

Complete assembly illustrations and step-by-step directions make it fun to build your own lovely, practical "modern group."

*Copr. 1949, Easi-Bild Pattern Co.

How to choose a glue:

Follow these directions and you'll solve all your gluing problems:



For boats, outdoor furniture, sports equipment—joints that must withstand outdoor exposure—**CASCOPHEN** (Resorcin Resin Glue). The first completely durable glue available to homecraftsmen.



For furniture, toys, heavy-duty home repairs—use **CASCAMITE** (Urea Resin Glue) where you want a light-colored or mold-proof glue line. Use **CASCO** (Casein Glue) for loose-fitting joints, general heavy-duty jobs. Both easily mixed in cold water.



Send coupon for furniture patterns to:

Casco Pattern Dept. PS-99
P. O. Box 215, Pleasantville, N. Y.

Enclosed is¢ for patterns checked below.

- () Record, Book Cabinet, Pattern No. 192—25¢
 () Multiple Moderns, Pattern No. 191—25¢
 () Modern Cabinet, Pattern No. 193—25¢

Name _____

Address _____

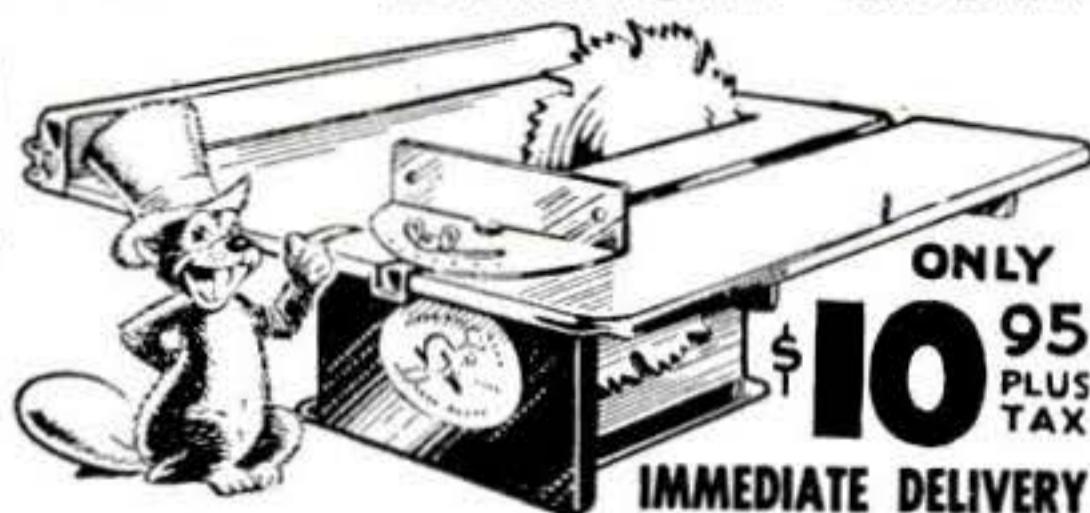
City _____ Zone _____ State _____

THE BORDEN CO. • CHEMICAL DIVISION
Makers of Casco Glues

Eager Beaver BENCH SAW

A man-sized
Ball Bearing
Bench Saw

Guaranteed
to Cut
2 x 4's



ONLY
\$10.95
PLUS
TAX
IMMEDIATE DELIVERY

LOOK AT THESE FEATURES

1. All Metal Construction
2. Rugged Ball Bearings
3. Light and Portable
4. Adjustable Rip Fence
5. Indexed Mitre Gauge
6. 1 1/2 inch Arbor Pulley
7. Full 2 inch Cut
8. Designed for Safety
9. Table Size 12 1/2" x 13 1/2"
10. 6" Combination Blade

If your dealer cannot supply you send check or money order with dealers name. We'll ship prepaid. Price does not include motor. No C.O.D.'s please.

SIERRA TOOL CO., INC., 1618-PS North Vermont Ave. Los Angeles 27, California



\$24.50
POSTPAID
U.S.A.

**COMPOUND
ANGLE
VISE**
for GRINDING
MILLING
DRILLING
AT ALL
ANGLES

Base 4" x 6"—Vise 1 1/2" x 2 1/4"—Vise Detachable
Shipped postpaid cash with order or C.O.D. plus
charges. WRITE FOR FREE CIRCULAR.
EN FAB, INC. 338 PARSONS ST., KALAMAZOO, MICH.

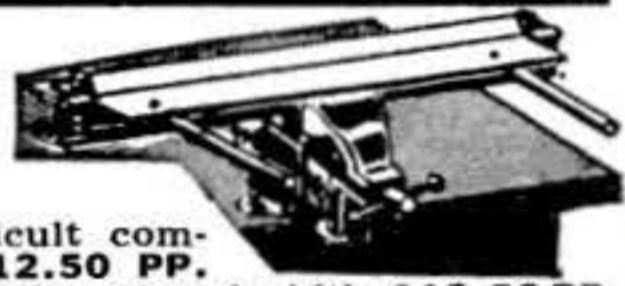
SCREWMIX—BEARINGS

Mixed screws & metal screws—30c Lb.	Bore	O.D.	Type	Price
Mixed wood screws—Mixed washers— Mixed cotter pins—30c Lb.	5/32"	5/8"	Ball	15c
Mixed nuts—Mixed aluminum rivets— 50c Lb. Mixed steel rivets—20c Lb.	3/16"	1/2"	Needle	15c
BARGAIN OFFER (\$2.40 value) one lb. each of above 7 mixtures— \$1.95	1/4"	5/8"	Needle	15c
POSTAGE Screwy Mix, Add 5c per lb. POSTAGE Bearings, Add 10c per order, Minimum order \$1.00	1/4"	3/4"	Ball	22c
	5/16"	1/2"	Needle	15c
	39/64"	13/8"	Ball	25c
	3/8"	7/8"	Ball	35c
	5/8"	1 1/4"	Ball	30c
	1"	1 1/4"	Needle	28c

JAY-CEE SALES CO., 4554 Grand River Ave., Detroit 8, Michigan

30" SHEET METAL BRAKE

Forms angles, flanges, seams. Bends 26 gage steel. Heavier copper and aluminum. Cam locking. Portable, can be clamped to edge of truck. All steel. Shipping wt. 42 lbs. Shipped express collect. 30" size... **\$24.50**



12" BRAKE. Fits in vise to form difficult compound bends, up to 20 gage steel. **\$12.50 PP.**
CUTTER. Cuts 18 gage steel any length and width, **\$12.50 PP.**
SHEET METAL PLIERS. 2 1/2" wide, **\$2.00**; 5", **\$3.00.**
PLASTIC BAR BENDER. 1/4 x 8 capacity... **\$1.00.**
IRON BENDER. Forms hooks, braces, eyelets. Bends 1/4 x 2, **\$10.00.**
 Immediate delivery. Order direct, cash or C.O.D., or send for folder.
WISE BRAKE MFG. CO., 1116 So. 27th St., Omaha 5, Nebr.

SHARPEN CIRCULAR SAWS LIKE AN EXPERT

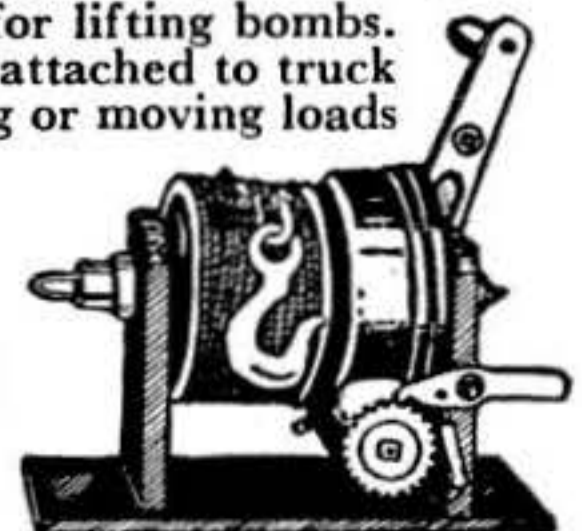


No experience needed. Two simple adjustments. Gets hollow-ground, cross-cut or combination saw blades true and sharp. Fits 6" to 12" blades with 1/2" to 13/16" centers. Includes file and complete instructions. **\$6.95** postpaid. (Check or money order) C.O.D.'s postage extra. Guaranteed—Money back if not satisfied after 10 day trial. A money maker for fix-it shops. Soon pays for itself. Order today.

SURE SHARP MFG. CO., Dept. S-109
P. O. Box 24 Santa Ana, Calif.

NEW WAR SURPLUS HOIST & WINCH

Originally made to be used on B-29s for lifting bombs. Mounted on welded steel base, can be attached to truck body or any solid base. Ideal for lifting or moving loads onto trailers, trucks or tractors or for machine shops, garages or warehouses. Capacity 2,000 lbs. Equipped with ratchet for holding load and 18 ft. 3/16" steel cable. Shipping weight 50 lbs. **\$29.95**
 FOB, Kansas City, Mo.



Send check or M.O. for immediate delivery. No COD's.

UNITED AUTO PARTS, INC.

1901 Troost

Dept. PS10

Kansas City, Mo.

GREATEST MOTORCYCLE YET

NEW 1950 HARLEY-DAVIDSON *HYDRA-GLIDE*

It's the finest performing Harley-Davidson of all time! New, flashing acceleration that shoots you ahead like a rocket; new, increased power that whisks you over hills like the wind; effortless steering; positive stopping; road-hugging stability; oil cushioned riding comfort! You'll thrill to every moment in the saddle as you take in exciting race meets, hill-climbs, gypsy tours and sight-seeing trips. There's no sport like motor-cycling, no fun like owning a Harley-Davidson! And it's so easy on convenient terms. See your dealer. Mail coupon now.



YEARS AHEAD!

- More Power
- Greater Acceleration
- Remarkable Stability
- Feather Touch Steering
- Positive Braking
- Amazing Comfort

HARLEY-DAVIDSON MOTOR CO., Dept. PS, Milwaukee 1, Wis.

Send free copy of ENTHUSIAST Magazine filled with motorcycle action pictures and stories; also literature on new 1950 models.

Name.....

Address.....

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

DEALERS: Valuable franchises available for the full line of Big Twins and lightweight. Write today!

HUNDREDS OF ITEMS AND IDEAS FOR THE WOODWORKER

A board or carload—Top grade kiln dried Mahogany—Walnut—Wh. Hd. Maple—Cherry—Poplar—Aromatic Red Cedar—Red, White and English Brown Oak—Sapeli—Andiroba—Balsa wood.

HARD TO FIND LUMBER

BIG NEW NO. 16 CATALOG FOR WOODWORKERS. 144 PAGES OF HARD-TO-FIND SUPPLY ITEMS.

The finest catalog we ever published. Full of unequaled bargains and useful information.

Greatest Selection of Fine Domestic and Imported Woods

Catalog shows in natural color 32 rare and fancy woods, 43 matched veneer designs, multi-colored bandings, inlays, overlays, 275 scroll patterns to choose from, labor-saving machinery and a section for beginner's instruction.

OVER 100 NEW ITEMS

My stocks are gigantic—bigger than ever before. Really FAST SERVICE on your orders. My new catalog includes a "gold mine" of hard-to-find hardware items. Whatever Wood Craftsmen need—I HAVE IT.

MAIL COUPON TODAY for GIANT NEW CATALOG #16

Only 15c Refunded on first order.

Harold F. Hunt, President
CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. A-10, Chicago 8, Ill.

I enclose 15c, to be refunded on my first order. Please send me your big new Catalog No. 16.

NAME.....

ADDRESS.....

TOWN.....ZONE.....STATE.....

Your Best Buy! SOUTH BEND



9" x 3" Model C, 6-speed Bench Lathe with 1/4 h.p. motor—f.o.b. factory \$187.35

Compare South Bend with any lathe regardless of price. Compare its accuracy, sturdy construction and fine workmanship... South Bend features that pay-off in better work; greater utility and long, dependable service. Then you'll agree that you get more for your money in a South Bend Lathe.

Write for information on South Bend Lathes with 9", 10", 13", 14 1/2", and 16" swings; 14" Drill Presses and 7" Bench Shapers. State machine interested in. Time Payment Plan available—25% down, balance in 12 monthly installments.



SOUTH BEND LATHE WORKS

Building Better Tools Since 1906

456 E. MADISON ST., SOUTH BEND 22, INDIANA

WISE-GRIP WRENCH

The Tool All America Is Talking About



WORLD'S MOST VERSATILE HAND TOOL!

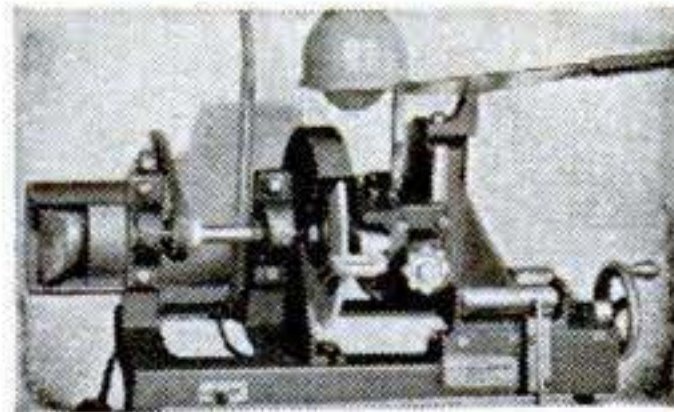
Does jobs no other tool can do. Double-lever action LOCKS jaws with tremendous grip—quickly adjusts to non-locking action. New Involute Jaw Curve holds all shapes—nuts, rounds, irregular shapes, with unbelievable ease. Has Knurled Jaw Tips that do not slip. Thin Nose. Super Wire-Cutter. New Geometry gives more power—easier opening. Fine alloy steel. Nickel plated finish.

WITH Cutter	No. 7W—7 in., \$2.25
	No. 10W—10 in., \$2.50
WITHOUT Cutter	No. 7C—7 in., \$1.85
	No. 10C—10 in., \$2.25
Also world famous original model:	
	No. 7—7 in., \$1.65
	No. 10—10 in., \$1.95

If not at your dealers, order direct.
Postage paid if price accompanies order.

PETERSEN MFG. CO. Dept. E-10 DeWitt, Nebr.

Always Mention Popular Science when writing



Pat. applied for

Start a NEW BUSINESS Or Add to Your Present Repair Business
Sharpen Dull Pipe Wrenches
Pipe Taps & Dies
"Gum" Circular Saws
Write for information.

J. C. MOORE INDUSTRIES P.O. Drawer 276 FREDONIA, PA.

ELECTRIC SHEAR SHARPENER

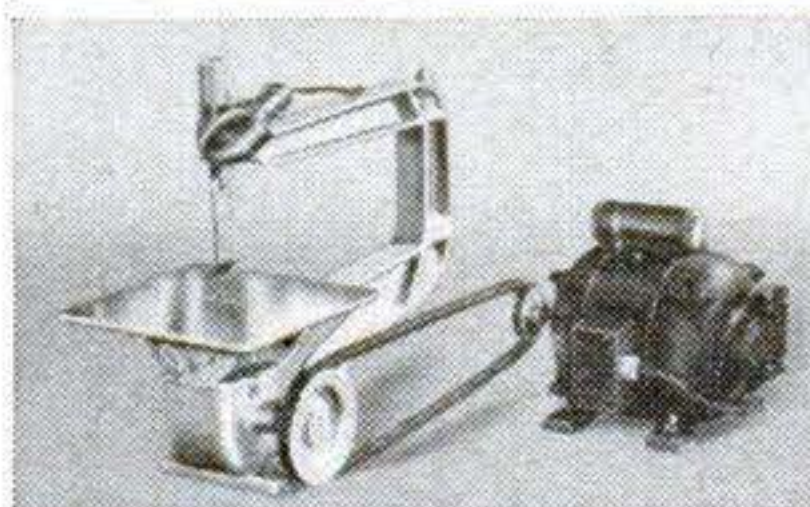
Over 65,000 Sold—It Must Be Good!



Genuine Carborundum Motor driven wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door. complete with electrical goods catalogue.

\$9.75 complete with vise

WILLIAM MARVY COMPANY, Dept. B
479 St. Peter Street St. Paul 2, Minn.



JIG & SABER SAW with TILTING TABLE

Professional model. As Saber—upper arm removable, work not confined to throat depth. As Jig—cuts to center of 24" circle, work up to 2" thick. Table tilts 45°, grad. scale. All-metal, smooth stroke, runs in

\$13.95 ea.

oil. Working parts hardened. Fully Guaranteed. Send Check or M.O., we ship Prepaid; or send \$2.00, we ship Exp. Coll. (Jig-Lite extra, \$1.95. Motor not inc.) Ship. wt. 15 lbs. Add Postage outside continental U.S.

HOB-E-EZE TOOLS Box 396 Niles, Mich.

WAR SURPLUS and OTHER ITEMS

CLUTCH for motor scooters, motor bikes, Lawnmowers, etc.
Mercury centrifugal clutch for use with any small gas engine. Belt pulley. 5/8" bore. New. Stock #400.....only \$9.95
In lots of 12.....ea. \$8.00

STAINLESS STEEL FLAT TOPS
Stainless steel one side. 3/4" veneer center. Ideal for: shelves, back bar work board, work table, etc. Stock #411.
22 x 19 1/2".....\$1.95 22 x 21 1/2".....\$1.95
22 x 34".....\$3.45 22 x 37".....\$3.95

HEAVY DUTY FARM WAGON
5 to 7 ton capc. Heavy duty 4 wheel 5-7 ton trailer, 27" high, rack size is adjustable 12 to 20 feet. Built of heavy 6" I beam channel iron and a 3" dia., seamless tube. Double bronze king pins, heavy duty hitch, double high speed Timken bearings. Width of track is 6'. This trailer will not whip and has been tested at speeds up to 50 MPH. Use it for chopper wagon, boat trailer, machine mower, logging, construction work. Trailer comes with 4 wheels and spare tire. All tires are airplane type and are GUARANTEED. Value is appx. \$700. OUR PRICE IS ONLY \$179.50. Stock #558.

4 WHEEL ARMY BOMB TRAILER
Costs less than price of tires. Can be used for compressors, const. work, light plants, foundries, machinery, etc. Wgt. 375. Goodrich & Firestone 6 x 9 tires 21" high. Trailer is 6'5" long. Axle size 1 3/4". Cone ball bearing race. 3" center channel 36" wide. Pay load 1 ton, will take 2 ton. 36" tongue. Zerk fittings. Tires list at \$28.00 each. Our price for complete trailer is \$90.00. Stock #559.

ALL PURPOSE VISE
Ideal for bench work, drill-press, milling machine, wood or metal. Jaws 5" wide, open to appx. 7". 5/8" screw square thread. Heavy duty built of steel. Stock #564.
Price.....\$6.95

RUBBER WHEELS Good for boats, scooters, wheelbarrows, etc. Stock #536.
2" x 10" & 1/2" bore.....\$ 1.95
2.75 x 10 5/8" & 1/2" bore.....\$ 3.95
4.00 x 8 5/8".....\$10.95
10 1/2" x 4, 6 ply 5/8".....\$ 8.95
14 1/2" x 5, 6 ply 1".....\$10.95
New airplane tires, tubes and wheels with high speed Timken Hyatt ball bearings.
Stock #544, 800 x 5-6 ply 1".....\$14.50
1700 x 20" 12 ply TUBES. Stock #545. \$44.50 for earthmovers, trucks. \$300 value.

TABLE SAWS, BLADES AND ARBOR
(A) All steel table saw 10" high. 1/8" thick table is 13 1/2" x 27". Saw comes with 7" combination blade, 6" grinding wheel, double end 1/2" shaft ball bearing arbor, and steady rest for grinding. Makes 2 1/2" cut. Saw has all holes drilled, nuts and bolts furnished and ready to assemble. Will take a 10" blade. Stock #555. Price.....\$9.95
(B) Table saw. Steel table top 3/4" thick with soldered hardwood veneer center. Size is 19 1/2" x 22"-10" high. 7" blade, 6" grinding wheel, double end 1/2" shaft ball bearing arbor, steady rests are included. Saw comes with nuts and bolts. All holes drilled. Will take 10" blade. Ready to assemble. Stock #556. Priced at.....\$11.95

EXTRA ACCESSORIES
6" wire wheel...90c 22" V belt....75c
1/3 HP heavy duty motor with capacitor \$17.50
Saw Blades. Made of tough steel. Teeth set for side clearance for wood cuts. High carbon, hand filed, are 1/2" or 5/8" shaft size.
Work Shop High Carbon
7" comb.....\$1.35 7" comb.....\$2.50
8" comb.....\$2.00 8" comb.....\$3.00
All blades are postpaid.
Double end ball bearing arbor. Half inch shaft 11 1/2" long. Bearing alone worth \$10.00. Stock #305. Only.....\$4.95

APEX UNIVERSAL JOINT
One Half Female socket. One Half inch stud, 5 1/2" overall. Fits any 1/2" shaft motor. Use as agitator or in any spot requiring a universal joint. List \$4.00 Stock #562. Our price 95c. Add 10c postage.

AIR COMPRESSORS
All ratings from 1/3 HP to 10 HP—new and rebuilt. Write for free details.

PLASTIC TUBING
Good for water, oil, air, electrical installations & radio work. Available in 100' lengths. Min. order 50'.
1/8", 3/16", 1/4", (your choice) per ft. 2c
5/16", 3/8" per ft. 3c
1/2", 7/16" per ft. 4c
1" 3 ft. lengths only, per ft. 6c
1 3/8" per ft. 8c

WRITE FOR FREE CIRCULAR

AC ARMY LIGHT PLANTS
300 watt.....\$89.50
500 ".....\$149.50
1000 ".....\$189.50
1500 ".....\$209.50
2500 ".....\$295.00
5000 ".....\$550.00
7500 ".....\$625.00
10000 ".....\$900.00
25000 ".....\$995.00
Write for circular.

GENERATORS
300 watt, 12V \$7.00
300 watt, AC \$ 29.50
1000 watt, AC \$89.50
1500 watt, AC \$99.50
2500-3000 watt, AC \$145.00
3000 watt, DC \$99.50
Write for circular.

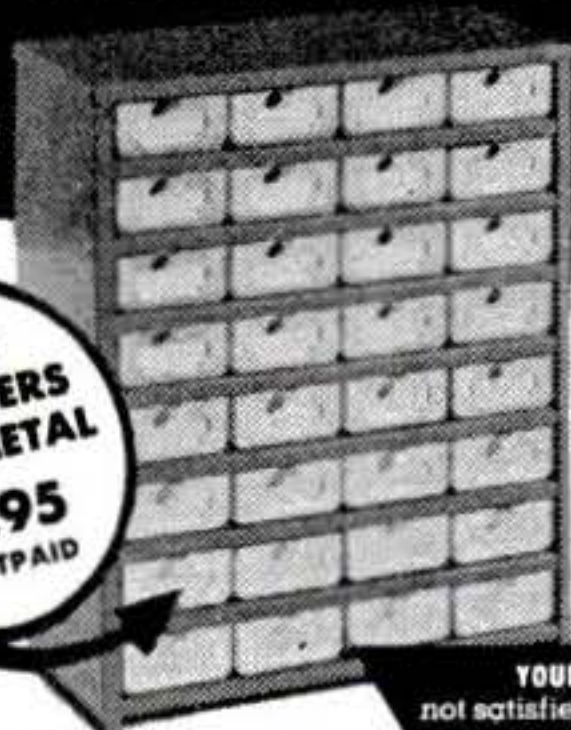
HEAVY DUTY RUBBER CABLE
3 wire #10 Super cable. Stock #351. 65' with lugs. Value \$26.00. \$13.00
Our price.....\$13.00
3 wire #10 government submarine type. Used underground, underwater, overhead. Cost U. S. 90c ft. Stock #542.
100 ft.\$24.00
250 ft.\$55.00
500 ft.\$100.00
2900 ft. reel.....\$330.00
2 conductor rubber cable #4—stranded—75 ft. length with connectors. List price \$177. Stock #543. \$90.00
Our price.....\$90.00
4 wire #6 stranded heavy duty. List price \$2.36 per ft. Stock #548.
50 ft.\$30.00
100 ft.\$55.00
250 ft.\$125.00
500 ft.\$225.00
1000 ft. reel.....\$400.00
3 wire #10 rubber cable two male connectors. Value \$109.50 Stock #554. Price.....\$35.00

ALL ITEMS GUARANTEED C & H ELECTRIC Co.
AS REPRESENTED
438 W. JUNEAU AVE.
MILWAUKEE 3, WISCONSIN

All prices F.O.B. Milwaukee. 25% deposit required on all C.O.D. orders. No C.O.D.'s under \$10.00. Use stock number when ordering. Many other bargain items not listed—write for our free circulars.

LITTLE THINGS HARD TO FIND?
GET YOURSELF A
HANDI-CHEST
FOR AS LITTLE AS
\$3.95
POSTPAID

32 DRAWERS ALL METAL \$8.95 POSTPAID



DRAWERS
Uniform in all chests are 1 1/4" deep, 2 3/4" wide, 5 3/4" long 1-piece aluminum units have removable dividers to make 3 bins, index cards on front. Kraft-board drawers have metal pull tabs.

YOUR MONEY BACK if you are not satisfied with your HANDI-CHEST

NOW with three times the "bins," HANDI-CHEST is a must for home, office, shop. Ideal kit for small parts, hobby needs, sewing, fishing, etc. Steel spot-welded cabinets, metal drawer guides, pleasing grey finish, rubber feet that won't mar any surface. Aluminum or Kraft-board drawers. Manufacturer ships promptly, direct, postpaid. Send check or money order. No C.O.D., please. Ohio orders add 3% sales tax. Ask about quantity discounts.

16 drawers Steel Cabinet is 6" deep, 8 1/4" high, 12 3/8" wide. 48 compartments in aluminum drawers Model 16A HANDI-CHEST complete **4.95**

Model 16K HANDI-CHEST, same size as above, with heavy Kraft-board drawers, metal pull tabs, complete **3.95**

32 drawers Steel Cabinet is 6" deep, 15 1/4" high, 12 3/8" wide. 96 compartments in aluminum drawers Model 32A HANDI-CHEST complete **8.95**

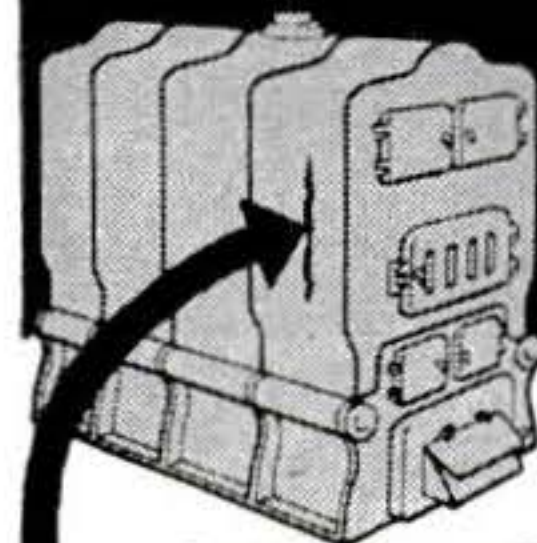
Model 32K HANDI-CHEST, identical in size, with heavy Kraft-board drawers, metal pull tabs, complete..... **5.95**

64 drawers Steel Cabinet is 6" deep, 15 1/4" high 24 1/2" wide. 192 compartments, aluminum drawers Model 64A HANDI-CHEST complete **15.95**

Model 64K HANDI-CHEST, same dimensions as 64A, sturdy Kraft-board drawers, metal pull tabs, complete **9.95**

ALL HANDI-CHESTS ARE SHIPPED POSTPAID IN U. S. A.
TIBBITS MFG. CO., Dept. 10F, Alliance, O.

STOP FURNACE LEAKS
Save
Fuel Costs



Seal up every heat-wasting crack, opened seam and other leak in your furnace, boiler, tank, radiators and piping tight—as professional repair men do—with Smooth-On No. 1 Iron Cement. Do it yourself—now—and cut this winter's fuel bills. You apply Smooth-On like putty, it hardens like metal, and stays tight, because it expands slightly as it sets. Buy Smooth-On No. 1 in 1 3/4-oz., 7-oz. or 1-lb. size at your hardware store. If they haven't it, write us.

FREE Repair Handbook

40 pages of ingenious, tested, short-cut repairs. Simple directions. 170 illustrations. Write today for YOUR free copy of the Smooth-On Handbook.

SMOOTH-ON MFG. CO., DEPT. 58K
570 Communipaw Ave., Jersey City 4, N. J.

Do it with
SMOOTH-ON
THE IRON CEMENT OF 1 000 USES





"SAVE IT AND
FIX IT"

FIXES

FURNITURE, DISHES, TOYS
BOOKS AND GLASSWARE

It's transparent, waterproof,
flexible and durable.
Get a tube
today.



DUACO CEMENT

REG. U. S. PAT. OFF.

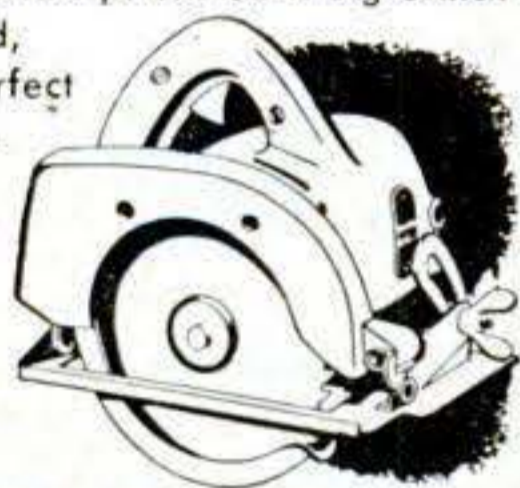
Every man's a handy man with
SKIL Home Shop Tools



6 in. SKIL Home Shop Saw

Fully adjustable for depth and bevel cutting

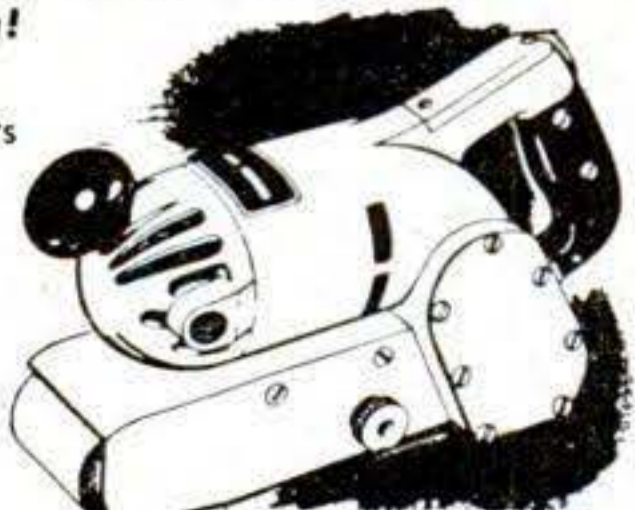
Now—a fully adjustable low-priced saw. Big 6-inch blade cuts through wood, metals, plastics. Fast, perfect balance for easy handling. Safe telescoping guard. Quality construction.



6 in. SKIL Home Shop Sander-Polisher

IT SANDS! IT DRILLS! IT POLISHES!

You'll find hundreds of uses for this wonder-worker. Polishes cars, furniture, woodwork. Cleans and scours pots and pans. Burnishes metals. Drills, sands, grinds, sharpens. Big 6-inch pad. 50% more powerful AC-DC motor



2 1/4 in. SKIL Home Shop Belt Sander

Takes the work out of sanding!

Removes paint and varnish fast. Produces satin-smooth finishes easily. Eliminates hours of tedious hand sanding. Light, compact, powerful.



Made only by SKILSAW, INC. leading maker of tools for industry.

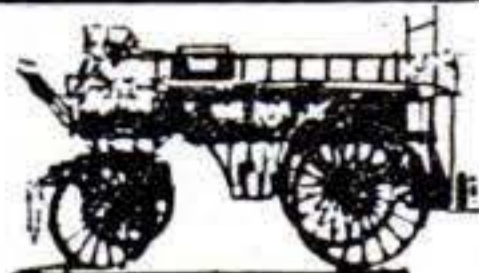


1911 MAX-
WELL \$2.75

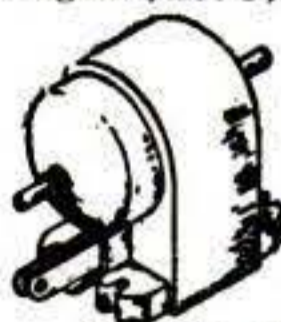
Superbly decorative, exquisitely detailed 7 1/2". Also: Olds, \$2., '09 T. Ford \$3.10, '10 T. Ford \$2.75, Stanley Steamer \$3.20, '03 A Ford \$2.75, Rambler \$2.60, Rco \$2.75, 3 in 1 E.M.F. \$3.20, Horseless Carriage \$1.75, Fire Engines 1/2" Scale, City Serv. Ladder \$4.25, Serv. Hose Reel \$2.25, Comb. Chem. Wagon \$3.75, Hose Wagon \$2.75, Steamer \$6.50. All P. P.

COLLECTORS MINIATURES "OLD-TIMERS"

NEW! PRE-FAB KITS



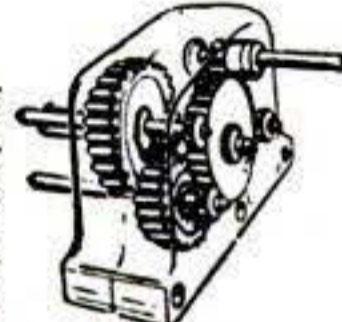
Comb. Hose Wagon



TINY ELEC MOTOR \$1.50
Compact powerful reversible. Plastic Housing. 1 1/2-4 1/2 V. Perm. Mag. 1" x 1 3/8" x 1 1/2" hi. 2 oz. Shaft 3/32 x 2".

SMALL JET ENGINE \$1.95
Nothing to wear. Instant starting. No Props. Easy to install-use. Flies 12" to 20" planes. Jetex - Perfect for boats-cars. Complete with fuel, accessories, instructions. 10 Extra Fuel 65c. Larger jet engine \$4.95.
HOBBYISTS HAVEN—VISIT

MULTISPEED GEAR BOX \$2
Plastic Housing 1/2 oz. 4 diff. speeds—shafts 1" w. Set pulleys etc. 25c Catalogs: 120 p. ship models 35c, H.O. Trix Trains 15c, Model Books—Plans 10c.



POLK'S HOBBIES

Dept. P. S. 109
314 5th Ave. N. Y. 1
Dealers Write. Open Thurs. eve.



SEND FOR FREE FOLDER

MULTI PURPOSE POWER TOOL

Magna Engineering Corporation
465 California St., San Francisco 4

Surplus Bargains

SEND 10c

JAMMED PACKED WITH BARGAINS on shop and machinery equipment, hobby supplies, aircraft parts, etc.

FOR 64 PAGE CATALOG

ATLAS EQUIP. CO.
229 S. W. BLVD.
KANSAS CITY, MO.

\$4.95

REAL ENGINE VALUE



A miniature gas engine that really operates. Thousands of Buzz "B" gasoline engines have been sold at twice the price. Now is your chance to buy a real 1/6th H.P. gas engine for only \$4.95. Turns up over 8,000 rpm. For Boats, planes, midget cars, etc. Guaranteed and ready to run. Includes Champion spark plug and tank. Send only \$1.00, engine shipped collect for balance, same day. Write for free catalog or SEND 10c FOR NEW MAMMOTH ILLUSTRATED CATALOG OF THOUSANDS OF HOBBY ITEMS.

America's Hobby Center, Inc., Dept. S-109, 156 West 22 St., N.Y. 11

NOW YOU TOO CAN BUILD 15 RADIOS

COMPLETE KIT \$14.75



Absolutely no Knowledge of Radio Necessary

You Need NO Additional Parts
The PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts. The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit, PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your KIT NOW! ONLY \$14.75

Postage prepaid with check or money order.
(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 113
497 Union Avenue Brooklyn 11, N. Y.



Now—a genuine Delta® Homecraft Tilting-Arbor Saw for only \$64⁹⁵!

(without side-table extensions, saw guard and splitter, or motor)



Free Book

"How to Start Your Home Workshop"

Page after page of ideas, tips, and pictures to help you in planning and getting started. Tells about shop location, lighting, hand tools, etc. For your coupon, send coupon at right.

New 8" bench model Only \$6.50 down

A genuine Delta Homecraft tool at an amazingly low price! One of the most versatile tools a hobbyist can own — for woodworking fun and healthful relaxation . . . for saving money on repairs around the house!

A Real Value

You'd expect to pay much more for this new Delta Homecraft bench model. Here's why:

1. All working surfaces are *cast iron*, for maximum rigidity.
2. Its saw arbor runs on lubricated-for-life ball bearings.
3. It performs all operations commonly done by larger, more expensive machines of its type.
4. It cross-cuts and rips stock up to 2 1/4" thick; it miters and bevels.
5. Accessories are available for all dado and moulding operations.

From start to finish, it's a machine you can be proud to own!

Put It In Your Shop

Your Delta Homecraft dealer can show you this new bench-model Delta Homecraft 8" Tilting-Arbor Saw. See a demonstration at your dealer's today!

If you don't know who your Delta Homecraft dealer is, send coupon below to us. We'll send you your dealer's name and address — and also a free book, "How to Start Your Home Workshop."

POWER TOOL DIVISION



Rockwell

Manufacturing Company

MILWAUKEE 1, WISCONSIN

TEAR OUT COUPON AND MAIL TODAY!

Power Tool Division
ROCKWELL MANUFACTURING CO.
683L E. Vienna Ave., Milwaukee 1, Wis.

Send me the name and address of my Delta Homecraft dealer — and also your free book, "How to Start Your Home Workshop."

Name.....

Address.....

City.....(.....) State.....

HM-71

WORLD'S LARGEST STOCKS OF JEEP PARTS

The King of Jeeps



WINTER SPECIAL

Used Canvas Tops Slightly Soiled. A3216-GPW115-2700 \$12.50

LOWEST PRICES IN AMERICA ON GUARANTEED JEEP PARTS!



COMPLETE DIFFERENTIAL ASSBY.
A788-GPW4207
\$22.50
Complete with Pinion.



UNIVERSAL JOINT
Journal Service Package
A1433-GPW18397
\$3.50



HUB & DRUM ASSBY.
A1690-GPW1102
New—\$9.35
Reprocessed—\$6.50



WATER PUMPS
639992-GPW8501
New—\$6.75
Outright Exchange—\$5.75
Reprocessed—\$5.50
Outright Exchange—\$4.50



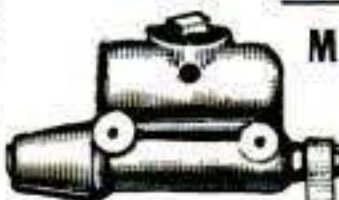
RADIATOR ASSEMBLY
Heavy Duty
A1214-GPW8005A
New—\$27.50
Rebuilt—\$22.50
Also interchangeable with Civilian Jeep #640145-640146



TRAILER LIGHTING CABLES
with one socket
A6019-GPW14407
\$4.00



BRAKE SHIELDS AND SHOE
A1496
\$6.95



MASTER CYLINDER
Complete
A556-GPW2140
\$5.95



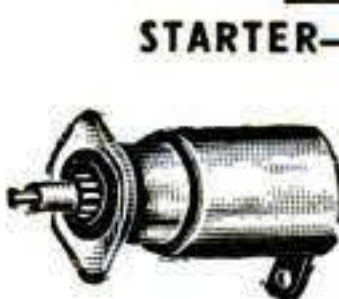
Oil Pan Gasket
639980-GPW6710
12c
Valve Re grind Gasket Set
A1537-GPW18387
75c



COMPLETE TRANSFER CASE
A1195-GPW7700
REBUILT (Outright) ... \$120.00
(Exchange) ... \$95.00



CARBURETOR REPAIR KIT
A6840-GPW18357B
\$4.35



STARTER—Auto Lite
No. MZ4113
A1245-GPW11001
New—\$26.50
(Replacement Type)—\$18.50



CYLINDER HEAD
A1534-GPW6050
New—\$8.40
Reprocessed—\$6.95



BELL CRANK
A1211-GPW3131 \$4.65
BELL CRANK SHAFT
A855-GPW3165 \$.80
BELL CRANK BEARING
A857-GPW3171 \$.40 (2 required)



SEAL BEAM UNITS
A1033-GPW13007
\$1.65



CLUTCH PRESSURE PLATE ASSBY.
638992-GPW7563
Outright \$7.60
Exchange 6.50



8-Pc. BRAKE LINING SET
116600-GPW18367
\$3.50



CLUTCH DISK
636755-GPW7550
Outright \$5.50
Exchange 4.75



FRONT AXLE SHAFT—LONG
A6030-GPW3207 \$27.00
FRONT AXLE SHAFT—SHORT
A6031-GPW3206A \$27.00
Interchangeable with Civilian Jeep CJ2A

BIG, FREE CATALOG
Write For Your Copy Today. Thousands of other parts and accessories available. **SHOP BY MAIL**—Order direct from this ad today.

TERMS: Net cash with order. Open account to rated firms only. C.O.D. Shipments should have 25% deposit with order. All prices are F.O.B. our yards, Chicago, Illinois.

BERG TRUCK & PARTS CO., INC.
1607 So. Wabash Avenue, Chicago 16, Illinois
Cable Address JEEP KING

STOP CHANGING MOTOR OIL!



End this needless waste and expense forever with **RECLAIMO** Today's Most Advanced Oil RE-REFINING Filter

Continuously cleans and RE-REFINES motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times! Proves conclusively that "Oil Does Not Wear Out Mechanically" as stated by U. S. Bureau of Standards. (Bulletin 86).

NEW ADDED FEATURE!
Gas - Moisture Vapor Injector
Increases Mileage with Smoother Performance

- REMOVES SOLIDS (by filtration)
- REMOVES WATER (by distillation)
- PREVENTS Excess Fuel Dilution
- PREVENTS Acid and Sludge Formation

"RECLAIMO"
MAINTAINS Stable Viscosity ELIMINATES All Oil Changes
CAR • TRUCK • TRACTOR OWNERS!
FREE 32-PAGE BOOK "OIL FACTS" (with bona-fide \$1000.00 offer on page 30), gives you the complete "Reclamo" story and details of our extraordinary 90-DAY NO-RISK TRIAL OFFER! Write for your copy TODAY!



RECLAIMO MFG. CO.
5083 ELSTON AVE., Dept. 11, CHICAGO 30, ILL.

Genuine Snap-on Tools

Available Only Through Snap-on's Direct-To-User Tool Service
WRITE FOR INFORMATION
SNAP-ON TOOLS CORP. • Kenosha, Wisconsin

HIGH POWER TELESCOPE

60 POWER-ALUMINUM TUBES-OPENS TO 33"
Variable Power Eyepiece Adjustable to 15X, 30X and 60X.



4.50 Leather Case Included
5 Sections. 4 Ground & Polished Lenses. Also used as 50X Microscope. Ready to use, only \$4.50 POSTPAID.

BROWNSCOPE CO. NEW YORK 19, N. Y.
Dept. 10P, 24 W. 45th St.,

PLYWOOD BOAT KITS



\$67.50 (Freight Included)
Build the 12 ft. V-Bottom "Sportsman" as shown. Ready-cut kits include all hardware, paint, etc. Send for free folder on all models as low as \$29.95, freight included.

TAFT MARINE WOODCRAFT
Dept. "R," 636 39th Ave. N.E. Minneapolis 21, Minn.

NOW! RICH SUDS

Your garden hose sprays New **SUDS-O-MATIC** also sprays fertilizer!
Your hose becomes your handiest household tool when you attach the amazing new SUDS-O-MATIC twin nozzle gun! Blasts dirt with soap and rinses thoroughly in one easy operation—ideal for cleaning house, car, porch, basement, garden furniture, screens, etc. Also sprays fertilizer on your lawn or garden. Fits any standard hose, never clogs or sticks. More than 20,000 homeowners already using SUDS-O-MATIC year 'round for countless household jobs. Send check or M.O. for your SUDS-O-MATIC gun today—complete, with generous supply of detergent pellets, only \$4.95



Load Suds-O-Matic with our fertilizer pellets and spray on lawn or garden. Bottle of 75 pellets, \$1.00
TRU-VALU SALES CO.
818 Wyandotte Kansas City, Mo.

You Can Be a Local COLORCRETOR



You can build a profitable, lifetime business with Colorcrete. Large waiting market. Work is easy and interesting. Moderate investment; high return. Large waiting market. Full instructions and liberal cooperation.

Sprayed-On Beauty

Colorcrete is modern beauty treatment for masonry surfaces — exterior and interior. Fuses to concrete, stucco, etc. Applied by air pressure. Range of many smart colors. Proven by 20 years of use on all kinds of buildings. Write or wire for Opportunity Book.

Colorcrete Industries, Inc.

572 Ottawa Ave., Holland, Mich.

Outstanding Business Opportunity



LOOK! It's New!

MECHANICAL TYPEWRITER ERASER



New all aluminum mechanical typewriter eraser. Convenient 5" pencil shaped holder. Replaceable slim eraser for letter-width erasures. Works like magic on any number of carbon copies as well as originals. Thumb-pin control for instant supply of fresh eraser. Smart royal blue finish. ONLY \$1.00. Send check or money order. Extra fills \$.25 per tube of 4. "Dealer Inquiries Invited"

STUDWELL PRODUCTS CO., Dept. P
70 EAST 45TH STREET, NEW YORK 17, N. Y.

ONLY \$1.00
Postpaid

SLASH YOUR TILLAGE COSTS!

- with the SEAMAN ROTARY TILLER
New, fact-packed book "Benefits of Rotary Tillage" tells you how and why.

Send for it — right away!

SEAMAN MOTORS, INC. 365 North 25th St. Milwaukee, Wis.

Sensational New Electric ① WELDER ② CUTTER!

FOR 110-115 AC or DC • WELD—BRAZE—CUT—SOLDER—HEAT TREAT BOTH only \$12 INSTRUCTIONS INCLUDED • LOWEST PRICE IN HISTORY!

The **WELDRITE** Combination—tested and proved by countless commercial and amateur users, is now offered direct to you at the amazingly low price of only \$12.00. No Gas—No Gauges—No Spark Lighter needed. Always ready for immediate use—Just plug **WELDRITE** into 110-115 AC or DC outlet. Uses standard welding and brazing materials. **WELDRITE** furnished complete with Converter Unit, #1 Single Holder for welding metal to 3/16" thickness, using up to 3/32" rod, and #2 Double Holder with Copper Coated Carbon Electrodes for Brazing, Cutting, Heat Treating, etc. Starting welding materials and instructions included. Ideal for home workshop. Invaluable for garages, repair shops, farms, etc.



FREE!

Illustrated Folder

SEND NO MONEY! 10 DAY TRIAL. Order your **WELDRITE** Electric **WELDER-BRAZER-CUTTER** C.O.D. today. Pay postman \$12 plus postage charges (wt. 4 lbs.) or send \$12 and we pay postage. Either way, if not satisfied, return **WELDRITE** in 10 days for refund, less postage charges. **WELDER HOOD**—Approved Arc Welding lens—only \$3.95. Calif. orders add 2 1/2% tax. 448 So. Hill • Los Angeles 13, Dept. B-10

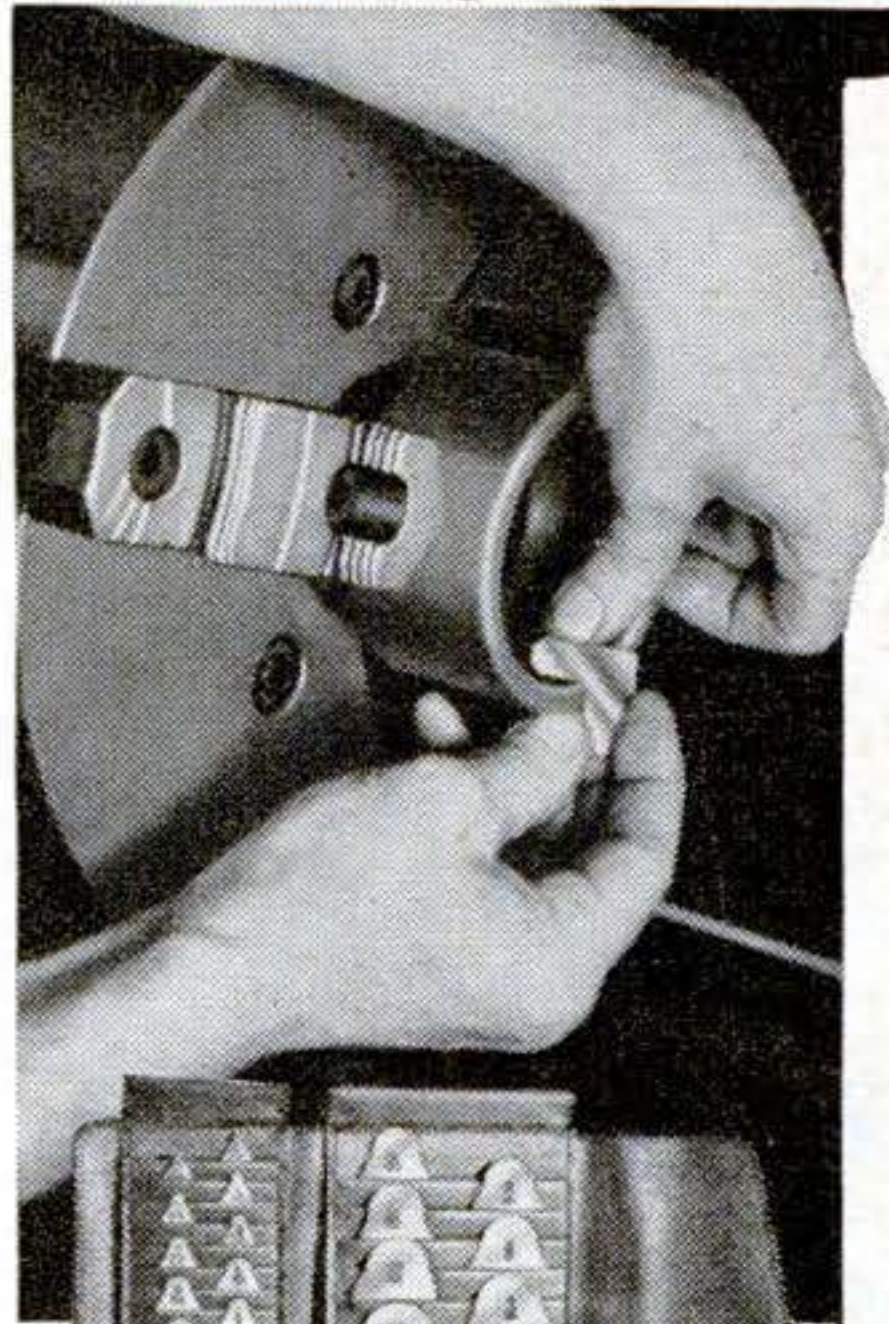
CALIFORNIA TECHNICAL PRODUCTS CO.

A New Principle in Radius Gages

PIONEERED BY

LUFKIN

... Providing 5 Applications for Each Radius



Determining radius of inside corners or fillets. Straight sides of gage are at 90°.



Taking radius of outside corners; also checking sides for 90° and tangent to circle.



Checking work on glass; checks convex parts with unusual projections.



For use on concave cutter (1/2 or less of circle).



Checking one-half of circumference.



HANDY KIT FOR EASY USE

Offered in 5 different sets in durable red leatherette kit, with pockets protecting against loss of blades and making selection easy. Range of blades from 1/64 to 1 inch.

These advancements in Lufkin Radius Gages typify the superior design and features which distinguish over a thousand other Lufkin measuring devices. "Lufkin" makes accuracy easy, fast, and sure. See your dealer this week.

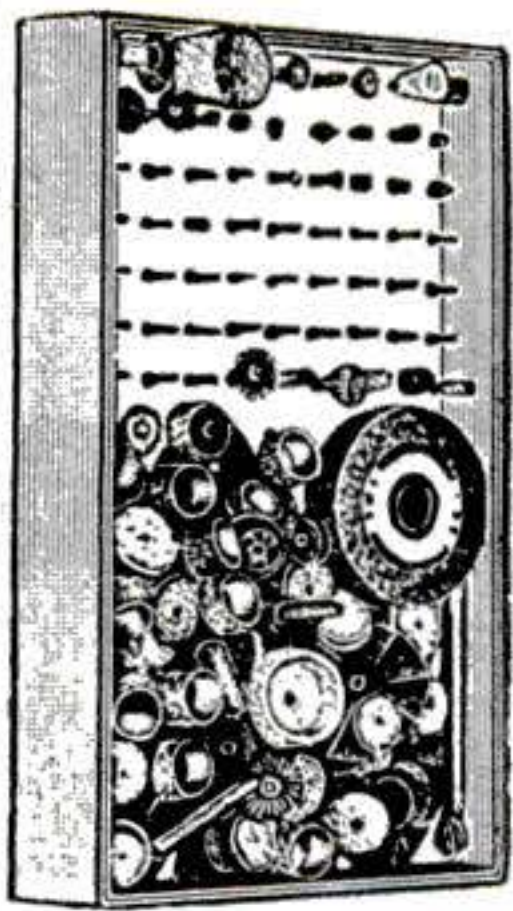
Write Department 5 for fascinating booklet, "The Amazing Story of Measurement". Enclose 10c (no stamps) to cover handling and mailing.



Buy **LUFKIN**

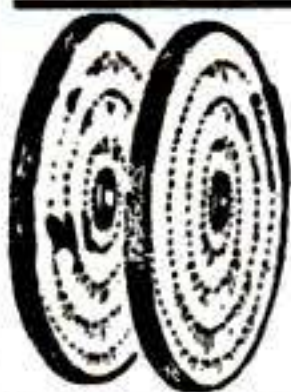
Precision Tools • Tapes • Rules • FROM YOUR DEALER
The Lufkin Rule Co. • Saginaw, Michigan

300 PIECE ELECTRIC GRINDER OUTFIT



THE MASTER KIT
fits all hand grinders for CUTTING, SHAPING, GRINDING, POLISHING Wood, Metal or Plastic
\$9.75
Post Paid in U.S.A.

- \$50 VALUE**
- 1 High Speed Steel Rotary File
 - 3 Grinding Wheels 1 to 3" diameter
 - 12 Mounted Stones 1/8, 3/32, 1/4" Shanks
 - 9 Rotary Cutters 1/8 and 3/32 Shanks
 - 30 Miniature Rotary Cutters 3/32 Shank
 - 10 Cut off Discs and Grinding Wheels
 - 1 Drum Sander 1/8" Shank
 - 15 Abrasive Bands for Drum Sander
 - 15 Leather and Felt Polishing Wheels 1/2 to 1" in diameter
 - 15 Felt Polishing Cylinders with Mandrel
 - 25 Abrasive Sanding Discs 1 1/2 to 2" dia.
 - 3 Rubber Wheels 7/8" diameter
 - 2 Speed Drills 3/32 Shank
 - 2 Mandrels 1/8 and 3/32" Shanks
 - 3 Rotary Bristle Brushes
 - 1 Rotary Wire Wheel Brush
 - 1 Circular Saw on Mandrel 1/8" Shank
 - 2 Rubber Cylinders with 3/32" Mandrels
 - 150 other items—all new and valuable.



8 IN. BUFFING WHEELS
5 Wheels for \$2.00
8 in. diameter muslin buffing wheels—1/2 in. thick. Perfect for all coarse and fine buffing. Amazing bargain.
Post Paid U.S.A.



SURPRISE VALUE
100 Pieces \$1.00
FOR ELECTRIC GRINDERS
Post Paid in U.S.A.
Grinding Wheels, Cut-off Wheels, Sanding Discs, Mounted Stones, Sharpening and Honing Stones, Rotary Cutting Burs, Abrasive Cartridges, and many other items. Rush check or Money Order.



18 ROTARY CUTTERS
\$13.50 Value \$5.85
Post Paid in U.S.A.
Assorted sizes cutter on 1/8" or 3/32" shank. Will fit all hand grinders. Ideal for cutting wood, metal, or plastic. Brand new.



2 CIRCULAR SAWS
ON 2 MANDRELS—
ALL AT ONE LOW PRICE
1" diameter saws on 1/8" Mandrels. For cutting wood, plastic, or soft metals. Order at once! Send Check or Money Order for this big bargain.
\$1.50
Post Paid U.S.A.

SCHUPACK SUPPLY CO., 7331 Cottage Grove, Dept. 56, Chicago 19, Ill.
ILLUSTRATED BARGAIN CATALOG FREE ON REQUEST



Ask Your Hardware Store for
FULLER'S
Unbreakable Amber Handle
SCREW DRIVERS

America's most popular line of moderately-priced screw drivers! Wide range of sizes.
FULLER TOOL CO., Inc., 911 Faile St., New York 59
World's largest maker of Amber-Handle Tools

SENSATIONAL! Super Jet TORCH

FAST: snap in fuel and light.
CLEAN: no smoke, carbon, or spilling.
SAFE: non-explosive fuel tablet burns 10 minutes. Ideal for soldering, silver soldering—wherever clean hot flame is needed. Used by model makers, service men, hobbyists, jewelers. \$1.39 postpaid includes 1 Torch, 12 Fuel Tablets.
AMAZING! New Type SOLDER PASTE
It's modern! Industry uses it! It's easy. Apply paste, heat w/th Torch. Eliminates cleaning—eliminates flux. Industry buys it by the keg—you buy it in 3 3/4 oz. jars @ \$1.10.
Special Combination Offer—Torch and Solder Paste...\$2.39
No C.O.D.'s—In Ohio Add 3% Sales Tax
IMMERMAN & SONS, 1812-S E. 13th St., Cleveland, Ohio.



HOW TO GET THE MOST OUT OF YOUR HOME WORKSHOP

Let Expert Craftsmen Show You How to **GET RESULTS WITH YOUR TOOLS!**



WOULD YOU like to **DOUBLE** the fun and profit you get out of your Home Workshop? Here's a brand-new book that *shows you how*—tells you tested ways to squeeze every last bit of enjoyment and money-saving use out of every piece of equipment in your shop, whether it is just hammer and saw or the most elaborate power outfit.

Hundreds of Money-Making, Money-Saving Ideas for Both Beginner and Expert!

Here's inside information on *how to make your tools do the job* in every woodworking craft! Recognized experts let you in on their favorite kinks, tricks and short-cuts—reveal know-how knacks of craftsmanship that will enable you to build chairs, tables, cabinets and other furniture in jig time; make home repairs and improvements; enjoy scores of *additional* workshop hobbies! Every subject is covered in rich, fascinating detail, from fundamentals of correct hand sawing and planing to getting the most out of your jigsaw, drill press, lathe, sander, circular saw, carving motor, jointer, bandsaw, shaper, planer, polishing motor, fretsaw, scroll-saw, router, grinder, etc. Over 690 illustrations! This big book even shows you how to equip your workshop on the budget plan with as little as \$25!

Order At Once for 7-Day FREE Trial!

When you see your copy of **HOW TO GET THE MOST OUT OF YOUR HOME WORKSHOP**, you'll vow it should sell for many times its amazing bargain price of *only* \$2.49! Order it today! Pay postman only \$2.49 plus postage for this sturdy Buckram-bound DeLuxe Edition, stamped in brilliant Aluminum. Make it work for you for *seven days free!* Then, if not fully convinced it can **DOUBLE** the pleasure and value you get from your Home Workshop, you may return it for refund of every penny! But don't fail to send the Order Form **NOW!**

MAIL FREE-TRIAL COUPON NOW!

Popular Science Publishing Co., Dept. 109
353 Fourth Avenue, New York 10, N. Y.

Send me **How to Get the Most Out of Your Home Workshop**. I will pay postman just \$2.49 plus few cents postage when book arrives. If not 100% satisfied, I may return book within 7 days for full refund.

Name.....

Address.....

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

Check here if you send remittance now, and we will pay postage. Same return and refund privilege.



Drive the **CROSLEY** Hotshot

America's own sport car!

Again Crosley makes automotive history—this time with the daring HOTSHOT—a new thrill in motoring! High in style, amazingly low in price—even less than other Crosley passenger models!

The Crosley HOTSHOT follows the dashing lines of racing cars, but will collect a crowd on Main Street or at the club. It's light, fast, economical. For those who want to participate in track racing, road racing or hill climbing competitions, the engine may be souped up as high as 12 or 14 to 1 compression ratio. Also, the windshield, bumpers, top and headlights are removable. Quickly detachable side doors, not shown, as well as top and side curtains, are standard equipment.

Powered by the amazing CIBA (cast iron block) overhead cam shaft engine—the only light, high speed, high compression, racing type engine built in quantity in this country. Equipped with Crosley's revolutionary Hydradisc Brakes—the ultra modern airplane type hydraulic brake now standard equipment on all Crosley cars.

Drive the new Crosley HOTSHOT. Learn about the hundreds of spectacular improvements in the entire Crosley line. For free literature describing the HOTSHOT and the 5 other Crosley models, including Station Wagon illustrated, write Crosley Motors, Inc., 2530-JK Spring Grove Ave., Cincinnati 14, Ohio.



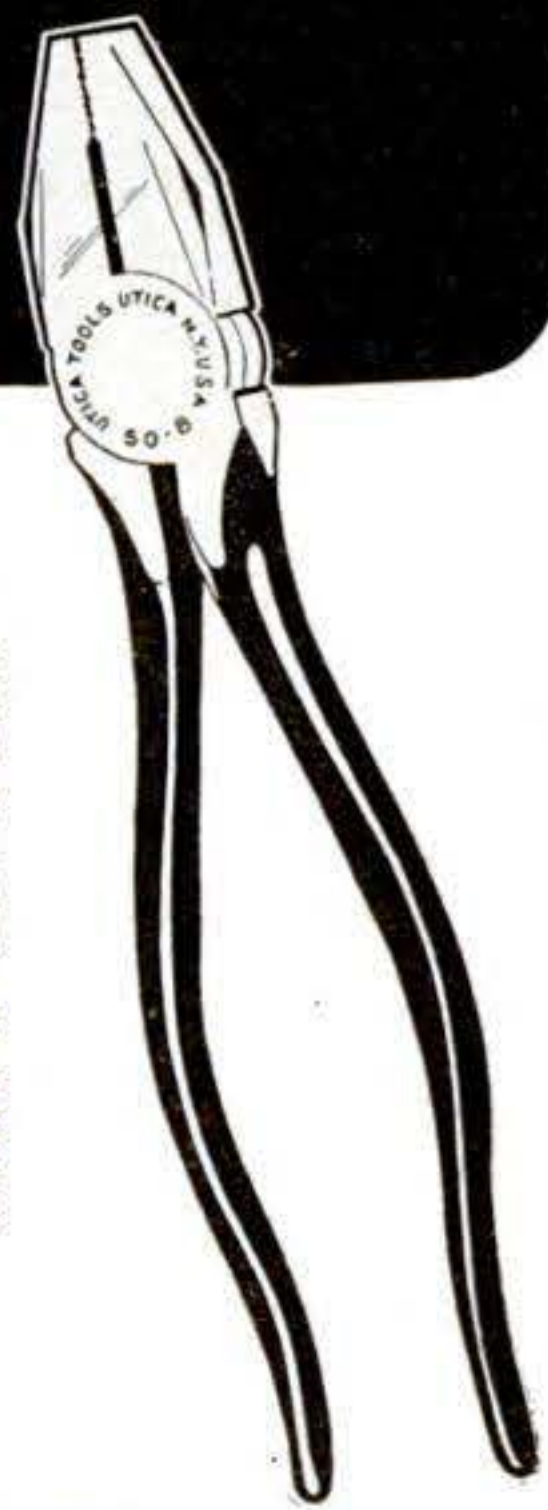
CROSLEY a FINE car

"You See Them Everywhere"

ONE OF **6** REASONS WHY UTICA TOOLS ARE BETTER

UTICA TOOLS have smooth working joints

Made better to last longer...



Good Craftsmen Work Better With Good Tools

Utica Tools—accurately designed and produced...respond with precision to the will of good craftsmen...mean fine workmanship!

Six precision machining operations on the joint are completed at one setting... assuring a smooth-riding and easy working joint, and thousands of clean cuts with minimum effort!

TOOL NO. 50 Electricians' Standard Side Cutting Pliers 4", 5", 6", 7", 8"



UTICA DROP FORGE and TOOL CORP., UTICA 4, NEW YORK

New HOBBY-TOOL GRINDER

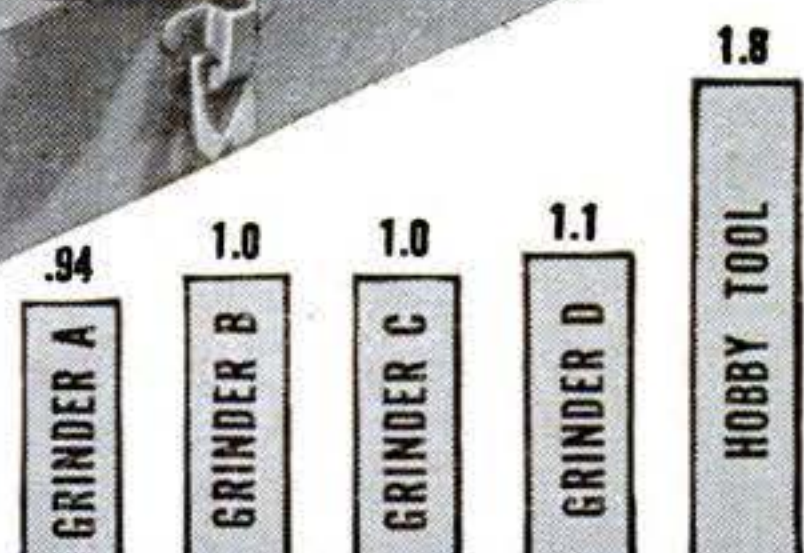
More power... more capacity... More value for your money!



DeLuxe Hobby Tool

- DRILL
- GRIND
- SAW
- BUFF
- POLISH
- BURR
- ETCH
- SAND
- SHARPEN
- CARVE
- ROUT
- ETC.

Comparative Torque In Ounce-Inches At 15,000 R. P. M.



Here's the light-weight, popularly-priced handgrinder that really has "guts" (see graph)... handles all 1/8" and 3/32" mounted accessories... gives you all the smooth trouble-free performance you've come to expect from Dumore. You'll be proud to work with... proud to own the Hobby Tool!

- Full 1/40 h.p. Dumore Motor... 28,000 r.p.m.
- Highest maximum power.
- Most power on continuous duty.
- Handsome styling... a beauty!
- Push-button tool lock... no wrenches.
- Handy, fast thumb switch.
- "No-tire" shape fits your hand.
- 1/8" and 3/32" chuck capacity.

Hundreds of uses in your shop and around the house. See it at your hardware dealer, or mail coupon today.

The DUMORE COMPANY

Dept. K-52, Racine, Wis.

- Please send complete information on the NEW Hobby-Tool Handgrinder.
- Send me DeLuxe Hobby Tool with 50 accessories (as illustrated); \$23.50 enclosed.
- Send me Standard Hobby Tool with 2 accessories; \$16.50 enclosed. (All shipping charges C.O.D.)

NAME.....
 ADDRESS.....
 CITY..... ZONE..... STATE.....
 DHT-1

CUT COUPON AND MAIL TODAY

BARRON Drill Press TOOLS



ROTARY WOOD
PLANER \$7.50



1" and 2 1/2" DRUM
SANDERS



ROTARY SURFACE
SANDER \$5.95



\$9.85
F.O.B. Detroit
ALL-METAL
DRILL PRESS TABLE

ALL-METAL
SHAPER FENCE
\$8.25
F.O.B. Detroit



ROUTER &
MORTISING
BITS
\$9.50
per set of six

SHAPER
CUTTERS
\$9.00
including
3 sets Blades



15 ESSENTIAL WORKSHOP OPERATIONS . . .

You can convert any standard make drill press into your most versatile, useful, low cost workshop tool. Barron Precision Tools now enable you to perform 15 indispensable shop operations—surface-plane woods and plastics—rabbet—tenon—panel—bead—groove—bevel—mortise—route—cut dovetail—sand surfaces and contours—shape—cut moldings—grind and buff. Over 200,000 Barron Tool users. Every tool sold on full 10 day money back guarantee.

See Your Dealer . . . Or Write Direct

BARRON TOOL COMPANY, INC.
570 Architects Bldg., Detroit 1, Mich.

FREE
Workshop
Guide &
Catalog

New MILLING ATTACHMENT



Sizes for 8" to 16" metal lathes. Build it yourself from our sets of semi-machined castings and save \$\$\$. Can be finished on your lathe alone. Complete drawings and instructions furnished with castings. Mill keyways, slots, splines, dovetails, flutes in reamers, special cutters. Produce gears, ratchets, racks; bore, face, etc., with this precision attachment.

FREE! Illustrated folder and price list of castings, milling cutters, etc. Write today. Mention your lathe.

HURON MACHINE AND TOOL CO.
YALE 2, MICHIGAN

STOP AUTO ACCIDENTS



with new STOP LIGHT FLASHER!

Makes Your Stop Light Flash 115 Times a Min.

FREE OFFER TO YOU! The "Stop-It" warns cars behind—makes your stop light flash on & off, on & off! Completely automatic, acts instantly when you step-on foot brake . . . attaches in 5 minutes to any car or truck. Approved by safety engineers, used by Police & Fire depts. Non-rusting, dust, oil, vapor, waterproof. Write NOW for free introductory offer—no obligation. Get this amazing "Stop-It" for your car at no cost to you! Dealers, salesmen wanted.

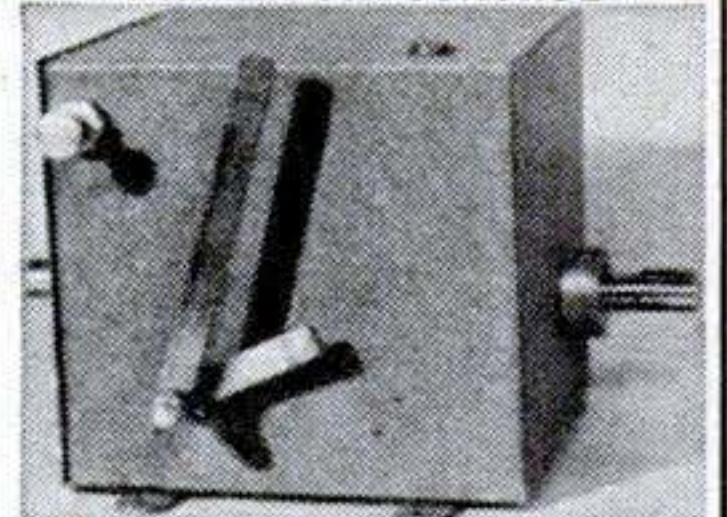
MACCHI & CO., Dept. PS-2, 927 Larkin St., San Francisco 9, Calif.

Hydraulic SPEED REDUCER of many uses

Variable Speeds and INSTANT REVERSE

Input Speed up to 700 R.P.M. For LATHES, REAMERS, TRANSMISSION, MIDGET CARS, MILLING MACHINE TABLE, SHAPER, THREAD MILLING FIXTURES, HOME MADE WOOD WORKING LATHE, EXHAUST FAN, PUMP, HOIST, GENERATOR, OVERHEAD TROLLEY, PRODUCTION BELT, OPENING and CLOSING DOORS, and MANY OTHER USES. Industrial or Home Use. Cost Government \$300.00. High Quality Precision Workmanship. Case measures 7 1/2" Long, 7" High, 6 1/2" Wide. Input and Output Shafts 5/8" diameter. Beautiful Red Crackle Finish Case. For use with 1/2 to 1 1/2 H.P. If C.O.D. is requested a 10% Deposit must accompany order and we ship F.O.B. Chicago.

FINGER TIP CONTROL

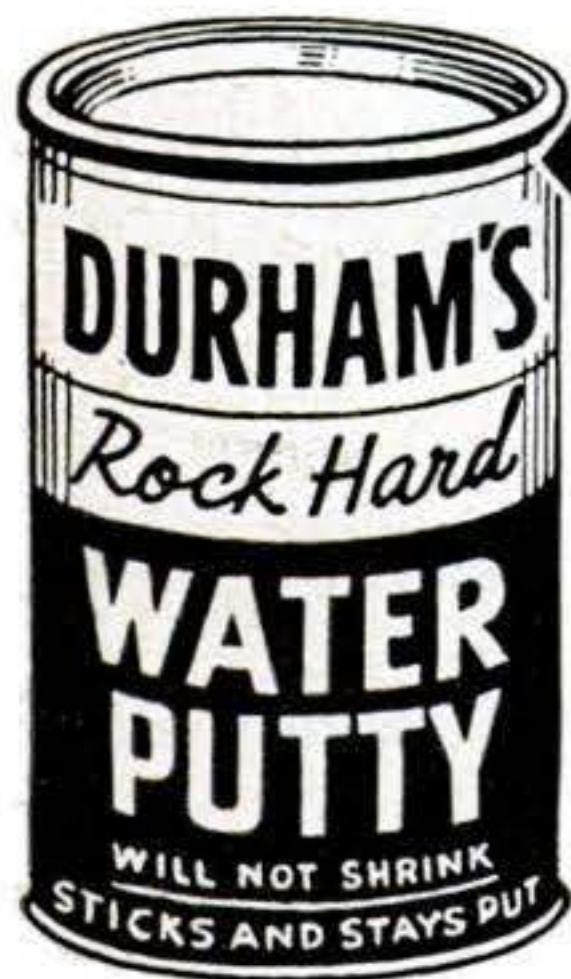


Shipping Wght.
25 pounds

Only
\$54.50
PREPAID
2 quarts oil
included FREE

1 1/2"-8 thread Lathe
Chuck Adapter, \$3 extra

DIRZIUS MACHINE SHOP "U" 1423-25 So. 52nd Ave., Cicero 50, Ill.



The Modern PLASTIC
for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you post-paid (in U.S.) for only \$1. Full money-back guarantee, order now.

DONALD DURHAM CO.
Box 804-V, Des Moines, Iowa

QUALITY*

Dynasaw

Satisfaction
Guaranteed or Money Back

- 2" capacity
- Cuts to center of 48" circle
- Cuts 1/4" Steel—Brass—Aluminum
- Cuts 1" wood freely
- 10" x 10" Precision Ground Grey Iron Table
Tilts to 45°

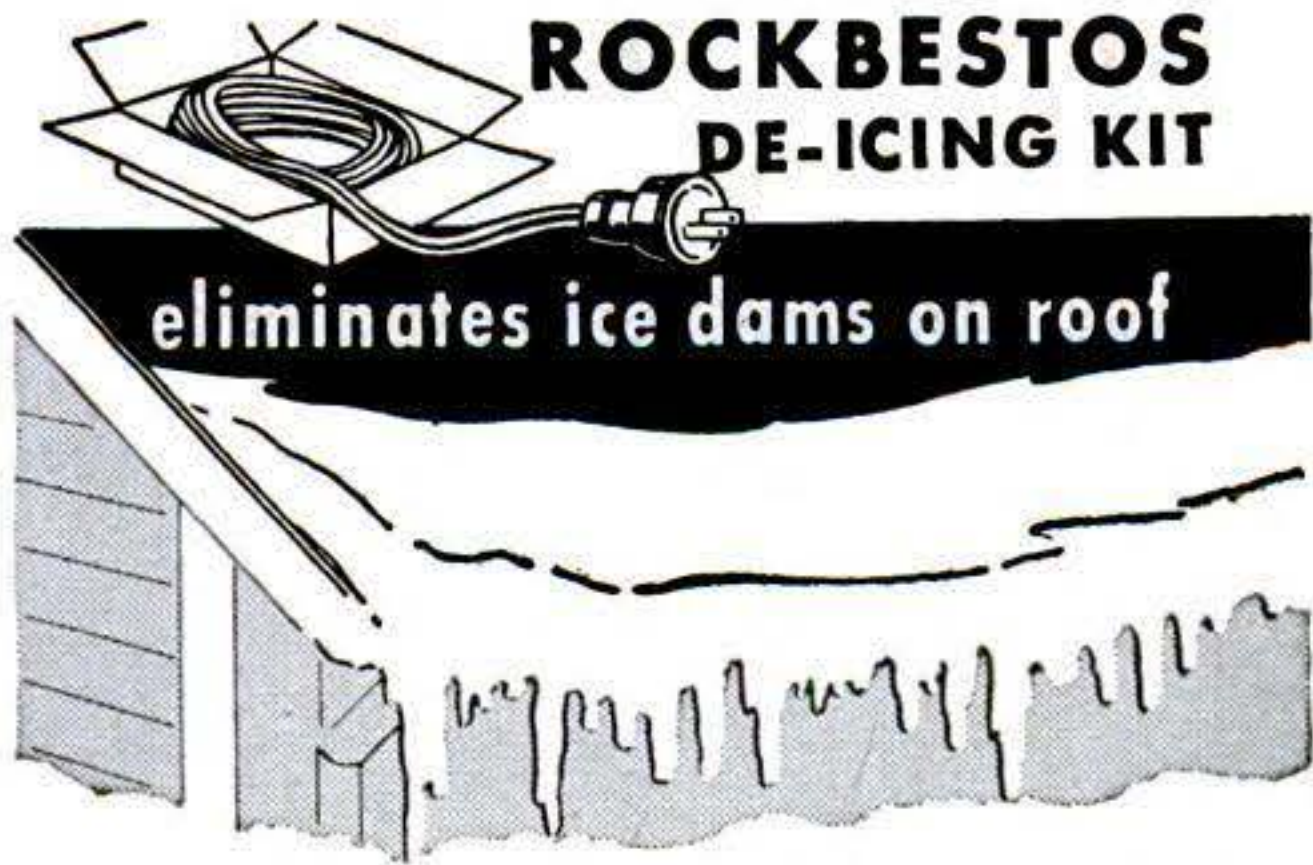


Write for free cata-
logue on DYNASAW
and other MP tools.

\$14.95

F. O. B. ROYERSFORD, PA.

* MARCUS-POLLAK, DEPT. 2, ROYERSFORD, PA.



ROCKBESTOS DE-ICING KIT

eliminates ice dams on roof

...saves costly repair of walls and ceilings

This complete heating kit—ready to use—protects 18' of roof by melting ice on roof edge and gutter. Eliminates winter water damage... costly replastering and repapering. Easy to install... will not damage roof. Kit contains 60' durable, lead-covered heating cable with plug, roof clamps, instructions. 120 Volt AC-DC.

ROCKBESTOS PRODUCTS CORP.
New Haven, Connecticut

See your
ELECTRICAL
DEALER

KING MIDGET HOME ASSEMBLED MIDGET AUTO



WORLD'S LOWEST PRICED AUTOMOBILE!

80-90 MI. PER GAL.—45-50 MI. PER HR.

Drive this car for as low as 50c per week. Precision built parts direct from factory with beautiful all steel body. Get all the facts on this amazing small auto—send 25c for detailed circular with large picture, 4 view drawings and price of all parts, or send \$1 (refunded first order) for this plus actual assembly book with 42 photos, drawings; blueprints of snow and ice conversions, etc.

MIDGET MOTORS MFG. CO., ATHENS, 2, OHIO

King Midget is the ideal small car for errands, sports use, to and from work, short business or pleasure trips, delivery service or second-car utility for the whole family. Comfortable—room for husky six footer.

SEND FOR FULL INFORMATION TODAY!



35 in. long—The JIM DANDY looks like the real thing! Weighs 14 ounces.

THE THRILL OF FIRING A REAL GUN without the DANGERS of SHOT or SHELLS

Shoots 6-inch rubber bands up to 50 feet! Real trigger action! 3 bands included; make more from inner tubes. Cash orders prepaid; C.O.D.'s plus postage. Order now!

ONLY
\$2

J-D MFG. Co. Dept. S9, 1408 W. 9th St., Kansas City 7, Mo.

BUILD YOUR POWER TOOLS

WITH OUR GUARANTEED INDUSTRIAL POLY BALL BEARING ARBORS

New Departure Self Lubricating Bearings

10,000 R.P.M.



B33—\$5.45 PP.
3/8 x 4 1/2 Spindle
B15 Plain Spindle \$3.95 PP.

(No extra charge for left hand threads)

C4—1/2 x 12 1/2 spindle, housing 2x8, \$7.95 PP.
C5—5/8 x 12 1/2 spindle, housing 2x8, \$8.45 PP.
C6—3/4 x 12 1/2 spindle, housing 2 1/4 x 8, \$9.45 PP.
D8—1 x 17 1/2 spindle, housing 2 5/8 x 11 \$18.75 PP.

1 INCH BETWEEN WASHER AND COLLAR SHAPER ARBORS—Free literature on request.

POLY PRODUCTS, 2032-B E. Walnut, Pasadena 8, Calif

FOR FAST ACCURATE BORING



No. 923 Bit Brace Heavy-duty. Steel clad, ball bearing head. Cocobolo hardwood handle and head. Strong, sturdy box ratchet. Entire chuck locks in place. Forged Universal jaws hold auger bits and drills from 1/8" to 1/2".



No. 617 Hand Drill Strong, lightweight, all-steel frame. Large, comfortable handle and knob. 1/4" capacity. 3 1/2" solid speed gear. Heavy-duty chuck with tool hardened jaws. Protected jaw springs.

NEW PROJECT PLANS... EARLY AMERICAN DESIGNS

Set of 15 plans 25¢

SERIES A: Cricket, spice cabinet & mirror, knife & fork box, match box, miniature blanket chest, nutmeg box, wall rack, napkin holder, colonial mirror, desk box, miniature cradle, mirror, shelf & drawer, tray, pipe & match box, candle stand. SERIES B: Miniature cradle tray, trinket box, miniature chest of drawers, spice chest, spice box, corner candle stand, coffee table, book shelf, spice cabinet, salt box, string box, shoeshine cabinet, footstool, kindling box, treasure box.

STANLEY

Reg. U.S. Pat. Off.

THE TOOL BOX OF THE WORLD
Hardware • Hand Tools
Electric Tools • Steel Strapping

SEND THIS COUPON... TODAY!

Stanley Tools, 2109 Elm St., New Britain, Conn. Please send me Series A () and Series B () of the new Early American project plans. I enclose 25¢ for each set.

Name.....

Street.....

City and State.....

This is it!
THE LOWEST-PRICED
BALL-BEARING TILT/ARBOR
SAW IN AMERICA!

\$39⁵⁰ F. O. B.

Kalamazoo, Mich.
 Price includes motor
 rail, belt, pulley, mitre
 gauge, fence, splitter, guard —
 less motor. Extensions \$3.50 each.

THE NEW Atlas
Power King 3001

Yes, this is it! Today's outstanding saw value. The new 3001 ball-bearing tilt/arbore Power King... with big saw features... yet priced so low it pays for itself on your first few projects! Send postcard for catalog today.

BIG SAW FEATURES!

- ★ **Tilt/Arbor Construction** — for safer angle sawing.
- ★ **Sealed Ball Bearings** — for smooth, lasting accuracy.
- ★ **Big Capacity.** Cuts 2 1/4" deep. 7 1/8" area ahead of blade. 12" x 16" table.
- ★ **Precision-Ground Grey-Iron Table.** Heavy cast iron table with precision ground easy-sliding surface.
- ★ **Rigid Rip Fence** — full table length, locks securely at both ends, releases instantly for positioning.
- ★ **Table Extensions** — 6 3/4" x 16" added on sides give you 25 1/2" wide table — 12" from blade to fence!



SPINDLE SHAPER

Cuts joints, grooving, mouldings, and edge work to add factory-like beauty to furniture and furnishings projects. The PK wood shaper is low cost, with many extra features. See it at your Power King dealers.

12" WOOD LATHE

36" between centers, 4 speeds, threaded for outboard turning, ball bearings. A most unusual value!



ATLAS PRESS COMPANY

1042 N. Pitcher St., Kalamazoo, Mich.



MATCHED PRECISION TOOLS FOR
WOODWORKING AND METALWORKING

NOW anyone can STOP FAUCET DRIP!

O'Malley FAUCET REPAIR KIT (All-Purpose Family Set)

EASY TO USE
 Stops faucet leaks—refinishes seats, inserts new seats. A new all-purpose family kit to end annoying water drip and to repair worn-out faucets... Saves water and water-heating expense. Family set includes "Nu-Seater" tools, "Drip-Stopper" tools, brass faucet-seats, washers and illustrated, simple directions.

ASK YOUR DEALER \$2.95
 for the O'MALLEY FAUCET REPAIR SET, the new ALL-PURPOSE FAMILY SET. If no dealer, remit direct

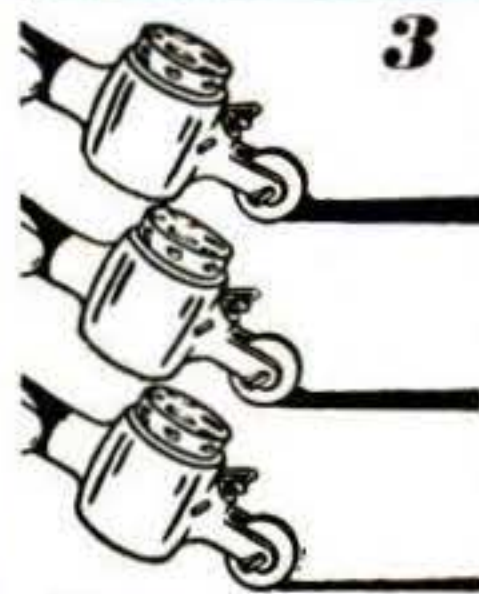
POSTPAID IN U.S.A.
 No C.O.D.'s please

Jobbers, Dealers, Write!

EDW. O'MALLEY VALVE CO.

1059 EAST 76th STREET • CHICAGO 19, ILLINOIS

3-Pc PAINT STRIPE SET Only **\$1.00**



3 SEPARATE TOOLS—

EACH MAKES DIFFERENT WIDTH

Stripe perfect lines—straight, curved, with any paint, lacquer, enamel, easy as drawing lines with ruler! Beautify furniture, toys, autos; make signs and imitation tile. Simple instructions included.

SEND NO MONEY. Mail order. Pay postman only \$1.00 plus postage. If not delighted return in 5 days for money back. Order Now.

STRADER MFG. CO., Dept. F-352
 259 Strader Ave. Cincinnati 26, Ohio

FREE PLANS POWER MOWER KITS FREE PLANS

Have one of the finest mowers money can buy. Write for FREE PLANS and PARTS LIST showing you how to SAVE up to 75% by assembling Triangle's POWER MOWERS.

3 WHEEL MODEL



SPECIAL FACTORY PRICES

Kits, Parts, Engines, Wheels, Etc. Also complete TRIANGLE MOWERS ready to mow, at Low Factory Prices. 3 and 4 wheel Models.

4 WHEEL MODEL



SAVE your back. Assemble or build your own 3 or 4 wheel power mower with our precision made kits and parts. Write today for full facts. Free Plans, Parts List, Low Factory Prices. DEALERS INVITED. **TRIANGLE MANUFACTURING CO., Dept. S-8, Box 185, Fort Scott, Kansas**



ONAN Portable ELECTRIC PLANTS

FOR CABINS, TRAILERS, CONTRACTORS, BOATS

Light weight, compact, air-cooled engine-driven. Furnish regular city-type A.C. electricity for lights, appliances, radios, etc. Can be carried by hand. Fit trunk of car. Plug-in receptacles on plant. Larger models for farms, homes, businesses beyond highlines. Catalog shows over hundred models. 350 to 55,000 watts.



Gasoline or Diesel Powered

WRITE FOR CATALOG

D. W. ONAN & SONS INC.
 2800 Royalston Ave., Minneapolis 5, Minn.



NOW a DYNAMIC HEAVY DUTY INDUSTRIAL WELDER

ONLY \$28.50
WORKS ON IRON, STEEL & other metals . . . does work you'd expect from a larger, costlier machine; portable, easily carried; OPERATES FROM ANY properly wired 110 VOLT LINE. Also available for 220 volt operation at slight additional cost; has 8 metallic & carbon arc welding heat stages. EASY TO OPERATE TRANSFORMER TYPE WELDER—If inexperienced you can learn to do professional work by following the SIMPLIFIED WELDING & OPERATING INSTRUCTIONS FURNISHED—comes complete ready to operate with helmet, rods, cable, instructions. SAVE TIME AND MONEY—Do your own welding—Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop. Make money doing repair work for others. Costs a few cents to operate.



SPECIAL GIFT OFFER! WORTH \$6.80 ARC TORCH YOURS at NO EXTRA COST!

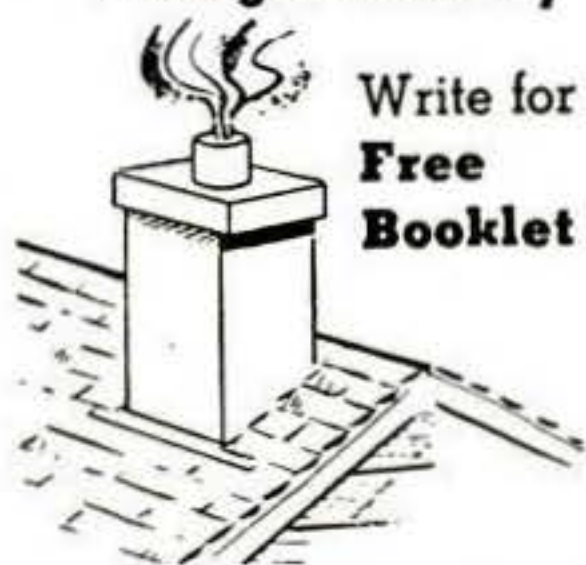
Write today for FREE DETAILS, ARC TORCH GIFT OFFER and DYNAMIC WELDER 10-Day Trial Offer. **DYNAMIC WELDER CO., Dept. ATD-109 15 EAST 23rd STREET CHICAGO 16, ILLINOIS**

Need a Chimney?

SAFER . . . Underwriters and FHA accepted, any fuel. **ECONOMICAL** save 50% over brick. **ENTIRE CHIMNEY SHIPPED COMPLETE** (convenient 2 ft. sections: base, housing, roof flashing, chimney cap). Nothing else to buy. **PERMANENT . . .** a lifetime chimney. **MORE DRAFT . . .** less soot, better heat.

You Yourself Can install it . . .

The VAN-PACKER Packaged Chimney



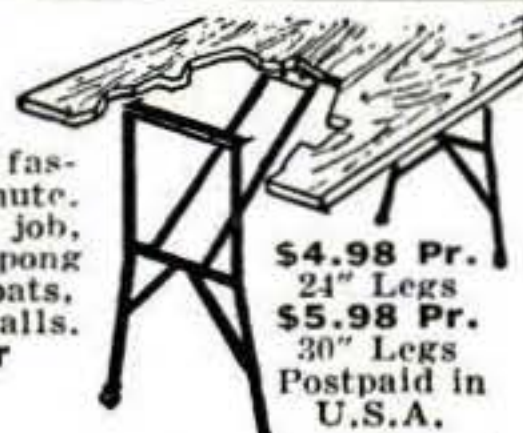
Write for **Free Booklet**

Van-Packer Corp., 134 West Adams Street, Chicago 3

MAKE! FOLDING TABLES - BENCHES - HORSES - IN A JIFFY

FOLD-A-WAY CHANNEL STEEL LEGS

Shipped complete, ready to fasten to your top in a minute. Rubber tipped. Used on the job, in homes, workshops, ping pong tables, trailers, camps, boats, churches, lodges, banquet halls. **Send for free circular**



\$4.98 Pr. 24" Legs
 \$5.98 Pr. 30" Legs
 Postpaid in U.S.A.

THE DIAMOND MFG. COMPANY

Dept. PS. 1100 Altamont Ave. Schenectady 7, N.Y.



Easy and Cheap to Operate

SAVE TIME, WORK, MONEY!

SHAW "DU-ALL"

and "PEPPY PAL" TRACTORS



PLOW

These rugged walking or riding tractors are ideal for farm, truck garden, orchard, poultry farm. Operate on a few cents an hour. A child can handle them.



CULTIVATE

DO DOZENS OF JOBS Both riding and walking tractors quickly and easily plow, cultivate, harrow, disk, bulldoze, spray, haul, grind, saw wood, etc.

SHAW MFG. CO.

LOW FACTORY PRICES Buy direct or thru your dealer. Year's guarantee.

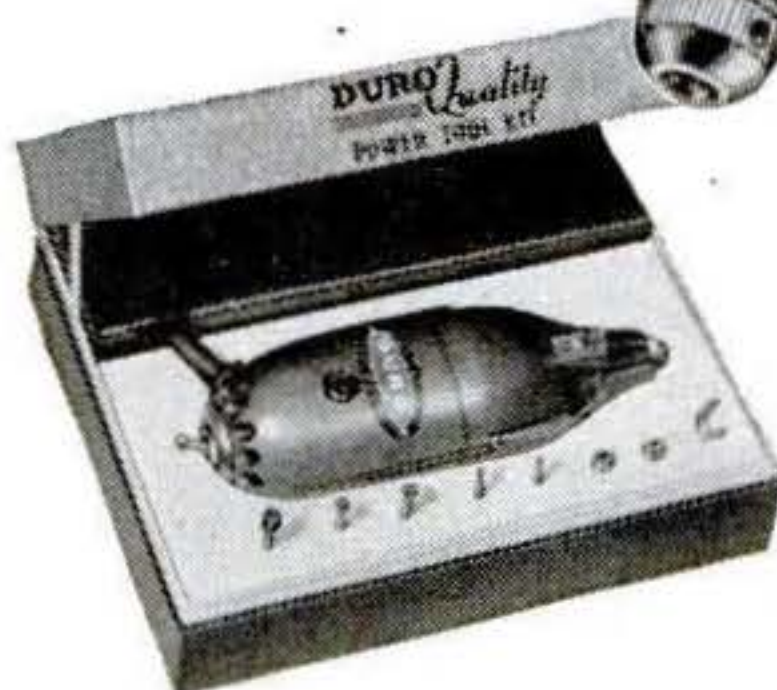
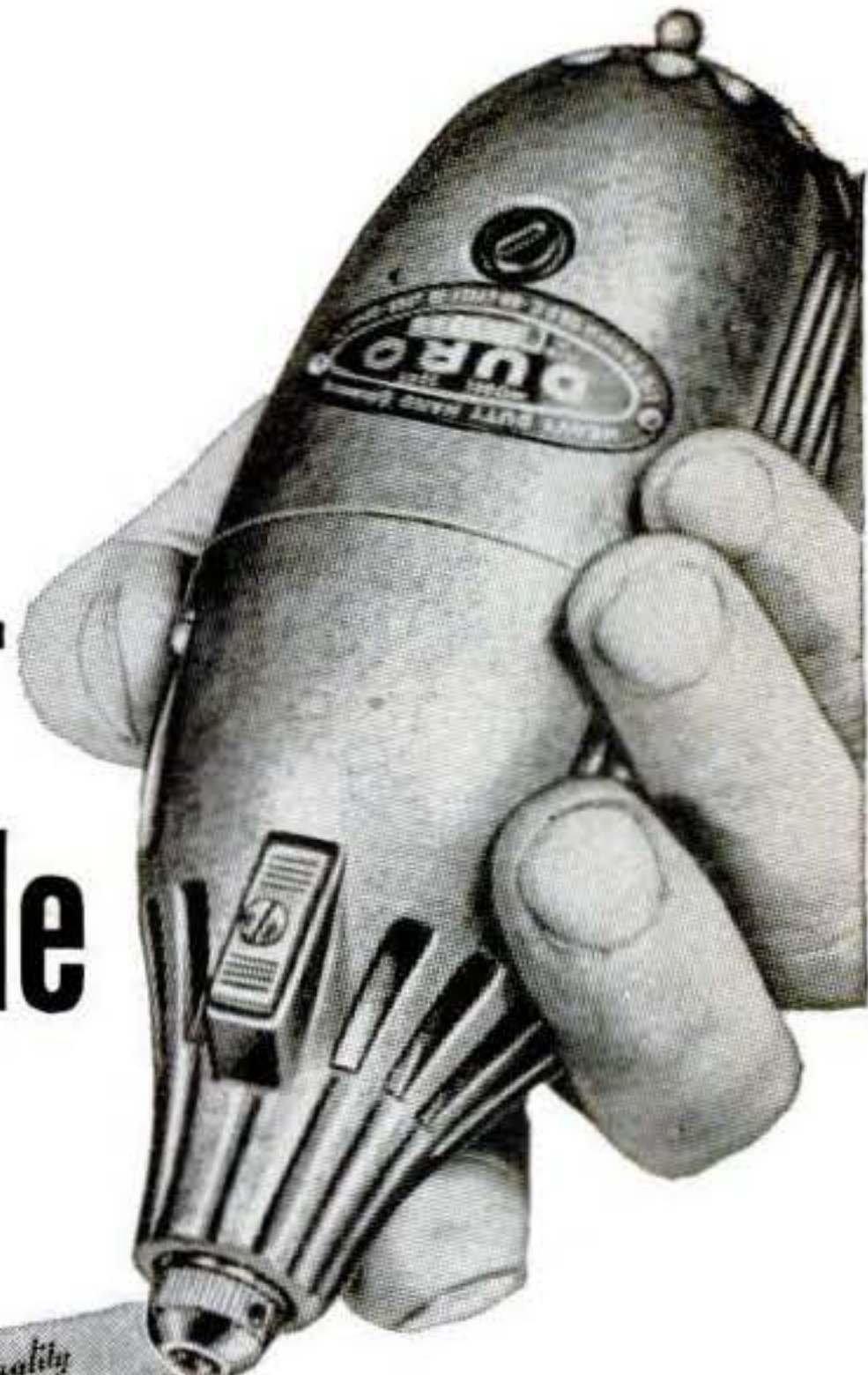
RIDING TRACTORS Four models from 5 to 12 1/2 H.P., 58 in. wheelbase, 36 to 52 in. wide, 24 in. plant clearance, Hand or electric starter. Walking Tractors 1 1/2 to 5 H.P.

FREE Illustrated folders giving complete details, pricelist—write today.

5710 Front Street, Galesburg, Kans. 668PS North 4th Street, Columbus, O.

SEE OUR EXHIBIT AT: KANSAS MANUFACTURERS' SHOW Wichita, Kansas, Spaces 67 & 68D, Forum Exposition Bldg., Oct. 18-23.

Pint Sized Power Miracle



Complete Super Power Tool Kit—Only

\$18.55

Contains power unit with cord, 5 abrasive points and cutting burrs, full operating instructions—all in one case.

New Duro Super Power Unit—the tool you'll use in a 1000 ways!

This is the kind of lightweight, perfectly balanced hand power tool that hobbyists and home craftsmen dream about! A compact fistful of super power, it runs cool and smooth at 20,000 RPM, develops 42 watts output.

With it, you can do clean, professional-looking sanding, polishing, grinding, engraving, carving . . . and scores of other operations.

Ball Bearing Flexible Shaft Doubles the Fun

New Duro flexible shaft fits over nose-piece of power unit, makes free-hand carving, engraving lots more fun. Flexible shaft, complete with hanger, only **\$15.55**

Write for Free Illustrated Circular

giving full details about the Duro Super-Power Unit and the low cost workshop units. Circular also shows almost a score of pictures and details about operations that you can do with these amazing power tools.

Start with this low cost tool kit and build a complete home workshop! One Duro Super Power Unit is used on all of these home workshop tools! You may buy them singly—or in a group.



Grinder & Shaper Only \$8.80

Drill Press Only \$11.95

Router Only \$8.15

Lathe—Only \$10.15

DURO METAL PRODUCTS CO. 2657 N. Kildare Ave., Chicago 39, Ill.

Gentlemen: Send me free circular giving full details on the Duro Super-Power Unit and the low cost workshop units.

Name.....

Address.....

WANT A BASEMENT WORKSHOP?



BUILD a handy workshop easily with Gold Bond Gypsum Wallboard, at low cost. Big, light-weight panels are fireproof, moisture resistant, and easy to nail. Decorate with Gold Bond Sunflex, the low-cost, one-hour wallpaint. Get both at your local Gold Bond Lumber and Building Material Dealer's.

Free Book of suggestions

NATIONAL GYPSUM COMPANY,
Dept. J-5, Buffalo 2, N. Y.

Gentlemen: Send free copy of new Book-let, "Modernizing Magic" showing remodeling ideas and methods:

Name

Street

City State

(Please print name and address.)



The JIFFY metal CABINET

**YOUR ANSWER TO
SMALL ITEMS STORAGE**
at home, office, and shop
(ideal gift, too)

So handy to keep nuts,
bolts, screws, nails,
parts, washers, stamps,
hobbyists' needs, etc.,
at your fingertips.



THIS 32 DRAWER UNIT ONLY \$5.95 POSTPAID

Stop searching, get a 32 or 64 drawer Jiffy to keep those small items that usually get mislaid. Spot welded steel, gray enamel finish, metal drawer guides. Dividers included with aluminum drawers make possible three compartments per drawer. Looks good anywhere. Send check or money order, please—no C. O. D.'s. Prices below. Your money refunded if not satisfied. Dealers write for quantity discount.

SPECIFICATIONS	WITH ALUMINUM DRAWERS	WITH CARDBOARD DRAWERS
32 Drawer Unit 6" Deep 12 3/4" Wide 15 1/4" High	Dividers and Index Cards Included One piece rustproof aluminum drawers for heavy service—good for work bench and industry use.	Suitable for most home uses. Heavy board kraft covered. Metal drawer pulls.
64 Drawer Unit 6" Deep 25 1/2" Wide 15 1/4" High	32 drawer - \$8.95 64 drawer - \$15.95	32 drawer \$5.95 64 drawer \$9.95
Drawer Size 1 1/4" Deep 2 3/4" Wide 6" Long	Marproof Rubber Feet included with all cabinets POSTAGE PAID	POSTAGE PAID

KAYTEE PRODUCTS, Dept. S, Box 588, Canton, O.

SERRATED JAWS FOR
POSITIVE GRIP

SWIVEL
JAW



Only
Locking Plier
with All These Features

A plier, wrench, clamp; 1000's of uses in garage and home. Heavy pressed steel body, rugged tool steel, replaceable jaws. 7" size, \$1.75; 10", \$2.25 (10% higher, Denver & West). At dealers everywhere.

SEYMOUR SMITH & SON, Inc.,
900P Main St., Oakville, Conn.

Quality Tools Since 1850

SEYMOUR SMITH
Snap-Lock
PLIER-WRENCH

ALL-NICKEL
FINISH

CAPACITY
INDICATOR

INSTANT
LOCK
RELEASE

ALNICO **MAGNETS** LIFT
125-lb.

AMAZING PERMANENT MAGNETS — WILL NOT WEAKEN! NON-ELECTRIC. Retrieve guns, tackle, tools and other steel items from lake, river, plating tanks, drains or other hard-to-reach spots. Recover drills, taps, etc. from floor sweepings. Clear alley of harmful tacks, nails. Many other uses listed. Pays for itself quickly. GUARANTEED: Try any magnet one week. Money refunded if you are not well-pleased. Cat. #P430 (Has a pull of 125 lbs. on a flat steel block) ... \$7.50
Cat. #P410 (40 lb. pull) \$2.50 Cat. #P528 (10 lb. pull) \$1.10
Cat. #P500 Hobbyists assortment of seven small magnets... \$1.10
RONALD EYRICH, 2566 N. 49th St., MILWAUKEE 10, WIS.

make your own *Gems* 29⁵⁰
F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only \$29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. M Burlington, Wis.



Decorative METAL WORK

A new manual for the amateur. Tells in easy to understand language how to make useful metal articles in your home workshop. You'll be surprised how easy and interesting metal work really is. Fully illustrated with diagrams and step-by-step instructions. Sturdy cloth binding. 253 pages. Send only \$2.00 and your copy will be sent postpaid. Popular Science Monthly—Dept. 109, 353 4th Ave., New York 10, N. Y.

ONE YEAR WRITTEN GUARANTEE!
ARMY AIR CORPS 16 JEWEL

ELGIN
\$19⁹⁵



Made for Pilots and Navigators of the U. S. Army Air Forces. They had to be good. Sturdy 16 Jewel Elgin men's wrist watches. Shock resistant. Sweep second hand. Luminous hands and dial. Stainless steel back. Unbreakable crystal. Water repellent. Made by ELGIN one of America's outstanding watch manufacturers. Fully reconditioned. One year written guarantee sent with each watch. Supply limited! SEND NO MONEY. Simply pay postman \$19.95 plus 10% tax and postage on delivery. Cash orders sent postpaid. United Products Co., 7941 S. Halsted, Dept. RES-1720, Chicago 20.

**"Wellworth" Sensational Offer! Reg. \$60.50
WESTINGHOUSE AIR COMPRESSOR**

2-CYLINDER PISTON TYPE

Operates with 1/2 H.P. Motor or equivalent gas engine.

Complete outfit consisting of compressor, pressure tank, air gauge, air chuck, 20-ft. hose, pop valve, copper tubing with 4 brass flared fittings for connecting compressor to tank, 4-way cross and 3 nipples. Complete outfit of 7 items. ONLY

\$29.95

COMPRESSOR SEPARATELY

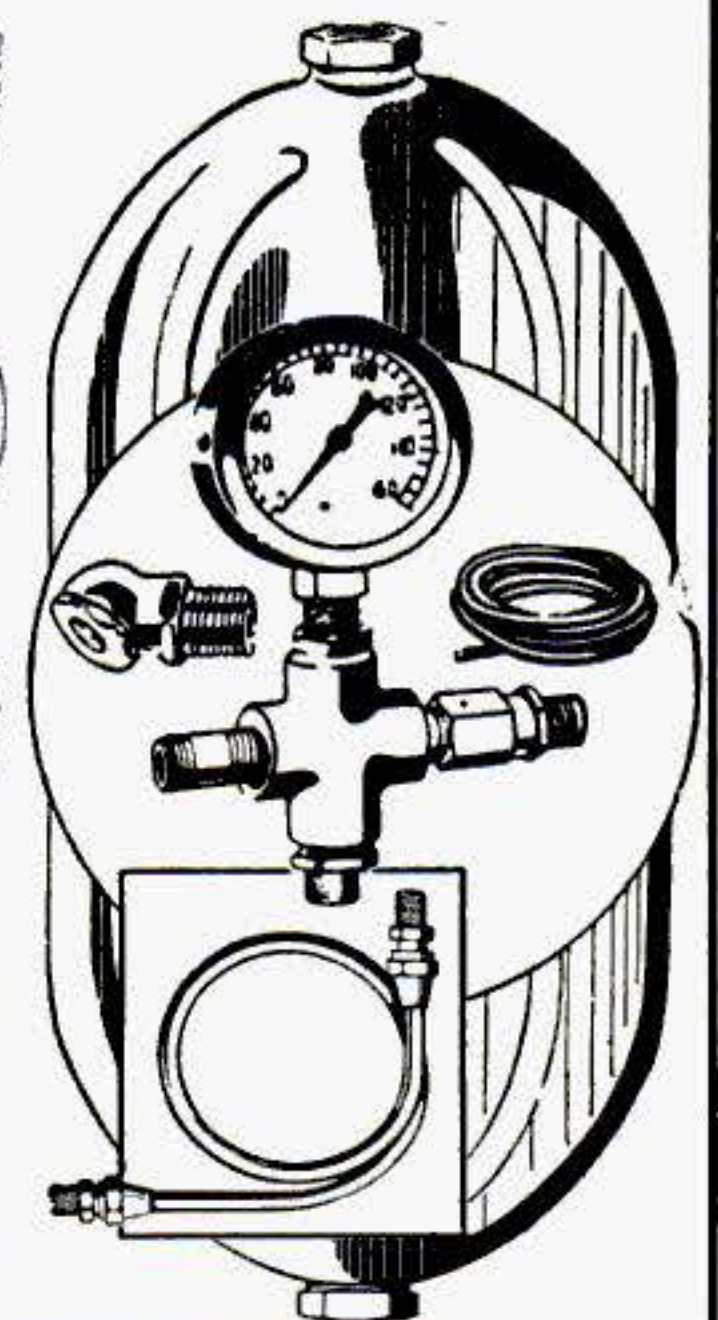
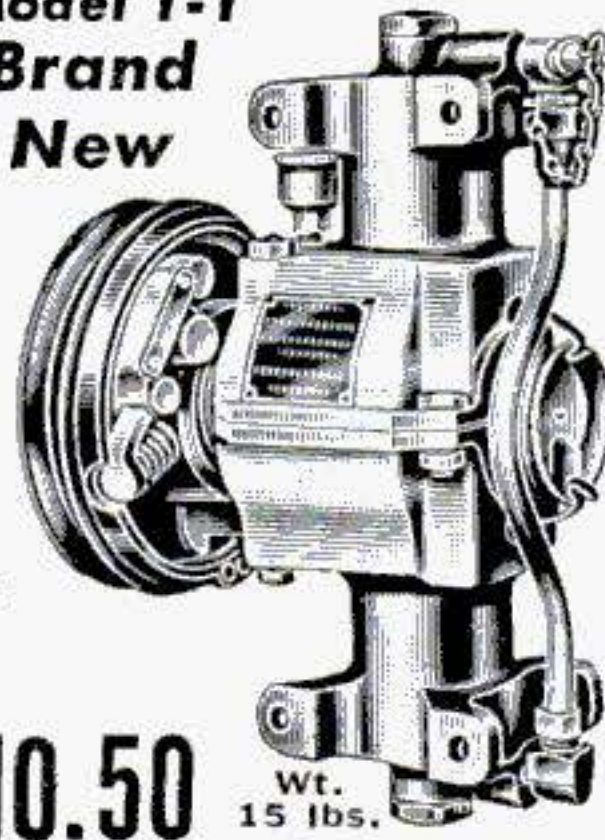
\$21.50

IDEAL for HOME • FARM • FACTORY
Wherever Compressed Air is Needed

For spraying paints, insecticides, etc.; inflating tires, operating air tools and many more uses. Automatic clutch makes it suitable for mounting and operating from trucks, tractors, etc. Instructions furnished. A fortunate purchase from the government enables us to offer you this amazing buy. All brand new equipment. Replacement parts available.

This low price is but a fraction of the price of manufacturer and of leading mail order houses.

**Model T-1
Brand
New**



SHIPPING WT. 40 LBS.
Equipment less compressor **\$10.50**

THE COMPRESSOR

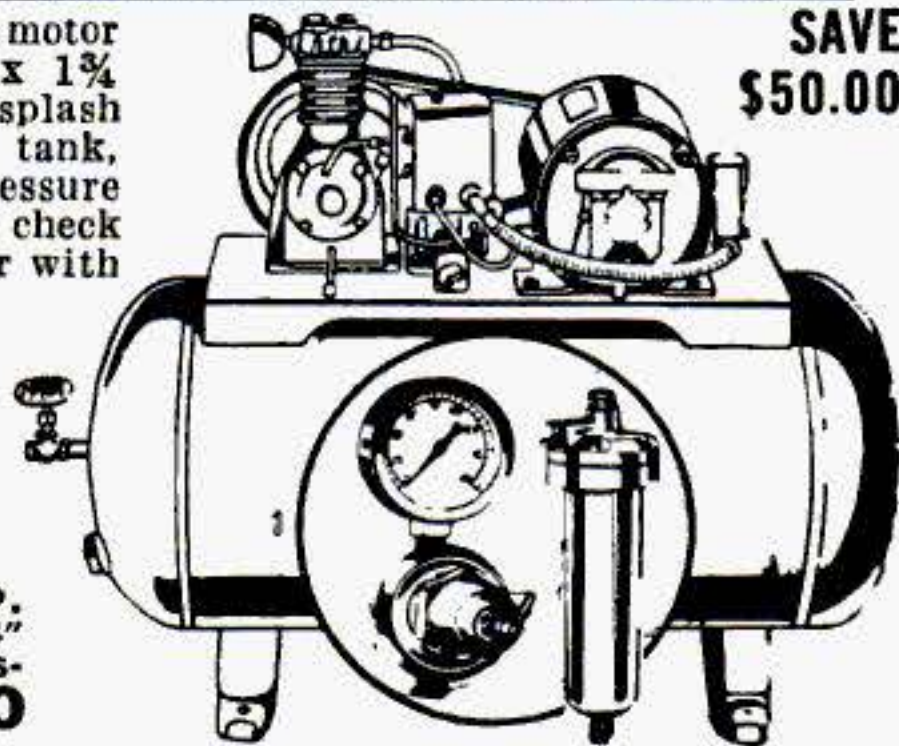
Piston Type, 2-cylinder, 2 inch bore, 1 1/2" Stroke Ball Bearing, 3.27 C.F.M. at 600 R.P.M. Capacity up to 6.54 C.F.M. Suggested operating pressure 75 P.S.I. DIMENSIONS: 9" wide, 11 7/8" high, 6 5/8" deep. Wt. 26 lbs.

TANK and ACCESSORIES

6" x 24" stainless steel tank suitable for 150 lb. pressure. Two 1/4" openings. Air gauge, pop valve, air chuck, 20 ft. hose, Copper tubing and fittings as shown. Wt. 15 lbs.

AUTOMATIC COMPRESSOR UNIT

1/3 H.P. heavy duty capacitor motor AC 110/220 volt 60 cycle, 2 x 1 3/4 inch piston type compressor, splash feed lubrication, 12 x 24 inch tank, automatic pressure switch, pressure range 100 to 125 lbs., CFM 2.2, check valve, safety valve, air regulator with gauge and filter, 20-ft. air hose with air chuck for inflating tires. V. belt drive. Shipping wt. 90 lbs.



SAVE **\$50.00**

Special **\$79.50**
Price

Same unit as above with 1/2 H.P. motor, furnished with 13" x 24" tank. CFM 2.8 at 125 lb. pressure. Shipping wt. 125 lbs. **\$98.50**

"WELLWORTH"

External Atomizing

SPRAY GUN



Flat and round spray, quart cup. Requires 2 c.f.m. at 35 to 40 lbs. pressure. Ideal for spraying lacquer, synthetic enamel, lead paint, etc.

Spray gun with 20 ft. hose and fittings. Wt. 7 lbs.

\$12.95

Spray gun only; wt. 5 lbs.

10.00

Prices f.o.b. Chicago. Immediate delivery. All items sold on money back guarantee. Send check or money order today. Catalog FREE.

WELLWORTH TRADING CO. 1831 S. STATE ST., DEPT. B-10, CHICAGO 16, ILL.

GIGANTIC MAIL SALE! CLOSEOUT WAR SURPLUS ITEMS



WELDING GENERATORS! G.E. D-C 275 to 375 Amp. ORIGINAL COST over \$275.00

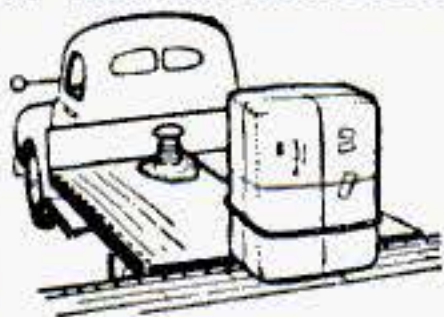
Brand New. Genuine G.E. Generators. Ready to operate. Build and repair your own machinery. Do professional work for pay. Drive with tractor, old auto engine, or electric motor. Hundred uses. Complete with instructions on "How-to Weld". Sale price, frt. pd. **\$89.90**

Same unit with helmet, rods, holder, cables, etc., frt. pd. \$104.50.

INDUSTRIAL CAPSTAN WINCH 3000 LBS.

MOUNT ON TRUCK, TRACTOR, BOAT, ETC.

Finest steel and bronze drive gears. 80 to 1 power ratio. Useful for farmers, truckers, merchants, factories, etc. Used by leading truck lines for loading. Excellent for hay hoist. Drive with old car 6-volt starting motor, power take-off, fan pulley, etc. Instructions.

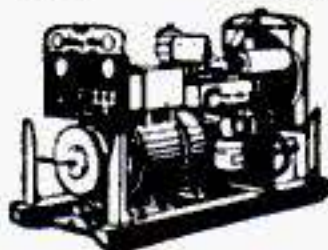


HUNDREDS OF USES. Easily mounted on tractors, trucks, docks, jeeps, etc. Many practical uses. Pays for itself quickly. Original cost over \$75.00. Sale price, frt. pd. **\$24.95**

3000 W 110V-60C POWER PLANT

Ideal Farmers, Sportsmen, Contractors

110-volt, 60 cycle, 3000 watt. Remote switch, electric self-starter. Easily made automatic start. Fine instrument control panel. Army's finest plants. Full maintenance—operation instructions. New condition. Cost Gov't. \$756.00. **\$345.00**
This marvelous plant—freight prepaid
Also lower price plants (Write for details).

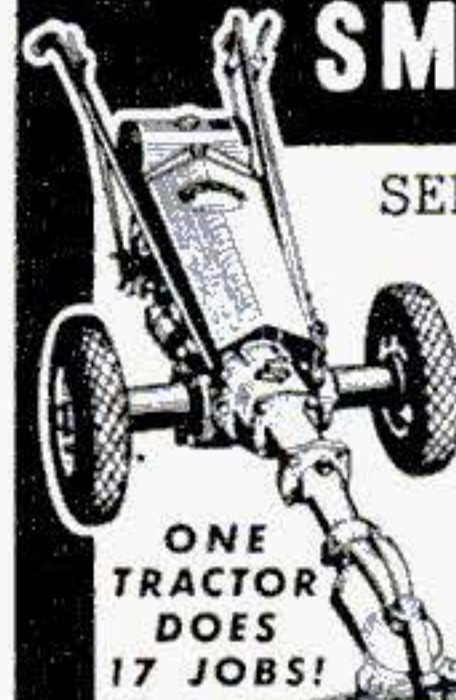


- Other Items Include:**
- Briggs 3.5 h.p. Gas Engines with utility clutch. **\$77.50**
 - Reconditioned Briggs ZZ 6.5 h.p. engine. **87.50**
 - Portable Power Air Compressor and Engine. **86.90**
 - Multi-speed (4-shaft) 110-v., 60-c. motor. **99.50**
 - Telephones **\$4.99**. Rotary Pump **\$3.95**. Selsyn Motors, Pair **8.75**
 - Dozens other sale items. Radio, electronic, electrical, etc. **3.39**

Order from ad or write for illustrated sales catalog. We pay all freight to you.

**BURDEN SALES CO. 8th and "O" St. PS-10
Lincoln, Nebraska**
(Formerly LECO ENGINEERING COMPANY)

**AMERICA'S MOST-WANTED
SMALL TRACTOR!**



SEE THE POWERFUL
5-H.P. GRAVELY--

the world's finest, yet most moderately priced Garden Tractor. Complete line of exclusively designed power tools for every Garden, Lawn and Field job.

**GRAVELY
TRACTOR**

FIELD-TESTED FOR 27 YEARS

MAIL NOW! FOR NEW FREE BOOKLET!

GRAVELY MOTOR PLOW & CULTIVATOR CO.
BOX 1084 DUNBAR, W. VA.

NAME _____

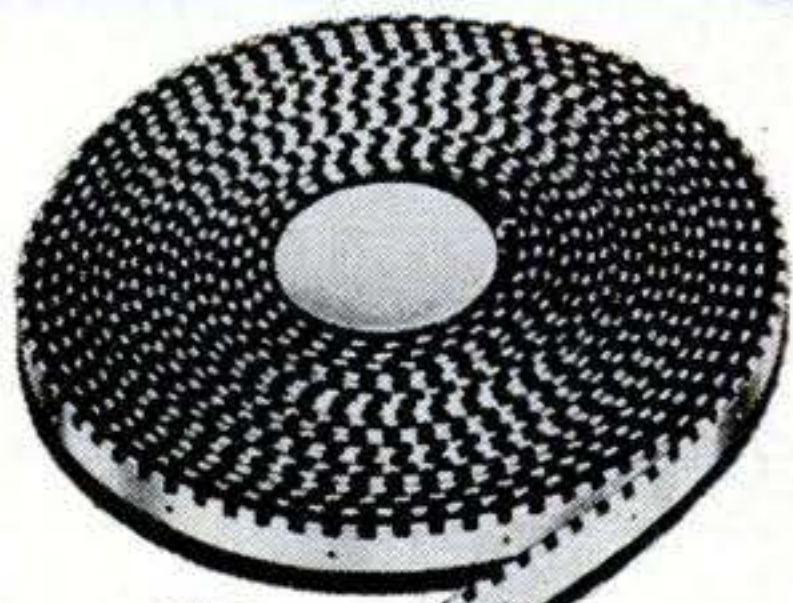
ADDRESS _____

TOWN _____ STATE _____

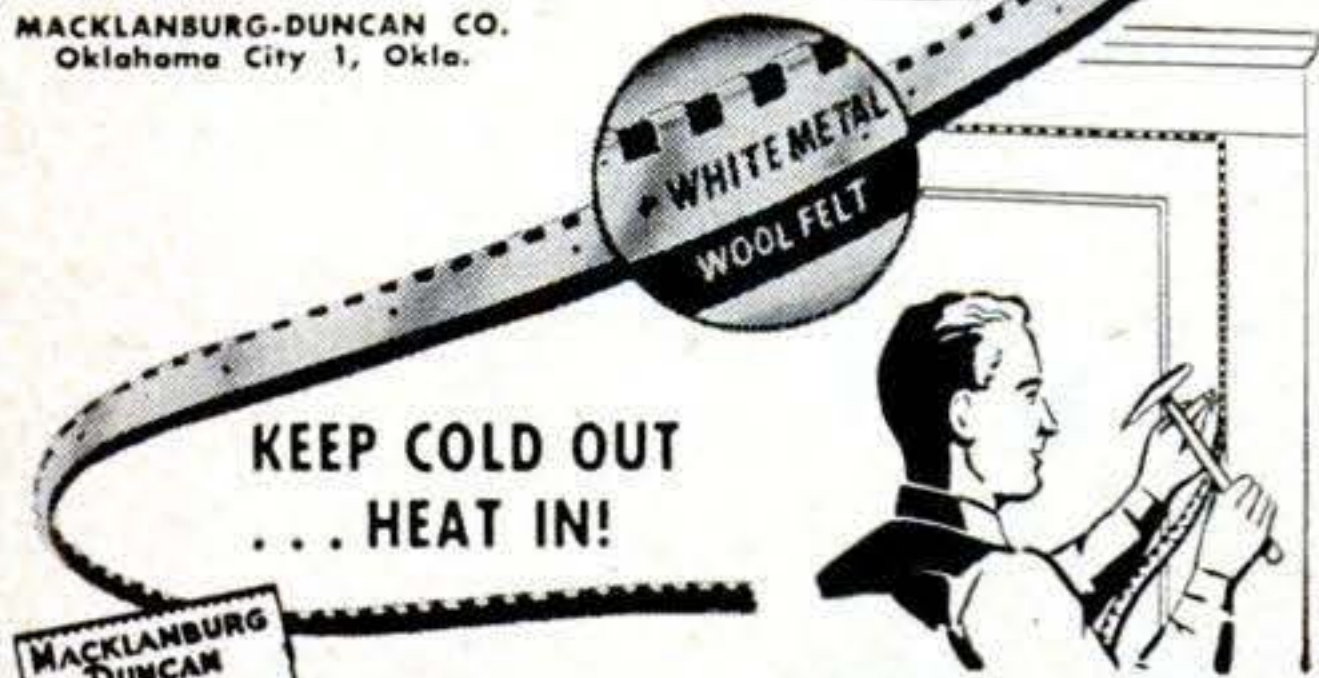
SOLVING YOUR LAWN & GARDEN PROBLEMS

Stop Drafts! Save Fuel!
WEATHERPROOF YOUR HOME
 WITH **Nu-WAY**
WEATHER STRIP

Easiest strip in the world to put on. Can be used on most any type door or window. Wool felt, reinforced with white metal.



MACKLANBURG-DUNCAN CO.
 Oklahoma City 1, Okla.



BUY AT YOUR LOCAL HARDWARE STORE, BUILDING SUPPLY DEALER OR LUMBER YARD

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
SAVE YOUR EYES

AVOID EYESTRAIN
 Use LEK-TRO-LENS on Your Lamps

Clever New Clip-On Lens For Reading • Sewing • Hobbywork • Fits 25 to 100 watt bulbs in lamps & light fixtures • Focuses twice the light • Swings to any position • Send Dollar Bill plus 6¢ postage **NOW** for 2

SEE BETTER LEK-TRO-LENS SATISFACTION GUARANTEED FAIRBRIDGE CO. Inc. Dept. 8 945 Main St. Bridgeport Conn.

GET "TWICE THE LIGHT" TODAY!
 IMMEDIATE DELIVERY

\$1.06 for 2 ppd

NEW! Trash Disposal Unit Burns Refuse Safely

● A new type outdoor dispose-all unit safely and quickly burns garbage and trash in any weather. All refuse, damp, green or dry is fully consumed. Scientific draft design completely eliminates fire hazard of flying ash, sparks, burning, blowing bits of paper. Intense combustion removes neighbor-annoying nuisance of flying scraps, smoke, smell.

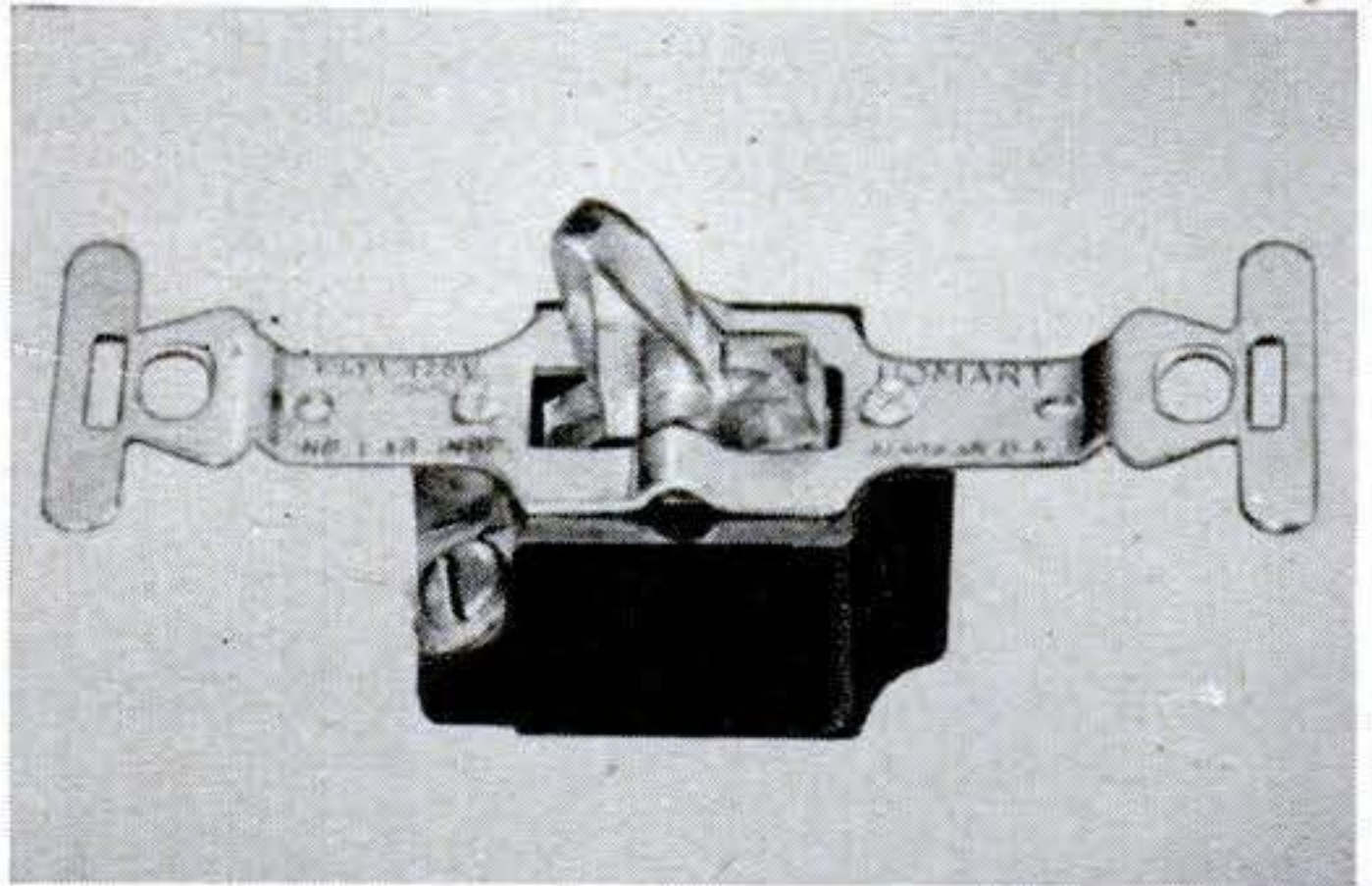
Sturdily built to last for years. Nothing to get out of order. Needs no watching. Will not blow over. Will not destroy grass or shrubs. Ends refuse hauling and fire hazards to quickly pay for itself. Measures 23" square at base by 40" high. Weighs 19 lbs. Over 2 bu. capacity. Recommended by Bureaus of Fire Prevention. Full price \$9.95—nothing else to buy. Sent F.O.B. Cleveland. Money back guarantee. Send check, cash, or money order to:

ALSTO COMPANY, Engineers Bldg., Dept. PS-10, Cleveland, Ohio

 **Aids to**

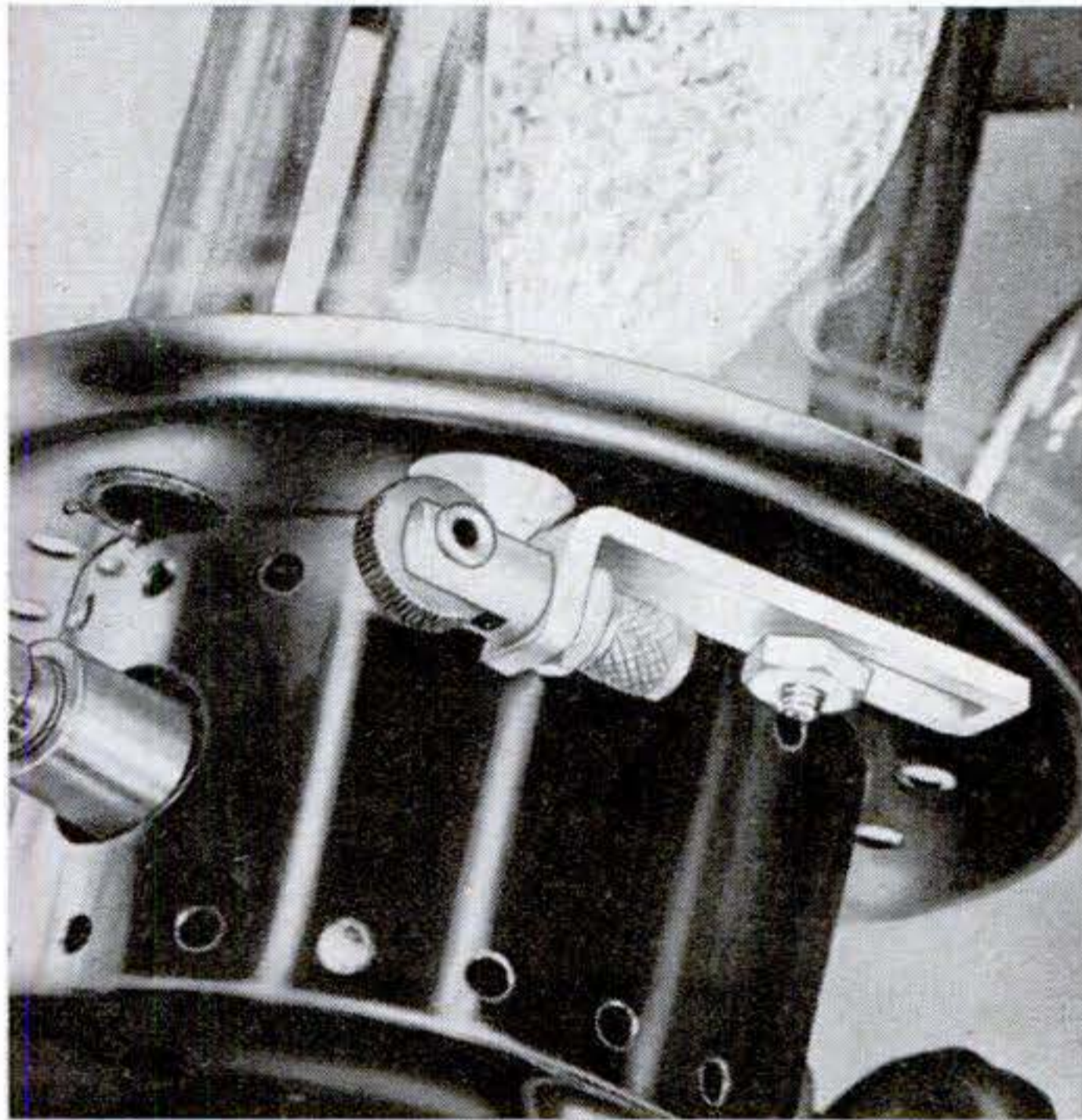


Multiple-Action Rolling Pin. Instead of one roller, this Bakelite® rolling pin has eight small ones. The maker, the Magnus Harmonica Corp., Newark, N. J., says that since the small rollers run over the dough oftener than one large one, the dough can be rolled thinner more quickly. A frame 7 inches in diameter holds the ½-inch rollers. The price is about \$1.70.

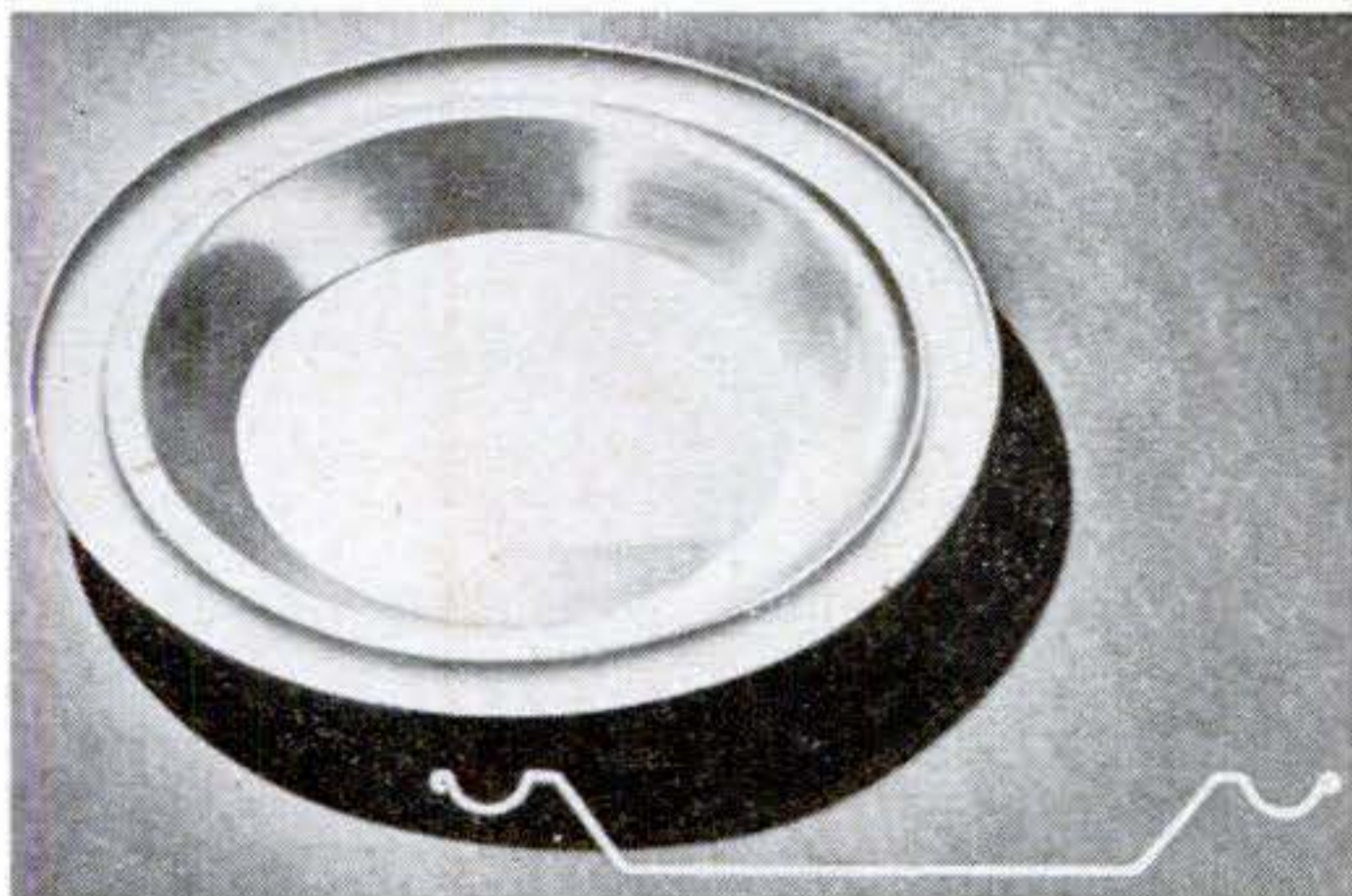


Switch Has Neon Lamp. Within the housing of this wall switch is a tiny neon lamp that directs light to the transparent-plastic switch handle. It glows only in the off position as a guide in the dark, and uses only about 10 cents' worth of current a year. It's priced at about \$1 by Sears, Roebuck and Co.

Modern Living



Lighter Bolts to Lantern. Working like a cigarette lighter, this gadget lights a gasoline lantern at the spin of a wheel. Tim's E-Z Lite® is made to fit all makes of gasoline lanterns, according to the distributor, Timcor, Inc., of Cleveland, O. One bolt holds it to the lantern. The lighter also fits gasoline lamps, stoves, and heaters. It's priced at about a dollar.



Pie Pan Has Juice Groove. Instead of dribbling into the oven, juice that overflows a pie goes into the juice groove when one of these tins is used. The pans, made of 24-gauge aluminum, take a standard 9-inch pie. Two pans fit the average oven. They're priced at two for 97 cents from Walter Drake, Colorado Springs, Colo.

now

PAIN EASIER!
PAIN SMOOTHER!
PAIN CLEANER!
PAIN FASTER!



No streaks!
No splashing!
No waste paint!
No dripping!
No bristles to fall out!

Rubberset's amazing new self-feeding FLO-MATIC Pressure Roller lets you paint smooth as a professional painter!

Lays smoothest coat of paint you ever saw! Now you can paint as expertly as a Master Painter! Actually paint *twice* as fast . . . and with results that any professional painter would be proud of!

Carries its own paint supply! Why fuss with dripping brushes? Rubberset's FLO-MATIC *carries its own paint supply* in the high-strength aluminum alloy cylinder handle. Takes only seconds to fill, paints *continuously!*

Easy as pressing a button! One coat covers perfectly! Just press gently on the pressure valve tube and *r-o-l-l* the paint on *any* surface—smooth or rough, interior or exterior!

Save money! Save time! Save effort! Not one drop of paint is wasted when you paint with FLO-MATIC! And FLO-MATIC lays such a smooth, even coat of paint that the paint goes further!

Only \$29.75



Easiest way to paint ceilings—No dripping! No splashing!

Don't paint an inch until you get full information about this newest, easiest way to paint! Mail the coupon today!

Rubberset Co.
 146 Haynes Ave.
 Newark 5, N. J.

PS-109
 (Mail in envelope or
 paste on postcard)

Mail me FREE complete information about the FLO-MATIC Pressure Paint Roller that lets me paint as expertly as a professional painter.

Name

Address

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

Name of your Paint Dealer

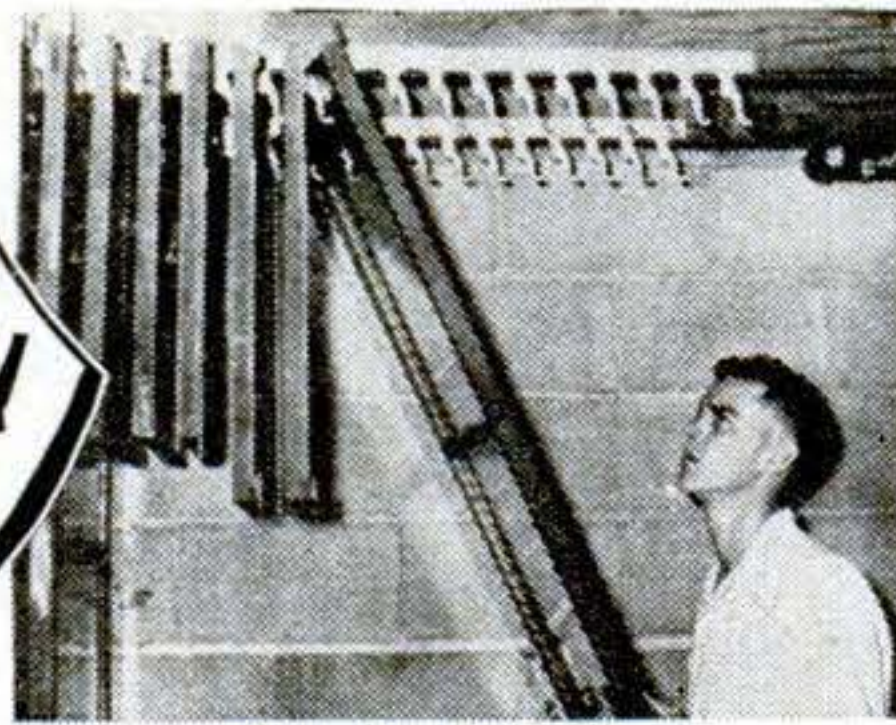
Address of your Paint Dealer

Rubberset Co. World-famous for the finest in painting tools

OCTOBER 1949 299

AT LAST!
The New and
Modern Way

STOR-A-WAY
HANGS
STORM WINDOWS
and SCREENS



Pat. No. 2,455,546

Finally, a storm window and screen storage hanger that will save you money, time and effort. The *Stor-A-Way* Hanger protects your window sashes—hangs storm windows and screens above the damp basement or garage floor—prevents warping of frames—reduces glass breakage—keeps the basement or garage neat and tidy.

Easy to install and operate. *Stor-A-Way* Hanger brackets are made from sturdy aluminum (will not rust) and are screwed or nailed to garage or basement joists. Window sashes slip on and off with ease—just slip sash between holding brackets and release—needs no adjusting—will last a lifetime.

Will hang windows vertically or horizontally. Installation instructions accompany each order.

- 6 window set (2 brackets).....\$1.88 plus 12c mailing
- 13 window set (4 brackets).....\$3.49 plus 16c mailing
- 20 window set (6 brackets).....\$4.95 plus 20c mailing
- 27 window set (8 brackets).....\$6.10 plus 25c mailing
- 34 window set (10 brackets).....\$7.85 plus 30c mailing
- 41 window set (12 brackets).....\$9.60 plus 35c mailing

Order now for immediate delivery—money refunded if not 100% satisfactory. Send cash, check or money order for full amount plus mailing cost.

SOLD BY
CHICAGO NATIONAL SALES—Dept. 111
20 N. Wacker Drive Room 454 Chicago 6, Ill.
Distributors and Dealers Write

**Now—anyone can
REMOVE PAINT**



Stripping finishes no longer means hours of arm-tiring work. Wonder-Paste Remover has changed all that!

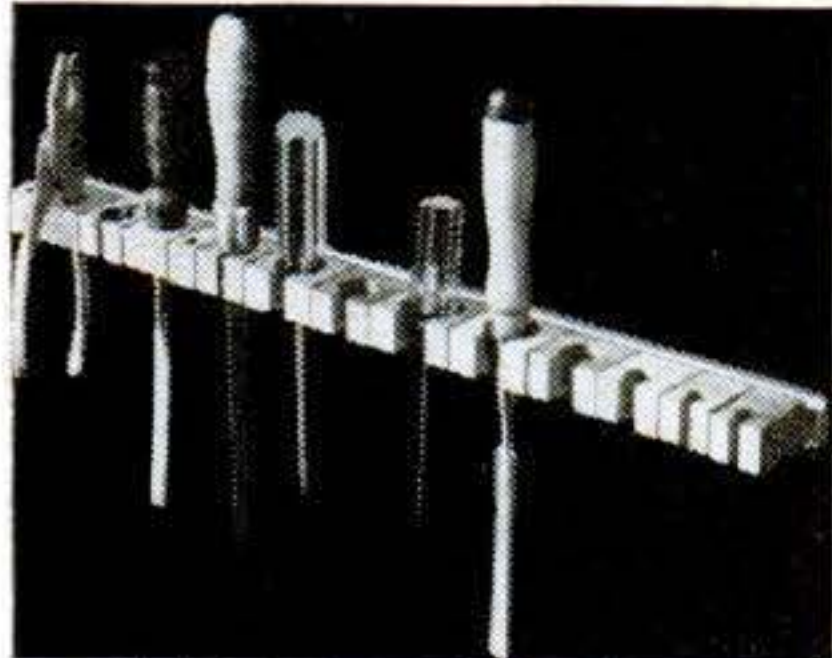
WONDER-PASTE

Equally effective on paint, varnish, enamel, lacquer, or shellac. Simply apply this powerful solvent with a paint brush. Allow time for it to penetrate completely. Then remove the soft, sludgy mass with a putty knife. Leaves the surface clean and smooth—no sanding needed.

Get Wonder-Paste at your paint or hardware store. Or write us for leaflet.



Wilson-Imperial Company, 121 Chestnut Street, Newark 5, N. J.



**TOOLS STAY SHARP
ALWAYS HANDY in
TOOLRAK**

Your tools at your fingertips—an ideal arrangement for everyone who uses tools. TOOLRAK prevents dulling and marring, keeps tools always ready for instant use. Selected hardwood blocks

fit into extruded aluminum backstrip, hold wide variety of tools, can be arranged and rearranged in any sequence. A handy shop and household accessory, a thoughtful gift.

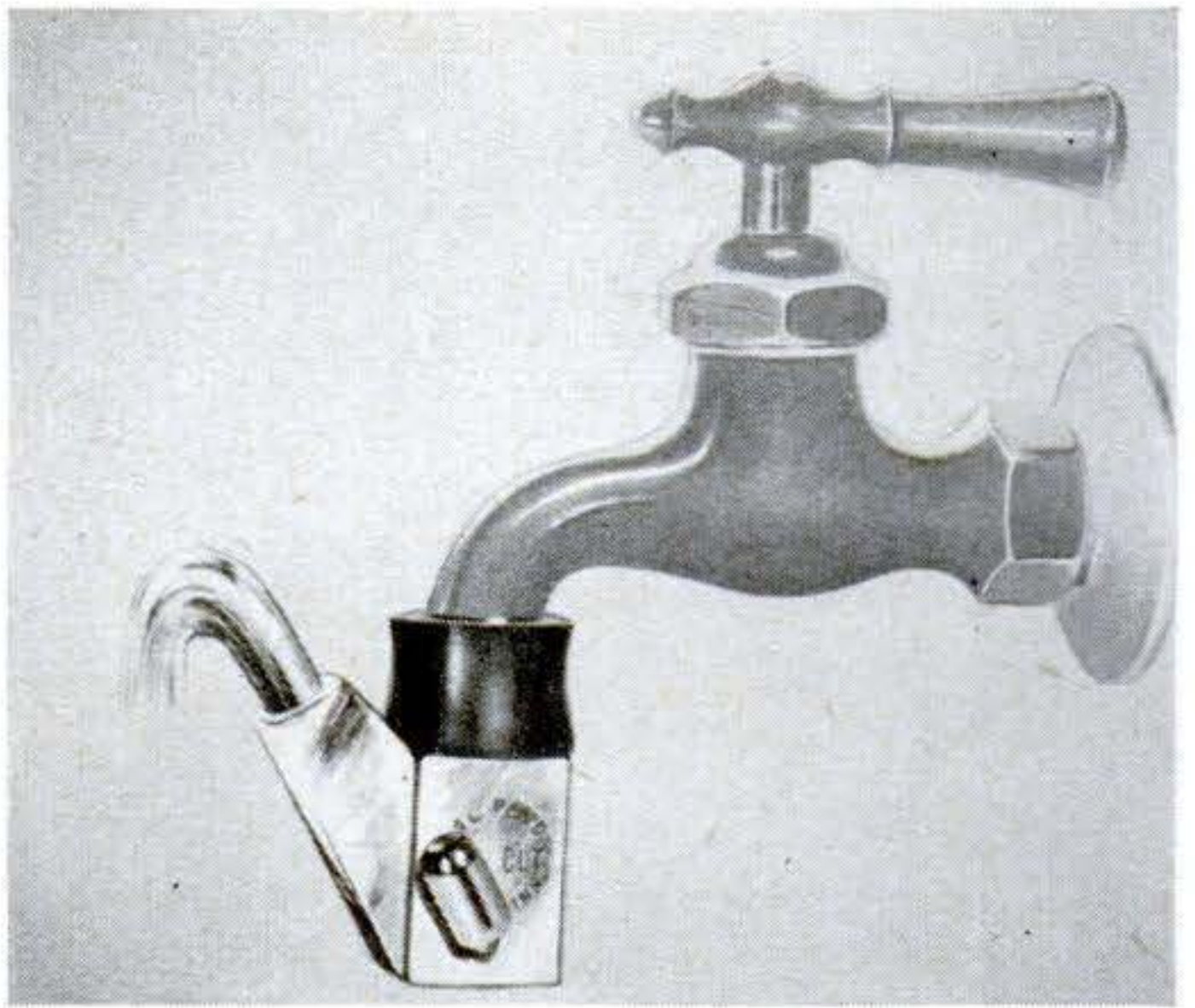
- ORDER TOOLRAK DIRECT**
- 18" size holds 14 tools, \$2.65 postpaid
 - 12" size holds 10 tools, \$2.00 postpaid
 - 8" size holds 7 tools, \$1.35 postpaid
- C.O.D. if desired: fees added. Colo. residents add 2% tax. Satisfaction guaranteed.

DAVIS DEVELOPMENT CO. Bldg. T-352A, Peterson Field
Colorado Springs, Colorado

Aids to Modern Living



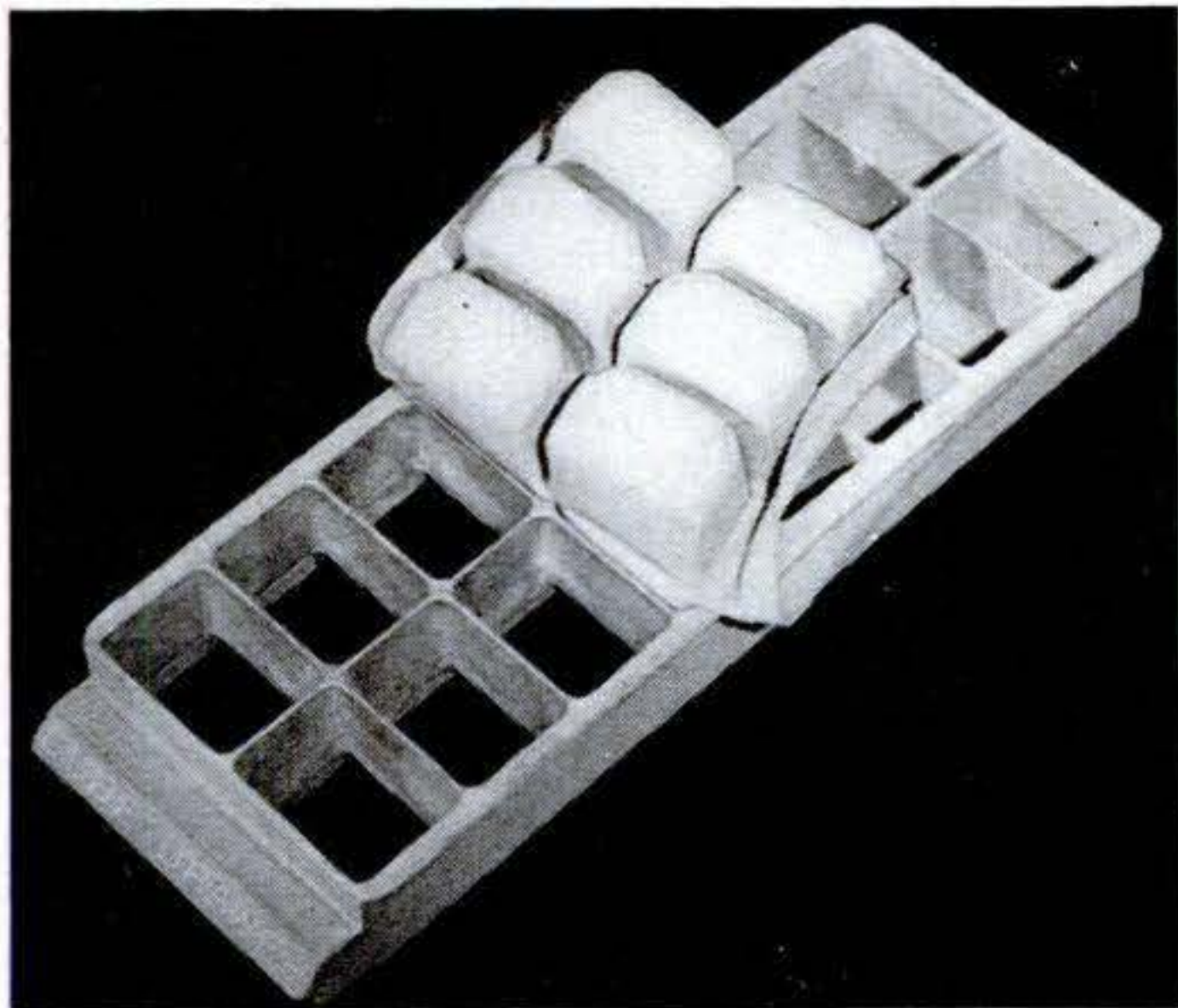
Converts Bottle to Lamp. Making a lamp of almost any vase or bottle is simple with these adapters offered by W. N. de Sherbinin, of Brookfield, Conn. The cork section comes in three sizes—1¼, 1½, and 2½ inches. It's a circular cork strip that can be peeled down, if necessary, to conform to the bottle neck.



Faucet to Fountain. The Handy Ann Faucet® attaches to a faucet by a rubber coupling. Push the lever up and it's a fountain. When you shut off the water, the lever drops and it is a faucet. It's especially handy for children. Handy Ann Products, Minneapolis, prices the nickel-plated, rust-proof gadget at \$2. It has a built-in screen that prevents splashing.



Lifts Toasted Muffins. Toast Lifter®, distributed by Benjamin & Medwin Inc., New York City, is a stainless-steel cage that fits almost all two-slice, pop-up toasters. English muffins and other breads that won't reach the top of the toaster slots can easily be removed with Toast Lifter. The price is about \$2.



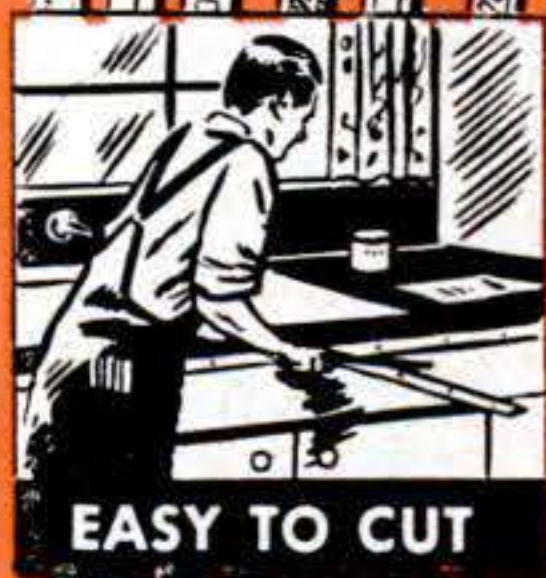
Remove One Cube at a Time. A flexible latex liner in the Cube Drawer® makes it easy to remove only the number of ice cubes you need. According to the maker, Cube Drawer Corp., Akron, O., a single cube may be removed just by pushing up on the underside of its pocket. The drawer retails at about \$2 and extra liners may be purchased separately if needed.

DEMAND GENUINE
Chromtrim
 TRADE MARK
 A PRODUCT OF R. D. WERNER CO., INC.



"Trim-it-Yourself"
METAL MOULDINGS
 trade mark-wrapped

FOR YOUR
 PROTECTION



EASY TO CUT



EASY TO BEND



EASY TO APPLY

Join the thousands who have beautified their homes, from cellar to attic...yes, TRIM IT YOURSELF with high-lustre CHROMTRIM and erase years from rooms in a matter of minutes! Insist on CHROMTRIM — the only line that was specially developed for home applications. The name CHROMTRIM is on every, ready-wrapped, 6-foot length... don't accept substitutes!

Serve yourself from this colorful Chromtrim floor display at your favorite store... choose from the 12 popular Chromtrim shapes that help modernize your home in hundreds of ways!



SEND FOR YOUR "TRIM IDEAS" BOOK!

R. D. WERNER CO., INC., 295 Fifth Avenue, N. Y. 16

Enclosed is 10c. Please send me a copy of your 16 page full color booklet "Trim Ideas", telling me how to decorate with Chromtrim metal mouldings.

Name

Address

City State PS-10

P.S.

Last minute news & notes...

THE MOSQUITO that zings you next year might make a little click in a Geiger counter. But don't let it worry you or waste your batteries. Army doctors are now rearing the little hummers in "hot" water in the hope that radioactive skeeters will signal how the pests migrate.

MORE LIGHT is coming in smaller packages. The 150-watt bulbs now being manufactured by Westinghouse are an inch shorter and a quarter-inch slimmer than the old bright-light jobs. Easier to get into that fixture over the bathroom mirror.

NOW THEY TELL US that garbage cans don't have to stink. Monsanto chemists have cooked up something to halt the molds and bacteria which decompose the garbage to produce the stench you don't love to uncover. Just ask for "Orthobenzylparachlorophenol."

NUMBERS instead of colors are being used to code wires for complicated electrical controls. The numerals are branded on every inch of insulation and won't wash or wear off. The makers (Midwest Automatic Control Co., Des Moines) unimaginative-

ly call it "Magic Wire". Harassed electricians, contorting themselves through today's elaborate circuits, think "Number Please" might be more appropriate.

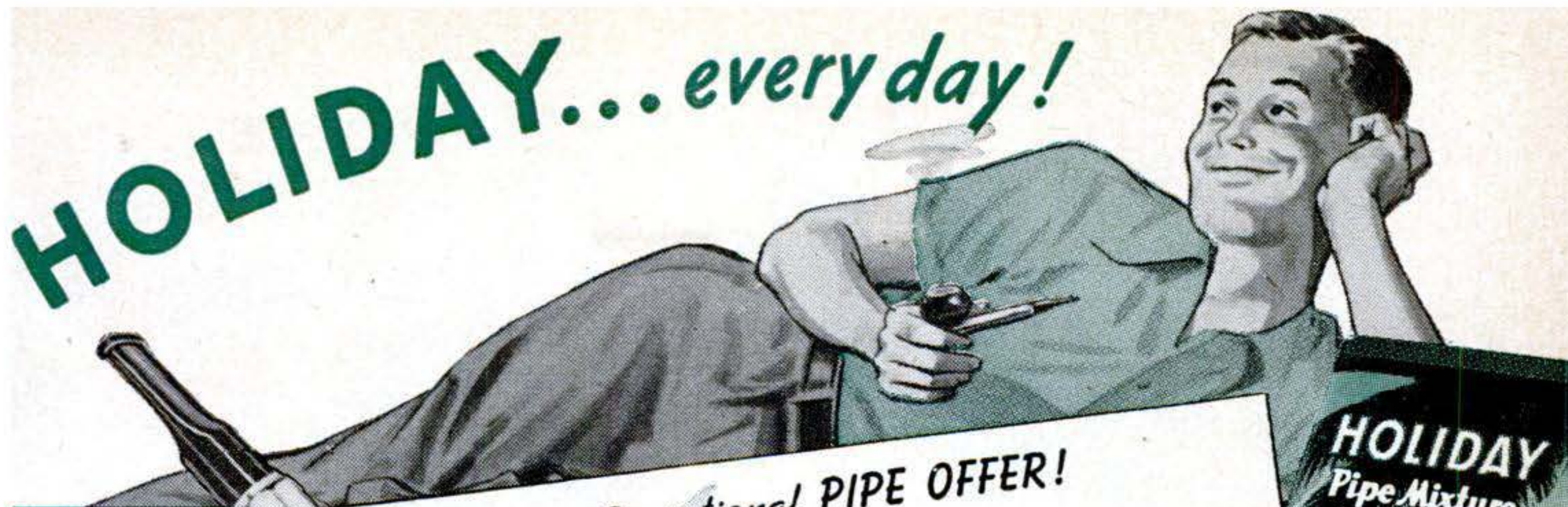
DISHWASHERS that call for less work on the part of the housewife than washing the dishes herself are every husband's dream. A new principle, developed by Husband Jerry LaRaus of Westport, Conn., uses jets that do the job on both sides of the plates.

SCIENTISTS are excited over the latest news from Berkeley, Calif., that a quarter-scale model of the proposed 5 to 7 BILLION volt "bevatron" is now running sweetly. Tests show that plans for the biggest atomic accelerator ever designed are basically okay. The big-billion job ought to be ready in three or four years.

GAR WOOD's new boat is not idly named "Venturi." It's a seagoing windtunnel that steadies itself by squeezing the air that rushes through the square gullet formed by its split hull and curved underdeck.

The Editors

HOLIDAY... everyday!



**TO MAKE
NEW FRIENDS
FOR HOLIDAY**

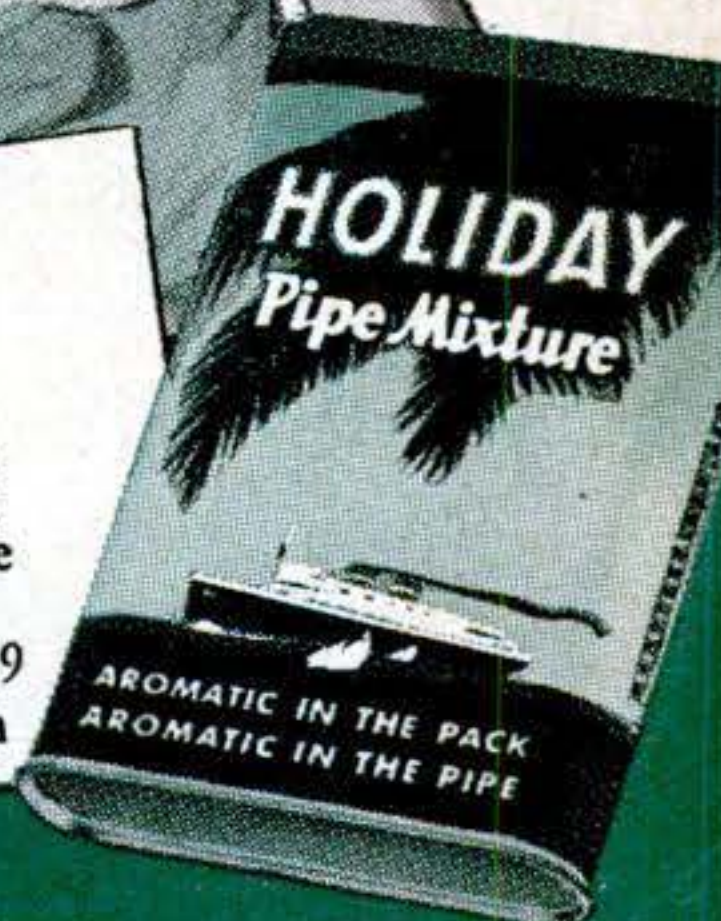
Cool-smoking aluminum pipe with genuine imported briar bowl

Here's a Sensational PIPE OFFER!

**3.50
only 50¢**

plus the inside paper wrapper from 12 tins of Holiday Pipe Tobacco.

Offer limited to U.S.A. Expires Dec. 31, 1949
Send to Holiday, Dept. PS-1, Richmond, Virginia

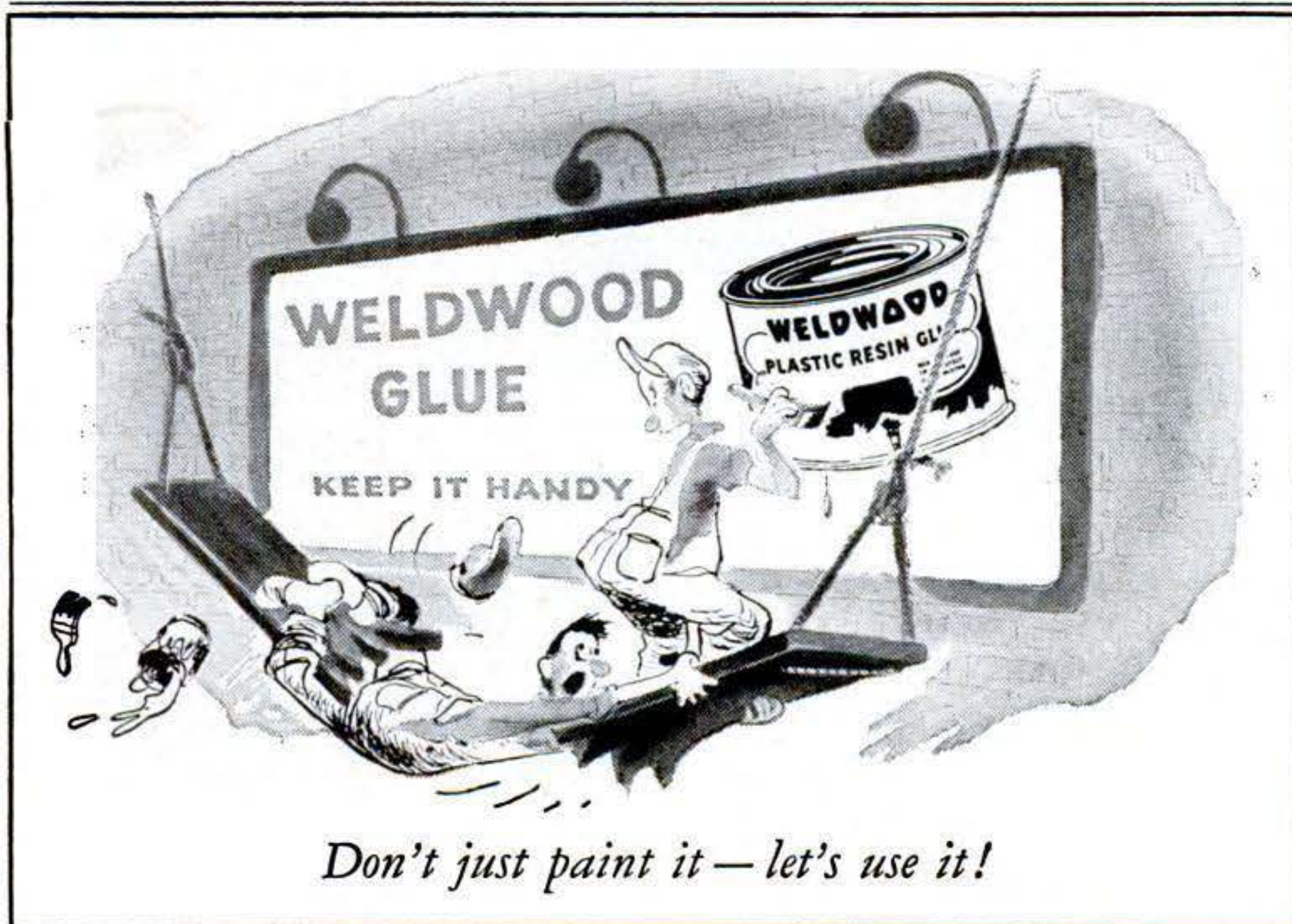


Also in vacuum pounds

HOLIDAY AROMATIC PIPE MIXTURE

Enjoy that real Holiday feeling 365 days a year with HOLIDAY—the aromatic High Grade pipe mixture—at a popular price. Only 15 cents!

AN ADVENTURE IN GOOD SMOKING



Don't just paint it — let's use it!



Remember Weldwood Glue when you need dependable wood-to-wood bonds. Quick and easy to mix with cold water... tremendously strong... stain-free... rot-proof... and *permanent*. At paint, hardware, variety stores and lumber yards. 15¢, 35¢, 65¢, 95¢ and larger sizes.

WELDWOOD PLASTIC RESIN GLUE
United States Plywood Corporation, New York 18, N. Y.

**ALSO HANDY FOR
WOOD HOBBYISTS!**



Firzite

—to give you smooth finishes on fir plywood and other soft woods.

A pre-finishing material that seals the wood pores... tames the wild grain... virtually eliminates checking and grain raising. An excellent base for stain, paint or enamel. White or clear. White Firzite provides an easy, low-cost way to achieve "blond," "bleached" or "wiped" finishes.



Satinlac

—to preserve the beauty of all woods.

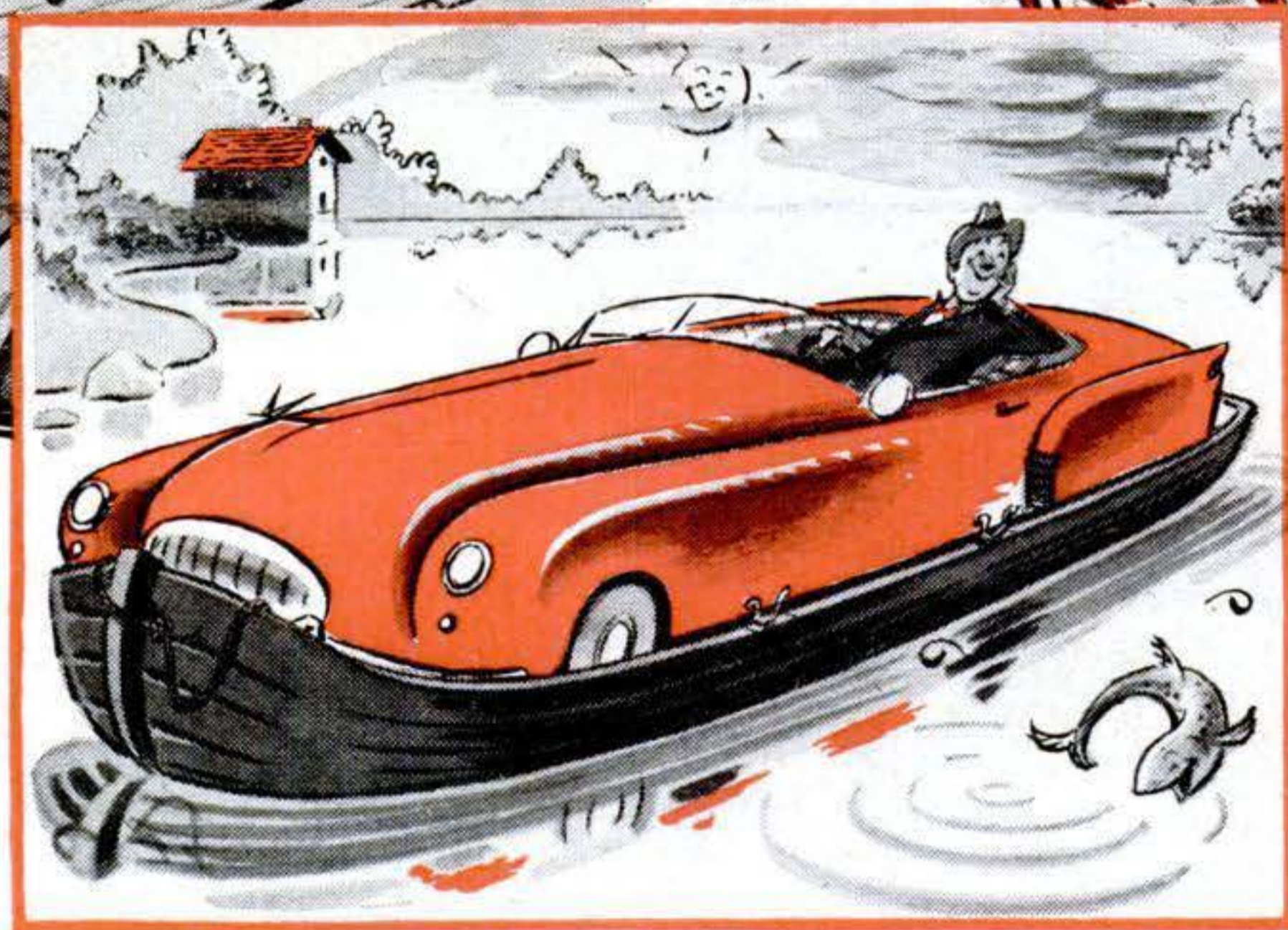
An inexpensive coating for the proper finishing of Weldwood Hardwood Plywood and similar woods. Clear. No brush marks. Brings out all the natural beauty of wood. Does not yellow or darken with age.

FIRZITE and SATINLAC are available from paint, hardware and lumber dealers. Write for leaflet No. 4 on finishing plywood.

IF YOUR SOLDERING TURNS
OUT LIKE THIS...IT'S TIME
TO CLEAN THE IRON!

and

IF YOUR CAR FEELS LIKE THIS
...IT'S TIME FOR MARFAK
CHASSIS LUBRICATION



THAT CUSHIONY FEELING LASTS LONGER WITH MARFAK!

There's a world of difference between *Marfak* chassis lubrication and ordinary grease jobs. Tough, s-t-r-e-t-c-h-y *Marfak* clings to wear points and fights friction for 1,000 miles and *more!* And just notice that "cushiony" driving ease that *lasts!* It's your sign that *Marfak* keeps right on protecting. Applied by chart, never by chance. Stop by for *Marfak* lubrication today at your neighborhood Texaco Dealer, *the best friend your car ever had.*



THE TEXAS COMPANY
TEXACO DEALERS IN ALL 48 STATES

Texaco Products are also distributed in Canada and in Latin America

BE A SUCCESS IN

Radio Mechanic For Air Line
I qualify me Radio Me- nited Air- ny Radio- Class Li- Hauger, California.

Makes More Money With Own Shop
"Am doing Radio Servicing full time. Have my own shop and am making more money now than I ever did before. Owe this to N.R.I."—Curtis Staeth, Fort Madison, Iowa.

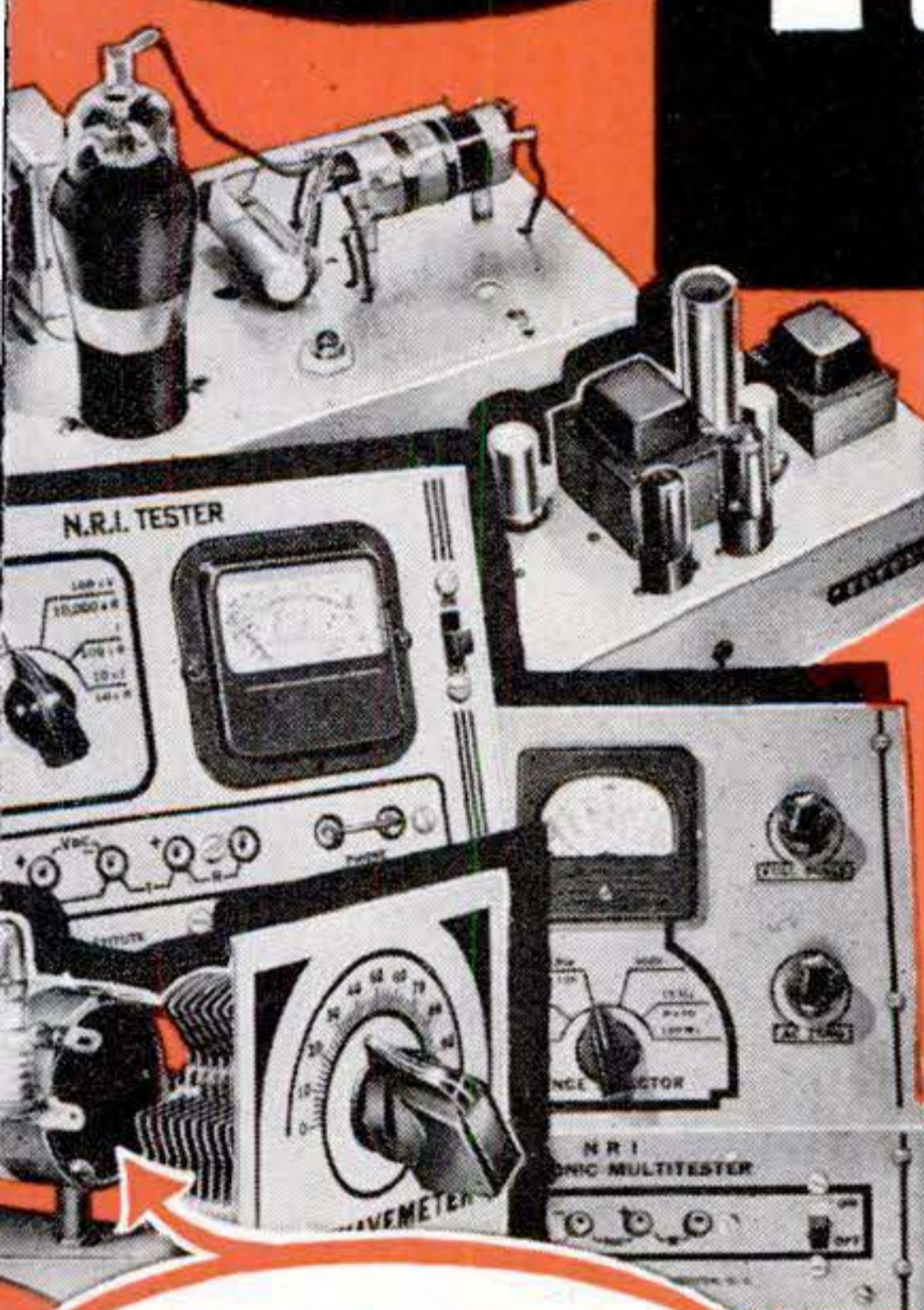
N.R.I. Graduate Doubles Salary
"I am employed by Station WKBO, as transmitter operator. Have more than doubled my salary since starting in Radio full time."—A. A. Herr, New Cumberland, Pa.

Makes \$10 Week Extra In Spare Time
"I averaged \$10 a week fixing Radios in my spare time. After graduating, managed an electrical store's Radio Department."—M. Joseph, Sacramento, California.

Today I am an expert Radio Techni- 4 employees me. Radio- ness has dou- G. Miller, To

RADIO-TELEVISION

Learn by Practicing at Home



Get a GOOD JOB -- Have a BRIGHT FUTURE in America's Fast Growing Industry

Do you want a good pay job in the fast growing RADIO-TELEVISION Industry? Or do you want to have your own money-making Radio-Television Shop? Here is your opportunity. I've trained hundreds of men to be successful Technicians . . . MEN WITH NO PREVIOUS EXPERIENCE. My tested and proved train-at-home method makes learning easy. You learn Radio-Television principles from my illustrated lessons. You get practical experience building, testing and experimenting with MANY KITS OF PARTS I send. All equipment yours to keep.

TELEVISION OFFERS NEW JOBS— MORE JOBS FOR TRAINED MEN

In 1945, there were 943 Radio Stations. Today, about 2700 are on the air! RESULT—THOUSANDS OF QUALIFIED MEN STEPPED INTO GOOD JOBS. Another example—only 19 Television stations were on the air in 1947. Today, more than fifty. Within a few months, 150, say the experts — and 1000 within 3 years. Then add developments in FM, Two Way Radio, Police, Marine, Aviation, Microwave Relay Radio. Think what this means! New jobs, more jobs for qualified men. The man who prepares NOW can reap rich rewards in this changing, developing, fast growing field!



I SEND YOU MANY KITS LIKE THESE FOR PRACTICAL EXPERIENCE

MAKE EXTRA MONEY IN SPARE TIME

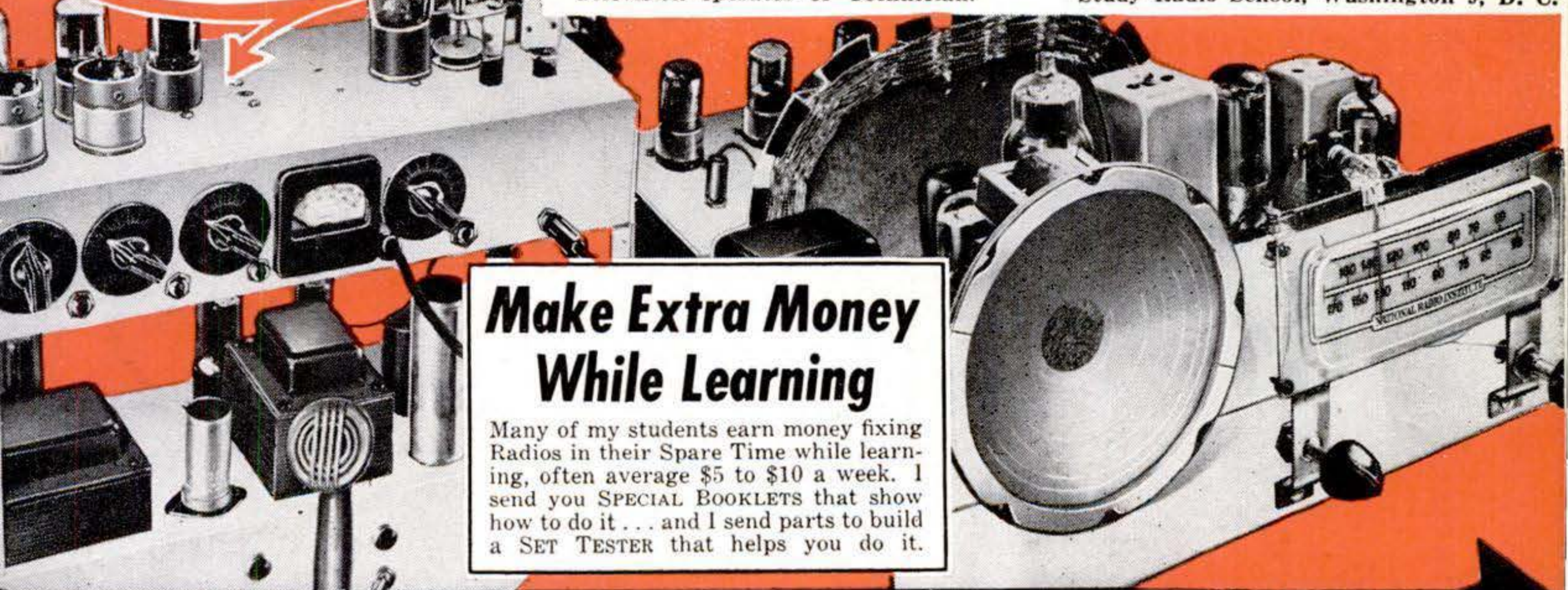
The day you enroll, I start sending you SPECIAL BOOKLETS that show you how to make \$5, \$10 a week or more EXTRA MONEY fixing neighbors' Radios in spare time while learning. From here, it's a short step to your own shop or a good pay



Radio-Television servicing job. Or let me train you for a Federal Communications Commission (FCC) License. Be a Radio-Television operator or Technician.

SEE WHAT N.R.I. CAN DO FOR YOU

Act Now! Send for two BOOKS FREE. Actual Lesson on Receiver Servicing and 64-Page Book on winning success in Radio-Television. Cut out and mail postcard. J. E. SMITH, President, Dept. 9KP3, National Radio Institute, Pioneer Home Study Radio School, Washington 9, D. C.



Make Extra Money While Learning

Many of my students earn money fixing Radios in their Spare Time while learning, often average \$5 to \$10 a week. I send you SPECIAL BOOKLETS that show how to do it . . . and I send parts to build a SET TESTER that helps you do it.

FIND OUT ABOUT THIS TESTED WAY TO BETTER PAY MAIL NOW!

When safety's a must, it's "PRESTONE" ANTI-FREEZE

YOU'RE SAFE
FROM FREEZE-UPS
no matter how cold it gets!

AVOID THIS!

YOU'RE SAFE
FROM BIG BILLS
due to frozen radiator or cracked engine!

AVOID THIS!

YOU'RE SAFE
FROM BOIL AWAY
no matter how warm it gets
between cold spells!

AVOID THIS!

One shot lasts all winter!

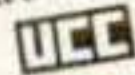
Now, more than ever, with cars a major investment, it makes sense to have the safest, surest anti-freeze in your car!

THERE'S NOTHING ELSE LIKE IT!

"Prestone" anti-freeze, America's Number One brand, is made to an exclusive formula. No other anti-freeze offers you the same protection. Year after year, more motorists depend on "Prestone" brand anti-freeze for safe, sure, all-winter protection.

NO RUST • NO FOAM
NO FREEZE • NO FAILURE
GUARANTEED! Ask your dealer to show you the guarantee. It's your assurance of all-winter safety.

The registered trade-marks "Prestone" and "Eveready" distinguish products of
NATIONAL CARBON COMPANY, INC.
30 East 42nd Street, New York 17, N. Y.
Unit of Union Carbide and Carbon Corporation



\$3.50
PER GALLON

"PRESTONE" BRAND

AMERICA'S LARGEST-SELLING ANTI-FREEZE