

AN EXTRA GAS TANK FOR YOUR CAR

Page 148

Popular Mechanics

JUNE 1974 60 CENTS

Build Surf Sailer, a surfboard-sailboat — it's both Page 71

Best bicycles: for commuting, shopping, touring Page 90

Re-siding your house:
I bought a good siding job Page 108

You can do it yourself Page 96

Save money: How to
groom your dog like a pro Page 85

Honda Civic and Fiat 128
owners get a beautiful
27-31 mpg Pages 120 and 134

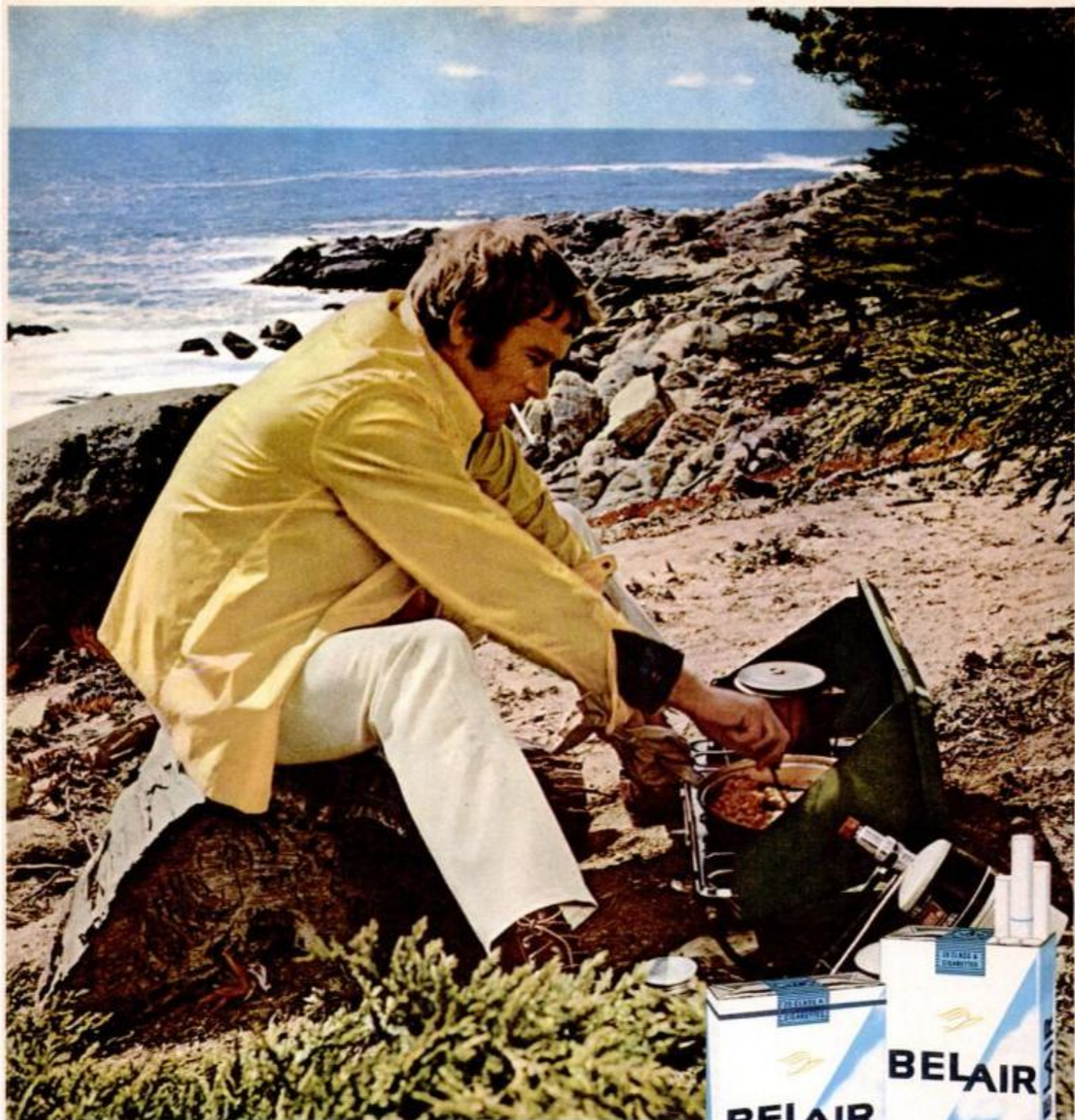
How to keep
cool for
less money

Page 116



SHOP AND COMMUTE
WITH A GAS-THRIFTY TRIKE

Page 77



Start fresh with Belair.

Just the right touch of menthol.

Eat out in style with this propane camp stove by Coleman. Complete with removable grate and folding wind baffles. Yours for free B&W coupons, the valuable extra on every pack of Belair.



To see over 1000 gifts, write for your free Gift Catalog: Box 12, Louisville, Ky. 40201.



Kings, 15 mg. "tar," 1.2 mg. nicotine; Longs, 18 mg. "tar," 1.4 mg. nicotine, av. per cigarette, FTC Report Sept. '73

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

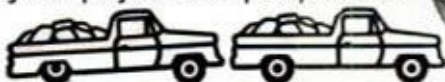
Firestone SAYS:

Ride-Rite® comfortaires will give you a higher grade of riding comfort, reduced sway and improved handling of your pickup truck, van or camper. They may be installed on virtually all 1/2-ton through 1 1/2-ton work-and-play vehicles.



Ride-Rite comfortaires Level Your Load

Ride-Rite comfortaires do not replace coil or leaf springs, shock absorbers or other equipment. But they *do* add immeasurably to maximum comfort and effective vehicle usage. They level your payload of people and



equipment . . . and reduce sway.

Install Them Yourself

In most cases you can easily install Ride-Rite comfortaires yourself. Suggested price is just \$134.95 per set of two complete with mounting brackets, inflating lines and installation instructions.



Here's How They Work

Installation of Ride-Rite comfortaires is independent of the vehicle's original suspension system. Installed properly, they will not rub or chafe in any way — even when driven with no air pressure in the bellows.

Level your vehicle by inflating Ride-Rite comfortaires with a hand pump. An optional air compressor. Or at any service station.

Ride-Rite comfortaires let you use the manufacturer's full recommended vehicle load capacity . . . with smoother road-handling and all the comfort of riding on air.



COME ON AND LEVEL WITH US

Clip out and mail this coupon to
**FIRESTONE, 1700 Firestone Boulevard,
 Noblesville, Ind. 46060**
 for free booklet, specs and information
 about RIDE-RITE comfortaires.
 Name _____
 Address _____
 City, State _____
 Zip _____



This One



A74Z-Y1Q-671X



comfortaires
 by FIRESTONE

The Power Line™ 880 and 881.



Adult Air Rifles by Daisy®

We gave these highly sophisticated air rifles power to spare. But we didn't stop there. We designed them so you can vary the shooting power.

With two or three quick, easy pumps, you're ready for just plinking.

With ten pumps, you're firing at maximum power, with a velocity of over 675 feet per second!

Add to that the extra heft. Perfect balance.

A contoured, man-sized Monte Carlo stock. A rifled barrel on the 881 and the ability of both models to handle either .177 caliber pellets or B·B's.

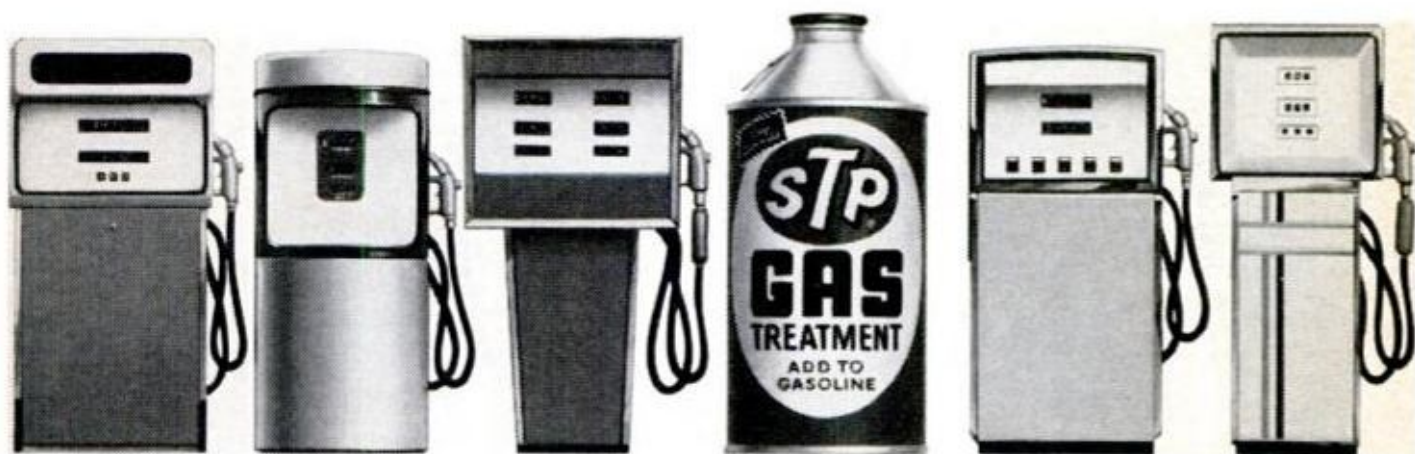
If a traditional Daisy B·B Gun is too limiting for you and a firearm too powerful, try the 880 or 881, made for adults age 16 and up. They're only two of the air rifles in the Adult Power Line Series by Daisy that also includes Daisy/FWB Olympic competition models. See them at your favorite sporting goods department.

The 880 and 881 adult air rifles. All of the power you'll ever need . . . but only when you need it.

POWER LINE™ by Daisy®

Division Victor Comptometer Corporation Mailing address: Daisy, Dept. P64, Rogers, Arkansas 72756
In Canada: Daisy/Heddon Ltd., Cambridge, Ontario N3H4T9

TODAY YOUR GAS NEEDS OUR TREATMENT



STP® Gas Treatment contains more power to clean than the leading detergent gasoline.

And these days, when a dirty carburetor can steal your precious gasoline, you need all the help you can get.

So get our treatment when you get your gas...
STP Gas Treatment.

**Today
you can't afford
a dirty carburetor.**

AUTOMOBILES, DRIVING

- [40](#) Detroit Listening Post
- [50](#) Imports and Motorsports
- [77](#) Sport trikes go street legal
- [120](#) PM Owners Report: Honda Civic
- [134](#) PM Owners Report: Fiat 128
- [148](#) Saturday Mechanic: How to install an auxiliary fuel tank
- [164](#) Detachable 'saddlebags' for your motorbike

SPECIAL REPORT ON BICYCLES

- [90](#) Best bicycles and gear for commuting, shopping and touring (a 10½-page roundup)

HOME AND YARD

- [85](#) How to groom your dog like a pro
- [96](#) Re-siding: You can do it yourself
- [103](#) How to rent and work from scaffolding
- [106](#) Other siding products you should know about
- [108](#) How I bought my siding job
- [112](#) The more you build the more you save
- [116](#) How to keep cool for less money

SHOP AND CRAFTS

- [71](#) Surf Sailer you can build from PM plans
- [141](#) Twin-duty target box
- [152](#) Newton's cradle: A surefire conversation piece
- [154](#) Hints from readers
- [157](#) You can build this buffet-bed table
- [164](#) Detachable 'saddlebags' for your motorbike
- [181](#) Hints from readers

BOATING, OUTDOORS

- [71](#) Surf Sailer you can build from PM plans
- [138](#) RV home away from home
- [141](#) Twin-duty target box

PHOTOGRAPHY

- [54](#) Likable little Leica is great for travel
- [64](#) Photo hints
- [115](#) New aids for photo drying
- [142](#) Tripods aren't always tripods
- [146B](#) Auto-winding Topcon: A little motor drive, a lot of camera

SCIENCE, INVENTIONS

- [82](#) Watch out for these career killers
- [152](#) Newton's cradle: A surefire conversation piece

AVIATION

- [74](#) Homebuilt aircraft: Tough little biplane built for two

ELECTRONICS, RADIO, TV

- [147](#) Spinning saucer and revolving rabbit ears aid TV reception

EVERY MONTH

- [8](#) Letters
- [20](#) Car Clinic
- [26](#) The Bicycle Shop
- [34](#) Appliance Clinic
- [46](#) All Outdoors
- [68](#) Homeowners' Clinic
- [124](#) It's New NOW: Latest products and developments (A 10-page roundup)



'Saddlebags' to fit your motorbike . . 164



Make a great conversation piece . . . 152



How to groom your dog like a pro . . . 85



How to re-side your home . 96

ON THE COVER: Shop and commute with a gas-thrifty trike converted for street use. Photo: Greg Wenger

AS A SERVICE TO READERS, *Popular Mechanics* publishes newsworthy products, techniques and scientific and technological developments. Due to possible variance in the quality and condition of materials and workmanship, *Popular Mechanics* cannot assume responsibility for proper application of techniques or proper and safe functioning of manufactured products or reader-built projects resulting from plans published in this magazine.

Swingline's Special Tonics and Home Remedies



POWERCUN 1000™ STAPLE GUN

Save energy, insulate your home. Screen in a porch. Cover outdoor furniture. Train a vine. Construct a trellis. Identify plants. Install a greenhouse. Decorate for a garden party. Construct a privacy fence. Put up ceiling tile. It's the extra heavy duty staple gun that drives into hardwoods (like oak). Also available as a kit with five staple sizes.



THE LITTLE RED FIXER™ ELECTRIC GLUE GUN KIT

An all purpose household fixer. Securely binds broken legs on chairs or tables. Mends ceramic and chinaware. Puts toys and models into shape. Also caulks and seams! Repairs in 60 seconds. It's small and fits any hand yet its space-age adhesive makes it big enough to do almost any job.

Kit includes 29 refill FixStix for gluing or caulking.

Swingline®

Div. of Swingline Inc., 32-00 Skillman Avenue Long Island City, N.Y. 11101

A word from Phyllis Diller:
If you have crummy looking aluminum
screens and doors around your house,
fix 'em. Get ALUMINUM JELLY™.
Just brush it on any
aluminum surface.
Then wash it off.
The crummy
look is gone.



© Woodhill 1974

For sale wherever fix-it products are sold.
Woodhill Chemical Sales Corp., Cleveland, Ohio 44128
World's Finest Fix-it Products

build the Invader



Popular Mechanics
cover feature Oct. 73

The Invader GT5A is the buildable kit car. Our pre-fitted parts and pre-finished fiberglass pleated upholstery result in Autokit's easy-to-build VW sports car kit. Complete accessories and financing are available. Kits from \$895. Write for free color brochure.

and make money

Dealerships are available.

Check box if you want details.

KIT INFO PM1 DEALER INFO

Name _____ Age _____

Address _____

City _____ State _____ Zip _____

AUTOKIT

Post Box 1073
Alameda, CA 94501

Popular Mechanics

JIM LISTON, Editor

SHELDON M. GALLAGER, Executive Editor

JOHN A. LINKLETTER, Managing Editor

WAYNE C. LECKEY, Home and Shop Editor

ALVIN KIETZ, Art Director

| | |
|-------------------|---------------------------------|
| BILL HARTFORD | Automotive |
| JOHN F. PEARSON | Science and Engineering |
| WM. T. McKEOWN | Boating and Outdoors |
| IVAN BERGER | Electronics and Photography |
| HARRY WICKS | Home Workshop |
| STEPHEN WALTON | Assistant, Home and Shop |
| MICHAEL LAMM | West Coast |
| ROBERT LUND | Detroit Automotive |
| GARRY WINTER | Copy Chief |
| RICHARD H. FUNK | Production |
| ALFREDO VEGA | Assistant, Production |
| DON EVANS | Technical Art Director |
| DAVID KOMITAU | Assistant Art Director |
| IRA HERRICK | Assistant Art Director |
| DON L. MANNES | Assistant Art Director |
| CLIFFORD B. HICKS | Special Publications |
| SOPHIE GRONOWICZ | Director, Bureau of Information |
| EVERETT JOHNSON | Cabinetmaker |

DANIEL J. COLEMAN, Director of Advertising

ADVERTISING OFFICES: New York: 224 West 57th St., 262-4282; Chicago: 520 N. Michigan Ave., 527-2400; Detroit: General Motors Bldg., TRinity 5-8711; Cleveland: 20310 Chagrin Blvd., Shaker Heights, 283-7788; Los Angeles: 601 North Vermont Ave., 666-6263.

JOHN A. REGINA, Advertising Production Manager

Published by The Hearst Corporation

FRANK MASSI
President

JOHN R. MILLER
Executive Vice President

RANDOLPH A. HEARST
Chairman

RICHARD E. DEEMS
President, Magazines Division

JOSEPH F. KERN
Publisher

ADDRESS ALL EDITORIAL COMMUNICATIONS TO: 224 West 57th St., New York, N.Y. 10019. For additional sources of information on the articles and products in this issue, write to Bureau of Information, Popular Mechanics, for free "Where-to-Find-It" list.

SUBSCRIPTION SERVICE: Mail all subscription orders, changes of address, correspondence concerning subscriptions, and Postmaster notices of undeliverable copies to Popular Mechanics, Box 646, New York, N.Y. 10019. Please enclose your latest address label for quickest service when writing about your subscription.

POPULAR MECHANICS IS PUBLISHED MONTHLY by The Hearst Corporation, 224 West 57th Street, New York, N.Y. 10019, U.S.A., Frank Massi, President; John R. Miller, Executive Vice President; Randolph A. Hearst, Chairman; Harrison A. Mitnick, Treasurer; Harvey L. Lipton, Vice President and Secretary. Hearst Magazines Division: Richard E. Deems, President; Raymond J. Petersen, Executive Vice President; William S. Campbell, Vice President and General Manager; John F. D'Avolio, Vice President and Resident Controller; Albert A. Rachoi, Vice President and Director of Circulation; Joseph F. Kern, Vice President for Popular Mechanics. Single copy in the United States and Canada, 60 cents. Subscription prices: United States and Possessions, \$5.69 for one year; \$10.29 for two years; \$13.69 for three years. Canada, add \$2.00 for each year. All other countries, add \$4.00 for each year. When changing address, give old address as well as the new, with zip code, and allow six weeks for change to become effective. Second-class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second-class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as second-class matter at the Post Office at Mexico D.F., Mexico, June 20, 1950. © 1974 by The Hearst Corporation. All rights reserved. Printed in U.S.A.

Who'd have thought I'd make so much money without going to college?

I still have to pinch myself every time I see my paycheck — it seems too good to be true!

Especially when I remember how sorry everyone felt for me because I couldn't go on to college. "Without college, it's a losing battle!" they all said.

Well, the college boys left for school, and I found a job. I worked hard, too, but never made it big.

Then I happened to read an announcement like this ... about the exciting job opportunities in Electronics.

I discovered that with proper training I could qualify for a job in many of the fields where the action is today ... computers, medical science, pollution control, radio and TV broadcasting, to name just a few. I found out that once I had some experience, I could earn \$12,000 a year or more ... the kind of money any college man would be proud of.

Most important — I realized how easy it would be for me to get this training. Right at home. In my spare time.

With a home-study course from Cleveland Institute of Electronics.

It looked like a terrific deal, so I enrolled with CIE ... and did I learn fast! I'm happily employed in Electronics now, earning good money in a career that means something. It's all so unreal that every once in a while I have to pinch myself.

Without college, I never thought I could do it. But, thanks to CIE there are now some college guys who envy me!

CIE Grads Report Success



"My CIE course gave me the technology I needed to understand many of the electronics concepts I never dreamed I could learn. I'm already earning 30% to 40% more than I could have without my CIE training."

Joe Perry, Cambridge, Mass.



"When I started my CIE training, I worked on a tug-boat. Then I landed a broadcast engineering job at a TV station. During my first year in broadcasting, I finished my CIE course and got two raises."

Richard Kihn, Anahuac, Texas



This composite story is typical of hundreds told by CIE graduates who are now enjoying exciting new careers in Electronics.

Send for 2 FREE BOOKS

So find out for yourself. Ask for CIE's 2 FREE BOOKS, "Succeed in Electronics" and "How to Get a Commercial FCC License." They describe the opportunities open to men with electronics training and show you how CIE courses can prepare you for a meaningful, rewarding career in the Science of the Seventies.

Both books are FREE ... send for them today! For your convenience, we will try to have a representative call. Mail reply card or coupon to CIE ... or write: Cleveland Institute of Electronics, Inc., 1776 E. 17th St., Cleveland, Ohio 44114.

APPROVED UNDER NEW G.I. BILL

All CIE career courses are approved for educational benefits under the G.I. Bill. If you are a Veteran or in service now, check box for G.I. Bill information.

CIE Cleveland Institute of Electronics, Inc.

1776 East 17th Street, Cleveland, Ohio 44114
Accredited Member National Home Study Council

Please send me 2 FREE BOOKS describing opportunities in Electronics and how to prepare for them.

Name _____
(Please print)

Address _____

City _____

State _____ Zip _____ Age _____

Veterans and Servicemen:

Check here for G.I. Bill information.

PM-91

ENGINE BRITE

Spray it on... hose it off! Dirt and grease wash away. For autos, tractors, power mowers, go-karts, marine engines.



AMERICA'S
NO
1
ENGINE
CLEANER
AND
DEGREASER

GUNK®

TAR
AND
BUG
REMOVER



Especially formulated to dissolve tar spots and loosen bug deposits from autos, motorcycles, buses, etc.

AT HARDWARE AND AUTO STORES EVERYWHERE

WHEN RUST IS A PROBLEM...
Reach for

LIQUID WRENCH

Loosens rusted nuts, bolts, screws and parts... in seconds! Safe on all metals.



SOLDER
SEAL®

TRANS-MEDIC

Stops transmission troubles! Eliminates slippage, down-shifting, rough shifting, sluggish action, gear whine. Reduces friction.

AT HARDWARE AND
AUTO STORES



LETTERS

TO THE EDITOR

Keeping those bikes legal

In regard to the article dealing with the conversion of a dirt bike to street use (*Turning Hobby to Horse*, page 84, April PM), people in Wisconsin—and perhaps other states—will find it a bit more difficult than the article indicates.

A staff member of our Dept. of Transportation explained to me that if a bike does not conform to the regulations of the federal government, it cannot be licensed. In addition, the manufacturer of the bike must notify the state of Wisconsin that this bike is built with the intention of its being a street bike.

If the maker indicates that a particular bike is for off-road use, there is no way, no matter what is put on it, that it would become licensable.

I urge readers to check their own state regulations before investing in additional equipment which may be purchased in vain.
GLENBEULAH, WIS. BOB ROLTGEN

After reading *Sidecars Are Back!* (page 77, April PM) and *Half Car, Half Bike, They're High-Mileage Machines!* (page 80, April PM), I felt I should write about a few of the legal problems that can come about with some of these changes.

In Michigan we now have a no-fault insurance law. Any vehicle with more than two wheels must have no-fault insurance. Motorcycles with two wheels do not need no-fault insurance, but as soon as a third wheel (sidecar or tricycle) is added, you must get it. According to insurance agents, this will mean a car-type insurance and the rates are much higher, especially if the owner is under 25 or single.

When a dealer sells a trail or race motorcycle that does not have the required safety equipment for street use, he cannot legally title it. Therefore, if someone wants to convert this cycle for street use, I would advise him to check with his state license bureau about the procedures for titling it

(Please turn to page 10)



**IF YOU USE YOUR PICKUP LIKE A TRUCK
AND A SEDAN,
YOU'LL WANT FIRESTONE'S WIDE OVAL TIRE SYSTEM
HELPING YOU.**

Sometimes you use your pickup for big, heavy loads. Other times you use it like a second car for your family.

So you need tires that can work for you like a truck's and a sedan's. You need Firestone's Wide Oval Tire System. And here's how it works.

On the front, you put Firestone's Transport 500 Wide Oval® truck tires. They're the steering part of The System, with a wide, wide tread designed to give stability to your pickup and help "float" it over soft stuff.

On the rear go Firestone's Traction All Season™ Wide Oval truck tires, the drive part of The System. Their treads are computer designed to behave nicely at highway speeds, but to really dig in and move your pickup through grass, mud, dirt and snow.

See your Firestone Dealer or Store. Ask for The System. Compared to regular truck tires, it'll improve both the performance and the looks of your pickup.



The Wide Oval System

Firestone

LETTERS

(Continued from page 8)

first. He may find it easier and cheaper to trade it for a street-legal bike.

WAYLAND, MICH. MORRIS L. HOLLOWAY

In *Turning Hobby to Horse*, author Carl Shipman states that when converting a dirt bike to street use, one may weld on "virtually any street-legal exhaust" in place of the stock exhaust. If this is done, there may be dire consequences. On some wildly ported two-strokes, the stock exhaust (actually an expansion chamber) is an essential ingredient, and its removal may well lessen the bike's power output. Consider instead accessory clamp-on mufflers—some work wonders.

ST. PAUL, MINN. PAUL W. ANDERSON

In the sidecar photos on page 79 (April *PM*), the one in the middle photo, which you called a BMW, is a Ural, made in Russia. It was an honest mistake by author Mike Anson, because the Ural is a cheap copy of BMW. This probably won't be the only letter you get on this. Keep up the

good work, but research the motorcycles a little more please.

FREMONT, NEBR.

BOB BAIN

'More power is not the answer'

I have just finished Ivan Berger's article, *Those Monster Power Amplifiers: Not Louder but Better* (page 133, April *PM*). If people need any amp like the power-drinking monster you wrote about, they must have a hearing problem.

My wife and I have been using a 20-watt rig for quite some time—most pleasant to listen to and very clean and crisp on both the high and low end. The secret is to put the signal into the front end clean and it will come out that way.

All I can say is what a waste! More power is not the answer.

JUNCTION CITY, CALIF.

W. F. DIXON

Ivan Berger responds: "I wasn't trying to say 20-watt amplifiers are bad (in my opinion, any good amp with at least 10 watts per channel will do a good job), but that

Cordless power trims grass fast without effort.



Disston Cordless Electric
Grass Shears 3 models
from \$14⁹⁹

Disston Cordless Upright Shears
Let you trim as you walk along!
2 models from \$19⁹⁹

New Disston Cordless
Extra-Heavy-Duty Convertible
Shear Converts from hand to
upright. Hand model \$25⁹⁹
Convertible handle extra

Choose Disston Cordless, and go the distance! One charge gives you power enough to trim a king size lawn. Super-hard blades slice clean, don't need sharpening. Non-stick coating prevents pulling and tearing. Scissors action gets you into corners. Rechargeable.

Cordless is Disston

monster amps are better. They're better because even normal listening levels involve brief transient peaks that can exceed a medium-power amplifier's capabilities and be distorted, whereas high-power amps can pass these peaks comfortably and cleanly. Between peaks, of course, both amps would sound alike.

"More power is an answer—or at least part of one. Whether it's worth the cost is an individual decision."

Don't knock that pipe

Your February issue has a tip about using a cork glued to the center of an ashtray for knocking out the dottle of a pipe (*Hints From Readers*, page 135). Your pipe-smoking readers would be doing themselves and their pipes a far greater favor by investing in a simple pipe tool (tamper, spoon and pick in one) and removing the dottle with it. Knocking a pipe on any surface is undesirable, but is even worse when a pipe has just been smoked.

SAN FRANCISCO, CALIF. ANDREW P. TETON

Almond power

I was reading old issues of PM to see if I could come across anything that would be of help in the energy crisis. One item I found was a letter on page 10 of the Feb. '53 issue which described automobiles that operate by burning almonds.

WASHINGTON, OHIO ROBERT D. MACK SR.


Actually, those autos were burning almond shells (which then give off a hydrogen-rich gas). However, according to the writer, it takes 31½ pounds of shells to move a car 80 miles. Might be okay for commuting, but it'd take a heap of shells for any long-distance travel.

No need for pollution controls

I disagree 100 percent with *Hands Off Pollution Controls* (*Detroit Listening Post*, page 50, April PM). Out in the Midwest such controls are not needed as we have such a movement of air out here that we don't need any junk like that. It also is

(Please turn to page 13)

Cordless power trims hedges without tying you down.



Disston
Cordless Shrub
and Hedge Trimmers
2 models from \$19⁹⁹

Disston Cordless
Extra-Heavy-Duty
Hedge Trimmers
3 models from
\$29⁹⁹

Disston does the big jobs — without a cord. Nothing to chop up, trip over or tie you to a wall. One charge gives you enough power to finish the job you started. Super-hard blades whack through toughest shrubbery. Extra light weight lets you maneuver free 'n easy. Choose the number one name in cordless. **Rechargeable.**

Cordless is Disston

**Popular
Mechanics,**

Box 1014 (Dept. HCG), Radio City, N.Y., N.Y. 10019

Enclosed is my check or money order for \$3.95 plus 50¢
for postage and handling. Send my *Popular Mechanics*
Master Home Care Guide to:

Name _____

Address _____

City _____

State _____

Zip _____

heavy-duty, plastic-coated cards that have been spiral-bound for easy handling. And, when a problem arises, you'll have a PM editor right there to help you do a "master" job every time.

By filling out this coupon, you'll be receiving all the help that a PM editor can give; you'll be receiving *Popular Mechanics Master Home Care Guide*. It comes loaded with step-by-step, fully-illustrated, money-saving solutions to some of the most prevalent home care problems. It's printed on 12

Get our *Master Home Care Guide*. It's like bringing a PM editor home for **\$3.95.**

Partial List of Contents:

- Patching wall cracks
- How to hang wallpaper
- Hanging a door and installing a lockset
- Repairing scratches in furniture
- Hanging drapery rods
- Silencing squeaky floors
- Removing stains
- Unclogging drains and stopping leaks
- How to cut fuel bills
- Handling an electrical emergency
- Waterproofing your basement
- Repairing aluminum storms and screens
- Repairing a damaged roof
- Painting the outside of your home
- Weatherstripping



**Announcing
Popular Mechanics
Master Home Care Guide**

The second in our Master Guide Series

LETTERS

(Continued from page 11)

a proven fact that this junk will cut gas mileage three to five miles. Out here everyone takes it off, and they will continue to do so.

In another article, *How to Live With Emission Controls* (page 128), you state that the unburned gas from the crankcase will burn. This is not so. I do not believe in the closed crankcase system and will not use it. Cars ran for years without this, and they still will.

I have just taken delivery on a pickup equipped to burn LP gas. If you are so much interested in cleaning up the air, why don't you do a little more research on burning LP gas, as this is a clean fuel.

HARROLD, S.D.

ERVIN BAYNE

Needs a hand-powered bike

Polio 15 years ago left me with good arms but useless legs. I can, therefore, no longer bicycle. My wife and children do a good deal of bicycling, and I have been searching

for years for some sort of machine with which I could join them. It occurs to me that one of your readers might have an idea. I should have either a three-wheel or four-wheel machine which I can propel, steer and brake using my arms. What I have in mind is a light, sporty machine that can be operated on the principle of the old Irish Mail by pumping a lever back and forth.

AMHERST, MASS.

NORTH BURN

We have a couple of hand-powered machines (one a three-wheeler) coming up in the near future. However, if readers have any suggestions, we'll be glad to forward them to Mr. Burn.

Master Home Care Guide

A great help in maintaining your home becomes available this month. It's the Master Home Care Guide, 24 pages of concise information printed on 12 plastic-coated boards that are spiral-bound together. It's \$3.95 plus 50 cents postage from Popular Mechanics, Box 1014 (Dept. HCG-L), Radio City, New York, N.Y. 10019. ★★

HERMAN SURVIVORS®

GUN BOOT

Nobody needs to tell a hunter how important warmth, durability and a perfect fit are to a man who spends his days in the field. At Herman, we found out what outdoorsmen need. Then we built our line of Survivor boots. The boot you're looking at is our Gun Boot, Model #7194. In redwood brown pebble grain rawhide. Like all Herman Survivors, it's built of the finest leathers. Inside and out. Then it's padded and insulated to -20° with Ensolite® foam. And fitted to the toughest, surest footing you can buy: The Armortred Vibram® sole. It's a great boot for work or sport. Survivors come in a number of styles. All are carefully crafted here in our Down East factory. They're tough. And they're comfortable. Like all our boots. When you're looking for quality in an outdoor boot, hunt up a pair of Hermans.



J. M. HERMAN SHOE COMPANY,
DEPT. 34, MILLIS, MASS. 02054

I'd like to try on a pair of Survivors. Please send me the Herman catalog and the name of my nearest dealer.
PM-GB-4-6

Name _____

Address _____

City _____

State _____

Zip _____



FREE CATALOG

New from PM

After three years in the preparation, Popular Mechanics **MASTER HOME CARE GUIDE** is finally here!

The second major building block in your PM Master Guide Series comes loaded with step-by-step, fully illustrated, money saving solutions to today's most common home care problems.

Here's some sample problems that **MASTER HOME CARE GUIDE** covers in detail: Hanging a door and installing a lockset; Patching wall cracks; How to hang wall paper; Repairing scratches in furniture; Unclogging drains and stopping leaks; How to cut fuel bills; Handling electrical emergencies and many, many more.

It's truly like taking a staff of PM editors home. Twenty-four pages of handsomely illustrated information on twelve heavy duty, plastic coated, waterproof boards. Makes a thoughtful gift that will be appreciated for many years to come.

To order your "First Edition," sure to become a collectors item, just send \$3.95 plus 50 cents for postage (check or money order) to: Popular Mechanics, Box 1014 (Dept. HCG-A) Radio City, New York, N.Y. 10019 with your name and address.

The remarkable new **SURF SAILER**, a combination paddle boat, sail boat and high performance surfboard by Leon Halfon and Bob Riley is now available in "hot-off-the-press," large, detailed plans with complete step-by-step instructions.

Now you can be envied by your neighbors while amazing your family by building this beauty in only a few weekends . . . for less than \$150 too!

Our editors liked **SURF SAILER** enough to feature it in this issue. Store it on end in your garage . . . it's only 75 pounds. Legally launchable at many public beaches, this unique craft is great for lakes too.

Of combination wood-fiberglass construction, this dynamite performer adds a whole new twist to surfboarding and promises to be the rage of the beach for many years.

To order, send \$9.95 to Popular Mechanics, Box 1014 (Dept. SS-A) Radio City, New York, N.Y. 10019 with your name and address.

SCUBA TOW is so new, it won't appear as a feature in PM until the July issue. If you're one of the smarties that read this column regularly, you have a 30 day jump on your friends and neighbors to build the neatest scuba accessory you'll ever see.

SCUBA TOW by W. Kent Markham of Florida is a self powered sea scooter right out of the pages of James Bond.

Patterned after costly commercial models, **SCUBA TOW** will pull you *on* or *under* the water for hours of effortless snorkeling or scuba diving.

Perfect for above water towing too.

You can build it in a weekend or two for less than \$140 from *full scale* PM plans. Best yet, the plans are only \$7.95 complete with giant size instruction booklet.

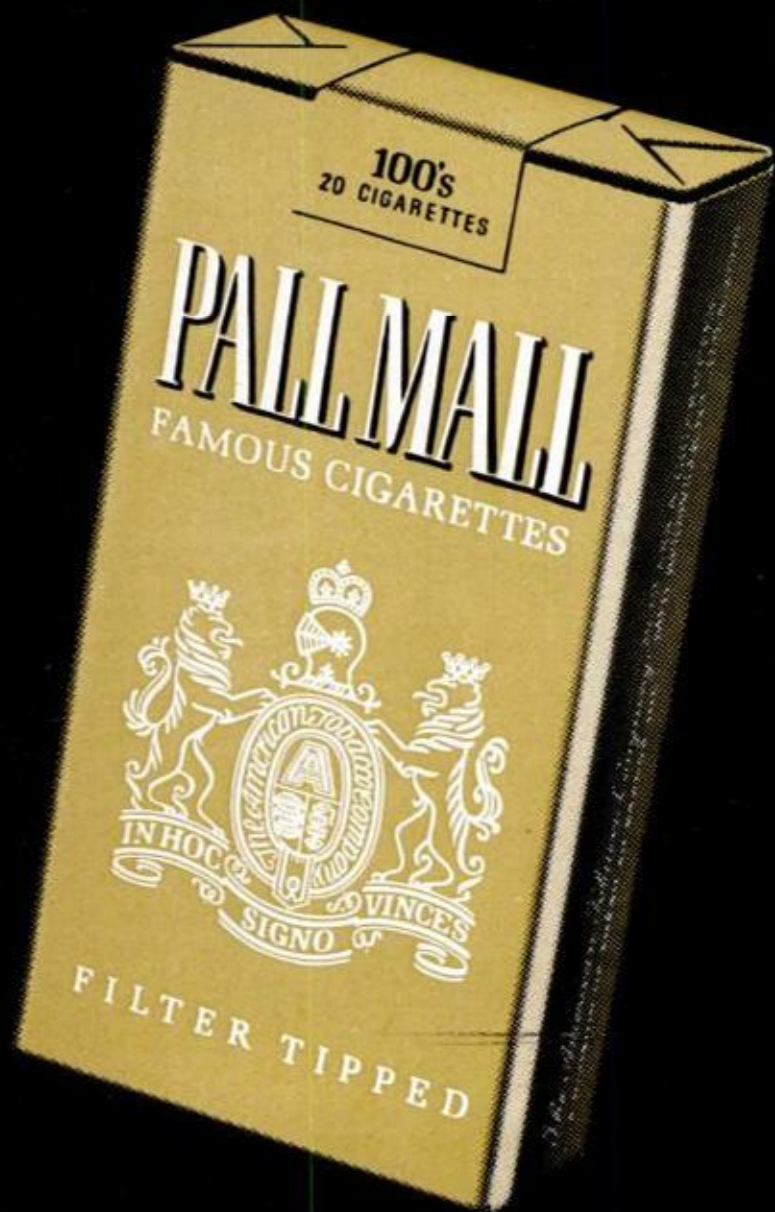
Send for your set *now* before the first printing is sold out to: Popular Mechanics, Box 1014 (Dept. STA), Radio City, New York, N.Y. 10019 with your name and address.

PALL

The longer
filter
that's long
on taste.

PALL MALL GOLD 100's . . .
"tar" 21 mg. — nicotine, 1.5 mg.
Best-selling 70 mm.
"tar" 23 mg. — nicotine, 1.5 mg.
Of all brands, lowest
"tar" 1 mg. — nicotine, 0.1 mg.

MALL GOLD 100's
lower in 'tar'
than the best-selling 70mm.



Warning: The Surgeon General Has Determined
That Cigarette Smoking Is Dangerous to Your Health.

21 mg. "tar," 1.5 mg. nicotine av. per cigarette, FTC Report MARCH '74.

* According to latest
U.S. Government
Report.

PLANS **WORTH WRITING FOR**

A REAL TWO-MAN SUBMARINE! Now you can build your own two-man submarine for scuba expeditions. It's built around a surplus aircraft wing tank. We show a specific tank, but the same principle can be used on any tank available. One man rides in the sub's bubble, the other outside. Parts (except the tank) are available from hardware stores and junkyards. For full packet including plan sheets and booklet, send \$10.00 to Popular Mechanics, Dept. SUB, Box 1014, Radio City, N.Y. 10019.

DUTCH MINI-BARN. Here's the greatest back-yard storage structure ever designed! Even though it's fairly large (10 ft. x 13½ ft.) it looks small, and very attractive. The roof design gives this "barn" 8 ft. of headroom inside. There is more than enough storage room for bicycles, lawn furniture, garden tools and other items that clutter-up your garage. The construction materials were selected for practicality as well as economy. We recommend that you order two sets of plans, one for yourself and one for a building permit. To order plans, send \$3.95 (one set) or \$5.95 (two sets) to Popular Mechanics, Dept. DMA, Box 1014, Radio City, N.Y. 10019. (For any or all of these items, be sure to enclose your name and address.)

BUILD PM'S "BOONIE BUG". This new concept in recreational vehicles combines the best of both worlds: you can take it into the wilderness for a weekend of camping fun, then drive it to work Monday morning. Based on a VW bus chassis, the Bug is easy to convert to off-the-road use, inexpensive to build and—most important—thrifty on fuel. It sleeps two adults with room to spare for one or two youngsters. For large, detailed plans and complete instructions, send \$14.95 to Popular Mechanics, Dept. BBA, Box 1014, Radio City, N.Y. 10019.

**“Finally
to be, doing**



"I'm right where I want exactly what I want to do."

(A TRUE STORY)

"Judy, start packing. We're moving out."

Bill Alfring was so fed up with the hassles of living in Los Angeles, he quit his job on the police force and moved his family up north to logging country.

Bill put a down-payment on a wooded home site along the salmon-filled Sacramento River. He got a job as a car salesman. Then, he started to think what he could do for a living that would give him more freedom.

A business of his own

"Judy, I've always wanted to know how a TV set works," he told his wife. "If I knew that, I could have my own TV shop. And as this town grows, my business would grow too."

So, Bill enrolled in the ICS TV program, kept selling cars, and studied his TV lessons whenever he had free time.

Two years later, Bill Alfring opened the doors of Shasta TV—right in the center of Anderson, California. Business grew rapidly. The shop needed to be enlarged. Today, Bill has two repairmen working for him.

Standing in front of his shop, Bill looks south to San Francisco and L.A. "That's where the people are coming from. It'll take time. But when they get here, my business could be worth ten times as much. I'll just sell out and find a better place to fish."

The right combination for success

Bill Alfring has the right combination for success. He's in a growing field. And he

has good training for it. You could, too.

Especially if you're interested in one of the fast-growing careers where ICS concentrates its training. Like TV Repair & Servicing. Electrician. Engineering. Automotive Mechanic. Drafting. Air Conditioning. Accounting. Business Management. (Check your choice on attached card.)

Ideal way to learn

As an ICS student, you study at home, on your own schedule. You waste no time traveling to and from class. And you never have to miss a paycheck.

But you're never alone. Skilled instructors are always ready to help you.

If you ever have doubts or problems or just want to talk to an instructor, you can call ICS from anywhere. Toll-free.

ICS training works

More than 8,500,000 men and women have turned to ICS for career training in the past 80 years.

Government agencies, unions and some of America's top corporations (including Ford, U.S. Steel, Mobil, Alcoa, GE, Motorola and RCA) use ICS courses in their own training programs.

Free demonstration lesson

If you want your job to give you more (more money, more day-to-day satisfaction, and more future), send for our career guide booklets and free demonstration lesson.

It's your life. Make the most of it.

*Bill Alfring often quits work early to catch a salmon in the Sacramento River that runs through his back yard. (see left)
(Photo: Charles Weckler)*



If card is missing, write for free career booklets to: International Correspondence Schools, Scranton, Pa. 18515. ©1974 ICS.

CAR CLINIC

BY MORT SCHULTZ

Belt off or on?

Would removing the airconditioner compressor drive belt save gas? Would it damage anything?—Marvin Starzak, Woodridge, Ill.

You may save only an infinitesimal amount. As long as the airconditioner is off, the drag on the belt is minimal. The pulley wheel is spinning freely. It's only when you turn on the airconditioner that the built-in clutch engages the compressor and steals power from the engine. Of course, it won't damage anything to remove the belt if it drives nothing except the compressor. However, be sure the belt isn't also used to drive another component, such as the water pump or power-steering pump.

Pumped dry

Why has my 1970 Chevrolet ¾-ton pickup (350-cu.-in. engine) ruined four water pumps in 45,000 miles? So far my Chevy dealer has honored the five-year, 50,000-mile warranty, but that's not the point. Losing a water pump on a camping trip in the middle of the desert in summer is no fun.—Morton H. Brown, Beverly Hills, Calif.

There was a rash of water pump failures until 1971 when Chevy issued technical service bulletin 71-T-37, that describes how to eliminate fan and clutch runout, which has a bearing on water-pump life. I suggest you remind your dealer of this bulletin and have him apply its procedures.

Gauging the trouble

The gas gauge of my 1972 Pontiac Catalina doesn't register. The service center has replaced the gauge three times, but it still doesn't register right. Could the trouble be in the gas tank?—William O. Saunders, Neffs, Ohio

Where else? The sending unit in the fuel tank consists of a float and resistor. As the float rises or lowers with the fuel level,

the resistor varies the resistance for electric current to flow through the tank unit and the amount of current flowing through the fuel gauge on the dash. If the problem isn't the dash gauge, as it obviously isn't, it has to be the float or resistor (or in the wiring between tank and dash gas gauge). I'll bet on the resistor, but it doesn't really matter since the float and resistor are a combined unit. Replacing one means that you also replace the other.

A stitch in time

Recently I attempted to tune up my 1970 Volkswagen 1300 sedan. According to VW specs, correct idle speed is 850 rpm and timing should be set at 0°. Having made these adjustments, I get such a high idle that severe dieseling results. Can you provide me and other VW owners with the correct procedure for setting idle and timing this car?—L. William McIntosh, Chalfont, Pa.

This proves that timing an ignition system involves more than just hooking up a couple of meters. Timing must be done meticulously and in a proven sequence, as follows:

1. Allow the engine to warm up for at least 15 minutes. Shut it off. Connect a tachometer and stroboscopic timing light as instructed in the directions accompanying the instruments. If you have trouble connecting the timing light to the sparkplug connector, connect it instead to the No. 1 cylinder wire at the distributor.

2. Coat the 0° mark on the crankshaft pulley with chalk or white paint to make it stand out. With a 10-mm socket wrench and extension loosen, but do not remove, the nut securing the distributor.

3. Start the engine and set idle speed to 800-900 rpm (900-1000 rpm if the car's equipped with automatic stick shift).

Note: Be sure you are working with the

(Please turn to page 24)

If you think you have to be towing your trailer to enjoy it...



Choose one of many nearby retreats and check into a Holiday Rambler

Holiday Rambler is a joy to live with. The aerodynamic 1974's are thrifty on the road, but you really can't begin to enjoy one till you park it somewhere.

So park it someplace pretty, close to home. Partake in the local campground fun. Let a little sunshine rub off on you and the kids. Take it easy. The comforts and unsurpassed luxuries of your Holiday Rambler help make trailering the joy it should be. Our exclusive Consumer Ser-

vice and Adjustment Plan will help keep your Holiday Rambler the trailer it should be.



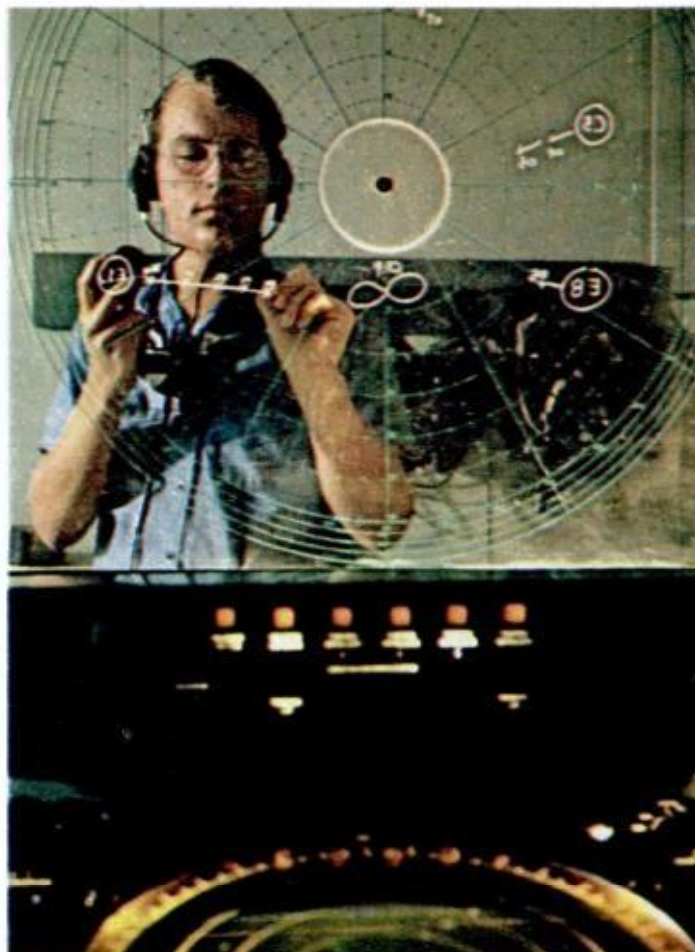
Reasons enough for you to take the RV you can't live with to one of our 300 Holiday Rambler sales and service dealerships. Trade up. Check into a Holiday Rambler, and discover joy with All America's Family Retreat. Write:

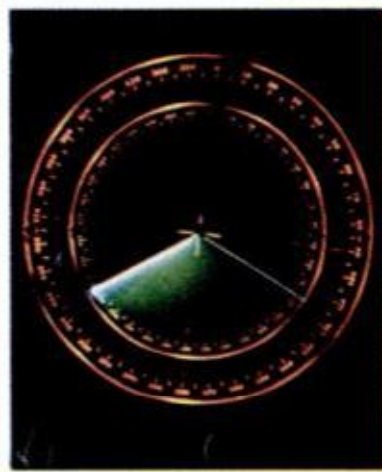
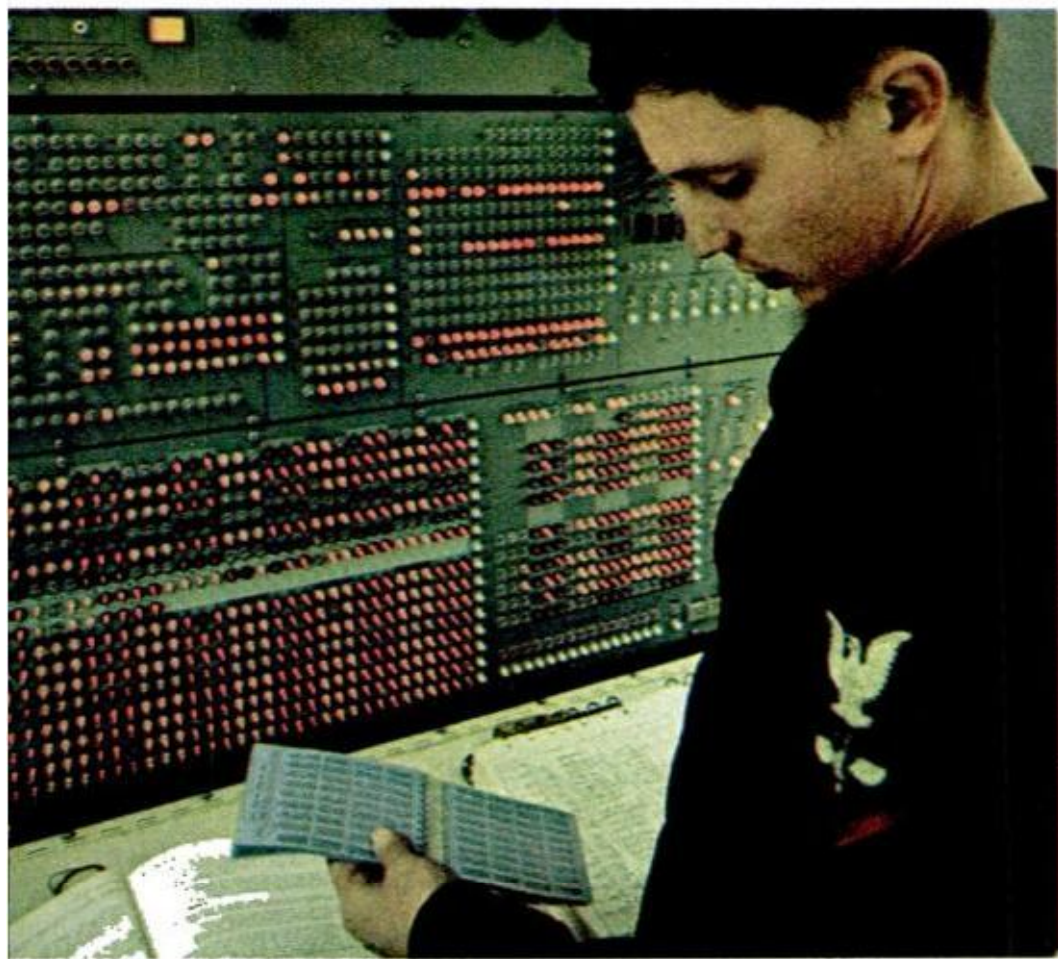
HOLIDAY RAMBLER CORPORATION
State Road 19
Wakarusa, Indiana 46573

The STRIBAND design is the trademark of Holiday Rambler Corporation



**The
\$17,000 question.
Can you meet
the challenge?**





\$17,000. That's about what it costs us to train you in the Navy's Advanced Electronics or Nuclear Power Programs. But the value of that training to you ... who can say?

It will enable you to operate and maintain the most advanced electronic systems or nuclear power plants. Skills that, in this nuclear age, should point you toward a fulfilling career. In the Navy or later on.

To qualify, you need a high school diploma and a good head, as well as good hands and a real desire to stick with thorough and sophisticated training. And a willingness to do your share of the housekeeping chores.

So the answer to the \$17,000 question is really up to you. Think you can meet the challenge? Talk to your local Navy Recruiter. Call us anytime (toll-free). 800-841-8000. Or mail the coupon at the right.

569

TO: U.S. Navy, Captain Robert W. Watkins
NAVY OPPORTUNITY INFORMATION CENTER
 P.O. Box 2000, Pelham Manor, N.Y. 10803

Please send me more information on: Advanced Electronics Program
 Nuclear Power Program Other Navy career opportunities.
 Or call 800-841-8000 toll-free (anytime, any day). In Georgia, call 800-342-5855. Call collect: in Alaska—272-9133, in Hawaii—533-1871.

Name _____ Date of Birth _____
 (Please print) _____
 Address _____ Phone _____
 City _____ State _____ Zip _____

Be someone special. Join the Navy.

CAR CLINIC

(Continued from page 20)

right specs (I'm giving those for Mr. McIntosh's car) by consulting your owner's manual or the label on the left side of the fan housing, or ask a VW dealer.

4. Idle speed is set by turning the bypass air screw on the carburetor. Make sure you make adjustments using the bypass air screw, and not the throttle stop screw (which will cause the problem Mr. McIntosh describes). If you can't get the engine to idle at spec, then it's a sure indication that timing is out of whack.

5. Aim the timing light at the mark and the split in the crankcase. Timing is correct if the mark on the pulley is in line with the split. If the mark is not in line with the split, rotate the distributor to the right or left until the mark and the crankcase split do line up.

6. Recheck idle speed with the tach. If it doesn't fall within spec, readjust the bypass air screw. Check and readjust timing once more if necessary.

7. Now, pull the green (vacuum) hose off the distributor. The mark on the pulley should move 19/32 to 23/32 inch to the left. If it doesn't, the vacuum advance needs attention.

8. Shut off the engine and retighten the nut on the distributor clamp. Push the green hose back on the distributor. Start the engine and recheck timing just to make sure.

Vibrating Volvo

I just finished replacing the clutch disc and pilot bearing on a 1965 Volvo 122S. This became necessary because I failed to grease the pilot bearing when I replaced the entire clutch assembly last year. I now find a slight vibration in the drive train. The only reason for its existence that I can think of is that I didn't mark the position of the pressure plate in reference to the flywheel. What do you think?—F. Eugene Lueg, Ruston, La.

I don't think marking the pressure plate has anything to do with the vibration. The pressure plate can only be connected one way—the way in which its holes and those of the flywheel line up.

I think that either the front and rear universal joints do not line up, or that a bad universal joint is causing the vibration. When you replaced the clutch disc and pilot bearing, you had to drop the front half of this two-piece driveshaft. The two shafts are splined together with a slip yoke, making it easy to have misconnected them. This could cause the vibration.

Regarding the possibility of a bad U-joint, examine all three joints closely. Brownish deposits or rust powder around a joint indicates failure. Also disconnect each joint and test it for flexibility. A stiff joint is a bad joint. Get rid of it.

Company cooperation

I read your article, Obstinate Opel (page 49, Nov. '73 PM), in which you say to write Buick to get a list of modifications that can be applied to solve Opel's poor carburetion. I wrote immediately, but the response from Buick (see enclosed) was less than helpful. —Dave Otewalt, San Jose, Calif.

Buick is doing right by you. By telling you to consult your Buick dealer's service manager, it points the way for you to solve the problem. Note that a carbon copy was sent to the regional Buick office in Burlingame, Calif., which has the responsibility of following this up to make sure your problem is cleared up. If you need further help, get in touch with that office.

SERVICE TIPS

□ **Water in the luggage compartment** of 1974 Ford Torinos, and Mercury Montegos and Cougars, could be entering around the taillamp lenses. Leakage can be halted by applying caulking cord, liquid butyl and paintable plastic sealer. This is warranty repair, so refer your dealer to technical service bulletin 59 (12/21/73), page 7.

□ **Fuel filler caps** of 1973 Plymouth Valiants and Dodge Darts and Challengers have been hard to remove and install. Chrysler Corporation advises lubricating the rubber gasket with Mopar Sil-Glyde, which your dealer has in four-ounce tubes (part No. 1881923) or 16-ounce aerosol cans part No. 1881924). Pull the gasket away from the cap enough to expose the underside of the gasket. Apply a liberal amount of lubricant on the entire undersurface. ★★ ★

GOT A PROBLEM WITH YOUR CAR? Ask Mort about it. Send your question to Car Clinic, Popular Mechanics, 224 West 57th St., New York, N.Y. 10019. Letters cannot be answered individually, but problems of general interest will be published in the column.



**The Gas-Saving Marina.
Some family car. From some family of cars.**



The Marina has a gas-saving, single carburetor version of our MGB engine, proven reliable in over 2 billion miles of driving. Great for economy—over 20 miles per gallon.



The Marina has positive rack and pinion steering like our Jaguar's. Great for responsive handling.



The Marina has a rugged transmission and fade-resistant disc brakes like our Triumph's. Great for driving satisfaction.



The Marina has a tough body-shell with an unusually high degree of torsional stiffness—stiffer, in fact, than that of our rugged Land Rover.

For the name of your nearest Austin Marina Dealer, dial (800) 447-4700. In Illinois, (800) 322-4400. Toll free.

*Manufacturer's suggested retail price P.O.E. Does not include inland transportation, local taxes and preparation charges. British Leyland Motors Inc., Leonia, New Jersey 07605.

Austin Marina. \$2,899*
The tough economy car from British Leyland.



THE BICYCLE SHOP

BY EUGENE A. SLOANE

Bicycling can be easy if you have the proper gear ratios that make it easy to climb even steep hills, but it's hard work if you have close ratio gears. As we discussed last month, the problem arises with the better bicycle, in that strange as it may seem, the more you pay for a bike, the closer gear ratios it is likely to come with. That's because fine bicycles have up till now seldom been bought by tourist cyclists, but have instead been made for and bought by racing cyclists. Which explains why that \$350 bicycle is so hard to pump uphill. American-made bicycles are made for more general use, as are the less expensive European and Japanese bikes, so they will have somewhat wider range gearing.

I suggest, at this point, you review last month's *Bicycle Shop*, (page 21) on gear ratios and pedaling cadence. Now that you understand all about gear ratios, let's get down to the specifics of changing over your gears to a set that will give you a ratio selection for whatever you're likely to have to cope with: type of road grade, wind velocity and direction and your own physical condition of the moment.

Your first approach in changing gearing is to change over the rear freewheel entirely, or to change individual cogs on that freewheel, to cogs of a wider ratio. The second approach, if you still don't have the gear ratio you want (see last month's *Bicycle Shop*) with the new freewheel or freewheel cogs, is to install smaller front chainwheels or convert to a triple front chainwheel set. This month we will tell you how to change freewheels and freewheel cogs. Next month we will discuss changing freewheel cogs, chainwheels and converting from double to triple chainwheels.

Which freewheel. There are a number of good freewheels on the market, made by Shimano, Maeda, Regina, Maillard/Atom, Cyclo, T.D.C., Zeus, Milremo and Simplex, to name a few. Each has its upper gear range limits. You can only get really wide gearing with the Shimano or Maeda because



Gear-ratio comparison: Top left is wide-ratio Shimano 14-34-tooth freewheel. Top right: medium-high-ratio Maeda 14-28-tooth freewheel. Lower left: Cyclo medium-low-ratio freewheel, 14-21 teeth. Lower right: Regina six-speed, low-ratio cluster with 13 to 19 teeth.

these freewheels go up to 34 teeth. Regina goes to 31, T.D.C. to only 24, Milremo to 30, Simplex to 28 and Zeus to 30. A good view of comparative gearing is shown in the photo above, which compares low, medium and wide-range freewheel gear clusters.

Before you select a freewheel, or buy one, make sure you know what threads are on your rear hub (photo below). Hubs are threaded differently depending on where the

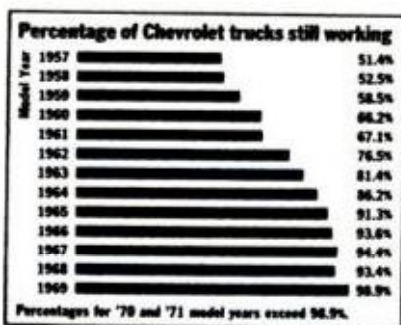


Finer hubs are made of aluminum alloy (much softer than steel), so hub threads on freewheel shoulder (at right) are aluminum and easily stripped. Take great care in threading on a freewheel that has steel threads; it's easy to damage the threads in the hub.

(Please turn to page 28)

CHEVY CHEYENNE

Where truck value is a matter of fact.



Fact: Over half of our 15-year-old trucks are still on the job.

Long, dependable service can tell you a lot about truck value and economy. So we checked the record books as far back as 1957. As the chart shows, 51.4% of our 15-year-old trucks were still in service on July 1, 1972.

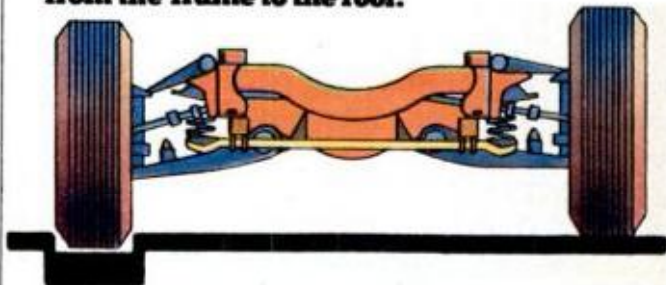
Fact: Year in and year out there are more Chevy trucks in use than any other make.

The actual number of trucks in use is another indication of truck value. And according to R. L. Polk and Co. official industry statistics, there are more Chevy trucks in use than any other make. Year in and year out.

Fact: Chevy light-duty trucks have traditionally high resale value.

Another way to measure truck value is by what they're worth when you're ready to make a trade. And according to Automotive Market Reports, an authoritative industry source, Chevy light-duty truck resale value is traditionally high when compared to other makes.

Fact: Chevy trucks are built tough from the frame to the roof.



Massive Girder Beam front suspension.

It's designed to withstand a life of hard knocks. Tough steel control arms with friction-free coil springs flex freely up and down, allowing front wheels to step independently over the rough spots. Multi-leaf rear springs are balanced to the front suspension.

Double-wall construction.

We build two walls of protection in pickup box, doors, hood, front fenders, even in the roof.

Computer-matched braking systems.

Complete brake systems are computer-matched to pickup size and capacity. Heavier duty trucks get heavier duty brakes.



Lasting Chevy Value

THE BICYCLE SHOP

(Continued from page 26)

hub was made, or what the bikemaker ordered. Most hubs on bicycles made in this country, or imported into this country, are threaded 1.370 inches x 24 threads per inch (TPI), the metric equivalent of which is 34.7 mm x 1. Hubs, however, may also be threaded 35 mm x 24. Better hubs are machined from aluminum alloy, with alloy threads that can be easily ruined by trying to thread on a steel freewheel with different threads (or easily stripped by threading on a freewheel the wrong way, inaccurately).

As we discussed last month, I prefer a rear freewheel with cogs of 14, 17, 22, 28 and 34 teeth for a truly wide-ratio gear cluster. I do a lot of touring over very hilly country, carrying about 20 to 25 pounds of equipment. My bike alone weighs 23 pounds. With carriers and equipment it weighs around 48 to 50 pounds and with me it totals about 210 pounds, which is a lot of weight to shove up steep grades. You can get this set of gears with either a Shimano or Maeda freewheel, or change cogs on these freewheel bodies to something close to that selection of cogs. I prefer the Shimano alternate tooth design (photo below) because every other tooth is missing on the 28 and 34-tooth cogs. This design makes it easier to



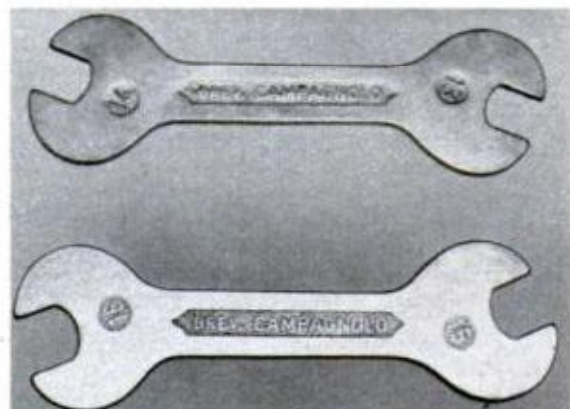
Shimano alternate-tooth design (left) is a 34-tooth freewheel gear with every other tooth missing. This makes it easier for the chain to climb up onto the big gear at the extreme angle it has to assume. To its right is a conventional 34-tooth freewheel gear in nonalternate design. Note that the Shimano gear is cut out to save weight.

shift to these big gears. The chain is at a very extreme angle as it approaches these two gears, and it is easy to get it "hung up" at this angle, especially if you try to shift under power on a steep hill climb. The result of this hang-up can be a locked wheel, loss of control and possibly an accident. Now let's change freewheels.

Tools you will need. Each make of freewheel requires its own removing tool (next photo). And, depending on freewheel make,



Typical freewheel tools. Top left: Maillard/Atom grooved freewheel and new Phil Wood tool that fits over hub locknut so you don't have to remove this nut. Top right: Cyclo with slotted tool. Bottom left: Shimano grooved freewheel and tool. Bottom right: Maillard/Atom freewheel with large opening and matching tool—which also eliminates need to remove locknut to insert tool. If all units had Atom's larger opening, life would be easier for bike freaks.



Thin cone wrenches are used for removing hub axle locknuts and cone nuts. Depending on hub, you'll need a 14, 15, 16 and 17-mm wrench set. Two wrenches are needed, one to hold the cone nut while you're loosening or tightening the locknut, the other to hold locknut.

removal procedures vary somewhat, as noted below. Besides the freewheel remover, you will also need a set of cone wrenches (photo above) for most of the freewheels, to remove locknut and spacer washers on freewheel side of the hub so you can install the freewheel removing tool. You will also need a good machinist's vise with copper or hard-wood-covered jaws.

Steps in removing freewheels

Freewheel removal procedures vary slightly, depending on make of freewheel, so I will discuss those with grooved or splined holes first, then those with slotted openings which receive the removing tool. Shimano and Maillard/Atom have splined openings and matching splined removers.

(Please turn to page 30)

Announcing the new Datsun 710. The driving man's economy car.

Between the most economical Datsun, the B-210, and the most luxurious Datsun, the 610, there's something new: The Datsun 710 2-Door Sedan, 4-Door Sedan and Hardtop.

An 1800cc overhead cam engine, power-assist front disc brakes and unibody construction balance the performance of the new 710's.

Graceful new lines, whitewall tires and wheelcovers make it handsome.

Rich carpeting, reclining bucket seats, tinted glass, electric rear window defogger and a lot of other no-cost extras make it luxurious.

And, of course, the gasoline mileage is the kind you'd expect from Datsun. In fact, our reputation is built on economy!

Before you make up your mind, drive a Datsun... then decide.

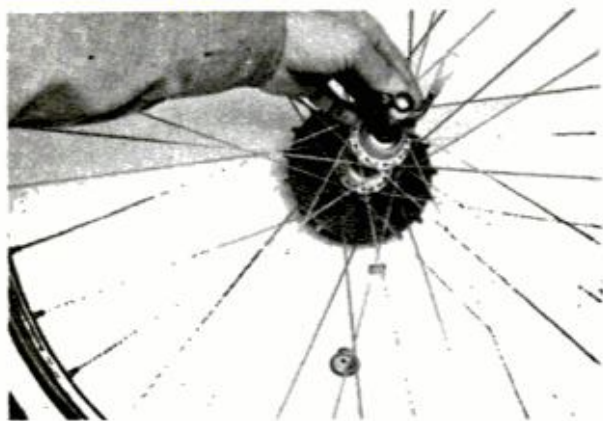
 **Datsun**
Saves



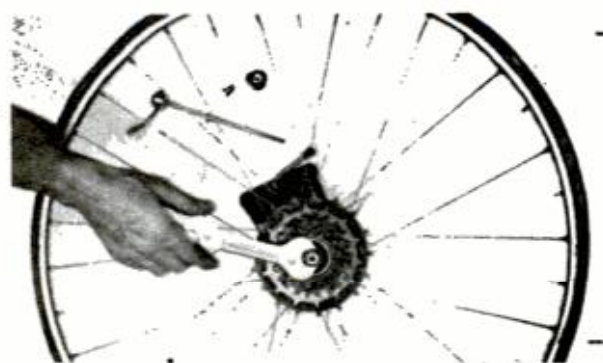
DATSUN

THE BICYCLE SHOP

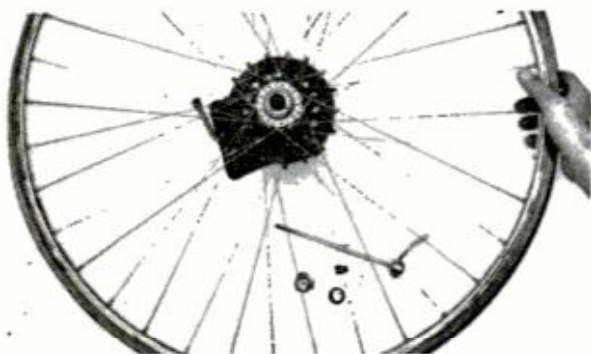
(Continued from page 28)



Step 1: Remove rear wheel and quick-release skewer (photo). Be sure to catch the two little springs on the skewer. They go back with small end toward hub.



Step 2: Inspect freewheel side of hub axle. You will note that hub locknut and spacing washers prevent you from inserting removal tool. If you can, with opposite axle locknut held in copper-jawed (or wood-protected) vise jaws, use a thin cone wrench to remove locknut. However, if locknut is on so tight that the entire axle turns in the opposite locknut (the one held by the vise) you will have to disassemble the entire hub, in which case refer to the April '72 *Bicycle Shop* (page 31) for hub disassembly instructions, or to the section on hub maintenance in my book, *The Complete Book of Bicycling*. If you're lucky, the cone locknut will be on loose enough so it can be turned without turning the locknut on the opposite side of the hub. If you can't grip the locknut with a cone wrench because the nut flats are buried too deeply in the freewheel opening, try a lock jaw set of pliers, preferably with curved jaws.



Step 3: Insert the freewheel removing tool in a vise, and put the freewheel on the tool. Twist the wheel counterclockwise to remove the freewheel. Once you have broken the "set" of the freewheel from hub threads, you should remove the wheel from the freewheel tool, the tool from the vise, and, turning the

wheel over, use the tool by hand to free the freewheel of remaining threads. As you approach the last threads be careful to support the freewheel so it does not mar the softer hub aluminum alloy threads. Now you are ready to install a new freewheel, and to do so just thread it on, clockwise, by hand, very carefully so as not to start it cross threaded on the hub. Lube hub threads with light oil first. Don't worry about getting the freewheel on tight, your first ride will take care of that.

The steps below apply only to nonsplined freewheels such as Regina, Cyclo and Maeda.

Step A: With quick-release skewer removed, and, if necessary, freewheel side hub locknut and washers removed, insert freewheel remover in freewheel. Then insert quick-release skewer in axle and lock down on removing tool.



Step B: Turn the wheel over, lock the tool in a vise, twist the wheel counterclockwise till the freewheel "set" is broken (about $\frac{1}{8}$ turn), remove the wheel from the vise, remove the quick-release skewer, thread off the freewheel with the tool by hand, or use wrench on the tool the rest of the way. Note: Some freewheels are wider than others, which means that on the small gear the chain may scrape on the chain stay. If this happens you will have to add a spacing washer to the right axle (freewheel side) to move the hub to the left for the needed clearance between small freewheel gear and chainstay. You will also have to readjust hub cones to "steal" space from the left side so there is enough axle showing on the right side for safe holding in dropouts.

For example, here are some freewheel widths: Maillard/Atom 14-24 teeth, 26.4 mm; Regina 13-31 teeth, 24.7 mm; Cyclo 14-21 teeth, 25.85 mm; Maillard/Atom 14-28 teeth, 25.2 mm; Maeda 14-26 teeth, 26.1 mm; Shimano 14-34 teeth, 27.3 mm, and Regina six-speed 13-19 teeth, 31.4 mm. (You can, of course, also change to close-ratio freewheel for road racing).

You will also have to "redish" the rear wheel so the rim is centered between the new locknut-to-locknut dimension, now that this dimension has been changed by adding a $\frac{1}{32}$ -inch to $\frac{1}{8}$ -inch spacing washer on the right. See the April '73 *Bicycle Shop* (page 40) for wheel dishing instructions. ★ ★ ★

Next month we will discuss cog change and chain-wheel change as well in Part 3 of the series, How to Gear Down for Easier Pedaling.



"Paving the Way"

The end of the road can be the start of your fun.

Provided that you started out on a dual-purpose motorcycle, such as one of the six intrepid Kawasaki enduro machines.

An enduro bike is generally thought to have two purposes. Riding on the road, and off the road as well. But we probably don't have to tell you that such a motorcycle will serve about as

many purposes as you want it to.

From getting you to a place where the fish are still biting to getting you home from work while supper is still warm. From running errands around town to riding to places you didn't know existed.

And when it comes to getting the job done, Kawasaki is paving the way for others to follow with endurable enduros indeed. Beginning with a small machine that's ideal for beginners. And ranging through a variety of sizes

up to a big 350, wherein beats the heart of a true mountaineer.

All with an impressive array of features that make them equally worthy of both street and trail.

The better to pave your way to many an exciting moment.

Kawasaki
lets the good times roll.

DODGE ANNOUNCES RAMCHARGER.



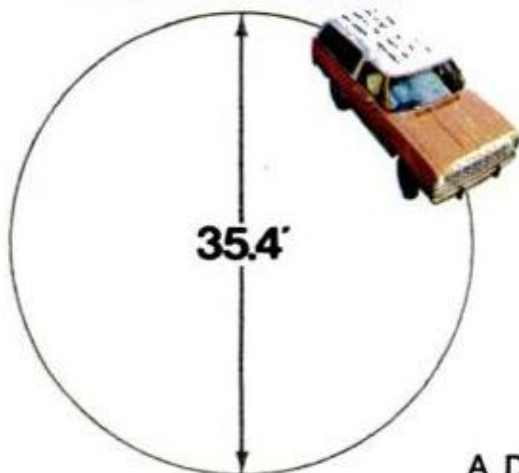
 CHRYSLER
MOTORS CORPORATION

RAMCHARGER ANNOUNCES:

FULL-TIME FOUR-WHEEL DRIVE Ramcharger was built especially for people who like to get off the beaten track. It has a frisky four-wheel drive that will keep you going when the going gets rough—in rain, snow, or mud. And "full time" means you don't have to shift in and out of four-wheel drive or get out to lock or unlock the front wheel hubs.



SHORT TURNING DIAMETER With a turning diameter of 35.4 feet, Ramcharger gives you the kind of maneuverability you need—especially on those back country roads that are Ramcharger's natural element.



CONSOLE ICE CHEST

If you opt for Ramcharger's deluxe interior, you get an insulated cooler right in the console. Just pack it with ice and a few cans of your favorite beverage. It's an exclusive.

REMOVABLE STEEL ROOF

Ramcharger's optional steel roof seals out wind-noise and rain. And because it is double-wall steel instead of fiber glass, it gives you even greater protection. (A soft canvas top is also available.)



OPTIONAL AUTOMATIC SPEED CONTROL

On stretches of open road, you can let Ramcharger take over. Just accelerate to the desired speed, set the control, and take your foot off the accelerator. Ramcharger does the rest. You can always accelerate for passing or take over again by braking or switching off the control.



AND MORE The options go on and on: An easy-to-operate lift gate. (It comes with the optional steel roof.) Two towing packages. An outside spare tire mount. An extra-large fuel tank. Heavy-duty springs. Air conditioning. Automatic transmission. Power steering. Roll bar. Skid plates. Tires ranging up to 10.00-15/B. And a choice of four different engines from the 318 V8 to the powerful 440 V8—all with standard Electronic Ignition.

EXTRA CARE IN ENGINEERING MAKES
A DIFFERENCE IN DODGE...DEPEND ON IT.



APPLIANCE CLINIC

BY PAUL MANN

MACAP can do

Jason C. Annis, an assistant professor at Kansas State University and member of the MACAP panel, thinks it's time for me to repeat some information we published about two years ago. I agree.

MACAP stands for Major Appliance Consumer Action Panel. It's an industry-sponsored but independent group that acts as mediator between consumer and manufacturer in disputes involving dehumidifiers, dishwashers, freezers, garbage disposers, gas incinerators, humidifiers, home laundry equipment, ranges, refrigerators, room air-conditioners and water heaters.

If a problem arises that you can't resolve with the dealer from whom you bought the appliance, or with the service agent he recommends, write or call the manufacturer first, giving full details. Then, if you aren't satisfied with the action taken by the manufacturer, write MACAP or call collect. Its address is 20 North Wacker Dr., Chicago, Ill. 60606; the phone number is (312) 236-3165. MACAP will study the problem and make its recommendation for a solution. Most people who contact MACAP are pleased with the results.

In presenting your problem, either to the appliance manufacturer or to MACAP, you'll make things happen faster if you provide this information: your name, address and phone number; type of appliance, brand, model and serial numbers; the dealer's name and address; service agent's name and address if different from dealer; location of appliance, and a clear description of the problem.

Two ways to stop a squeak

Our Frigidaire refrigerator (FPD 121TN) has operated satisfactorily since we bought it in 1969, but now has developed an intermittent squeak. I've discovered that the noise occurs during the frost-free cycle and is caused by the motor of the small air-circulating fan located in the inner wall in

the freezing compartment. I assume the bearings of the motor have gone dry. Being a do-it-yourselfer who knows how to get the fan out of the wall, I'm wondering if you can tell me if these bearings can be lubricated and, if so, how?—W.A. Schneider, Claremont, Calif.

There are two ways to go: (1) Remove the motor, take it apart and replace the old "nonlubricated" rotor with a new rotor that has prelubricated bearings. It can be ordered from a Frigidaire dealer—part No. 6599392. (2) Remove the motor, take it apart and oil the rotor with a few drops of household lightweight machine oil. The job may have to be done again in a few years.

Cooling those back rooms

I have some advice for your readers which is prompted by your reply in an earlier column to a man whose three-ton, central cooling system didn't adequately cool distant rooms. He complained his unit was recharged several times and inspected by several servicemen without an increase in efficiency. Tell him and others having the same problem to go into the attic and check each duct for a damper. If there is a damper, make sure that it is open. We were uncomfortable in the back bedroom area for several months after buying our house until I found a damper that was partially closed. Now we get all the cold air we need.—J. A. Dalton, Houston

Many thanks for a good tip. For more, see *How to Keep Cool—for Less Money*, on page 116, this issue.

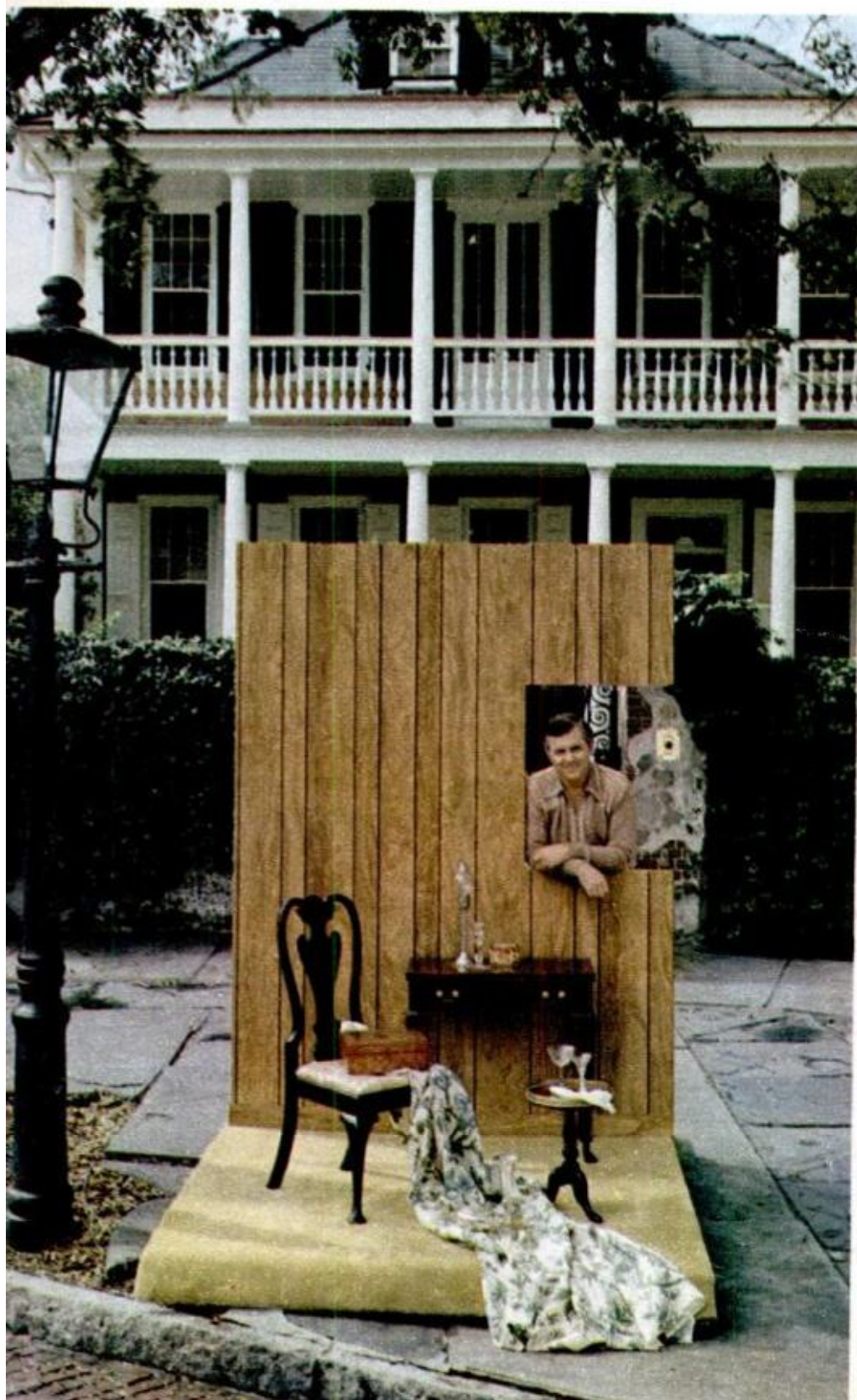
No exorcist needed

I have a fairly new, but temperamental rotary mower. It is powered by a Model V-47 Power Products Series 600 two-cycle engine that starts perfectly and runs smoothly. However, if you shut off the en-

(Please turn to page 36)

**"If old mellowed wood is
what you'd love to have,
move into this 1743 landmark.
There's a better way. Without the movers."**

—Wally Bruner, Star of "Wally's Workshop" TV Show



"Something happens to fine wood after it's been on a wall for a couple of centuries. It gets an inner glow. A luster. A patina. Trouble is, there are only a few places—like the George Eveleigh House in Charleston, South Carolina, where you can find paneling like that.

"But you can get Constitution™, a new printed wall paneling, in three wood tones, from The Paneling People.

"They found a way to reproduce that mellow, authentic wood-grained look to make it feel like it's been polished and buffed by generations of loving hands.

"You can panel a 10' x 15' room with Constitution panels measuring 4' x 8' x 5/32" for about \$100.* And build heritage right into your home. Check the Yellow Pages under 'Paneling' for the U.S. Plywood dealer nearest you.

"If you can saw, measure and hammer, you can do it yourself. The Paneling People even have a book that tells you how.

"It's called 'All About Wall Paneling' and all you've got to do to get it is send your name and address and 50¢ to U.S. Plywood, Dept. PM6, P.O. Box 61, New York, N. Y. 10046."

The Paneling People



U.S. Plywood

 **U.S. Plywood**
Division of Champion International

**Based on mfg'r's suggested retail price.*

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



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

Just Mail Coupon—No Salesman Will Call

BELSAW SHARP-ALL CO., Stan Field, Pres.
715H Field Bldg., Kansas City, Mo. 64111

Name _____

Address _____

City _____ State _____ Zip _____

FREE
BOOK

MAKE BIG MONEY IN EITHER OF THESE TWO FIELDS



TRACTOR-TRAILER DRIVER

We can train you to operate the big diesel rigs. Study at home followed by practical training at school-owned facilities in Miami, Fla. Accredited Member NHSC. Home Office—Miami, Fla.

APPROVED FOR VETERANS AND INSERVICE PERSONNEL

HEAVY EQUIPMENT OPERATOR

Learn to operate cranes, draglines, scrapers, clamshells, bulldozers, backhoes, trenchers. Study at home followed by practical training at school-owned facilities in Miami, Fla. Accredited Member NHSC. Home Office—Miami, Fla.



UNIVERSAL TRAINING SERVICE, Dept. PM
1901 N.W. 7 St., Miami, Fla. 33125 • Phone: (305) 642-0800

- TRACTOR-TRAILER DRIVER
 HEAVY EQUIPMENT OPERATOR

PLEASE PRINT

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____ Age _____

APPLIANCE CLINIC

Continued from page 34)

gine when it's warmed up, you can't get it to start again unless you let it cool down or remove the sparkplug and reinstall it. The engine isn't overheating, always shows good spark and fuel supply, and the plug is brand new. I even tried different brands of sparkplugs. Occultism?—C.A. Fleckenstein, Belleville, Ill.

No, bindism. If my theory is right, there is a misfitting part inside the engine that expands as heat builds up and is causing a bind that prevents starting. When you remove the sparkplug, you are reducing internal pressure just enough to relieve tension. The problem may lie with a misfitted connecting rod. In any case, I think the engine has to be disassembled and checked against factory tolerances. If I'm correct in assuming that you've had the problem since you bought the mower, I think a letter to Tecumseh explaining the situation should bring results.

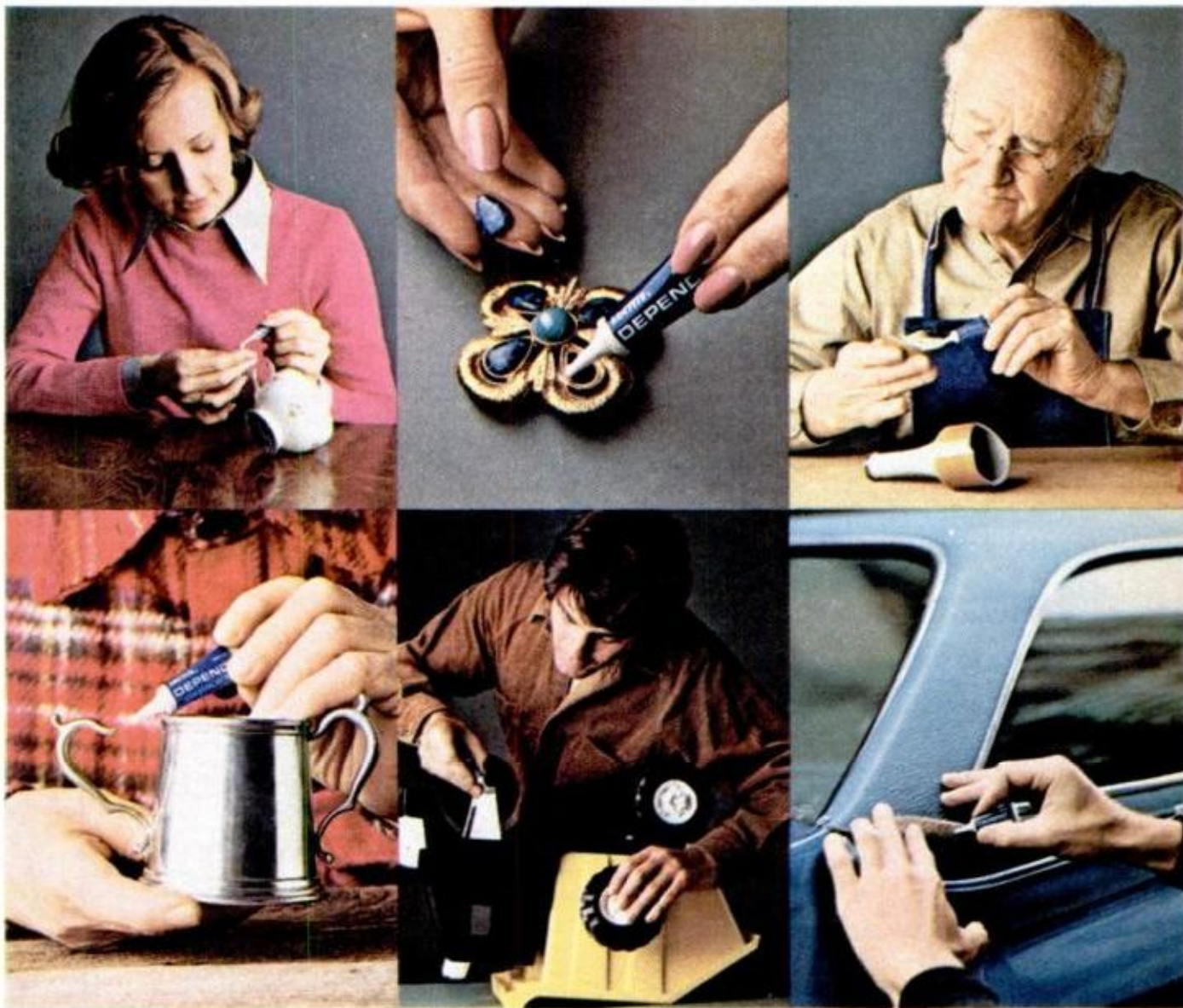
For additional information on two-cycle engines, watch for *How to Keep Your Power Mower Purring* in next month's *PM*.

Dishwasher care in closed home

We have a dishwasher in our country home. The house is closed during the winter. When we open it in the spring and use the dishwasher, it makes noise and leaks. We have had the unit repaired several times and have had the pump assembly replaced, but our serviceman can't tell us how to protect the appliance over the winter. Please help.—A. Mendelsohn, Brooklyn, N.Y.

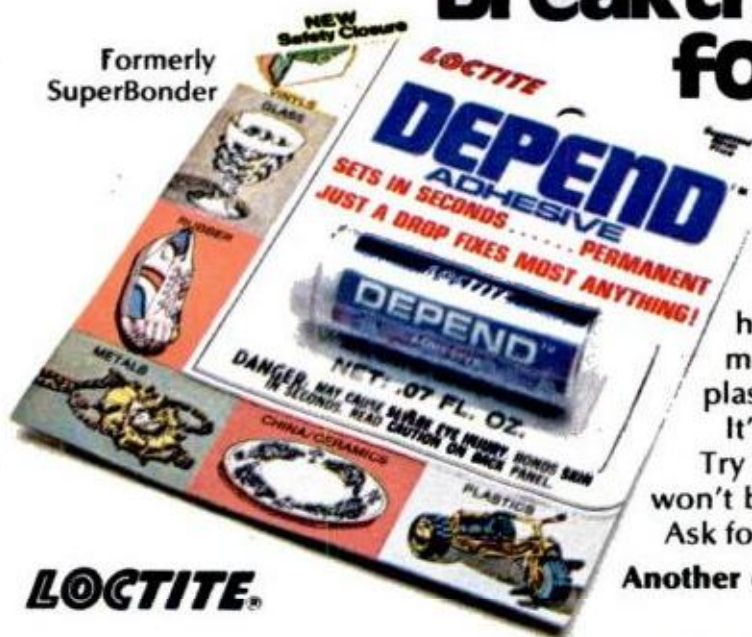
I think that water remaining in the pump assembly over the winter is probably freezing. The expanding ice destroys pump gaskets, causing leaks and noise when you start the machine. Next time you close the house for the winter, pour a little automotive antifreeze into the dishwasher. It will drain into the pump and keep water there from freezing. In the spring, place baking soda in the detergent cup and run the machine through a couple of cycles. This should put a stop to your repair bills. ★★★

If you have a question about any appliance, send it to Appliance Clinic, Popular Mechanics, 224 West 57th St., New York, N.Y. 10019. Sorry, but letters cannot be answered individually. Problems of wide interest will be answered in this column.



Breakthrough for bad breaks.

Formerly
SuperBonder



Now you can use the same incredibly strong adhesive that industry has used for years: Loctite Depend Adhesive.

In less than 30 seconds, Depend Adhesive invisibly bonds most non-porous materials like metal, porcelain, ceramic, plastic, leather, even glass. Permanently. It'll even hold two *different* materials.

Try it. Our money-back guarantee says you won't be let down.

Ask for Depend wherever adhesives are sold.

Another quality product from Loctite Corp.

LOCTITE

New Loctite Depend Adhesive

T.M. LOCTITE CORP.

Loctite Corporation, Newington, CT. 06111

Introducing Ford's SuperCab

...the pickup cab roomy enough for a back seat.

Now you can have a 2-door pickup that seats a family of six! Ford's new SuperCab makes a big difference in capacity—for people or things • The rear cab floor measures 5½ ft. wide and over 2 ft. front to back. Protected, lockable space behind the front seat totals 44 cu. ft. • SuperCab gives you a choice of rear seats. Pick Ford's exclusive full-width foam seat that folds flat for cargo. Or facing jump seats that fold up • SuperCab pickups come with 6¾ or 8-ft. box. Front disc brakes. Tailored carlike interiors. Famous Twin-I-Beam front suspension. Try a new SuperCab pickup at your Ford Dealer's... a real family pickup.



3 ways you can use Ford's extra room.



Foam-padded rear seat (optional) folds down to make a flat floor for cargo.



Jump seats (optional) have foam-padded cushion and back, fold out of the way.



The big 44-cu. ft. cargo space is easy to reach from either side of the front seat.





New 2-door SuperCab adds 44 cu. ft. of extra space • GVW's up to 9,300 lbs. provide for heavy loads like slide-in campers • Double-walled quarter panels toughen cab construction • Fuel tank and optional auxiliary tank are both located *outside* the cab, between the frame rails • Large rear side windows are standard; flip-open feature optional • Choice of economical Six or three V-8's. Try Ford's new quiet SuperCab now.

**Works like a truck.
Rides like a car.**

FORD PICKUPS

FORD DIVISION



DETROIT LISTENING POST

Late kickoff for '75 cars

The new cars may be later than usual this year. The auto companies are reluctant to pin down dates when the '75s will be introduced until they can get out from under the pile-up of unsold big cars. There's no point in bringing out the new stuff if you can't sell the old. Many dealers have enough big cars in stock now that they won't have to reorder until August or September.

It's not only the '74 cars Detroit is worried about. As of late March, some car divisions were still running sales contests for dealers to help move leftover '73 models. And there's no incentive for an early start on the '75 small cars, because Detroit can sell all the compacts it can produce without bringing out new models. It adds up to a late start for the '75 cars.

French compact for Chrysler

There's been another shift in gears in Chrysler's small-car program. The car may be produced overseas, at least in part. The company has been studying 16 different combinations of a part U.S., part British, part Australian and part French compact. Chrysler has looked at the idea of producing the entire car in those countries and alternate plans that call for components to be made in one country or the other and then to be shipped to another country for assembly.

The vehicle Chrysler is now focusing on is an updated version of the French-made Simca 1100 and Simca 1204 of a few years ago. Chrysler's code name for the car is C-180. It's a four-door with bucket seats in front and bench seat in the rear. The car is 178 inches overall on a 105-inch wheelbase. It is 68 inches in width, 56 inches high and has a 55-inch tread. It weighs 1130 kilograms (2491 pounds) equipped with an automatic transmission. The standard engine is an 1812-cc four-cylinder. (These dimensions are exact, right off the factory specs.) If Chrysler should go ahead with its

present plan, the new Simca will be manufactured in France and imported into the United States.

Peek preview

I think I caught a flash of one of Ford's new small cars on a Detroit freeway, but it was such a now-you-see-it, now-you-don't glimpse, there wasn't time to note details. It was headed in the direction of Ford world headquarters, and I was going the opposite way. It was a tight-looking car, very squared off front and rear, something like the Plymouth Cricket of two years ago. But more boxy. It had the Ford name on the trunk and XL-Something along the front fender. Anyway, it's no secret that Ford's version will be called the Granada and the Lincoln-Mercury's version will be known as the Monarch.

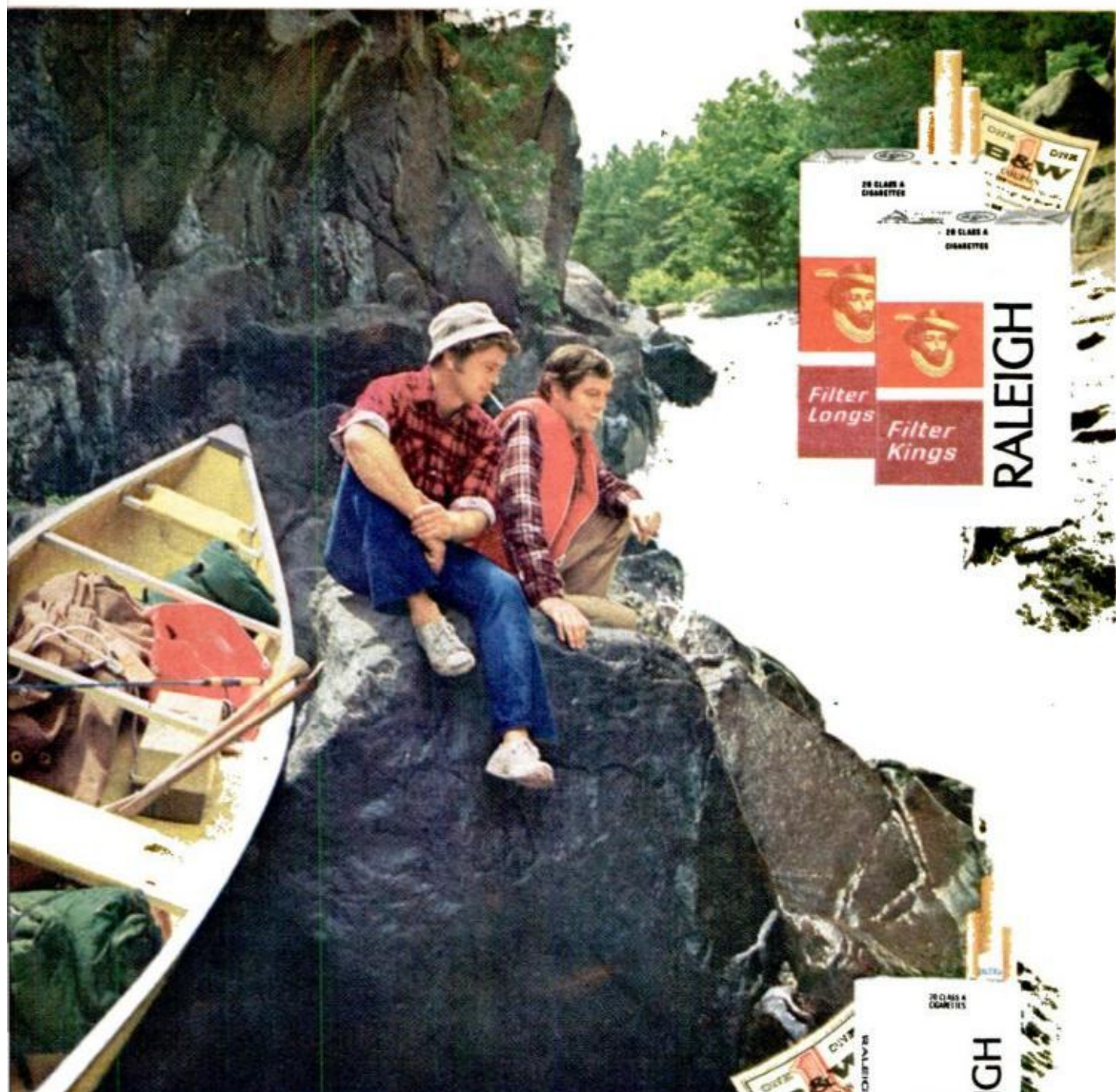
AMC van on the way

Why no mention of American Motors in *PM's* article about van-type vehicles used for car pooling, appearing in the March issue? Because AMC doesn't make a van. But that will be corrected during the '75 model year. As soon as the tooling is ready, AMC will have a van.

New Vega to become Olds compact

Olds is second in line, after Chevrolet, to get a crack at the new version of Vega coming next year. There will be two Vegas for '75. Not two models. Two different cars. The present Vega will be carried over with minor changes and GM will uncork the new Vega worked up for the Wankel—but without the rotary engine for the time being. Pontiac will have a takeoff of the current Vega. Then, as soon as Olds can tool up, it will have a carriage-trade version of Vega

(Please turn to page 42)



Spend a milder moment with Raleigh.

And discover really satisfying tobacco taste.



Sleep out in comfort with Sportline Sleeping Bags. 34" x 77". Water repellent, with Dacron 88® Polyester or Acryon Acrylic filling. Yours for free B&W coupons, the valuable extra on every pack of Raleigh.

To see over 1000 gifts, write for your free Gift Catalog: Box 12, Louisville, Ky. 40201.



Introducing
Raleigh Extra Milds
 Mild natural flavor
 Lowered tar

© BROWN & WILLIAMSON TOBACCO CORP.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

Extra Milds, 14 mg. "tar," 1.0 mg. nicotine, av. per cigarette, by FTC method; Filter Kings, 16 mg. "tar," 1.2 mg. nicotine; Longs, 18 mg. "tar," 1.3 mg. nicotine, av. per cigarette, FTC Report Sept. '73

THE SCOTT ENGRAVER

Your spare time money-maker

Scott's SM300K turns 10¢ worth of plastic laminate into a product you can sell for 75¢ to \$1.00. Every business is a prospect. Make name plates, signs, plaques and more . . . in just minutes, using just one hand. A complete, ready-to-operate engraving shop to help you make big money in your spare time!

To find out more, send for free catalog, today.
Dept. 06501

SCOTT MACHINE DEVELOPMENT CORP.

P. O. Box 217
Walton, New York 13856

Scott fills every engraving need—
from stock to fonts.



MIGHTY MAC SHREDDER- CHIPPER MODEL 12-P



Process garden refuse material through a mighty Mac shredder-chipper for compost heaps or till directly into your soil. The model 12-P shown above will chip tree limbs up to 3" diameter for valuable mulch. Don't burn your refuse; recycle it back to the soil. Process corn stalks, manure, leaves, sod and flower stems. Write for free literature describing the Mighty Mac quality line. Amerind MacKissic Inc., Box 111, Parker Ford, Pa. 19457

DETROIT LISTENING POST

(Continued from page 40)

II. GM is not yet the power in small cars it is in other areas. But it is pushing hard to close the gap.

Service shops drying up

You know how it's supposed to be with doctors when they go to a party. Everybody sidles up to mooch a little free advice on their aches and pains. You guys who work on your own cars may soon find yourselves in the same position. This country has suffered a shortage of professional mechanics since World War II. Now the problem is intensifying. The number of places where you can get a car serviced is shrinking every day. New-car dealers, particularly those handling the big cars, are going out of business. When a dealer shuts down, his service customers have to find a new shop to service the car. At the same time dealers are folding, many independent service stations are going under.

I've been covering the service side of the auto business for *Motor*, a Hearst trade magazine for the service station owner, for 20 years and I've never known a time when service capacity was as tight as it is now. If you know how to repair your own car, you may suddenly find yourself very popular with a number of people who are not do-it-yourselfers.

Same cars, different label

If you haven't been paying attention to the nuances, you may not be aware that Detroit no longer builds big cars, standard-size cars or full-size cars. That's what the manufacturers would like you to believe, anyway. The new name for the large cars is "family size." Family is supposed to be a good word. Big is a bad word.

This is like GM changing the definition of a hardtop when it put a center pillar in its hardtops a couple of years back. Up to then, everybody thought a hardtop was a car without a center pillar. "Wrong!" GM roared back. The company insisted it was still building hardtops, but now they had center pillars. Have it your way, as they like to sing in that jingle for the hamburger chain. ★★★

The better the equipment the better you'll be equipped.

NTS Home Training gives you new skills for exciting careers.

Jobs open up for technicians with down-to-earth training. The future is bright in the Electronics field. The Automotive industry is already gigantic with more than 95 million cars. Opportunities are expected to increase in the Home Appliance field. And the Air Conditioning, Refrigeration and

Heating industries will grow rapidly in the next few years. There are many exciting careers waiting for the highly skilled technician. With NTS Home Training and the valuable NTS equipment, that skilled technician could be you!

Electronics Division

Become skilled in color TV & Radio Servicing, Computer Electronics, Automation/Industrial Electronics, Audio Electronics or Electronic Communications by training on solid-state equipment. Build solid-state 315 sq. in. digital Color TV with Varactor Diode Tuning; B&W TV; AM/FM Stereo Receiver and Speakers; Computer Trainer; FET Volt-Ohmmeter; Electronic Tube & Transistor Tester; Oscilloscope; Color Bar Generator; Transceiver and more. Send today for new color catalog and details on all 12 courses and equipment.



NTS/GR2000
Solid-State
Color TV

Air Conditioning/Refrigeration/Heating Division

NTS Training can prepare you for great opportunities in this expanding industry. Equipment includes Hermetic Unit Analyzer; Leak Detector-Soldering Kit; Charging-Testing-Purging Manifold Set with dispensing and piercing valves. Plus Socket Wrench, Open-End Wrench, Tube Bender Sets, and much more. Choose from three outstanding courses. Check the coupon and receive free color catalog.



Home Appliance Division

Learn to service ranges, washing machines, dryers, and other household appliances. And you can start your own business as you train! You'll use the exclusive NTS Circuit Trainer to increase your experience in appliance circuitry. The Motor Speed Control Kit gives you valuable experience with solid-state circuits. Also included is professional 4-in-1 Appliance Tester that performs many troubleshooting tasks, and hand tools.



Mechanics Division

America's most important industry pays good wages. Four courses cover the field in Auto, Truck and Diesel Mechanics and include big 109-piece Socket Wrench and Tool Set, Performance Kit and other professional diagnostic equipment. Plus bonus "hot shop" lessons. Send today for catalog and complete details.

Classroom Training at Los Angeles

You can take classroom training at Los Angeles in sunny Southern California. NTS occupies a city block with over a million dollars in training facilities. Check box in coupon or card.

Approved For Veteran Training

Accredited Member: National Association of Trade and Technical Schools; National Home Study Council.



SEND FOR
FREE CATALOG
AND LESSON
SAMPLE →

No obligation. No salesman will call.

NATIONAL TECHNICAL SCHOOLS

Technical-Trade Training Since 1905
Resident and Home Study Schools
4000 So. Figueroa St.,
Los Angeles, Calif. 90037

NATIONAL TECHNICAL SCHOOLS

Resident and Home Study Schools/Technical-Trade Training Since 1905
4000 So. Figueroa St., Los Angeles, Calif. 90037

Please rush FREE CATALOG and SAMPLE LESSON for course checked below. No obligation. No salesman will call.

Electronics Division

- | | |
|---|---|
| <input type="checkbox"/> Master Course in Color TV Servicing | <input type="checkbox"/> Master Course in Electronic Technology |
| <input type="checkbox"/> Color TV Servicing (for Qualified Technicians) | <input type="checkbox"/> Industrial Electronics |
| <input type="checkbox"/> Master Course in B&W TV & Radio Servicing | <input type="checkbox"/> Computer Electronics |
| <input type="checkbox"/> Practical TV & Radio Servicing | <input type="checkbox"/> Basic Electronics |
| <input type="checkbox"/> FCC License Course | <input type="checkbox"/> Audio Electronics Servicing |
| <input type="checkbox"/> Master Course in Electronic Communications | <input type="checkbox"/> Audio Technology for Qualified Technicians |

Air Conditioning/Refrigeration/Heating Division

- | | |
|---|---|
| <input type="checkbox"/> Master Course in Air Conditioning, Refrigeration & Heating | <input type="checkbox"/> Air Conditioning & Heating |
| | <input type="checkbox"/> Refrigeration |

Mechanics Division

- | | |
|--|---|
| <input type="checkbox"/> Master Course in Auto, Truck & Diesel Mechanics | <input type="checkbox"/> Truck, Heavy Duty & Diesel Mechanics |
| <input type="checkbox"/> Automotive Mechanics | <input type="checkbox"/> Engine Tune-up & Electricity |

Home Appliance Division

- | | |
|--|--|
| <input type="checkbox"/> Home Appliance Master Technician's Course | <input type="checkbox"/> Home Appliances Servicing |
| | <input type="checkbox"/> Handyman Appliance Repair |

Name _____ Age _____

Address _____

City _____ State _____ Zip _____

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

Dept. 201-064

ALL OUTDOORS

Bonuses for BB buffs

Pellet guns now compete in events like the International Air Gun Competition in Phoenix (early June) and U.S. Jaycees BB Gun Championships for juniors at Manchester, N.H. (July 5-7), Crosman is celebrating its 50th anniversary with shoot-offs for Explorer Scouts. Daisy programs include a \$40 four-gun range kit especially for clubs.

Belts for outdoorsmen

Survival knife, sheathed as belt buckle, is unique stainless single or double blade with black or brown belt for \$30; Bowen Knives,



Box 14028, Atlanta, Ga. 30324. Hunt buckle, belt are \$5 and two ammo box tops; Remington Arms, Bridgeport, Conn. 06602.

Computer camping

A number of campground chains will now offer both advance reservations and gasoline availability data bank information up ahead for RV travelers. Ticketron can also reserve state park campsites in California, Florida, Ohio, Pennsylvania and Virginia.

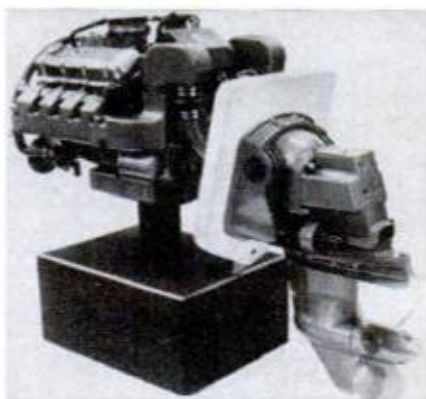
Travel tackle

During a recent trip fishing a number of states from my minihome RV, I tried an assortment of the new small four and five-

piece travel rods for comparison with my Zebco. None had limber fly-rod action but all are backpack compact—and caught fish!

New—fore and aft

Added starter in the stern-drive race is Kiekhaefer Aeromarine's K-Drive 400 with power steering, rated for up to 250 hp. New engine shown with it is liquid-cooled inverted-V with high power-weight ratio.



Give 'em air

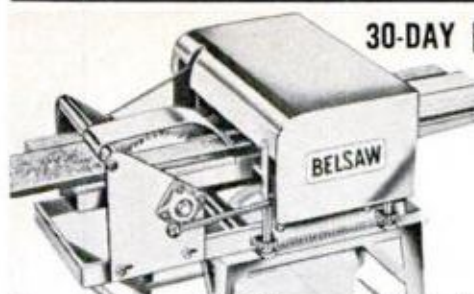
Car, trailer and bicycle tires, inflatable boats, air mattresses, beach toys, footballs, balloons—you need but name it and you can blow it up with Coleman's Inflate-All 12-volt \$35 air compressor that plugs in a car's lighter. [\(Please turn to page 48\)](#)





PLANER • MOLDER • SAW

30-DAY FREE Trial!



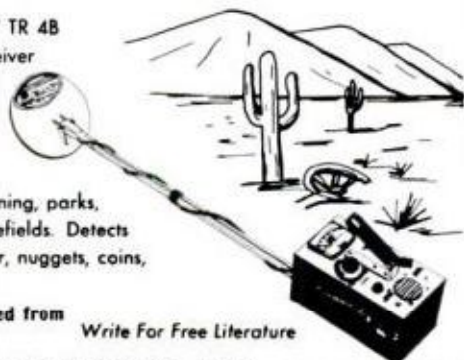
Now you can use this ONE power-feed shop to turn rough lumber into moldings, trim, flooring, furniture... ALL popular patterns. RIP... PLANE... MOLD—separately or all at once with a single motor. Free 30-Day Trial. Low Cost—only \$35 down.

Send Postcard Today—No Salesman Will Call

BELSAW POWER TOOLS 905H Field Bldg., Kansas City, Mo. 64111

-- re-DISCOVER --

with Colomaster IV TR 4B the transmitter-receiver mineral and metal detector



Ideal for ghosttowing, parks, beaches and battlefields. Detects gold, silver, copper, nuggets, coins, rings, jewelry, etc.

Other models priced from \$79⁵⁰ up

Write For Free Literature

WHITE'S ELECTRONICS, INC. CREDIT TERMS AVAILABLE
1011 Pleasant Valley Road, Rm. No. 512, Sweet Home, Oregon 97385

SUBSCRIBER'S

Change of Address Form

Please use this form to notify us at least six weeks before you move to your new address.

1. Present address: Attach address label from a recent issue, or print your name and address exactly as shown on the label.

NAME _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____

2. Fill in new address:

NAME _____
 NEW ADDRESS _____
 CITY _____ STATE _____ ZIP _____

3. Mail this form to:

POPULAR MECHANICS
Subscription Service Dept.
Box No. 646
New York, N.Y. 10019



MAKE BADGES AND BUTTONS FOR FUN AND PROFIT

Great new money making machine. Make any quantity permanent metal (plastic protected) slogan badges. Supply to groups, for fairs, conventions, campaigns, carnivals, etc. Ideal fund raising system. Badge parts cost you less than 10¢ apiece and you sell finished slogan buttons for up to 75¢ apiece, photo buttons for up to \$2.50 each. Get sample button and fully illustrated money making plans by return mail, enclose 25¢ to cover postage and handling, or order complete BADGE-A-MINIT kit.

Kit contains:

- Solid precision made BADGE-A-MINIT hand die press and color coded dies.
- 25 assorted color discs for slogan badges.
- 25 complete badge part sets.
- \$29.95 complete plus \$1.75 shipping.

R.P.M. ASSOCIATES LTD. Dept. PM-6
Box 618 LaSalle, Illinois 61301

Yes, send complete BADGE-A-MINIT System. My check or money order is enclosed for \$29.95 plus \$1.75 for postage & handling.

NAME _____
 ADDRESS _____
 CITY _____
 STATE _____ ZIP _____

Send sample button and fully illustrated facts, I enclose 25¢ to cover postage & handling.

Unconditional money back guarantee if returned intact within 10 days.

MOLDS

for making
Ornamental Concrete
Items...



Book about Aluminum Molds with prices and production trade secrets direct from world's largest mold manufacturer.

SEND \$3.00

CONCRETE MACHINERY COMPANY, INC.

P. O. BOX A99 - HICKORY, N. C. 28601



BUILD THESE BEAUTIFUL CLOCKS



NOW AT BIG SAVINGS!

Send just \$1 for plans & instructions to build choice of: (A) Grandfather, (B) Steeple, (C) Grandmother—plus information-packed catalog of movements, dials, parts & kits to build these & 16 other fine clocks. All 3 plans—\$2.50. Catalog alone—25¢.

MASON & SULLIVAN
Dept. PM, Osterville, MA 02655
IN CANADA
Colonial Times, Waterloo, Ont.

LIVE IN THE WORLD OF TOMORROW . . . TODAY!

UNUSUAL BARGAINS

NEW PRODUCTS • NEW MATERIALS • NEW IDEAS

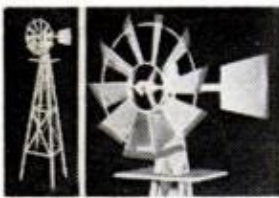
NEW! KIRLIAN PHOTOGRAPHY KIT!



Experiment in the fascinating new field of "Kirlian" electrophotography—images obtained on film without camera or lens by direct recording of electric charge transmitted by animate & inanimate objects. Each "aura" differs from another—animate aura said to change corresponding to physical changes. \$50 Kit gives everything needed except film including portable darkroom, double transformer isolated from power source; complete instructions.

Stock No. 71,938H \$49.95 Ppd.

AUTHENTIC SCALED WINDMILLS



Real-thing replicas show wind direction, wheel silently revolves on ball bearings. Give your grounds unique rural charm! Great centerpiece for planter, flowers. Use to hold yard sign, house number, sign or as mailbox. For school, a fine "energy crisis" science project—does everything but pump water. Heavy gauge steel, durable outdoor finish; aluminum color w/ red trim.

No. 71,923H . (17" DESK MOD.) \$10.95 Ppd.
No. 71,924H (41/2'-14 LB) \$32.50 Ppd.
No. 85,229H . (8'-46 LB) \$44.95 FOB

ACTUAL WORKING SOLAR HOME PLANS



Learn all about the most fascinating possible home of the future. It can be your "now" answer to today's energy crisis in housing. Expert Dr. Harry E. Thomason tells advantages, problems, savings, and more in this important 20-page fact-filled booklet. Also includes 8-page oversize insert of basic, actual solar home plans, a valuable guideline to you and your architect in fitting space requirements, design ideas, and local area building codes.

No. 9440H (Solar House Plans) \$10.00 Ppd.

"FISH" WITH A MAGNET



Go treasure hunting on the bottom! Fascinating fun & sometimes profitable! Tie a line to our 31 1/2 lb. Magnet—drop it overboard in bay, river, lake or ocean. Troll it along bottom—your "treasured" haul can be outboard motors, anchors, other metal valuables. 31 1/2 lb. Magnet is war surplus—Alnico V Type—Govt. cost twice our price. Lifts over 40 lbs. on land—much greater weights under water.

Stock No. 70,570H 31 1/2 lb. \$11.50 Ppd.
Stock No. 60,215H 11 1/2 lb. \$6.50 Ppd.

4 1/4" ASTRONOMICAL TELESCOPE



See craters on moon, rings of Saturn, double stars. Up to 270X. New vibration-free equatorial mount. f/10 mirror corrected to better than 1/4 wave length. Gives theoretical limited resolution. Rack and pinion focusing. Aluminum tube. 6X finder telescope. 2 standard eyepieces and Barlow lens gives power up to 270X. Free Star Chart, 272-page "Handbook of the Heavens" plus "How to Use Your Telescope."

Stock No. 85,105H (Shipping Wt. 42 lbs.) \$115.00 F.O.B.

6" REFLECTOR TELESCOPE (with clock drive) \$259.50 F.O.B.

Stock No. 85,086H \$36.95 Ppd.

3" REFLECTOR TELESCOPE \$36.95 Ppd.

FREE SOLAR ENERGY BULLETIN!

Jampacked with facts on cells, panels, home plans, furnace, cooker, more—for hobby, industry, schools. Request #9903H.



MAIL COUPON FOR GIANT FREE CATALOG!

180 PAGES • MORE THAN 4,500 UNUSUAL BARGAINS!

Completely new 1974 Catalog. Packed with huge selection of telescopes, microscopes, binoculars, magnets, magnifiers, prisms, photo components. Ecology and unique lighting items, parts kits, accessories—many hard-to-get surplus bargains, 100's of charts, illustrations. For hobbyists, experimenters, schools, industry.

EDMUND SCIENTIFIC CO. 300 Edscorp Building, Barrington, N. J. 08007
Please rush Free Giant Catalog "H"

Name _____
Address _____
City _____ State _____ Zip _____

EDMUND SCIENTIFIC CO. ORDER BY NO. • Send Check or M.O. • MONEY BACK GUARANTEE
300 EDSCORP BLDG. BARRINGTON, NEW JERSEY 08007
PLEASE ADD 50¢ HANDLING CHARGE — \$1.00 FOR ORDERS UNDER \$5.00 — TELEPHONE 609-541-3488

ALL OUTDOORS

(Continued from page 46)

In the bag

Indoor types are learning outdoor gear is stylish, longer wearing, better made. An example: L.L. Bean's Heavy Duty Haversack



in tan twill, leather trim, \$18.50 postpaid from the famous Freeport, Me., supplier.

On-the-go gadgets



This miles-per-gallon computing meter that hooks up to your car's speedometer and fuel line, \$35, is one of many items in Sears' new 80-page catalog of RV and camping accessories. Other listings: winches, tents, cookware, sleeping bags, lanterns, heaters, inflatable boats, back-packing equipment.

Three guns—five barrels



Winchester semi-auto .22



Colt Sauer three-barrel



Browning 2000 gas auto

A three-barreled gun? Yes, the new sleek Colt Sauer Drilling 12-gauge double has a rifled .30/06 below and handsome price about \$1600. Winchester's new 490 .22 is semi-auto; Browning gasser has easy recoil. ★★

THE EASIEST MONEY YOU'LL EVER MAKE...BELIEVE IT OR NOT! IT'S TRUE

**"I MADE \$35,000 IN JUST 1 DAY
AT HOME IN BED WITH THE FLU"**

By simply putting my successful money method
in action I'm making thousands of dollars
every week whether I work or not...

**I WILL QUICKLY TEACH ANY MAN OR WOMAN
MY PROVEN "EASY MONEY SECRET" OF
STARTING FROM SCRATCH AND MAKING A
FORTUNE PRACTICALLY OVERNIGHT!**

**OFFICIAL PROOF OF RESULTS
CERTIFIED NOTORIZED AND DOCUMENTED
LEGAL SWORN AFFIDAVIT:**

TO WHOM IT MAY CONCERN:

As the Accountant for Unique Ideas, Inc., Mr. Ernie Tucker, Pres., I attest to the fact that he earned Thirty Five Thousand Dollars in a single day and presently averages in the thousands every week.

Personally I've always found him to be both a Successful and Honest Man. I Certify that all of these statements are true.

Certified Public Accountant's Name Available upon Request.

Bank Reference: Chelsea National Bank

825 Seventh Ave.

New York, N.Y. 10019

Notary Public

Harry Shalita Dec. 3

1973

ONE HUNDRED DOLLARS

**YOU DON'T NEED MONEY
TO MAKE MONEY**

Obviously you were not born rich so what? 85% of the men and women who are rich today started with very little money and had only average education, so why not be honest with yourself and stop using lame excuses, stand up and face the fact that the only real difference between you and thousands of rich Americans is that they discovered the right moves to make and you did not!

**YOU GET RICH MAKING
"THE RIGHT MOVES"**

I've proven this to be true despite the fact that I was born poor and barely squeaked through high school. I still made a fortune in just a short period by making the right moves and I'll show you exactly how I did it.

But why am I so anxious to reveal to you my secret money making method? Surely there's more to it than because I enjoy helping others share in the rich good life as I have but frankly I expect to profit at least two hundred thousand dollars, maybe more, from the publishing of these ads in nationally famous magazines and newspapers.

STOP WASTING PRECIOUS YEARS

I should know, I wasted more good years than I care to remember, before I finally discovered the secret of making money. I stayed up to my neck in debt, bounced around from one eight hour dead end job to another. Just working, waiting and wishing for a great fortune to fall in my lap. I got married, became a proud father at a young age. I worked in a toy factory for a short time and peddled cosmetics from door to door, but everything I tried my hands at failed because I didn't know the right moves to make. This only happened to me twelve years ago. No doubt there are millions who are suffering this agonizing torment now.

**REVEALING: THE RICH MAN'S
SECRET MONEY MAKING METHOD**

It's true that most rich persons keep

their money making secrets to themselves, seldom sharing it with others, but fortunately I met several unusually fair minded rich men who were so impressed with my ambition to get rich that they agreed to teach me the secret money making techniques that their many years of making millions had taught them, providing I would virtually work for them at least one year. I eagerly jumped at the opportunity to gain this valuable knowledge and said yes to their generous proposition. So for one year I listened and watched very closely, until I learned from A to Z how these financial wizards made thousands of dollars every single day. I'll always be most grateful to these men for teaching me their fast and easy money-making secrets. It didn't even matter that I was practically penniless when I first put these methods into action.

**SUDDENLY IT STARTED
MAKING MONEY FOR ME**

At first it was unbelievable ... I paid off all my bills and my wealth continued to multiply. Huge sums of cash poured in so fast that I was forced to employ a full time bookkeeper and retain a corporation attorney, accountant and tax expert to help manage my prosperous financial affairs.

We had investments, property, stocks, money in the bank and can afford most anything we want. My family and I enjoyed our wealth and success. We were very proud of our accomplishments and it was our secret of making the right easy moves that made it all happen.

**THIS IS YOUR CHANCE
DON'T BLOW IT**

It's a better chance than I had. If you're really serious I'm willing to share my secret. Surely I can afford to give it to you free of charge, but I won't, why should I give you something for nothing? Instead I'm going to ask you to send me ten dollars for sharing my secret. What's more, I want you to know that I intend to make a fair profit

from the information I mail you, why not? If I can show you how to make more money than you ever made in your life why should you care if I make a profit? Remember what I'm giving you for only ten dollars cost me 12 years to master. Even more important you get certified and documented proof beyond the slightest doubt that my method can make a fortune, this is why I can offer you the strongest legally binding guarantee possible!! A guarantee so incredible that you'll probably think it sounds too good to be true.

**UNUSUAL \$1000
GUARANTEE**

This is a legal and binding guarantee from me to you. The information I'll send you can actually put thousands of dollars in your pocket. But this is my pledge to you, after just 10 days if you don't agree my secret method is worth at least \$1000.00 in cash to you (one hundred times the ten dollars you pay) send it back and I'll rush a full refund, including your 10¢ postage. You take absolutely no-risk —not even the price of a stamp.

GET READY TO GET RICH

Every single day my method can bring you more cash. You'll never again need to borrow, budget or ask anyone for credit. You'll be proudly independent. You can enjoy those luxuries you've always dreamed about, but never could afford. Sound impossible? But it's not, you only need a serious belief in my proven method, very small capital and enough ambition to give it a try. Remember "nothing ventured nothing gained" and there's absolutely no way you can lose.

**JOIN THOUSANDS WHO ENJOY
THE RICH GOOD LIFE:**

Ed K. says: "I never earned over one hundred dollars a week in my life until I

made 2 thousand dollars the first month using your money making method. I'm glad I took a chance." Sincerely, Ed K., N.Y. You can easily learn what I taught him and now his money worries are over, so why not take advantage of this rewarding opportunity. Any news of good fortune travels fast, already thousands of just average men and women have benefited from my concept, you will too. But I will not promise you'll make as much money as fast as I have, yet, it's possible you'll make a lot more even faster.

**YOU CAN LIVE HIGH ON THE HOG
AND DO LESS WORK...**

I'll show you how to stop breaking your back to make ends meet and start using your head to get easy riches. If you're seriously fed up with being treated like a hard working stiff while others enjoy the rich good life, then don't pass up this opportunity—you risk absolutely nothing—not even the price of a stamp.

MAKE THE RIGHT MOVE NOW

RUSH ORDER COUPON

Ernie Tucker, Pres.
Unique Ideas, Inc. Dept. PM-c
1674 Broadway
New York, N.Y. 10019

Yes count me in on your \$1000 guarantee offer. I enclose \$10. Rush your proven easy money method. I understand that it has been officially certified, notorized and documented. If I don't agree it can actually put \$1000 or more in my pocket within 10 days I can return it for a full refund, including my 10¢ postage. There is no risk on my part.

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



© 1973 Unique Ideas, Inc.

My briefcase crammed with thousands of dollars to be deposited in my bank.

**AN HONEST NO NONSENSE WAY TO RICHES
IT ACTUALLY WORKS FOR YOU**

No equipment to buy or lease, no hustling your friends to buy junk merchandise and no books or correspondence course required.

**DEFINITELY NOT A CON GAME, FRANCHISE,
INVESTMENT SCHEME OR GIMMICK**

IMPORTS AND MOTORSPORTS



Sleep-in sidecar

Here's another addendum to *Sidecars Are Back!* (page 77, April *PM*), and a practical addendum to your motorcycle if it's 500 cc or larger. The Centaur GT sidecar, which measures 6½ x 3 feet, may better be described as a camper trailer for your bike! It'll sleep two and completely protect passenger(s). Included in the \$800 price is a removable hardtop, lights, carpet, bucket seat and hardware for quick and easy attachment. A dash panel even provides for installation of a radio or tape deck! This ultimate sidecar is the brainchild of Don Spaulding who, with his wife, rode it coast to coast in 57 hours, 25 minutes! Fungi-neering, Box 943, Martinez, Calif. 94553.

All the world's cars

When's the last time you saw an Ami? A Hai? A Lawil Log? Rex? YLN? How about a Hindustan Ambassador Mk II? Probably never. But you can get a lot more than your 2½ cents worth on each of these cars and more than 800 others in production today from *World Cars 1974*. The \$21, coffee-table volume really delivers: all specs plus essays on the car and racing year. Heald Books, Box 17, Pelham, N.Y. 10803.

Around the electrical circuit

There are more models of electric cars on the road than you'd imagine: The Smith, The Jones, the You-Name-It. You name it after yourself when you build it is what you do, because you can't buy an electric



car in a dealer showroom. Fiddling with electric cars is becoming a national pastime.

One company attempting to meet the demand for components is McCulloch Electronics in Los Angeles. Its showcar, above, is a traveling showcase for the company's products: principally batteries, motors and controllers.

Meanwhile, Japanese manufacturers have been showing various electric vehicles in their country's motor shows. A futuristic sports van from Daihatsu (photos on page 52) is a four-passenger vehicle. Maybe we'll have electric cars sooner than we thought—from Japan. After all, that's where we get almost all our motorcycles, cameras, transistor radios . . . not to men-

(Please turn to page 52)



The wet head is dead.

When John leaked, you thought he was just spouting off. When he made funny noises, you thought he was whistling Dixie.

But when he flipped his lid during The Late Show, you could turn the other cheek no longer. So you shut off his water. And shut him up once and for all.

Of course, there's a more sensible way to deal with toilets that leak, squeak and whistle. It's called Fluidmaster. A simple-to-install hydraulic device that works with water pressure, for fast, positive shut-off.

Fluidmaster eliminates the old-fashioned rod arm, float ball and other corrosive parts.

Write today for full details. And learn how you can keep John from becoming a dead head.

Manufacturer of the Model 100, 200, and 400.



FLUIDMASTER, INC.

P. O. Box 4264 | 1800 Via Burton | Anaheim, Ca. 92803

FOR THE MAN WHO LIKES TO DO-IT-HIMSELF.

With money-saving, "do-it-yourself" tips—more than in any other magazine—on how to maintain and repair your home, your car, your boat, your power mower, your TV and nearly everything that breaks down, wears out and needs fixing. Plus feature articles on Automobiles and Driving, Shop and Crafts, Science and Inventions, Boating and Outdoor Recreation, Home and Yard, Electronics, Radio and TV, Photography . . . and much, much more!

ENTER YOUR SUBSCRIPTION NOW.

POPULAR MECHANICS

Simply fill in the form and mail it promptly. **WPM4F1**

POPULAR MECHANICS
250 West 55th Street
New York, New York 10019

Please enter my subscription for

1 yr. \$5.69 or 2 yrs. \$10.29

Name _____ (please print)

Address _____

City _____ State _____ Zip _____

Payment of \$ _____ is enclosed.

New Renewal

On new subscriptions, first copy will arrive in about 8 weeks.

(Above prices apply in U.S. & Possessions only. Canada add \$2 per year. All other countries add \$4 per year.)

The Ultimate in Ignition Systems!
★ **ELIMINATES BREAKER POINTS.** ★
Perfect Timing and Dwell never change!

- Never wears out or needs any Maintenance.
- Eliminates Tune-ups.



● **The Most Advanced OPTO-ELECTRIC SYSTEM**

- The Allison Breakerless System eliminates the Points and Condenser, replacing them with an Opto-Electronic Trigger, using a Light-Emitting Diode and Phototransistor. The only "TRUE" Electronic Ignition! Gives 40 times more Timing Accuracy than ANY system using mechanical Breaker-Points! Unlimited RPM. Smoother running... (No timing fluctuation as with Magnetic units).
- All Solid-State Components.
- Unaffected by Temperature, Moisture, or Vibration!
- Easier Starting under any condition. Increased Horsepower. Sparkplugs last longer. Perfect timing increases engine Efficiency and Gas Mileage up to 30%!

Quick and Easy Installation! Tested and Proven reliability.

- Only \$49.95
- SATISFACTION GUARANTEED!
- 1-YEAR FACTORY WARRANTY.

(State Make, Year, Engine Size). (Calif. Res. add Tax).

● CONVERT YOUR "C-D" UNIT TO BREAKERLESS!

"TRIGGER-UNIT" ONLY \$34.95

● Send Postcard for FREE BROCHURE Today.

ALLISON AUTOMOTIVE CO.

P.O. Box 881-X, TEMPLE CITY, CAL. 91780

MIGHTY MUSCLES

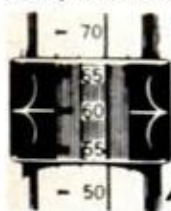


Even if you
"Hate Exercising"!

Now power-pack your body with inches of mighty muscle in just 5 minutes a day. Even if you've always "hated exercising," the proven-effective BULLWORKER System can help you build the body of your dreams F-A-S-T: amazing muscle-power increases of up to 4% per week or more: 50% increase in 3 months!

Compare these benefits with any other method. No weights. No barbells. No long and boring exercises. Bullworker is easy and quick to use, anywhere—at home, in the office. You don't even have to disrobe.

In just 2 short weeks Bullworker guarantees to produce positive results you can actually see in a mirror, measure with a tape: otherwise YOU PAY NOTHING! Mail coupon today for free illustrated booklet and complete details. No obligation.



Built-in Powermeter

You can actually measure your musclepower g-r-o-w-i-n-g from the very first day.

FREE 24 page BOOKLET



Bullworker Service Dept. BW-1352
201 Lincoln Blvd., Middlesex, N.J. 08846

Please send me my FREE full color booklet about BULLWORKER 2 without obligation. No salesman will call.

Name _____ Age _____
Street _____
City _____
State _____ Zip _____

Canada: Home delivery duty paid. Ask for FREE booklet.

IMPORTS AND MOTORSPORTS

(Continued from page 50)



tion stratified-charge engine technology (Honda CVCC).

Still, we may beat the importers to the punch and have in the United States a mass-produced, reasonably priced electric car of our own. The one closest to the assembly line is the Vanguard CitiCar, now in final testing in Florida. Next month, PM Editor Jim Liston will report on what may become the first successful electric car since the Baker Electric.



Winning races is no sweat

Richard Petty, always cool-headed in racing situations, is especially cool these days. Cool Head is a fabric helmet liner connected to a pump and cooler in the car. In a 140° racing-car environment the device reduces pulse rate, weight loss, body temperature and fatigue. Richard tests it here. Maker: Aerotherm Div., Acurex Corp., 485 Clyde Ave., Mountain View, Calif. 94042. ★★



This bird was caught stealing gas

Just one bird, like the one above, can rob you of valuable gasoline mileage. In fact, in an eight-cylinder engine, one misfiring spark plug can cost you as much as a 12 per cent loss in gasoline.

Just a few of the causes of spark plug fouling that can rob you of gas mileage:

Over-rich carburetion. Faulty automatic choke. Clogged air cleaner. Using fuel with improper octane rating for your engine. Worn piston rings. Using spark plugs of wrong heat range.

Check spark plug installation instructions in your Owner's Manual before any installation. Just to be sure.



How do you catch a gas thief like this? The answer: with a tune-up that includes a new set of AC Fire-Ring Spark Plugs.

And remember, even if you are driving slower these days, AC has a spark plug engineered for your car and your kind of driving.

So tune up with AC Fire-Ring Spark Plugs. Get rid of the gas thieves in your car, and see if it doesn't help improve your mileage. Today every drop counts.



AC SPARK PLUG DIVISION OF
GENERAL MOTORS CORPORATION

Likable little Leica is great for travel

by Ivan Berger
PHOTOGRAPHY EDITOR

My basic vacation-photo outfit has always included a camera with through-the-lens light meter, a wide-angle, a tele and a fast normal lens—plus a stiff shoulder from hauling it all around. But just such an outfit—the new Leica CL with 40-mm f/2 wide-angle/normal and 90-mm f/4 tele lenses—is cradled in my palm below, light and small enough to nestle in two pockets.

The CL will take most bayonet-mount Leica “M” lenses (or older Leica-thread lenses, with adapters). However, the two lenses shown were designed, like the CL

itself, for compactness; not just because they're smaller than earlier Leica lenses (the space-saving “collapsible” versions can't telescope completely without injuring the CL's meter cell), but because one of them—the 40-mm—is designed to take the place of both a 35-mm wide-angle and a fast 50-mm normal lens.

And the CL's finder system was designed to match those lenses. Bayonet in the 90-mm, and a bright frame in the finder shows you just the 90-mm field; bayonet in the 40-mm, and the finder shows you fields for it and for 50-mm lenses. Unlike earlier Leica Ms (and Leitz's current M5 model), there are no frames for 35-mm or 135-mm lenses, though you can use them with external finders.

The rangefinder isn't perfectly suited to all other lenses, either. Keeping the camera compact required a shorter measuring base (see page 56) and less finder magnification than on “M” Leicas, cutting focus accuracy a bit. That makes the CL less suitable for lenses longer than its 90-mm, or faster than its 40-mm f/2 (though I got sharp results with my 35-mm and 50-mm f/1.5 lenses).

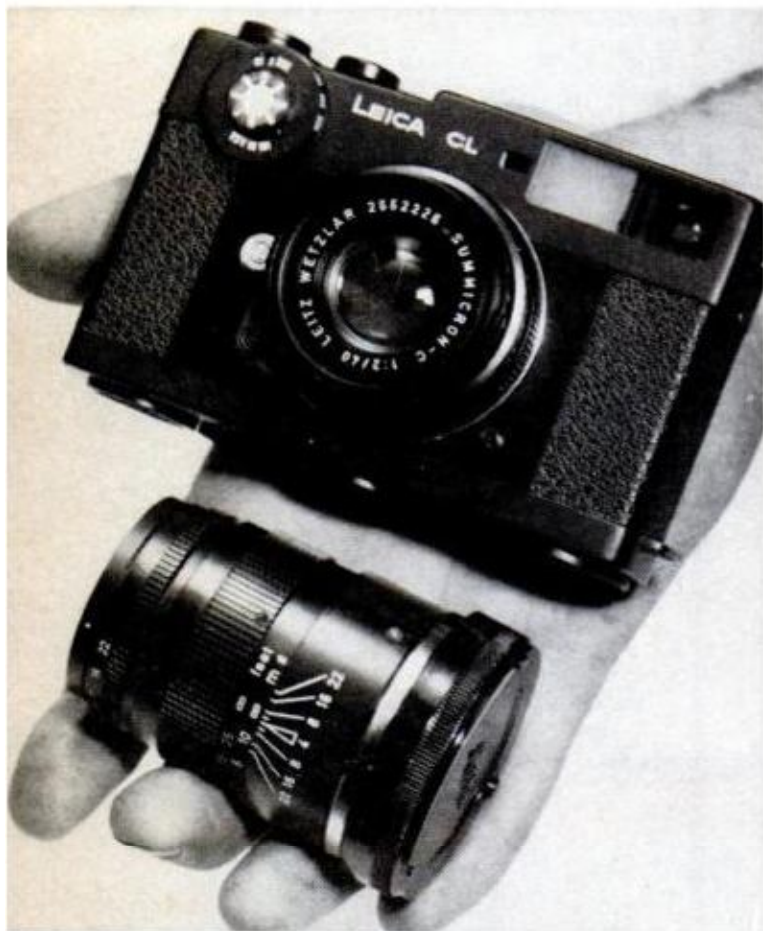
Obviously, the CL isn't as versatile as a single-lens reflex. But it has advantages over an SLR, too. Not only is it smaller and lighter, but it's quieter (no mirror flap) and focuses easily and accurately, even with wide-angle lenses in dim light.

As with most of today's SLRs you'll find exposure information in the finder window. And, as in a few reflexes, you'll find a shutter-speed scale there, too.

Like most rangefinder cameras, the CL is a better action camera than an SLR. Its focusing is, for most people, quicker and more precise than a reflex's, the image doesn't disappear at the moment of exposure, and you can see around the edge of the bright frame to spot action which might be about to intrude on the picture area.

It is perhaps a marginally better avail-

(Please turn to page 56)



Complete CL outfit—camera with normal/wide-angle 40-mm f/2 lens and 90-mm f/4 telephoto—nestles easily in palm of hand, can cover wide range of situations.

The 1974 Kabar
is a lot like the
1898Kabar.



1974 Kabar
folding hunter #1184.



Circa 1910 Kabar folding hunter

We're happy to report
very little progress during
our 76 years.

Kabar knives are still made one-at-a-time
by master cutlers. Each pocketknife still gets
over 130 hand operations. And our
standards of quality are as tough as ever.

We aren't about to change, because
today more than ever, hand-made is
better than machine-made.

That's why you owe it to yourself to own a
Kabar pocket or hunting knife.

Brand Cutlery®
Kabar

Handcrafted in the U.S.A. since 1898
Kabar Cutlery, Olean, New York 14760
a Cole National Company

Write for your Kabar dealer's name.

MAKE EXTRA \$\$\$ EVERY DAY!
Get into the big, year-round
EXTRA MONEY BUSINESS
that's EASY to learn—EASY to
do—and EASY ON YOU!

Be a LOCKSMITH!

You Can Make Up to \$10 an Hour—even while learning!
Train FAST at Home!

Never before have money-making opportunities been so
great for qualified Locksmiths. Now lucrative regular
lock and key business has multiplied a thousandfold as
millions seek more protection against zooming crime.
Yet there's only one Locksmith for every 17,000 people!

Start Collecting CASH PROFITS Right Away

You're "in business" ready to earn \$5 to \$10 an hour
a few days after you begin Belsaw's shortcut training.
Take advantage of today's unprecedented opportunities
in Locksmithing for year-round EXTRA INCOME in spare-
time—or fulltime in a high-profit business of your own.
Hundreds we've trained have done it. So can YOU! All
tools plus professional Key Machine given you with
course. These plus practice materials and equipment,

**THIS PRO
KEY MACHINE—
YOURS TO KEEP—**

can add \$25 to
\$40 a week to your
income . . . and it
won't cost you a cent
with your training.

**ALL TOOLS, MATERIALS AND PRACTICE
EQUIPMENT COME TO YOU WITH YOUR COURSE.**



FREE



Tells how
to make
money in
Locksmith-
ing almost
from the
start!



"War injuries left me
badly handicapped, but
now I'm a financial success
as a Locksmith, thanks to
your training. Besides, the
work is fascinating. If I can
do it anybody can." — Glen
Johnson, Larned, Kan.

plus simple, illustrated lessons, plus expert supervision,
plus business-building guidance will enable you to KEEP
THE MONEY COMING IN! Ideal for retirement—good
jobs, too.

SEND FOR EXCITING FACTS—No Obligation

Discover what's in Locksmithing for you—how Belsaw's
master-locksmith-approved training can give you the
skill you can depend on to EARN MORE—ENJOY LIFE
MORE. Just fill in and mail the coupon below to receive
full information by return mail. Do it TODAY!

BELSAW INSTITUTE, 105H Field Bldg., Kansas City, Mo. 64111
Accredited Member National Home Study Council
Approved for all Veteran Training

MAIL THIS COUPON—NO SALESMAN WILL CALL

**BELSAW INSTITUTE, 105H Field Bldg.
Kansas City, Missouri 64111**

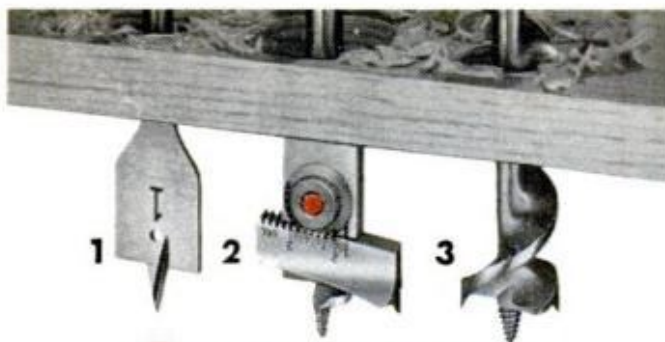
Please send me free of cost or obligation your
publication "Keys to Your Future" on how Belsaw
can quickly train me to make money in Locksmith-
ing and how all tools and Key Machine are given
me to keep.

Name _____

Address _____

City _____ State _____ Zip _____

Check here if eligible Veteran.



3 easy ways to bore holes faster

1. Irwin Speedbor® "88" wood bit for all electric drills. Spade-type head, exclusive hollow ground point. Starts fast, cuts fast. 17 sizes, 1/4" to 1 1/2", and sets.

2. Irwin No. 22 Micro-Dial® hand brace expansive bit bores 35 standard holes, 7/8" to 3". Just dial your size. No. 21 bores 19 standard holes, 5/8" to 1 3/4".

3. Irwin 62T Solid Center hand brace bit. Delivers double-cutter boring action. Medium-fast screw pitch. Balanced cutting head. 18 sizes, 1/4" to 1 1/2", and sets.

Every Irwin Wood Bit precision-engineered of finest tool steel, heat treated full length and machine-sharpened. They last, bore fast. Buy Irwin . . . buy the best.

Strait-Line Chalk Line Reel Box
50 ft. & 100 ft. sizes

Popular Priced Irwin self-chalking aluminum alloy box. Easy action reel. Leak proof. Practically damage proof. Fits pocket or hand.

© Registered U. S. Patent Office



IRWIN®

every bit as good
as the name

at Wilmington, Ohio 45177, since 1885

woodworking bench from Denmark



WRITE TODAY FOR FREE CATALOG

Crafted in old World tradition, these fine benches are made of SOLID Danish Beech — not veneers. Features built-in horizontal & built-in vertical hold vises, adjustable surface holds by means of steel dogs. Tool Tray. Steel spindles.

49" Hobbyist, 60" or 80" Advanced Amateur/Professional models. One folds for storage.

Craft Products Div., Leichtung & Galmitz, Inc.
5187 Mayfield Road Cleveland, Ohio 44124

USE WHAT THE PROS USE!



FOR CAR & HOME
1000 PLUS USES!
LUBRICATES
PENETRATES
PREVENTS RUST

Starts Wet Engines . . .
Stops Squeaks . . . Removes Moisture . . .
Lubricates all moving parts . . . Buy wherever automotive products are sold.

CRC

Chemicals, Inc.
Warminster, Pa. 18974

LIKABLE LITTLE LEICA

(Continued from page 54)

able-light camera than most reflexes, with its quick focusing and a meter that reads down to 1/2 second at f/2 with Tri-X. But it's still no match for Leica's M5 in that.

The camera may be compact, but the price isn't: with 40-mm f/2 lens, the CL is \$498; its 90-mm lens is \$249. ★★★



Size comparison (top) with earlier Leica M2 shows both CL body and lenses smaller, despite built-in meter. But shorter rangefinder (arrows) is a limitation (see text), and size may be too small for some. Viewfinder (above) shows shutter speed (top), meter (right) and fields for 50-mm, new 40-mm lenses. Inserting 90-mm lens switches frame to cover 90-mm field.

DAP for the best fix-up product buys in town!

DAP Fixer Products™ help you do the job right the first time. DAP '33' GLAZING COMPOUND, the best way to replace broken window glass, outlasts ordinary putty by years. PANEL-NU,™ in handy spray or liquid, cleans, renews and beautifies paneling and finished wood surfaces. DAP LATEX CAULK applies easily, dries quickly so you can caulk and paint the same day. And DURATITE® WOOD

DOUGH, in Natural and eight popular wood colors, fills holes, hides gouges, scratches in wood, baseboards, furniture. DAP . . . your best friend in home fix-up.™

DAP Inc., General Offices: Dayton, Ohio 45401
Subsidiary of *Plough, Inc.*

4669

© 1974, DAP, inc.



Back-yard storage with dual purpose utility



Left: A little beauty for tools and kids. Looks more like a storybook cottage. 10 ft. square with 6 ft. porch.
B1300 Single set \$3.95
B1300A Two sets \$5.49

Right: Delightful A-frame. Outside stairway to attic crawl space. 8 ft. by 12 ft. and almost 13 ft. high.
B1302 Single set \$3.95
B1302A Two sets \$5.49



Left: Playhouse and storage with covered walkway. Two-story house 8 ft. wide by 12 ft. long. 2nd floor 2 ft. 4 in. wider.
B1277 Single set \$3.95
B1277A Two sets \$5.49

These appealing back-yard houses can also serve as playhouses or place for a guest. Extra plans are for obtaining permit.



Left: Dutch mini-barn with country charm. Looks small but is 10 ft. by 13½ ft. Roof design gives 8 ft. overhead.
B1279 Single set \$3.95
B1279A Two sets \$5.95

Right: Featuring a pillared porch with a dutch door. Shake roof topped with a birdhouse-cupola. 8 ft. wide by 8 ft. deep.
B1301 Single set \$3.95
B1301A Two sets \$5.49



Popular Mechanics, Box 1014, Dept. AD, Radio City, N. Y. 10019

I am enclosing \$_____ for _____ sets of plans of buildings indicated below. (Please write numeral 1 or 2 in box.)

B1277 B1302 B1301 B1300 B1279

Name _____

Address _____

City _____ State _____ Zip _____

Announcing

Popular Mechanics Picture-Tools - the handiest shop-organizers ever designed

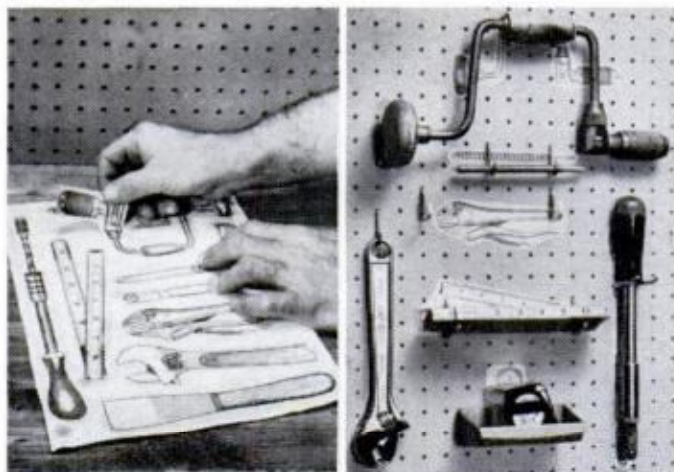
POPULAR MECHANICS PICTURE-TOOLS are a great new idea to take the confusion out of *what goes where* on workshop tool panels.

The complete PM PICTURE-TOOL KIT consists of seven big sheets (9¾ x 11¾ in.) of a special heavyweight paper with a pressure-sensitive adhesive on the back. On each sheet are beautiful drawings of hand tools and portable power tools—all (74 in total) you're likely to have in your shop. Most are full size; the others, only slightly reduced.

Also enclosed in the kit is a blank sheet of the same special paper, printed in an overall color to match the tools. This sheet enables you to design your own drawings or silhouettes of any special tools you have.

Each of the PM PICTURE-TOOLS is carefully die-cut. You simply peel it off the backing paper and apply it to the proper spot on your panel. You can apply PICTURE-TOOLS to any painted or unpainted wood, plywood, hardboard and even perforated-hardboard surface.

Later if you want to move a few tools or rearrange the entire panel, you can peel off



the PM PICTURE-TOOLS and move them to new locations. They are reusable!

Once your PICTURE-TOOLS are in place, you'll know at a glance exactly where each tool in your shop belongs. You'll also know—again at a glance—what tools are missing.

Best of all, you'll be surprised how PM PICTURE-TOOLS will instantly and dramatically enhance the appearance of your shop!

**Order your PM PICTURE-TOOL KIT today!
Only**

\$3.95

Popular Mechanics, Box 1014 (Dept. PT), Radio City, N.Y., N.Y. 10019

Enclosed is my check or money order for \$3.95.

Send my PM PICTURE-TOOL KIT to:

Name _____

Address _____

City _____

State _____

Zip _____

PUBLICATIONS **WORTH WRITING FOR**

PM'S PICTURE-TOOLS are a great new idea to take the confusion out of *what goes where* on workshop and tool panels.

The complete PM **PICTURE-TOOL KIT** consists of seven big sheets (9¾ x 11¾ in.) of a special heavy-weight paper with a pressure-sensitive adhesive on the back. On each sheet are beautiful drawings of hand tools and portable power tools—all you're likely to have in your shop (74 in total). Most are full size; the others nearly so.

Also enclosed in the kit is a blank sheet of the same special paper, printed in an overall color to match the tools. This sheet enables you to design your own drawings of special tools.

Each of the PM **PICTURE-TOOLS** is carefully die-cut. You simply peel off the backing paper and apply it to the proper spot: on painted or unpainted wood, plywood, hardboard and even perforated-hardboard surface.

Later, if you want to move a few tools or rearrange the entire panel, you can peel off the PM **PICTURE-TOOLS** and reuse them in new locations!

Once your **PICTURE-TOOLS** are in place, you'll know at a glance exactly where each tool belongs.

Order your PM **PICTURE-TOOL KIT** today. Simply send a check or money order for \$3.95 to Popular Mechanics, Dept. PT, Box 1014, Radio City, New York, N.Y. 10019. Be sure to enclose your name and address. ★ ★ ★



Allis-Chalmers.
**Our big ones are known
for muscle power.**
**Our little ones
for yardpower.**

Step out behind one of our easy going rotary mowers. Fingertip handling, offset wheel design, and grass bag as standard will help you stroll through summer. Four models, 19" and 21" cut.

Or take a close look at the unmatched maneuverability and power in our 5 and 8 hp riding mowers...with big mowers that follow ground contours for no-scalp performance.

And, full range lawn and garden tractors with big tractor features for year round yard care. Six models—8 to 19½ hp—with attachments to groom your yard to perfection.

You'll find our little ones can handle some mighty big jobs.



ALLIS-CHALMERS
OUTDOOR & LEISURE PRODUCTS

BOX 512, MILWAUKEE, WI 53201

THREE FROM PM

POPULAR MECHANICS PICTURE-TOOLS are a great new idea to take the confusion out of *what goes where* on workshop tool panels.

The complete PICTURE-TOOL KIT consists of seven big sheets (9¾ x 11¾ in.) of a special heavyweight paper with a pressure-sensitive adhesive on the back. On each sheet are beautiful drawings of hand tools and portable power tools—all (74 in total) you're likely to have in your shop. Most are full size; the others are only slightly reduced.

Each of the PM PICTURE-TOOLS is carefully diecut. You simply peel it off the backing paper and apply it to the proper spot on your panel. Once the PICTURE-TOOLS are in place, you'll know at a glance exactly where each tool in your shop belongs.

To order, send \$3.95 (check or money order) to: Popular Mechanics, Box 1014 (Dept. PT), Radio City, New York, N.Y. 10019 with your name and address.

POPULAR MECHANICS COMPLETE GARDENING GUIDE. First we assembled every bit of information you need to make your lawn and garden beautiful. We condensed *these* basics to *their* essentials. Then we added more than 20 fact-filled tables and charts, and scores of show-how drawings. Finally, we printed this vital material on heavy plastic-coated cards, and spiral-bound them together.

You'll be amazed at the vast amount of information packed into your COMPLETE GARDENING GUIDE. Planting dates and depths for all kinds of seeds and bulbs; when to prune what, and how; information on the 56 most popular shrubs, and the 21 best hedges; all about ground covers; how to lay flagstone, patio blocks, bricks; how to build decks—and much, much more.

To order, send \$3.95 (check or money order) to: Popular Mechanics, Box 1014 (Dept. GG), Radio City, New York, N.Y. 10019 with your name and address.

1973 INDEX AND SHELF WRAPPER. Do you want to find an article on 17 ways to thiefproof your car? How to build a colonial footstool? The latest bicycle touring gear? How to remodel your bath?

Your copies of *PM* are chock-full of such information. Sometimes, though, it can be frustrating to find the article you want.

The 1973 PM INDEX AND SHELF WRAPPER references and cross-references all of those thousands of items. You can find *any* article in seconds.

Send just \$1.49 to Popular Mechanics, Box 1014 (Dept. PMI), Radio City, New York, N.Y. 10019 with your name and address.

3 well-paid skills NRI can teach you at home in your spare time... You learn on professional equipment you build yourself and keep!



1 TV-RADIO SERVICING/ELECTRONICS

There's a big demand for men who can service televisions, computers, communications and other electronic equipment. With NRI's step-by-step learning programs that use fun-to-do experimenting kits — you can quickly prepare for a

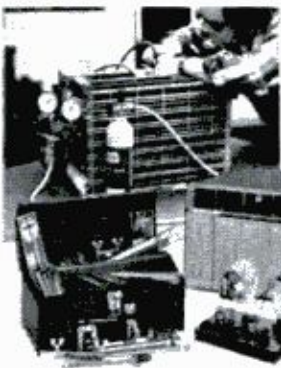
top pay job, or a business of your own. In NRI's TV-Radio Servicing Course you build NRI's exclusive New 25" diagonal, solid state, color TV set. NRI's Free Electronics Catalog explains the 14 training programs in TV-Radio Servicing Computerized Industrial Electronics, and NRI's New Solid State CB Communications program.



2 AUTOMOTIVE SERVICING

Save dollars servicing your own car, or prepare for a top-paying mechanic's job. You learn step-by-step with bite-size texts combining practical service work with top quality professional equipment that you

keep. NRI's Master Automotive Technician Course includes — at no extra cost—your own analyzer scope (an NRI exclusive) and 9 other servicing items. NRI's Tune-Up and Electrical Systems program offers 8 servicing items. Both courses give you "hands-on" experience and the chance to earn spare time money.



3 AIR CONDITIONING, REFRIGERATION, AND HEATING

The "boom" industry of the '70s, where tens of thousands of technicians are needed. NRI courses were developed with the technical assistance of the York Division of the Borg-Warner, a world leader in air condi-

tioning. Training units include a *Circuit Demonstrator* for circuit studies; a *Control Simulator* for learning electric controls. The Master Course has a window air conditioner for troubleshooting and your own personal use. Resident training at *York Institute* is optional at no extra charge.



"Hands-On" Training Pays Off... NRI pioneered custom-designed kits with bite-sized texts to make learning at home fun and profitable. You get professional test instruments to perform experiments and keep for use in servicing. Tens of thousands of NRI graduates are proof it's practical.

Earn \$5 to \$7 an Hour, Starting Soon... Keep your present job while preparing for a top-paying job, or your own business. With NRI's professional equipment (provided at no extra cost) you can make good money doing repairs for friends.

Train with the Leader—NRI... NRI's innovative training lets you proceed at your own pace, assisted by your own NRI home training expert.

NO SALESMAN WILL CALL

APPROVED UNDER G.I. BILL Check G.I. line in coupon.

RUSH Coupon for ONE FREE Catalog



NRI TRAINING
3939 Wisconsin Avenue
Washington, D.C. 20016

Please rush me ONE FREE catalog checked below. I understand NO SALESMAN will call. Check Only One.

- Automotive Catalog 946-064 TV-Radio Servicing/Electronics 100-064 Air Conditioning, Refrigeration & Heating Catalog 513-064
- Send me facts on G.I. Bill

Name _____ Age _____
(Please Print)

Address _____

City _____ State _____ Zip _____

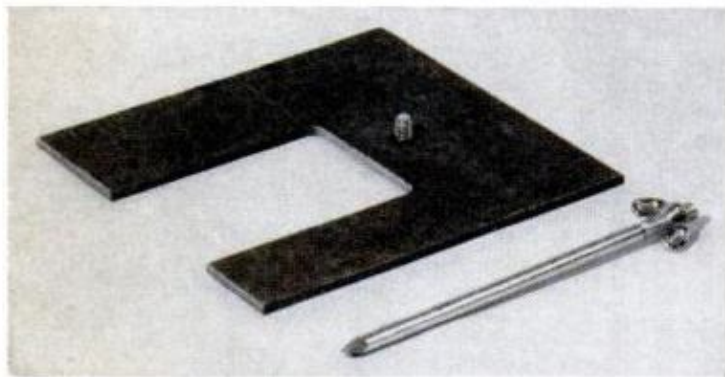
Accredited Member National Home Study Council

PHOTO HINTS

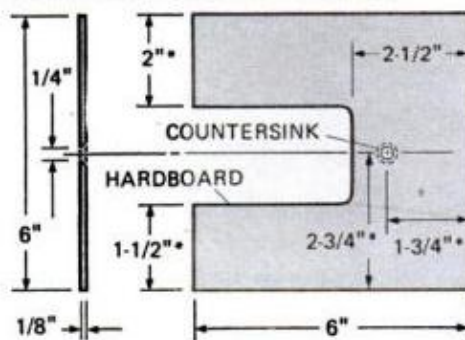
FROM READERS



Close-ups of low-lying flowers and the like—or low-angle shots of larger objects—are easy with the Flatpod (shown in use, left) and the Spikepod (in lower left photo). Flatpod construction (below) is simple; only materials are a $\frac{1}{4}$ -20 screw and a piece of hardboard; unit works indoors or out. Spikepod, made from a $\frac{1}{4}$ -20 carriage bolt with the head end sharpened to a point, is for use in soft ground.



*OR POSITION TO MATCH YOUR CAMERA



Indoor-outdoor camerapods for low-angle close-ups

Low-level close-ups aren't easy: Those tripods which can hold a camera close to the ground often require accessories, or hold it upside down. And why tote two feet of tripod to hold a camera at a two-inch elevation? My solutions—the Flatpod and Spikepod, fit in your pocket, and can be made for less than \$2.

The Flatpod is made from a 6x6-inch scrap of hardboard. Cut a slot as shown for lens clearance, drill and countersink $\frac{1}{4}$ -inch hole for a $\frac{1}{4}$ -20 x $\frac{3}{8}$ -inch flathead bolt, and you have a low-level stand that will hold your camera and most macro lenses steady

on any reasonably level surface. The lens-clearance slot and tripod screw positions shown are for my Nikon; you may have to adjust them to fit other cameras.

The Spikepod is even simpler: just hack-saw off the head of a long $\frac{1}{4}$ -20 carriage bolt and file the cut end to a point. Add a wingnut to tighten the spike to the camera. To use, just jam the spike into the ground. You can use three, four or six-inch bolts; I carry all three. A small pan head is a handy addition to either mount, for fine adjustments in composition.

—Ronald J. Kubiak, Pittsburgh

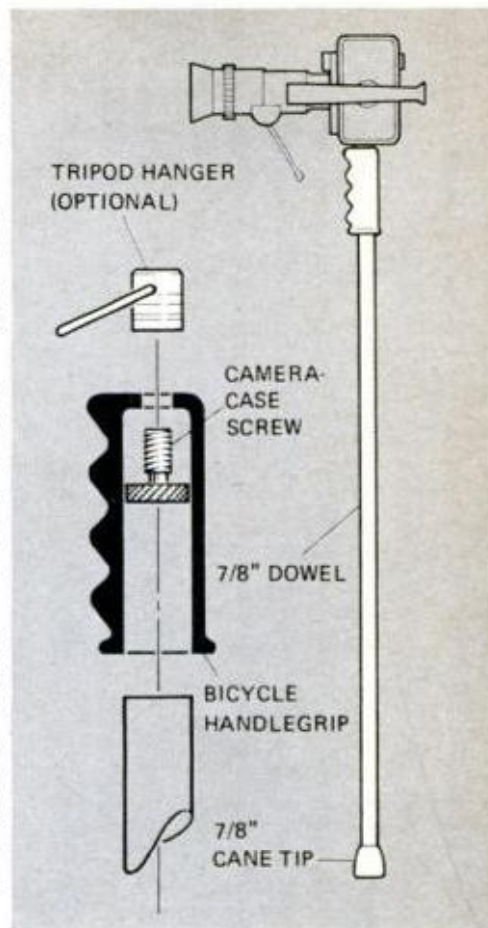
Broomstick unipod for steadier pictures

Add one more leg to the two you have already, and you're a tripod. That's the unipod principle. And while you and the unipod together aren't quite as shake-free as a true tripod, the unipod's much easier to carry.

My homemade version doesn't telescope like the commercial ones, but it's a lot cheaper, and at least as light and sturdy. All you need is a length of $\frac{7}{8}$ -inch dowel, a $\frac{7}{8}$ -inch cane tip, a bicycle handlegrip, and a camera-case retaining screw (available from photo dealers).

To put it all together, tape the retaining screw to one end of the dowel securely; then coat that end with glue and push the handlegrip down tightly over that end till the screw threads extend through the grip's end hole (most grips have one, but if yours doesn't, it's easy to punch or cut). Seat the cane tip on the dowel's other end, and you're done.

Length is up to you: A dowel long enough to raise your camera's finder to your eye level is steadiest, but most awkward to carry. I made mine 36 inches high so it will double as a walking stick, and I squat or sit to use it. A tripod hanger ring helps keep the screw threads clean when not in use, and lets you attach a rawhide thong as a wrist strap. Another useful option is a golf-shoe spike in the bottom, covered by the cane tip when it's not in use.—*J. S. Paul, Bakersfield, Calif.*



Minolta helps you celebrate the morning.



You can find the wonder in a new day with a camera that doesn't hold you back, a camera fast enough to catch the fleeting moment.

From the moment you pick it up, you're comfortable with a Minolta SR-T. This is the 35mm reflex camera that lets you concentrate on mood and insight. The viewfinder gives you all the information needed for correct exposure and focusing. Because you never have to look away from the finder to adjust a Minolta SR-T, you're ready to catch the one photograph that could never be taken again.

Next time you're up with the dawn, be ready with a Minolta SR-T. For more information, see your photo dealer or write Minolta Corporation, 200 Park Avenue South, New York, N.Y. 10003. In Canada: Anglophoto Ltd., P.Q.

Minolta SR-T 101/Minolta SR-T 102



One of the Most Shocking and Candid Books Ever Written – Vol.1 of **CRIMES AND PUNISHMENT**



The **FIRST** Pictorial Encyclopedia of Aberrant Behavior

A startling look at the world through the eyes of rapists, mass murderers, kidnapers, con men and the super-cops who bring them to justice!

CRIMES AND PUNISHMENT is a vital social document of unprecedented importance that is bolder than detective fiction and more intriguing than conventional journalism. This definitive encyclopedia probes far behind the headlines as it lays bare the history of the violent age in which we live.

Forget about your free gift if you "don't want to get involved." Volume 1 involves you to the hilt, as it shows you how life looks to the assassin and sex murderer, and reveals the modern methods used in the war against crime. If you're curious about abnormal behavior, if you would like to peer into the incredible subculture of the underworld, return the accompanying coupon without delay and receive what may well be the most remarkable volume you have ever read on any subject.

The distinguished editors of this unique and reasonably priced new series have compiled a wealth of information—much of which is published here for the first time. You'll read the true accounts of the most notorious crimes of all—the Sharon Tate murder case...the story of Param

Youngblood, deaf-and-dumb rapist killer...the atrocities of Hitler's black SS...the Ku Klux Klan...the Mau Mau. You'll follow the careers of the Marquis de Sade, Rasputin, Willie "the Actor" Sutton, "Lord Haw-Haw," Bonnie and Clyde. All in all there are nearly 3000 gripping pages, more than 2000 incredible photographs.

Each volume highlights the great crimes, the great trials, the history of criminology, and includes an encyclopedic section which is part of a comprehensive 20-volume "A to Z" of crime. Throughout, the emphasis is on you: how you are affected by crime...what you can do to protect yourself...how science and the law work to preserve your life and liberty.

The world's first pictorial encyclopedia of crime and deviance is available only by mail. To receive your fascinating 144-page complimentary volume just mail the coupon back to us. Accepting Volume 1 does not commit you to purchase anything—even if you do. And you may examine any other volumes in the series **FREE FOR 10 DAYS**, if you wish to do so. But do act now and claim, as a free gift, one of the most important volumes ever written on crime and deviance.

YOURS FREE!

144 fascinating pages...over
100 photographs...\$3.98 value!

Measures A BIG 8½" x 10¾"

Some of the Entries In
Your FREE VOLUME

The Granite Woman And The
Putty Man

Brady And Hindley—The Murderers
Of The Moors

Sexual Sadism, Charlie Manson
And The Dominant Personality

Lady-Killer Neville Heath

The Lindbergh Kidnapping

The Witches Of Salem

The Beginnings Of Criminology

Ex-Criminals As Detectives

Fingerprinting

Blood Tests And Ballistics

Eugene Aram—18th Century

Scholar-Murderer

The Real Bonnie And Clyde

CRIMES and PUNISHMENT

A PICTORIAL ENCYCLOPEDIA
OF ABERRANT BEHAVIOR



The Ku Klux Klan

NO OBLIGATION TO BUY ANY BOOKS AT ANY TIME

Send No Money—Detach and Mail This Coupon Today!

FREE BOOK CERTIFICATE

MAIL TO:



The Symphonette Press

A Service of Longines-Wittnauer, Inc.

6 Commercial Street, Hicksville, N.Y. 11801

YES! Send me Volume 1 of the 20-volume CRIMES AND PUNISHMENT encyclopedia as a FREE gift, with no obligation to buy anything.

As a subscriber I will be notified in advance of all future shipments, and I may reject any shipment or cancel my subscription, simply by notifying you before the shipment date on the invoice accompanying my advance shipment notice. If I am not completely delighted with any volume after 10-day FREE examination, I may return it at your expense and owe nothing.

If you do not hear from me after I have received my FREE volume, I understand that you will send Volume 2 the next month, Volume 3 the following month, and the remaining volumes the month after that. I will be billed only for those volumes I decide to keep, at the rate of one volume per month at the low price of \$3.98 per volume, plus shipping, processing and applicable sales tax. I may cancel at any time by writing to you.

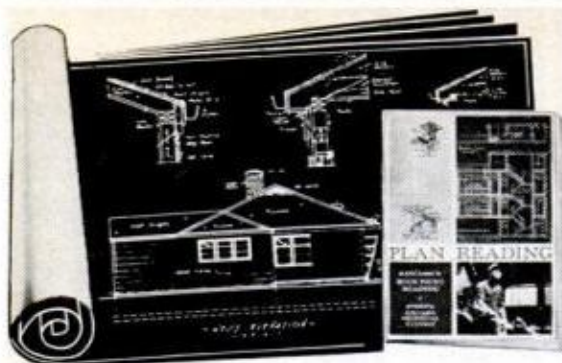
Mr.
 Mrs.
 Miss _____ (please print clearly)

Address _____

City _____ State _____ Zip _____

Signature _____ Tel. No. (____) _____

316



FREE BLUEPRINTS and TRIAL LESSON —for your greater success in Building

Beginners, craftsmen, even foremen and superintendents, have sent for these free blueprints and trial lesson in Plan Reading as a means of trying out Chicago Tech's home-study Builders training. Learn how you can master Plan Reading—Estimating—and the practical details of all types of construction in your spare time at home. Mail coupon below today—see how you, too, can prepare for a better job—higher income, or start your own contracting business.

CHICAGO TECHNICAL COLLEGE/School for Builders
2000 S. Michigan Avenue, Chicago, Ill. 60616

CHICAGO TECHNICAL COLLEGE Veterans
Dept. PM-64, 2000 S. Michigan Ave., Check
Chicago, Ill. 60616 Here

Please mail me a Free Trial Lesson, Blueprints and Builders Catalog. I understand there is no obligation—no salesman will call.

NAME _____ AGE _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

IT'S SO HANDY BECAUSE IT BONDS SO MANY THINGS.

Goodyear Pliobond® adhesive bonds almost anything to almost anything. Sold at full industrial strength, it forms flexible bonds that don't become brittle with age. Used by industry and consumers for over 25 years. Available in bottles and tubes at stores everywhere. Stick with it.



FIX LAWN MOWERS FOR FUN & PROFIT



Fascinating new Handbook by F. Peterson gives you the knowledge skilled mechanics learn.

OVER 125 ILLUSTRATIONS show how to trouble shoot, repair carburetors, engines, balance and sharpen blades, etc. Exploded drawings are extensively used.

INSTRUCTIONS COVER reel, rotary and rider mowers, preventive and routine maintenance, how to identify brand names, where to obtain replacement parts. How to buy and use a lawn mower. **Friends gladly pay \$10 to \$50 to fix their lawn mowers.** Try the **HANDBOOK OF LAWN MOWER REPAIR.** Rush only \$6.95 plus 50¢ handling on 10-day money-back guarantee.

EMERSON BOOKS, INC. Dept. 558A
Buchanan, New York 10511

SAKRETE®

Make something out of it!

Consider the man-hours you invest in your projects. Consider that SAKRETE Cement Mixes meet or exceed the standards of the American Society for Testing and Materials. Now guarantee your projects' lasting values by using ready-to-use SAKRETE Concrete, Sand or Mortar Mixes.



FREE . . . at your neighborhood SAKRETE dealer, our step-by-step instruction booklet featuring (20) select projects. Or, send 25¢ to cover handling to SAKRETE, P.O. Box 1071, Cincinnati, Ohio 45201.

Insist on **SAKRETE** Concrete and Mortar Mixes
The brand the pros use.



SAKRETE is a registered trademark of SAKRETE, INC. © 1974

Energy Crisis or not CompuSpark is the Hottest Thing Since Rome Burned

"Best Helluva Ignition at any price... PERIOD!"



Tom McCahill

Automotive Authority
Noted Test Driver
Journalist

Tom McCahill



"When Gaylord Electronics first approached me with their CompuSpark, I figured it was just another CD unit to put to the test."

"After the first 10,000 miles, I checked my point wear and plugs. They were like new, so I decided to go another 10 grand. I have just skipped my 40,000 mile tune-up and am close to 50,000 miles, and I am saving over 20 percent on my gas bill. It's 'The Best Helluva Ignition' at any price... Period!"

Best wishes
Tom McCahill

CHECK THESE COMPUSPARK FEATURES

- Increases gas mileage as much as 20%—many owners report more! Few say less.
- Instant and reliable all-weather starts.
- Tune-ups virtually unnecessary for as much as 3 to 5 years of normal driving.

Double Guarantee

Give it a fair trial for 60 days and remember our 37 month free repair or replacement policy. We will send you a refund check if you sincerely think that CompuSpark does not measure up to our claims.

GAYLORD ELECTRONICS, INC., Dept. PM / GHU
2314 Fourth St., Berkeley, CA 94710, (415) 849-0300

WHY GAYLORD DID IT

WE WANT YOU TO SAVE GAS! You should get a 20 percent improvement in fuel mileage with CompuSpark

LAB TESTING

Highly respected John Geraghty of John Geraghty Automotive, Inc., Verdugo Road, Los Angeles, evaluated the CompuSpark and oilfilled coil at our request. He reported:

"They really surprised our dyno and us, too. At their price, they are unbeatable. Closest performing units are costlier, some at \$100 or more."

SAVE TIME—USE OUR 24-HOUR HOTLINE

You can order CompuSpark from anywhere in the U.S.A. or Canada by phone. Simply dial Area Code 415/849-0300.

Order CompuSpark today. You have everything to gain, nothing to lose.

GAYLORD ELECTRONICS, INC., Dept. PM/GHU, 2314 Fourth Street, Berkeley, CA 94710 (415) 849-0300

PM-674

Please rush

- Compu Spark unit ready to install @ \$54.25 individually tested
- Compu Spark kit @ \$49.98
- Voltmaster MK II oil filled and sealed 50,000 volt coil. Advisable even alone for performance and economy over stock. Specially discounted to our customers @ \$18.98 gpd. (Normally lists for \$24.00.)
- Compu Spark Xtra Hi Performance Pak. Compu Spark together with specially matched and mateif selected ratio coil @ \$68.98
- Bumper Sticker "COMPU SPARK SAYS IT 'Keep on Trucking' but—Conserve Energy!" Free with order.
- Decal "This Car Equipped with Compu Spark 'CDI'." Free with order.

Complete product brochure included Free with all orders.

- Enclosed \$ _____ check or money order.
- Charge to my Master Charge BankAmericard American Express

Full Card Number _____

Expiration Date _____

California residents, please include sales tax

Please add \$1.50 postage, handling, shipping and insurance. In Canada add \$2.00. Add an additional \$1.00 for airmail, otherwise, we'll ship it as fast as possible.

You can order 24 hours a day, 7 days a week by dialing (415) 849-0300
car _____ model _____ year _____ 12 volt negative ground required

Name _____

Address _____ City _____ State _____ Zip _____

GAYLORD ELECTRONICS, INC., Dept. PM/GHU, 2314 Fourth Street, Berkeley, CA 94710 (415) 849-0300

For A Sparetime or Full Time Business, There's Good Money In Sharpening



Here's a proven practical way to earn extra dollars in spare time—to develop a money-making repair business of your own. Investment is small. There's no overhead, no stock of goods to carry. No experience needed, no canvassing. You do it with the famous Foley Saw Filer that automatically sharpens all kinds of saws—and the Modern Lawn Mower Sharpener that precision sharpens all types of mowers.

EARN \$5 to \$8 An Hour Sparetime

Hundreds of people like yourself are making cash like this—\$20 to \$30 a week—right now in spare time. "My spare time saw filing business has made me \$952 these first ten months"—says R. T. Chapman. Many have built a complete sharpening service with such year-around profits. You can too, simply by following the sure, easy Foley Plan.



Foley

MANUFACTURING CO.
MINNEAPOLIS, MINN.

FOLEY MFG. CO., 616-4 Foley Bldg., Minneapolis, Minn. 55418

- Saw Filer information.
- Lawn Mower Sharpener information.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

We Finance You
Foley will help you get started with minimum investment. No franchise fee. Write for complete information. No obligation.

HOW MANY MILES SINCE YOU CHANGED OIL?

OVER 3000 ? MORE THAN 60 DAYS ?



Engine Experts say that the additives in oil have probably been used up if you're past these figures. It's likely that your engine is collecting gum, varnish and gritty carbon deposits.

So it's time to add RISLONE to your engine oil. Get rid of deposits before they start causing problems like sticking rings, and valves, noisy lifters, lost compression and power.

RISLONE is a bargain, too. It saves a quart of oil while it gives your engine a clean-up treatment. And, clean engines run better, stay in tune longer, go further on every gallon of gas. Try RISLONE now. It's different!



RISLONE National Championship Racing Jacket only \$8.95 prepaid. Durable Nylon wash and wear. RISLONE yellow with black-red racing stripes. XS, S, M, L, XL, XXL. Send check or money order to RISLONE Racing Jacket, The Shaler Company, Waupun, Wis. 53963

**THE SHALER COMPANY
Waupun, Wisconsin 53963**

In Canada: Warren Packaging Co. Ltd.-
Scarborough, Ontario

**WHY BENJAMIN'S NEW
SUPER SINGLE SHOT AIR RIFLE**

Is Just The Ticket For Plinkers Who Don't Want To Play Second Fiddle To Their Shootin' Pals.

The more you shoot this beauty, the more you will appreciate what a rewarding companion it is to those who want top performance and versatility.

One of the chief reasons many shooters put their trust in Benjamin is the fact our new gun remains unchanged in basic design since 1908. And when you have been making anything as long as we've been building air rifles you learn how to make them right.

Of course, this new version looks so strikingly different from older models you'd never know they had anything in common. Just the same, all the things we've learned over the years are embodied in our new pump-up. We are proud of this Benjamin and the fine reputation it has earned for POWER, ACCURACY, DEPENDABILITY.

Use anyplace. Safe, Quiet, Lightweight, Odorless. Expertly crafted features add to shooting fun. BB, 177 or 22. Reasonably priced. At dealer's.

**BENJAMIN AIR RIFLE COMPANY
896 Marion St., St. Louis, Mo. 63104**

**FREE
Catalog**

You Can DEPEND on BENJAMIN

Walnut Monte Carlo Stock and New Design Pump Handle. Thumb Safety Behind Breech.

NEW 8 HP SUPER BRONC

THE BIG BIKE FOR ALL SEASONS



Model VT-8 Kit
Price—
\$279.95

**HEALD'S NEW
"SUPER BRONC"**

Model VT-8 has a new 8 HP 306 cc Tecumseh engine. Torque Converter drive, big air cushion tires, front and rear shocks, large padded seat, chrome fenders, #40 chain and chain tightener. Optional features include 21" x 12" wide, knob tires both front and rear, electric start, lights, aux. 5 qt. gas tank, front ski and quiet spark arrester muffler. Super Bronc comes in money saving easy-to-build semi-kit form. Kit price Model VT-8 — \$279.95. Ideal for farm or recreational use.

FOR MORE INFORMATION WRITE:
**HEALD INC., Dept. PM-6, P.O. Box 1148,
Benton Harbor, Michigan 49022**

FREE CATALOG

**Check Your Engine Oil
From Your Dashboard**



Now you can check your engine oil level from your dashboard — without getting out of your car and opening the hood. No need to depend on gas stations to safeguard the life of your engine. "OILGUARD" tells you instantly if you need oil. Easy-to-install, safe, non-electric system. Installation kit has adjustable dipstick, bracket & complete instructions. Satisfaction guaranteed for this precision instrument. Thousands now in use. \$29.95 plus \$1.50 for shipping & handling. Send car make, model, dipstick length with check.

**SUPERMARINE PRODUCTS CO.
Dept. PM • 1 Johnson Dr., Raritan, N.J. 08869**

U.S. Surplus High Speed Rotary Files. Hardened Steel. For filing, drilling, milling, carving, routing any metal or wood. Cutting edges from 1/4" to 1", shanks all 1/4" Brand new, in air-tight G.I. packs. Export order - Add \$1.00



36 Tool Set, G.I. cost \$265.00, now \$17.00
16 Tool Set, G.I. cost \$109.00, now \$11.00
Save Even More, Both Sets, now \$24.00
100% Guaranteed. We Pay the Postage. Order Now!

**U. S. SURPLUS CENTER, Dept. 503
715 Camden, San Antonio, Texas 78215**

**BUILD YOUR OWN ELECTRIC
SAW SHARPENING MACHINE**

from materials readily available at your local hardware or electrical supply outlet. WE TELL YOU HOW.

with complete easy to follow, step by step, plans & illustrations, including materials list & saw sharpening instructions for \$8.95.

\$ EARN MONEY \$. . . evenings, weekends, full-time. Sharpen saw blades, cutting tools, knives, scissors, garden tools, for YOURSELF and others. Order now.

SEND \$8.95 (Calif. residents please add sales tax) to:

**SHARP-EZE, Dept. P-6
515 No. Arrowhead Ave.
Suite 103
San Bernardino, Calif. 92401**





The Family Album of mid-size Chevelles.

Nine mid-size, mid-price choices from Chevrolet. A complete family of coupes, sedans and wagons. Sixes and V8's. All with emphasis on the kind of value that makes sense these days.

Four nice coupes.

If you've got economy on your mind, you'll be happy to hear that the popular Malibu (1), a car with a reputation for value, is our lowest priced Chevelle coupe. The Malibu Classic (2) adds a touch of comfort and class with its rich interior, coach windows and more. The

Malibu Classic Landau (3), with its special half-vinyl roof and pinstriping, is the most distinctive Chevelle, while our Laguna Type S-3 (4) is clearly the sportiest, with its bold body stripes, Rally wheels and special suspension.

Two roomy sedans.

Back to economy again with the Malibu Sedan (5), our lowest priced Chevelle. A family car with 4-door practicality. The Malibu Classic Sedan (6) is richly appointed, especially on the inside, so six adults can ride in style.

Plus three wagons.

Three comfortable, family-size wagons, starting with the Malibu (7), our most economical mid-size wagon. The Malibu Classic (8) has elegant touches you're sure to appreciate. The Malibu Classic Estate (9) tops our wagon line with the look of wood.

All Chevelle wagons, by the way, are available in 2-seat and 3-seat models.

That's our family.

Now let's meet yours.

Chevrolet

CHEVROLET MAKES SENSE FOR AMERICA

HOMEOWNERS' CLINIC

BY W. CLYDE LAMMEY

Replacing a roof support

The front wall of my ranch home has an offset, making the soffit, or roof overhang, three feet wide over the offset. This is supported at the corner by a 4x4 post which is rotted at the bottom, although the end bears on concrete. The post must be replaced, but how can I protect the new one from the same fate?—Sam Corbett, St. Louis

Select a straight 4x4 and paint it with a wood preservative, making successive applications until the wood will no longer absorb the liquid. I assume the lower end of the original post was drilled and placed over a metal pin (anchor bolt). Drill the new post the same way, then up-end it and fill the hole with preservative. Let the post stand several days, or until all the preservative has been absorbed, before installing it.

Cutting felt discs

My wife has a home decorator project that requires cutting zillions of perfectly round discs of about 3/4-in. diameter from colored felt about 1/8 in. thick. Can you tell me how this might be done in the home shop?—Charles Wilson, Harrisburg, Pa.

You may have to do a bit of searching to find an arch punch, but many well-stocked hardware stores do carry them. It is a hand tool made especially for cutting discs from rubber, leather, fabric, felt and even soft metals. To use it, you grip a block of close-grained hardwood in your vise, end grain up. Put the felt on the block, place the punch over it and tap the punch with a hammer or mallet. And there you are—a perfect round of felt. Arch punches are available in many sizes, including 3/4-in.-dia.

Broken concrete step

A corner of the first step on my concrete stoop has broken. The corner carries the iron rail post, set in lead. The break is, of

course, diagonal across the corner. How does one make this difficult repair?—Stanley Mills, Shenandoah, Iowa

First, remove the broken-off portion from the rail post. Possibly this can be worked off the lead filling by manipulation. Otherwise, you will have to break it away with hammer and cold chisel. Rather than melt off the lead, file it to a taper to anchor in the new concrete. Make a right-angle form of boards and brace it securely in place. Locate and prop the iron rail in original position with rope guys. Then use a prepared concrete patcher (prepared "gravel" mix might be used, but I prefer the patcher), following package instructions in all details. After filling the form, tamp the mix lightly and trowel or brush-finish smooth. At best, you can regard this as only a semipermanent repair.

Painting chain-link fencing

Just how can I paint chain-mesh fencing without spattering paint all over the place, wasting both the paint and my time?—Eldon Hall, Carbondale, Ill.

You can do it quite neatly, slow but sure, with a sponge, preferably a natural sponge. Trim one face to a ragged, flat surface and dip it in a paint-roller tray. Or you can do a slightly faster job with a long-nap roller, the type designed for wire fences. Neither way will eliminate the spatters entirely, but you'll get more paint on the fencing and less on yourself and the ground than with a brush.

If your chain fencing is new, let it weather a year or more before painting. If it's old and somewhat rusted, clean it with a wire brush before painting. ★★ ★

Do you have a home maintenance or repair problem? Send it to Homeowners' Clinic, Popular Mechanics, 224 West 57th St., New York, N.Y. 10019. While letters cannot be answered individually, problems of wide interest will be discussed in this column.

The Challenger. New Viceroy Extra Milds.

The one cigarette
with lowered tar
but lots of taste.

Compare the taste with
other low tar cigarettes
...it's really no contest.



14 mg. tar



Warning: The Surgeon General, Has Determined
That Cigarette Smoking Is Dangerous to Your Health.

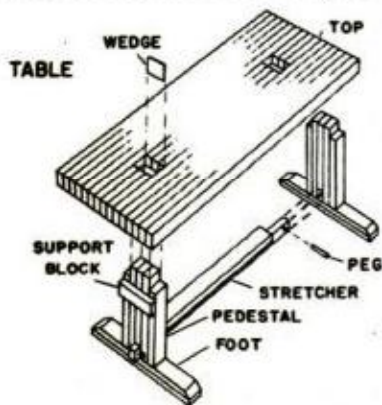
14 mg. "tar," 1.0 mg. nicotine, av. per cigarette, by FTC method

Manufactured by American Tobacco Company, Winston-Salem, NC

Stanley gives you more of a hammer. Free plans prove it.

Is a hammer just a hammer? No way! Take this butcher-block table for instance, where you've got a lot of 8 penny nails to drive in. Your arm will tell you, right away, that you'd better use a quality hammer — a Stanley.

You see, Stanley makes hammers with better balance and heft. Which means you're able to drive those nails in fast and easy. And on the mark. And you



won't end up with a tired, shaky arm or a sore, tingling grip.

Along with a better design, Stanley gives its hammers a rim tempered face. That's a feature no other hammer

has. In case you strike a foul blow, there's less chance of a steel chip to fly up at you. (Of course, you should always wear safety glasses anytime you use any striking tool.)

Find a store with a good tool department, you'll find Stanley hammers. Look at them.

hammers. Quality you *know* will help you do things right.

As for the butcher-block table and benches, you can put them together for around \$60 in materials. And

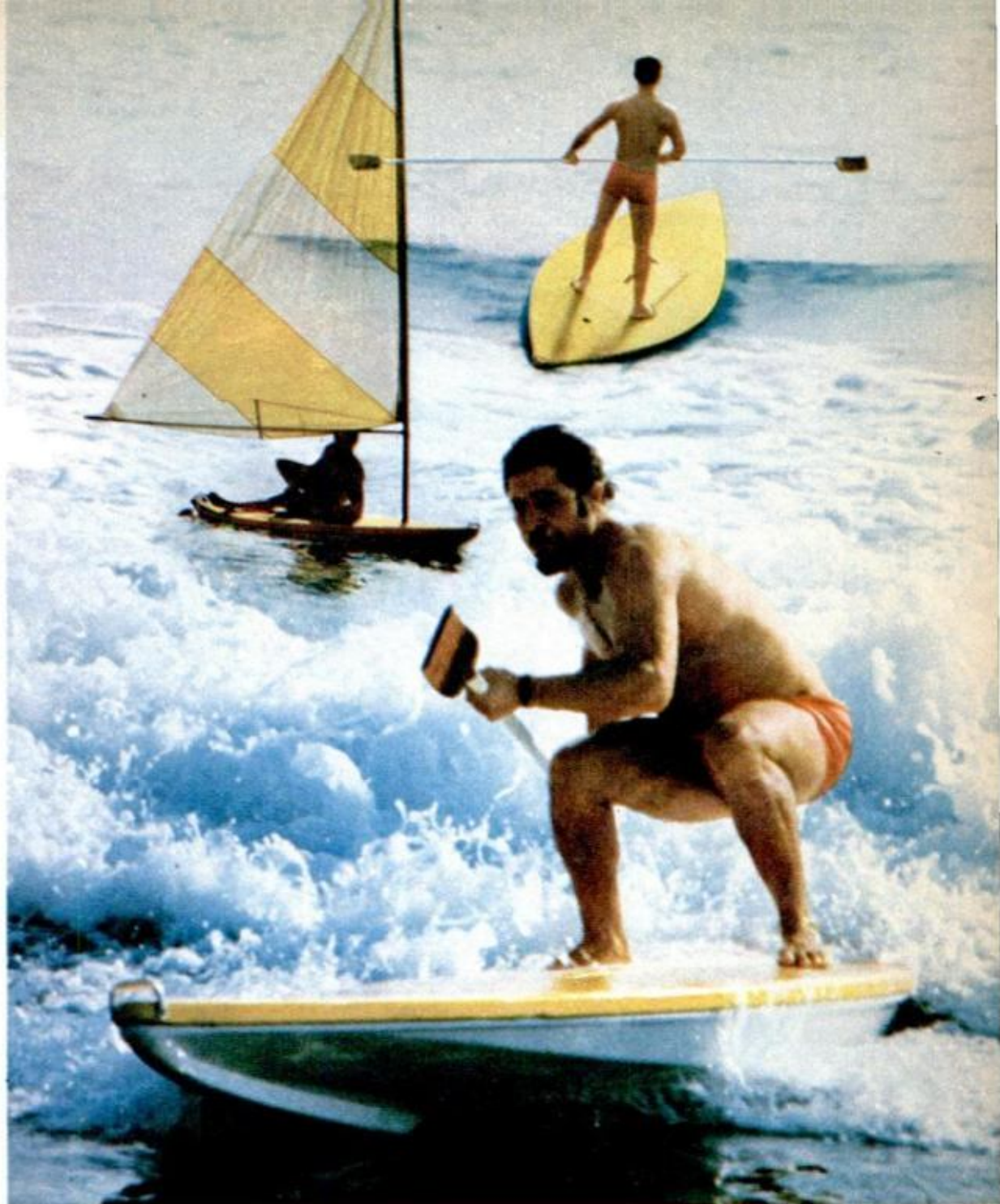


Heft them. You'll see that Stanley packs a lot of quality into its



you'll have a lot of pleasure doing it. To get the free plan, send your name and address to Stanley Tools, Dept. T1, New Britain, Conn. 06050.

STANLEY helps you do things right.



Three different ways you can use this unique 4x8-foot flat-hull craft at lake or beach. It weighs only 75 pounds, stores on end in corner of a garage and adds a whole new twist to surfboarding.

Surf Sailer you can build from PM plans

It's a sailboat, paddleboard and surfboard all in one for under \$150.

by Robert Q. Riley

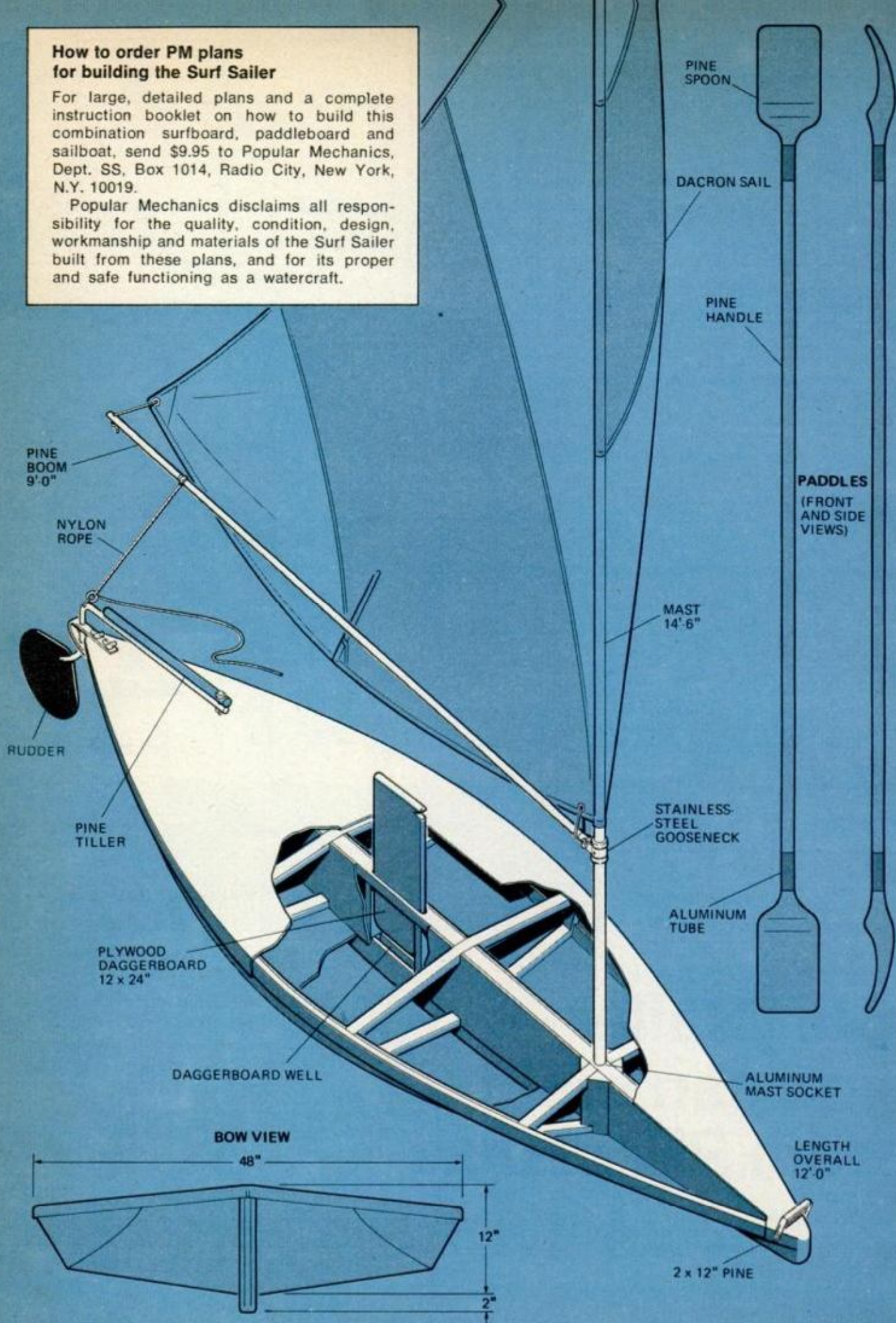
Paddleboards are one of the oldest means of transportation over the water and sails are one of the oldest methods of propelling a watercraft. Leon Halfon put the two together and the Patent Office granted him a patent on the result. The Surf Sailer (originally the Bot-N-Board) is a combination surfboard, paddleboard and sailboat that will add a new pleasure to your Sunday afternoons at the lake or beach. And when you return home, your only maintenance consists of hosing it off and standing it in a corner of the garage.

If you've never gone paddleboarding,

How to order PM plans for building the Surf Sailer

For large, detailed plans and a complete instruction booklet on how to build this combination surfboard, paddleboard and sailboat, send \$9.95 to Popular Mechanics, Dept. SS, Box 1014, Radio City, New York, N.Y. 10019.

Popular Mechanics disclaims all responsibility for the quality, condition, design, workmanship and materials of the Surf Sailer built from these plans, and for its proper and safe functioning as a watercraft.



you're in for a whole new water sport. "The paddleboard has its origin in Africa," says Halfon. "There they ride their paddleboards in a kneeling position, using a single paddle to move the board through the water." With Surf Sailer you stand on the board and instead of the conventional paddle, use a 9-foot pole with a strange-looking wooden "hand" on each end. By dipping one end and then the other in the water, you can paddle at about jogging speed.

If you are an accomplished surfer, you will probably find the Surf Sailer a little tame for surf. But if you've wanted to try surfing and don't want to embarrass yourself by falling too often, the Surf Sailer will make you look like an expert. The board is larger and heavier than the conventional surfboard and consequently more stable. With just a little practice, you can paddle through six-foot surf standing up. When you spot your wave, turn around and ride it to shore using the long paddle as a rudder.

The paddle eliminates the need for the dangerous skeg used on other surfboards. You surf with the paddle handle against your hips, letting the paddle trail in the water. With rudder, daggerboard and sail assembly removed, the board is completely free of any lethal hardware.

You want to go sailing? Slip in the mast and the daggerboard, attach the rudder bracket with two bolts, and in less than three minutes you can set sail directly from shore. At Malibu, Calif., the Surf Sailer is the only boat allowed to launch directly from the public beach. Rigged for sailing, she handles the wind and water like a veteran. Barely 12 feet long and weighing a mere 75 pounds, it skims through the water with very little wind. The Surf Sailer carries up to three people, but she performs best with two aboard. If you use the craft to teach yourself to sail, you will probably get blown over a couple of times before you learn. If you feel you are going over, you need only let go of the boom stay line and the sail will automatically dump the wind.

If you happen to capsize, the board won't sink; the hull is a completely sealed unit. To right it, stand on the side molding, grab the daggerboard and use your weight to flip it over. Once you learn the art of sailing, you will find the Surf Sailer very stable in the water with instant response to the tiller.

"I like to dive for lobster or bass," says Halfon, "and the Surf Sailer makes an ideal

(Please turn to page 166)



Attach the rudder, add the daggerboard, slip in the mast, and in less than three minutes you can be sailing the Surf Sailer directly off the beach.



Single bolt attaches the rudder to the tiller. When rudder strikes the ground, it pivots upward without damage, lets you ride sailboat right up onto beach.

Tough little biplane built for two

Wild enough for aerobatics, yet safe enough for novices, this unusual side-by-side open-cockpit two-seater is fast becoming one of the most popular homebuilts you can make from plans.

by Sheldon M. Gallager
and Howard Levy



You have to look twice to be sure you aren't seeing double. But there, sure enough, are two pilots sitting side by side in a single-cockpit biplane—a rare sight for an open two-winger of nostalgic vintage style. The plane is the Wichawk, an unusual homebuilt designed by veteran aeronautical engineer Dave Blanton. It's named after its birthplace—Wichita, Kans.—the home of many other famous biplane designs.

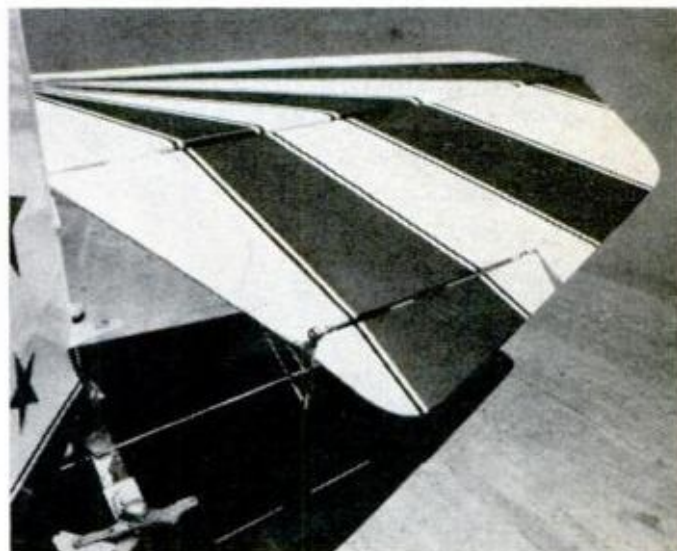
Blanton arrived at the idea for his novel double cockpit through simple, basic logic: Since horizontally opposed engines are 'by nature two people wide, and since the engine determines an airplane's fuselage width, why not also make the cockpit two people wide? The result is convenient dual-control, side-by-side seating that offers more flying companionship than a tandem arrangement, as well as easier instruction for the beginner. It also provides roomy baggage space behind the cockpit—not possible in tandem jobs. Blanton must be doing something right for nearly 100 Wichawks have already been built, and plans for several thousand more have been sold to prospective builders.

The Wichawk is reminiscent of the historic Stearman PT-17 World War II biwing trainer, though it's smaller (about $\frac{3}{4}$ scale), faster and considerably stronger. Fully aerobatic, it's stressed at an incredible 12 Gs positive and 9 Gs negative—enough to permit it to perform any maneuver an airplane is capable of. Powered by a four-cylinder, 180-hp Lycoming engine, it will, in Blanton's words, "run off and leave a 300-hp Stearman like he's tied to a tree." While top speed is officially rated at 140 mph, the ship can hit up to 180 mph in a power dive without coming apart at the seams.

Blanton's aim in choosing the biwing configuration was to provide maximum performance and ruggedness for the competition pilot as well as safe, easy handling for the novice. The biplane's natural stability, high lift, low stall speed and quick responsiveness serve both purposes well. Blanton should know. In his 30 years of aviation experience, he's racked up an impressive list of accomplishments, including the first autopilot for lightplane use, long-range fuel systems for record-breaking endurance

Wingless Wichawk, looking a bit like a plucked chicken, shows heavy engine firewall and strong tubular-steel fuselage construction. Central top wing section contains 25-gallon fuel tank.

Steep takeoff angle (top photo, below) proves Wichawk's ability to get off the ground fast—actually within 150 feet. Note wheels set well forward to prevent any tendency to nose over in landings. Center photo below shows geared antiservo trim tab control in right-hand elevator.



Photos: Howard Levy

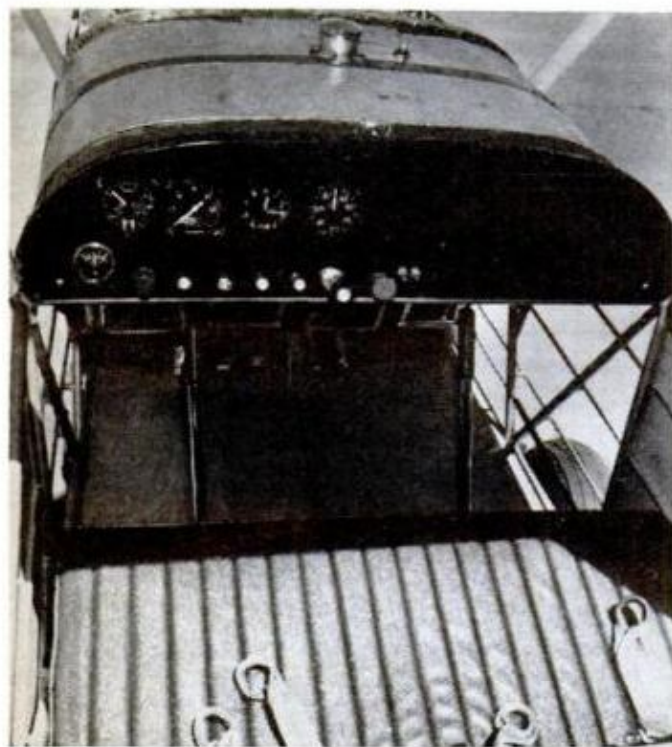
flights and the initial research work on Jim Bede's revolutionary BD-2 and BD-4 prototypes. The Wichawk is the culmination of these three decades of aeronautical ingenuity. It is both wild and tame at the same time. For the beginner, landing speed is a mild 45 mph. Takeoff distance is a mere 150 feet—half the distance of a football field—so you get up fast.

The ship is difficult to get into trouble with because even in a stall, only the upper wing stalls—the lower wing remains flying. For this reason, the ailerons are located in the lower wing so they continue to give positive control at or near stall speeds. Cruising speed is 127 mph; rate of climb, a zooming 1700 feet per minute, with a service ceiling of 19,000 feet. Two fuel supplies—a 25-gallon tank in the center portion of the upper wing and a 15-gallon tank in the nose—provide a total of 40 gallons and a range of 500 miles.

In addition to side-by-side seating, the Wichawk incorporates a number of other thoughtful design touches. The wheels are set well forward to permit panic braking without danger of nosing over. The engine firewall is especially beefed up to withstand the shock of a thrown prop blade—a mishap that can shake a plane to bits in seconds before there's time to cut power. In the Wichawk, shock destruction stops at the

firewall, enabling you to make a safe emergency landing. The rudder pedals are of the hanging stirrup type with toe brakes, keeping floor area neatly clear of obstructions. The wings are arranged to give maximum visibility in all directions—even in inverted flight, you can still see the horizon, normally blocked off by the up-tilted top wing. If you want a second cockpit, you can add one in place of the after baggage compartment, converting the Wichawk to a three-seater tandem biplane—another unusual design. And if you don't go in for wind-in-the-face flying, you can stick on a bubble canopy.

Construction is basically fabric over wood and metal framing. Wingspan is 24 feet; overall length, 19 feet, 3 inches. The wings have a constant chord of 50 inches. Empty weight is 1280 pounds; gross, 2000. Estimated building cost is \$3500, allowing about \$2200 for the engine. With a cheaper rebuilt engine, it's possible to get the cost below \$2000. Construction time averages 2000 hours, which Blanton admits is a lot but says is well worth it considering what you come out with—one of the finest all-around aerobatic sport planes that can be had at any price. His plans sell for \$125 from Javelin Aircraft Co., Inc., 9175 East Douglas, Wichita, Kans. 67207. Precut wing ribs and welded parts can also be purchased to simplify assembly. ★★★



Wide cockpit seat and twin sticks are shown above and at right. Center lever between sticks is trim control. Instrumentation looks skimpy, but actually includes everything needed for VFR daylight flying.



Out on the street the trike can't take on the big road hogs, so keep to the lanes and byways and always wear your helmet.



Sport trikes go street legal

They started out as fun vehicles, but now they're a good way to do the chores and save gas for the family car!

By Jake Grubb

Tricycles are put aside by most persons sometime before the age of seven. But now there's a tricycle for adults. Motorized trikes are becoming increasingly popular for commuter use, shopping and all-purpose utility. They started as ATVs (all-terrain vehicles) that could scale hills, run over sand, track through mud, crawl over rocks—do anything a dirt-going motorcycle could do but without the risk of tipping over.

Today there is a good crop of three-wheelers to choose from, with more and more being converted by their manufacturers for street use. Several companies are already offering street trikes that reach speeds of over 50 mph and get gas mileage comparable to that of mid-sized motorcycles. Fifty miles per gallon is not unusual. All street commuters presently available are single seaters. Most are modified ATVs that are suitable for both on and off-road use. A small number, however, are specialized road

machines that generally have taller gearing than the ATVs, more power, lower body profile and also extra cargo space that most dirt models do not have. Their prices generally reflect these added luxuries.

Laws governing usage of mini trikes for street transportation to date, are those that apply to motorcycles. Legally these trikes are classified as motorcycles. They must have a high/low beam headlight, taillight, a battery ignition system which allows lights to stay on when the engine is not running, rear-view mirror and in some states, turn signals. EPA noise pollution requirements are the same as for motorcycles (86 dbA until 1976), and the continuing governmental controversy over motorcycle air pollution is currently as indefinite for three-wheelers as for two-wheelers. Suffice at this writing to say that two-cycle engines appear more threatened by legislation than do four-cycle engines.

There have been isolated complications with street legality due to differences in regulations among the states. Alsport's RTS-SL for example, is "street legal in some states"—48 to be exact. Obscure technicalities such as a minimum 23-inch seat height requirement in New Mexico eliminate legality in that state because of its lowered profile. Concerning these problems, sport trike dealers from state to state, at the request of manufacturers, are making special efforts

to become aware of restrictions affecting their respective lines. In rural areas many trikes are being run as "farm tractors" using reflective triangles on the rear!

Basic design of existing three-wheelers can be grouped into two categories: the "sit in" type and the "sit on" variety. The "sit in" format incorporates a low-slung backbone frame, bucket seat set low and in front of the rear wheels and an engine mounted just in front of the rear axle. The "sit on" format is like that of a motorcycle. Most manufacturers have chosen this format because of its carlike comfort and lower center of gravity.

Off-road recreation as the original premise of the sport trike is good enough reason for ownership. But recent applications include uses for business commuting, daily shopping and other errands, plant surveillance and economical weekend travel. Because of their low retail cost, low maintenance, durability, excellent gas mileage and compact size, motorized mini trikes seem to have almost unlimited additional uses for work and play. Here are some of the manufacturers and their products:

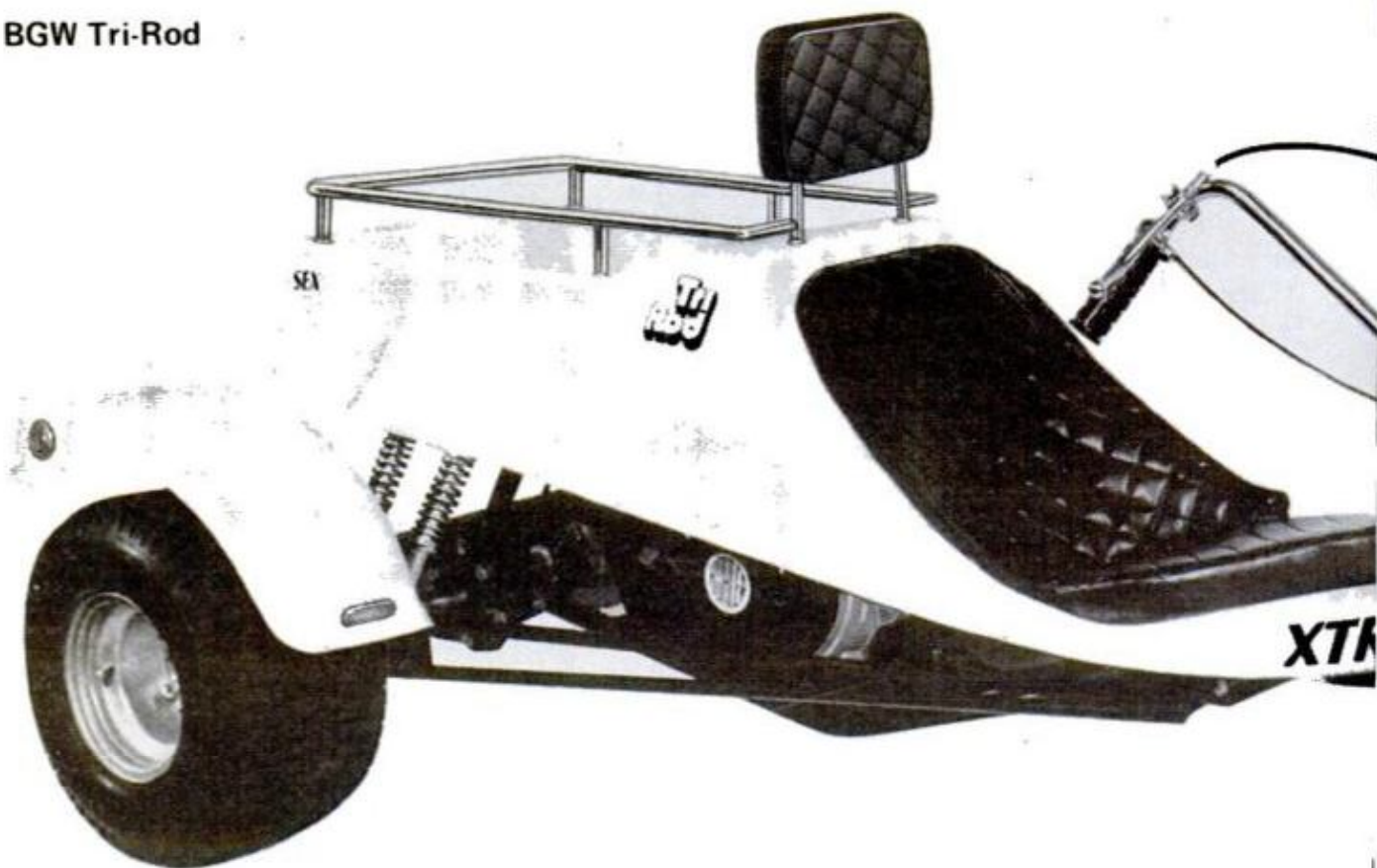
BGW. The RL-20 Mini Pickup features hydraulic disc brakes, headrest, integrated

cargo carrier and full independent suspension. Available with choice of four engines, it can be a conservative commuter or a powerful performer. Automatic transmission, calibrated speedometer and optional electric starter round out the RL-20 and also apply to Tri-Rod dirt/street models. Priced from \$600 to \$1200. Contact: BGW Industries, Box 1683, Mansfield, Ohio.

Dunecycle. The Mohave 500E boasts 27-hp from a durable Kohler 295-cc two-cycle engine. Three-way independent suspension incorporates heavy-duty leaf springs and automatic shocks on the rear; hydraulic shocks with "leading link" action at the front forks. Large hydraulic discs, front and rear, make for efficient stopping and an argon-welded heavy-wall tube frame with T-bone structure insures superior strength. Dunecycle is presently nearing completion of a street model based on the 500E. Key differences include tires suited for pavement, a 10-inch spoked front wheel and a fiberglass body encompassing engine cover, seat and gas tank. Price of the 500E is \$1100 (\$1350 projected for street version). Contact: Dunecycle, Box 2967, Santa Fe Springs, Calif. 90670.

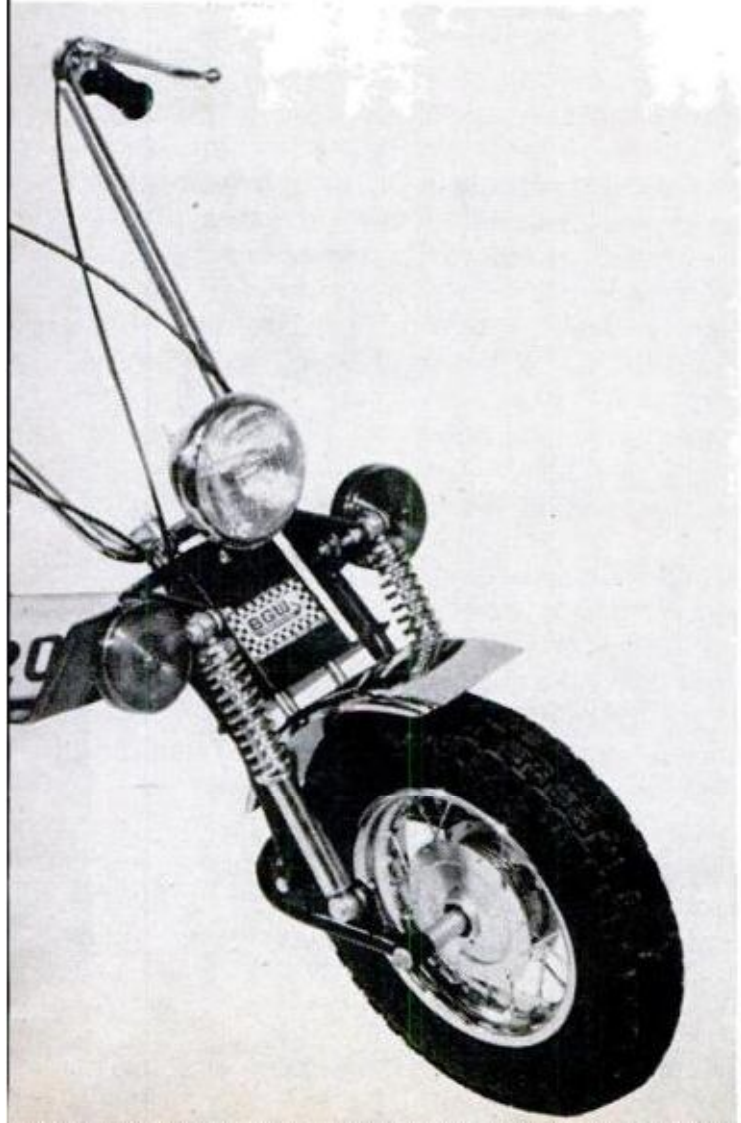
Explorer. Explorer's 800R comes fully

BGW Tri-Rod





Rupp's Centaur was designed from the ground up as a street machine. It should start coming off Rupp's assembly line as this issue of PM reaches the newsstands.



Heald SST

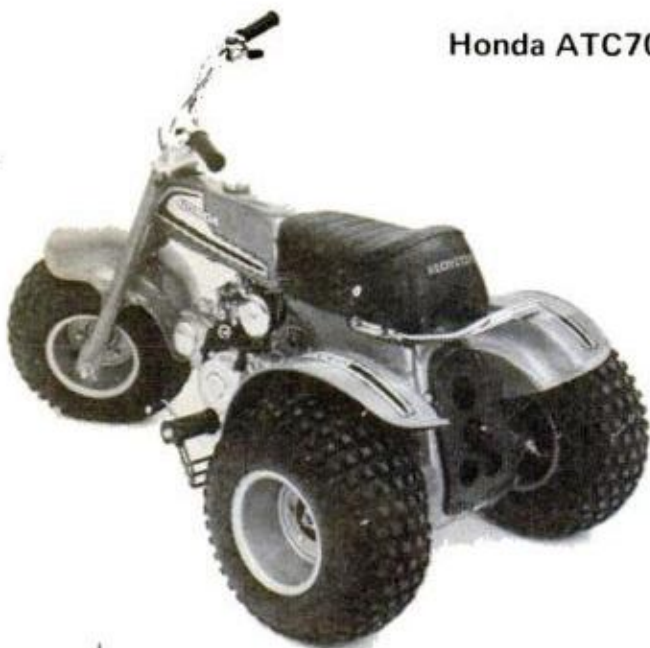


Explorer 800R

equipped for the highway as well as off-road. With turn signals, mirror, horn, high/low beam headlamp and electric starter, no modifications are necessary for application to commuter use. A four-cycle Tecumseh engine supplies eight-hp to the rear wheels for a top speed of 50 mph. The 800R is capable of getting over 70 miles per gallon. It's \$730. Of seven models in the Explorer line, a 23-hp rotary-engined trike is scheduled to be the newest and most exotic street model. Now under final testing, it is a Sachs rotary-powered luxury mini for the demanding three-wheel cyclist. Contact: Owosso Explorer Corp. Box 177, 1415 West Oliver St., Owosso, Mich. 48867.

Heald. Sold only as kits, Heald ATV trikes are designed for easy home assembly. They are of quality construction at a very fair price. The new Heald SST has a two-cycle 295-cc Kohler engine, Comet torque converter transmission, high flotation tires, six-inch band brakes, thickly padded seat and three-way suspension. Options include a front ski, running-light kit, tote rack, auxiliary gas tank, windshield, electric

Honda ATC70



MTD Mudbug



starter and T-2 Trailer Kit. Many owners are modifying their SSTs for road use, which can be done by adding a Heald light kit plus standard street legal necessities. It's about \$400 set up for street. Contact: Heald, Inc., Box 1148, Benton Harbor, Mich. 49022.

Honda. Honda's ATC70 is an all-terrain three-wheeler with a straddle-type seating arrangement. A comparatively short 35.2-inch wheelbase and narrow 31.5-inch overall width render it quite small but compact dimensions aid loading and transport. With high-flotation 16-inch ATV tires and a low ground clearance of 3.5 inches, the ATC is a pure off-road vehicle. The \$450 machine is not currently highway orientated. Contact: American Honda Motor Co., Inc., Box 50, Gardena, Calif. 90247.

MTD. The offroad Mudbug is a clean-looking ATV with hefty construction. It comes with a choice of tires and optional accessories to fit the demands of individual owners. The popular Mudbug 722 comes standard with an 8-hp four-cycle engine, leading-link front telescopic suspension, adjustable front headlight, alternator and dual-disc rear brakes. Four MTD models range from \$500 to \$600. Contact: MTD Products, Inc., 5389 West 130 St., Box 2741, Cleveland, Ohio 44130.

Muskin. Tri-Cat from Muskin is an outgrowth of success in the manufacture of off-road minibikes. Widespread in popularity, the Tri-Cat is available throughout the United States with over 700 service centers across the country. Off-road versatility is this three-wheeler's primary asset. Racing is an essential concern at the factory for testing and improving the product. The basic Tri-Cat is powered by a 5-hp Briggs & Stratton engine, features front telescopic suspension, low-pressure ATV tires and a highly durable torque converter transmission. It's \$400. While not presently offering a street model, Muskin is considering its production. Contact: Muskin Corp., 225 Acacia St., Box 311, Colton, Calif. 92324.

Pacesetter. The WR-SP III is a heavy-duty trike built to withstand rough going. It's a "sit-on" type with a 9-hp Wisconsin Robin engine mounted between front and rear wheels. Rear suspension is of motorcycle swing-arm construction. Ready from the dealer for trail triking, farm work, landscape maintenance, hunting or back-country travel, optional accessories from Pacesetter make WR-SP III street legal at

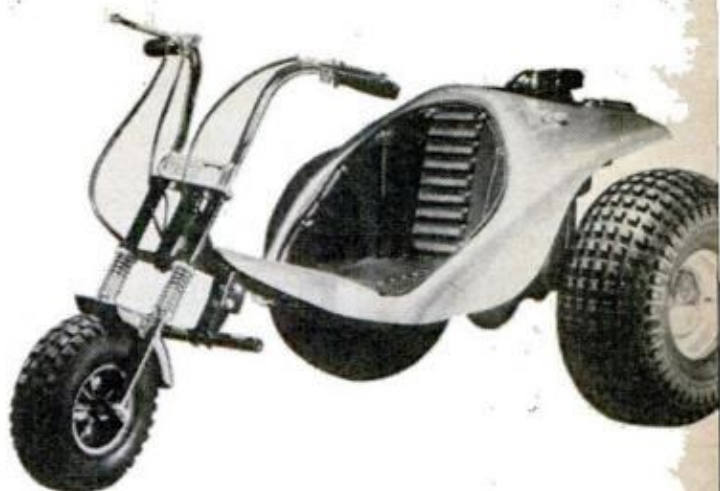
minimal cost. A 7½-horse model is also available. The machines are in the \$700 to \$800 range. Contact: Pacesetter Enterprises Inc., Cascade, Iowa.

Rupp. Well known for its durable, small-displacement minicycles, Rupp Industries now offers the Rupp Centaur, a three-wheel commuter. It is larger, longer and more stylized than contemporary three-wheelers and not derived from an ATV format. The Rupp, designed and built strictly for street use, features an automatic transmission with reverse gear, dual-beam headlights, side lights, fully adjustable automotive rear independent suspension and six cu. ft. of storage capacity with a locking door. A 340-cc Kohler two-cycle engine incorporates capacitor/discharge ignition and Mikuni fixed-jet carburetor. The Rupp's top speed is 55 mph. Windshield, padded headrest, tachometer and other important optionals are available. It's expected to be priced about \$1700. Contact: Rupp Industries, Inc., 1776 Airport Rd., Mansfield, Ohio 44903.

Snowco. Off-road three-wheelers include Super-Scat, Nomad, Tri-Scat, Farm-Scat and Mini-Scat. Of these, Nomad is a rugged cargo carrier, Tri-Scat is for the rigorous boonie rider, Super-Scat shines as a smooth-track performer and Mini-Scat is a tough 2½-hp trike for kids. All can be fitted with Snowco's full line of ATV accessories, including front ski for snow travel, folding overhead canopy, roll bar, tinted front windshield and foot splashguard. While no street three-wheeler is offered, Snowco's head and taillight kit help an owner make his own modifications for road riding. Snowco vehicles range from \$300 to \$800. Contact: The Snow Co., 4350 McKinley, Omaha, Neb. 68112.

Tri-Sport. Variety heads the Tri-Sport line. The 3-hp MTS 30 is an extra small mini for youngsters; 5-hp TS 110 and 14-hp TS 101 are economical off-road performers; the TS 130 is a durable 8-hp workhorse and the RTS 8 is a luxury ATV. Accessories such as the Alsport 2-Passenger Trailer and Alsport Cargo Trailer are items of added versatility. The RTS SL, Alsport's attractive street machine shown on the cover, features cargo rack, engine cowling, headrest, electric starter, tachometer, three-way independent suspension and rear bumper, plus standard highway necessities. Available with 290-cc or 340-cc engine the RTS SL is in the \$1500 range. Contact: Tri-Sport, Alsport, Inc. 84 Whittlesey, Norwalk, Ohio 44857. ★★

Muskin Tri-Cat



Snowco Tri-Scat



Tri-Sport RTS SL



Watch out for these career killers

Almost every shop, factory or office harbors a Lazy Albert, Cranky Cathy or other poorly motivated worker. Don't follow their example if you want to succeed in your job.

by Fred R. Howell

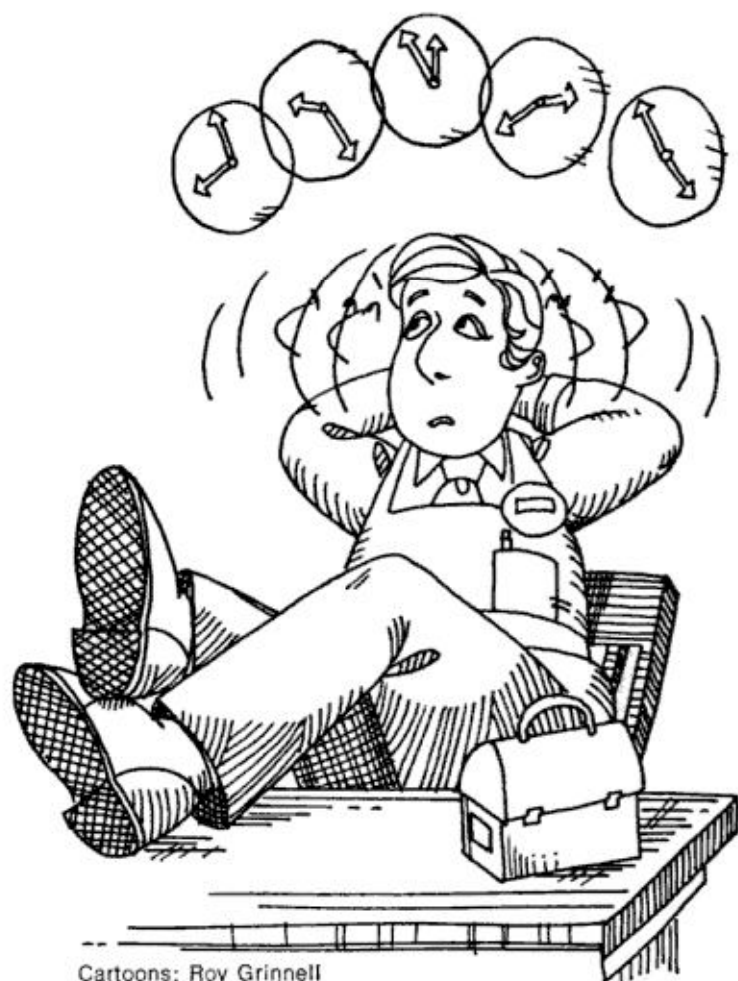
"Hear the latest? They're moving the plant to Texas." This information is imparted in a low, conspiratorial voice at the water cooler. The speaker is Troublemaker Ben.

"Texas? Oh my gosh!" You don't have anything against the Lone Star State, but the fact is that the plant presently is located in Hoboken, N.J. You've got a house in the suburbs, the kids are in school, you belong to a congenial car pool.

But the momentary fright passes. You know that Troublemaker Ben loves nothing better than a juicy rumor. If the plant isn't moving, it's closing down. Or the boss is about to be fired or the foreman demoted. At best, Ben is a questionable source of information.

Most every shop, plant or office has its Ben—and a lot of other characters, too. During 10 years' work in machine shops—eight of them as foreman—I came up against them all, from Lazy Albert to Cranky Cathy. Some were pretty good workers, others were not. What they all had in common was a rotten attitude.

You don't become a success in business or industry on ability alone. Attitude has a lot to do with it—and that's what this article is really all about. Whether you're just starting out or you've been working for a few years, you won't get far in your career if you emulate any of the characters



Cartoons: Roy Grinnell

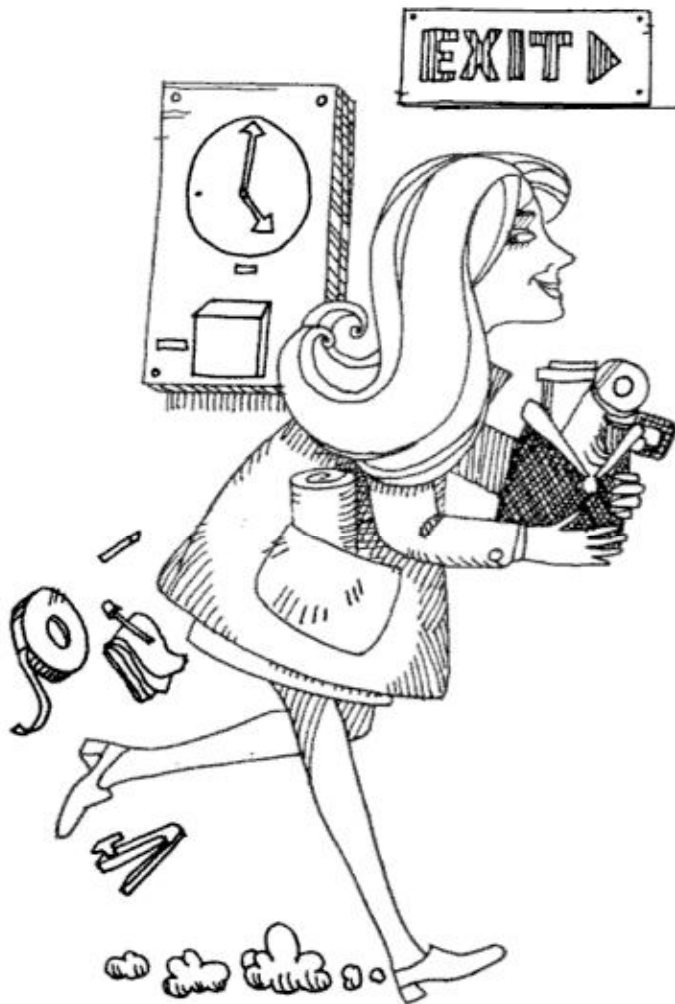
that make up the typical shop's rogues' gallery.

Consider Lazy Albert. Albert is a congenital fault-finder and a devout believer in never giving an extra minute's time to the company.

He never starts work until the bell rings in the morning. Then he takes his time getting his tools ready. Albert says that at the salary he's getting, the company is lucky he even shows up for work. To volunteer for extra work, says Albert, is out of the ques-

tion; to help a fellow worker, sheer madness.

If he does little else, Albert keeps a sharp eye on the clock. He's the first in line when it comes time to punch out for lunch or at quitting time. If the foreman asks Albert to put in half an hour of overtime to finish



his unit, Albert is sure to explode with rage. He is equally sure to remain just a line worker unless he manages to change his attitude.

Then there's Takehome Alice, who regards anything not nailed down as a potential company benefit.

She takes home paper towels and soap from the ladies' room and doesn't bat an eye when the poor janitor is confronted by other female workers demanding to know why he can't keep the ladies' room properly stocked.

Tools also have a way of disappearing around Alice, whose husband maintains a well-equipped home workshop. This creates friction among co-workers who must spend time looking for a missing wrench or gauge. But you can be sure that Alice will scream

her head off if one of her tools disappears.

At lunch you sit next to a dour gent I'll call Last Job John. Give him half a chance, and he'll spend the lunch hour telling you how great his last job was compared to his present one.

His last job offered a better medical plan, more insurance and more holidays. He got a bonus darn near every three months, was paid for jury duty and got a cash present on his birthday.

John claims he didn't have to work half as hard at his last job as he does here. Sometimes he even stayed home and had a friend punch him in and out. On the job, he likes to tell the boss how they did it in his last shop. He is so engrossed in the line he is peddling that he doesn't listen to the foreman's instructions. Result: John's work is lousy, his reject rate high.

If you ask John why he left his last berth, you get nothing but vague answers.

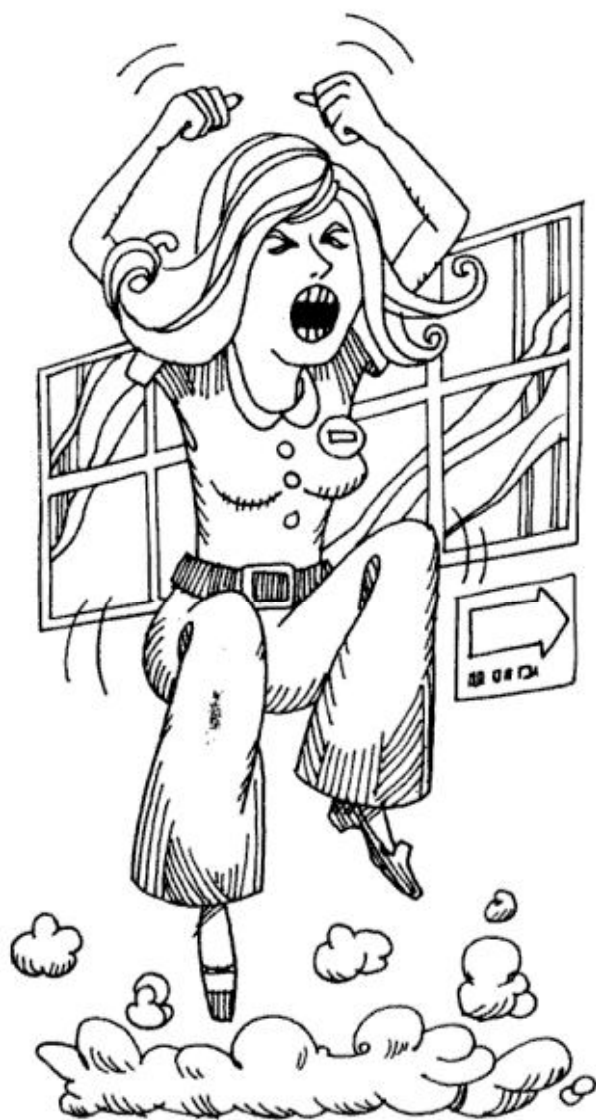
Every company has a Bitter George (a close relative of Last Job John). George claims the company is cheap, pays low salaries and hires mean bosses. His slave-driving boss, according to George, is unfair and bent on getting every ounce of work he can out of his men.

George is especially bitter about the fact that he's been passed over for promotion several times. What he fails to explain is that many a morning he comes in heavy-eyed and yawning. He's addicted to the late-late show on TV and doesn't seem to



come awake till it's near quitting time. His work output is not spectacular.

Troublemaker Ben, on the other hand, is an excellent worker and makes few mistakes. (That's how he keeps his job.) But



don't listen to anything he has to say unless it's about how to use a particular tool or handle a certain project.

Poor old Charley made the mistake of listening to Ben. One day Ben took Charley aside and said, "I hear you're going on the night shift."

But before the boss could inform Charley that he was in line for promotion to lead man on the night shift—with a good increase in salary—Charley stormed into his office and shouted he was not about to be buried on the night shift. They'd better find themselves some other chump to take over that slot.

The boss was flabbergasted by Charley's outburst, and Charley was chagrined when

he got the full story. The thing Charley didn't get was the promotion.

Gabby Gus probably would not have fallen victim to Ben's rumor mill, for Gus is too busy talking to listen to anyone else. To hear him tell it, he has all the solutions to the world's and the company's problems. On his way to the supply bin he is sure to talk to at least two people, slowing them up or, possibly, causing them to ruin a job.

A two-minute trip for anyone else takes Gus ten minutes. The foreman has to spend part of his day telling Gus to get back to work. And if Gus works next to you, you'd better wear ear-stoppers.

Cranky Cathy is a different story. She can go for days without talking to her fellow workers. She's easy to offend. As a result, she's avoided by most of the people in the shop.

Woe betide the poor soul who sits at Cathy's place in the cafeteria or uses a company tool that Cathy has earmarked as her own. Ironically, she has no idea how her attitude and actions alienate co-workers.

I haven't described all the types in the typical shop's rogues' gallery. Work long enough and you're certain to run into others.

The main thing is not to let a Bitter George or Troublemaker Ben influence your career. Stick to your guns, do your job as you see it. Here are some other positive things you can do:

Be friendly and listen to fellow workers, but don't adopt their negative attitudes or poor work habits.

Judge your foreman, the boss and the company by the way they treat you. Don't be swayed by loose shop talk.

Read company booklets and other publications. Learn for yourself about benefits such as holidays, sick time, pension rights, profit sharing and the like. If there is something you're not clear about, go to the personnel department or ask your boss.

If you hear a rumor that bothers you, ask your supervisor for the facts. If it's possible, he'll give you the straight scoop.

Steer clear of office or shop politics. The surest way to gain advancement is by doing your job and showing a willingness to take on added responsibility. And when you've been promoted on your own merit, you're beholden to no one but yourself—a most comforting thought. ★ ★ ★

How to groom your dog like a pro

by Lee Coe

Grooming and clipping your dog yourself is a good way to save money and keep your pet looking his best at all times. Though your dog may act disgruntled or skittish during a grooming session, he'll feel like a million afterwards. And he'll show it.

Clipping and grooming by a pro costs as much as \$15 in many areas. But by investing in a few tools and learning some basic know-how, you can save that fee and still do justice to the good characteristics of the breed.

For example, an unclipped poodle looks like a rag mop; appealing perhaps, but certainly not the dandy the name conjures up. In addition, unkempt hair can cause runny eyes, infected ears, sores from mats that irritate the skin, and offer a haven for fleas, lice or ticks.

Smooth-coated breeds such as certain hounds and bird dogs are the easiest to keep well groomed. All that's needed is a medium or soft-bristled brush. A vigorous daily brushing with the lie of the hair will remove dust and loose hair, and distribute the natural oils that keep your pet sleek and shiny. A grooming glove with a rough, rubberized palm also does a good job.

Long-haired dogs require a stiff-bristled brush and a metal dog comb that has medium-spaced teeth with rounded tips. Begin at the tail and brush vigorously against the lie of the hair as you work forward, taking care around sensitive areas. You may have to do this several times before you have loosened all the dead hair. Finally, comb the hair the "proper" way.

If yours is an outdoor dog that luxuriates in dust or sand baths, even a good brushing may not bring back the shine to his coat. A bath will do the trick, but too frequent bathing removes the oils that keep a dog's skin healthy. A bath once a month should



A basic grooming tool is a metal dog comb with medium-spaced teeth rounded at the tips.

keep him handsome and socially acceptable. There are dry shampoos that also do a good job, but they contain ingredients that are very drying to the skin and thus shouldn't be used too often.

This type of grooming is all that's required for so-called "natural" dogs, which do not need clipping to bring out their typical conformation (the general appearance of a dog characteristic to the breed). Setters, curly and smooth-coated retrievers, and other long-coated dogs are given this simple grooming.

Breeds requiring special clipping to bring out their conformation are cocker spaniels, the longer-coated terriers and poodles.

You may save yourself money if you have an old pair of electric barber clippers around the house. But the blade will not be coarse enough to clip a heavily haired dog. If there's a barber supply house in town, take your clippers with you and ask for the *equivalent* of a No. 15, No. 10 or No. 5 dog-clipping blade, depending on the breed you want to clip.

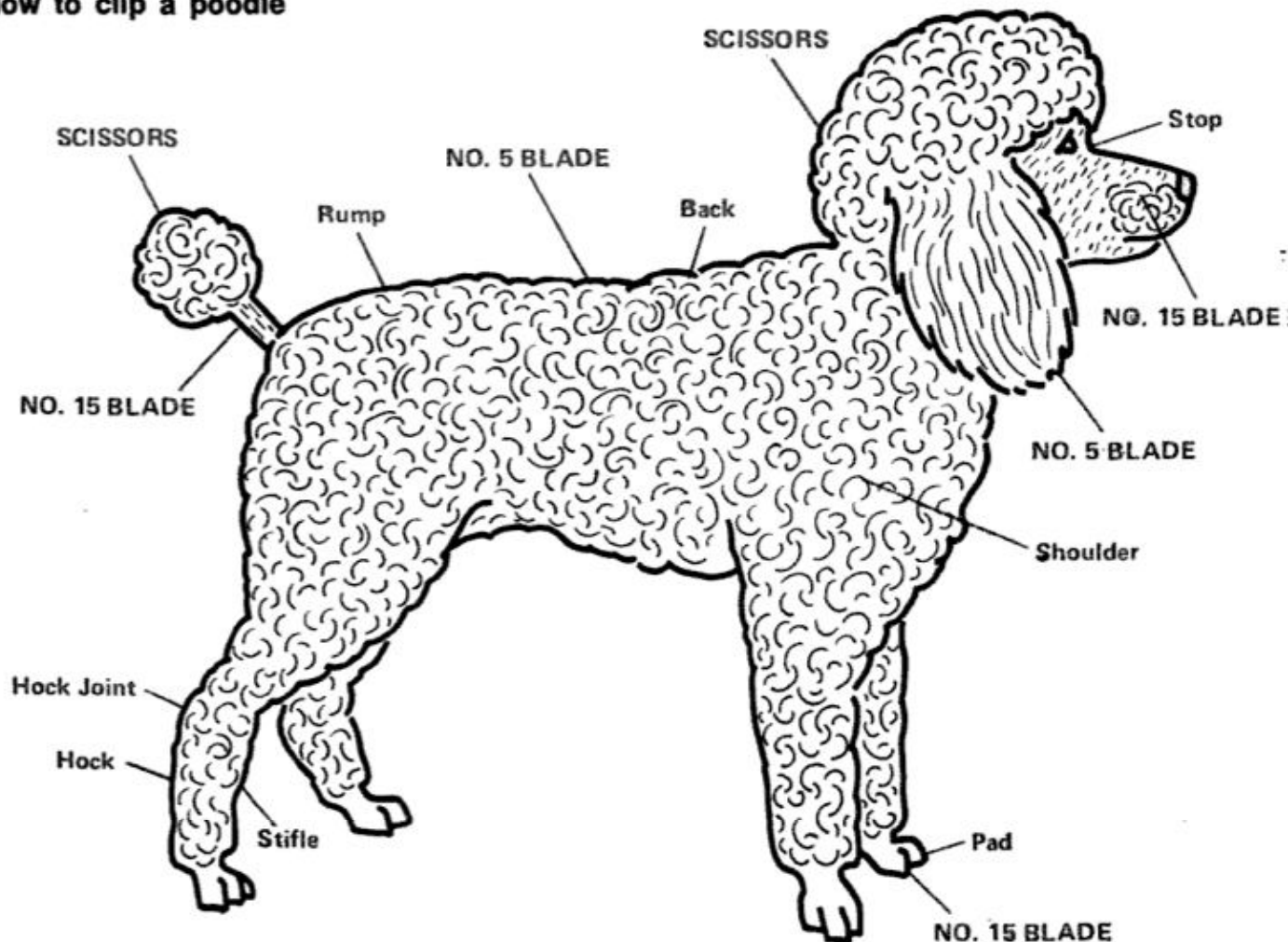
The No. 15 and No. 5 blades are for poodles, the No. 10 and No. 5 for cockers and terriers. Blades cost from \$6 to \$8.

Dog clippers run from about \$30 to over \$60 for a heavy-duty model. If you're hesitant about investing in new clippers right away, you may be able to rent a pair at a tool-rental shop. Rates range from \$2.50 to \$4 for a 24-hour period.

Bathing your dog can be a pleasant experience for both you and the animal—if done properly. Small dogs can be bathed in

(Text continues on page 89)

How to clip a poodle



A poodle does not shed its coat, nor does the coat ever stop growing. Some poodle owners, stymied by high professional grooming fees, permit their dogs to grow a coat so dense and matted that grooming becomes almost impossible.

A kennel clip—as opposed to a complicated show clip—can easily be done by the amateur. It is attractive on any of the three sizes of poodle and is easy to care for. The No. 15 blade is used for all areas to be clipped very short, the No. 5 blade for the rest of the coat.

Using the No. 15 blade, you clip the entire face and part way down the throat, shaping a “V” on the throat. The cheeks are clipped from the outer corner of the eye up to the base of the ear and into the “V” on the throat. The topknot begins at the eyeline, save for a tiny inverted “V” clipped between the eyes. The topknot is combed out and scissored to produce a “half ball” configuration that covers the eyebrows in front and blends smoothly into the neckline in back (rather than being cut to stand out from the neck).

The feet are completely clipped from just below the dewclaw. (Most poodles have their

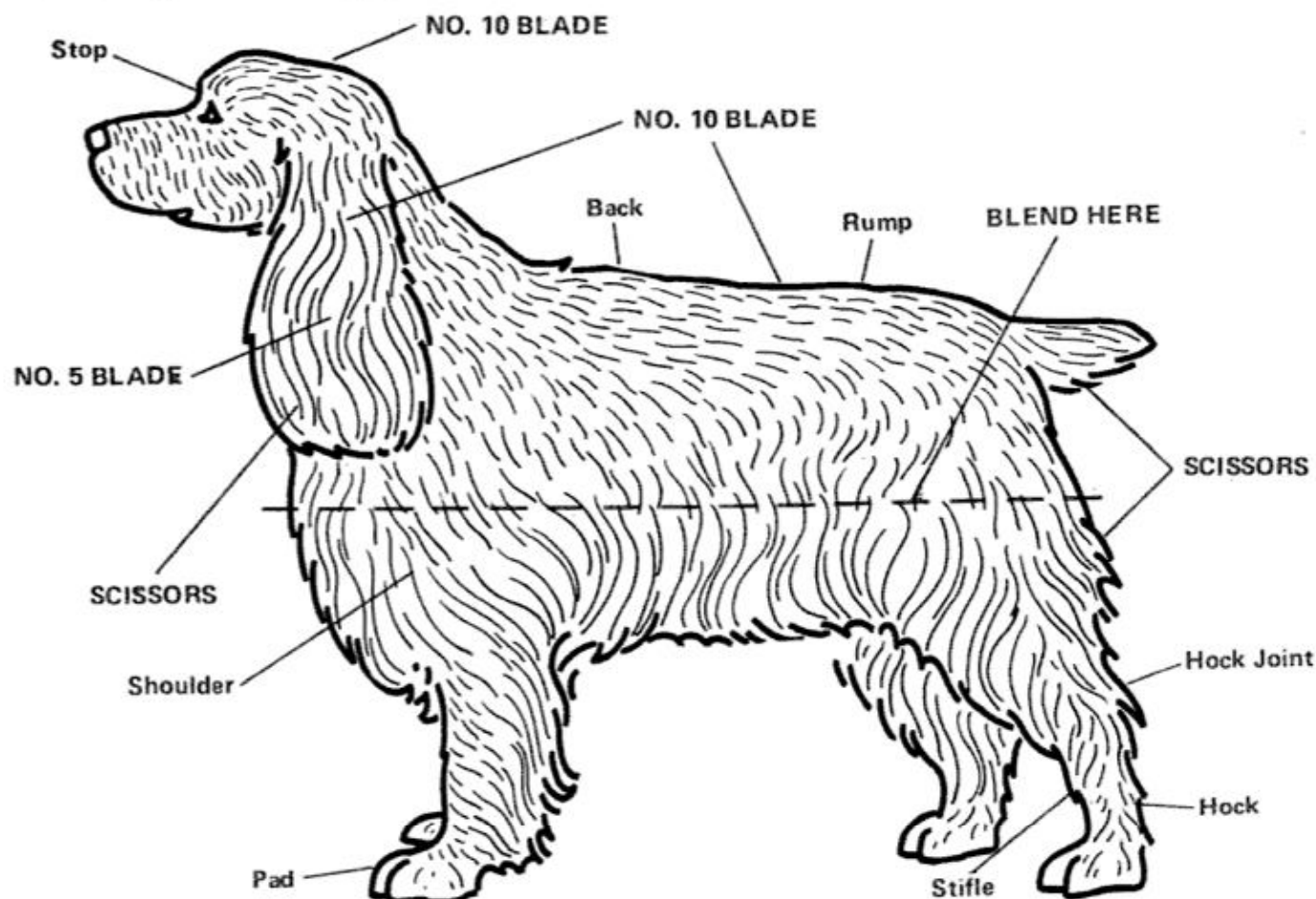
dewclaws removed, on both front and rear legs, when the tail is cut as a pup.) The tail is clipped all around to within about half an inch of the tip, leaving a puff of curly hair. It is combed and then shaped with scissors into a ball of fluff.

The dog's coat is clipped by going with the lie of the hair to avoid chafing. Be sure to clip the inside of the thighs and the lower abdomen.

It is always necessary to bathe and thoroughly dry a poodle after clipping. Then the coat is combed out and any straggles cut with scissors. In combing, press the comb into the hair and against the skin and pull it straight out. This will fluff the hair and give the desired puffy look to both the tail and topknot.

The hair growing inside the ears should be removed to prevent infections. Use your fingers to pull out the hair, holding the ear—folded open—with one hand and plucking a few hairs at a time with the other. Alternate ears to minimize discomfort. This procedure is not really painful, and once the dog has become accustomed to it, can be done at a single session.

How to clip a cocker spaniel



If not clipped, the cocker's profuse coat will be continually matted and his handsome face covered with shaggy hair. Using the No. 10 blade, the face, head, neck and back are clipped, going with the hair wherever possible. Pulling the skin smooth will help prevent clipper burns and cuts, and permit a cleaner cutting of the face. Clip under the chin and down the throat, blending into the feathers on the chest.

The neck and back are clipped to the widest part of the body, where the hair is blended into the long hair of the belly (broken line on drawing). Blending isn't difficult. As you approach the area where blending begins, tip the clipper blade away from the coat while continuing to follow the line of the body, moving smoothly into air where the body curves inward.

The top of the tail is clipped and the feathers on the underside are scissored, tapering from the base of the tail to the stub tip. The ears are clipped down about an inch from the top of the head with the No. 10 blade; then the No. 5 blade is used. The long hair on the ears' edges should be combed away from the ear and cut with scissors to leave about an inch of hair, curving the cut with the shape of the ear. The

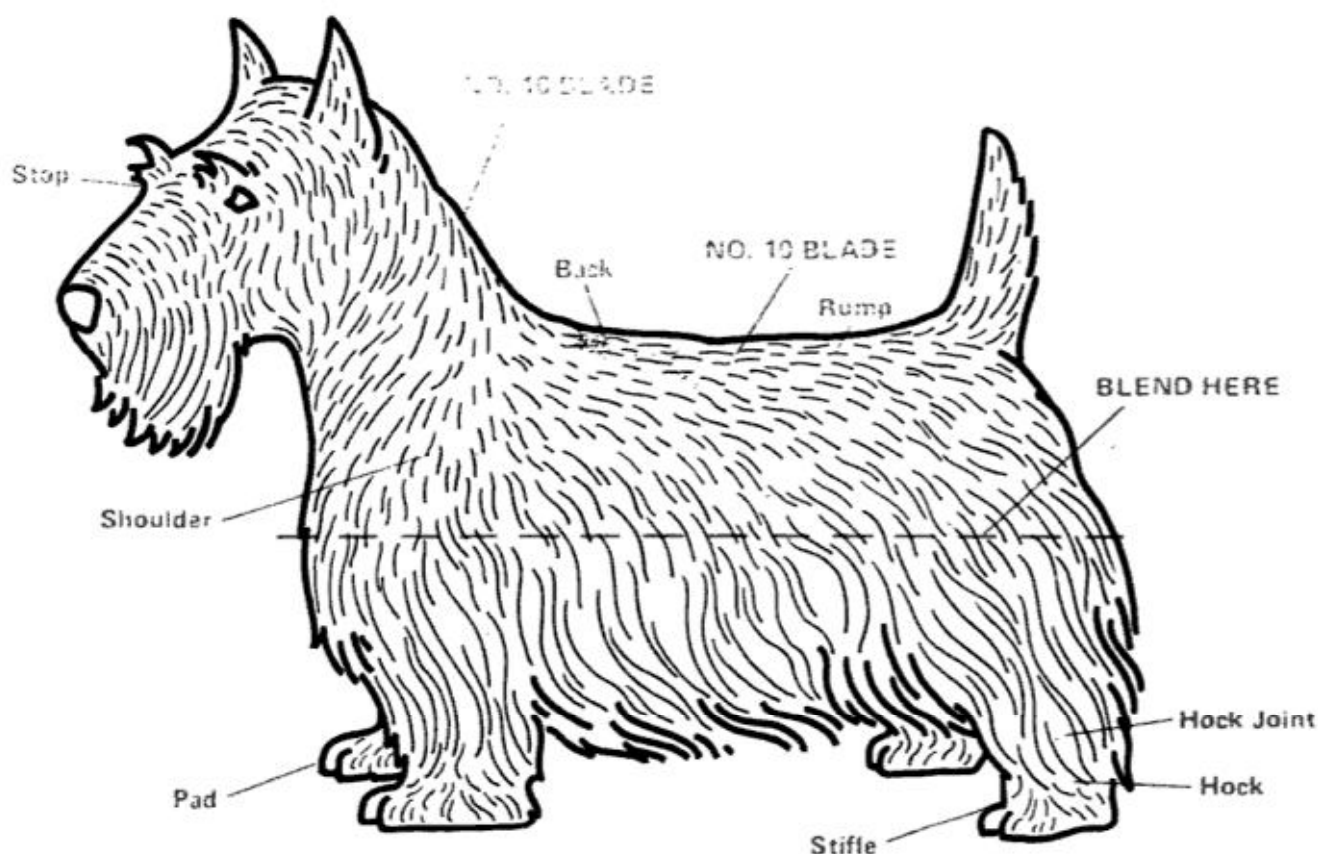
inside of the ear leathers is clipped with the No. 5 blade and excess hair clipped from around the ear opening to allow air to get inside.

Many cockers have chronic ear infections because there's not enough ventilation to keep ear canals dry.

The hair on the legs is combed out from the leg and scissored. The stifle (knee) has a lot of hair that can be clipped quite short with scissors without spoiling the cocker look. The heavy thigh hair should be combed out and scissored; so should leg hair below the hock.

Using scissors, trim the feet while the dog stands four square. Cocker spaniels have heavy hair growing between the pads of their feet. This hair should be clipped out to prevent mats that can make the dog lame. But remember that spaniels have partially webbed toes; take care not to cut the skin. Either the No. 10 or No. 5 blade can be used to clip the hair between the thighs to help avoid mats. With scissors, trim the belly feathers to correspond with the hair left on the backs of the front legs. Blend the chest hair into the belly feathers. After the dog is clipped, bathe and dry him. A good combing will reveal any uneven places that need further trimming.

How to clip a terrier



Terriers with wiry coats—the wire-haired terrier, scottie, Irish terrier, Sealyham and Airedale—are clipped in a similar manner. Only the No. 10 blade is used.

Going with the lie of the hair, clip the top of the head, leaving the eyebrows. Then clip the cheeks, starting just in back of the lips. The top of the nose is clipped out from the "stop." The neck, throat and back are clipped with the hair down to the widest part of the body. At this point, it is blended into the longer hair.

The top of the tail is clipped, the rest scissored, tapering slightly toward the tip. Clip under the tail around the anus, blending into the thigh hair.

The idea of blending is to avoid an abrupt change from the short hair of the back and the long hair left on the rest of the body. The longer hair should begin at the same level (broken line on drawing) on the chest, shoulders, sides and thighs.

The eyebrows are combed forward and scissored to a length that permits them to stand out, not hang, tapering to the outer corner of the eye. The whiskers are combed straight down over the lips and jaw. With

scissors, trim the front whiskers straight across to a length of about one and a half inches. Then turn the dog's head and cut whiskers to angle up toward the corner of the mouth.

The front leg is scissored so that the hair bristles rather than hangs. The leg should appear straight up and down from all angles. The paws are trimmed as the animal stands four square. The hair on top of the feet is combed up, cut and blended into the hair on the front of the leg. If this is done correctly, the terrier will appear to be standing on his toes.

The hind legs are scissored to follow the line of the stifle (knee) in the front of the leg. The thigh feathers should be trimmed to a length that covers the point of the hock (the lower leg joint that corresponds to the ankle in man). The leg below the hock is trimmed in the same manner as the front legs.

The underline of the body is scissored to correspond with the way the legs have been clipped. Whether your terrier has erect or cocked ears, they should be clipped with the lie of the hair on the outside and along the sides so the edges are sharp and clean.



Electric clipper, extra blades, nail clipper, scissors and rug remnant on workshop bench convert a basement into a grooming parlor. If the floor has drain, larger breeds can be bathed standing on floor. Smaller dogs can be accommodated in sink or laundry tub.

Clipper equipped with coarse blade is used on coat. It's important to cut with the lie of the hair to avoid chafing and nicking of skin. You may save extra money if you already own an electric barber clipper.



a sink or washtub. With larger breeds you may have to resort to the lawn or the basement floor, if it has a drain. Use a spray attachment on your hose.

The dog should be restrained with a piece of rope so that he can't dash off in the midst of the proceedings. Stuff cotton in his ears to keep water out and apply base eye ointment to protect his eyes from the shampoo. Pull out the lower lids and squeeze a line of ointment on them, then gently rub lids to spread ointment over the eyeballs.

The dog should be wet thoroughly first, then lathered with shampoo—a regular "people" shampoo is best. Rinse the animal well. When the coat feels "squeaky clean," its time to use a cream rinse. Always rinse thoroughly, so that no soap residue is left to irritate the dog's skin.

Smooth-coated dogs can be towed nearly dry. Larger ones with long hair should be permitted to shake themselves well first. Then they, too, should be towed. Some types of electric hair dryers can also be used for the final drying. Once dry, the animal should be combed out and trimmed where needed.

Some other grooming tips:

- The dog's nails should be clipped as often as required. White nails show a pink line in the center—the "quick." The nail should be cut below this line so the blood vessel won't be injured. You must use more caution with black nails, in which the quick is not readily apparent. Remove a little at a time, and cut nails more frequently. Styptic powder will staunch blood in case of a slip.
- If your dog has dry hair or skin, use lanolin hair dressing. Working against the lie of the hair, apply the dressing with a massaging action. A dry coat may result from a diet lacking in fat. If you're feeding your dog a dry food, add bacon grease, steak fat or salad oil to each meal.
- Fleas, ticks or lice can be killed with a medicated shampoo. Follow directions carefully, for the shampoo can be toxic to the animal.
- In a tick-infested area, comb long-haired dogs and do a "hand" check of short-haired breeds daily. Check particularly behind and in the ears and between the shoulder blades, places the dog can't reach very well.
- Terriers and poodles should be clipped about every six weeks. By that time the coat will have grown out, but the pattern you have established will still be obvious and easy to follow.

★★★

Best bicycles and gear for commuting, shopping and touring

PM's bike expert, author of *The Complete Book of Bicycling*, picks the equipment you'll need to go just a few blocks—or many miles.

by Eugene A. Sloane

Whether you ride for short trips shopping around town, commute to work or take long-distance tours, the bicycle can be your route to glowing good health. And a bicycle can be a very practical, fuel-saving means of transportation.

There are, however, bicycles and bicycles, from the one-speed, coaster-brake model to the 10 or 15-speed \$400 ultrahigh-performance machine for distance touring and camping trips. Actually there are bicycles within this broad range best suited to each of these diverse uses. For example, you wouldn't (or shouldn't) use a Rolls-Royce to run down to the store, but it would be ideal for long trips. A reverse twist, in bicycles, would mean you should not use a heavy coaster-brake bicycle for long trips, but it would be ideal for short runs in town, where it would not be a disaster if it got rained on or even were stolen.

Given such varying requirements in bicycle usage, I have selected bicycles and related accessories and equipment for each basic use: utility cycling, commuting and for distance touring and camping. Since some of the accessories—such as lights—can be used in all types of bicycles, I will mention them only once.

I should point out that I am not necessarily in favor of your owning three types of bicycles. If you're a beginning cyclist who

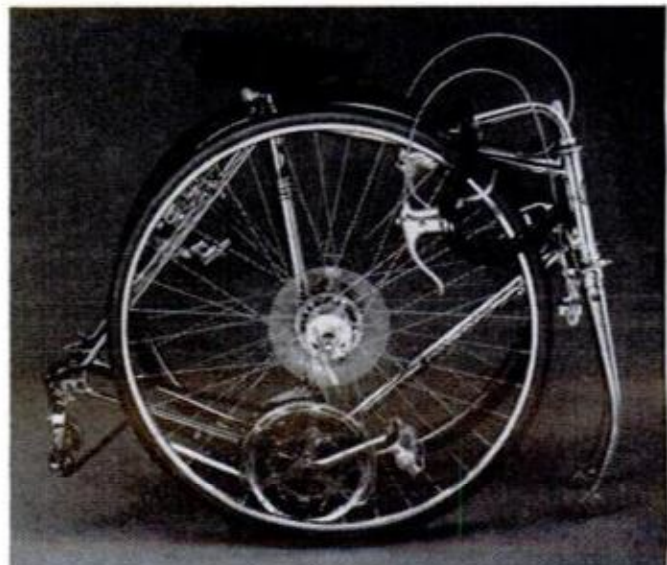
wants a bike for short trips, you may never get beyond the coaster-brake, one-speed bike stage. However, within even the utility bike category, you should be able to buy a sturdy, reliable machine for well under \$100. If you begin to take longer trips, such as commuting to work five miles or more (even up to 15 miles one way), you will need a better bike with at least five speeds. You'll want something even better for touring.

Bicycles for around town

Auto-use research shows that the average distance driven each time a car is started is five miles or less (barring long trips). A utility type bicycle will do just as well, and, with trailer attached, can bring home the groceries. Here are my selections for utility, around-town bicycles:

DBS Oglænd Kombi Lux, \$135, is my first choice. Although this bicycle is above my price bracket for utility bikes, it is so utilitarian I have made it my first choice. This is a two-speed model, in case you have hills to cope with. I found this model, at around 35 pounds, light enough so it could be toted up stairs. Since it is easily taken apart, it can be stored in comparatively little space, so it is ideal for the apartment dweller. Or, you could keep it in the trunk of your car.

The Kombi has excellent brakes, an internal expanding hub brake up front, internal coaster-brake rear, which means you can stop safely even in the rain since both brakes are weather-protected. Lights should be easy to install since there's built-in internal wiring for front and rear lights. Best of all, it comes with a large wire



This commuters' Gitane Get-Away can be disassembled in minutes, stored anywhere in its own carrying bag.

Commuting

Photos: Stephen Fay



Gene's selections for the well-equipped bicycle commuter include: Schwinn SlacJac compact rain suit (photos, top left), which can be worn as a coverall or as a jacket with the pants rolled up in the jacket waist. For safety, rider at left wears Romer helmet, Gladd reflective body and leg bands and Schwinn strap-on light on arm (or leg). Bike has reflectors by Bright Star, front light by Wonder Corp. For convenience, Cannondale front and rear bags are quickly removable, carry rain suit, extra tire tube, bike tools and personal gear. Gitane bike quickly comes apart, can be stuffed into its bag, stored next to desk or work area. Above: quick release on Gitane handlebars and saddle (and wheels) speeds disassembly of bicycle.

JUNE 1974 91



rear-mounted carrier plus a removable front-mounted basket. Its short wheelbase and small 20-inch wheels make the Kombi highly maneuverable in city traffic.

The saddle and handlebars are the quick-adjust type. The Kombi comes with front-light mount, handlebar bell, pedal and rear reflectors and all-purpose assembly tool. The importer is Intersport, Inc., Box 1241, Bellevue, Wash. 98009. (L.L. Bean also sells it. Write L.L. Bean, Freeport, Me. 04032.)

Schwinn Speedster (men's) or Breeze (women's), \$74.95, my second choice, comes as a single coaster brake or as a three-speed. I have selected the three-speed. This is a no-nonsense, sturdy bicycle which, as a three-speed, has front and rear caliper brakes, sturdy wheels with 26 x 1 $\frac{3}{8}$ -inch tires. The one-piece crank needs little maintenance, and the entire unit is built to last. Frame sizes are 17, 20, 22 and 24 inches for men and 17, 19 and 21 inches for women. At 38 to 40 lbs., not exactly a lightweight, but very adequate for utility cycling. Schwinn Bicycle Co., 1856 North Kostner Ave., Chicago, Ill. 60639.

Huffy Model H6888, \$84.75, third choice, has the unique Tokheim 5-10-speed trans-

mission. It's really a five-speed, but with gear ratios as broad as those found on a touring 10-speed. Really too heavy, at 42 lbs., for touring, it is ideal for utility cycling. The transmission system works like a dream, shifts under power even when hill climbing. It's a safe five-speed too, because even the most determined child or klutzy adult can't mis-shift or cause chain hang-up. You can even shift down to a lower gear while at a standstill.

I would have given this bicycle first rating, but it isn't yet on the market. (I have ridden a test model at length.) Some will be available this summer, with a general supply scheduled for January. Men's frame size is 22 inches; women's, 19 inches. The bicycle has front and rear side-pull caliper brakes and 26 x 1 $\frac{3}{8}$ -inch tires. Saddle is mattress type and a luggage carrier on the rear is standard. Maker is Huffman Manufacturing Co., Box 1204, Dayton, Ohio 45401.

The new Tokheim transmission is a major step forward in safety, gear ratios and durability over coaster brake or multispeed internally geared hubs.

Accessories and equipment

Since the most frequent use for a utility bike is going to fetch things, it makes sense to consider how to carry groceries, small hardware items and children. I believe a bike-mounted child carrier is dangerous. With a child on the handlebars steering is awkward. If the child is in a carrier over the rear wheels, balancing is a bit easier, but still awkward.

By the same token, you can get heavy and ungainly wire carriers for each side of the bike, but again you're unbalanced.

I strongly recommend you get the most out of your utility bike by using a two-wheel trailer made for towing by bike. (I don't like one-wheeled jobs; they tend to jackknife down-hill.)

The Cannondale Bugger BR-1, \$54.50, is the trailer I recommend. It can double as a garden cart as well as a child carrier. There's a separate plastic seat with safety straps to carry two or three small children safely. The optional seat is \$19.95, is model BC-18. The trailer itself comes with a hitch that is quickly fastened to or removed from the bicycle seatpost. It has a bag that zips all around, which I prefer for carrying groceries. With an open bag, the trailer is model BR-2 and sells for \$44.50. They're



Secure bicycles from thieves with these chains and locks. Clockwise, from the top: American Lock Co.'s $\frac{3}{8}$ -inch Super Foiler vinyl-clad cable and 601 padlock; Schwinn Bicycle Co.'s $\frac{3}{8}$ -inch vinyl-clad chain and lock; Ryco Howler, model H5; American Coiler model CC3146 with combination lock; Schwinn $\frac{3}{8}$ -inch Super Cable. Next to the cable is American's HT-16, a seven-pin tumbler, tubular-cylinder padlock.

Shopping

Drivers will see you when your bike has a Bike Safety Flag (right) by the St. Croix Corp. Safest way to carry kids (top right) is in the Cannondale BC 18 trailer with child seat and safety strap. Right center: A single master bolt lets you take apart—and reassemble—the Oglaend DBS Kombi Lux bicycle, which is recommended for general utility use. Below: You can carry groceries safely in the Cannondale BR 1 trailer, shown attached to the Kombi Lux utility bike. Short wheelbase and small wheels of the Kombi provide a highly maneuverable bicycle for city shopping. Note that the Kombi is fitted with a Wonder headlight and Bright Star reflectors. Added safety comes from dual braking system with its front hub brake which gives good wet-weather stopping power. (The rear brake is coaster type.) This bike has quick-release adjustments on the saddle and handlebars so you can quickly fit the bike to anyone in the family. A detachable, front-mounted shopping basket (not shown) comes with the bike.



J. Barry O'Rourke



made by Cannondale Corp., 35 Pulaski St., Stamford, Conn. 06902.

You might want to add a small handlebar or saddlebag to your utility bike to hold such things as a spare tube, purse, wallet, flashlight and other sundries. If so, check the selection in the touring and camping section.

TCS Steel Carrier, \$10, is my choice. I have toured with aluminum carriers; they're lighter, but a lot weaker, than steel ones. TCS's steel carrier is almost as light as an alloy carrier, and a lot better. Available from Tourist Cycling Shop, Box 4009, Boulder, Colo. 80302. You can also obtain a steel carrier from a Schwinn store for around \$6.

Safety equipment selections

If you ride at night, you need lights. You must make yourself visible to drivers; reflectors aren't good enough. If you ride at all, you should wear head protection. You may think you look silly riding a bike with a crash helmet, but you'd look (and feel) a lot sillier with a fractured skull. Bike accidents are at least keeping pace with bike sales. Finally, you do need reflectors. Some

states now require them, and they do back up lights that could fail.

Romer Helmet, about \$19, is a 17-oz. open-top helmet with a suspension system that separates the head from the plastic helmet shell. Made in Germany, designed for white-water canoeists, it's cool enough for hot-weather use. In winter, use any good light-weight motorcycle crash helmet with ear flaps. One light model is the Trooper Hat for around \$16.50 made by G/R Distributors, 3015 North California Ave., Chicago, Ill. 60618. The Romer helmet is available through sporting goods stores, or by mail from White Water Sports, Box 9406, Denver, Colo. 80209.

Wonder Bike Head-Lite, \$4.99 with batteries, is an excellent, light-plastic light that is best fastened to the head tube. It doesn't throw enough light to let you see where you're going, but it does do a fine job of letting motorists see you. I sprayed Day-Glo paint on my Wonder Lite and attached it to my seatpost, under the saddle. This makes a fantastic rear light. The importer is Wonder Corp. of America, Box 1402, 24 Harborview Ave., Stamford, Conn. 06902.

Snap-On Bike Lite, No. 522, \$3.99 less batteries, takes two D-cells. Heavier than the Wonder Lite above, it lets you see where you're going. It's made by Gulco Div., Bright Star Industries, 600 Getty Ave., Clifton, N.J. 07015.

Strap-on safety light, Schwinn 05-815, \$2.35 less batteries. Strap it on your left leg, and the up-and-down movement adds visibility. Can be used to read maps, but not to see the road. Amber lens for front and side visibility, with red lens rear.

Generator lights you should forget; they are heavy, don't work when you're stopped.

Rear light, No. 178124 Rampar (Raleigh Industries), \$3.95 less batteries. This is my preference for powerful rear visibility.

Bright Star Reflector Kit, \$2.95, is box of prismatic reflectors for front, rear and side visibility; also, if your bike should

(Please turn to page 170)

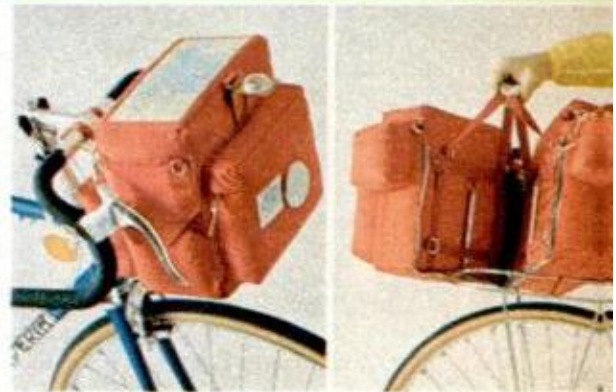


Whether you tour long distances or commute locally by bike, you should carry these tools and parts: 1. Adjustable wrench; 2. dumbbell wrench; 3. small screwdriver; 4. freewheel remover; 5. spoke wrench; 6. chain rivet remover; 7. brake pads; 8. tire irons (for wired-on tires); 9. spare spokes; 10. spare cable; 11. rim cement (for tubular tires); 12. patch kit; 13. bearing grease; 14. tube (for wired-on tire); 15. WD-40 chain lubricant; 16. spare tubular tire; 17. sticky tape for tubular tires (instead of rim cement); 18. rim tape for wired-on tires (to keep spokes from puncturing the wired-on tire tubes).



When you're on tour, you need to know where you're headed. These handy little compasses are liquid-filled, thin enough to fit into a pocket and can be used for map reading. They're made by Silva. Huntsman (bottom) pins to handlebar bag.

Touring and camping



Superia bike (top left) is Gene's choice with TCS panniers, Cannondale saddle and bar bags. Top to bottom (above): American Safety inflatable boat; Gerry Pioneer tent; Comfy Mt. Vista sleeping bag; Gerry Shortie pad; Gerry propane and Optimus gasoline stoves; L.L. Bean nesting cookware; first-aid and wash-up kits from L.L. Bean; TCS bar bag; TCS panniers (which zip together as single piece of hand luggage). Left: Boy in L.L. Bean warm-up suit uses Cannondale pack to bring groceries to campsite.

Re-siding: You can do it yourself

With two friends helping,
a PM staff member
re-sided this old house
in five Saturdays.

by Harry Wicks
WORKSHOP EDITOR



Mineral siding can be worked with tools most do-it-yourselfers already own. Shingles come in 4-ft. lengths and are available in nine colors. Above, author (right) and friend on scaffold. At right, first side is completed; work progresses on second level of front. Old gutters were torn down and replaced with new when siding work was completed. Below, close-up view of Stratalite Thatch Siding reveals handsome, woodlike texture.





Before and after photos taken during the first and last weeks of November. Original clapboard siding was cracked, blistered and peeling (turn page for close-up look). New siding enhanced looks, reduced fuel consumption.

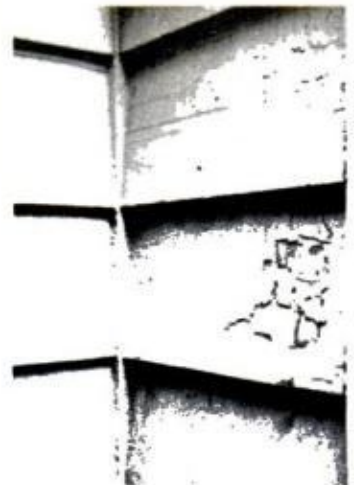
Like many homeowners, I simply grew tired of repainting my house every few years. That, plus the fact that I had the unrewarding experience of having paint blister, peel and scale within two years of painting—despite the hours spent in preparation and painting and the high-quality paint used—meant this was the year for me to re-side rather than re-paint.

There were several points to consider when choosing the siding:

First, I wanted my home to present a woodlike appearance that *did not* look factory-made.

Second, due to limited time and equipment, the installation procedure had to be

Why the job was necessary



Photos of old clapboard (above and top of facing page) reveal why paint no longer would do the job. Three before and after views were taken at ground

level; same conditions existed on upper levels. Two years previous, the bays between studs were vented, paint still deteriorated to condition shown.

Getting ready for the siding



First step is to remove all attachments such as shutters (left) and flowerbox beneath windows (center). Molding over soffit-wall joint is also removed. On

job shown, it was necessary to replace molding with a double layer of wood lath so profile of shingle courses remains unchanged from foundation to soffit.

realistically within the range of a do-it-yourselfer.

Third, also due to limited time, the siding had to be prefinished.

I briefly entertained the notion to let someone else do it for a change, but price quotes ran from \$3000 to \$5000, depending on the particular siding the contractor was pushing.

So I decided to do-it-myself, selecting Stratalite Thatch Siding S-120. Manufactured by GAF Corp., the mineral siding is available in nine colors. It comes in shingles measuring 12x48 in., and sells for \$36 per square (100 sq. ft. of coverage). Color-

matched installation nails and Kick-Strip undercourse (see photos, page 100) are included in the per-square price.

I measured the house for the total number of squares needed (arrived at by adding up the square footage of all walls and subtracting square footage of doors and windows) to do the job and came up with 20. I added 10 percent for waste and ordered 22 squares. Total cost of the job was \$1027. Broken down, costs ran \$792 for shingles, \$60 for felt, staples, galvanized nails and wood lath, \$75 for scaffold rental and about \$100 for metal corner trim, J-channel and the like.

Even using the lowest contractor price



Scarred siding was on all four sides of the house; corner at left is on west side, area shown in center is on the south. Last paint job (two years ago) con-

sisted of thorough scraping and cleaning, spot-priming with aluminum paint, alkyd primer and alkyd finish coat. Though quality paints were used, job failed.

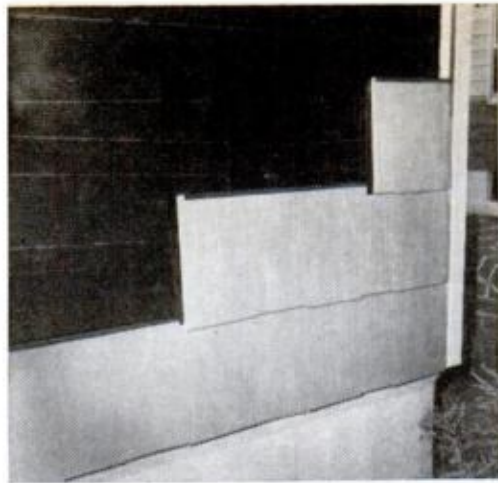
Applying the siding



Fifteen-lb. asphalt-saturated felt is stapled over existing siding (left). Next, where required for solid nailing, wood lath is nailed on below clapboard butt edges. Corner mold is then installed at both ends of wall run (right). To install corner, nails are driven through trim's flanges into the clapboard butt edges.

Double layer of wood lath is applied to bottom edge of lowest clapboard (below left). Center: First shingle is held by nail at right end, backing strip is placed beneath joint. At right, 4-ft. spirit level is used to level shingle and remaining three nails are driven home. Chalkline could be used instead of level.





On first course, Kick-Strip Undercourse—GAF's system for obtaining an architectural shadowline under butt edges—is placed on top edge of shingle before shingle goes on house (far left). To assure staggered joints, a full (48-in.) shingle is used to start first course; half and quarter-length shingles start second and third courses respectively (near left). Procedure for starting remaining courses is then repetitive.

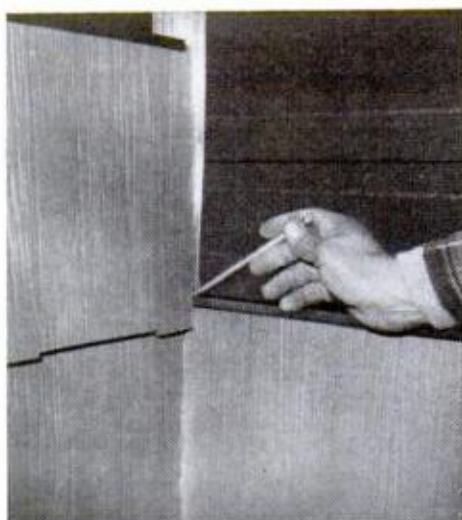
Fitting siding around windows and doors



Before shingles go up, J-channel is installed on all casings around windows and doors (see drawing, facing page). As you come to a window, shingle is held in

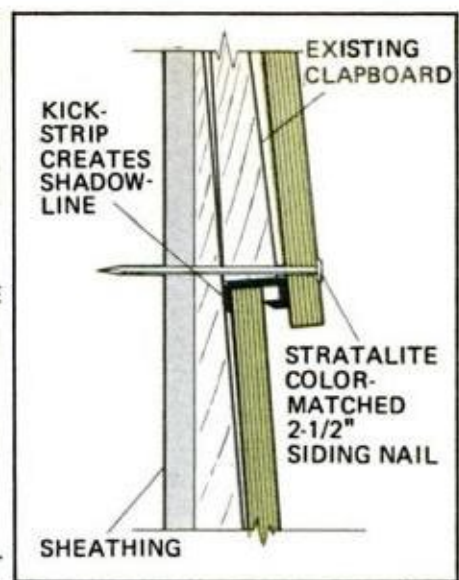
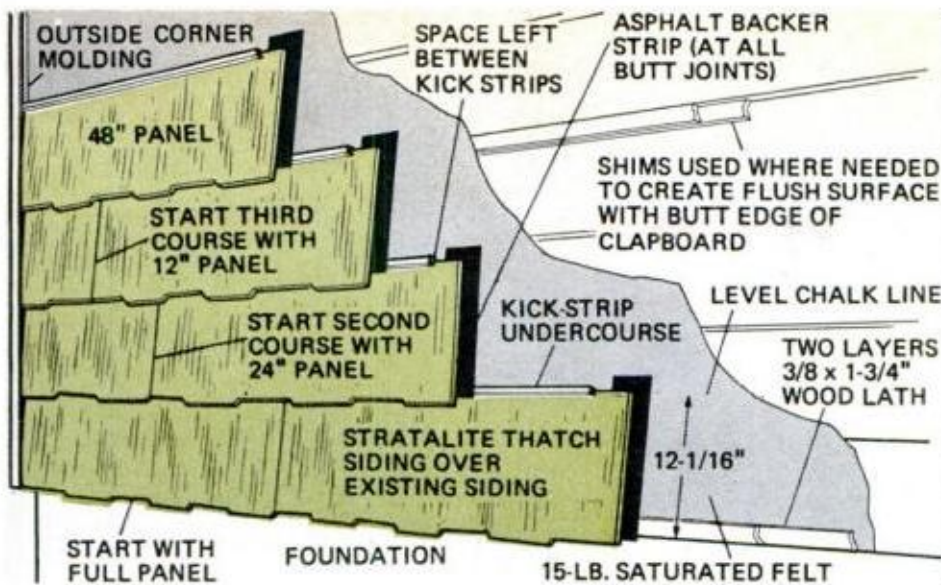
place and marked for cutting. Shingle can be cut regardless of notch size (photos left and center); door is treated in same manner as windows (right).

Scribing inside corners



After felt is stapled to existing siding, aluminum flashing is nailed at inside corner; this provides a "valley" for any rainwater seepage through finished joint.

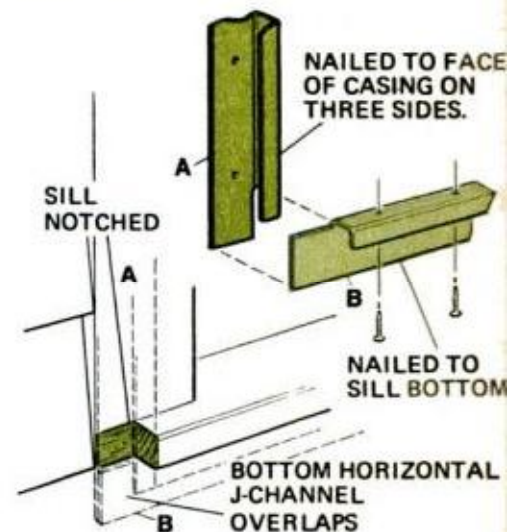
First shingle butts corner, must be notched to fit over Kick-Strip on shingle at right. Notch is cut using metal-cutting blade in a sabre saw.



J-channel is nailed to underside of sill; sill ends are notched to suit vertical channels which go up next.



Channel is installed using spirit level. Casing reveal (exposed width) should be the same throughout job.



All J-channel ends are notched; vertical (A) overlaps horizontal (B), shown by dotted lines.



Second shingle is held in place and scribed for custom fit. To see finished inside corner, see photos at top of page 99.

quote, which, it should be noted, called for material inferior to what I ultimately used, I saved about \$1973—well worth hustling for on five or so weekends.

As can be seen in the photos and drawings, the material is easy to work with. The trickiest part of the job is in applying the J-channel around windows and doors. But if a neighbor has recently had his house resided with aluminum, take a close look; most aluminum siding goes up using a similar system. Keep in mind that the bottom horizontal goes under the sill; thus sill ends must be sawn off for the vertical channels. The drip cap at top must come off too; J-channel replaces it. For more information and name of the nearest Stratalite Thatch Siding dealer, write Building Products Div., Dept. PM, GAF Corp., 140 West 51st St., New York, N.Y. 10020. ★★

Working with the materials



To cut metal corner moldings and notches (left and center), sabre saw with hacksaw blade is used. Shingle straight cut (right) is made from back using

carbide-tipped blade in circular saw. Shingle is fully supported by plywood worktable; blade is set to just clear work. Cutoff is made with waste cantilevered.



On cut, or notched-on-top-edge, shingles, Kick-Strip must be trimmed to required length. Plastic strips cannot butt one against the next because of expansion and contraction due to temperature changes. Strip is then slipped on top of shingle. On long runs (courses), it is not necessary to cut strips. After a course of shingles is up, simply slip strips over shingles, leaving at least $\frac{1}{4}$ -in. space between adjacent plastic strips. Cut the last strip to suit.

The finishing touch



When shingle must be cut, a slight white crack is visible at joint (left). Touch-up paint provided by GAF Corp. quickly conceals the joint. Nail-polish-

sized jar of paint shown was used to touch up entire house. For efficiency, carry paint in nail apron, paint joints as soon as cut shingles go up.

How to rent and work from scaffolding

by Harry Wicks
WORKSHOP EDITOR

Photos: Robert D. Borst

2

1



3

Unless your home is one story high, when you plan your re-siding job you should figure it will be necessary—and desirable—to rent scaffolding. Besides being unsafe, it is practically impossible to nail up most siding materials from a ladder. You need one hand (at least) to hold the materials, another to swing the hammer and a third for holding onto the ladder.

Though re-siding a house cannot be put in the “fun job” class, scaffolding will make the chore as bearable as possible because: 1) You can bring tools and worktable right to the job; this will eliminate time-consuming trips to tools when cutting and fitting. 2) Siding material can be brought up in sizable amounts and kept close at hand. 3) Most im-

(More photos on next two pages: text continues on page 168)

1. While work progresses on front (second floor), the scaffolding goes up alongside for safety and ease of corner shingling. Type used is called platform scaffold.

2. Once scaffolding is in place, materials for application on house front can be safely hoisted up via it and a ladder.

3. Last level of planking for two-story home is passed up so side can be finished. Safety grab rail goes on after planking is up.

Some scaffold safety rules

Below are some common-sense safety rules designed to promote safety in the use of steel scaffolding. They do not purport to be all-inclusive or to replace other safety rules intended for usual or unusual job conditions.

Always use adjustable screw-type plates instead of blocking to adjust to uneven grade conditions.

Always plumb and level scaffold as erection proceeds. Do not force braces to fit. Level and move scaffold until the proper fit is made easily.

Always fasten all braces securely.

Always use caution if erecting steel scaffolding near overhead power lines.

Always secure planking with nails where it overlaps on the scaffold run. Planking should be immovable.

Never use ladders or makeshift devices on top of scaffolds to increase height.

Never overload a scaffold. For weight limits, consult renter.

Never allow unsupported ends of plank to extend an unsafe distance beyond supports.



Ladder is used to reach peak at gable end. It, in turn, rests upon plank held by roof brackets fastened to porch roof.



Scaffold erection goes quickest if two men work together (left). In center photo, next tier is added so scaffold planks can be moved up for highest area.

Planks are placed on platforms and the safety grab-rail is installed. It's a must to use grabrail each end to prevent accidental walk off scaffold.



Roomy two-level setup lets you bring worktable and tools to job. Center: Adequate-width planking gives feeling of security despite height.

Insert-pin is used at all joints between end platforms. Pins are not "fixed" in legs, but simply slide in and out of the tubular framing.



Scaffolding required a bit of jiggering on this side of house because of cantilevered window section in rear. It took three men 20 minutes to assemble.



Middle tiers of platforms (center photo) go up simultaneously with end tiers. Right: Second level can be handled easily because man is on the ground.



Two pairs of diagonal braces are used between each pair of platform end frames. Until diagonal braces are secured, the insert-pins keep sections from falling.



Each pair of braces is connected and pivots at center. Once these are installed (see below) scaffolding is rigid, planking can go up (photo right).



Diagonal brace is slipped over stud on platform leg (left) and the brace-lock is tapped into lock position. Center: Brace stays put until you remove it.

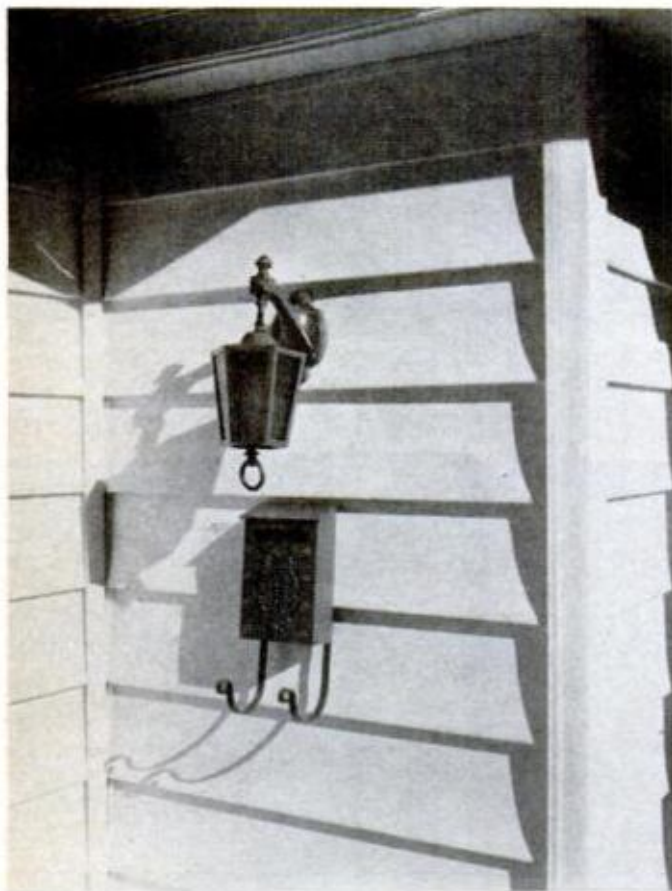


Because ground is level, rigid base-plates were used. If grade is uneven, leveling-type jack-plates must be used to keep scaffolding level, plumb.



Other siding products you should know about

More and more new products for home exteriors are appearing on the market. Here are seven types to consider.



Ideal for re-siding and new construction, vinyl clapboard (above) is made by Certain-Teed Products Corp. If you prefer wood, consider one of U.S. Plywood's prestained textured sidings (Oldbridge, right). They're available in 4x8, 4x9 and 4x10 sheets, and 26 colors.

Each spring, millions of Americans emerge from winter hibernation—ladder and paint bucket in hand—to start the annual assault on the exteriors of their homes. Most are justifiably concerned about how the house looks, because it's the exterior that is constantly on display.

The latest, and growing, trend in fixing up the house has been to cover unsightly siding and start afresh. Building product manufacturers are aware of this. Thus a larger-than-ever selection of siding material is now available.

There are six basic exterior sidings available to the homeowner: aluminum, asbestos, insulated (the type that closely resembles roof shingles), steel, vinyl and wood. On these pages several types are shown. Before making a final decision you should visit your local lumberyard to determine if yet another type of siding suits your home, taste and budget better.

Some questions to ask when selecting a siding: How does weather affect it? Which has a tendency to retain dirt and pollution's effects?

Also, consider which siding offers best insulation and termite protection if these are of concern in your locale. ★ ★ ★





2 1

California Redwood Assn. photo

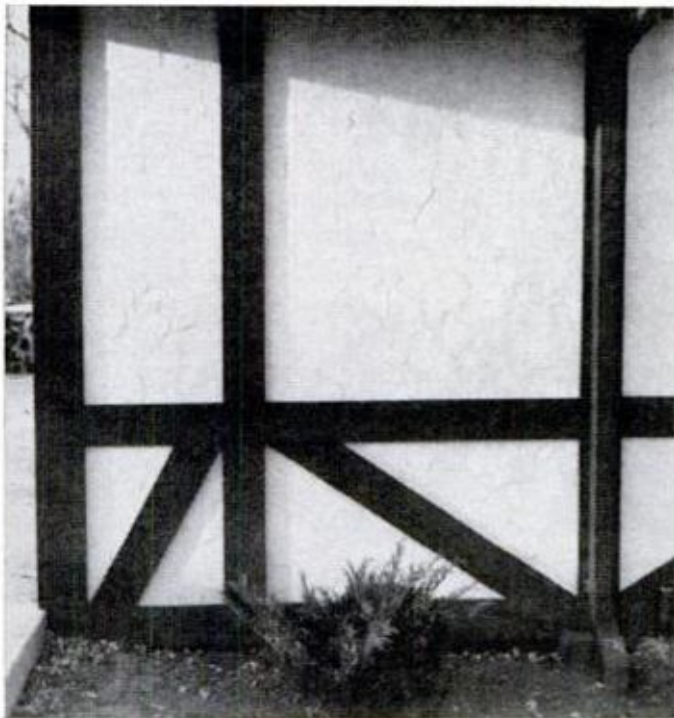


3

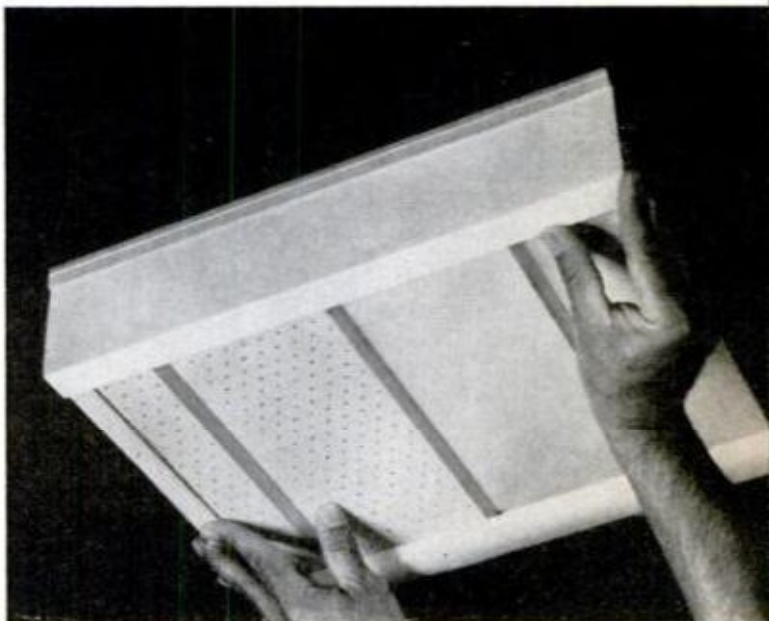
4



5



Material to suit every taste: 1. Redwood plywood, Inverted Batten pattern; 2. Stuccato siding, Masonite Corp.; 3. 4x8-ft. textured hardboard, Georgia-Pacific Corp.; 4. shingle-siding (16x48-in. size), Boise Cascade; 5. vinyl soffit and fascia system, Bird & Son.



How I bought my siding job

You have to 'shop' carefully for a contractor if you hope to get a top-quality job. The siding business still suffers from growing pains—and still has its share of snake-oil salesmen and incompetent contractors.

Photos by the author



Our 50-year-old Tudor-style house in a New York suburb was a perfect candidate for siding. The stucco was cracked, there were leaks around windows and through decayed exposed beams, the walls lacked insulation, and the house had grown tired-looking. Now the only paint required is for three exterior doors.



by John F. Pearson

The dynamic duo—two aluminum-siding salesmen—appeared at our door one evening last August. In the market for siding, we had responded to their company's impressive ad in the classified directory.

The young men—both appeared to be in their mid-twenties—apologized for arriving two hours late. It now was dark, and the moonless night made it rather difficult for the No. 1 man to examine and measure our house. While he scrambled about with flashlight and rule in hand, the other member of the team made small talk with my wife and me. Our modest living room impressed him as being "lovely," an adjective favored by siding salesmen.

When No. 1 rejoined us, he launched into a seemingly endless flip-chart lecture extolling the virtues of his product and company. Then they littered our rug with samples of siding, pieces of gutter and insulation. I was assured that their particular combination of insulation and siding created the best wall in the business.

Wham! Wham! One of the salesmen was



Insulation, felt and aluminum foil went up before the aluminum siding was hung. The insulation used is basically a Styrofoam that comes in large sheets. (A piece of it shows above head of worker on left side of scaffolding.) In lower photo, head mechanic saws siding panel at cutting table.



using a piece of siding as a punching bag. "See? There's no way our siding can be dented. You want to try it?"

I shook my head, still disgruntled by the long flip-chart lecture. I asked for an estimate and No. 1 went back to his clipboard. Ten minutes later he had finished his calculations.

"Are you ready?" he said with a practiced smile. "Here's where we get down to the nitty-gritty. The complete job, including siding, soffits, fascia, gutters and leaders, will cost \$11,000."

I sucked in my breath. That was twice the previous top estimate. "That's out of the question," I said.

"Hear me out," he responded quickly. "I

can give you a 10 percent discount if you permit us to use your name in our redbook. The redbook, I learned, contained the names of "satisfied" customers.

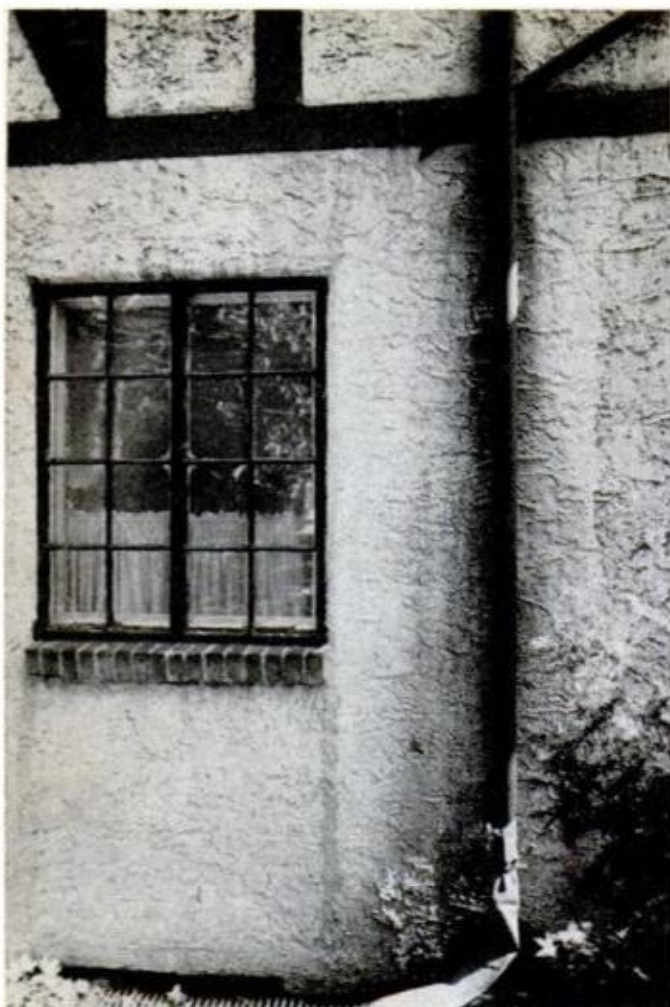
"And that's not all. Because we haven't had to use our advertising budget this year—we have more business than we can handle—there is a pool of money available that we can use to help our customers. We can—for a limited time—make a further discount of 20 percent. So, if we figure a total discount of 30 percent, that makes your price \$7700."

He beamed at me, but the smile faded when I said I would think about the proposition. He looked almost surly when I asked him to put the estimate in writing. He scribbled it on the back of a business card, adding: "Good for one week only."

It was evident that the salesmen were quick-hit artists whose sole interest was the fat commission. Their involvement in the job itself would be nil. I was more than happy to close the door on the young purveyors of snake oil.

A second slightly shady entry in the contractor stakes was also a classified-directory discovery. He told us that he owned his company and employed many salesmen. He looked prosperous in a silky polka-dot shirt, bell bottoms and patent-leather loafers. His car, I noted, was a Mercedes.

The first strike against him was that he rattled off five different estimates, ranging



Crack running down from right side of window sill had been patched unsuccessfully in the past. Note how moisture has caused paint to peel on beams. When new gutter-and-leader system was put up, leader shown was moved for more efficient, neater installation.

from \$3980 to a high of \$6850, and was disturbingly vague about the differences between the various jobs.

Strike two: He refused to give us addresses of houses he had done. "That would present a Herculean task," he intoned.

Strike three: He told us our house was "lovely."

It's worth mentioning that the two realistic bids—honest might be a better word—came from companies recommended to us by friends who knew the contractors' work first hand. The first of these bids was \$4800; the second, \$5100. We chose the second because the job promised to be more thorough, worth an extra \$300. In addition, the contractor impressed us.

Dan, the man who did our job, has been in the aluminum siding business for 14 years. "Long enough to see it become respectable," he says. He sent us a list of about 20 homes. We managed to see a dozen and talk with several owners; all gave Dan good marks.

Dan did not lead off with the usual compliment. Instead, he warned us that our roof was in bad shape—a fact I was aware of but trying hard to ignore. He suggested that both roof and siding be done at the same time, so the jobs could be coordinated—a tip we acted on.

Though Dan does not do roofing, he was the only salesman who seemed to think our roof worth mentioning. (Ironically, the dynamic duo's company does roofing, but it's hard to spot a bad roof from the ground, especially in the dark.)

Dan's crew did a good job on a house not easy to work with. It had a tough stucco exterior that necessitated a cartridge gun being used to nail furring to the walls. A clapboard house of the same size probably would have taken half the time.

At the conclusion of the job, I asked Dan if he would sit down with me and give me tips that would help the average homeowner "shop" for a top-quality aluminum siding job. The information that follows—in question and answer form—is a distillation of that rap session.

How do you select the good contractor from among the poor ones?

To begin with, choose only a specialist. Don't bother with the guy who does driveways, finishes basements and also does siding. The business has matured enough to produce contractors who are specialists.

Especially beware of the operator who offers a ridiculously low price. He works out of his hat. He's not insured; his workmanship is shoddy, and he's not going to be around to provide future service.

Even though a contractor may be recommended to you, you should check him out with the local Better Business Bureau. Also ask him for the name of the bank where he maintains his business account. You can call the bank and get some kind of reading on the man's business reputation.

But wouldn't that irritate a contractor—to ask him for a bank reference?

Not at all. No legitimate contractor will be annoyed. If anything, he's proud of the fact that he pays his bills and has a solid business. You should check him out before you sit down with him. Otherwise, you're wasting your time and his.

Okay, that's how you should evaluate the contractor. Now, how do you check his work?

You should inspect at least three of his jobs. Talk to the homeowners, find out what they think of the work. Find out if the job was finished when the contractor left—or did he have to be called back for any reason.

What things do you look for in a job?

First inspect the house from the street—evaluate general appearance. Then eyeball the end of a wall. See if it “lays” fairly flat, if each of the panels is on the same plane. Next you look at the seams on a wall. Let’s say the wall is 30 feet wide. Since aluminum siding generally comes in 12½-foot lengths, you should see no more than two or three seams per course of siding. If you see that a lot of short pieces were used, you know that the contractor or mechanic was more interested in saving money on materials than in the appearance of the job.

Another thing about seams. As you may know, siding pieces are joined with an overlap. These overlaps should be away from the viewer. Let’s say a house has its front door on the right. Then all overlaps on that wall

Work completed, contractor (right) makes final inspection. Choosing the right contractor is the key to getting a top-quality job. This man is proud of attractive treatment his crews give windows. No shutters were needed to dress up our rejuvenated house.



should be to the left. That way you don’t see any raw edges as you approach the door.

Next, look at an outside corner and see if it’s plumb. Then see how the panels meet at that corner. One panel should not be higher than the other.

There are other things. You should see if the mechanic had the know-how—and took the time—to custom-bend window frames. Do you see a substantial, attractive frame, or did the contractor make do with a simple, factory-formed molding that doesn’t look like much of anything? Finally, look at the gutters and leaders. Did the man line up and pitch the gutters properly, did he rivet elbows and run-off extensions?

These are the main things the prospective buyer should look for. But of equal importance is this: The buyer must be sure that the contractor shows him jobs done by the same mechanics that will do the buyer’s house. There’s a big turnover of help in this business. And a job done by Fred and Joe may look great, but if the buyer doesn’t get Fred and Joe, now in business for themselves, he may be out of luck.

You indicate that workmanship varies greatly, that much of it is poor. What’s the reason?

For one thing, there are no mechanics’ unions, no apprentice programs. It wasn’t until recently that trade-school training became available in New York State.

Another thing—there are no professional standards so far as contracting goes. If you have the money for a license—it’s \$50 in this area—you’re in business.

Similarly, the distributors will sell siding to anybody who walks in off the street. It doesn’t matter that the buyer is a half-baked mechanic who recently was fired for incompetence. He’s made a deal with a homeowner and he wants to buy siding.

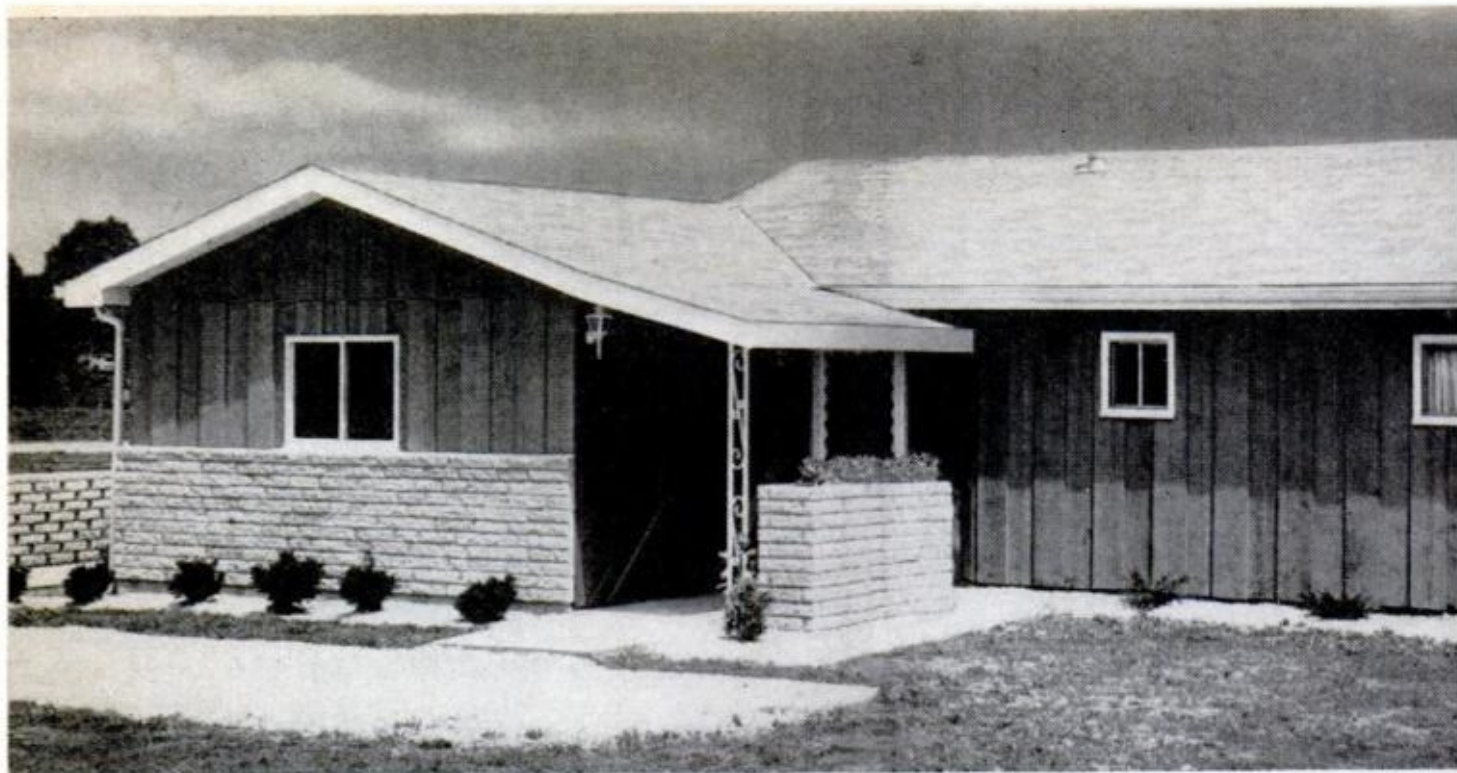
How much of a crew does the average siding job require?

Two or three men. They should have a minimum of two stepladders, two extension ladders, a stage, a metal brake or bending machine, cutting table, power saw, drills and a well-equipped pickup truck. If you’ve signed a contract with a guy who shows up alone in a station wagon, you’re in trouble.

What should the buyer know about gauge?
There are two gauges in the industry—

(Please turn to page 166)

JUNE 1974 111



The more you build the more you save

by Jim Liston EDITOR

The house shown above first appeared in *Popular Mechanics* in November, 1969, under the title *We Built This House for \$7500*. The builder, Bob Rex Hunt, had sent us a snapshot of the house, a set of plans and an itemized list of his costs. We were skeptical; even in 1969 it didn't seem possible to build anything at that price. But we traveled to rural Cicero, Ind., and found this little gem of a house to be all and more than was claimed for it. It is the best low-cost home we have ever seen.

It has three bedrooms, two full baths, 90 square feet of closet space, a 15x38-foot living area that combines an efficient U-shaped kitchen with a family room with fireplace and sliding glass doors. And it's centrally airconditioned.

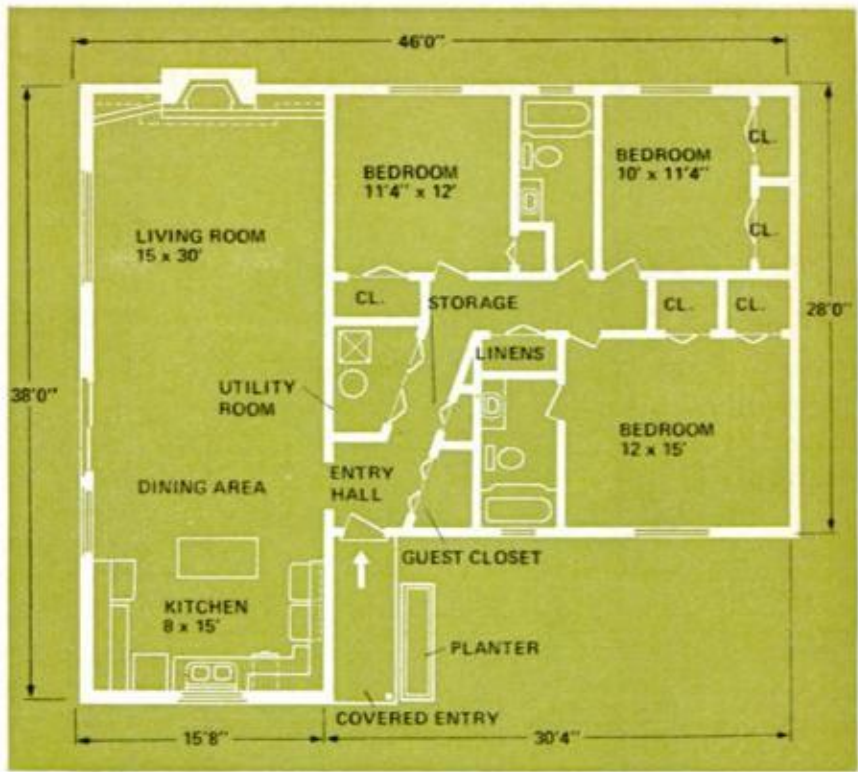
Bob Hunt has receipts to show that he built the 1457-square-foot house for \$7500. He purchased 90 percent of the material at retail prices. With the help of his wife and his 15-year-old son he did everything but the excavating and electrical work. The

market value of the house was \$20 per square foot when Hunt sold it recently and he completed the larger version (opposite) which he calls the "\$17,000 Luxury House."

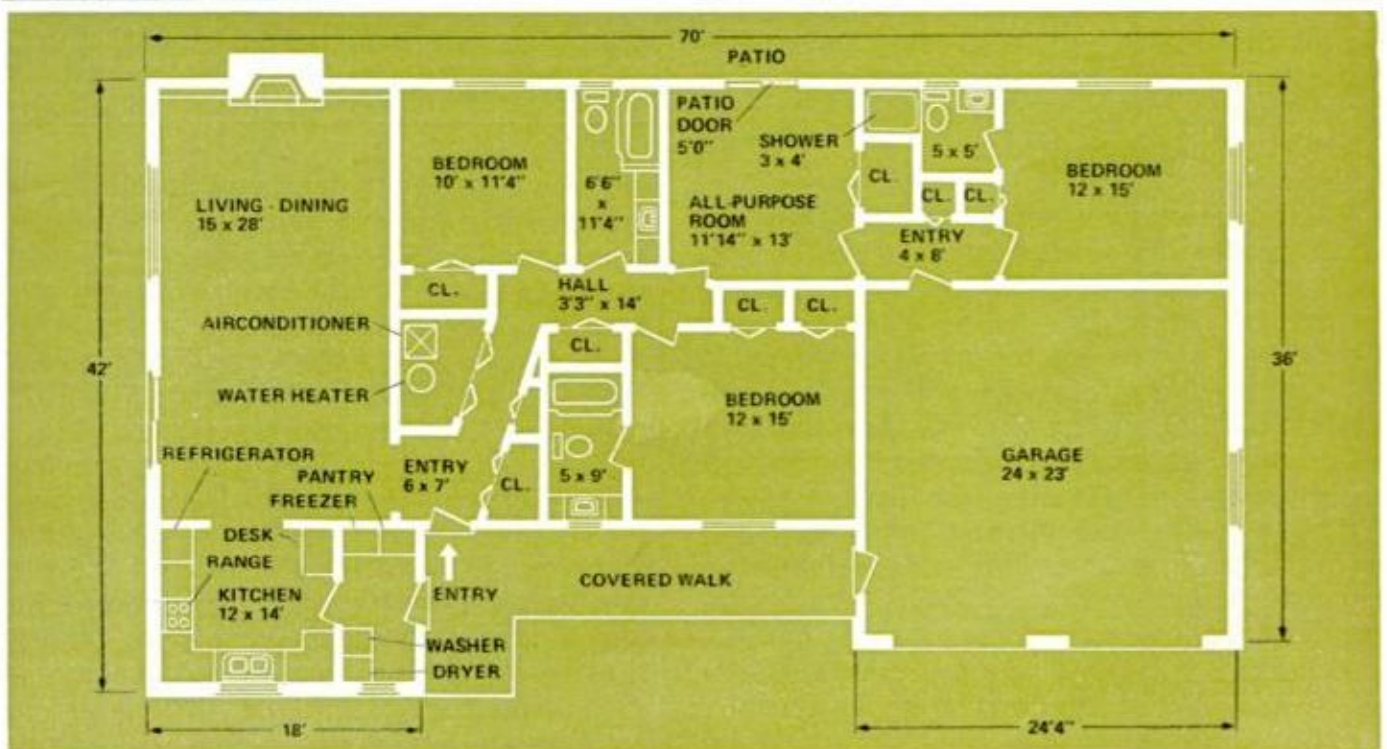
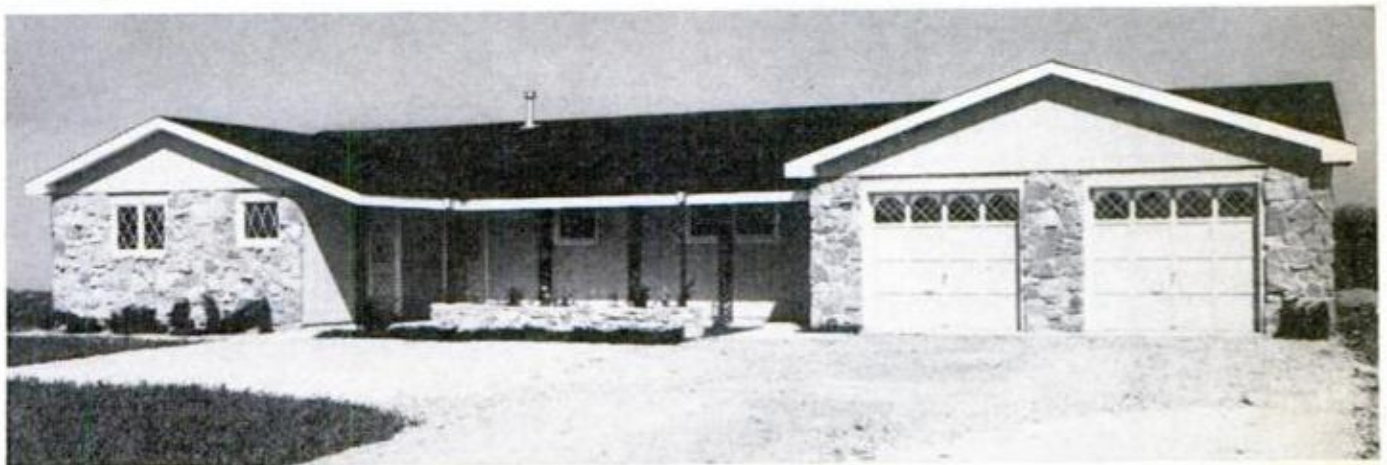
Hunt's aim with the first house was to determine what it would cost a man to build with his own hands a good quality, comfortable, attractive, reasonably spacious home. With the second house he sought to determine the cost per square foot of building a "luxury" home and to demonstrate again the savings possible if the homeowner did the work himself.

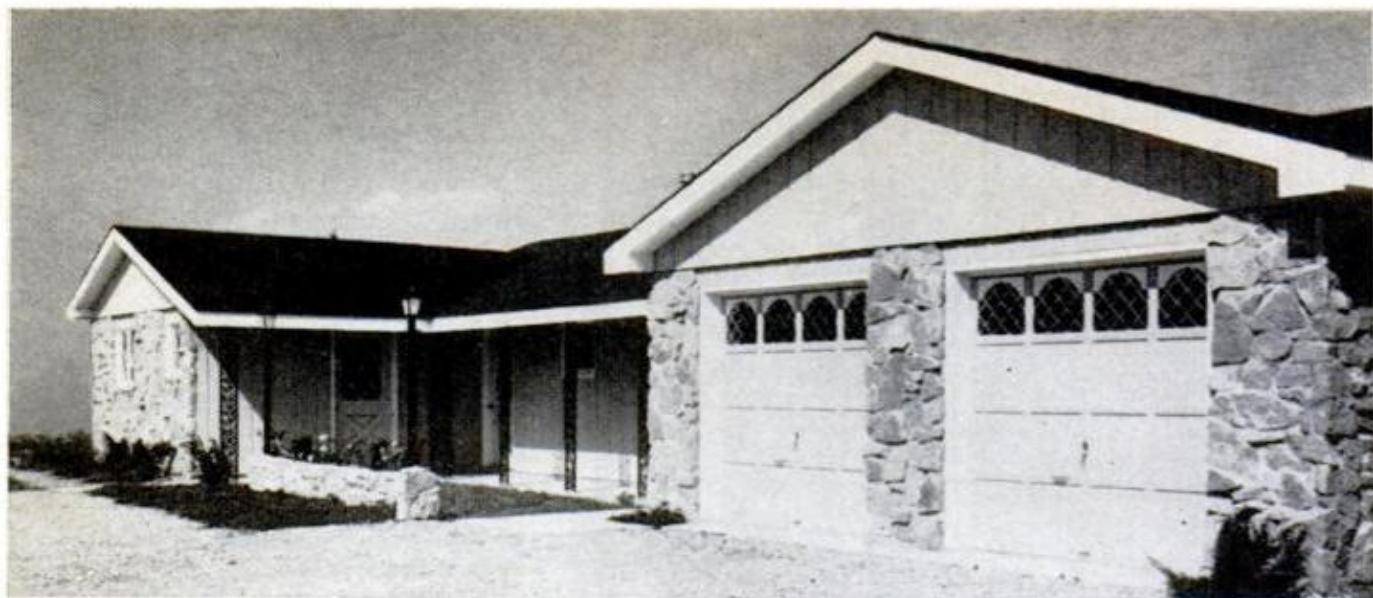
The larger house has a mud room for the washer, dryer and freezer; an all-purpose room which can be used as a quiet study away from the living area; a teen-ager or senior-citizen suite back of a large double garage, and a third full bath.

There are 1800 square feet of house and 576 square feet of garage. The house cost \$17,000 to build or about \$7 per square foot. Hunt estimates the market value at \$20 per square foot for the house and \$10 per square foot for the garage. This amounts to \$41,760, or a net savings of \$24,760 in cost. Add to this what is saved in interest on



"Economy" ranch house and larger "luxury" version below can be completely or partially built by an amateur.





Front can be finished with stone or—like other sides—resawn fir plywood siding. Stone adds \$2000 to value.

a 20-year mortgage on that amount—\$19,800.

Bob Hunt calls this a “luxury” home because he has included everything he considers necessary for comfort and convenience, plus many extras that improve the style of the house. But he has retained such money-saving tricks as designing almost all rooms so they can use 12 or 15-foot factory roll carpeting, and slab construction.

It is Hunt’s conviction that almost any man with average mechanical ability can build a house with the materials available today. Yet he doesn’t believe that building a house can be taught by mail.

“Each man knows his own ability,” he says, “and he should get professional help on jobs he knows he is not qualified for. There’s a lot the layman can do in every trade if he has an adviser.” Although Hunt has been in construction since 1935, he hired help with the plumbing and electricity in the \$7500 house.

Hunt recommends that the footings and slab be done by professionals. “You can rip out almost anything else if you make an error. Concrete has to be right the first time.” If a man isn’t capable of doing all the work himself, he can still save a lot on labor costs by doing the jobs he’s qualified for. Most experienced amateur carpenters are capable of framing the luxury model, Hunt believes, and the roof construction is simple because it makes use of manufactured trusses.

The material cost of framing the house—including windows, doors, garage doors, fascia, soffit, siding and shingles—totaled \$4152. Since labor costs for framing range

from 85 cents to \$1 per square foot in Hunt’s area, he saved \$1918 by doing his own, plus \$192 by doing his own shingling. Men who prefer to leave this work to professionals and get the job under roof can save by finishing their homes themselves from that point.

Here are some jobs an amateur can do: insulation, installing drywall and paneling, carpeting, hanging doors, making and installing kitchen cabinets and nailing on the exterior finish of resawn fir plywood siding. Of this Hunt says, “Almost anyone who can read a rule and drive nails can handle siding.”

Typical of the savings possible: The liv-

FOR PLANS AND INFORMATION about these and other homes by Bob Hunt, send for his brochure *Return to Reality*, enclosing 50 cents for postage and handling, to: Bob Rex Hunt, R.R.1, Cicero, Ind. 46034.

ing room is 15x28 feet and the difference between what it cost and what it’s worth is approximately \$13 per square foot. So a man saves \$5460 by finishing the living room himself. Two of the bedrooms are 12x15 feet; he can save \$2340 on each. Finishing the 14 by 18-foot mudroom saves \$3276. The more *you* build the more you save.

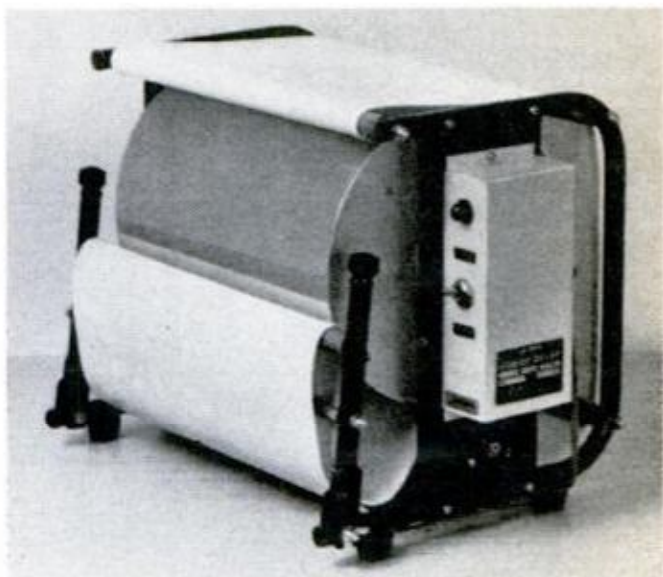
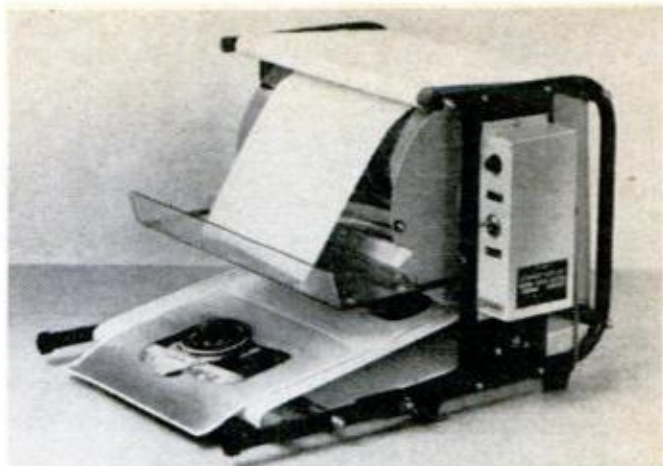
Few men without Bob Hunt’s experience and ability will be able to build this house for \$17,000—that’s the cost of materials and Hunt spent little on labor. But the average do-it-yourselfer with a good helper can take it from framing to finish work. And for that he will get an airconditioned four-bedroom home for \$20,000 to \$30,000. You can’t get that any other way. ★ ★ ★

New aids for photo drying

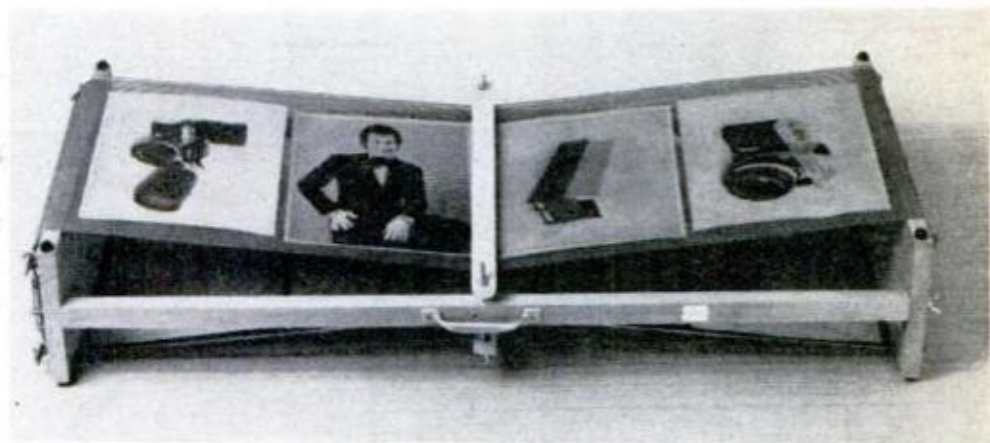
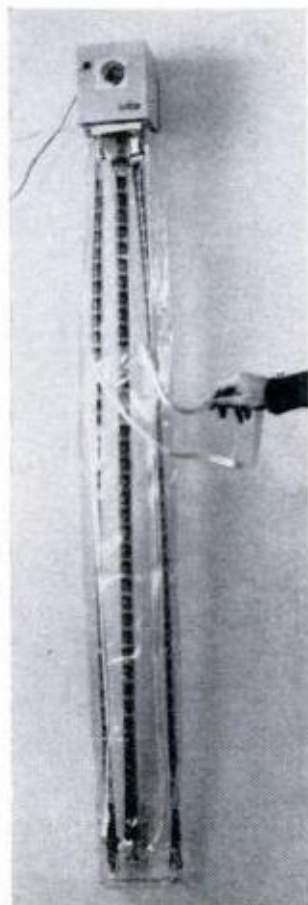
Drying can be one of the most irksome aspects of darkroom work: minutes ago you were busy developing, and now there's nothing you can do but sit and wait until your negatives are ready to print, or your prints can be shown without dripping.

To alleviate the frustration a little, the drum dryer to the left can speed up print drying, without requiring all the storage space such dryers usually need. The dryer below does the same for film (we showed a similar one in *Build This Foldaway Film Dryer*, page 56, Dec. '72 PM.) For users of quick-drying resin-coated papers, the one at right below holds several prints safely till they air-dry.

Brooks Space-Saver dries prints up to 10x12, can handle up to 30 8x10s an hour. Like the big, professional dryers, it's motorized, has a nonadjustable thermostatic heat control that keeps the drum surface at about 200° F. Unlike big dryers, though, it folds in seconds to take up only 11½ x 18 inches of shelf space and sits only 12¾ inches high. From Burleigh Brooks (44 Burlews Court, Hackensack, N.J. 07601), it takes 600 watts of power, costs about \$125.



Photos: Peter Schneider



Depth of Field "Open Air" print-dryer (above) holds prints flat between taut layers of plastic screening while they air-dry. Model 15 (shown) holds 16 8x10s or 8 11x14s, and costs \$24; attache-case-sized Model 10 holds eight 8x10s and costs \$18. Either model can be rested on end, on edge or stacked. Also available is a blower attachment designed for quicker drying, at a cost of \$25. All prices plus \$2 postage from Depth of Field, Box 141, Madison, Wis. 53703.

Prinz Jet (left) takes roll film, not prints. Warmed, filtered air bathes up to three rolls of film, which hang straight to prevent end-to-end curl. A timer shuts it off. It's priced at \$44.95 plus shipping from Bass Camera, 179 West Madison, Chicago, Ill. 60602.

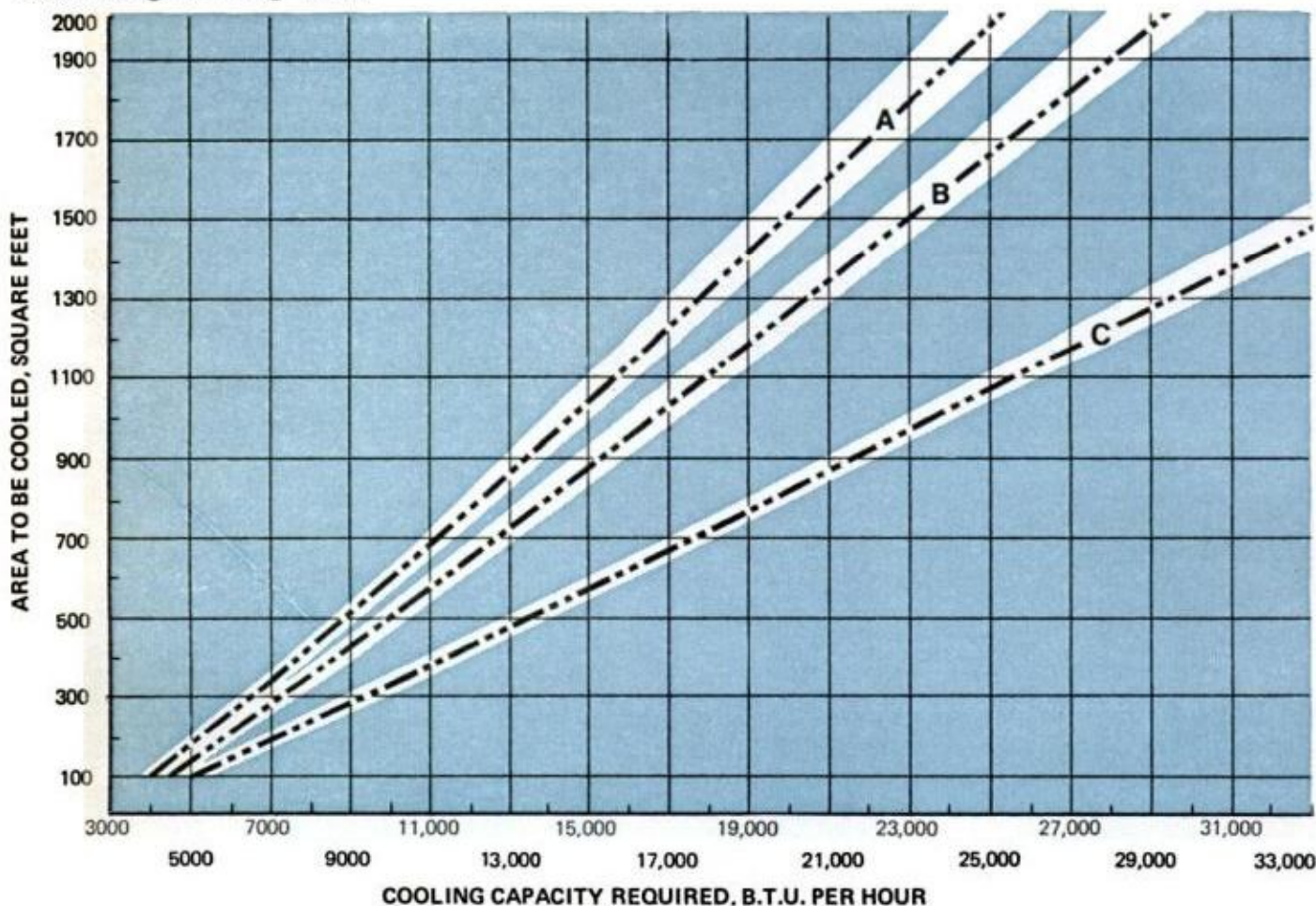
How to keep cool for less money

To stay comfortable this summer and save money, too, you will want to use cooling equipment with capabilities that match the load your home imposes. You will want to use new or existing equipment as efficiently as possible, and you will want to make sure that conditions in and around the house are helping your cooling equipment do its job, not fighting it. This page and the three that

follow will show you how to get the most comfort for the least money.

The Square Feet Method of determining cooling-load capacity, explained below, was recently developed by the Assn. of Home Appliance Manufacturers, which also issues a more detailed load estimate form, and publishes test results, including efficiency ratios, for room airconditioners sold in

Estimating cooling load



For most efficient cooling, a room airconditioner must be sized to suit its load. Too small, and it won't do the job; too large, and it will fail to control humidity, and its compressor will run intermittently—while you will have paid more for the unneeded capacity. AHAM's new method of determining cooling load uses the graph above. To begin with, determine the area to be cooled (in square feet) and locate this figure on the left side of the graph. Then move across to the intersection of band A, B or C, depending on the condition of the space above—band A, occupied space above; band B, attic above insulated floor; band C, attic above

uninsulated floor. From the intersection, move within the appropriate band to the left for more northerly exposure or to the right for more westerly exposure. From this point, read down to the bottom of the graph and note the number. This is a preliminary figure for the cooling load. Now subtract 30 B.T.U. per hour for each linear foot of wall separating the area to be cooled from other cooled rooms. If more than two people occupy the area, add 600 B.T.U. per hour for each additional person; if only one person occupies the area, subtract 600 B.T.U. per hour. Add 4000 B.T.U. per hour if the area should include a kitchen.

this country. Write AHAM, 20 North Wacker Dr., Chicago, Ill. 60606 for literature.

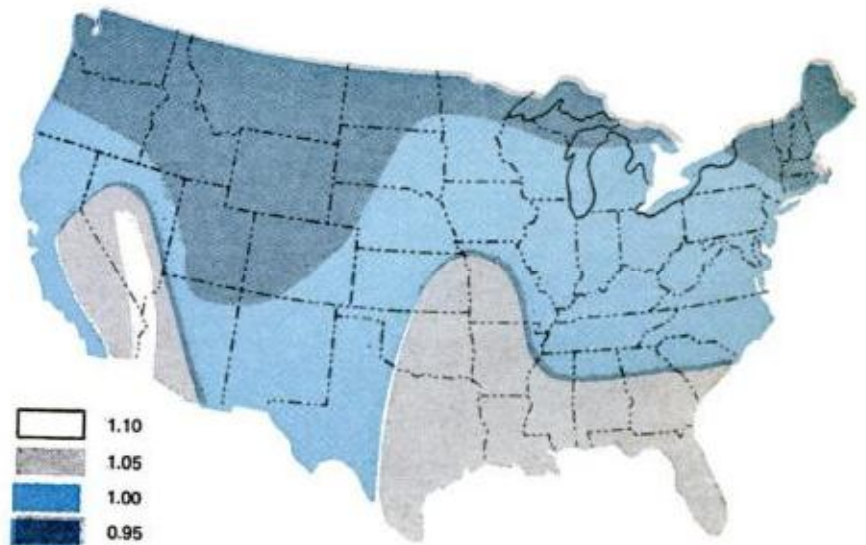
Insulation makes a dramatic difference in the cost of both cooling and heating. A 6-in. layer of insulation installed between attic-floor joists will pay for itself in a few years. Wall insulation also makes a sizable difference, but insulating walls of an existing house usually requires an expert.

If you do not like to come home to a warm house, consider using a timer control (with enough rated capacity for your air conditioner) instead of running air conditioning all day with no one at home.

A thermostat setting of 78° F. will give reasonable comfort and save money. On hottest days, do not try to keep indoor temperature more than 15° lower than outdoor.

Completing the estimate

Now locate your geographic area on the map at right and multiply your previous B.T.U.-per-hour figure by the appropriate factor for your location. The resulting number is the cooling capacity you require; if, however, the room air conditioner is intended primarily for night use, reduce this amount by 30 percent.



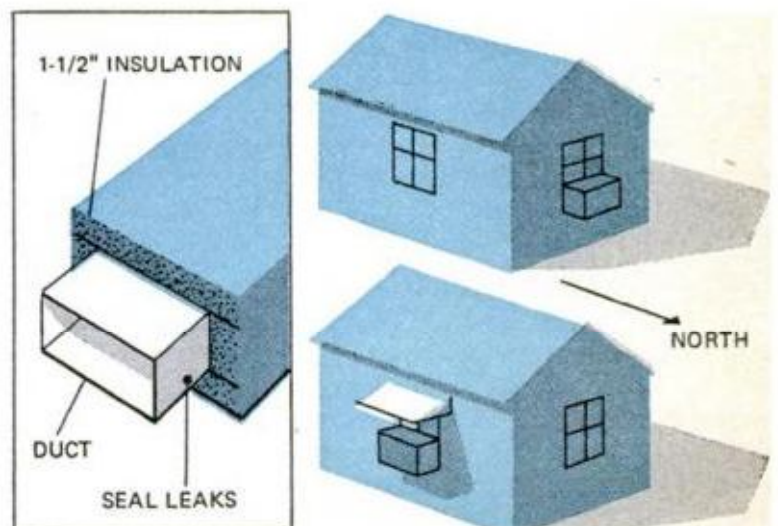
Buy efficiency you can use

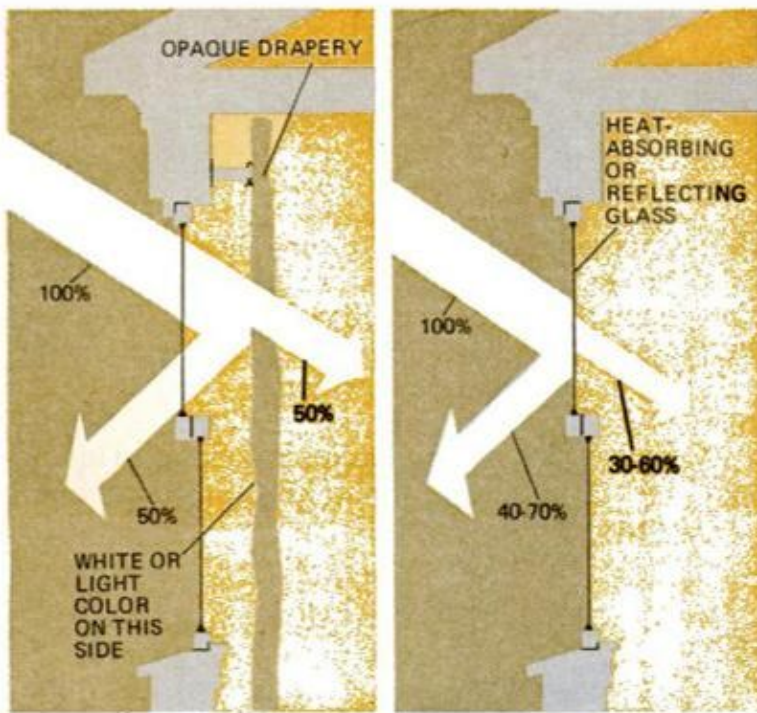
A room air conditioner's energy efficiency ratio (EER) is found by dividing its electrical input in watts into its cooling capacity in B.T.U. per hour. EERs between 5 and 7 are common for smaller units, but high-efficiency models with EERs of 11

and higher are also available, and cost more initially. From the price of electricity in your area, and knowledge of your family's habits of cooling use, you can estimate how long a high-efficiency unit will take to repay its extra cost.

Install and operate efficiently

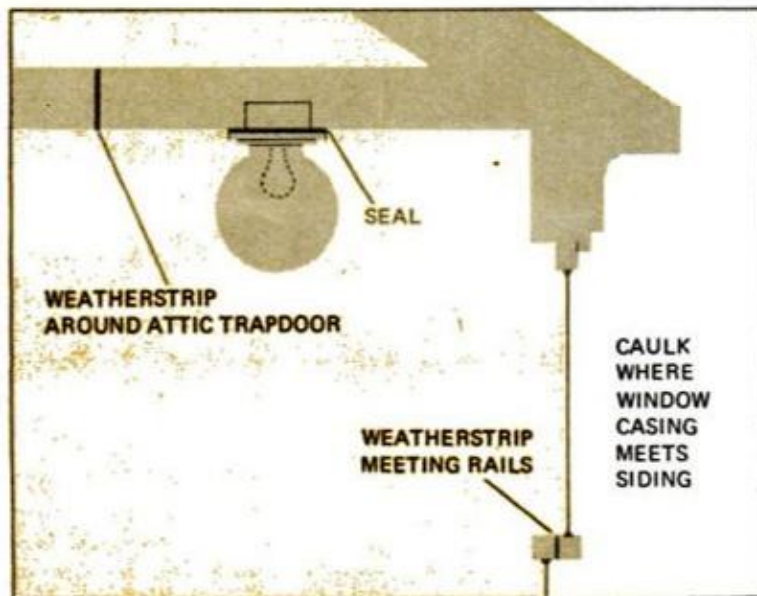
Where possible, install a room air conditioner on the north side of the house or shade it to keep direct sun off the case. Insulate central air conditioning ducts, especially where passing through hot attic spaces; seal leaks with tape or caulking compound. With either type of air conditioning, check and clean (or replace) filters regularly, keep condenser surfaces clean, follow manufacturer's instructions on lubrication. With central air conditioning, locate the thermostat on an inside wall, in a spot with good circulation, out of sunlight and away from pipes and appliances. Operate with all occupied rooms at same temperature for greatest efficiency.





Keep the sun off and out

Sunlight admitted to the space being cooled turns into heat, and most window glazing provides a greenhouse effect by keeping that heat from escaping as infrared radiation, so the more light kept out the better. Draperies or blinds, if opaque and light-colored on the outward-facing side, can reduce heat gain (through windows) up to 50 percent. Keep them drawn during daylight hours. For new construction or reglazing of large areas, consider heat-absorbing and reflecting glasses; these can cut solar heat gain from 40 to 70 percent. Awnings, overhangs and screens can reduce solar heat gain by 80 percent, but must not trap hot air near the window. Shade trees do the same job, but take time to grow. Though no factor in solar heat gain, double glazing insulates and reduces heat gain by conduction from outdoor air. So do storm windows—leave them all year on windows not needed for ventilation.

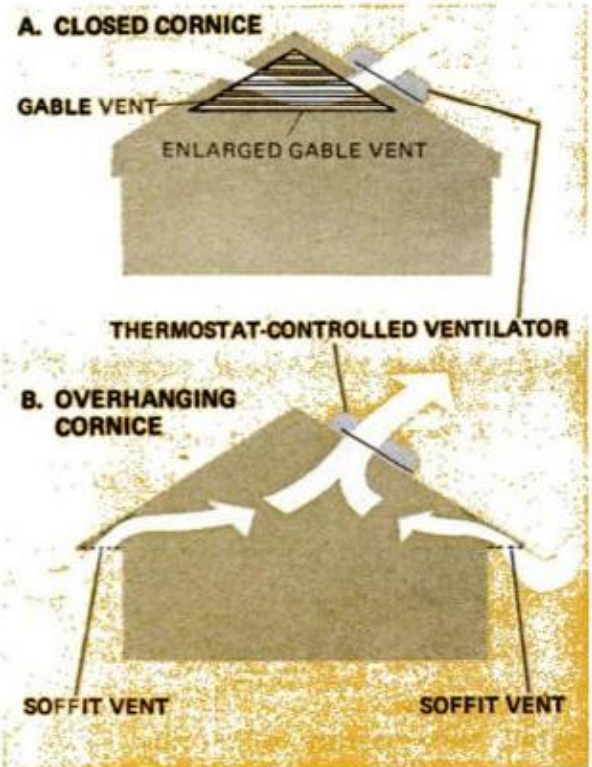


Reduce infiltration

Infiltration of hot, humid outdoor air cannot be completely avoided, and a certain amount of fresh air is necessary. But building construction is far from airtight, and you can increase indoor comfort by reducing infiltration with weatherstripping and caulking, and by stopping air leaks between cooled spaces and uncooled spaces like the attic. Close your fireplace damper, and if air registers are not part of a central airconditioning system, close them, too.

Reduce heat generation

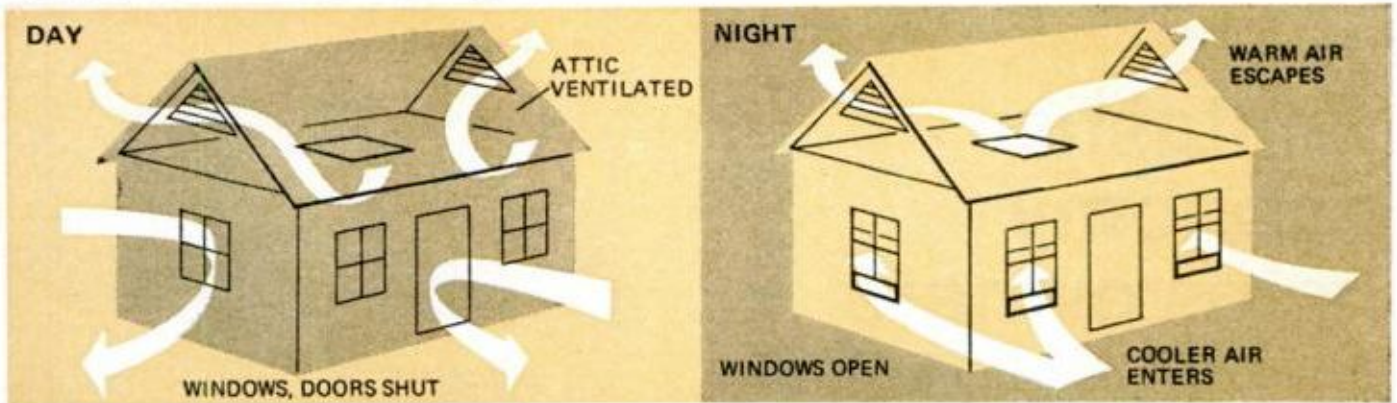
Cooking, lighting, showers, clothes washing and electric appliances all add to the load your cooling system must handle. Try to reduce use of lights and larger appliances as much as practical. Shower and do laundry during cooler times of day or evening, and use exhaust fans in bathroom and kitchen—but turn them off as soon as showering or cooking is completed.



Improve attic ventilation

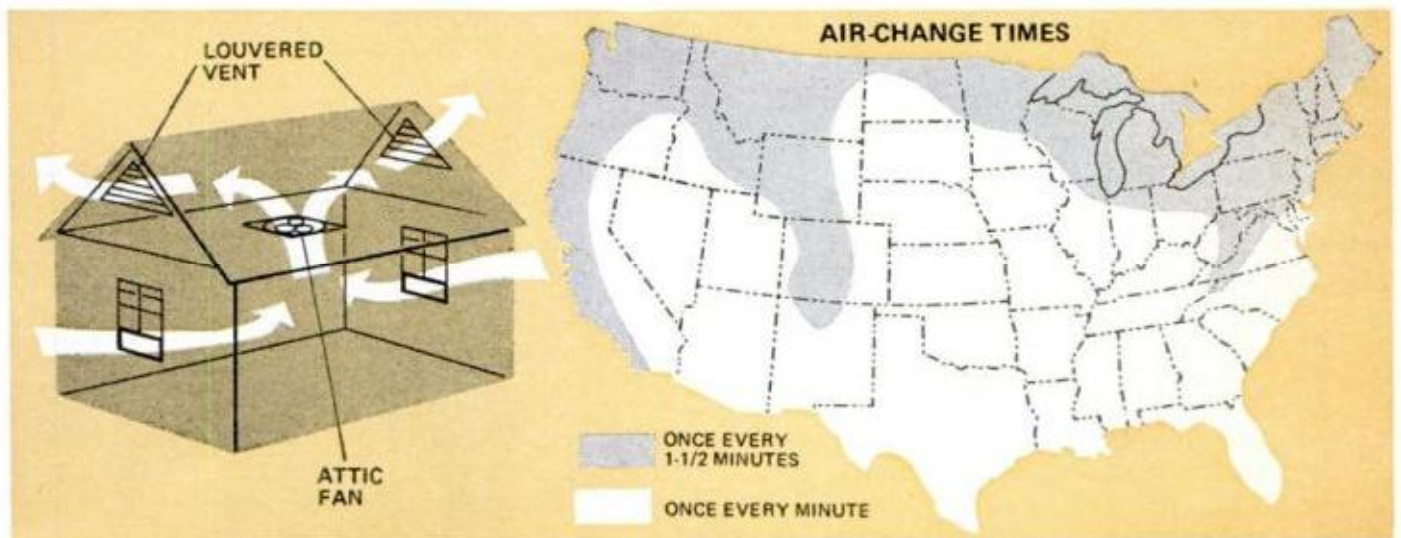
A hot attic radiates heat downward, and an inadequately ventilated attic can easily reach a temperature of 150° F. While insulation between attic-floor joists cuts radiation, cooling the attic by improving its ventilation will also increase comfort in living areas. A powered ventilator (louver) governed by a thermostat is mounted as high on the roof as possible, used with gable or soffit vents of adequate size. General practice calls for net free area (effective area) of such vents to equal 1/300 of the attic floor space, in most cases.

Comfort without airconditioning



Houses without airconditioning can still be livable if closed up tightly when outdoor air becomes warmer than indoor. Circulation to attic should be

prevented. At night, cooler air can be allowed to enter via windows. Warmer air rises through entrance to attic and escapes out gable vents.



Cooling with an attic or window fan

Still air seems warmer than it is, and moving air helps cool you by speeding evaporation of moisture from the skin. Whenever the outdoor temperature is lower than the indoor temperature, as at night, attic and window fans can provide fairly effective cooling. These fans are rated in cubic feet per minute (c.f.m.). To determine the size you

need (as a minimum), calculate the volume of the area to be cooled. This figure is the size you need if your locality is within the unshaded portion of the map; if your locality is within the shaded portion, divide the volume by 1.5 to determine needed capacity in c.f.m. For daytime ventilation, draw air from shaded side of house.

Cooling by means of evaporation

In sections of the country with naturally dry climate, cooling by evaporation is commonly used, and may cost less than airconditioning. Water is sprayed on absorbent material through which air is drawn by a fan. This air, which has been cooled by the evaporation of water, is then returned to the living area, where the air is changed every 1½ to 3 minutes. ★★★



Fantastic economy helps owners overlook hard-starting problems

A nationwide survey based on 1,700,000 owner-driven miles.

by Michael Lamm
WEST COAST EDITOR



Photos by the author



Honda's Civic replaced the tiny Honda 600 last year, but it's not just a re-vamped or enlarged 600. It's an entirely different car that shares nothing with the 600 except name, rock-bottom price and the front-wheel drive feature (see *Owners Report: Honda 600*, page 96, Nov. '71 PM).

Where the 600 used an opposed twin with front-wheel drive, the Civic carries an overhead-cam, in-line Four set transversely up front. Again it has front-wheel drive, but with McPherson-strut front suspension. In all, the powertrain resembles that of the Fiat 128 (page 134). The Civic is a good deal bigger and more conventional than the breadboxy 600.

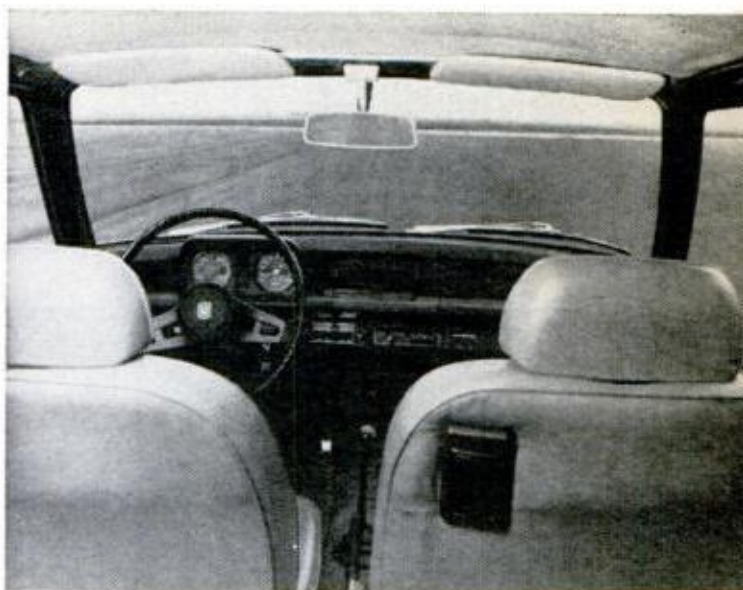
Sometimes a car like this gets sold only because of its low price. Civic owners who did buy to save money were surprised. A California teacher exults, "So far, the Civic has exceeded all my expectations," and he's not alone in his amazement.

The Civic is long on fuel economy, and while some owners did find corners cut on carpet quality, metal gauge, upholstery thickness and such, they mostly agreed the Civic gives good value for the money.

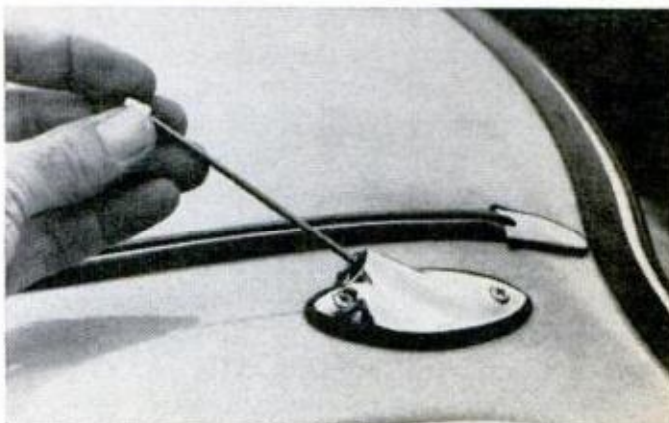
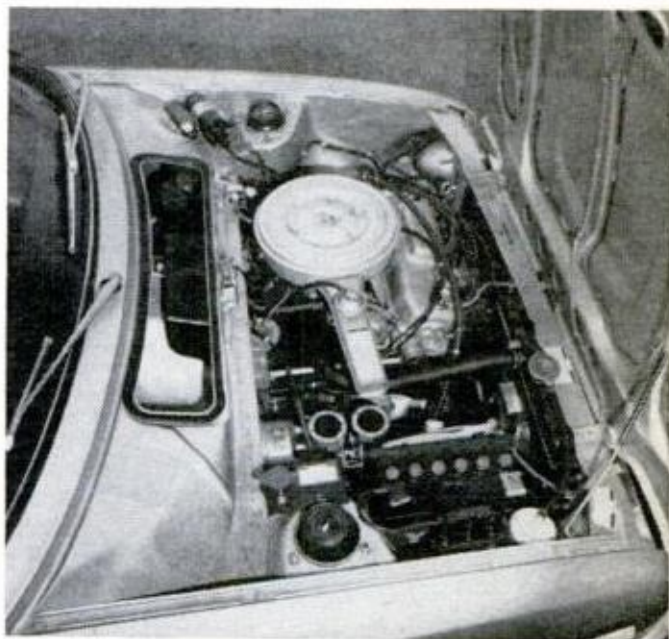
Other owners were aware of the engineering in the car before buying, so it was not the low price alone that determined their choice. Says a West Nyack student: "I wanted a small car that was peppy, good on gas, fun to drive, and had more features than comparably priced cars: fwd, four-wheel independent suspension, front disc brakes, rack-and-pinion steering." He reports great handling, solid comfort, good acceleration, and superb gas mileage. On the minus side, he'd prefer heavier sheet metal, stronger exhaust system (it tends to crack and leak), and tighter clutch.

In Michigan, a counselor reports that he bought two Hondas at the same time. "We sold my Eldorado and traded my wife's Sportabout in on two Civics. The ride is surprisingly comfortable, and we're ex-

The ohc Four, set crosswise, displaces 1170 cc and rates 50 bhp net. Transaxle stands behind engine. Access is good to everything but gear-box dipstick. Small, thoughtful touches include roof antenna and rubber rub strips to protect top when you strap on plywood or other cargo.



Simple but not stark instrument panel is easy to read through steering wheel. Seats recline, and ashtray at rear is standard. Some owners noted absence of a day/night mirror and would prefer visors to swing to sides. They praised interior roominess and space utilization which, they said, gives a bigger-car feeling.



tremely pleased with both cars. They supply our needs. We get to the same places in the same amount of time as before." These cars, by the way, are equipped with Hondamatic, a semiautomatic fluid coupling, and interestingly this owner reports almost 6 mpg less than drivers with conventional transmissions.

"When I first drove my Honda," says an Ohio production manager, "I couldn't get over the sound of the engine and the feeling of control I had of the car. The engine is quiet and solid—no ricky-tick noise, just a quiet purr. The pickup and pep are impressive. There's plenty of passing power in third." This owner, though, found the shoulder harness hard to pull out of its retractor, as did others. He gave excellent marks on workmanship, comfort, interior space (three adults ride with him in commuting) and handling on ice and snow.

What do owners think of Honda's front-wheel drive? "American carmakers better wise up," warns an Ohio accountant, "because the Honda and Audi and Saab are much better handling than domestic small cars." A Michigan telephone operator asserts, "Front drive is great—it never gets stuck!" "Handles beautifully even on slippery roads," says a Massachusetts technician. But another owner warns that with studded tires up front, braking on ice can be tricky. Yet, "Roadability feels like a sports car."—Florida plasterer. "Doesn't blow around on the road like a rear-engined car."—California secretary.

The only measurable objection to fwd was a repeated comment that the Honda tends to pull to the left when accelerating hard. Several owners noted this, and all said they'd been told by their dealers that this is "normal—all of them do it." Indeed, it's a reaction to engine torque and certainly nothing to worry about.

How does the Civic perform over long distances? A Los Angeles heavy-equipment mechanic reports, "I drove 4000 miles from L.A. through El Paso down to Chihuahua, Mexico, and then back via the Grand Canyon. Not a bit of trouble through heat and freezing. So I said, *That's some small car!* I congratulate the Honda people."

Fully 22.2 percent of our owners had no complaints at all about their Civics. It's a remarkably high figure, because even among Volvo owners the figure was only 14.6 percent. And another 11.2 percent felt that no change was necessary to improve



Rear quarter pane flips out for better ventilation; drip rail keeps rain from coming in. Airconditioning may be ordered, as may semiautomatic transmission, but performance and fuel economy suffer with these items.



Owners like clean, simple styling. Hatchback can carry five or six grocery bags across back. Bumpers on '73 Civics were judged fragile; this year's aren't.

the Civic; that in fact, it *can't* be improved.

However, the other 87.8 percent did offer suggestions for improvement, the strongest cry being for larger, wider, better tires. The Civic comes with 6.00S-12s, which are difficult to find and fairly expensive to replace in this country. Many owners suggested widening and upping tire size to 13 inches, because 13s are readily available everywhere and are among the least expensive sizes sold. Bigger tires, though, mean larger wheel wells and less front legroom.

Other suggested improvements were mostly of a minor nature, and a number of them underscore that this car is built to a price. Here's a sampling: Owners would like a rubber covering on the accelerator pedal. Day/night mirror. Rear defroster standard. Gas tank bigger than 10 gallons. Stronger front-seat tracks. Less road noise at 60-65 mph. More positive reverse shift.

Complaints about "cold starts" and "hard starting" indicate that Honda might consider an automatic choke for U.S. models. Good coordination of manual choke setting and outside temperature is necessary, and choke setting must be eased off gradually as engine warms up.

On interior roominess and comfort, nearly everyone agrees there's plenty of both—even 6-footers. The rear seat offers more legroom than many larger cars, and in the hatchback (there's a hatchback and a coupe), groceries fit neatly.

While general comfort got excellent marks, ride was judged a little harsh and jiggly. "It hits the bumps awfully hard," notes a Michigan optometrist. "Rides hard, like most small cars."—Illinois engineer. "Dips in the road remind you you're in a small car with tight springs," comments an Atlanta bus driver. And a Memphis librarian sounds this warning note: "The tight suspension will alienate those desiring a ride comparable with plush Detroit products."

On dealer service, owners were about equally split. A Louisianan writes, "The car is an honest statement of cheap transportation, but the dealer is just cheap and not honest."

But on the other side of that coin: "The dealer is very courteous, professional, and goes out of his way to make sure I'm satisfied."—San Francisco accountant.

This last comment from a New Jersey management consultant seems to sum up the thoughts of many owners. He writes, "I am not a car freak and consider the private automobile something of a blot on the escutcheon of society. But since we're in this thing, we might as well make the best of it. The Honda Civic strikes me as a brilliant approach toward the goal of economizing and conserving. It's not perfect, but it's giant strides ahead of most other attempts at sensible personal transportation." ★★★

Summary of 1973-74 Honda Civic Owners Reports*

| | | | | | |
|----------------------------------|-----------|------------------------------------|-------|---|-------|
| Total miles driven | 1,730,518 | Number of cars owned: | | What type of trouble? | |
| Average miles per gallon: | | Only Honda | 31.1% | Hard starting | 29.5% |
| Local driving | 27.3 | Two cars | 49.4 | Exhaust leaks | 12.9 |
| Long trips | 31.9 | Three cars | 14.1 | Choke | 11.9 |
| Body styles: | | Four cars | 4.4 | Electrical | 8.1 |
| Hatchback | 66.2% | Five or more cars | 1.1 | Transmission | 5.7 |
| Two-door sedan | 33.8 | Other makes owned: | | Fan belt | 5.2 |
| Why the Honda Civic? | | Chevrolet | 20.1% | Did you repair it yourself? | |
| Economy of operation | 80.0% | Ford | 16.8 | No | 85.0% |
| Initial price | 19.7 | Oldsmobile | 10.8 | Yes | 14.0 |
| Styling | 16.6 | Pontiac | 9.3 | Dealer repairs satisfactory? | |
| Size | 14.5 | Plymouth | 8.2 | Yes | 71.3% |
| Handling | 12.7 | Buick | 7.8 | No | 28.7 |
| Performance | 8.1 | Comfort opinion: | | What changes would you like? | |
| Specific likes: | | Good to excellent | 81.1% | Bigger, better tires | 11.2% |
| Economy | 79.0% | Average to poor | 18.4 | More legroom | 7.1% |
| Handling | 64.2 | Workmanship opinion: | | Fewer rattles | 4.4 |
| Comfort | 21.0 | Good to excellent | 83.0% | Change seat-belt system | 4.1 |
| Styling | 20.7 | Average to poor | 17.0 | Bigger gas tank | 4.1 |
| Specific dislikes: | | Dealer service opinion. | | Reliable rear defroster | 4.1 |
| Cold starts | 12.9% | Good to excellent | 45.4% | Age distribution of owners: | |
| Rattles | 9.2 | Average to poor | 54.4 | 15-29 years | 49.0% |
| Harsh ride | 7.9 | Had any mechanical trouble? | | 30-49 years | 38.1 |
| Poor dealer service | 6.9 | Yes | 53.7% | 50-plus | 12.2 |
| Underpowered | 6.6 | No | 45.3 | Would you buy another Honda Civic? | |
| Ventilation system | 4.2 | | | Yes | 92.1% |
| Quality of materials | 4.2 | | | No | 7.9 |

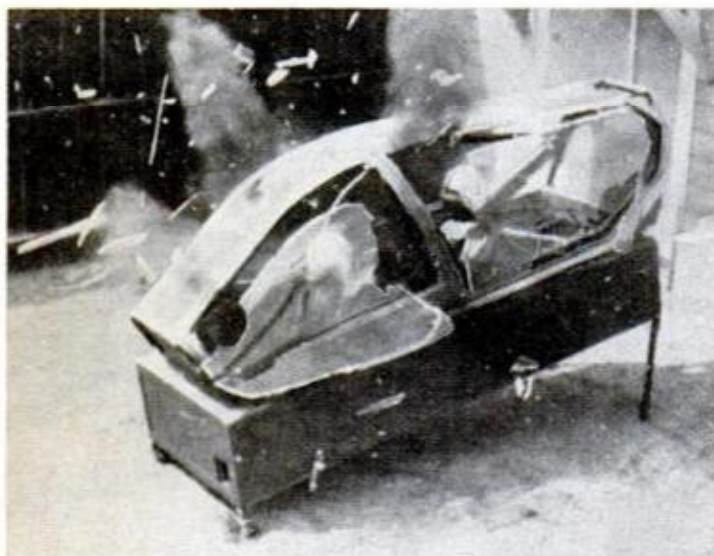
*Percentages might not equal 100% due to rounding or insufficient data.

IT'S NEW

NOW



Quick escape for copter pilots

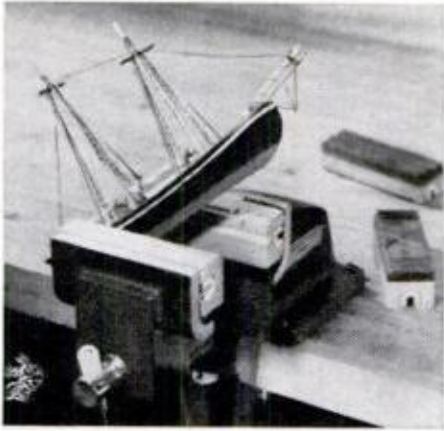


The helicopter cabin that appears to be exploding at left isn't really blowing up. It's a test cockpit pod for the AH-1G military copter fitted with a special explosive canopy. In an emergency landing or crash, canopy windows can be blown out with small charges embedded in rims. The idea is to give pilot and gunner a quick, easy means of escape in case of fire or approaching enemy. The survival system was developed by Teledyne McCormick Selph, Hollister, Calif., for Bell Cobra copters.

Open wide: Now comes the "hatch-front," a new type of walk-in electric car

Just swing up the top-hinged front hatch and walk right in—that's how easy it is to enter this tiny new French electric car called the Citadine. Less than 7 feet long, the battery-powered midget seats two and has space in back for carrying baggage or shopping purchases. It's said to have a range of 60 miles on a single charge and to be capable of hitting speeds up to about 30 mph. The novel front-opening body is formed of streamlined molded plastic and is only a little more than 40 inches wide. The car has no maker yet, but was recently exhibited at the International Auto Show in Paris.





Versatile vise

Lockjaw vise has lockable rocker jaw with built-in pad to hold delicate, odd-shaped objects gently. Standard jaws (on bench) are silicone aluminum. \$25.96; optional rubber jaws are \$7, clamp \$5. Spear & Jackson, Inc., 4767 Clark Howell Hwy., Atlanta, Ga. 30349.



'Mobile asphalt plant' mixes blacktop on the run

Hot asphalt delivered from plant to road-repair site usually cools off so much it's hard to apply and often makes a poor patch. This giant "Asphalt-Mobile"—first of its kind—mixes blacktop on the spot in any desired quantity within minutes and with no waste, saving road maintenance departments time and money. Irl Daffin Associates, Lancaster, Pa., makes it.

Handy fishpole holders mount anywhere

Fishing rods store neatly in these racks designed for a variety of mounting arrangements in boats, campers, station wagons or at home. Rubber rings hold the tips, while spring clips grip the handles. The racks can be installed vertically,

horizontally or overhead. Three models include an 8-rod holder curved to match station-wagon roofs (below), a straight 8-rodder and a small 3-rodder. Prices from Mitchell Enterprises, 211 West Ave. 33, Los Angeles, Calif. 90031.



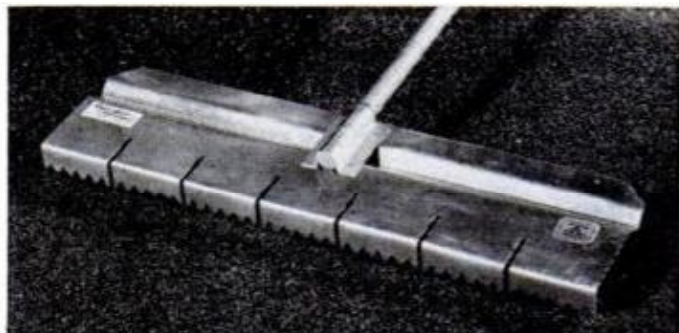


Rotorless 'helicopter'

What may be the nearest thing to a "flying jeep" is now under test by the U.S. Marine Corps for use as a small two-man aerial car. It's actually a helicopter fuselage fitted with twin ducted-fan propulsion units, one on each side. Steering vanes direct the airflow so the craft can move in any direction—up, down, forward, back or sideways.

High-speed rake for lawn debris

Rake-Well is a 24-inch-wide lawn rake that picks up leaves, grass clippings, pine needles—all kinds of lawn trash—fast, without digging into grass roots. Lightweight aluminum rake has hardwood handle; \$4.95 postpaid from Rothwell Rake Co., Terminal Box 3392, Spokane, Wash. 99220.



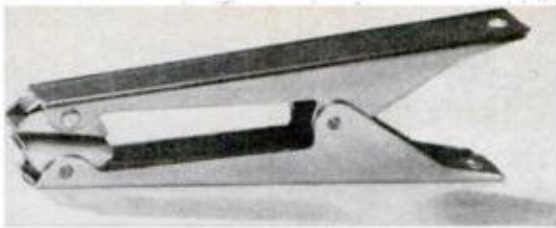
All-plastic folding chair: Light and easy to carry

This all-plastic chair weighs only 6 pounds, folds flat for convenient storage. Its contours make it as comfortable as padded folding chair. Its rigid polyurethane is rugged, resists stains. Available in red, yellow, white and black for suggested retail price of \$15 at department stores and other housewares outlets. Gotham Industries, 1150 Broadway, New York, N.Y. 10001.

Water pressure powers toothbrush

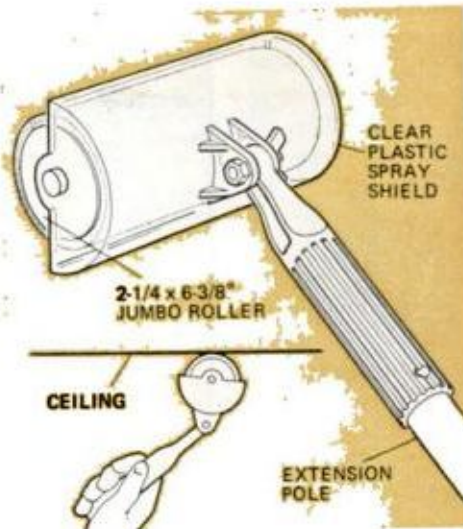
What's the next logical step after the electric toothbrush and water pulser? A water-turbine-powered brush that uses back-and-forth motion many dentists now say is better than up-and-down lets you select speed, feeds water through the brush when desired. Device, invented by dentists, is not yet in production.





Spring clamp for irregular work

This versatile spring clamp has floating jaws that pivot as much as 60° to fit odd shapes and angles, is ideal for gluing irregularly shaped work. Plastic-faced jaws are 3/8 by 1 inch, open to 2 3/4 inches. Clamps, made of cadmium-plated steel, are \$2.90 per pair plus shipping from Brookstone Co., Peterborough, N.H. 03458.



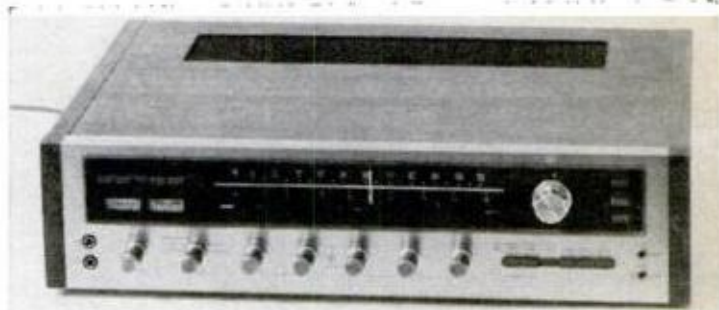
Spatter-free roller holds more paint

Latex roller with see-through spray shield holds more paint than conventional 9-inch roller because of larger diameter. Shield keeps splatters off user, particularly when painting ceilings. Roller cleans up quickly by spinning in water stream. Retail for \$4.98. Product Development & Manufacturing Co., Box 727, Mendota, Minn. 55050.



Plastic embedding kit

You can embed coins, photos, specimens and other objects in crystal-clear plastic with this Super Size Crystal Cast Kit. Outfit includes quart of casting plastic, hardener, three reusable molds, mixing cups and sticks, sandpaper and buffing material. Refills are also available. Kit retails for \$10; made by Fibre Glass-Evercoat Co., Inc., 6600 Cornell Rd., Cincinnati, Ohio 45242.



Lafayette quad receiver is powerful buy

Lafayette's LA-4000 was the first four-channel receiver with a full-logic SQ decoder. But it's full of other features, including: front-panel tape outputs; bass, treble and mid-range tone controls; and a high filter. Amplifier power is 4x41 watts RMS at 8 ohms; it performed very well for us. Originally \$569.95, it's now on sale at \$469.95 from Lafayette.



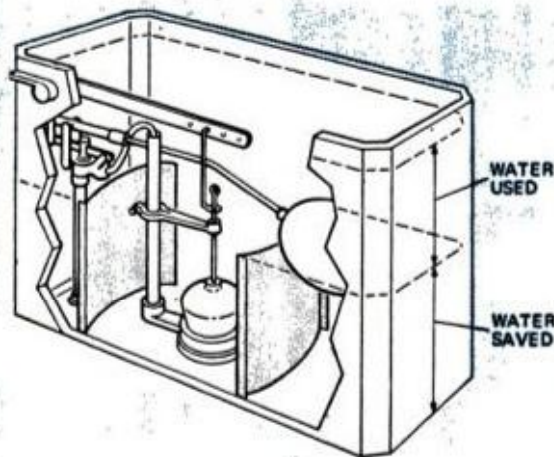
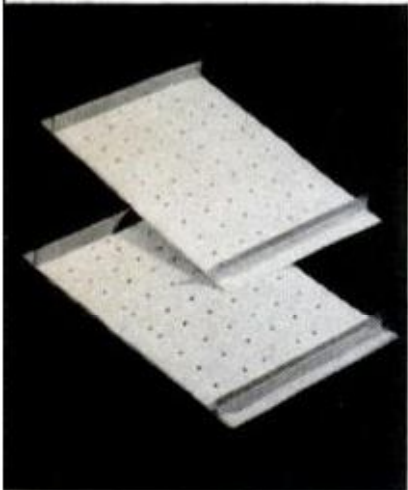
Easy, no-mess oil changing for your car



Changing your own oil saves money, but is messy. These two aids take the fuss and mess out of the job. In photos at upper right, a tube is attached to a special valve replacing the crankcase drain plug. Just open the valve and old oil drains into a handy throw-away bag. Auto-Drain kit is \$4.95, Suburban Products, Inc., Box 636, State and Front Sts., Manhattan, Ill. 60442. Photos at left show similar system but with remote drain-control lever that mounts under the hood. It's \$15.95, United Product Development Co., 1450 West Ridgeway, Jackson, Miss. 39213.

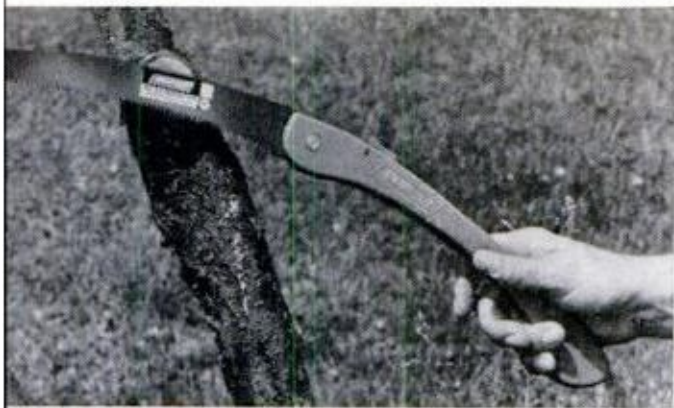
Two-faced bellows fits any reflex, any lens

Spiratone's Macrobel T bellows can hold a Nikon lens on a Pentax body—or almost any other combination you need. Standard "T" mounts screw on rear of bellows to fit almost any 35-mm reflex; special "T" flanges fit on the front to accept most lenses. Without accessories, it fits between any "T" lens and its mount. \$20 plus mounts.



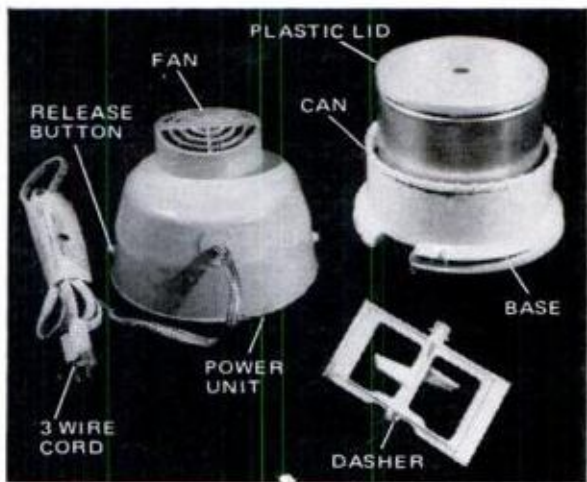
Water-saver for toilet tank

Water savings of up to 50 percent with normal flushing action are claimed for Aqua-Miser. Two rubber walls in the device form a double dam in a standard toilet tank to retain water otherwise wasted—without changing height of the water needed for flushing. Installs without tools; \$3.98 post-paid from AQM Corp., 1909 New Rodgers Rd., Levittown, Pa. 19056.



No-stick outdoor saw

Snap-Cut pruning and camping saw cuts both dry and green wood without binding or sticking, has 10-in. blade coated with Teflon-S that folds away (near left) for safe carrying in pocket or knapsack. Suggested retail price is \$5.12. Seymour Smith & Son, Inc., Oakville, Conn. 06779.

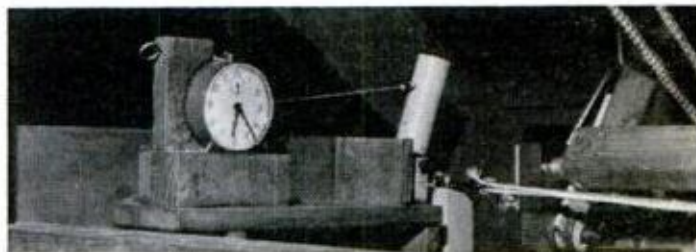


Ice cream delivered to your freezer —by machine that makes it there

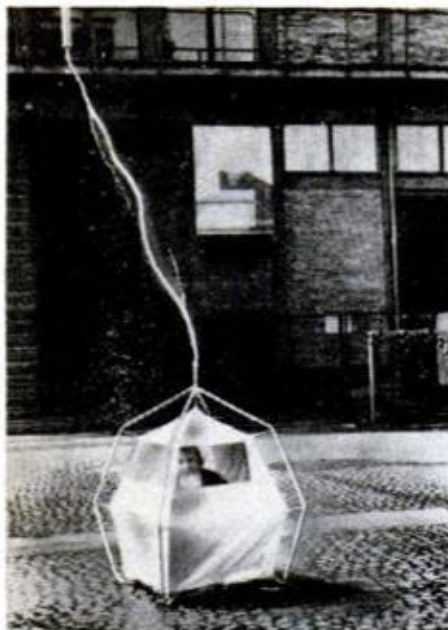
Salton Ice Cream Machine lets you enjoy fresh ice cream made without preservatives and does away with the mess of rock salt and ice—the cold is supplied by your home freezer or freezer compartment. The machine, which makes a quart of ice cream at a time, is \$19.95. Salton, Inc., 1260 Zerega Ave., Bronx, N.Y. 10462. Top photo above shows how the compact ice cream maker fits right in a freezer compartment; lower photo shows the machine disassembled.

Mechanized bed rocks you awake, not asleep

Bavarian locksmith Albert Marschmann found nothing would wake him, not even loud clock bells or telephone calls. About to lose his job, he solved the problem with this tilting bed frame, linked to a timer mechanism, that flips him out onto the floor at a pre-set time every morning. Now he makes rock-awake beds for other oversleepers at Ferdinand Sauerbruch Strasse No. 10, 8261 Töging am Inn, Germany.



NOW



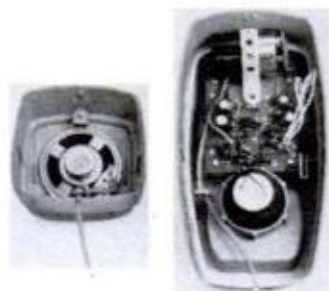
How to get hit by two million volts—and live to tell about it

Huddling snugly inside this portable lightning-survival tent, you're safe from up to a two-million-volt charge, says German inventor Dr. Ing Johannes Wiesinger of Munich. Designed for use by soldiers, hunters, farmers and work crews caught out in the open during severe thunderstorms, the device consists of a tubular metal frame and metalized fabric enclosure that channel the charge harmlessly to the ground. The occupant sits on an inflatable rubber pillow, isolated from the effects. The tent can be put up in less than two minutes and folds for easy carrying.



Shooters' tree perch

Easier shooting for hunters and wildlife photographers is possible with this tree perch that self-locks to any straight trunk at any height, providing a comfortable platform to sit on. It's also a climbing aid, supporting your feet as you hitch yourself up a tree. At ground level, it doubles as a handy camping seat, cooking shelf or animalproof food cache. \$37.95, Baker Mfg. Co., Box 1003, Valdosta, Ga. 31601.

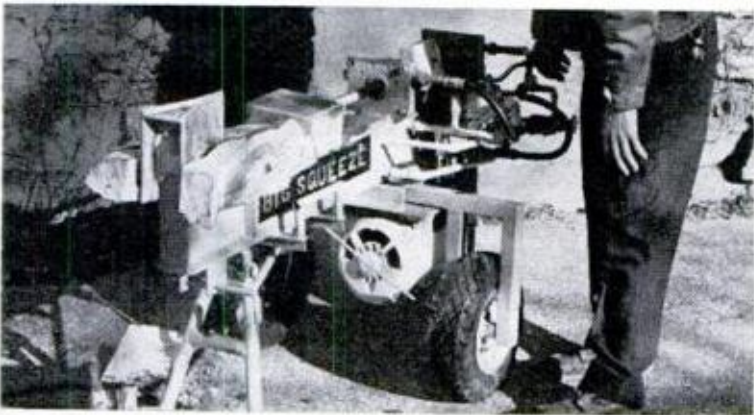
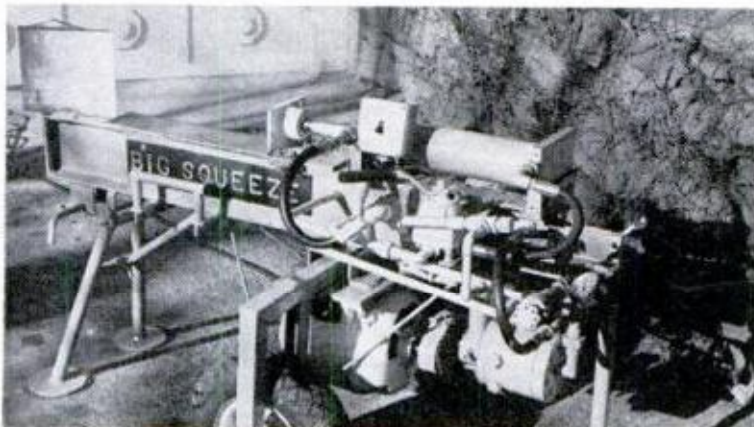


Heath telephone amp kit

Battery-powered, this amplifier aid switches on when you rest your phone's handset over its microphone. You hear through the small extension speaker, while the phone's mouthpiece picks up your voice (if you talk a bit loud). It takes 1½ hours to build, costs \$14.95 (plus shipping and 9-volt battery) from Heath Co., Benton Harbor, Mich. 49022.

Home log splitter—big squeeze, little cost

Proving that a little ingenuity can often accomplish big jobs, this hydraulic log splitter was home-built by Felix Tozeski, a welding technician at Worcester Polytechnic Institute, Worcester, Mass. Tozeski cobbled up the design from \$35 worth of junk parts, while commercial versions cost up to \$1000. The machine uses a 2000-p.s.i. hydraulic ram to drive huge logs against a cutting wedge, splitting them handily into firewood.



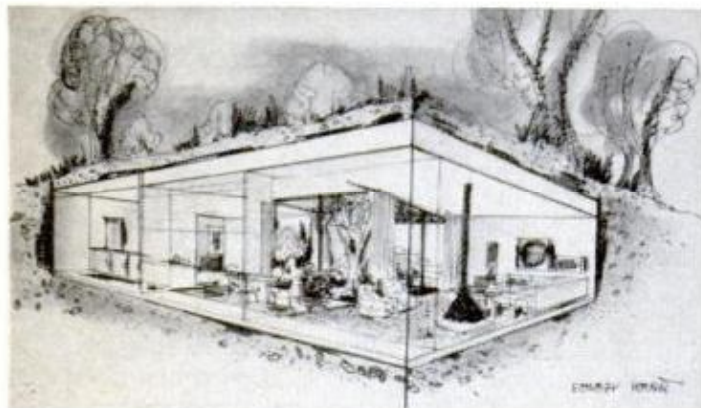
Three helpful books for the craftsman and homeowner

Everyone interested in furniture will enjoy the 24th edition of *Seng Furniture Facts* (bottom), a handy reference work and textbook on the subject; \$1.50 post-paid from the Seng Co., 1450 North Dayton St., Chicago, Ill. 60622. *Old Ways of Working Wood* by Alex W. Bealer (right) is a comprehensive guide to the historical development of woodworking methods, with more than 200 line drawings by the author. An excellent reference guide for the professional woodworker, hobbyist or collector, it's \$12.50 from Barre Publishers, Barre, Mass. 01005. *Home Repair: A Minimal Maintenance Manual* by Gershon J. Wheeler (left) stresses preventive maintenance to reduce the need for professional repairs; \$9.95 from Reston Publishing Co., Box 547, Reston, Va. 22090.

Outdoor cooking ideas

Like a hibachi but of rust-free ceramic material for more even heat, Kamachi (far right) is \$19.95 in red, green or gold; California Kamado, Box 7076, Long Beach, Calif. 90807. Charmglowette portable gas barbecue can be used with accessory folding stand (near right), is \$61.90; optional stand, \$14.90. Charmglow Products, 908 Main St., Antioch, Ill. 60002.



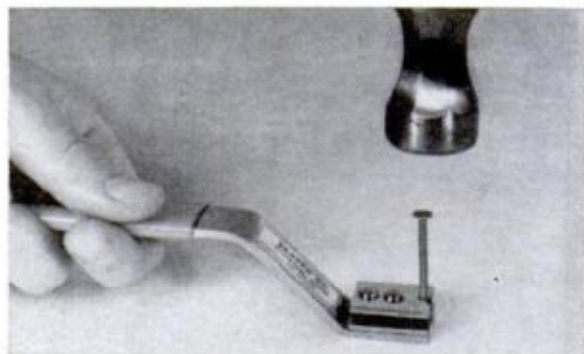


The house that hides underground

Inside, it looks like any other house, but there's one big difference—it's entirely underground. An experiment to promote good ecology, it's designed around an open atrium (top) that lets in light and provides a pleasant courtyard for outdoor living. **Advantages:** one-fifth normal heating cost, 25-percent lower building cost, privacy from neighbors and no unsightly damage to surrounding property. Designer is architect John E. Barnard Jr., Ecology House Associates, 60 Main St., Osterville, Mass. 02655.

Magnetic nail starter

Handy nail starter for hard-to-reach spots, Nailit has magnetic vee that holds nails, brads of all sizes, gives unobstructed view of work, doubles as shop magnet. For nailing at angles, the tool is tilted. It's \$1.95 plus 45 cents for shipping and handling; Seatek Co., Inc., Dept. PM, 6 Neil Lane, Riverside, Conn. 06878.



Safer car seat for children

A padded wraparound face and chest shield completely encloses infant riders in this new protective car seat for children. The seat is anchored by both lap and shoulder harnesses, unlike most types held in place by lap strap only. Developed by Ford engineers, it's approved by Physicians for Automotive Safety, is \$25 at Ford dealers.



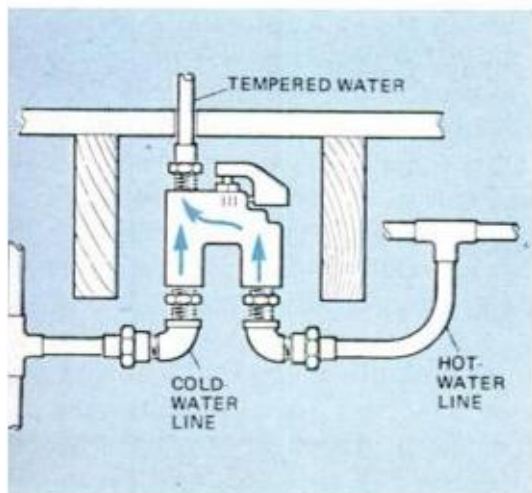


Sears' new mowers go all-electric

In line with the growing trend toward electric power for yard work, Sears' latest offerings include two new battery mowers—a 32-inch rider model (top) and a 14-inch cordless push type (bottom). The rider features a three-speed transmission, differential rear axle and three motors—one for drive and two for blade power. The push model has a removable safety "key" (shown in lower photo) that prevents accidental start-up when it's not inserted. For prices, consult Sears catalog or retail outlets.

Eek! My heart's skipped a beat!

Worn like a piece of jewelry, this decorative "bracelet" for women actually contains tiny electronic sensors that monitor a person's heart rate. If indications of stress or irregularities occur, an alarm sounds, warning the wearer to rest, take medication or seek medical aid. Designed for use by patients with known chronic heart ailments, the device also contains a compartment for emergency pills. Not yet on sale but under study, it was developed by Mary Ann Scherr, 4064 Shaw St., Akron, Ohio.



No-sweat valve for toilet tank

Temperator Valve keeps condensation from forming on toilet tank in warm weather by providing regulated mixture of hot and cold water when tank fills. The brass fitting includes check valves to prevent backup, installs below floor or under tank. Price is \$12.95 postpaid or \$13.95 for model with drain (for summer homes), from Oakridge Industries, Box 18475, Cleveland, Ohio 44118.

PM OWNERS REPORT:

Photos: Irv Dolin



Fiat 128 SL Coupe is a coup in small-car styling. Over half of the owners surveyed selected the coupe over the 128 sedan or wagon, both of which are completely different in sheet metal. Shown here is the '74 model with its five-mph bumpers front and rear. Despite their mass, they don't detract from the car—the front provides a perfect mounting platform for the optional driving lights! Almost all owner comments in this survey refer to 1973 model 128s since it was conducted just before the '74 became available.

Right on top with mpg, but too many rpm per mile

A nationwide survey based on 1,250,000 owner-driven miles.

By Michael Lamm
WEST COAST EDITOR

The Fiat 128 seems more like an entire line of cars than just a model. Its engine and mechanical components are shared by several very different cars—including the new X 1/9. The Fiat 128-SL coupe, shown here, spans a 9-inch-shorter wheelbase (87.5 inches) than the 128 sedans and wagons. It shares no sheet metal with them, yet all use the same ohc in-line Four, water-cooled and nestled transversely for maximum use of space. Thus, the 128s resemble the Honda Civic ([see Owners Report, page 120](#)).

The Fiat 128's tightly packaged powertrain, combined with a frameless unitized body and rather boxy lines of the sedan and wagon, allows generous interior space. The 128 wagon, in fact, although 10 inches shorter than Chevrolet's Vega wagon, contains five cubic feet more cargo space.

Owners in our survey ranked economy absolutely tops among specific likes. Since 71.7 percent listed "operating economy" as their primary reason for buying and 71.8 percent repeated it as their No. 1 like—they seem well pleased with their cars.

Interestingly, the owners' gas mileage averages 29.6 mpg for all types of driving: That's exactly the same mileage Honda Civic owners are getting with their cars.

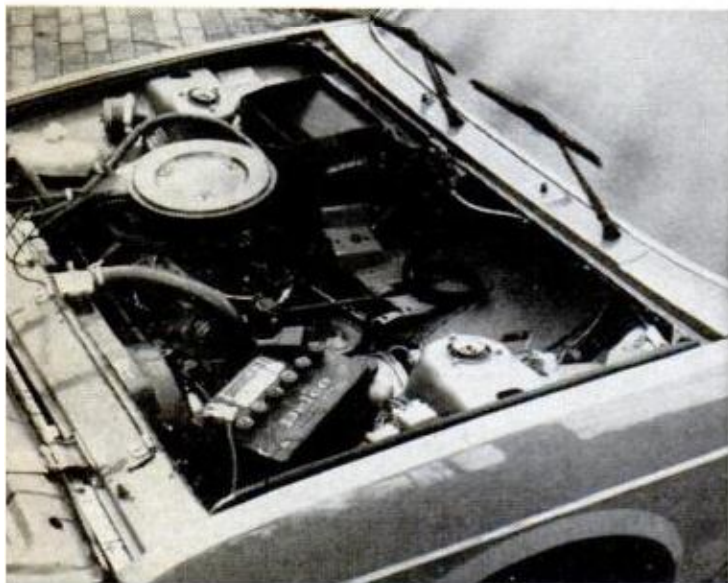
Hard on the heels of economy (and, of course, economy includes more than just gas mileage) came handling as a specific like. Here's a good quote from an owner who really reacts to the 128's radial-shod front-



wheel drive: "Listen, man," shouts a Fort Worth shipping clerk, "I've taken winding roads at 85 mph, no lie. Sure, I drive stupid, but this car handles like it was built for stupid drivers." Forgiving handling is what the enthusiasts call it.

Comfort and roominess came in for a 30 percent I-like response. We asked owners to rate comfort specifically. Reactions: "We are four adults who went skiing every weekend last winter—some 400 miles round trip. Everyone had enough room in my little 128 SL coupe for comfort," enthuses a Virginia musician. A Michigan student adds, "I think it's very comfortable. All passengers are amazed at the vast amounts of leg and headroom and the reclining seats." A Florida underwriter claims, "I find the 128's comfort extremely good—it's the most comfortable

Engine compartment with the 1290-cc, overhead-cam Four placed transversely has plenty of room for servicing—and the spare tire (removed here to show the under-hood hardware). Trunk of 128 coupe (lower photo) holds take-apart bike: sedan trunk is even bigger.



small car I've ever ridden in." And a New Jersey clergyman: "The seats are much more comfortable and roomy than the VW's we owned previously."

The specific I-don't-like that evoked the most noise was noise. Peeved owners said that above 55 mph, the engine roars. Fact is, it's revving nearly 4000 rpm at 60 mph, so it's one of autodom's busier powerplants. A fifth, overdrive gear would be welcome. We also got complaints of wind roar and road noise at 55-60 mph. Squeaky brakes were another constant complaint, but perhaps no more than on other cars with front discs. And some owners complained about black dust from the wearing pads accumulating on their front wheels.

Dealer service came in for groans: 64 percent rated it average to poor. "It seems a shame," notes a New Jersey teacher, "that such a good car is negated by a lack of concern by the dealer's service people."

A Denverite reports the two Fiat dealers in town are perpetually overcrowded with service work. An Illinois engineer writes, "I found the dealer quite conscientious—his service people found detail defects that I hadn't even complained of. But then their zeal resulted in a tune-up that ended in a maladjusted carburetor and incorrectly set timing, neither of which were problems when I brought the car in."

On workmanship, these comments represented a pretty good cross section: "Put together as well as a Cadillac." "I believe workmanship is very high for a car in this price range." "Good overall." "Fine except for the paint job, which is too thin." A New York editor seems to love his Fiat despite some problems: "The 128 coupe is one of the most practical ways to have fun on wheels—great handling, adequate performance, good brakes and roomy (if you don't use the back seat much). But I haven't yet managed to go the whole 3000 miles between recommended services without *something* breaking down."

Among general inconveniences mentioned, one of the more common was hard starting in cold or damp weather. The engine also appears to be hard to keep running after it has first been started. Several owners mentioned four or five false starts plus lots of coughing and hiccupping. Fiat 128s use a manual choke, and with the lean fuel mixtures that pollution controls have brought about, the engine tends to die easily if not warmed up. We suspect though, that many

of the owners haven't checked their manuals to fully master the ancient and almost lost art of manual choking.

To improve the 128s, a few owners suggested more horsepower, particularly for long grades. Some asked for larger gas tanks, not unreasonable considering that the coupe's tank holds 9.6 gallons and the sedan's and wagon's 10. Others pleaded for a lockable glovebox, larger foot pedals, better separation of switches on the steering column, more sound-deadening and a better radio.

A New York investor confides, "Two friends bought new Fiat 128s as a direct result of riding once in mine." A Florida photographer mentions, "I liked my 1972 sedan so well we decided to keep it and trade my wife's VW in on another 128 sedan when she needed a new car. That's why we have two now." And a California chemist: "There is no production car on the road that will corner as well, that gives such great gas mileage, that has so much power in a 1290-cc engine, and has this kind of traction in snow. To get rid of the noise problem, I installed an inch of fiberglass insulation, so it's now very quiet. ★★★



Roominess is one advantage of front-wheel drive that owners appreciate (top photo). Absence of drive tunnel leaves room for low center console (right). Full carpeting is one of standard interior appointments. Coupe rear is perfect for kids; sedan better for adults.

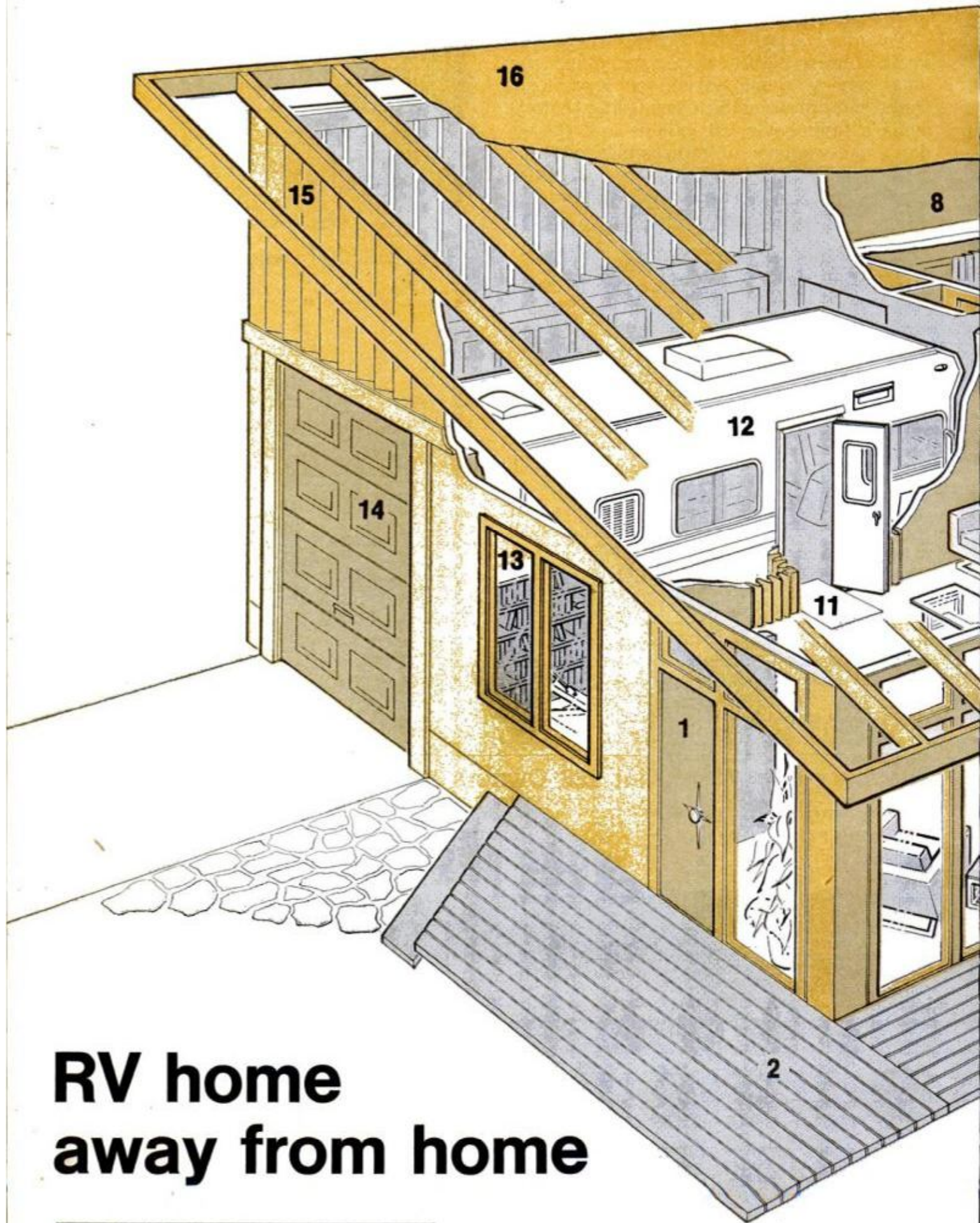
Summary of 1973-74 Fiat 128 Owners Reports*

| | |
|-------------------------------------|-----------|
| Total miles driven | 1,258,342 |
| Average miles per gallon: | |
| Local driving | 27.2 |
| Long trips | 31.9 |
| Model years: | |
| 1973 | 99.6% |
| 1974 | 0.4 |
| Body styles: | |
| Two-door coupe | 59.9% |
| Four-door sedan | 29.5 |
| Station wagon | 10.6 |
| Why the Fiat 128? | |
| Operating economy | 71.7% |
| Initial price | 18.7 |
| Size | 15.7 |
| Handling | 15.7 |
| Styling | 15.7 |
| For front-wheel drive | 13.5 |
| Specific likes: | |
| Economy | 71.8% |
| Handling | 67.0 |
| Comfort | 30.8 |
| Roominess | 22.0 |
| Front-wheel drive | 15.4 |
| Styling | 12.3 |
| Specific dislikes: | |
| Noisy above 55 mph | 18.4% |
| Cold starts | 14.9 |

| | |
|--------------------------------------|-------|
| Poor dealer service | 11.4 |
| Underpowered | 11.4 |
| Squeaky brakes | 6.6 |
| Number of vehicles owned: | |
| Fiat 128 only | 35.1% |
| Two cars | 49.8 |
| Three cars | 11.7 |
| Four cars | 1.7 |
| Five or more cars | 1.7 |
| Other makes of vehicle owned: | |
| Chevrolet | 15.3% |
| Ford | 15.3 |
| Pontiac | 9.3 |
| Oldsmobile | 8.0 |
| Dodge | 6.7 |
| Fiat | 6.7 |
| Volkswagen | 6.7 |
| Comfort opinion: | |
| Good to excellent | 88.2% |
| Average to poor | 11.3 |
| Workmanship opinion: | |
| Good to excellent | 71.9% |
| Average to poor | 28.1 |
| Dea'er service opinion: | |
| Good to excellent | 36.0% |
| Average to poor | 64.0 |
| Had any mechanical trouble? | |
| No | 51.3% |

| | |
|--|-------|
| Yes | 48.7 |
| What type of trouble? | |
| Electrical | 16.8% |
| Brakes | 10.6 |
| Cold starts | 9.7 |
| Clutch | 7.1 |
| Fuel pump | 6.2 |
| Did you repair it yourself? | |
| No | 90.1% |
| Yes | 9.9 |
| Dealer repairs satisfactory? | |
| Yes | 63.0% |
| No | 37.0 |
| What changes would you like? | |
| More power | 12.0% |
| Bigger gas tank | 7.0 |
| Remove seatbelt interlock | 5.5 |
| Less noisy brakes | 5.0 |
| Fewer rattles | 5.0 |
| Age distribution of owners: | |
| 15-29 years | 49.8% |
| 30-49 years | 31.6 |
| 50-plus | 13.6 |
| Would you buy another Fiat 128? | |
| Yes | 83.4% |
| No | 16.6 |

*Percentages might not equal 100% due to rounding or insufficient data.

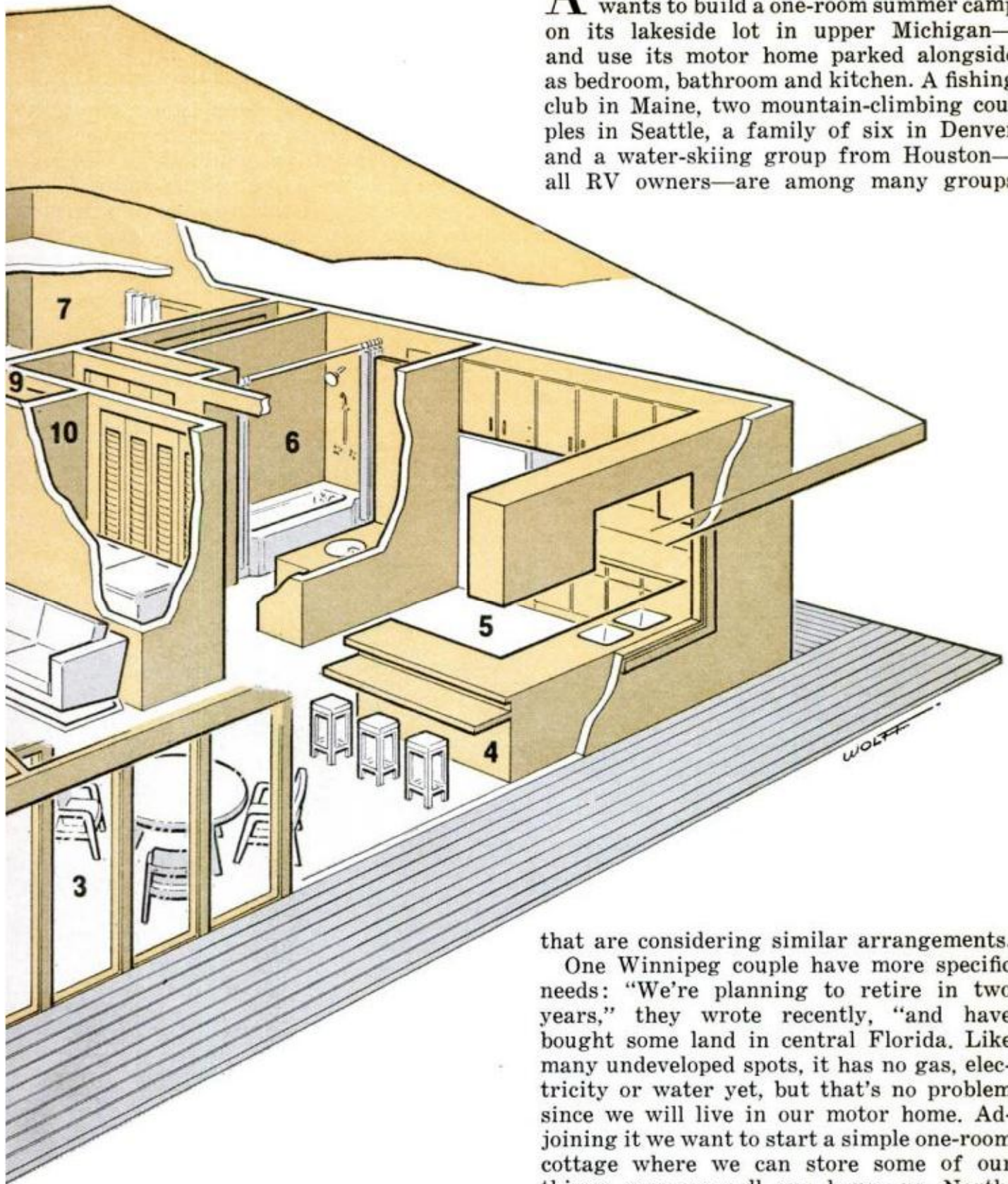


RV home away from home

by Bill McKeown OUTDOORS EDITOR

138 POPULAR MECHANICS

A recreational vehicle family in Toledo wants to build a one-room summer camp on its lakeside lot in upper Michigan—and use its motor home parked alongside as bedroom, bathroom and kitchen. A fishing club in Maine, two mountain-climbing couples in Seattle, a family of six in Denver and a water-skiing group from Houston—all RV owners—are among many groups



RV cottage built around motor home and its utilities has: (1) door opening from (2) deck into basic (3) living area. Added room divisions can include (4) bar/breakfast counter with pass-through space to (5) kitchen. Plumbing and sewer connections allow addition of (6) bathroom. Shutting off back of two-car garage makes (7) bedroom with (8) storage over. (9) Utilities room with furnace and central air conditioner plus (10) laundry room are refinements. (11) Level ramp leads to (12) motor home. (13) Workshop. (14) Garage door. Louvered (15) front, side ventilation under (16) roof.

that are considering similar arrangements.

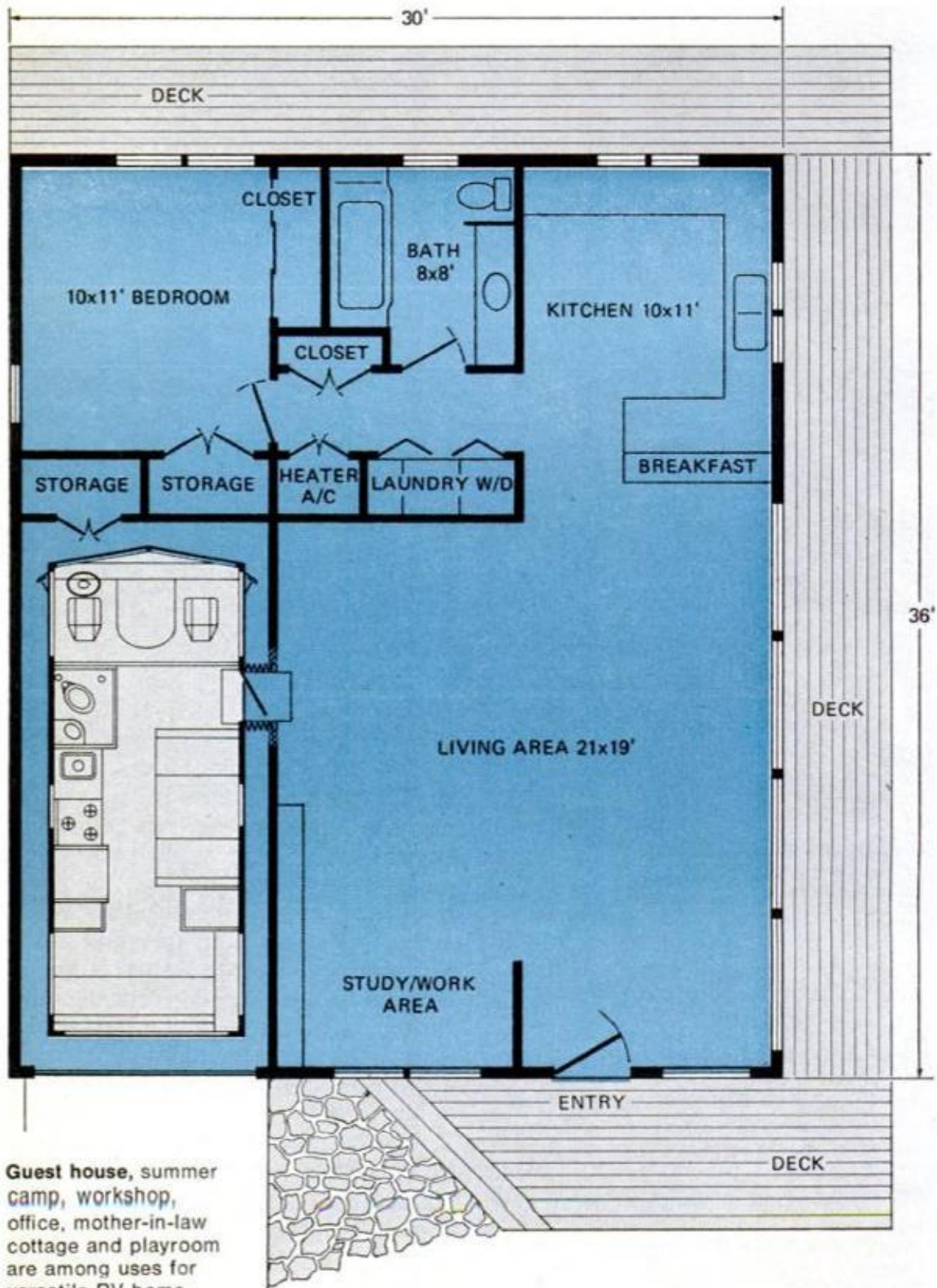
One Winnipeg couple have more specific needs: "We're planning to retire in two years," they wrote recently, "and have bought some land in central Florida. Like many undeveloped spots, it has no gas, electricity or water yet, but that's no problem since we will live in our motor home. Adjoining it we want to start a simple one-room cottage where we can store some of our things once we sell our house up North. Eventually we will expand and fix it up with room for our children and grandchildren when they visit. Part of the year we'll shut it up and take to RV touring again. What kind of house can you suggest?" Several RV retirees have similar projects underway in New Mexico.

PM's basic RV base, shown here, starts with an enclosure and carport. Check local

building codes and restrictions, plus insurance requirements, before getting started. Since some communities don't like the appearance of an RV, we have enclosed the carport with a garage door but louvered the top for ventilation so that the generator, airconditioner or furnace can be employed. For extensive use, exhaust hose extension or chimney connection may be installed.

Floor level of the camp cottage is planned at a height equal to the RV interior with a walkway leading in and accordion walls and

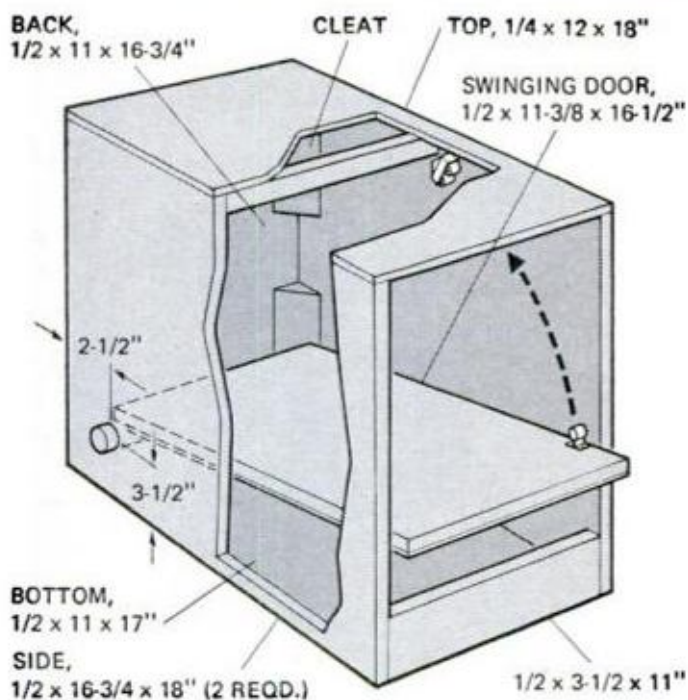
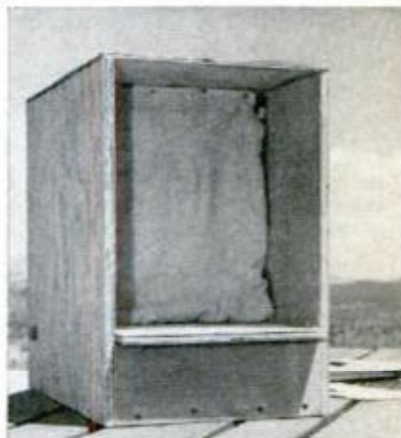
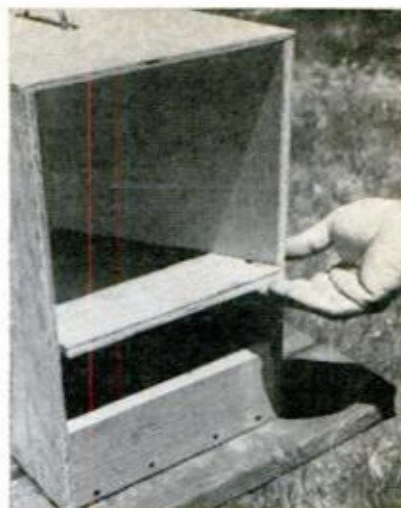
ceiling fitting snugly around the RV door. Initially the room can be a simple screened-in shelter—with windows, walls, plumbing, room divisions, kitchen and bath, furnace and airconditioning, separate bedroom and outer decking added later. Storm shutters can close up the house completely when the owners drive off on tour. With sleeping accommodations in the vehicle and a fold-out sofa in the living area, back-bedroom space may be kept as a garage extension for a second car. ★★★



Guest house, summer camp, workshop, office, mother-in-law cottage and playroom are among uses for versatile RV home.

Twin-duty target box

by Marshall Lincoln



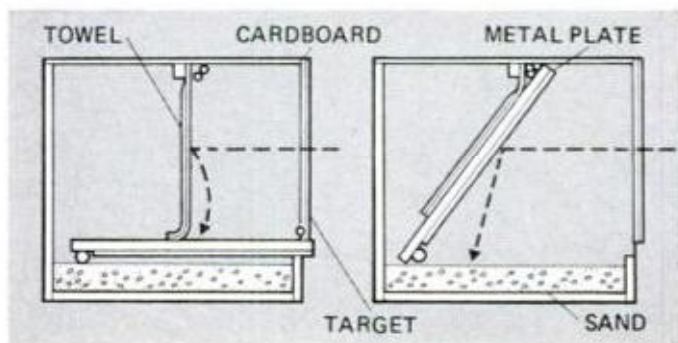
Designed to catch both plastic practice rounds and lead bullets and pellets, this easily constructed target box uses hinged inner deflector.

Inner hinged and steel-shielded door (top right) lifts to snap into cabinet latch. Lowered (above) it exposes towel backstop for reusable plastics.

Box construction (left) is designed for standard pistol target. Sand layer in bottom traps lead that can be sieved out for recasting, reloading.

A swinging door is the unique feature of this simple target box. With metal boiler plate or sheet-metal door in 45° up position, pellets and lead bullets are deflected down into a sand cushion in the bottom of the box. With the door tilted down to floor the box, a folded bath towel hangs midway back to stop plastic pellet practice rounds so that they are undamaged and can be collected and re-used after indoor or outdoor shooting.

The simple 1/2-inch-plywood box can be built in any size. As shown, it easily mounts standard pistol targets on a piece of corrugated cardboard stapled over the front of the box. The swinging door hinges on a dowel and is held up by a cabinet latch. Mount a carrying handle on the top of the target box. ★★★



Tripods aren't always tripods

by Ivan Berger
PHOTOGRAPHY EDITOR

Clamps turn anything handy into a tripod, fix camera on doors, furniture, fences, car bumpers; some (Capro, Kaiser, Linhof) even screw into trees.



MIIDA
ELEVATOR
TRI-CLAMP,
\$29.75



CAPRO MINI-CLAMP, \$6.95

KAISER
MINI-KLETTE,
\$9.95
(LEGS RETRACTED)

LINHOF
HEAVY-
DUTY
CLAMP
WITH
TREE SCREW,
\$54.50



Photos: Peter Schneider

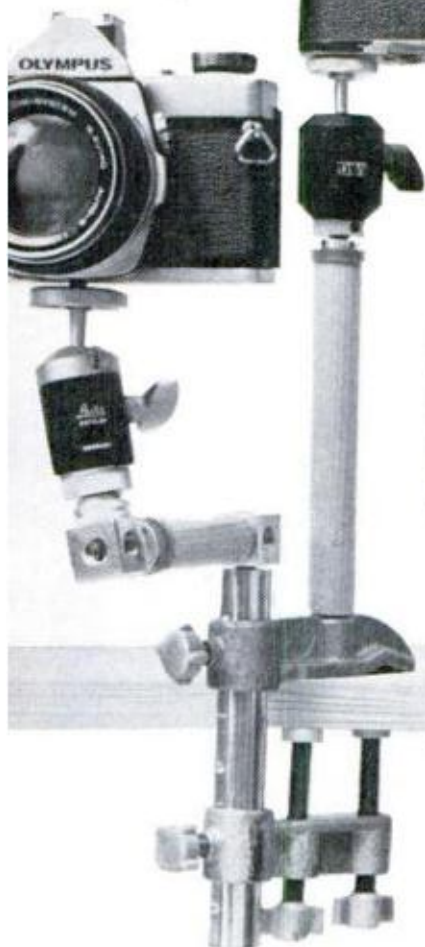
Accura Vacuum Camera Support has trigger-operated suction-cup base, adjusts several inches up and down, lists for \$16.

Cameras aren't all that these clamps and mini-tripods can hold. Here the Camera-Grabber doubles as a flash stand.



The trouble with tripods is that they're never with you when you need one. Too bulky to carry around with you all day, your tripod is likely to languish in your closet while you stub your toe against the many situations in which you need something to hold your camera still. For instance:

- Time exposures.
- Close-ups.
- Shooting Kodachrome on overcast days.
- As emergency flash or reflector stands.
- Keeping the camera aimed while you set

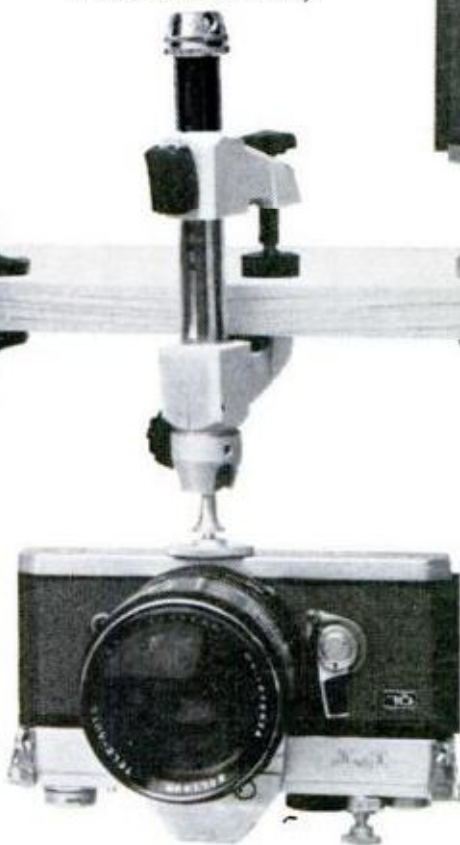


ROWI UKV KIT, \$32

KAISER KLETTE III,
\$14.50
(TREE SCREW AND
LEGS RETRACTED)

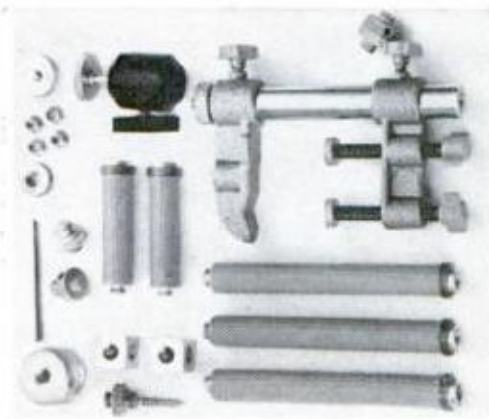


ACCURA
CLAMP-IT,
ABOUT \$7



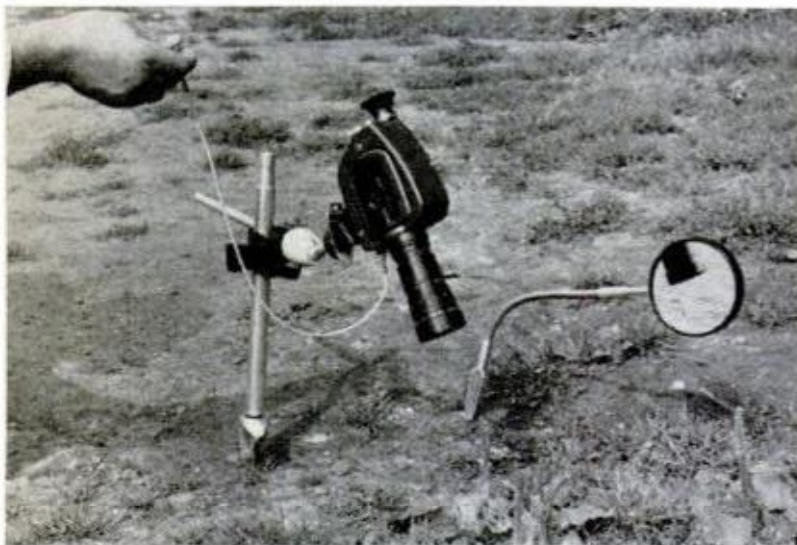
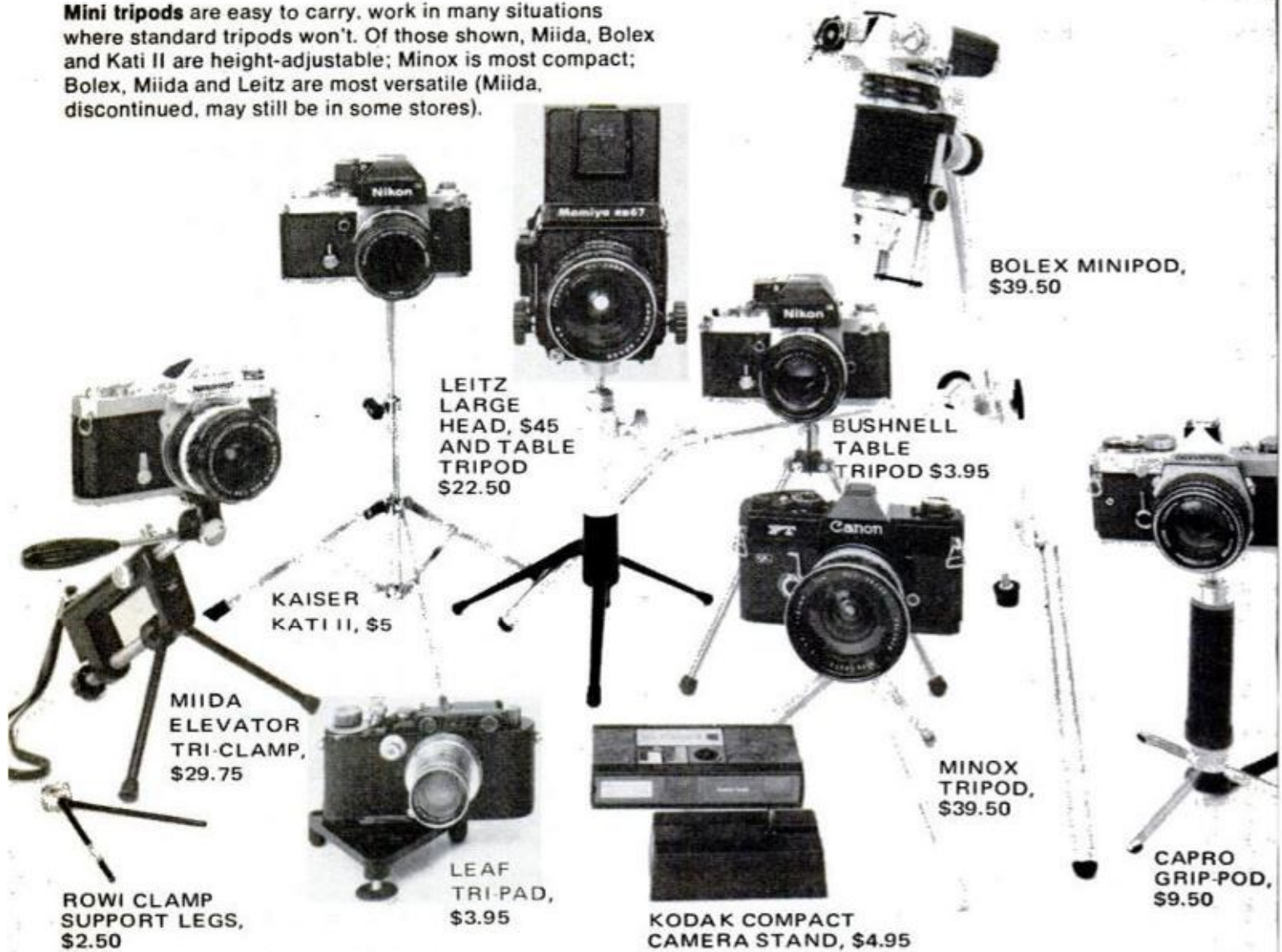
PRINT-FILE DELUXE
CAMERA GRABBER,
\$22.50

Rowi UKV kit (right, far right and directly above) costs \$32—plus \$15 for its optional leather case (not shown)—but its 18 pieces will adapt readily to a wide and weird variety of purposes and applications. Two such configurations are shown here—but you can imagine much more from the disassembled view.



Mini tripods fit your pocket or camera bag

Mini tripods are easy to carry, work in many situations where standard tripods won't. Of those shown, Miida, Bolex and Kati II are height-adjustable; Minox is most compact; Bolex, Miida and Leitz are most versatile (Miida, discontinued, may still be in some stores).



Alpa Macrostat system is versatile, expensive—but you can buy just the pieces you need. Outfit at right includes Stabil miniature tripod (\$119.50), plus other components worth about \$110. Outdoor outfit above includes large and small ground-spike, mirror reflector, other components; costs about \$80.





Built for telescopes, Bushnell Shooters Stand (\$28) needs ball-joint head (Leitz head is shown) for camera use. Height range can be increased with \$6 extension shown.



Adjustable ball-joint heads let you angle mini-tripods to rest them against your chest or vertical surfaces. Cappo Grip-Pod is shown.

the self-timer and get in the shot yourself.

The problem's not insoluble. The stores are full of tripods that fold small enough to fit your gadget bag or pocket, clamps that convert any handy object into camera supports (fence rails or your car door, for example), even supports built especially for use in your car.

We've tried all the gadgets shown except the Questar car-mount and the Accura vacuum pod, and here are our favorites:

- Minox—high-priced, but by far the easiest to carry. (It would be even easier, though, if it had a pocket clip.)
- Miida—very versatile (it doubles as a clamp or tripod), but just discontinued; so



Bolex's "praying mantis" Minipod adjusts to many different applications as shown here and on next page. It folds down to 12 inches long, weighs 22 ounces, and comes with its own carrying case and shoulder strap.



Two pocket tripods: Heavy, stable Leitz (shown with \$22.50 and \$45 ball-joint heads) swivels shut for pocketing or to double as a tele handgrip. Minox's three sections and cable release fit inside one another.

Turn your car into a camera dolly

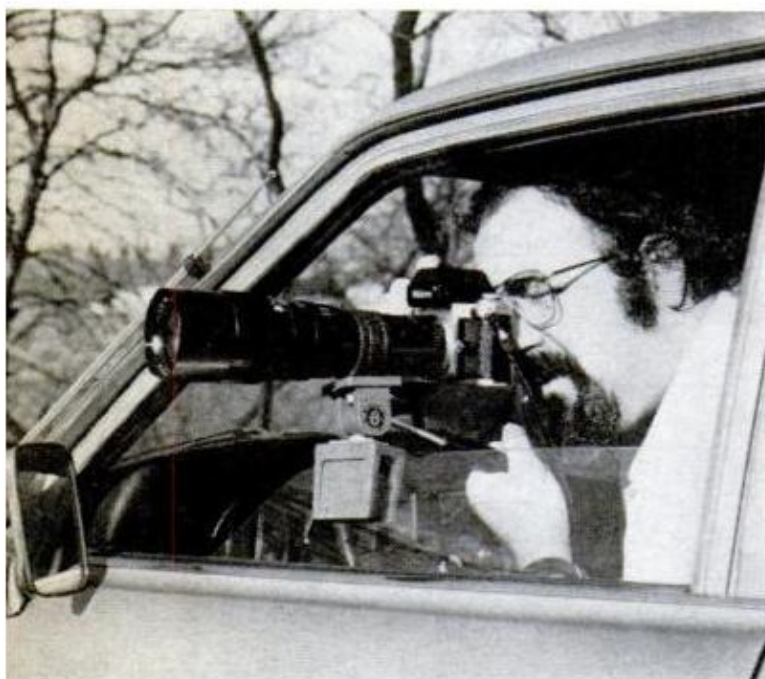
Questar Corp.



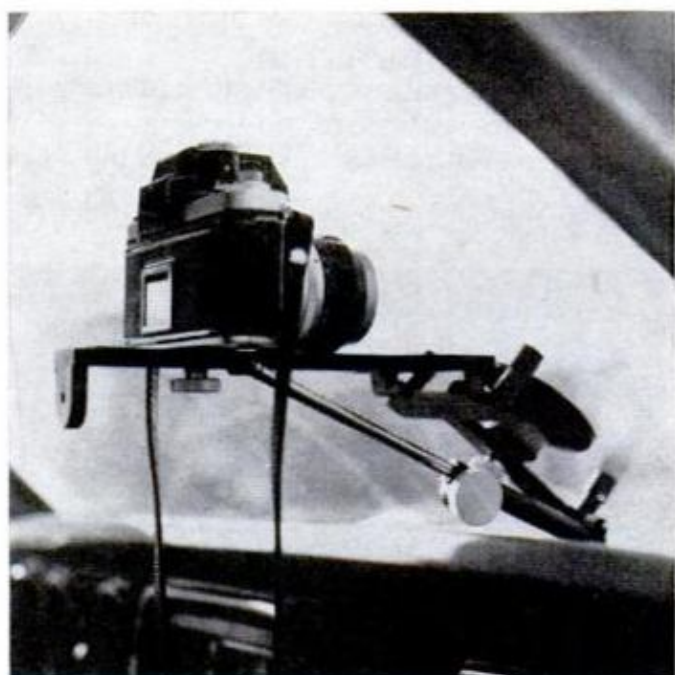
Questar Carpod (\$43.50) is designed to fit all cars. It was designed by Dr. R. C. Ashley, who uses it to shoot birds from the roadside, in comfort.



Bolex Minipod again, here braced against a car dashboard for over-the-hood shots. Adjusted differently, it can hook over bumper for low-angle dolly shots.



Bushnell Car Window Mount (25) has soft jaws that clamp over window glass, sturdy pan head. Like Bushnell's Shooter's Stand (previous page), it's very solid.



Rowi Car Camera Support (\$21.60), grips windshield with suction cup, adjusts to windshield angle. In our tests, it held camera securely for days.

if you want one, look fast for a store that still has one in stock.

□ Leitz—a classic: *very* solid, folds flat, and doubles as a pistol grip for long tele lenses. Leica quality all the way.

□ Bolex Minipod—you'll never figure out *all* the tricks it can do; obviously the work of a very good, mad genius.

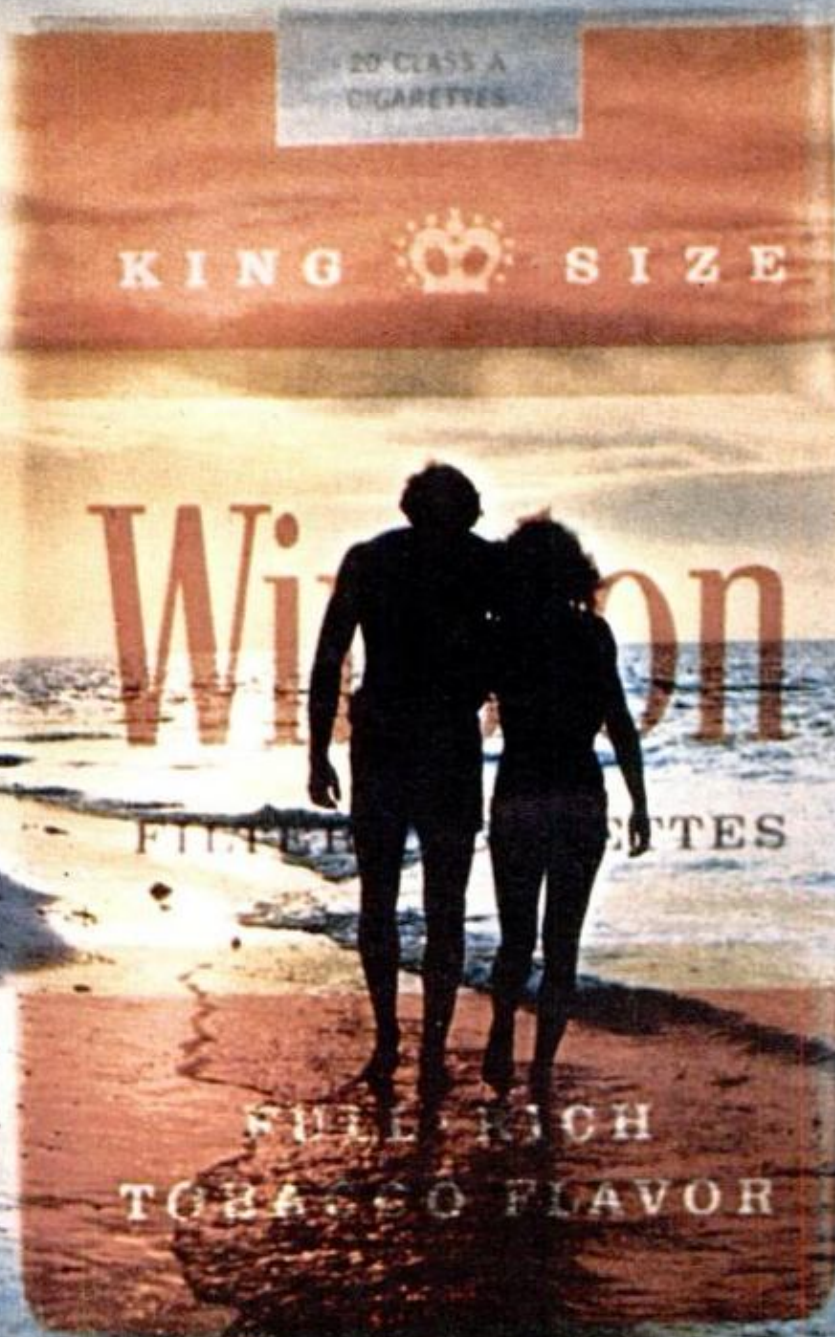
□ Rowi car mount—makes very steady movies, and sticks for days.

□ Bushnell Table Tripod—sturdy, and a steal at just \$4.

□ Rowi UKV—like an Erector set, does everything.

Questar, Leaf and Bushnell sell by mail; the rest are available through dealers. ★ ★ ★

Winston



tastes good like a cigarette should.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

© 1974 R. J. REYNOLDS TOBACCO CO.
20 mg. "tar", 1.3 mg. nicotine av. per cigarette, FTC Report SEPT. '73.

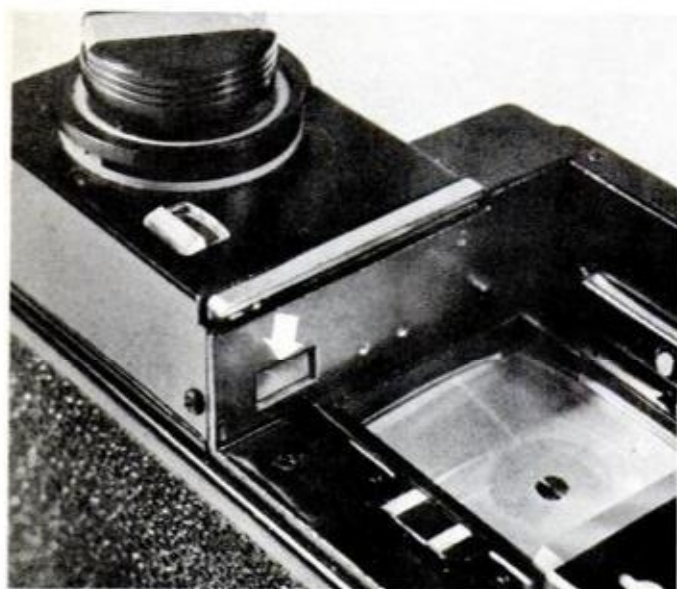
Auto-winding Topcon: A little motor-drive, a lot of camera

by Ivan Berger
PHOTOGRAPHY EDITOR

Photos by Robert D. Borst



Wrist strap and griplike motor housing fit the hand comfortably (above), make Auto-Winder-equipped Topcon easy to hold and carry. Meter window (below), next to rewind knob, lets you see needle from waist or chest level; projection at rear of window catches light to illuminate meter for eye-level viewing. Window (arrow) transmits meter image to prism finder.



Press the trigger of Topcon's Super DM Supreme, and after the usual SLR noises there is a not-so-usual whir. That's the Auto Winder electrically advancing the film and recocking the shutter for you.

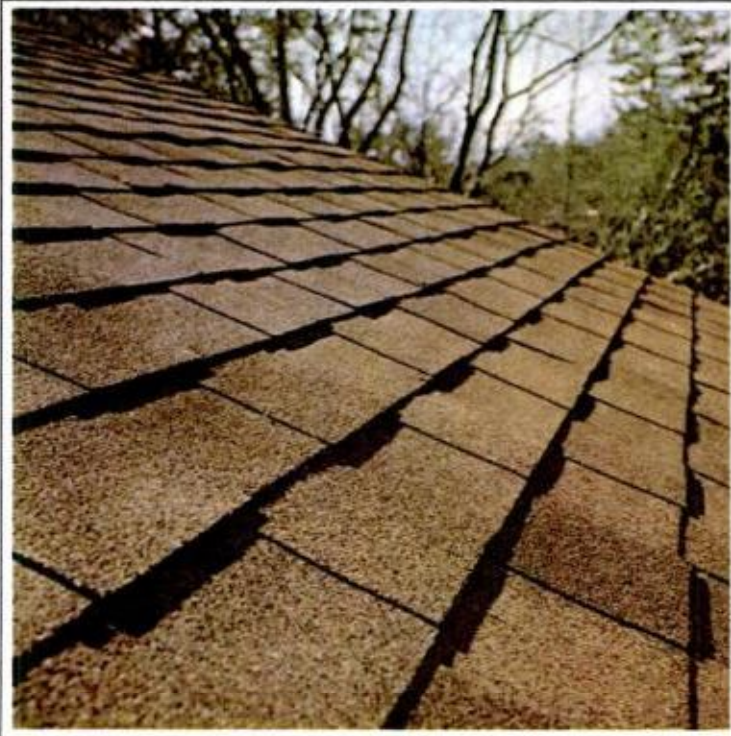
Topcon is careful not to call it a "motor drive"—true motor drives (including Topcon's own) can fire continuous, machine-gunlike bursts at three frames or more per second, as long as you hold the trigger down. The Auto Winder just lets you shoot one frame at a time—but it did let me shoot $1\frac{1}{2}$ frames per second without taking my eye from the finder, versus my top thumb-winding speed of 1 per second. And while motor drives are heavy, bulky and cost around \$500, the Auto Winder weighs just 10 ounces, costs \$123.50, and slips over the camera so neatly that it actually makes it easier to grip (in use, your fingers curl around the motor housing, while a padded strap helps you hold and carry the camera easily). Our winder jammed occasionally, but a button unjams it.

Without the winder, the DM is still a lot of camera—and a lot less expensive: \$604 instead of \$727, with the 50-mm f/1.4 GN lens. "GN" stands for Guide Number: Set it for your flash and film (it's simpler than the instructions make it seem) and it will automatically adjust its f/stop for correct exposure, as you focus. There are 20 other Topcon lenses, from 20 to 500 mm.

The camera's finders include interchangeable waist-level and prism models, both shown here. An exposure-meter dial atop the camera lets you check exposure with the waist-level finder in place. It also helps you get more candid pictures with the prism finder, by letting you check and set exposure without alerting your subjects by looking through the finder. The meter window has a raised plastic lip that does a great job of gathering light to illuminate the meter scale; for really dim light (the meter can read down to 1/1000 second at f/1.4 with Tri-X) a \$19 accessory light fits over

(Please turn to page 182)

The Woodlands fiber glass roof.



The beauty of a wood roof without the ugliness.

The beauty of a wood shake roof can't be denied.

But neither can the drawbacks.

A wood shingle has an ugly tendency to split, crack, and rot.

Even worse: Wood roofing burns and spreads fire.

The Woodlands fiber glass-asphalt roof gives you all the beauty of wood, but none of the drawbacks.

The secret is that a Woodlands roof is built with overlapping layers of asphalt-saturated fiber glass.

The three-dimensional

overlays create long, dramatic shadows that give your roof the look of wood.

The fiber glass base and the asphalt team up to deliver tremendous roof life—and a Class A rating for fire.

That's the best fire rating Underwriters' Laboratories can give a roof.

It's a terrific combination: The beauty of wood shingles. And the safety and value of a Class A roof.

Before you select a roof for any home, find out more about the enduring beauty of Woodlands.

It's the finest fiber glass roof you can buy. The top of the line from the people who know the most about fiber glass-asphalt roofs: Johns-Manville.

Send me complete information (including color selection chart) about The Woodlands Roof.

Johns-Manville
Box 5705-RP504
Denver, Colorado 80217

Name _____

Address _____

City _____

6•••• 3••••



Johns-Manville



**Johnson's
new 70 hp.**

**5 hp
more punch
without
more paunch.**

Five more horses than last year's loop-charged 65 hp but not more size. We did it by making the combustion chamber even more efficient than before. Improved the carburetion, too.

Our new 70 hp loop-charger makes fuel work harder and last longer. Does it with precisely positioned intake and exhaust ports. A Johnson design that brings in the new fuel mixture while pushing out the exhaust in one continuous power loop.

Does it with exhaust tuning that uses the energy of sound waves to pull more exhaust gases out of each cylinder. To pack in more of the new fuel mixture. Giving you more power without using more gas.

With pressure-back piston rings that reduce friction, engine wear and fuel consumption. With MagFlash™ capacitor discharge ignition for smooth, gas saving running, troll to full throttle. For fast, sure starts.

See our new loop-charged 70 hp at your Johnson dealer. And see our other outboards, 2 to 135 hp—plus a new electric auxiliary motor made for maneuvering. Or write for free catalog. Johnson Outboards, Div. Outboard Marine Corp., Sea-Horse Drive, Waukegan, Illinois 60085, Dept. PM-64.



First in Dependability
Johnson
OUTBOARDS

Spinning saucer and revolving rabbit ears aid TV reception

by Ivan Berger
ELECTRONICS EDITOR

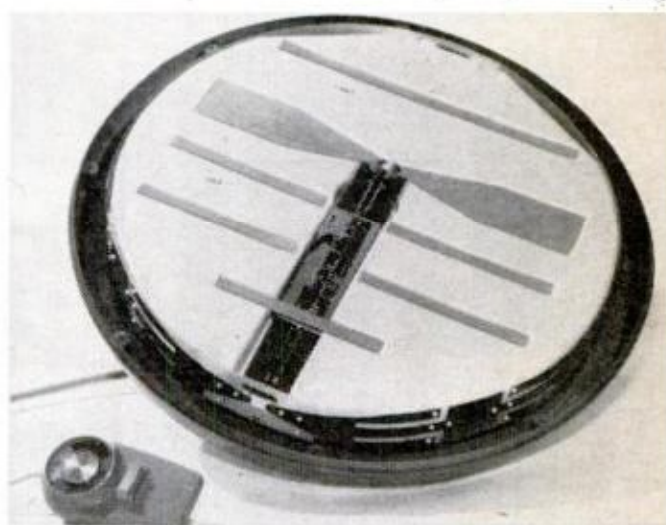


Pushbutton remote rotation lifts Spico Remotomatic a bit above the ordinary rabbit-ears' league.

If problems in putting up outdoor antennas restrict you to rabbit ears, you know their limitations: Their directivity is poor (they pick up ghosts from behind as well as signals from the front). Their signal pickup is weak. And no matter how clearly you tune and aim them, the perfect adjustment that costs you five minutes of fiddling disappears as soon as you move a few feet away.

Two new products can help the rabbit-ear blues: Spico's Remotomatic (\$40) has a pushbutton remote rotator, so you can aim it from your chair. Thus you adjust it for the normal pattern of signals in your room, not just for the pattern that exists when you serve as a signal reflector next to the antenna.

RCA's new Mini-State does a lot more. Not only is its remote control more elaborate (with more precise control and lights



RCA's Mini-State "saucer" antenna works outdoors (as shown, top) or indoors (mounted on its three short legs it can fit inconspicuously under furniture). Inside Mini-State (shown above with lid removed) is unidirectional antenna of foil elements on foam plastic, plus signal amplifier (in rectangular well behind "bow-tie" pickup antenna element). Remote control shown rotates antenna from your chair, lights to show direction in which the antenna elements are pointing.

that show which way the antenna's pointing) but it is unidirectional, comparatively dead to signal reflections from the rear. That means there are fewer ghosts—and its built-in signal amplifier gets stronger signals than rabbit ears can. Mounted indoors (awkward, with its 21-inch diameter, but not impossible), its performance even on UHF is about halfway between that of rabbit ears and a high-gain outdoor antenna; mounted outdoors (its plastic shell is weatherproof), it should work even better. Mini-State is \$100; a nonrevolving version is \$75. ★★★

How to install an auxiliary fuel tank

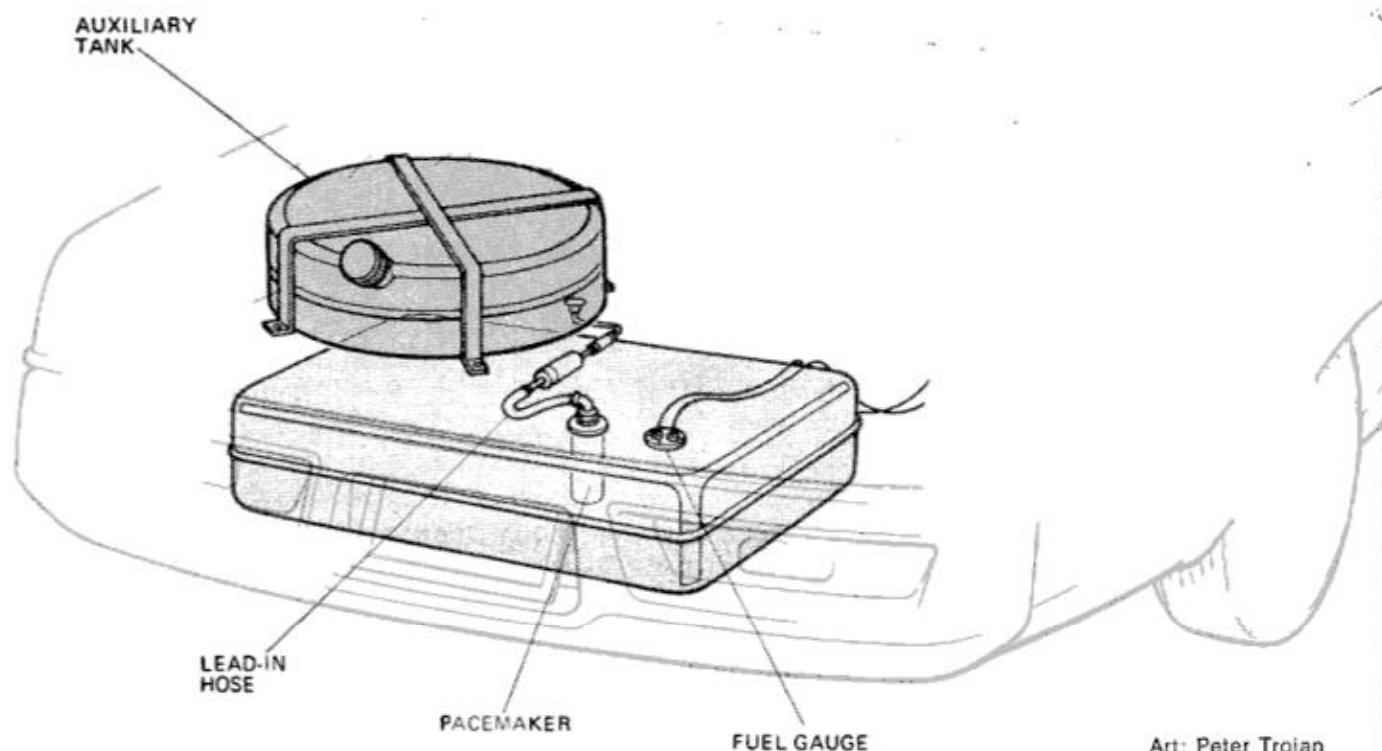
With an extra tank you can drive all night without running dry, and tank up when and where the price is right.

by Bill Hartford
AUTO EDITOR

Keeping your tank topped off is a good habit. Or, better, good car care. Most PM readers know, for example, that it minimizes the accumulation of water from condensation in your tank. That's why so many knowledgeable car owners were indignant to hear themselves referred to as "gas hoarders" earlier this year. They were only doing what they had always done.

Increasing your driving range with a greater on-board supply of fuel is, likewise, a matter of intelligent planning. It means fewer stops, and may mean that you won't stop in the middle of nowhere with a dry tank. The best way to extend your range is with an auxiliary fuel tank. There are two types: The built-in tank that connects directly to your original-equipment tank, and the auxiliary tank that can be tapped when you need it.

The built-in tank is available in several configurations. Saddle tanks, for example, are designed for pickup trucks and fit inside the pickup bed behind the rear wheel wells. Shown below is a spare-tire type of tank. It can be mounted either flat or ver-



Art: Peter Trojan

Preparing your car's gas tank



Drain tank, fill it with water and then locate position for Pacemaker.



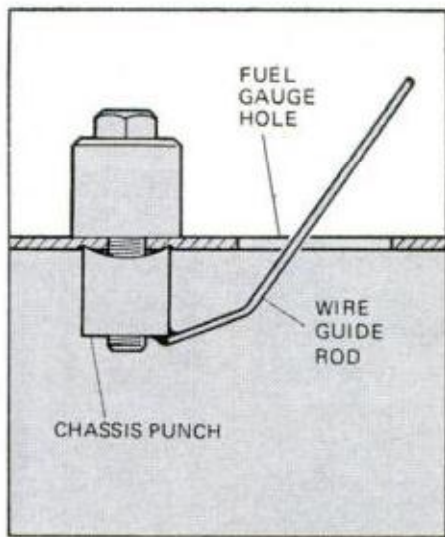
Punch a 3/8-inch hole in the tank so that chassis punch can be used.



Remove the sending unit that transmits fuel level to gas gauge.



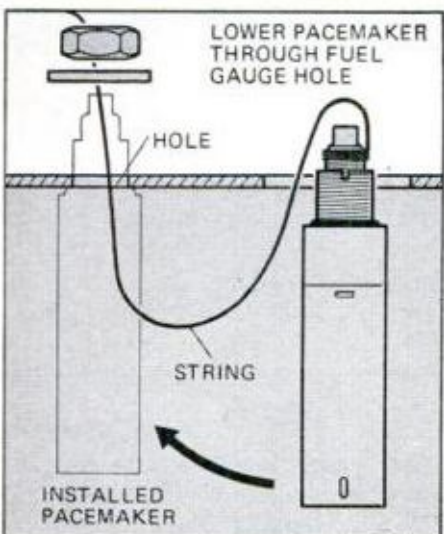
Chassis punch is mounted in position ready for cut by using the fuel-gauge hole for access.



A wire guide rod is used to locate the bottom part of chassis punch under the top part.



The Pacemaker valve is shown mounted in place. Follow technique shown below left for installing.



Thread string down through mounting hole, up through fuel-gauge hole, tie to Pacemaker and position.



Gas line and fuel filter are connected to Pacemaker before the tank is replaced on car.



Tank is ready to be raised into position and secured. Make sure that fuel lines are routed properly.

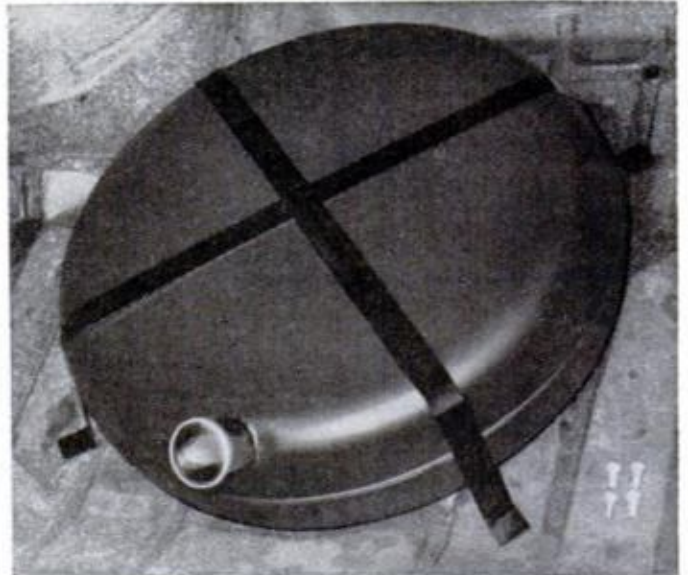
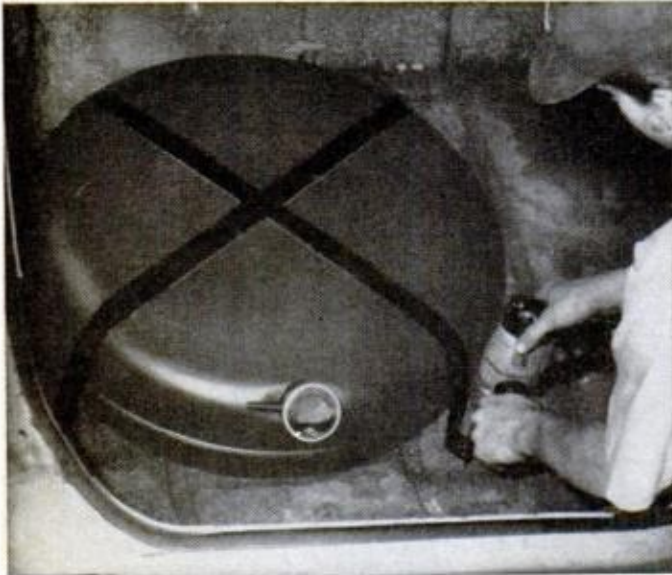
tically. The gravity-feed unit connects to the main tank and therefore doesn't require its own evaporative emissions control. Heart of this auxiliary tank system is the Pacemaker valve which mounts in your existing tank. It automatically feeds gasoline from the auxiliary tank to the main tank,

so there's no need for elaborate switching and gauge systems common to some multiple fuel-tank systems.

The Pacemaker and spare-tire tank are products of Hickey Enterprises (HE). They're at 1645 Callens Rd., Ventura, Calif. 93003. The Pacemaker unit is \$20; the 15-

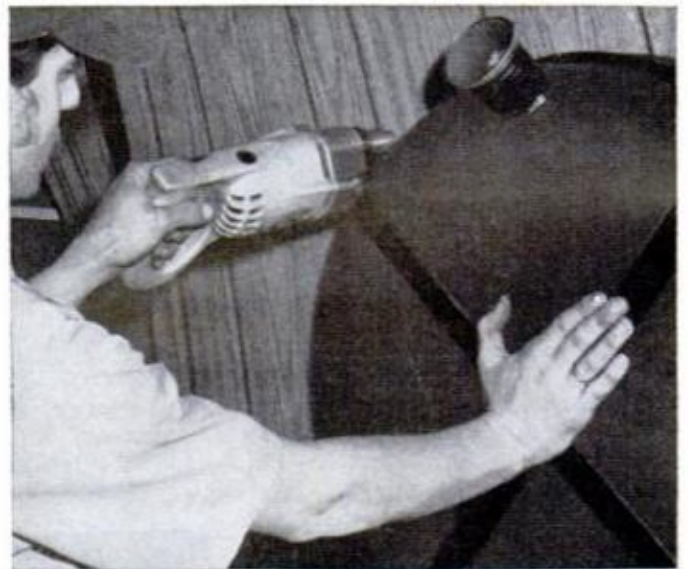
1

2



3

4



5



1. To mount the tank flat in the trunk, position it and drill holes for mounting strap bolts.

2. The tank is installed in position. This tank, from Hickey Enterprises, comes with all hardware.

3. Tank is filled in a normal manner. Check that all hose connections are tight and there are no leaks.

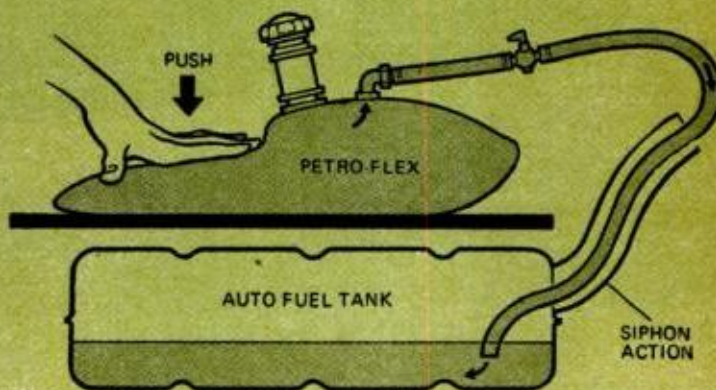
4. In campers or vans, the auxiliary spare-tire type tank can also be mounted vertically.

5. The steel mounting straps are used in vertical mounting also. Make sure bulkhead is reinforced.

gallon tank, \$70. Prices include all hoses, clamps, valves, filters and mounting straps. Details of connecting the auxiliary tank to your original-equipment tank are shown on page 149 and details of mounting the tank are shown on page 150. Check legality of the tanks in your area before ordering.

An auxiliary tank that lets you carry reserve fuel safely is shown below. The Petro-flex tank is a spin-off of research and development of fuel cells for auto racing. Petro-flex tanks are available in 8, 15, and 45-gallon sizes from Aero Tec Laboratories (see below). ★★★

From race car to family car



Petro-flex fuel cell enables you to carry reserve gas safely and siphon it in your car's tank as needed.

Fire has always been the greatest threat to the safety of racing-car drivers. Safety harnesses and structural design of the car enable a driver to withstand tremendous forces in a collision. It's fire that's the killer.

Recent developments, however, have greatly reduced even the fire hazard in motor racing. Fire-retardant materials for racing suits enable a driver to withstand incredible exposure to flame without injury, and automatic-cockpit fire extinguishers have been used with success. But the credit for minimizing the chance of fire in the first place goes to the fuel cell. It contains the fuel and keeps it from igniting in all but the most devastating crashes.

Aero Tec's flexible Petro-flex units are consumer applications of the company's experience in the manufacture of racing fuel cells that are approved by auto-racing sanctioning organizations nationally and internationally. They are also used in federal government limousines. A Petro-flex installed in your trunk is as safe as, if not safer than, almost all original equipment tanks in extremely vulnerable locations with exposed filler positions behind the rear license plate (some cars,

notably imports, now have tanks moved forward to safer positions over the rear axle).

Petro-flex bladders are constructed of an impregnated fabric called ballistic nylon. While not bulletproof, they are extremely rugged and self-sealing in case of puncture. The bladders are available in 8, 15 and 45-gallon sizes, at \$160, \$200 and \$300, respectively.

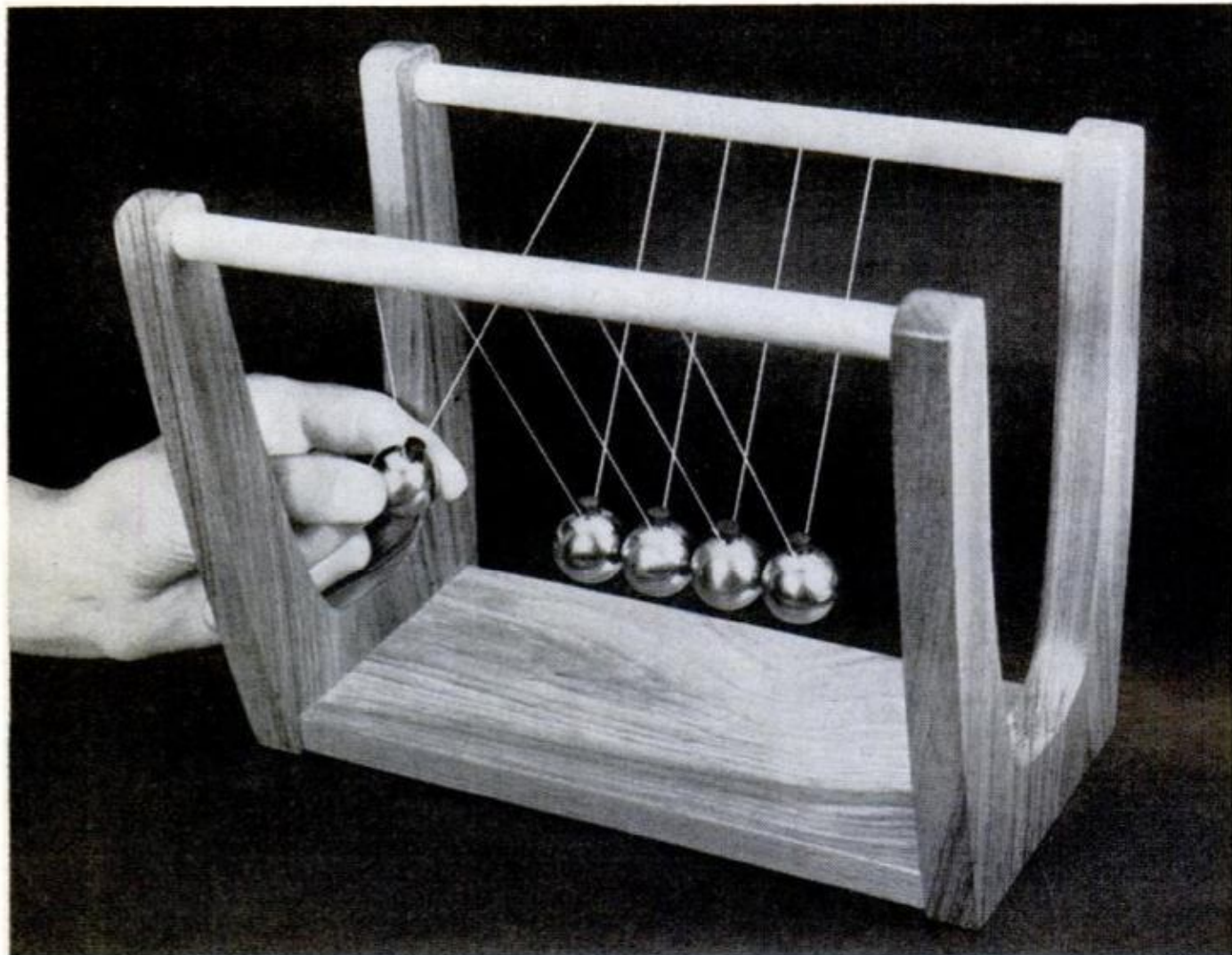
Each Petro-flex bladder is larger than its rated capacity by several gallons to provide for expansion. When empty, it rolls into a compact package. For filling you simply lay it out in the trunk, secure it by the corner tabs and place the gasoline hose nozzle in the filler neck. The top surface of the bladder rises on the fuel; there's no need to hold it up as you fill.

When you're ready to siphon fuel from the Petro-flex into your tank, you simply press down to start the siphoning action. You could also use a siphon pump to start the flow or install an electric fuel pump for transfer of fuel.

For more information about Petro-flex and Petro-cells (tanks for permanent installation) write to Aero Tec Laboratories, Inc., Fuel Cell Systems Div., Hewson Ave., Waldwick, N.J. 07463.

A surefire conversation piece

by Kenneth Wells



Action is started by swinging the ball at one end, causing the ball at the opposite end to fly up. Middle balls remain stationary. Way-Mar Co., Box 164, Hartsdale, N.Y. 10053, sells the five balls for \$1.75 postpaid.

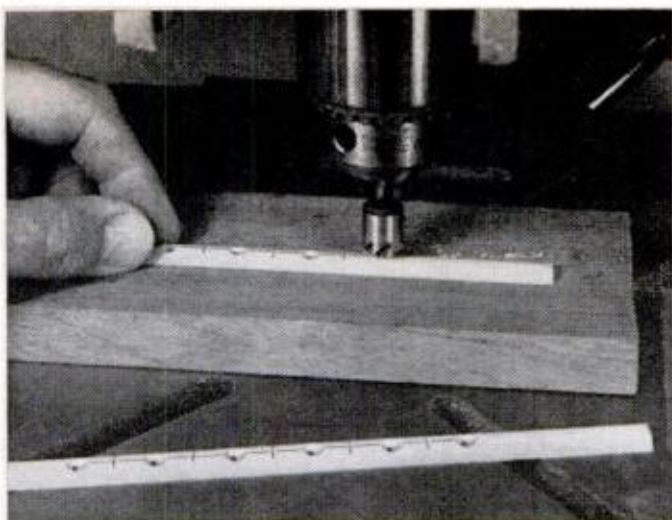
Sir Isaac Newton, the 17th-century English scientist, invented his famous cradle to demonstrate his theory of motion. The fascinating action of the swinging steel balls striking one another is as intriguing today as it was 300 years ago. Only the end balls move; the middle ones transfer energy without moving themselves at all.

To make a Newton cradle, draw a pattern for the U-shape ends, trace it on $\frac{3}{4}$ -in. hardwood and saw out two identical members. Drill blind holes for the $\frac{1}{4}$ and $\frac{1}{2}$ -in. dowels. Prepare the base and drill the mating $\frac{1}{4}$ -in. dowel holes in the ends. The two $\frac{1}{2}$ -in. dowel rods from which the steel balls hang by thread consist of two halves between which the threads are clamped. Tiny

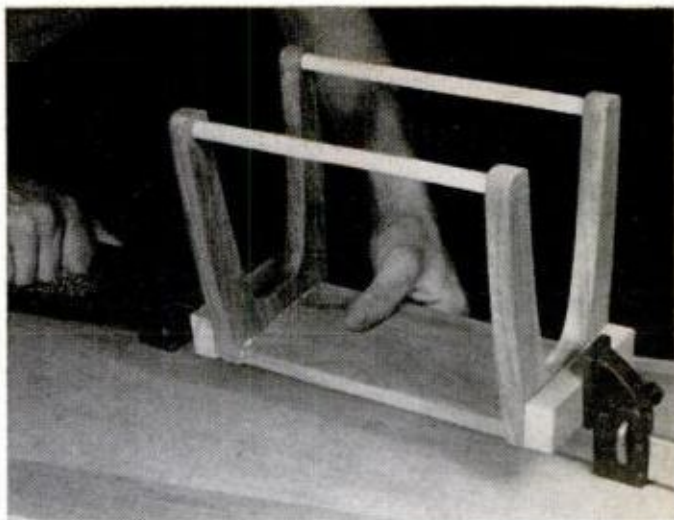
kerfs are filed crosswise in the bottom halves to space the threads $\frac{3}{4}$ in. apart, then $\frac{1}{8}$ -in. holes are drilled and countersunk midway between the kerfs for tiny flathead screws.

The threads are attached to the steel balls with tapered plugs made from bits of dowel pressed into $\frac{1}{4}$ -in.-deep holes drilled in the balls. The threads are placed across the holes, the cork-like plugs coated with epoxy and then forced into the holes.

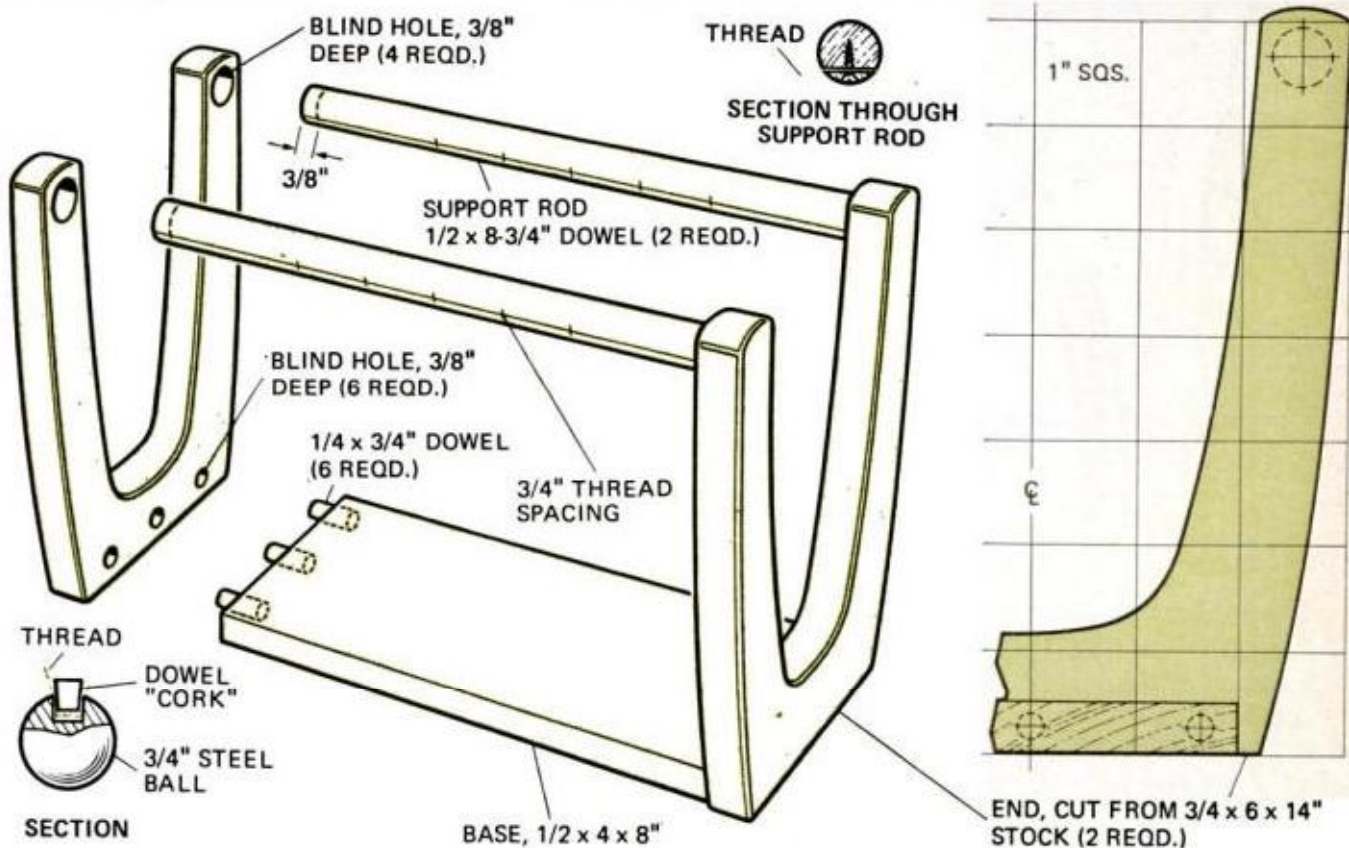
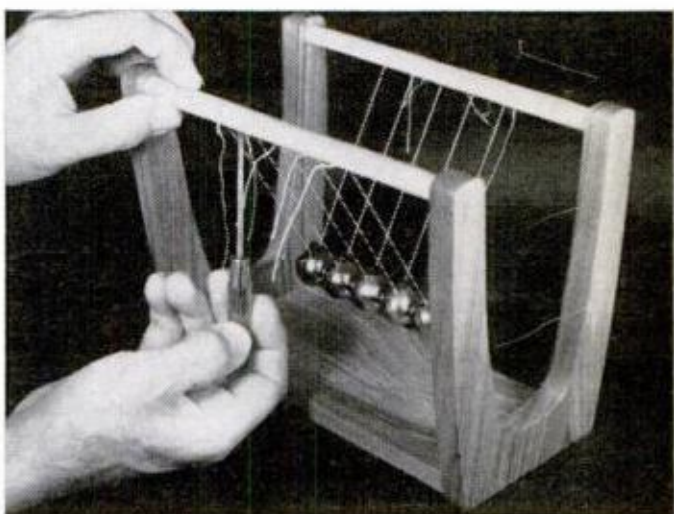
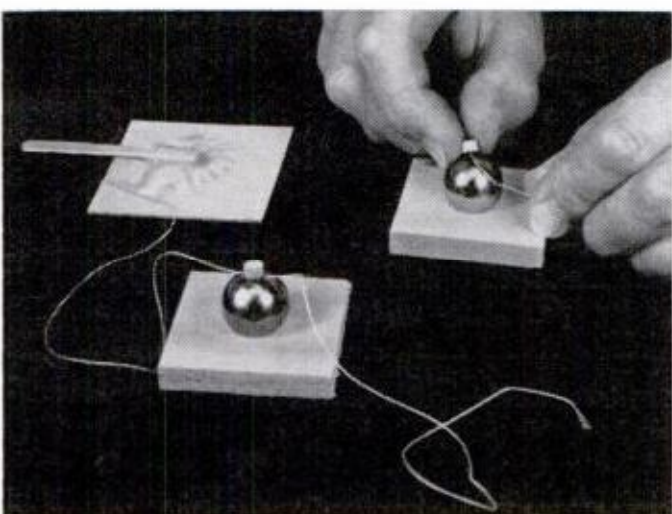
Finally, the threads are passed between the two-part dowels, the screws tightened a little and the threads adjusted to align the five balls. When all the balls are in a row, the screws are then tightened for good, clamping the threads, and the excess thread cut off. ★★★



Lower halves of split dowels are drilled and counter-sunk for tiny screws to clamp ends of ball-hanging threads. With balls resting in holes in scrap (below), threads are affixed to balls with epoxied plugs.

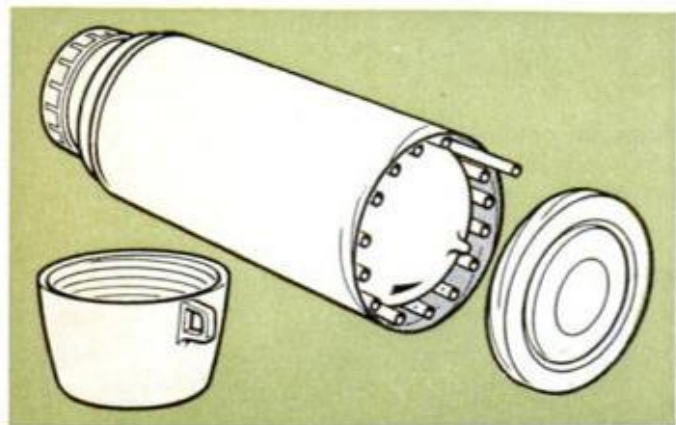


Parts of cradle—dowels, base and ends—are glued and clamped at one time. Threads are held between halves of dowels (below) by tightening screws on underside when five balls hang in alignment.



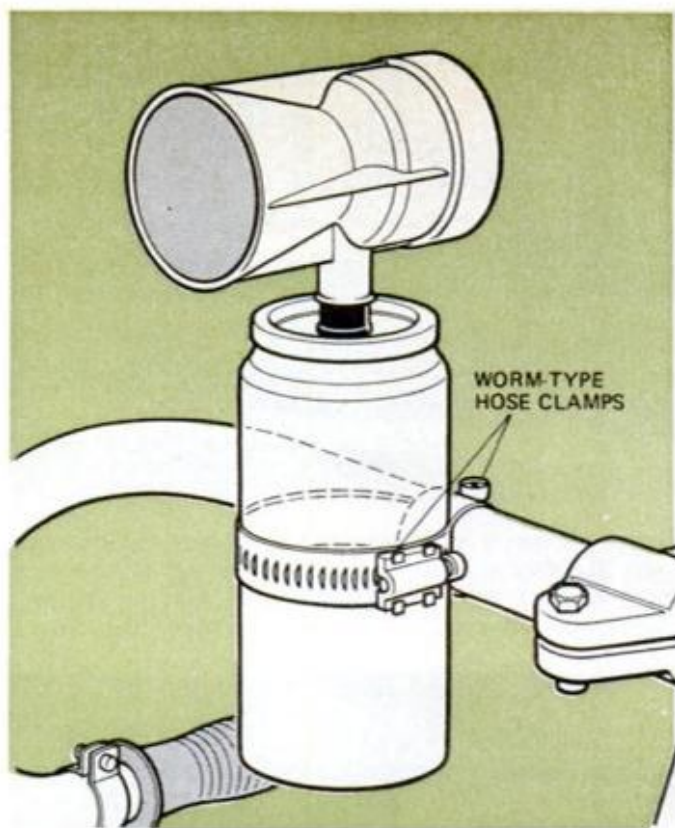
HINTS

FROM READERS



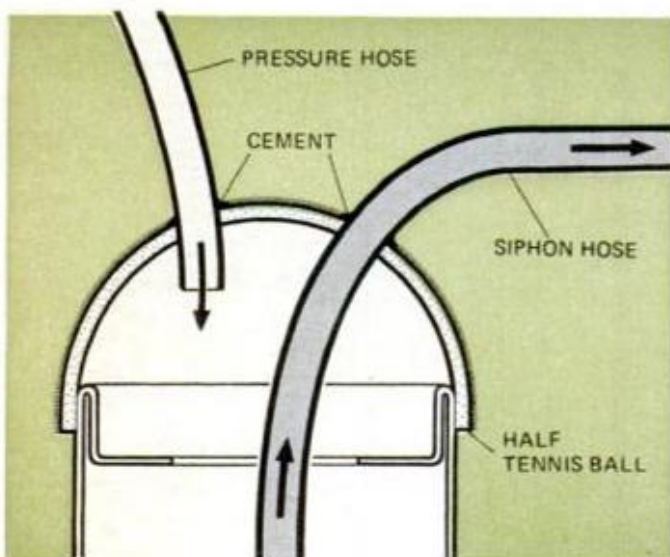
Shockproofing vacuum bottle

Some vacuum bottles can be effectively protected from damaging bumps by packing plastic soda straws, spaced about $\frac{1}{2}$ -in. apart, between the glass inner flask and outer shell.—*Solon E. Ogden, Brooktondale, N.Y.*



Loud bike horn

A small, gas-powered horn makes an excellent warning "horn" for a bicycle—it really gets attention. Mounting it with interlocked hose clamps is quick and allows for easy replacement.—*Evan Langman, Atlanta*



Siphon starter

To siphon gas without getting a mouthful, make a starter like this with your siphon hose and a second length of hose cemented into half a tennis ball as shown. To use it, press the half-ball against the container's spout and blow into second hose—the pressure will start siphoning action.—*M. G. McMullen, Santa Margarita, Calif.*



Removing latex-covered wallpaper

To steam off wallpaper that's been painted, you have to scratch the surface of the paint so the steam will penetrate the paper beneath. I found the teeth of a handsaw did the trick. Simply hold the saw at right angles to the wall and draw the teeth lightly across the paper. Be careful not to dig into the plaster.—*A. E. Rohmer, Washington, D.C.*

Here it is!

Popular Mechanics

COMPLETE GARDENING GUIDE

All the basic information on home gardening at your fingertips!



Partial list of contents:

Landscaping

Garden surfaces

Gardening in your
climate

How to improve
your soil

Starting seeds

Trees

All kinds of
transplanting

Shrubs

All about pruning

Flowers

Lawn care

Vegetables

Garden pools

Fruits, nuts
and herbs

Container gardening

Outdoor play areas

Storage structures

FIRST WE assembled every bit of information you need to know to make your lawn and garden the most beautiful in your neighborhood. We condensed *these* basics to *their* essentials. Then we added more than 20 fact-packed tables and charts, and scores of show-how drawings. Finally, we printed this vital material on heavy plastic-coated cards, and spiral-bound them together.

You'll be amazed at the vast amount of information packed into your COMPLETE GARDENING GUIDE! Planting dates and depths for all kinds of seeds and bulbs; when to prune what, and how; information on the 56 most popular shrubs, and the 21 best hedges; all about ground covers; the shapes and heights of the 52 most popular tree species; how to select evergreens; how to lay flagstone, patio blocks, bricks; how to build decks; all about air-layering, whip-grafting and other ways of starting plants; how and when to transplant almost anything; all about lawn renovation; and much, much more. *You can have all this basic gardening know-how at your fingertips!*

No gardener can be a complete gardener without the COMPLETE GARDENING GUIDE! Order your copy today!

Send Check or Money Order For \$3.95 to:

POPULAR MECHANICS, Box 1014 (Dept. GG) Radio City, New York 10019

FREE PLAN **Be Your Own Boss**
New Business Opportunity
FILING SAWS



Start a steady repeat CASH business in your basement or garage. Earn \$5 to \$8 an hour in your sparetime! Excellent profits in saw sharpening business! Automatic Foley Saw Filer, easy to operate, files combination saws, hand, hand and circular saws. No experience needed. H. C. Deibert wrote us: "Since I got my Foley Filer 5 years ago, I have averaged 4 1/2 saws each day since I started."
 Every saw you sharpen brings you more customers. "I rented a two-car garage and have all the work I can do," writes Charles H. Smith.

We Finance You

Foley will help you get started with minimum investment. No franchise fee. Write for complete information. No obligation.

Send Coupon for FREE Information

FOLEY MANUFACTURING CO.
 643-4 Foley Bldg., Minneapolis, Minn. 55418
 Send complete information and Time Payment Plan.
 Name _____
 Address _____

DIESEL & CONSTRUCTION MECHANICS ARE IN DEMAND
 for the Heavy Construction and Road Building Industries. Write for details concerning our training program or Phone (305) 642-0800

UNIVERSAL DIESEL & CONSTRUCTION MECHANIC SCHOOLS, Dept. PM
 1901 N.W. 7 Street/Miami, Fla. 33125
 Name _____ Age _____
 Address _____
 City _____ State _____
 Phone _____ Zip _____

MAKES TRASH VANISH!



BURN IT ON THE SPOT WITHOUT AIR POLLUTION
 Amazing incinerator burns trash on your premises, with no fuel, no fire hazard. Meets tough pollution laws. Simply light with a match and turn on the power. A high speed air stream makes TRASH-AWAY a super-charged furnace. Burns completely, without smoke, almost no residue. 110 volt. Outdoor use. **8 MODELS FROM \$49.95.** Write for catalog, free trial offer.

LEWIS & CLARK Dept. 5236 Wooster Rd. PM Cincinnati, O. 45226

BEST BICYCLES AND GEAR

(Continued from page 178)

32 oz. Available in men's and women's sizes (specify your size) and in navy or red with white trim. Great for those cold, chilly days.

Flyrod, take-apart, Fenwick, \$39.50, 15 oz., L.L. Bean.

Inflatable two-man Pack/Raft boat. \$100. With oars, seats, repair kit and carrying bag which doubles as inflater, about 5 lbs. Doubles as excellent air mattress and emergency lean-to-shelter. American Safety Equipment Corp., 7652 Burnet Ave., Van Nuys, Calif. 91405. This plus the fly rod is, of course, an optional item for touring.

Nylon shell, about \$6.50. Breaks the wind on colder days or when going downhill at high speed. From L.L. Bean.

Compass, Huntsman, L.L. Bean No. 6393, \$6.50. I consider a good hand-held compass a "must" for bicycle touring. This one has protractor plate for topographical maps, magnifying glass. Weighs 1 1/4 oz.

"Howling" Bike Lock Model H5X, \$19.95. I consider this a "must" if I camp outside. Otherwise a thief could make off with my bike by cutting the lightweight cable—all I can carry on a trip. The Howler screams loudly if its cable is tampered with, comes with five feet of sheathed cable and built-in lock, weighs only a pound. Cable is replaceable if cut. Other models are \$12.95 and \$14.95. From Ryco, 1 First St., Los Altos, Calif. 94022.

Shortie ground rubber mat, \$7.50, 18 oz. Keeps ground moisture from getting to you. I never travel without one, if I camp. From Gerry and sporting-goods stores.

Rescue blanket, \$2.50. Weighs 2 oz. From L.L. Bean. Metallized PVC, wind and waterproof. Tiny package unfolds to 56x84-inch blanket. Reflects over 90 percent body heat. Ideal for emergency use if your sleeping bag gets wet.

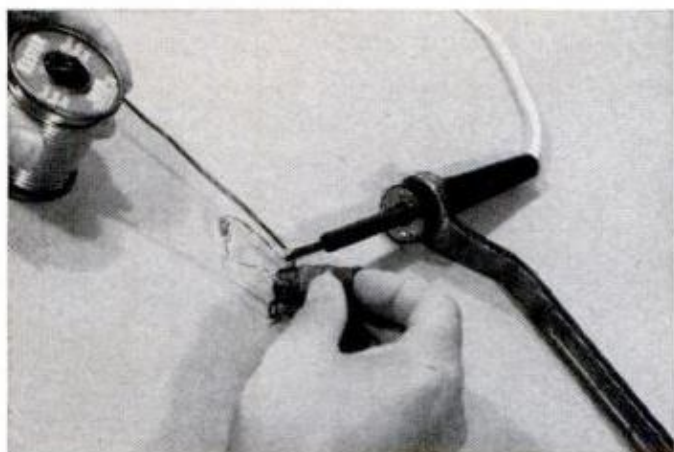
Odds and ends. Insect repellent (use Cutter cream type). Wash-up kit (compact soap and cloth). Sold by L.L. Bean.

Bike cover, \$5.99 (or \$6.99 for one that will cover either a two or three-wheeler). Heavy plastic cover with grommet tie-downs on the bottom. From Cov-R-Rite Industries, 362-66 150th Ave., Madeira Beach, St. Petersburg, Fla.

Rain suit, \$24.95. Pants section rolls up in pocket at bottom of jacket, so jacket can double as windbreaker on cold days. Ask for SlacJac at Schwinn bike stores. ★ ★ ★

HINTS

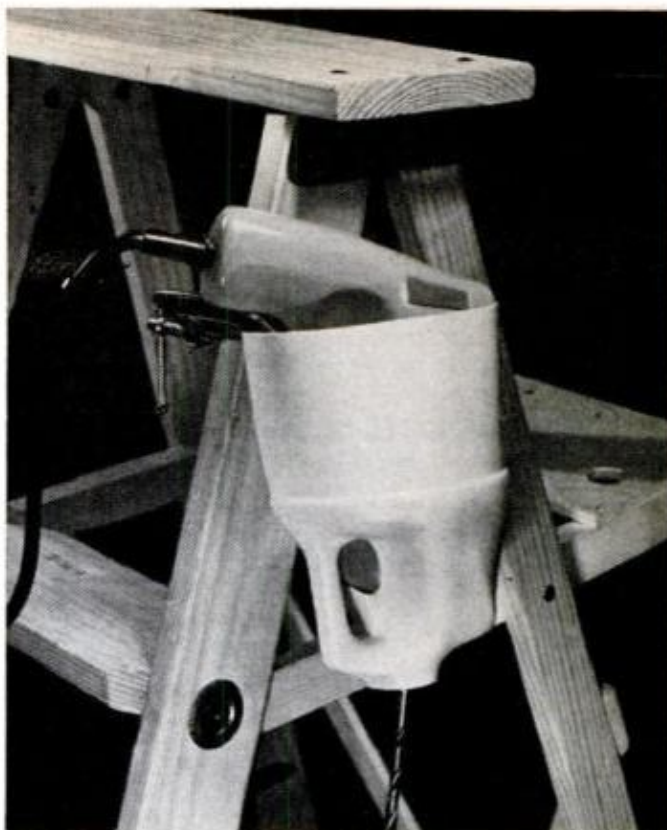
FROM READERS



Wrench holds soldering iron

For a "third hand" on a small soldering job, a box-end wrench of appropriate size can be used to hold a pencil-type iron. A few turns of friction tape around the iron may be needed for a snug fit in the wrench.

—Ken Patterson, Regina, Sask.



Drill holster from jug

A plastic jug, with the bottom and a part of its neck cut off, makes a handy holster for a portable drill when you're working on a step-ladder. With slots cut into the side, the holster can also be worn on your belt.

—Andrew Vena, Philadelphia



Spots 'monitor' recording

Checking to see whether or not your cassette tape recorder is still running while you're recording can be a nuisance. You'll be able to tell at a glance if you dab spots of white paint onto the spindles.

—R.C. Rask, Denver



Can crayon sharpener

A pop-top soft-drink can is a handy sharpener for lumber crayons used in the shop. Shavings stay in the can or on its top. If desired, the opening can be reshaped with a file to give an extra-sharp point.

—Bill Pearce, Tampa, Fla.

GOVT. SURPLUS

and other bargains
SAVE to 90%

Send for this catalog



The world-famous Airborne Catalog. Fully illustrated. Contains 1000's of bargains in hydraulics, electrical, marine, automotive & hardware items . . . and more! A must for mechanics, machinists, hobbyists, sportsmen, inventors, etc. Send 50¢ to cover postage & handling. In a hurry? Send \$1 for airmail delivery. Must include zip.

AIRBORNE SALES CO. Dept. PM74
8501 Steller Dr., Box 2727, Culver City, Ca. 90230
Satisfying world-wide customers since 1945



PERMANENT MAGNETS

MONEY BACK GUARANTEE

- M-710 (Wt. 53 oz.) Has pull of 225 lbs. on steel block. . . . \$21.50
- M-625 (Wt. 49 oz.) Has pull of 125 lbs. on steel block. . . . \$14.50
- M-575 (Wt. 18 oz.) Has pull of 75 lbs. on steel block. . . . \$ 8.50
- M-500 (Wt. 13 oz.) Has pull of 50 lbs. on steel block. . . . \$ 6.50
- M-47 Hot Pad Magnets . . . 20 for \$2.50 . . . 50 for . . . \$ 6.00
- M-CD-05 Bulletin Board Magnets 8 for \$ 1.00

Also Alnico Rods, Bars, Horseshoes, Channels, Single Handed Magnetools, Magnetic Bases and Magnetic Latches, Ceramic Bars, Magnetic Tape with Adhesive Backing. Write for price list.

Send Money Order or Check - We Pay Postage - Sorry No C. O. D.'s.

MIAMI MAGNET COMPANY, 7846 W. 2 Ct., Hialeah, Fla. 33014

PUMP DRAINS pools, cellars, laundry tubs IRRIGATES — CIRCULATES — SPRAYS



Heavy duty ball bearing pump. All metal, rust-proof Type XB. Stainless shaft. Use 1/4 HP or larger. 1 HP 1,200 GPH 60' high or 3,000 GPH 25' well. 5,200 GPH max. 1 1/4" in: 1" out. Belt or direct drive. \$17.95
Type P won't rust or clog. Bronze bearing. To 2,400 GPH. 1" in: 3/4" out. \$11.95
P'd cash with order. Money back Guarantee.

LABAWCO, Box 40, Belle Mead, N.J. 08502

inventors

if you have
a better idea...

for a new product, or a way to improve an old product, contact us — "the idea people".

We will develop your idea, introduce it to industry, negotiate for a cash sale or royalty licensing!

Send for our **FREE** "Inventor's Information Kit". It has a special "Invention Record" form, an important brochure: "Inventions—Their Development, Protection & Marketing", and a Directory: "500 Corporations Seeking New Products". (It also tells you why we're known as "the idea people".)



RAYMOND LEE ORGANIZATION
230 Park Ave., New York, N. Y. 10017
(212) 686-8500

Yes, I'd like to find out how to take action on my idea. Please send me your **FREE** "Inventor's Kit" A-12

Name (Please Print)

Address

City State Zip
NEW YORK BOSTON CHICAGO GENEVA SAN FRANCISCO TORONTO
MONTREAL LOS ANGELES VANCOUVER DALLAS KANSAS CITY

AUTO-WINDING TOPCON

(Continued from page 146B)

it. Another window (photo, bottom page 146B) pipes an image of the needle into the prism finder, where it shows up just below the picture area. Just above the picture area, yet another window shows you your f-stop, through a prism (photo below) that overhangs the lens's aperture scale. The meter itself reads and averages the whole picture area at full aperture. ★★★



Auto Winder attaches easily. "GN" scale on lens is for automatic exposure compensation with nonauto flashguns (see text); window on prism overhang (arrow) lets you see f-stop settings in the finder. Sharp sweeping image (below) made with 25-mm wide-angle lens had slight distortion at extreme edges. Curve of skyscraper at right is in the building—not in the lens.





from the leading **HOW-TO** publisher . . .

a new edition of

Popular Mechanics **25¢**

Plans Publications Projects

Listed inside are the famous PM publications: the *Master Shop Guide*, containing all the basic shop information you've ever wanted to know; the *Gardening Guide*, jammed with how-to for green-thumbers; a series of great auto tune-up booklets; plans for everything from a beautiful tool-storage structure to a 20-foot travel trailer! Also, we offer a special service—photocopies of a thousand and more great PM articles of the past.

FOR ORDERING INSTRUCTIONS see pages 31 and 32.




Want to impress your relatives, astound your friends—and have a ball doing it? Send for this great *new* edition of the famous *Popular Mechanics Catalog*. You may find yourself building your own airplane, or a beautiful little “Mini-Barn” for storage in your back yard, or any of a thousand other fascinating projects. No matter what your interests, you'll find plans listed in this fully illustrated catalog that will set your mind spinning, from garages to ground-effect machines, from elaborate models to complete houseboats, from house plans to fine little one-evening projects. The *Catalog* also lists the greatest how-to books and shop guides ever published. *Order your copy of this brand new edition today!* Send only 25¢ to cover postage and handling.

**Popular Mechanics, Box 1014, Dept. CO-5,
Radio City, N.Y. 10019.**

I am enclosing 25¢ in coin (no stamps please) for my copy of the *Popular Mechanics Catalog*.

Name _____

Address _____

City _____ State _____ Zip _____

The bargain hunter

NEW DESIGN
SHARPENING MACHINE
LOW COST • HIGH PROFIT

Now, you can quickly sharpen • Hand Saws
 • Circular Saws • Knives • Scissors • Ice Skates
 • Chain Saws • Rotary Mower Blades • Hedge
 Shears • Tools • Clipper Blades • Paper Cutters.

Do a more professional sharpening job and
 make more money serving your community.
 Complete factory schooling and promotional
 aids. Write for literature.

TREYCO
 P.O. Box 216-A
 North Tonawanda, N.Y. 14120

**DETROIT APPROVED
 PICKUP
 TANKS**



Original equip-
 ment type poly,
 now available in auxiliary tanks
 for pickups. Increase gas capac-
 ity 40 gals. Far superior to metal,
 complete hidden, no body work
 necessary. Easy 1 hour installa-
 tion—Truck discounts pay for
 tanks in a short time. Two tanks,
 brass valve, hose, complete.
 Meets Federal Regulations.

PICKUP EQUIPMENT CO. INC.
 Dept. PM-674, P.O. Drawer C
 Hewitt, Texas 76710
CALL TOLL FREE 800-433-2386



FREE!!! POWERFUL MUSCLES FAST!
 Fantastic New Discoveries in the science of
 bodybuilding. Now, in the privacy of your
 bedroom, our method will add inches of pow-
 erful muscles to arms, chest, shoulders &
 legs. Learn secrets on trimming the waist
 with ultra-modern methods—fast! Results
 Guaranteed! Send for free brochure. Universal
 Bodybuilding, Box 485-M1, Dearborn, Mich.
 48121.



**ADJUST-A-POWER
 HOSE NOZZLE**

70% more power.
 Precision solid
 brass. Adjusts from
 solid jet stream to
 heavy or pin point
 spray. Finger tip
 control shutoff. For
 garden / patio / boat
 driveway. Fits
 standard garden hose. Needs no washer—
 leakproof guarantee. \$2.59 ea. 2 for
 \$4.99. Add 45c ship-hdlg. Mail check
 Bob Neumann, 2921 S. LaCienega,
 Culver City, CA. 90230.

**PLANS AND INSTRU-
 TIONS FOR**

| | |
|-------------------------|--------|
| Go Kart | \$2.00 |
| Mini Bike | \$2.00 |
| Mini Car | \$3.00 |
| Pedal Boat | \$4.00 |
| 12" Sail Boat | \$4.00 |
| Snowmobile Sleigh | \$3.00 |
| Mini Jeep | \$3.00 |

Mini Vehicles Plans
 Dept. C.P.O. Box 92
 Chazy, N.Y. 12921

**FREE
 HOT
 WATER**

Works every sunny day at no cost!
 Used all over Israel, and parts of
 Europe. Easy to build from readily
 available materials. All necessary
PLANS, (with variations). Send
 \$3.95 with name, address, & Zip to:
 Norway Engineering Co., Dept. P,
 2110 Pontius Ave.
 Los Angeles, CA 90025

**IMPORTED
 SWITCH BLADE
 COMB**



8 1/2" overall length
 4 3/4" closed
 • FUN
 • PRACTICAL

Spring
 action comb
 snaps into
 place and locks.
 Perfect for conver-
 sation piece and prac-
 tical use. Replaceable
 comb. Money back if not
 satisfied. Send \$4.95 plus
 30c postage to:

EXECUTEK
 P. O. Box 12742
 Dallas, Texas 75225

**ADJUSTABLE—ALL PURPOSE—REUSABLE
 HAND-SPRAYER**

Nozzle adjusts
 from fine mist
 to jet-stream

1001 USES—YEARS OF SERVICE

USE • Home • Arts & Crafts
 FOR • Garden • On the Farm
 • Garage • In Industry
 • Office • In School
 • Workshop

**PERFECT FOR
 HUNDREDS OF
 JOBS!**
 (dealers
 inquiries
 welcome)

- Ironing
- Cosmetics
- Plants
- Paint
- Insecticides
- Disinfectants
- Air Purifiers
- Deodorizers

• AND MANY OTHERS!

**LARGE REUSABLE 16 OUNCE
 POLYETHYLENE BOTTLE**

**SATISFACTION GUARANTEED
 OR MONEY REFUNDED.**

Send check or m.o. for \$1.98
 for each sprayer ordered plus
 .25 cents for postage and
 handling to:

ALLAN'S,
 P.O. BOX 6295, CHICAGO, ILL. 60680

**IMPORTED
 LOCK BLADE
 KNIFE**

ONLY \$275 each

9" Overall Length
 5" When Closed
 • Sharp and
 Tough
 • Stainless
 Steel Blade

Locks into
 position to
 prevent acci-
 dental closing.
 Razor sharp
 tough stainless
 steel blade for re-
 liable use and hard,
 long service. Money
 back in 5 days if not
 satisfied. Send \$2.75
 plus 25¢ to cover pos-
 tage and handling.

WESTBURY SALES CO.
 P.O. Box 434, Westbury, N.Y.
 11590 Dept. L-6-PM

WATER
WATER
WATER
WATER
WATER

"HOW TO DRILL YOUR
 OWN WATER WELL"

\$1.00 ppd
 SATISFACTION
 GUARANTEED

DEEPROCK CO.
 OPELIKA, ALA. 36801

KARATE

JUDO • SAVATE • JIU-JITSU

The Greatest Self-Defense System
 Known to Man! FREE Brochure re-
 veals Self-Defense Techniques.

Send to: Universal, Dept. M
 Box 39303, Detroit, Mich. 48239 **FREE**

**BEAT SOARING MEAT PRICES
 RAISE TROUT & CATFISH IN YOUR POOL**

Regular, above ground or wading during
 the 8 months you do not swim. Finger-
 lings to pan size cost 40¢ per lb. & 1 hr
 time weekly. Use automatic feeder; leave
 unattended for a week. Only \$4.95 ppd.
 Check or M.O. Complete instructions to:

SOUTH COAST TROUT & CATFISH FARM
 BLDG. "A"
 P.O. Box 1117, Inglewood, Calif. 90308

RV KITS

CAMPERS • COVERS
VANS • TRAILERS • 5th WHEELERS
PLANS & FULL SIZE PATTERNS


FREE CATALOG
GLEN L RVs
 9152P Rosecrans
 Bellflower, CA 90706



**NEW STANLEY STEAMER
 STEAMS AWAY WRINKLES**

Terrific for freshening all
 your clothes—never leaves
 a shine. Automatically
 shuts itself off. 5 Year Guarantee & U.L.
 Approved. Beautifully Built, Packaged and
 Priced at \$9.95 with Lint Brush &
 Presser/Roller.

J.R. MICHELS COMPANY
 5525 W. Parker Ave. Dept. 15TG
 Chicago, Ill. 60639



PORTABLE STEAM CLEANER
 Steam in 80 seconds

CLEAN:
 Engines, Air Filters, Lawn mowers. 3
 year guarantee on fire box, coils. Uses
 liquid soap, propane fired. Weight 120
 lbs. Auxiliary pump required on low
 water pressure.

WEDCO MFG. INC., Dept. M-5,
 Box D, Jackson, Wyo. 83001





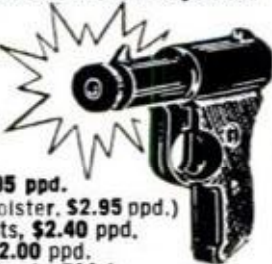
SILVO
(BRAND NAME)
TOOL
CATALOG
Thousands
of exciting
tool values!

Stanley, Skil, Thor, Wen, Disston, Wiss, Wellsaw, Dremel, Plumb, Huot, Kennedy, Channellock, Rockwell, Helois, Vise-Grip, Crescent, Rigid, Pony Clamps, Unimat, Foredom and many other Nationally Advertised brands of Tools & Supplies. We ship Coast to Coast at prices Hard to Beat. Send \$1.00 for our big 196 page tool catalog today.

Silvo Hardware Co., PM-74
107 Walnut St., Philadelphia, Pa. 19106

FACTORY CLOSEOUT!
AIR PISTOL \$7.95
(with FREE can of pellets) ppd.

Shoots both pellets and darts. This fine, well made .177 cal. German air pistol is just the ticket for target or Varmints. Accurate. No CO2 cartridges to replace, either. Once in a lifetime bargain. Order several. Supply limited. Only \$7.95 ppd. (Secret leather holster, \$2.95 ppd.) 600 Deluxe Pellets, \$2.40 ppd. 20 Steel Darts, \$2.00 ppd. **AIR PISTOL, Dept. PM-6**
4535 Huntington Dr. South
Los Angeles, Calif. 90032



Unbelievable relief...



for
TIRED FEET

YOU CAN MAKE YOUR FEET FEEL ALIVE AGAIN! This roller was designed for persons using their feet too much, too little, or with feet problems. It massages and strengthens feet, exercises feet and legs, stimulates circulation, and reduces nervous tension. Use while watching T.V., working at desk, relaxing in easy chair, while reading, or when bed-ridden. Quality constructed of wood. Send \$19.95 plus \$1.50 for postage and handling to Christel Products, Dept. P1, Box 524, Danville, Illinois 61832

NUNCHAKUS (KUNG-FU STICKS): Strongest classic style—\$5.50. **FREE** instruction Sheet attached. Not shipped to California.
KUNG-FU TRAINING DISKS: Thrown as darts. Automatically leap 60" float & attract. Attached **FREE** Training Lessons reveal safety self-training step by step. For your health & self-defense. 19 special alloy disks—\$3.00.
Books: "KUNG FU & TAI CHI"—\$1.95, "SECRETS OF SHAOLIN TEMPLE BOXING"—\$5.95, "KUNG FU MEDITATION"—\$1.95. Book List—**FREE**. All postpaid. Send check to **MR. YANG, C & S Co., 2402E St. Charles, Cinnaminson, NJ 08077**



THROTTLE-SPEED CONTROL

10% Better gas mileage. Effortless luxury driving on any level highway and a bonus of gas savings. Safe, system will not operate if electrical system or stoplights burn out. Just a touch of the illuminated switch turns it on. A touch of the brake pedal releases it. 45 min. installation time, out of the way on engineside firewall. Guaranteed. Fits all 12V. cars and trucks.

PERFORMANCE

P.O. Box 4567 Westport, Mass. 02790

110 VOLT AC GENERATORS

60 cycles. Faibelt driven from car or gas engine. Operates TV, refrigerators, all power tools. Over 13,000 in service. Guaranteed six months. 1500-watt \$75.00; 3000-watt \$115.50; 4000-watt \$141.50; Self-excited X generators need no batteries—1200-watt \$95.00; X3500-watt \$151.00, all postpaid.

TOOL POWER® patent pending

115 volts DC, 5000-watts, 50 amps from your car's alternator. Guaranteed 20 years. Instal. in ten minutes. Operates all power tools. Arc welding, fast battery charging. Any like device by any name is an infringement of our patent pending. All copiers are notified. Be safe, buy from the inventor and developer. \$25.00 postpaid. Attractive dealer plan.

VIRDEN PERMA-BILT COMPANY
P.O. Box 7160 PM, 2821 Mays
Amarillo, Texas 79109

FOUR OF PM'S ALL TIME GREAT CLASSIC CARS. Product of the roaring twenties. Ready-to-frame full color reprints available. 6½" x 9". Available as long as supply lasts. Send \$1.25 to Popular Mechanics Dept. CC, Box 1014, Radio City, N.Y. 10019.

"OUR FOUNDRYETTE" BLAST FURNACE SINCE 1935

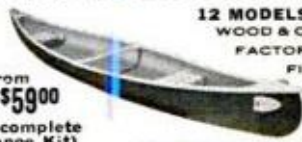


Hobbyists, Schools, Inventors, etc. Make your own castings of any metal from cast iron, down to lead and zinc. Available in sizes from 1½ to 285 lbs. **RED BRASS.** Complete units furnished with all sizes. Send 25¢ for circular.

KANSAS CITY SPECIALTIES CO., INC.
Dept. P-6, P.O. Box 193, Middleton,
Wisconsin 53562

BUILD YOUR OWN CANOE

12 MODELS
WOOD & CANVAS OR
FACTORY MOLDED
FIBERGLASS
KITS
From \$59.00
(a complete Canoe Kit)
FREE CATALOG
TRAILCRAFT, INC.
Box 60679, Concordia, Kansas 66901



AAMCO® And You Can Make It!

The world's largest transmission chain is still growing strong after ten years. Over 500 of our franchises located from coast to coast. New openings in some markets mean you too might qualify. For further information write:

AAMCO Transmissions, Dept. 65
408 E. Fourth St., Bridgeport, Pa. 19405

"LISTEN IN" TO POLICE-FIRE RADIO CALLS IN YOUR CAR!

WORKS with ANY CAR—Portable or HOME RADIO! Just **PLUGS** in—No wiring—3 minute hookup! Switches instantly from regular radio to **ALL POLICE—FIRE—EMERGENCY—TAXI—STATE-GOV'T** 2 way radio calls! Works Everywhere—Anytime! **Dual Band 36-49 & 150-175 MHz.** Should last for Years!
SEND ONLY \$2.00 (cash Ck M.O.) and pay postman \$12.99 COD postage or send \$14.99 for Ppd Del in USA. **COMPLETE** with Antenna and Plug in to use with ANY Home—or Portable Radio! Full Instructions—1 year Service Warranty—**10 DAY MONEY BACK TRIAL—SOLD ONLY** Direct from Factory—at this special price.
WESTERN RADIO DEPT. BPM-6 KEARNEY, NEBR. 68847



BUILD PM'S 'BOONIE BUG' Based on a VW chassis! Smart-looking with its gleaming red exterior, build-it-yourself "Boonie Bug" camper is a smooth-rider on the highway and a rugged mountain cat on back trails. Sleeps two adults with room to spare for one or two youngsters. For large, detailed plans and complete instructions, send \$14.95 to **Popular Mechanics, Dept. BBF, Box 1014, Radio City, New York, N.Y. 10019.**

CLASSIFIED ADVERTISEMENTS

Rate: \$2.20 per word payable in advance each insertion. Capitalized words—75¢ per word additional. Minimum insertion ten words. To be inserted under the proper classification, copy must be in our office by the 10th of the second month preceding date of issue. The next available issue to place an advertisement in America's No. 1 Classified Section is August. The closing date is June 10th. Send remittance and order to H. E. Kappel, Popular Mechanics, 224 West 57th Street, New York, New York 10019. Please make remittance payable to Popular Mechanics.

POPULAR MECHANICS

WHEN ANSWERING ADVERTISEMENTS PLEASE USE THE ZIP CODE NUMBER

AUTOMOBILES

"GLOVE-BOX" KIT, MAVERICK & COMET cars. FREE brochure. Karr Enterprises, PM, 6930 Sylvan Rd., Citrus Heights, Calif. 95610.

VACATIONERS Install Gas—Scrooge, Tools. Unnecessary, \$4.95 Guaranteed. Details Free. Rainbow, 49 Brookside Avenue, Torrington, Conn. 06790.

SAVE GASOLINE. Better Starts. Easily Installed. \$4.95 Guaranteed. Free Information. C-Williams, Box 19712, Columbus, Ohio 43219.

CAPACITIVE DISCHARGE IGNITIONS, DISCOUNTED. Rodgers, Son (PM), Box 3583, Anaheim, Calif. 92803.

SAVE GAS! up to 6 mi Per Gallon! New No Cost Patent Pending Easy Carburetor Modification. 100% Guaranteed! Instructions \$3.00. A.M.S., Box 486-E, Osseo, Minn. 55369.

PATENTED License Plate Security Locking Device, for Sale or Licensing. James Syversen, 402-45 Street, Brooklyn, New York 11220.

HOW TO BUY CARS AT TOP DISCOUNT Save Hundreds. Read Before Buying. Send \$1.98: Kaplan, Box 428, Newfield, New Jersey 08344.

SAVE GAS! Increase Mileage! Free Literature from Arrow Products shows how! Box 374M, Broken Arrow, Oklahoma 74012.

END EXPENSIVE AUTO REPAIRS. Do it yourself and save. Nationally known auto expert shows you how. Send \$1.95 plus 50¢ postage for Auto Repair Book. Hilltop Enterprises, Dept. 28A, 2002 Notre Dame Avenue, Belmont, California 94002.

24½ MILES PER GALLON! Big Car V-8 Runs On 4. All Pistons left in. Explanatory Report \$3.00. Kinney, Box 32, Highland, Mich. 48031.

ELECTRIC CAR, CONVERT Compact Car to Battery Power, 55MPH, Solid State. Plans \$10, Pictures and Info. \$1.00. Seecom, Box 1274, Tustin, Cal. 92680.

RING—VALVE JOB WHILE DRIVING! Results Guaranteed! 21st Anniversary **INTRODUCTORY OFFER—\$5.50 (2—\$10.50)** AIRMAILED! MOTALOY DIVISION, C.H., Rt 8, Box 604, Fayetteville, N.C. 28304.

DRIVE ELECTRICAR. Easy to Build. Plans \$5.00. Electricar, 1202 W. Cleermont Cir., Huntsville, Alabama 35801.

MIDGET CARS

WANTED: Messerschmitt Tiger. Contact: Robert Verh, 141 Richmond Rd., Richmond Heights, Ohio 44143.

YOUR AD IN POPULAR MECHANICS WILL BE SEEN By More than 5,000,000 active buyers for your products and services. It costs only \$2.20 per word. And, if you wish to run all or part of your ad in bold capital letters—you can do so for as little as 75¢ per word additional. Act now! Send your Classified ad to: **POPULAR MECHANICS, CLASSIFIED DEPARTMENT, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.**

AUTO SUPPLIES AND EQUIPMENT

"GAS-Saving." New Device Increases mileage, installs easily. Guaranteed. \$4.95. Grime, 17785 Whitney, Strongsville, Ohio 44136.

ATTENTION! QWIK CHANGE MOTOR OIL AND FLUID TRANSFER PUMP. Changes oil through dipstick tube from top side of car. Transfers gasoline quickly and can be used as a bilge pump for small boats. Send \$9.95 to O'Rourke Shippers, 224 Stuart-Drawer 1A, Clute, Texas 77531.

PROTECT YOUR CAR! Do It Yourself Auto-Alarm. Complete Installation, Instructions, Diagrams, Parts. Price List. Send \$1.00 To: **PALCO**, Box 3241, Bridgeport, Conn. 06605.

NEW, patented auto sun visor . . . sure protection against sunglare while driving. \$2.00 pair, dealer discounts. Permian Company, 743-6 North Poplar, Kermit, Texas 79745.

NEW MASTER CATALOG Of Automotive Overhaul and Service Manuals, Reference Books, and Publications. Invaluable. \$1.00. **NSC**, Book Division, Drawer 1547-PM, Ann Arbor, Michigan 48106.

GASOLINE SAVER—PHASER—Guaranteed to increase gasoline mileage up to 25%. Patented and test proven. Easily installs on any car, truck, etc. Send \$19.95 ppd. **PHASER**, Box 2084-D, Pasadena, Calif. 91105.

ANTIQUÉ FORD PARTS. Illustrated Catalogue \$1.00. Mark Auto. Layton, New Jersey 07851.

MOTALOY Ring Valve Job while you drive. \$6.00—Two—\$11.00. Guaranteed. Andris, Box 34237, Department 226D, San Francisco, California 94134.

ALTERNATOR/Generator Rebuilder's Course: Includes Tooling & Test Equipment: Write: Hedelund Engineering, P.O. Box 2127, Sepulveda, California 91343.

AIRMASTER Gas Saver Fits All Cars, \$14.95. Airmaster, Lenora, Kansas 67645.

PARTS: Army jeep and truck parts. Spare Parts & Equipment Co., P.O. Box 751, Lexington, Kentucky 40502.

IGLIT Continuously Indicates Ignition Performance. Helps Tune too. Q-ARC, Box 47876, Los Angeles, Calif. 90047.

TOWING Rig Complete \$395.00. Jeep Winches \$99.50. Steam Cleaners \$297.88. **BEJAY**, 4144 Glencoe, Venice, Calif. 90291.

(DEPENDABLE Service Since 1951). . . . **RING** Valve Job \$6.50 (Two—\$12.00). . . . Guaranteed! . . . **MOTALOY**, Grantham, Penna. 17027.

REVOLUTIONARY Auto Air Conditioner You can build for under \$50. **SAVE GAS.** FREE Detailed Information. Space Age Research Co., Dept. PM6, Box 770, Columbus, Indiana 47201.

GAS-GUARD Guaranteed Anti-Siphon Gas Device. Easy To Install. Dealers Wanted. Price \$1.98. Sylvia Beatty, Chestnut Street, EauClaire, Pa. 16030.

BURN Kerosene. Save Fuel. Beat 1975 Emissions. Gain Performance Any engine. Kits and Franchises. Power Genie, Box 872, Lancaster, Pa. 17604.

SAVE MONEY. Pressure sensitive metal labels mark your inch wrenches, drills, gauges with metric equivalent. Complete set with conversion wall chart \$3.98. Satisfaction Guaranteed! Metric Engineers, Box 327A, Warwick, N.Y. 10990.

CHANGE Your Vehicle, Boat Alternator Output as Needed. Operate Tools, Appliances, Arc Weld, Lights, Anywhere. 115V or Less. Adapter Plans \$2.00, Kit \$7.95, Assembled \$12.95. R. Martin, Box 48786, Los Angeles, California 90048.

STOP BATTERY FAILURE While Driving and Add Extra Years to its Life. Tested and Proven Liquid Cadmium Formula will Chemically Rejuvenate your Battery. Guaranteed! \$3.50. Valley Enterprises, 7549 Etiwanda Avenue, Reseda, Calif. 91335.

MESSAGE Flasher on car back shelf, warns motorists. Seven pushbutton dashboard control. Flashes red messages: Don't Tailgate, Slow Down, Don't Blow Horn, Parking. Careful Please, Disabled, Dim Lights. Mfr. price \$29.95 postpaid. Teletale, Inc., Box 35145-D, Detroit, Mich. 48235.

CONVERT Your Compact Car To Electric Power. Approx. 35-40 MPH for around town driving. Recharge For Pennies. Send \$7.95 for Parts Sources and Plans. S. A. Drayer, 5755 Cove Dr., Orlando, Fla. 32809.

GAS SAVER Carburetor Evaporates Gasoline, Runs Engine on Fumes Alone. Detailed plans \$7.00. Carburetor, 113 Walnut, Port Clinton, Ohio 43452.

SUPER-FILTER. Cleaner, cooler oil means longer engine life, better mileage, fewer changes. Catches particles to 1/100-micron. Aluminum fins take-out heat. Never buy another filter—uses roll tissue—pays for itself. Install like OEM filter. Thousands in use. Moneyback guarantee. \$19.95 PPD. Tell us year and model. Brochure 20¢. **RPG Industries**, 1317 W. Olympic, Los Angeles, Cal. 90015.

POINTS And Condensers, Heavy Duty For All U.S. Cars. \$2.00 Per Set. Number Cylinders, Year and Make. Hulme, 932 S. High, West Chester, Penna. 19380.

(Continued on next page)

AUTO SUPPLIES AND EQUIPMENT

(Continued from preceding page)

ELECTRIFY YOUR VW for Low Cost. Pollution Free Operation. Full Directions and Diagrams, \$25.00. T. J. Frizzell, Charlestown, N. H. 03603.

AMAZING GAS SAVER For Ford Engines, Numbers 351-460. \$4.00 postpaid. **ATOMIZER**, 502 School, Clarksdale, Miss. 38614.

NOW—"Wash" Your car without soap or water in minutes. **VACU-SHINE** miracle auto cloth does it. Can save you \$100.00 a year! Thirty day unconditional money-back guarantee. Only \$2.98! Celia, 705 Sycamore, West Chester, Penna. 19380.

AUTOMOTIVE Tune-up Charts and Catalog \$2.00. Deductible From First Purchase. **FREE** Information on the **HYDRO-CATALYST**. Send \$2.00 To: **POWER**, PO Box 711, Englishtown, N.J. 07726.

AT Last CD Electronic Ignition, put it together yourself. Fast, simple. We supply parts. Send \$4.95. Cardinale, 96 Home Street, Somerset, New Jersey 08873.

STOPS GAS THEFT. Revolutionary "Siphon Proof" device installs easily in seconds, without keys. Send \$2.00, Guaranteed. **DECEMA**, P-716 W. Main, Independence, Kan. 67301.

"BATTERIES Renewed \$1.49. Details Free." Drischel, 823 Willow, Williamsburg, Ohio 45176.

LECTRICKAR, 1/2¢ Per Mile, 50 MPH. Convert VW's Fiats to Electric. Plans \$22.50. Robert Bucy, Box 28794, Dallas, Texas 75228.

CONVERT YOUR AUTO ENGINE TO STEAM POWER. Here's How. \$10.00. Steam: P.O. Box 4132, Torrance, Calif. 90510.

MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

HONDA, \$25.00. Other bargains. Send 50¢. Motorscooter, P443, Bend, Oregon 97701.

MAKE Your Bicycle Electric. Plans \$2.95. Kielian, 130 Drake, South San Francisco, Calif. 94080.

BICYCLE PARTS CATALOG. Gold mine for hard to get foreign and domestic parts, tools and accessories. Send \$2.00 for this big 8 1/2 x 11 inch 160 page catalog. Refundable if not completely satisfied. Wheel Goods, Dept. J. 2737 Hennepin, Minneapolis, Minnesota 55408.

GAS Motor Attachment for Bicycles. Plans \$2.00. Go-Bykco, Rothsay, Minn. 56579.

GO-KARTS Factory direct low as \$19.95. Send \$1.00 for catalog and complete set of plans and drawings. Schmieder Motors, RD #1, Doylestown, Pa. 18901.

WOW!!! TRAIL-BIKE PLANS \$1.00. MAKE YOUR BICYCLE ELECTRIC Ride 5¢ Day. Plans \$2.00. Mr. WIZZARD, Box 204, Roselle, Illinois 60172.

MOTORCYCLES, Mini-bikes, Go-karts, Supplies. Discount Catalog 25¢. Lorenzo, Danville, Illinois 61832.

MINI-BIKE/KART ENGINE Easily Converted From Rotary Lawnmower Engines; Plans \$2.95. Albar Sales, Box 386A, Yarmouth, Maine 04096.

SAVE COSTLY BICYCLE REPAIRS. Fix Oval and Wobbling Spoked Wheels. Steel Wrench. Detailed Instructions. \$1.75. Stash Enterprises, Box 32467, Jamaica, N.Y. 11431.

INSTANT fist size bicycle carrier. Unique hook strap linker design. Unrolls into full size carrier. Power grips bike to car bumper. No tools needed, \$9.00: Joe Grieco, 428 Monterey Lane, San Clemente, California 92672.



AVIATION

HANG GLIDERS. Build your own delta wing glider with aircraft aluminum & rip-stop nylon. Packet includes—complete plans, photos, assembly instructions, flight manual and more. Now \$6.00. Information 25¢. Aircraft Unlimited, Box 1616B, Minneapolis International Airport, Mn. 55111.

COLLECTORS, Hobbyists, this 1912 reprint "Building an Aeroplane" contains plans for Curtiss Biplane and Bleriot Monoplane. Rush \$4.00 to—King's, Box 17646, Nashville, Tenn. 37217.

MOTORCYCLE/AIRPLANE CONVERSION—Easy to build, powered by your motorcycle, attach or detach in minutes. Info. \$1.50. Plans \$7.50. R & W Engineering, 23951 Craftsman Rd., Calabasas, Cal. 91302.

HANGLIDER DIRECTORY; Plan Catalog; samples: magazine, newspaper: Self-Soar Association, Box 1860, Santa Monica, California 90406: \$2.00.

BUILD—One-Man Jet helicopter. Easy inexpensive. Detailed plans, drawings—\$5.00. Helicraft, Box 7153, Baltimore, Maryland 21218.

BE A Government licensed aviation mechanic. Practical training. Free Information. Aero Mechanics School, Dept. PM-Municipal Airport, Kansas City, Missouri 64116.

AIRBOAT Propellers, Engines, Hubs, Mounts, Supplies. Corvair, V-W Conversions. Removable Airdrives. Catalog \$1.00. Banks-Maxwell, Box 3301E, Ft. Worth, Texas 76105.

HANG GLIDER DESIGNS. 3-Views Ideal for Framing, \$2.00 each. Wright 1902 Glider, Pilcher, Chanute, Others. Catalog 50¢. Conover Products, Dept. 2M-6, Rt. 1, Toddville, Iowa 52341.

HANG GLIDERS. Proven Rogallo Design. Plans—\$5.00. Kits, Accessories, Complete Kites. Compare Quality And Price Before You Buy. Free-Flight Systems, 12424 Gladstone, Sylmar, California 91342.

YOUR Aircraft design analyzed. Full performance, stability, stress reports. Free information. Malo, 5 Kim Ct., St. Peters, Mo. 63376.

HANG GLIDING, Designing/Building/Flying. Handbook. 205 pgs, 350 illus. \$5.35 PP. Dan Povnter, 48-S Walker, N. Quincy, Mass. 02171.

BE A Government licensed aviation mechanic. Practical training. Free Information. Aero Mechanics School, Dept. PM-Municipal Airport, Kansas City, Missouri 64116.

HOVERCRAFT

AERO-CAR Amazing Hovercraft built easily with ordinary tools. Lawnmower engine power. Carries one man plus. Hovers, flies forward, backward. Sideways over land/snow/water. Complete construction plans and brochure. \$5.95. Aero-Projects, Box 5118PM, Clinton, New Jersey 08809.

INFLATABLE BOATS

INFLATABLE BOATS, kayaks, floats, surf kayak. Catalog. Smiths', B2101B, 333 E. Ontario, Chicago, Ill. 60611.



BOATS AND TRAILERS

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

SOLAR POWERED BOAT! Stamped addressed number 10 envelope. Box 357-B, Lakeside, California 92040.

BOAT Kits. Molded Fiberglass. Save money—assemble yourself. Factory molded sections bond into one-piece craft. 20 models—14' to 32' Cruisers, Runabouts, Sailboats, Accessories, motors, trailers. Easy terms. Free catalog. Luger, Dept. BC-74 3800 West Highway 13, Burnsville, Minnesota, 55337.

BOAT-FRAME KITS, PLANS, FULL SIZE PATTERNS especially for amateurs. Easy, proven methods include step-by-step pictorial instructions. Sail—Jets—Inboards—Outboards—Cruisers—Houseboats—Hot Boats—Hydroplanes and many more from 8' to 49'. Also complete supplies and accessories—fiberglass, bronze screws and nails, hardware, sails, spars—"How-to" Books, Send \$1.00 for **HUGE NEW** 112 page catalog. **GLEN-L**, 9152 MP Rosecrans, Bellflower, California 90706.

CANOE! Kayaks! Factory Direct quality kits, from \$30.00. Many different models. Canvas hulls. Strongest construction materials. Free literature. Sportscraft, Box 636-P. Allentown, New Jersey 08501.

FREE Catalogue—plans, patterns; Canoes, sailing canoes, kayaks. 14-17' trailable cruising sailboats. Quicksilver. 255A Shamrock Blvd., Venice, Florida 33595.

NEW 1973 Outboards . . . Top Brands 6 H.P. \$288 . . . 18 \$418 . . . 40 \$565 . . . 50 \$728 . . . 65 Electric \$958 . . . 85 Electric \$1,098 . . . **ALL SIZES** . . . Scott-McCulloch Parts . . . Handling 50¢ . . . Electra Marine, 610 Merrick Rd., Lynbrook, New York 11563.

FIBERGLASS Canoes, Kayaks, and Duckboats. Many exciting models. Easily assembled kits. \$49.95 up. Free Literature. Riverside Canoes, Box 5595P, Riverside, Calif. 92507.

FREE Catalog, Kayaks, Canoes, Plans, Kits, 36 models. Outdoor Sports, Box 1213-P, Tuscaloosa, Ala. 35401.

300 BOAT Designs. Plywood, fiberglass, ferro-cement. Catalogs, Powerboat (2) 160 pages, \$1.50, Sailboat, 76 pages \$1.00. Marinecraft, Box 161-M, Brighton, Mass. 02135.

BOAT KITS, HULL KITS, FRAME KITS, PLANS AND PATTERNS. World's Largest Catalog Over 300 Designs, 7 to 77 feet for the Amateur, in Plywood, Fiberglass or Ferro Cement. **SAIL-Prams**, Day Sailers, Motor Sailers, Ocean Racers, Trimarans, Catamarans. **POWER-Cruisers**, Trawlers, Runabouts, Fishing Boats, Kayaks, Inboard and Outboard Hydroplanes. Also Complete Boat Builders Materials, Sails, Fiberglass, etc. Send \$1 for Catalog or \$2 for Catalog Plus Boat Builders Guide to: Clark Craft, 16-P Aqua Lane, Tonawanda, New York 14150.

FIBERGLASS BUILDERS MATERIALS Lowest Factory Prices in Cloth, Matt, Roving, Pesin, Epoxy, Foam, Nails, Fittings. Send \$1.00 for Literature (refundable) or \$2.00 for Literature plus Booklet on Mo'd Making and "How To Fiberglass". Clark Craft, 16-P1 Aqua Lane, Tonawanda, New York 14150.

SAIL THIS SUMMER. Build **QUICK CAT** 12' Catamaran. Cost Under \$100.00 Complete, Common Materials, Fun, Quick Construction. Plans and Instructions \$5.00 ppd. Box 404A, Grand Haven, Mich. 49417.

PLANS: Canoes, Kayaks. 25 World Famous Designs. Free Brochure. Riversports, Box 1393, Eugene, Oregon 97401.

CANOE SAIL Rig Plans. \$5.00, or 25¢ for information. Panaco, 2882 Havasu, Highland, Cal. 92346.

(Continued on next page)

CAMPERS AND TRAILERS— KITS—PLANS—

BUILD YOUR OWN RV with GLEN L. Component Kits, Plans and Full Size Patterns. **FREE CATALOG.** Campers, pickup covers, fifth wheel trailers for domestic and import trucks. Travel Trailers, camping trailers, van conversions. **SAVE! PREPAID FREIGHT SPECIAL!** GLEN-L, 9152 PM Rosecrans, Bellflower, California, 90706.

MARINE EQUIPMENT & SERVICES

MARINE Engines, conversions, parts, equipment. Catalog Free! Stokes Marine Industries, Coldwater, Michigan 49036.

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

ATHLETIC AND BODY BUILDING COURSES

JUDO self-defense Illustrated Complete Instructions \$1.00. Roberts, 2429 Beach Court, Riviera Beach, Fla. 33404.

KUNG-FU Free Literature, \$1.00. Refunded Upon First Order. P.O. Box 1755, Honolulu, Hawaii 96806.

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

MASSIVE Arms Fast!! Sensational New Course. \$2.00. Greenline, Box 627, Monterey, Park, Calif. 91754.

WEIGHT Exercising Equipment, send 25c to cover postage for illustrated catalog. Exercising Equipment, P.O. Box 662, Holyoke, Mass. 01040.

TWO Barbell Courses \$1.00. Catalogue. Harry Good, B-542, Seneca, Missouri 64865.

BARBELLS! DUMBELLS! MAKE YOUR OWN. Simple, Proven, Economic Method. Plans \$2.00—Money Order Only. Weights, P.O. Box 731, Escanaba, Michigan 49829.

INSTANT Karate! Black Belt Equivalency—2 months or Refund! Mind Technique. \$2.50—Complete! Phenoministics, Box 281, Gresham, Oregon 97030.

ARMS, 18+ Inches in 90 Days or Refund!! Revolutionary Specialization Technique. \$3.00—Complete!! Phenoministics, Box 281 Gresham, Oregon 97030.

SPORTING GOODS & EQUIPMENT

GOLF BALLS. Solids, Range, Floating. AMEGOLF, Box 631, Littleton, Colorado 80120.

TRAMPOLINE Kit (Pit Type) 6' x 12' Commercial Duty \$165.00 Prepaid. "Teco", Box 706, Matthews, North Carolina 28105.

700 PAGE Catalog low direct factory prices, fishing, Hunting, Archery, reloading Camping. Send \$1.00 Refundable. Herters Inc., Dept. CPM, Waseca, Minn. 56093.

FREE Wholesale Catalog, Lure Parts, Molds, Blanks, Reels, Archery. FinnySports (ME), Toledo, Ohio 43614.

ARCHERY Lowest Discount Prices. All top brands. Orders shipped same day received. Money-back guarantee. World's Largest Supplier. Free catalog. Anderson Archery Corporation, Grand Ledge, Michigan 48837.

FREE CATALOG. Fishing Tackle, Archery Hunting and Camping Equipment. Lowest Prices. Cabela's Inc., Dept. S23, Sidney, Nebraska 69162.

NOVELTIES Catalogue, Free Contest. Catalogue 50c. Scoremor, Box 5-P, East McKeesport, Pa. 15035.

CAMPING EQUIPMENT AND TENTS

FREE 112-Page Camping, Marine Color Catalog. Laacke & Jovs, 1439 N. Water, Milwaukee, Wisconsin 53202.

PAPER PLATE HOLDERS turns flimsy paper plates into sturdy ones! Perfect for campers, picnickers, etc! 10" Diameter, Set of 4—\$2.98! Order #1A572. Kim-Ro Specialties, 5267 Farmbrook, Dept. 21, Detroit, Mich. 48224.

WATER PURIFICATION TABLETS! Have safe drinking water anywhere. 100 tablets \$2.98. Campers Supply, Box 182, Clarion, Iowa 50525.

TRAVEL RESORTS

PUERTO RICO. COSTA AZUL at Luquillo. Three Bedroom Beach House for Rent Weekly for Vacations. Ed Pinney, 148 East 78th St., New York City 10021. (212)879-8870.



FISHING, TACKLE, LURES

TROPHY Trout super streamers! Guaranteed! Patented! \$1.00/pair. Skeie, Box 903, Boulder, Colorado 80302.

FREE CATALOG—Fishing Tackle, All Top Brands Plus Exciting Specialties Offered Only Here. Netcraft Inc., Box 5510, Dept. PMCL, Toledo, Ohio 43613.

SWISS Army Type Knife. Stainless Steel. 12 tools in one. Can opener, fish scaler, hook remover, hole punch, file, saw, etc. A MUST in every tool box, tackle box and outdoorsman's pocket. \$6.00; We pay postage. LAIMA INDUSTRIES, Department 3, 105 West Smith, P.O. Box 1303, Kent, Washington 98031. Unsatisfied? Immediate refund guaranteed.

EARTHWORMS, LIVE BAIT

\$5000 YEARLY, spare time. New worm bed, raise worms **INDOORS, ODORLESS, SOILLESS.** FREE literature. H&K Inc., P.O. Box 8351, Olivette, Mo. 63132.

EARN Money raising fishworms for us! Exciting details free! Oakhaven—56, Cedar Hill, Texas 75104.

FREE Literature. Profitable Business Raising Fishworms, Crickets. We Teach you how to Raise and Sell. Write today. Carter Fishworms, Plains, Georgia 31780.

BIG Profits Raising Worms Soilless Method, Three Oaks, Dresden, Tennessee 38225.

FROGS, FISH, REPTILES

\$20,000 POSSIBLE Raising Bullfrogs! Details Free! Bravco-A, Box 696, Temple, Texas 76501.

AQUARIUM SUPPLIES

BUILD YOUR OWN COFFEE-TABLE AQUARIUM. Photocopy of article as it appeared in PM available for \$1.50. Send orders to Popular Mechanics, Dept. HE, Box 1014, Radio City, N.Y. 10019.



HUNTING, GUNS, DECOYS

PELLET GUNS for fun or serious target shooting anywhere. Giant selection. Finest models. Satisfaction Guaranteed. New 100 page catalog free (\$1 value). Write ARH, Dept. 15, Grantsville, West Virginia 26147.

DOGS & KENNELS

INSULATED DOG HOUSE PLAN. Floor slides out for easy cleaning. Roof is water proof. Photocopy of plan as it appeared in P.M. available for 50c. Send order to Popular Mechanics, Dept. HE, Box 1014, Radio City, N.Y. 10019.



POULTRY & GAME BIRDS

QUAILS, Incubators, cages, supplies catalog. Marsh, 14216 Brookhurst, Garden Grove, Calif. 92643.

RABBITS—CHINCHILLAS—FUR BEARING ANIMALS

\$500-\$1000 MONTH Plan raising rabbits for us. Free details. White's Rabbitry-PM, Hudson, Ohio 44236.

RAISE Rabbits Successfully by knowing Facts. 48 Page Illustrated Book describing 25 Breeds, Housing, Breeding, Feeding, Markets, Marketing, etc. 25 cents. American Rabbit Association, 36 Arba Building, Bloomington, Illinois 61701.

EARN \$10,000 Yearly Raising Angora Wool and Breeding Stock. Details 25c coin. American Angora, Malta 12, Montana 59538.

MAKE Big money raising Rabbits, Cavies, Chinchillas for us. Catalog 50c. Keeney Brothers, New Freedom, Pa. 17349.

RAISE Chinchillas. Guaranteed income. Illustrated catalog \$3.00. Refundable. DeShon Chinchilla, Route 2H, Roanoke, Indiana 46783.

PETS—BIRDS, CATS, HAMSTERS, ETC.

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

HORSES, LIVESTOCK

"HOW TO TRAIN HORSES"—FREE book tells how to break, train, make money with horses. Beery School, 1106 Pleasant Hill, Ohio 45359.

HYDRAULIC RAM & WATER PUMPS

WATER Well Drilling and Pump Drawing \$1.00. Hado, Box 56, Allegan, Mich. 49010.

ELECTRICAL SUPPLIES

CONVERT 220 SINGLE PHASE to three phase simply and economically. Run several three phase motors simultaneously. Illustrated wiring instructions \$2.00. C. Montgomery, 1826 Shepherd Road, Anderson, Indiana 46011.

ELECTRIC MOTOR SUPPLIES! Equipment Plans! Modequip, Box 7266, Kansas City, Missouri 64113.

BATTERIES, GENERATORS

FREE Power, Heat, Lights; Complete Electric Windmill Plans, up to 20,000 watts \$10.00. Solar heating plans for home heating, cooking \$8.00. Other simple plans and instructions—Build Electric Bike or Car \$4.50, Electric Outboard \$4.00, run Three Phase Motors on Single Phase \$2.00. Use AC motors as Generators \$2.00. List of other plans and kits 50c. Dan Ran, Box D, Reno, Nevada 89506.

BATTERY Reconditioning Kit, includes molds, material, instructions. Apex Engineering, 3100 Ramona, Atascadero, California 93422.

ENGINES, MOTORS

WINDING Data, 275 motors, \$1.25. Data Company, 512 Kensington, Kansas City, Mo. 64124.

STEAM Engine Kits, Catalog-Handbook \$1.00. Reliable Industries, New Baltimore, Mich. 48047.

REWIND Car Generator for 110 VAC. Power Plant Plans \$2.00. Schmauss, 1228 East Cass, Tampa 33602.

HOW to convert gasoline engines into steam engines. Send \$5.00 for complete detailed information to: **STEAM POWER, STAR ROUTE BOX 25PM, GREENLEAF, OREGON 97445.**

STANLEY Steam Engine, full size Duplicate copy. Catalog-handbook \$5.00. Joyce Engines, P.O. Box 102, Union Lake, Mich. 48085.

(Continued on next page)

MACHINERY, TOOLS AND SUPPLIES

ENGINE Lathe Information. Prices—Time Estimate. Free Brochure. Harlan Tool, Box 43207, Cleveland, Ohio 44143.

METAL Cutting Lathes, low as \$33.85. Taig, 15048 Proctor, Industry, Calif. 91746.

SANDBLASTERS, \$32.50—\$749.50. Free Catalog—Truman, 1330 Market, Youngstown, Ohio 44507.

SMALL Foundry furnaces. Supplies. Free literature. Pyramid Products, 3736 South 7th Avenue, Phoenix, Arizona 85041.

1400 CATALOGS Listed and Described! Sources for **EVERYTHING** Imaginable! Rush \$2.00. **MASTERLOG**, Box 24413-YF, Oakland, California 94623.

END Mills. Lathe Milling Attachments: Information. Potter, Box 73, Cedar Rapids, Iowa 52406.

100 SET Screws—6/32-3/8 \$4.98. Floyd's Hardware, Lumberton, North Carolina 28358.

AMAZING NEW MULTI-SNIP cuts through steelwire, sheetmetal, hardboard, strapping, plastic and leather. Now only \$2.98. Send to P. F. W. Products, 412 Dickinson Blvd., Dept. PM, Kingsford, Michigan 49801.

NEW! Ratchet palm-grip screwdriver multiplies turning power; increases leverage, maneuverability; adjusts easily—straight, forward, reverse; heavy duty flat/Phillips heads interchangeable; non-conducting. Satisfaction Guaranteed. Check or Money Order—\$5.95 includes shipping. Peter Keyes Features, Dept. 112, Box 1285, San Clemente, Calif. 92672.

12 GROSS Mixed Machine Screws \$5.95. 5 Gross Larger Sizes \$9.95. All Kinds of Assortments, Nuts, Bolts, Screws, Washers, Taps, Dies, List 50¢. Refundable First Order. Nutty Co., 1576SMS Fairfield, Conn. 06430.

MAXIMAT, Unimat Lathes, Bench Mills. Metals. Cutters. Micrometers. Catalogue \$1.00. Campbell (PM) 1424 Barclay, Springfield, Ohio 45505.

WELDING, SOLDERING, PLATING

ELECTROPLATING Equipment, Portable Platers, Supplies, and "Know-How." Build your own tanks for nickel, chrome, etc. Easy-to-install PVC liners. Rectifier components—all sizes. Schematics, parts lists, formulas, operating instructions for all-plating. Guaranteed to save you 25%—75%. Some good used units for sale. Free Details. Platers Service Company, 1511-PM Esperanza, Los Angeles, California 90023.

WELDERS. Convert To Heliarc. High Frequency Unit 0-225AMP. Plans \$4.00. Convert To DC Plans \$3.00. Information Supply Co., Box 166, College Park, MD. 20740.

BRAZE WITH YOUR PROPANE TORCH. Amazing Strength! Sample silver brazing wire, flux, and instructions, \$1.00. NSD-PM, 2251 Shawnee Dr., N. St. Paul, Minn. 55109.

PLANS For Engine Stand Hyd. Tube Bender, Abrasive Cut Off Saw, Break, and Press. Plans. PO Box 56, Campo, Calif. 92061.

GOVERNMENT SURPLUS

1974 SURPLUS Army, Navy Store, 52 Page Illustrated catalog. Send \$1.00. Ruvel, 3037 North Clark, Dept. 6-J, Chicago, Illinois 60614.

FREE Catalog Government Surplus and Sporting Goods. Enclose 8¢ Stamp. Bonanza Surplus, Box 725-PM, Grand Haven, Michigan 49417.

GOVERNMENT SURPLUS, How and Where to buy in your area. Send \$2.00. **SURPLUS INFORMATION**, 30177PM HEADQUARTERS BUILDING, Washington, D.C. 20014.

JEEPS!!! PICKUPS!! 100,000 items direct from government. Your area. Latest information & surplus categories: \$2.00 **MONEYBACK GUARANTEE**, Order manual #137, from "Dependable Products", Box 113, Vista, California. 92083.

"U.S. GOVERNMENT SURPLUS Directory." How, Where to buy 100,000 items (including Jeeps) . . . low as 2¢ on dollar! Most complete information available . . . \$1.00. **SURPLUS DISPOSAL**, Box 6586-AF, WASHINGTON, D.C. 20009.

JEEPS From—\$52.50; Typewriters from—\$4.15; Cars from—\$31.50. Walkie-talkies, motorcycles, airplanes, boats. Typical "As Is" bid bargains from Uncle Sam. Tremendous variety. Exciting free list. Write: Enterprises, Box 402-X101, Jamaica, New York 11430.

JEEPS \$52.40. Airplanes \$75.01. Typewriters \$6.70. Boats \$7.50. Typical Bargains Available Nationwide. Sales Directory And Surplus Catalog \$1.00 (Refundable). Midwest Surplus, Box 401-PM, Dayton, Ohio 45401.

NO CATCHES. Buy any surplus direct from U.S. gov't. All information \$2.00. Bridgeworth, P.O. Box 2292-C, Vancouver, Washington 98661.

"HOW To Buy Government Surplus" New Booklet Reveals How You Can Bid!!! Bargains directly from Government!!! Send \$2.00; Surplus Booklet, 449-602 Greenbelt, Holtville, New York 11742.

HOBBIES AND COLLECTIONS

INTERESTING, INFORMATIVE, HELPFUL All Hobbies Magazine. Subscription \$3.00. Sample 35¢. Write: Hobby Trade, Box 134, Clifton, New Jersey 07012.

AUTOGRAPHS—Letters, Documents of Famous People, Bought and Sold. Monthly Catalogues Issued. Neale Lanigan, Box 133, Fairview Village, Pa. 19409.

COLLECT Military Medals, list 25¢. Vernon, Box 387PM, Baldwin, N.Y. 11510.

SOLAR ENERGY EXPERIMENTER'S KIT! SEND STAMPED ADDRESSED NO. 10 ENVELOPE. Box 357-M, Lakeside, California 92040.

50 JUNGLE BUTTERFLIES \$3.25. 15 Beetles Worldwide \$3.35. Giant Bargain List. Dept. P, Collectors' Wonderland, Box 1170, New York 10008.

STOCK Certificates—Beautiful Decorative—Collectors Items. Free List. Faver, 2766 Quaker Road, Yorktown Hgts., New York 10598.

DECALS, EMBLEMS, PATCHES

EMBLEMATIC Fraternal Emblems. Free Brochure. Potter Specialty, P.O. Box 1568, Tampa, Florida 33601.

CUSTOM Designed Embroidered Emblems, Decals. Inexpensive. Free Catalog, details. Southern Emblem, Box 8PMB, Toast, North Carolina 27049.

EMBLEMS, TOP QUALITY, Embroidered, guaranteed colorfast. Direct to you from leading factory. Order 25 to 25 million. Firm quote from your own sketch or Design-Guide supplied free. A-B Emblem Corp., P.O. Box 5695, Weaverville, N.C. 28787.

DECALS—Wildlife—Dogs—Horses. Send—10¢ for Free Folders. PM, Tyler, 1301 Methuen Street, Dracut, Mass. 01826.

CRIPIT Of '76—Is **THE** American **BUMPERSTICKER!** Send \$1.00 to: LBT Co., Box 7286, Alexandria, Va. 22307.

RETAIL Dealers Wanted: Sell our Beautiful, Multi-Color, Iron-On Heat Transfers. Free Catalog—Sample \$1.00. Specialty Merchandise Wholesaler, Princeton, Iowa 52768.

FLAGS—U.S. Church, etc. Low prices. Free catalogue. Atlantic School Products, Box 5 Nixon Branch, Butler, Penna. 16001.



STAMP COLLECTING

\$35.00 CATALOG Value! 1000 Different Worldwide. \$2.00, with profit-sharing approvals. Universal, Box 6D, Kenosha, Wisconsin 53141.

WANTED: Quality Collections and Accumulations of Stamps and Covers. Ship For Top Offer. Advanced Philatelics, 5410 Wilshire, Los Angeles, Calif. 90036.

FREE! Big Bargain Catalog—New Edition listing thousands of bargains including U.S. & B.N.A. stamps, packets, albums, accessories and supplies. Also, fine stamps from our approval service which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. E64PM, Jamestown, New York 14701.

SEND Only 10¢ for nice collection of U.S. stamps including "\$5.00" Issue and scarce mint SipeX Souvenir Sheet. You will also receive the most wonderful catalog of stamp offers in America. Littleton Stamps, Dept. SS1, Littleton, New Hampshire 03561.

WOW! 110 All Different Germany 10¢ Commemoratives, Airmails, High Values, Big Catalog, bargain lists. Also, fine stamps from our approval service, which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. A64PM, Jamestown, New York 14701.

SURPRISE COLLECTION! Exotic mint British Colonials absolutely free with approvals. **VIKING**, Great Neck, NY 11021.

BETTER Than Gold 120 Swisstamps incl. Juventutes, Comm. Send \$3.00. Baumer's, 2304 NW 7 Pl., Miami 33127.

U. S. PLATE blocks, 7 different 3¢ commemoratives \$1.00! Approvals. Gordon Davison, Hillsboro, New Hampshire 03244.

TWELVE Different Sets In G'assines—\$1.00. Business Starter Kits. Reda, 64 Harrington, Willingboro, New Jersey 08046.

100 DIFFERENT United States Commemoratives, 50¢ with Discount Price List. Shelton, Box 547C, North Miami, Fla. 33161.

FREE! \$3.00 Better Stamps. Approvals Accompany. Postage 10¢. Gains, Box 788-E, Mattoon, Illinois 61938.

SPACEPHOBIA? Romania nudes plus 50 different 10¢ with approvals. BKJ, Astor, Boston, Mass. 02123.

FREE Auction Catalogs. Collect Stamps the cheapest way. Carson, Box 5404, Lawton, Oklahoma 73501.

200 DIFFERENT Stamps 10¢ with Approvals. **WKAJ STAMPS, P.O. BOX 6445, NEW ORLEANS, LOUISIANA 70174.**

200 WORLDWIDE Postal Agencies bring direct **FREE** Service to Collectors. Only \$1.00 for Complete List. Gray, Box 1063, Palo Alto, California 94302.

FREE Brochure Describing Membership Benefits Offered by largest National Society. Write **APS**, Box 800-P, State College, Pa. 16801.

15 WORLDWIDE stamps plus approvals 25¢. Fredrickson Stamps, Post Office Box 187, Wappingers Falls, New York 12590.

SENSATIONAL Clearance Offer. Forty different Packets \$1.00. Norge, Wyckoff, N.J. 07481.

100 WORLD Wide Stamps 25¢ Plus Approvals. If you Act Now. One Hitler Stamp **FREE**. Adults Only. Brandywine Stamp Co., Box 3008, Newport Branch, Wilmington, Delaware 19804.

(Continued on next page)

STAMP COLLECTING

(Continued from preceding page)

1500 FOREIGN \$2.00; 5000 \$4.00; 9000 \$6.00. 5000 USA, contains airmails, regulars, revenues, 19th Century, high values, commemoratives, etc. \$4.00. 300 pre-1940 USA commemoratives \$2.00; 700 \$4.00. No approvals. Meyers, 5321 Fleming, Richmond, California 94804.

RUSSIA Pictorials, 25 for only 10¢ with approvals. Philmart, Box 3869, McGregor, Texas 76657.

225 STAMPS For only 10¢! Airmails. Pictorials: stamps from strange countries cataloging up to 25¢ each! Plus unusual stamps to examine. Buy any or none return balance, cancel service anytime. Mystic Stamp Co., Camden 80, New York 13316.

FABULOUS Collection! 107 different stamps from all seven continents. Get Q.E.-II Silver Wedding (bound to be a classic), giant Mongol horseman, many other new, old issues from Asia, Africa, Europe, North, South America, Australia, Antarctica. Also stamp selections to examine. Buy any or none, return balance. Cancel service anytime. Send 10¢ now. Williams Co., PM87, St. Stephen, N.B., Canada.

SINGLE STAMPS 2¢ and up. Mounted in books. **TRUST STAMP COMPANY**, P. O. Box 100-P, Jamaica, New York 11435.

50 DIFFERENT Old U.S. Revenue Stamps \$1.00. Winchester Stamps, Box 3592, Mansfield, Ohio 44907.

TEN Different Nudes; 20¢. Approvals. Stamp Farm, 2M67, Oxford, Wis. 53952.

FOREIGN Approvals! Gigantic values! 3¢ each. ABC, Dept. 3301-A, Box 6000, San Francisco 94101.

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

"AFRICA" 25 Beauties, 15¢. Approvals. Gorliz, Box 28765 PM, Memphis, Tennessee 38128.

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

ABSOLUTELY Free United States Mint Souvenir Sheet When Requesting United States Approvals. K&B, Box 70, Brooklyn, N.Y. 11223.

500 DIFFERENT Stamps, \$1.25. Smith, 508-A Brooks, College Station, Texas 77840.

100 DIFFERENT British Empire 10¢. Approvals. Gibson, Box 34, Lansdowne, Pa. 19050.

100 OLD United States between 1861 and 1939. \$1.00. Ed Roush, 423 Shepard, Mansfield, Ohio 44907.

20 HISTORICAL U.S. Commemoratives 10¢. Bargain U.S. Approvals. **PINTO**, Box 111, Park Ridge, Illinois 60068.

80 DIFFERENT U.S. Stamps. Includes 1943 flag stamp of occupied nations. Only 25¢. Approvals included. Willett Co., Box 338-M, Yorktown Heights, N.Y. 10598.

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

U.S. BARGAIN, 50 Different 25¢, with beautiful worldwide, approvals. Stamp Center, Kennebunk, Maine 04043.

RUSSIAN Space Collection 35¢, including Russian Approvals. Snedco, Waldwick, New Jersey 07463.

FREE, Mint Worldwide Packet. Approvals. Hildebrand, Box 5645, Redwood City, California 94063.

PICK And Choose from Thousands of Stamps 3¢ Each. Continental, Box 9384M, N. Hollywood, Calif. 91609.

190 POPULAR MECHANICS

GET Scarce Kennedy memorial, Red China, Vietnam stamps plus new countries, topicals, commemoratives, many more! Valuable collection of 100 different stamps from the world over. Colorful new and old issues—wild animals, famous people, far places, others! Also stamp selections to examine. Buy any or none, return balance. Cancel service anytime. Rush 10¢ today. Garcelon Co., 8PMA, Calais, Maine 04619.

UNITED STATES 5¢ Plate Block, 25¢. With Discount Price List. Stevens, Box 546D, North Miami, Fla. 33161.

BREATHTAKINGLY BEAUTIFUL 50 Different mint Monaco Multicoloured Pictorial Commemoratives only \$1.00 with accompanying mint complete set approvals. Pagoda, Box 132P, Sidney, Ohio 45365.

75 DIFFERENT Canada 25¢. Approvals. Oroszky, P.O. Box 1, Sarnia, Ontario, Canada.

2-D SPACE STAMPS! Incredible! Spectacular Mint Set (6 Magnificent Stamps!) and **SURPRISE PACKET!** Yours, with Colorful, Exciting, Adventure—Filled Approvals. Rush 25¢ Today. **APOLLO**, Box 1417-PH, Idaho Springs, Colorado 80452.

50 DIFFERENT U.S. COMMEMORATIVES 25¢ Fine Used U.S. Approvals Accompany. Craig Stamps, Box 425-N, Bellmore, New York 11710.

"INVERTED Error" Dag Hammarskjold, 10¢ with approvals. Belmont Stamps, Washington, D.C. 20015.

VIETNAM 25 Different 10¢ approval. Sam Chazen, Box 95, Ozone Park, N.Y. 11417.

THOUSANDS Of Stamps 3¢ each. Pan Pacific Stamp Co., P.O. Box 9413, No. Hollywood, Calif 91609.

CANADA, 25 Different Commemoratives, 25¢. Approvals. Wilson, Box 116, Dollard des Ormeaux, Quebec, H9G-2H5, Canada.

LOOK! 100 Beautiful Romania Pict, 25¢ Approvals. Scenic Stamps, Box 1973-B, Vancouver, Wash. 98663.

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

STEEL STAMPS. Multicolored paintings printed on USS Steel Foil. Mint set from Bhutan, 25¢. Topical approvals. LeBlanc, Box 110-PS, Glen Cove, New York 11542.

110 DIFFERENT U.S. Commemoratives, \$1.00. Stamps, 7607 Larchview Drive, Dallas, Texas 75240.

BETTER GRADE U.S., Canadian Stamps for advanced collectors. Borgen, Box 645, Seiad Valley, Calif. 96086.

FREE New used Congo animal set. Approvals included. Alpaughco, Highbridge, N.J. 08829.

U.N. MINT 25 Different \$1.00. Philpot, 119 Chateau, Milwaukee, Wis. 53217.

70 DIFFERENT NUDES \$2.00. No Approvals. Kemp, 9952 Tamarack, Pacoima, California 91331.

OLDER U.S. STAMPS. Approvals to Adults Spending \$5.00 or More Per Selection. Engle, Box 208P, Lowell, Michigan 49331.

255 DIFFERENT Worldwide: .25¢. Approvals. Tibbets, 8675 Meadow, Downey, California 90242.

FREE High Value Russia Set. Approvals. Chapmans. Box 487-R, Galesburg, Michigan 49053.

ABSOLUTELY Foreign pictorials with approvals. Low prices. Tom & Jerry, Box 5052PM, Mission Hills, CA 91345

PIONEERS Of the Air Age—first flight covers. Postal markings tell historic data. Real collectors' items now. \$1.00 each or 4 all different flights for \$3.25. K.M. Walsh, Box 308-5, Tuckahoe N.Y. 10707.

PHILA Fax' Market Reports Give REAL VALUES of Your Stamps. Send 25¢. **SASE**, For Sample. Phila Fax, Box 13331, Portland, Oregon 97213.

FRANCE #1100—\$4.95 each. Israel—1974 Jerusalem Exhibition—3-S/\$4.00 Set. Limited Quantity. Want Lists Solicited Europe 1964 to date. Mint only. Franklin, P.O. Box 467-PM6, Jamaica, New York 11434.

BECOME a stamp dealer!!! Write: International, 6767LG South Atlanta, Tulsa 74136.

FREE BARGAIN LISTS! U.S. Plate Blocks-Singles. Scotco, Box 855-PMF, Miami, Fla. 33147.

EXOTIC 25 Malaysia Pictorials, 25¢. Approvals. Summit, 1146-49th Street, Brooklyn, NY 11219.

BEGINNER! What interests you? US? Foreign? Mint? Used? Tell us! Get fine approvals! **DISCOUNTS!** Grimco GG3, 7741 West Amelia, Phoenix 85033.

FREE MOONLANDING MINI-COLLECTION worth \$7.15, after \$1.00 approvals purchase. Brebner, 10923-146th Street, Edmonton, Canada T5N 3A8.

FREE. British with approvals. Stamps Unlimited, Box 2295, Kalamazoo, Michigan 49003.

ESTATE Disposal—Send \$1.00, \$5.00, \$10.00—Receive Generous US Lot. **SATISFACTION ASSURED**. Edwin Hinson, Box 163, Nashville, Tenn. 37202.

207 DIFFERENT triangles, sports, topicals, etc. Value near \$7.00. Only 25¢. Free catalog and coupon worth \$1. Approvals. Jayto Stamps, East Syracuse, New York 13057.

TAIWAN (Formosa)! 30 different used stamps. \$3.00. A. Wallace, Box 628, Montreal, Canada, H3C 2T8.

AIRMAILS—42 Different U.S. (\$3.50 Retail Value) \$1.00 to Approval Applicants. Michael Wilcox, Box 217, Bloomfield, Conn. 06002.

WHOPPERS! 35 splashy fish stamps. 25¢ Approvals. Castle, Box 15-PM746, Flushing, New York 11352.

STAMPS Free! New Issues—New Countries — Triangles — Rockets — Olympics — Scouts — Birds — Flowers — Animals — Also Old Canadian and U. S. Stamps. Plus complete illustrated Canadian Stamp Catalog. Send 10¢ for mailing. Gray Stamp Co., Dept. A, Toronto, Canada.

SEND Only 5¢ for Worldwide Collection of over 50 different Singapore, Grenada, Chad, etc. Contains old and new Issues, sports, animals, etc. You will also receive interesting lists and a certificate worth 50¢ toward purchases. Goliath Co., Dept. TP-1, Bethlehem, New Hampshire 03574.

COINS, TOKENS, CURRENCY

SEND 10¢ for new edition valuable Guidebook "HOW TO COLLECT COINS." Also included 5 foreign coins from Turkey, Spain, etc., and best coins and supplies catalog in America. Littleton Coin Co., Dept. XB-1, Littleton, N.H. 03561.

GOLD AND SILVER! Bullion type coins. Wholesale systematic monthly investments. Mexican coin experts. Brochure free. Colonial Coins, 909 Travis, Houston, Texas 77002.

INDIANHEAD & LINCOLN CENTS 1883-1949 33 different \$2.99. Catalog 25¢. Edel's, Carlyle, Illinois 62231.

SEND \$1.00. Receive Ten Beautiful 1939S Cents. Mustain, Box 2247P, Seal Beach, Calif. 90740.

10 DIFFERENT Indian Head Pennies, \$7.75. Free Coin Catalog. Village Coin Shop, Dept. P, Plaistow, N.H. 03865.

4 BUFFALOS And Price List \$1.20. Rongo, 1265 81st Street, Brooklyn, New York 11228.

COINS At Discount Prices! Free Brochure. Gene Carlton, Chandler, Okla. 74834.

(Continued on next page)

COINS, TOKENS, CURRENCY

(Continued from preceding page)

SILVER DOLLARS Uncirculated, 1880-81—1883-84-85 \$12.00 Ea. Catalogue 50¢. Shultz, Salt Lake City, Utah 84110.

FREE: Lists of Thousands of Stamps and Coins. No Approvals. Bryson, 612M White, Toledo, Ohio 43605.

"1939-S" CENT, Brilliant Uncirculated, \$1.00. Price List. Reitmair, 916 Crawford, Bethlehem, Pa. 18017."

"S" MINT Lincoln Hoard. Not Picked. Lots of Old Ones. 50—\$3.00 100—\$5.95 500—\$23.50. Village Coin, 20929 Ventura, Woodland Hills, Cal. 91364.

1909-SVDB cent in catalog. Free rare coin 25¢ with California \$10 gold piece. \$1.00. Allen's, Box 8244PM, Pittsburgh, Pa. 15217.

CENTS! 1931-D \$2.95; 1933-D \$2.10; Postage Extra! Listing 25¢. Nelson, 306-N, Chappaqua, New York 10514.

GOLD COINS . . . TWO PESO PIECES Weight 1.666 grams .900 Gold. Uncirculated. \$13.00 each. 2/\$25.00 PPD. AOG, c/o Eight Bond Street Ltd., 8 Bond Street, Great Neck, New York 11021.

UNCIRCULATED 1968-S Lincoln, 10¢. Bargain Lists included. Farley Coins, Metamora, Illinois 61548.

FREE BU Mexican Dime. SASE required. Northwoods, Box 24, Big Fork, Minn. 56628.

SILVER Dimes! Three Different, \$1.10. Goan, Box 822, La Mesa, California 92041.

GOLD BU Maximillian 1865 Peso only \$4.95. Coins, Ltd., Box 143S, Canton, N.C. 28716.

UNCIRCULATED: 1960-D Small Date Lincoln, 35¢, including coin catalog. BAUMAN, Box 211, Brooklyn, N.Y. 11210.

ANTIQUES, RELICS, INDIAN GOODS & CURIOS

FLEA MARKET SHOPPER. This massive 320 page volume lists the value for thousands of antiques and collectibles, from Superman comic books worth \$40.00 to a Mickey Mouse clock valued at \$500.00. Only \$3.95. Satisfaction Guaranteed. Carter House, 8409 Cozycroft, Canoga Park, Calif. 91306.

SELL AMERICANA Antiqued Documents and Old Money. Sample 60¢. Christopher, Box 244, Fishkill, N.Y. 12524.

FREE!! Lists Antiques, Indian Relics, 10 Arrowheads \$4.00. Hyde's, Box 2304, Santa Fe, New Mexico 87501.

INDIAN Relic list. Arrowheads \$4.00. doz. Folsom, \$5.00 each. C. Secrist, Deerfield, Missouri 64741.

SELLING 10,000 Indian Relics. Arrowheads, Knives, Spearheads, Scrapers, Etc. List Free. Lear's, Glenwood, Ark. 71943.

"APACHE" Authentic Fine Stone Arrowhead Collections. 25-\$5.25, 100-\$15.00. Tribal Hall-S, Apache Junction, Arizona 85220.

RADIO Tubes for Antique Radios \$3.00; Schematic Diagrams \$5.00. Johnson, 364 Coeur d'Alene, Spokane, Wash. 99204.

EVERYBODY LIKES DIXIE GUN WORKS.

TONS Of antique gun parts and supplies. All reproduction muzzle loading guns. Send \$2.00 for enlarged illustrated catalog No. 123A. Dixie Gun Works, Union City 12, Tennessee 38261.

MODELS—CARS, SHIPS, TRAINS, PLANES, ETC.

SHIP And Yacht model fittings: Pine construction hull kits: blueprints. Send \$1.00 for illustrated catalog. A.J. Fisher, Inc., 1002 Etowah Avenue, Royal Oak, Michigan 48067.

MODEL Airplanes—Big 220 Page Catalog \$1.00. Sig Company, Montezuma, Iowa 50171.

SHIP Model Kits, fittings, plans, books, tools, engines, motors. New illustrated catalog 75¢. Mass. residents add 3% tax. James Bliss & Co., Dept. SM, Route 128, Dedham, Mass. 02026.

MODELS TOOLS ACCESSORIES. Send 50¢ for illustrated 100pp catalog. **HOBBIES** by YODAR, P.O. 15083A, Pittsburgh, Pa. 15237.

SHIP MODEL Kits, Plans, Fittings from our own Workshop. Big Illustrated Catalog: 75¢. Bluejacket Shipcrafters, 145-V. Water Street, South Norwalk, Conn. 06854.

MOTORS, Miniature type for Hobby. Experimenters, Serviceman. 1½ to 6 Volts DC. 1200 to 12000 RPM'S. Package of 5/\$1.00, plus 30¢ postage per order. No C.O.D. Lepley Hobby Centers, 9453 Marigold, North Ridgeville, Ohio 44039.

GAMES, TOYS, PUZZLES, NOVELTIES

GEODESIC Sphere. 17" dia. walnut stain \$5.00, clear acrylic \$6.00. Instructions. **SPHEREDECOR**, Box 593, Maitland, Fla. 32751.

MINIATURE Charms — Trinkets — Toys. (3) **FREE** Samples. **TREASURE CHEST**, 9321 PM Capeview Ave., Norfolk, Va. 23503.

SPACE games, sample \$1.00. **FREE** catalog, Innovations, P.O. Box 6246, Virginia Beach, Va. 23456.

MAGIC TRICKS, JOKES, VENTRILOQUISM

HOUDINI'S Greatest Magic! You can do them all! Large illustrated catalog 50¢. House of 1000 Mysteries, Box 5007-P, Ft. Lauderdale, Florida 33310.

PERFORMING to yawns? Learn why. \$1.00. Conjurers Craft, Box 65-M, New Hyde Park, New York 11040.

PROFESSIONAL Magical Effects, ideal for the beginner or accomplished Magician! Newest Catalog 75¢. Midnight Magic Mfg. Co., 110-M Proctor, Revere, Massachusetts 02151.

FABULOUS MAGIC New 1974 Catalogue 50¢. Our Specialty Orders Shipped Same Day. No Substitutes. **Fabulous Magic**, 3319 East Charleston, Las Vegas, Nevada 89104.

MAGIC Amaze, Mystify, Entertain! New 1974 Catalog 25¢. Hundreds of Best Tricks for Stage, Pocket, Parlor. Jeffries Magicland, Dept. 11, Dallas, Texas 75201.

FREE! World's leading novelty catalog. 1600 Funmakers, Jokes, Tricks, Science, Sports, Hobbies, Jewelry, Psychodelia. Johnson-Smith, C-10, Mt. Clemens, Mich. 48043.

VENTRILOQUISM! Learn at home. Guaranteed. Information **FREE!** Dummy Catalog 25¢. Maher, Box 9037PM, Denver, Colorado 80209.

COMPLETELY Illustrated catalog. 84 pages. 25¢. Manhattan Magic, Box 334-M, N.Y.C. 10011.

MAGIC MAGAZINE. Tricks, News, Dealers Offerings. Monthly Since 1936. 2 sample Copies \$1.00. Genii, P.O. Box 36068M, Los Angeles, California 90036.

WORLD'S Finest professional magic tricks. Joker's Novelties. Giant illustrated catalog 25¢. Top Hat, Evanston, Illinois 60204.

BE A Magician! Two booklets explaining 156 tricks plus large professional catalog. \$1.00. Magic, Inc., 5082 Lincoln, Chicago, Illinois 60625.

WOW! Magic, jokes. Largest selection. Amaze, mystify friends. Super Giant Catalog 25¢. Abracadabra-MP, Colonia, New Jersey 07067.

TWO! Different Magic Catalogs 25¢. Miami Magic, 9734 Bird Road, Miami 33165.

LEARN VENTRILOQUISM! Guaranteed. Information **FREE.** Dummies, Courses, Puppets, Marionettes. Cata.og 25¢. Izzy's Ventriloquism School, 6034 South Pulaski, Chicago, Illinois 60629

JUMBO CATALOG 20¢—Tricks! Novelties! Andersen's, Box-52P, Park Ridge, Illinois 60068.

BOOKBINDING

REBIND YOUR DAMAGED BOOKS. With a few common tools and a homemade book press (plan included) you'll be able to handle anything from a torn hinge to a complete rebinding. Photocopy of article as it appeared in P.M. available for \$1.75. Send orders to Popular Mechanics, Dept. HE, Box 1014, Radio City, New York 10019.

BOOKS, CATALOGS, NEWSPAPERS

40 BOOKS \$3.00. "FREE" Details. Housoken, 789PM, Windermere, Florida 32786.

GIGANTIC BOOK SALE! Huge Selection. Free Catalogs. Write: Salter-B, 162 Calvert, Tonawanda, New York 14150.

FREE Magazines—306 in all—Details for 10¢ stamp! BLASEL, Box 183, Cuyahoga Falls, Ohio 44222.

SOLAR Energy Handbook, \$6.50. Ficoa-J, 2901S Wentworth, Milwaukee, Wis. 53207.

CROP-DUSTING BOOKS, set of five. \$26.75. Publisher, 5301-44, Lubbock, Texas 79414.

MIDGET Bible, size of Postage Stamp 60¢. Christopher, Box 244, Fishkill, N.Y. 12524.

FREE VENTRILOQUIST NEWSPAPER! Fascinating. Informative. Profitable! No obligation. Maher, Box 9037PB, Denver, Colorado 80209.

PUBLISH Your Book! Join our Successful Authors: All subjects invited. Send for Free appraisal and detailed booklet. Carlton Press, Dept. PMF, 84 Fifth Avenue, New York 10011.

NATIONAL Geographic Magazines, 1888-1971, any issue. Buxbaum, Box 465-PM, Wilmington, Delaware 19899.

FREE Book. Prophet Elijah Coming Before Christ. Megiddo Mission, Dept. 63, 481 Thurston Road, Rochester, N. Y. 14619.

WIRETAPPING Expose . . . Your Privacy Invaded . . . Details \$1.00—Refundable. Don-Q Box 548-PMO, Seattle, Washington 98111.

FREE Catalog! Hundreds Books. Fleischer, 129 Walnut St. Everett, Mass. 02149.

LIKE BOOKS? Send 10¢ stamp for catalog. Grider Sales; Dept. E; Box 17277; Dallas, Texas 75217.

DON'TS! For Mail Order Beginner! Six Don'ts that may save Time and Money! Send \$1.00. Sylvia Beatty, Chestnut Street, Eau Claire, Pa. 16030.

DEVELOP a winning personality! Break through the barrier of resistance to attract—friends, romance, job!! Send \$2.25 to Unique, Dept. AA-2, Milan, Ohio 44846.

FREE Book List containing interesting, unusual books. Cookery, astrology, health, Hobbies, Marriage, Parenthood, Occult, Sports, Self-improvement, 22 etc. Knowledge House, Dept. PM, 85 W. Hyatt Avenue, Mt. Kisco, NY 10549.

SENSATIONAL OFFER! Family books 8¢ each. Free Brochure. Winchester Enterprises, 2807PM Hargrave Street, Phila., Penna. 19136.

(Continued on next page)

BOOKS, CATALOGS, NEWSPAPERS

(Continued from preceding page)

"UNUSUAL" Books! Catalogue Free! International Imports, Box 7798PM, Atlanta, Georgia 30309.

BOOKS!! Mailorder, Astrology, Health, many more. 70% off newsstand price. **FREE** Catalog. Satchell Sales, Box 214-1A7, Elk City, Okla. 73644.

HOW To Get Success, Wealth, Happiness, Health. How To Solve Personal Problems, Free List Low Cost Books. W. Beebe, 3136 Dixie Hwy., Erlanger, Ky. 41018.

OUT Of Print Bookfinder. Box 663PM, Seaside, Calif. 93955. Send Wants.

OPERATION SUCCESS The Way To Riches, Success and Happiness. Chart and Book \$2.95 postpaid. **ALADDIN'S**, 611 Gravier St., New Orleans, La. 70130.

PLAYS, SONGS, MANUSCRIPTS

SONGWRITER. Pros Tell How. Music, Money, Marketing, Everything. Details. Nashville Songwriting School, 708-P Berry Road, Nashville, Tenn. 37204.

PUBLISHING Contract Guaranteed on selected songs and poems. Free evaluation Hollywood Songwriters', 6253 Hollywood, 1117-PM, Hollywood, California 90028.

SONGWRITERS, Poets . . . New Song Material Wanted for Publishing, Recording at Our Expense! Grand Recording, 1354-PM Hancock St., Quincy, Mass. 02169.

SONGS, Poems for Publishing, Recording . . . Ballads, Rock, Sacred, Blues, etc. We Pay Costs on Accepted Songs! Country-Western Recording, Box 523-PM, Quincy, Mass. 02169.

SONGWRITERS Needed. Send Poems, Songs. Musically Yours, Box 606PM, Laurel, FLA. 33545.

SPIRITUAL, Religious Poems, Songs Needed for Publishing, Recording! Accepted Songs Published, Recorded at Our Cost! Chapel Recording, Box 162-PM, Wollaston, Mass. 02170.

RELIGIOUS, Inspired Poems, Songs Wanted for Publishing, Recording! We Pay Costs! Cathedral Recording, Box 78-PM, North Weymouth, Mass. 02191.

POEMS, Songs Wanted! Free Publishing, Recording! Talent, 17-PM Longwood Road, Quincy, Mass. 02169.

RECORDINGS, Publishing Contract. Songs, Poems, Talent Searchers, Suite D, 6311 Yucca, Hollywood, Cal. 90028.

WANT Your book published? Learn how—we publish, advertise, promote, distribute. Many successes. Free booklet PM. Vantage, 516 W. 34th Street, New York City.

SUCCESSFUL SONGWRITER HELPS BEGINNERS! Write: Happytime Recordings, B-54, Alviso, California 95002.

SONGPOEMS, SONGS! Urgently Needed, Possible Recording/Publishing. 50-50 Agreement, Betty's Music Makers, 345B Park Bldg., Pittsburgh, Penna. 15222.

SONGS SONGPOEMS Wanted For Radio Show, Hollywood Music Productions, 6425-PM, Hollywood Boulevard, Hollywood, California 90028.

BUSINESS SERVICES

WE ADDRESS (IBM Selectric) and stuff envelopes at \$39.50 per 1000. PMC, Box 6182, Chicago, Ill. 60680.

BUSINESS OPPORTUNITIES

FREE INFORMATION-MAIL ORDER, IMPORT-EXPORT, WHOLESALE, BUSINESS from home, without capital. Sell Gifts, Appliances Houseware, 1001 items. Modline, 719W Faulkner, Eldorado, Ark. 71730.

192 POPULAR MECHANICS

BIG PROFITS! SELLENGRAVED, METAL, SOCIAL SECURITY PLATES. FREE SALES KIT! MYERS, 928-PM CRESCENTHILL, NASHVILLE, TENNESSEE 37206.

ELECTRONIC Assembly Business. Big profits. Start home, spare time. Investment, knowledge, experience unnecessary. Free illustrated literature. Barta, Box 248-GF, Walnut Creek, Calif. 94597.

PREPARE Tax Returns—Policeman Albert Myers made \$2000 his very first season. Train at home. VA Approved. National Tax School, Monsey, 2FE, N.Y. 10952.

START TODAY. Mail order or direct sales. Complete kit shows how. Catalog & details, \$1. **BIERHAUS**, Dept. PM6, 134 Remsen St., Brooklyn, N.Y. 11201.

IMPORT-EXPORT opportunity, profitable world-wide, mail order business from home, without capital or travel abroad. We ship plan for no risk examination. Experience unnecessary. Free report. Mellinger, Dept. H-2706, Woodland Hills, California 91364.

BIG Money, Selling Imported Original Oil Paintings. Mimano, PM64, Box 169, Hainesport, New Jersey 08036.

GET RICH! Unbelievable gimmick. You could have discovered it. Proven money-maker. Send \$1.00 for details: C&C Associates, Box 17964, Tucson, Arizona 85731.

EARN EXTRA MONEY in your spare time mailing commission circulars. Free details. The Benmar Co., Dept. PM64, 216 South 23rd Street, Richmond, Ind. 47374.

RAISE Rabbits, Laboratory animals for us. We supply Equipment, Breeders, Instructions. Details 25¢. Rabbits Of Michigan Research, MP-11, Countyline Road, Pentwater, Michigan 49449.

HOMEWORKERS EARN \$150.00 WEEKLY Stuffing our sales letter into preaddressed stamped envelopes. Make \$1.00 each, no limit. Beginners kit \$2.00. Boldventures, Drawer 956-K, Orange Park, Florida 32073.

SECRETS! Mail Order Success. Internationally famous expert reveals how to make home business fortunes. Beginners: Get free report "Make Money By Mail". Discloses free advertising, profitable products. Mailco, Dept. HC706, Woodland Hills, California 91364.

PIANO Tuning Learned Quickly At Home! Tremendous Field! Musical Knowledge Unnecessary. GI approved. Information Free. Empire School, Box 450327, Miami, 33145.

\$2,000.00 MONTHLY! Unique Advertising Business. Happy Star, Box 833, Half Moon Bay, California 94019.

COLLECTION System! Sample \$3.00, Two \$5.00, Dozen \$24.00. Sell \$15.00 Each. Creditors Service, Murphy, N. C. 28906.

GET Rich—Convert Dimes Into Dollars! Details 10¢. Books, USSAH Box 23, Washington, D. C. 20317.

FREE Details. 100-400% Profit Selling Books by Mail. Profit, 858 Glencoe, Denver, Colorado 80220.

CASH in on the Gasoline Shortage as Gas-Guard distributor. High profits wholesale or retail. Details 25¢. Kirkland, Box 359, Milton, Pa. 17847.

MAILORDER IMPORTS. Reports Reveal Foreign Drop-Ship Sources. World Trader's Digest. Ideal Mail Order Item. \$1.00. Young's Gifts, 1126 Court, Dept. PM, Redding, Calif. 96001.

CHECK US to make big money. Security in Building Maintenance. Show you how. No franchise—Reasonable. Hart Enterprises, Dept. A, Box 3426, Granada Hills, Calif. 91344.

BIG MONEY Raising Potted Herbs. Free Minicourse. Herbalism Institute-B, Box 968, Glendora, California 91740.

WORKERS Needed! Earn \$600 Weekly. Application \$2.00. Franklin's, 2775 Landpark, Sacramento, California 95818.

\$25,000.00 GUARANTEED Income. Fantastic Mailorder Business. Information 25¢. International, Box 217, Madison, Wisconsin 53701.

\$1000.00 PROFIT From 1000 Mailings! Seven Point Program Free! Baker's, 13923M Stoneshire, Houston, Tex. 77037.

\$15,000.00 YEAR guaranteed with Vacuum Cleaner Repair-Rebuilding Business! \$25.00 starts. Free Details. Baron, Box 863A, Portales, New Mexico 88130.

MAKE \$1,000 or more per month from your own home. Details. Channing, Box 4175-PM, Tampa, Florida 33607.

\$30.00 DAILY possible at Home. Details —50¢. Wicklund, 3219 90th Curve NE, Minneapolis, Minn. 55434.

CLIP NEWSPAPER ITEMS FOR CASH PROFITS Earn \$5.00 to \$35.00 each. Information: Send 50¢ and stamped self-addressed envelope: Gills News Clipping Service, P.O. Box 5206, Honolulu, Hawaii 96822.

\$700 MONTHLY. Immediate income. Stuff envelopes at home. Information, send self-addressed stamped envelope. Cottage, Box 25053—CAS, Los Angeles, CA 90025.

MONEY Master's Manual reveals secrets of the insiders. Write: Mims, 1007 18th Avenue East, Cordele, Georgia 31015.

\$24,000 YEARLY Selling Information by Mail. Smithco, Dept. 1P6, 114 Leinster, Saint John, N.B., Canada E2L 1J3.

\$178.00 WEEKLY. Work One Hour Daily. Free Brochure FAS, Box 13651-PM, San Antonio, Texas 78213.

STUFF ENVELOPES. \$500/THOUSAND! Guaranteed Earnings! Send Stamped-Addressed envelope. NRG, 271RT1, Owego, New York 13827.

MAILORDER DEALERS. Your Own Business Immediately. Everything Supplied. Free—Catalog. Details: Dunes, 310-5A Southeast Parkway, Richmond, Indiana 47374.

NEW Make Extra Money Mailing commission circulars easy. Complete beginners Kit. \$1.00 (Refundable). Trade-SC21, 4122-32nd, San Diego, Cal. 92104.

HOW To Start Your Own Mail Order Business!!! GET THE FACTS!!! Free Proof. **MICHAELS!** Dept. PM-6, Box 6685, Kansas City, Missouri 64123.

INSTANT Money! Plastics are the wave of the future. Big profits now! At home! Spare time! Materials costing 11¢ bring back \$2.58 profits immediately! Free information. Rush name on postcard to: Warner, Room LC-2-DF, 1512 Jarvis, Chicago, IL 60626.

MAILORDER!! Sure Fire Program. Tested. Proven. Complete Money Making Details. Mara, Box 527PM, Mahwah, New Jersey 07430.

PROVEN Successful Mailorder Imprint Catalog Program. Everything tested, available. Free details, sample catalog. Allen, 554PM6 Spruce, Garwood, New Jersey 07027.

I MADE \$2,000.00 Monthly by Mailorder . . . Evenings Only! Why Not You? . . . Free Proof! Asbury, Box 2061-D, Erie, Pennsylvania 16512.

ADDRESS Envelopes \$150.00 Weekly possible. Details. Send \$1.00—stamped addressed envelope. Keen, Box 9995PM, San Diego, California 92109.

400% PROFIT From Square Foot 1/4" Plastic. Details Free. Jo-Mar-Ko, POB A34893, Detroit, Mich. 48234.

EARN \$50.00 DAILY Manufacturing Concrete Bricks. Almost No Investment. Send Large Stamped Envelope. Hilmar, Box 347-DH, Valrico, Florida 33594.

(Continued on next page)

BUSINESS OPPORTUNITIES

(Continued from preceding page)

MAILORDER—Establish your own business. Everything supplied—catalogs, ads, photos, mailing lists. Merchandise drop-shipped. Gif-Guide, 1137 Crenshaw, Dept. 404, Los Angeles 90019.

AMAZING Mailorder Profits using proven methods. Details Free. Chapman, 390-VE Danbury Road, Wilton, Conn. 06897.

BOOKKEEPERS Operate Profitable Book-keeping Service. Earn \$10.00-\$20.00 hour. Details free. Universal Bookkeeping, Box 664-M, Springfield, Missouri 65801.

\$250.00 PER Thousand stuffing envelopes! Unconditional Money-Back guarantee! Complete Starters Kit \$1.00. **HOMEWORKERS**, Box 24413-NF, Oakland, Cal. 94623.

RECEIVE \$250.00 Per Thousand—stuff Envelopes—Earn Immediately—Details 25¢. Saffar, Box 1956-PM9, Atlanta, Georgia 30301.

CLAIM ABANDONED SILVER—\$20.000 Secret Revealed! Free Information: Silverman 4A-13, Box 548, Woodville, Texas 75979.

START Your Own Correspondence School. United Career Schools, 5820P Imperial Hwy, South Gate, Calif. 90280.

WORLD'S Largest supply. Merchandise 25% to 40% under wholesale. Bankrupts. Closeouts 10¢ under dollar. Imports. Hong Kong clothes. Automobile discounts. Free details. International Buyers, Box 16386 MM, Portland, Oregon 97233.

SELL Books by mail. Complete dealer set-up—25¢. Midwest Mail Sales, Box 44R2-PM, Shawano, Wisconsin 54166.

MAKE Magnetic signs. Machineless method. Profits enormous. Write: R1B49APM, Bardstown, Ky. 40004.

HOLLYWOOD CEMENTCRAFT: Offers Highly Profitable Home Business. Experience Unnecessary. Unlimited Unique Pottery Designs Easily Made Without Moulds. Bird-baths, Fountains, Wishing-Wellis, Waterfalls, etc. Chemical Coloring Formulas. Marble-glazing. **FREE** Illustrated Brochure. **CONCRETE FACTS**, 602 Athens Street, Altadena, California 91001.

COPUBLISH "Mail Sale Advertiser," leading mailorder paper. Copy and details 25¢. U.S.A. only. Vanroy Shirk, Lebanon, Pa. 17042.

FREE Catalogs. Repair air conditioning refrigeration. Tools, supplies, full instructions. Doolin, 2016 Canton, Dallas, Texas 75201.

\$70 TO \$200 WEEKLY—Home, Spare Time Simplified Mail Bookkeeping. Immediate Income. Easy. Auditax, Box 34741A, Los Angeles, Calif. 90034.

VENDING Machines. No selling. Routes earn amazing profits. Big catalogue Free. Parkway Corporation, 715PBM Ensor Street, Baltimore, Maryland 21202.

\$60.00 DAY. Manufacturing Concrete Posts. Blocks. Mold Equipment Catalog \$1.00 refundable. Carlyne, Route One, Box 95, Rapid City, South Dakota 57701.

MAILORDER Records help get increased business! Complete 32 page Record Book shows your inquiries, orders, advertising, expense, etc. Only \$1.00. **H. E. KAPPEL, POPULAR MECHANICS, DEPT. R, 224 WEST 57TH STREET, NEW YORK, NEW YORK 10019.**

EARN \$60.00 Daily manufacturing Concrete Fence Posts. Practically no investment. Send stamped-addressed envelope. American, Excelsior Springs, Mo. 64024.

\$400.00 MONTHLY Raising giant fishworms. Soilless method. Charlie Morgan, Bushnell, Florida 33513.

EARN Money raising fishworms for us! Write: Oakhaven-38, Cedar Hill, Texas 75104.

\$1.00 LISTS You year sent to 1000 Importers, Jobbers, Mailers, our mailing year. Dixie, King, North Carolina 27021.

I MADE \$40,000.00 Year by Mailorder! Helped others make money! Start with \$15.00—Free Proof. Torrey, Box 318-Y, Ypsilanti, Michigan 48197.

PORTABLE Sandblaster \$29.95. Distributor wanted. Free brochure. INKA, Box 66573—A, Houston, Texas 77006.

MAILORDER Millionaire helps beginners make \$500 weekly. Free report reveals secret plan! Executive (1A6), 333 North Michigan, Chicago 60601.

FREE SECRET BOOK "2042 Unique Proven Enterprises." Tiny businesses but huge profits! How Little Fellows beat inflation. Work home! Haylings, T39, Carlsbad, California 92008.

\$200.00 DAILY In Your Mailbox! Opportunity To Follow Mailorder Experts. Free Details. Associates, Box 136-A, Holland, Mich. 49423.

TAKE Catalog orders. We drop-ship 1001 best selling specialty products. Lowest below wholesale prices. Immediate Delivery Spectacular home business opportunity. Free Book. Specialty Merchandise, Dept. K-F, Woodland Hills, California 91364.

HOW TO MAKE MONEY ADDRESSING, MAILING LETTERS. OFFER DETAILS 10¢. Lindbloom, 3636 West Peterson, Chicago 60659.

MAIL Baby Catalogs Imprinted with your address to New Mothers for Big Profits! Details 25¢. Volz PM, Ypsilanti, Michigan 48197.

MAILORDER BEGINNERS LIBRARY. Learn Professional Secrets Inexpensively! Write: HOW, Box 4457-PM6, Downey, California 90241.

HOW TO RAISE \$100.00 to \$1,000,000.00!! Write: Capital-PM, Dawsonville, Georgia 30534.

NEW, Compact fire extinguisher. Fantastic profits. Exclusive territories. Norwich Chemical, Norwich, Connecticut 06397.

MAKE \$92.00 FROM Square Foot Plywood (Jigsaw or Bandsaw necessary). (Proof) details 25¢. (Refundable). Woodart, Bridgewater, Mass. 02324.

HOMEWORKERS—Mailers Wanted! Free Information. A. Allen, 2418 Lori, Santa Ana, California, 92706.

MAKE \$7.50 to \$15.00 hourly building portable custom cases in your home. Huge demand. Get orders by mail. We supply materials, instructions—everything. Free details. Customcase, 6075 De Soto, Dept. X-K-F, Woodland Hills, California 91364.

FREE COLLECTION AGENCY Details!! \$1000.00 Monthly Possible. Master-PM, Dawsonville, Georgia 30534.

\$25 DAILY Possible At Home. Details—Rush Stamped, Addressed Envelope. INFOMART, Box 597-T6, Lansing, Mich. 48903.

REPAIR WATCHES For Profit or Hobby. Learn at home. Free information. Chicago School of Watchmaking, Dept. YFA, Fox River Grove, Illinois 60021.

NEW EXCITING BUSINESS. Free Details. T. Pearson, 787 Haight, San Francisco, Calif. 94117. Dept. 1028.

\$3,000 MONTHLY from your home!! Write: Craig-106, 8614¼ Troy, Spring Valley, California 92077.

BECOME "Mortgage Broker." Lucrative! Capital Sources, Box 640099, Uleta, Florida 33164.

\$200.00 SPARE Time earnings with your Tablesaw. Write: Workshop Five, 3800 Harney, Vancouver, Washington 98660.

REPAIR Hydraulic Jacks—Details Free. Write: Hydraulic Parts Supply, Box 295, Port Isabel, Texas 78578.

BEGINNERS, Best Start, Mail Order. Details Free. Cornucopia, Box 3-39223, Groesbeck, Ohio 45239.

BIG Profits Addressing Envelopes 25¢. Willard, Box 1497X, Tustin, Calif. 92680.

\$200 WEEKLY STUFFING ENVELOPES home. Start immediately. Details 25¢. **ARTHUR'S**, Box 526PM, Mt. Airy, North Carolina 27030.

WORRY AND HATE GONE FOREVER . . . ! Details—Guaranteed Free. **JAWCO**, PO Box 345-MW6, Stoughton, Wisc. 53589.

MAILORDER Opportunities! Free Packet. Kennedy Mailing Service, Box 351-PM, Selma, Alabama 36701.

\$20,000 YEARLY!! Complete Mailorder Program! Information—Free! Wiemels, 325-MJ Elmwood, Bay Village, Ohio 44140.

MAILORDER—Sell "Insiders" Money Secrets!! Kildebeck-HA, 1207 Eighth, Alhambra, California 91801.

MAILORDER Dealers wanted! L-K Industries, 238 Boardman Blvd., Youngstown, Ohio 44512.

EARN \$30.00 HUNDRED Stuffing Envelopes. Immediate Earnings, Beginners Kit \$1.00. (Refundable). **COLOSSI**, 1433 61 Street PM6, Brooklyn, New York 11219.

EARN Extra Money in Your Spare Time Mailing Commission Circulars. Rush Addressed, Stamped Envelope For Free Details. Ultis, 10716 Francis 1-PM, Los Angeles, California. 90034.

CURIOUS About Mailorder? Discover opportunities awaiting you. Get the Facts, then Decide! Free Information. Rembold Enterprises, 1418AJ Nelson Road, Post Falls, Idaho 83854.

EARTHWORMS. Raise For Profit! Growers Needed Nationwide. Guaranteed Market by Contract. Clear Creek Bait Farms, 5300A Clark Road, Paradise, California 95969 Phone 916-877-4936 Daily 9 A.M. to 5 P.M. P.S.T.

RECEIVE Mail Galore! National Listing, \$1.00. Sullins, 1313-M, Brunswick, GA. 31520.

UNUSUAL shag carpeted hassocks. Easy profit results. Free Information. Toadstools, POB 1044-P1, Mason City, Iowa 50401.

FREE below-wholesale Catalog: Gifts, Toys, Novelties, Sundries, 1001 Products. 200% to 500% Profit! Your own business; mail order, wholesaling, rack merchandising. Imprints. Drop Shipments. Profit. Box 537-AE6, Pico Rivera, California 90660.

\$25.00 HUNDRED STUFFING ENVELOPES. Send stamped-addressed envelope. Tayco, Box 8010PM6, Stockton, Calif. 95208.

GET Out of the Rat Race and into the Money with a business of Your Own. Details \$2.00. Conestoga Supply House, 1014 Willow St. Pike, Lancaster, Pa. 17602.

MAILORDER—Carry no stock. Companies will pack, ship under your label. One-man operation capable of \$10,000-\$20,000 year. Details Free! Elite, Box 715-PM, Lynbrook, N. Y. 11563

NEW, UN-OBTAINABLE ELSEWHERE. World patents pending. Assembly work in your home, earns \$20.00 p'us per hour or refund. No investment, skill or tuition necessary. Start earning immediately. Sample \$10.00 postpaid. Walmsley's, Box 1187, Blaine, Wash. 98230.

WRITE FOR PROFIT. Send for Free, no obligation Writing Aptitude Test. Analyze your writing potential. Writers Institute, Dept. 48-06-4, 100 Mamaroneck Ave., Mamaroneck, N.Y. 10543.

HAVE A CONFIDENTIAL CHICAGO ADDRESS or **BRANCH OFFICE**: Business, Personal; Low Cost, Since 1944! MCOC-86, 216 Jackson, Chicago 60606.

(Continued on next page)

BUSINESS OPPORTUNITIES

(Continued from preceding page)

FREE DETAILS. Manufacture Television Antennas. Experience Unnecessary. Highly Profitable. Business Research, Box 5658 A6, San Antonio, Texas 78201.

CASH in on the Crafts Boom! Sell your craftworks locally, nationally, through established channels. Complete information. Satisfaction Guaranteed. \$1.00. **CONTACTS**, Box 24413NF, Oakland, Calif. 94623.

MAIL Order Manual. Complete instructions. Send \$2.00. Post-All, Box 11-PM, Fullerton, Calif. 92632.

EARN Extra Money in Your Spare Time Mailing Commission Circulars. Rush Addressed, Stamped Envelope for Free Details. Darleen Bube, Box 47, Corydon, Indiana 47112.

MAIL ORDER BEGINNERS—Look before you leap! Write for free information. Hudson Bay Importers, P.O. Box 1031L, Emporia, Virginia 23847.

PERSONALIZED Photo Stamps, photo posters. Make money easily! Free Samples. Postmatic, East Providence, R.I. 02914.

GET RICH by mail. Beginner's Instruction Kit, \$2.25 one-time investment. (Refundable.) LYF, Box 1872, Milwaukee, Wis. 53201.

HOW TO SELL BOOKS BY MAIL. Free information, Daly, PM64, 86-10 Roosevelt, Queens, New York 11372.

START Profitable Home Mailorder! No investment, merchandise dropshipped. Particulars, 25¢ (refundable). Mears-PM, 5363 Essex, Alexandria, Virginia 22311.

UNLIMITED Earnings with Fantastic Money-making methods. Free Details: Riverview Enterprises, Box 291, Macomb, Illinois 61455.

INCOME APARTMENTS Make Money. Free Information. Sullivan (PM6), 754 Myrtle, Albany, New York 12208.

PROVEN Item Sells Instantly. Make \$8.00 on Every \$12.95 Sale. Send \$2.00. Angel Rodriguez, Box 26550-P, Los Angeles, Cal. 90026.

"YOUR Small Business Made Easy" Booklet Designed To Help Plan Your Business. Price \$2.00. **DOBBIEN**, Brocton, New York 14716.

BIG PROFIT mail order, distinctive gift catalog, details \$1.00. **BERKELEY MERCHANDISING CO.** St. Stephen, S.C. 29479.

SINCERE in your Desire for Financial Independence?? Potential Unlimited with this Proven Method for Mailorder Enterprise. Guaranteed. \$2.00. **APSCO**, Box 178-PM Quakertown, Pa. 18951.

MANUFACTURER Seeking Agents: Sell Garden, Farm Sprinklers. Mail 50¢ or Stamps for Brochures, Prices. Selian's, 959 S. 5th St., Lindenhurst, New York 11757.

\$100 WEEKLY Possible! Mailing circulars for advertisers. Details—Rush stamped envelope. Service, Box 721P, Lynbrook, New York 11563.

\$2,000 MONTHLY selling information by mail. Free proof! Associates, Box 123PM, Wenonah, N.J. 08090.

"101 WAYS for boys and young men to make money . . . and plenty of it." An unbelievable new book. Send \$2.50 to AG Books Box 196, Simpsonville, Md. 21150.

MAIL New Catalog featuring top-notch Baby products. No merchandise investment. Everything dropshipped. Free profit details. Jaafri Industries, 9807M Brookshire, Downey, Calif. 90240.

MAKE durable building plastic easily. Waterproof, fireproof, economical. Bays Laboratory, Cedaredge, Colo. 81413.

"MADE \$40,000.00 YEARLY by Mailorder! Helped others make money!" Start with \$15.00. **FREE** Proof. Offenhauser, Box 111, Dept. PM. Canonsburg, Pa. 15317.

MAKE \$200.00 Weekly on over 1,000 Gift and Specialty Products. Free details. National, Box 547, Oneonta, New York 13820.

\$10,000 PER Month Possible With Fantastic New Business. Write: Classes, Box 318, New York, N. Y. 10010.

NEEDED—Homeworkers to stuff and address envelopes. Rush 10¢ stamp to TR Enterprises, Box 1296B, Newport News, Va. 23601.

1000% PROFIT Preserving Baby Shoes in China or Bronze. **FREE LITERATURE.** NBC-PM, Drawer C-1, Coral Springs, Florida 33065.

EXECUTIVE TYPE MAILORDER Business. \$15,000 annually plus. Full year trial basis. Northeast Imports, Box 121M6, Fremont, N.H. 03044.

My New business can easily make you \$1500 per month. **GREATER PEORIA MAILORDER, 1315A GREENLAWN, PEORIA, ILLINOIS 61605.**

WE NEED GINSENG GROWERS! \$3,000-\$30,000 Annually! We Buy Your Crop. Send \$2 for seed sample and information. Glass's Ginseng Exchange, Box 336 Rochdale Station, Jamaica, NY 11434.

SAVE 70% ON BOOKS! Over 600 Excellent Publications. Rush \$1.00 for Complete Listing. Happy Star, Box 833, Half Moon Bay, Calif. 94019.

MAKE 2 to 3 Times Your Cost On Hundreds Of Products. Gift Items, Novelties, Toys, Carded Merchandise, 1001 others. \$1.00 Brings Giant Catalog, Refundable On First Order. Aubrey Products, (AB-2), Normandy Beach, N.J. 08739.

SENSATIONAL New Window, Wall and Car Cleaner. Guaranteed, send \$3.50 For Distributor Demonstrator, 14245 Utrillo, Irvine, California 92705.

FREE MONEYBOOK "990 Successful, Little One-Man Businesses", plus cash loans. Work home! Small Business Index, Dept. 7, Kerrville, Texas 78028.

IMMEDIATE EARNINGS distributing commercials. Beginner's Kit, \$1.00. Lewcard3, Brea, Calif. 92621.

BECOME Our Mail Order Distributor with \$150 Investment. Free Brochure. Audit Controls, 40 Brookside Ave., Fair Lawn, New Jersey 07410.

HOW TO FINANCE YOUR OWN BUSINESS. Get \$500 to \$2 million. Free offer. Capital-17, Kerrville, Texas 78028.

SEVEN Complete Mailorder Opportunities, Details Free! AM Sales, 31-14 94 St., East Elmhurst, NY 11369.

\$200 WEEKLY! Make, Sell Bricks! Free Information! Xcito Bricks, 5715 N. Mozart, Chicago, Ill. 60659.

FUN, SUSPENSE, OPPORTUNITY FOR ENORMOUS PROFITS. ONE DOLLAR, BOX 1403, POMONA, CALIFORNIA 91769.

MONEYMAKING OPPORTUNITIES

SELL New Sensational Low-Cost Burglar Alarm. Samples for trial. Lightning seller. Northwest Electric, Ave. 452, Mitchell, S.Dak. 57301.

STUFF ENVELOPES, \$250, THOUSAND, Supplies Furnished Free. Send Stamped, Self-Addressed Envelope. Rick Wilson, 1045 Berkeley, Fircrest, Washington 98466.

MONEY IDEAS. Profitable Opportunities. Plans, Formulas. Send 25¢. Chervence, R/3P, Cabool, Missouri 65689.

DON'T throw money away on mailorder courses. Details 25¢. ShanTimm, Box 97-PA6, New Milford, Conn. 06776.

NEED Money? High Steady Income! Depression Proof. Details 25¢. Colonial, 206-2A, Swarthmore, PA 19081.

AMAZING profits operating your own musical instrument repair business. Booklet EB-2 tells how. \$12.00 postpaid. Order today. Erick Brand, 1117-B West Beardsley, Elkhart, Indiana 46514.

MONEY! Earn in Spare Time, Home. Eight Easy Ways. Booklet \$1.00. La Mar, 21037 Southbend Cir. 3, Rocky River, Ohio 44116.

"HOW TO GET 20 TO 90% OFF ON EVERYTHING YOU BUY!" Informative book by Jean and Cle Kenney. 248 Exciting pages. "A must in every home." Send \$1.95 plus 35¢ postage to: Cross Country Peddler, Main Street, Waterville, Vermont 05492.

HIGHER INCOME Security and Power. 256 Page Book "Thinking Big" Reveals Secret That Make Men Rich. \$2.00. Richard Studstill, 3463 Simca Drive West, Jacksonville, Florida 32211.

GUPPIES FOR PROFIT. Make Money in Spare Time Raising the Fish everyone wants. Details \$2.00 (Refundable), P.O. Box 3418, Portland, Oregon 97208.

HOMEWORKERS. Receive \$100.00 weekly lifetime income, mailing 6 envelopes daily. Setup \$2.00. Gemco, B-21244A, Indianapolis, 46221.

MAKE extra money from spare time hobby. New booklet tells how. Only \$1.00. Simmons PM64, North 4612 Windsor, Spokane, Wash. 99205.

YOUR Job Next To Go? Enter Import-Export. Earn from home—minimal investment. Booklet, \$1.00. LaMar, 21037 Southbend Cir. 3, Rocky River, Ohio 44116.

200% PROFIT! Sell 1001 Products From Home, Fleamarkets, Garage Sales. Catalog And Sample \$2.00. René, 3402 21st., Rio Rancho, N. Mexico 87124.

\$6.00 HOUR Possible Part-Time. Show Sample, Take Orders For Engraved Metal Social Security Cards. Send Name, Social Security Number For Free Sample, Details. Lifetime Products, Box 25489-PM, Raleigh, N.C.

OUTSTANDING OPPORTUNITY. \$3 Investment makes you Thousands. Complete Information \$1.00. Send stamped envelope to ALCO Mail Sales, Box 8248, Camp Lejeune, N.C. 28542.

SILVER earns you money! Hundreds responding to our tiny ads enjoy lowest costs, instant cash convertibility, astounding profits! \$10 minimum. Instructive literature free. Stagecoach, 1124 NW 40 Ave., Gainesville, Fla. 32601.

\$2,000.00 MONTHLY! Selling Information by Mail. Happy Star, Box 833, Half Moon Bay, California 94019.

STUFF ENVELOPES. \$500/THOUSAND! Free Supplies! Send Stamped-Addressed envelope. NRG, 271RT1, Owego, New York 13827.

WE PAY \$1.00 apiece for Newscippings of Wedding-Engagement Announcements. Details \$1.00. Mementos, Box 3267-PM, Saxonville, Mass. 01701.

PRESTIGE and money yours. Amazing business opportunity. Free details. Sunset, P. O. Box 7411, Houston, Texas 77008.

BECOME WEALTHY—Use financial manipulation—Two ways out of debt without bankruptcy. Birden, Box 8846-P, Pinebluff, Ark. 71601.

SELL \$3.00 Health Books—Mailorder. Cost 50¢. Amrose, Box 8282-XX, Richmond, VA. 23226.

HOW To Make Money Writing Short Paragraphs. Information Free. Barrett, Dept. C-27-K, 6216 N. Clark, Chicago 60660.

\$40 DAILY Possible tying fishing files at home. Details 25¢. Flyco, Box 946PM, Albany, Oregon 97321.

(Continued on next page)

MONEYMAKING OPPORTUNITIES

(Continued from preceding page)

CLIP Newspaper Items. \$1.00-\$5.00 each. Details free. Walter, Box 1360-PA, Erie, Pa 16512.

MAKE Statuettes, novelties, imitation marble. Sell to stores or start gift shop. Free details. Marbleizing, 41 Waverton, St. Louis. Mo. 63124.

VENDING Machines. No selling. Routes earn amazing profits. Big catalogue free. Parkway Corporation, 715PMM Ensor Street, Baltimore, Maryland 21202.

FREE—Easy Ways to make money selling exciting new products—Full—spare time. Send name, age, for 5 months free subscription. Salesman's Opportunity Magazine, 1460 Hancock Center, Dept. 013, Chicago 60611.

ADDRESSERS—50 Companies want Addressers. Send self-addressed envelope. Cal Enterprises, Box 4516-X, Compton, Calif. 90224.

SWEEPSTAKES Contests. How to win. Write for free information. General Contests, 1609-18 East 5th., Duluth, Minnesota 55812.

FREE SECRET BOOK "2042 Unique, Proven Enterprises." Largest successful collection! Fabulous "Little Knowns." Work home! Haylings-T38, Carlsbad, Calif. 92008.

\$200.00 FROM Sheet 1/4" plywood (scrap). Details 35c. Novelties, 610 So. 24th, Elwood, Indiana 46036.

\$250.00 PER Thousand stuffing envelopes! Unconditional Money-Back guarantee! Complete Starters Kit \$1.00. **HOMEWORKERS**, Box 24413-MF, Oakland, Cal. 94623.

LEARN The secrets of repairing junk batteries. "Fabulous Profits" at home. Apex Engineering, 3100 Ramona, Atascadero, California 93422.

WORLD'S Leading Contest Magazine 50c. Prizewinner, 1315 Central, St Petersburg, Fla. 33705.

LEARN Sign Painting—\$1000 Monthly. Part-Time. Free Catalogue. Kaufmann Company, Centertown, Missouri 65023.

HOME Business Ideas! Free Details! ABC Enterprises, Box 1824-P, Columbus, Georgia 31902.

WOODWORKERS—\$200.00 Weekly Constructing Aquariums Of Wood. Orders By Mail. Free Details. Myron Stallsmith—Stacy Drive, New Middletown, Ohio 44442.

200% PROFIT Selling Rings. Triple Money in 30 Days or Money Back. Free Details. Anka, P.O. Box 8036-PM, Cranston, Rhode Island 02920.

HORSEPLAYERS—Free!!!! How Turfwin Won \$300 Weekly. Guaranteed! Turfwin, Box 581PM, Port Washington, New York 11050.

EARN A \$50,000 FORTUNE AT HOME. DETAILS 25c. Mr. Wizzard, Box 204-C, Roselle, Illinois 60172.

SPARETIME MONEY, own home, by mail. Been telling how since 1929. Factual, case histories, new products, thousand offers. Specimen 50c; annually \$12. Mail Trade Magazine, Box 1302, Springfield, IL 62705.

SELL AUTHENTIC Silver, Turquoise Indian Jewelry, Navajo, Zuni. Small investment necessary. Wholesale prices. Rotega Traders, Box 17651, Tucson, Arizona 85731.

EARN \$30.00 HUNDRED Stuffing Envelopes. Immediate Earnings. Beginners Kit \$1.00 (refundable). Colossi, 1433 61 Street, PM6M, Brooklyn, New York 11219.

\$1,000 Extra Monthly. Sound Good? **FREE** Details. Worldwide Success Unlimited, Box 398PM, Orland, Cal. 95963.

\$70,000-\$80,000!! From Automatic Plan! \$5.00. McMeekin, Box 20331-PB, Los Angeles, California 90006.

MAKE Money Collecting Coins, Writing Fillers, Mail Order Imports, Government Surplus, With your Camera, \$1.00 each. Crosby, 140 Solida, Port St. Lucie, Florida 33452

\$1,000,000 CASH! New Jersey State Lottery! Instructions for non-resident participation. Guaranteed. . . . Send \$2.00. Frekl, 51 Magnolia Drive, Dept. 1A6, St. Louis 63124.

FLASHING LIGHTS For Outdoor Signs. Visible Day or Night. \$50.00 up profit per sale. **LIGHTED TRAILER SIGNS.** Rent them. 300% monthly profit. Mobile Signs, 242A Lonoak Rd., Paducah, Kentucky 42001.

\$50,000 BROOCH If set with Diamonds. Sells for \$16.00 If set with Rhinestones. Write for wholesale cost. Kit, assembled. Alderman, 400 P Country Pky., Williamsville, N. Y. 14221.

MAKE EXTRA MONEY. Copyrighted report shows how to make money in your spare time—without working. \$1.50—Derbea, Dept. M6, Box 356, Independence, Kansas 67301.

SELL Zodiac Emblem, Engraved Social Security Plates with Carrying Case. Free Sales Kit. Lambertson, 440132-B Tamiami Station, Miami, Florida 33144.

FLEA Market Shopper—320 Page Volume Lists Value for Thousands of Antiques and Collectibles—Fashioned Primarily as Weekend Shopper Guide—\$3.95 plus .50 postage—Katie's, 4788 Goodland Street, Dept. PM, Santa Maria, Calif. 93454.

FREE! Starting checklist for mailorder beginners. Business Research, Box 5658A6, San Antonio, Texas 78201.

MORE Money! 500 Companies Need Homeworkers! Complete list \$1.00. Columbia, Box 24413MF, Oakland, California 94623.

PHOTOGRAPHY Can Bring You Extra Money. Millions Of Photos Are Purchased By Various Publications Annually. Our Rooklet Reveals: Kinds of Photos Wanted; Where and How to Submit Them; How Much They Pay; and Legal Regulations. **EARN ADDITIONAL INCOME** With Your Camera. Send \$1.50 for booklet #MO-54P to **LYNN WEST**, Twin Lakes Road, Box 794, Shawnee, Okla. 74801.

\$300.00 WEEKLY Possible—Stuffing Envelopes. Start immediately! Details, 50c (refundable). Royal-PM2, Box 36643, Los Angeles 90036.

\$175.00 WEEKLY correcting pupils' lessons! Samples, \$1.00! Castle's, 507LP Fifth, New York City 10017.

EARN EXTRA CASH sewing, clipping newspapers, stuffing envelopes. Information 35c with stamped, self-addressed envelope. Montgomery-PM2, Rt. 1, Robinson Tract Rd., Box 271, Pulaski, Va 24301.

HOW to make money with your camera. Millions of photos bought by magazines yearly. Book et tells how and where to sell your pictures. #MO-54P \$2.00. Holland House, 7660 Somerville Dr., Dayton, Ohio 45424.

HOW TO WRITE MONEYMAKING "Information" Folios, Booklets, on Any Subject. Free Details. Jaycee Barnes, (B-6), Box 913, Glens Falls, New York 12801.

LATEST Fortune Making Secrets Gigantic Food Industry Revealed—Ex-Food Manufacturer—60 Pages—Free details. 1217 Kottenberg Ave., San Jose, Calif. 95125.

MONEY, Security, Power—Learn valuable Secrets that Make Men Rich. Send \$2.00 for 256 Page Book. "THINKING BIG." Gifts Unlimited, 12009 Viers Mill, Dept. 101A, Wheaton, Maryland 20906.

\$50,000.00 A YEAR CASH can be yours. Plan can be worked by any average person part time. Send \$3.00 for step by step details. Harold Collin, Box 214F, R #1, New Franken, Wis. 54229.

\$10,000 FROM \$5 Investment. Jiffypor-trait (PMF), 2830 Gaffey, San Pedro, California 90731.

WOODCARVERS. You Can Make Money With Your Talent. Write: Wildwood, Box 350, Prescott, Wis. 54021.

MONEY Through Music!! Music knowledge not needed. Sure fire system now only \$3.95!! Guaranteed. Music (2F1), Box 15661, Salt Lake City, Utah 84115.

COPYRIGHTED Book Revealing Facts and Fiction in Mail Order is only \$2.00. Satisfaction Guaranteed or Return for Refund. Hope Enterprises, Book Dept., Hope Mills, N.C. 28348.

MAKE MORE MONEY. Copyrighted Report Shows How to Make Extra Money with Hobbies. Send only \$1.00. Anne Benson Sales, Department 717P, Simsbury, Conn. 06070.

NEW REPORT: Cash for photographs. Specific buyers listed. **PAYS** your travel. \$1.00. Alexander Enterprises, 1295B Beacon, Brookline Massachusetts 02146.

WHY Lose? Know Expected Catalog Profits Before Investing. Complete Report \$9.95. Guaranteed. Taylor Made, 6520 Worms / Herrnsheim, Herrnsheimer 122, West Germany.

BEATING THE HORSES Is no gamble at all for me now! Send \$10.00 and I will show you why 99% of all horseplayers lose and how you can be in that 1% bracket of winners as I am. This is no phony system! Gary Rapacz, Argyle, Minnesota 56713.

FIGHT INFLATION! Make Money Collecting Coins. How to Start. How to Search for Rare Coins. Where to Sell. Send \$2.00. Best-Yet Mail Order Service, 1275 Doucette-PM653, Beaumont, Texas 77701.

FUND RAISERS: Energy Crisis can help your group raise \$100-\$1,000 within 30 Days! GMC-1305PM, 130 West 42nd, NYC 10036.

GET World's Biggest Wholesale Import Catalog. Write: World, Medina, Washington 98039.

GUARANTEED WINNING Blackjack System! Mathematically verified! Casino tested! Easily learned. Details, \$1.00 Refundable. Scientific Gambling, Box 1270P, Berkeley, California 94701.

MAKE MONEY IN SPARE TIME. Earn generous commissions as a subscription representative for leading magazines. For free details, send this ad with your name and address to: **POPULAR MECHANICS**, Room 1107S, 250 W. 55th St., New York, N.Y. 10019.

OPERATE Mail Order My Way. To \$7.00 profit every \$1.00 invested. Proven, Fantastically Successful. Facts Free. Benton, 114B Carrier, Liberty, N.Y. 12754.

\$200 SELLING PANASONIC, SONY, Etc. We Drop-Ship. Catalog. Globe Distributors, 883 44th St., Brooklyn, New York 11220.

FINANCIAL OPPORTUNITY—Would You Risk A \$3.00 Investment For Possible Financial Independence? Send \$3.00 and I will disclose my plan. Greer Enterprises, Inc., P. O. Box 5461, Midland, Texas 79701.

\$20.00 POSSIBLE from one junk water heater. Complete diagrams and instructions for starting this fantastic business, \$1.00. Modern, Box 222-M3, Upland, Calif. 91786.

PROFITABLE OCCUPATIONS

HOMEWORKERS NEEDED. Do easy addressing mailing—Free details. Wiley's, 43 Glenville Ave. Rm. 7A, Boston, Mass. 02134.

MY NEW business can easily make you \$1,500 per month. Investive, Box 710-PM, Hartwell, Georgia 30643.

(Continued on next page)

PROFITABLE OCCUPATIONS

(Continued from preceding page)

ADVERTISING BUSINESS—You own it! \$400 first week or money back. Write: Action Ad Clock, Room AC-2-DF, 1512 Jarvis, Chicago, Ill. 60626.

FT. SMITH Auction School, Ft. Smith, Ark. 72901. Resident & Home study. Veteran approved.

PLASTERCRAFT!!! Profitable home business. Molds available. Details: Lynnette, 6251C Mentor Park, Mentor, Ohio 44060.

SHARPEN—Scissors, Pinkers. Light, compact equipment. Supplies. Blackhawk's, Sheldahl, Iowa 50243.

BECOME A Mortgage Broker. Highly respected, interesting, lucrative prestige business. For complete information write: United, Box 6284-F, Marietta, Georgia 30060.

SALESMEN—DISTRIBUTORS

HERTEL Exclusive reference Bible! Big profits! Startling 3-dimension cover! Demonstrator, supplies furnished. Top commissions plus extra bonus earnings! Free outfit. International Book, Dept. PM, Box 118, Wichita, Kansas 67201.

SELL to Firehouses, then send for my brochures, gifts, & specialty items. Franchised Distributors, Rocky Point, NY 11778.

AUTOMATIC Fishhooks. Free details. Samples, \$2.00. Aron, 61PM, Mastic Beach, New York 11951.

SELL Advertising Ball Pens, Calendars, Ad-Specialties—Build Own Repeat Business—Free Details—Fleming, Dept. A, 6535 Cottage Grove, Chicago 60637.

HOUSEHOLD PRODUCTS ROUTE. EARN \$25 or more daily. Also Party Plan opportunities for men, women full, part time. McNess, Freeport (2664), Illinois 61032.

SELLING KNAPP SHOES IS EASY. HIGHEST Cash commissions immediately. Enjoy a steady income with satisfied repeat customers. Your own hours. No investment. Free Sales Kit. Lowell Harris, 612 Knapp Centre, Brockton, Massachusetts, 02401.

EARN Big commission full or part time. \$1.00 for sample and details, refundable. R.L. Enterprise, 84 Ash St. Dept. 1AG, Nashua, New Hampshire 03060.

AGENTS WANTED

AUTOMATIC REPEAT COMMISSIONS. 30,000 Office Supplies. OSECO, 3505-NPM, Elston, Chicago 60618.

FREE catalogs. Magnetic padlocks manufacturer. Other quality imported items. Global Import, Box 388M, El Toro, Calif. 92630.

BIG profits selling non-metallic auto gas-guard. Details free. Odessa, 4652C 151st S.E., Bellevue, Wash. 98006.

EVERY Man a prospect. Refundable sales kit offer showing line belt buckles, tie clasps, money clips, cuff links, lapels, identification badges, individualized with customer's name and emblems. Cap badges for trucking, bus, taxi, police, firemen, also postal, letter carriers and heavy construction emblems. Choice 5000 emblems. Hook-Fast, Box 1088-PM Providence, R.I. 02901.

YOUR Own business. Used Suits \$1.50; Overcoats 65¢; Mackinaws 35¢; Shoes 12½¢; Ladies' Coats 30¢; Dresses 15¢. Enormous profits. Catalog Free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago, Illinois 60608.

BEAT HIGH LIVING COST—Take Orders for America's Finest Shoes from Friends, Neighbors! Easy. Profitable. No Experience Needed. Selling Outfit Free! Mason Shoe, K-972, Chippewa Falls, Wis. 54729.

BIG Profits Selling "Stop Thief Kit", Code Valuables. Details Free. Odessa, 4652-D 151st S.E., Bellevue, Wash. 98006

FABULOUS New Beauty Mask. Earn Fantastic Profits Part Time. Also Party Plan—Crew Manager Opportunities, Barnes, Box 759-H, Portsmouth, Va. 23705.

EMPLOYMENT INFORMATION

HAWAII Work and Live in Paradise. List Occupation and job preferences. Send \$5.00 for job listines. JAYNE—Box 88007, Honolulu, Hawaii 96815.

AUSTRALIA NEEDS YOU! Many opportunities. Excellent Information. \$1.00. Bill Herbert, Box 262, Whitmire, S.C. 29178.

OVERSEAS Bulletin of specific openings published twice monthly for professionals, military, craftsmen. Complete information, guaranteed. Current issue \$5. Not post office box operation. Trans-Global Overseas Network, 301 E. Franklin, Richmond, Va. 23219 (804) 644-0351.

AUSTRALIA—NEW ZEALAND WANT YOU!!! 50,000 Jobs! Paid Transportation! Latest Information and Forms. \$1.00 Austco, Box 3623-E, Long Beach, California 90803.

OVERSEAS JOBS—Now Hiring, 103 Countries, All Occupations, High Pay, Free Transportation, Tax Benefits. Latest Computerized Reports—\$2.00. TRANSWORLD, International Airport, Box 90802-E, Los Angeles, California 90009.

CIVIL Service Careers! We show you how! Free Details! P.W., Box 562, Royal Oak, Michigan 48073.

AUSTRALIA NEEDS YOU!! Jobs, Jobs... **ALL SKILLS NEEDED.** Government paid passage. Complete fact book lists, wages, housing, farming, recreation, rents, taxes... plus new employers lists. Guaranteed \$1.00. Seaview-F, Box 56-L, Toronto, Canada M6E 4Y4

GOOD Pay, Strenuous Labor. Free details. Black Hall, P.O. Box 285, Ashland, Mass. 01721.

AUSTRALIA NEEDS YOU! 8,000 Jobs—Free Transportation! Complete details about Rents, Salaries, Schools, Taxes, Teaching, Immigration Requirements and Forms... **GIANT EMPLOYERS LIST! GUARANTEED.** Send \$1.00. Phillips, Box 477-22A, Doraville, GA 30340.

JOB HUNTERS GUIDE—where, how to find, plus 1004 job titles, \$2.00. Enterprise, Dept. M16, Box 13421, Phoenix, Ariz. 85002.

HAWAII EMPLOYMENT OPPORTUNITIES—Hawaiian companies employing thousands now hiring. All occupations and summer jobs. Send \$2.00 for latest information and Company Directory to Wini's Limited, Box 10306, Hono'ulu, Hawaii 96816.

HELP WANTED

GET THAT JOB! Professional Type Reproducible Resumé Forms. \$2.00 For Three Sets to: Fullerton, P.O. Box 117, Natrona Hts., Pa. 15065.

OVERSEAS Jobs—Europe, South America Australia, Far East, etc. 2000 openings all trades. Construction, Office, Engineering Sales, etc. \$700 to \$3,000 month. Expenses paid. Free Information. Write: Overseas Jobs, International Airport, Box 536-M, Miami, Florida 33148.

EARN At Home Addressing Mail. Details 25¢ and Stamped Envelope. Deeco-151, Box 9308, North Hollywood, Cal. 91609.

OVERSEAS EMPLOYMENT . . . Australia, Europe, South America, Asia! All Occupations! \$700-\$3,000 monthly! Write: Employment International, Box 29217-AF, Indianapolis, Indiana 46229.

AUSTRALIA needs you! 8,000 Jobs—Free Transportation! Complete details about rents, salaries, schools, farming, taxes, social life, teaching, immigration requirements and forms... Plus Giant Employers List! \$1.00. Guaranteed! Austr, Dept. M, 718 W. Pipeline Rd., Hurst, Texas 76053.

REAL ESTATE AND FARMS

FREE CATALOG! Giant SUMMER edition! Over 5,400 properties described, pictured—Land, Farms, Homes, Businesses—Recreation, Retirement. Selected Best throughout the U.S.! 74 Years' service, over 670 Offices, 40 states Coast to Coast. Mailed FREE from the World's Largest! **STROUT REALTY, INC.**, 60-MX E. 42nd St. NY, NY 10017: 7-MX S. Dearborn, Chicago, Ill. 60603: 150-MX N. Santa Anita, Arcadia, Calif 91006.

CANADIAN LAND FROM \$25.00 AN ACRE CHOICE. Properties available across Canada. Low monthly payments. Ideal for farming, cottages, hunting, fishing. Free Catalogue. Canadian Estate Land. Dept. PMC-6, 286 Lawrence Ave. West, Toronto, Ont., Canada M5M 1B3.

HOW TO BUILD YOUR OWN GET-AWAY CABIN ON PRIMITIVE LAND. First, select the proper site—mountain slope, meadow, stream—because terrain will determine the type of building. Buy the land first. The cabin plans can wait. The land won't. America's vanishing wilderness is definitely vanishing. So act now, while we still have primitive acreage in Montana, Idaho and Eastern Washington. Five to forty acre tracts. As little as \$2000. Low down payment. Terms available. Guaranteed road access, warranty deed and title insurance. Growing timber on every tract. Some view and stream sites. Camp on it before you build. See for yourself how great this wild country still is. But it's selling fast. So enjoy it now, hold for retirement or investment. Write for free lists of sites, maps and complete information: Reforestation, Inc., Dept. C-40, P. O. Box 14006, Opportunity Station, Spokane, Wash. 99214.

CANADIAN Land: \$285.00, \$10.00 month. Free information. Vacation Acres, 7771-A Bernard, LaSalle, Canada, H8N 1V8.

GOVERNMENT LANDS FROM \$7.50 ACRE! Vacationing, Farming, Investment! Exclusive "Government Land Buyer's Guide" . . . plus "Land Opportunity Review" listing lands throughout U.S. Send \$2.00. Surplus Lands, Box 6588-AF, Washington, D.C. 20009.

CENTRAL Ontario—Choice 640 acre Sportsmen's paradises still available—\$20.00 plus \$6.50 taxes yearly. Maps, pictures. \$2.00 (Refundable). Information Bureau, Norval 4, Ontario, Canada.

\$1 ACRE—Canadian border—hundreds campsites, islands, farmlands, directly from tax authorities. (Non-profit). Lists, photographs mailed. Register, Room 10, 110 Church Street, Toronto 1, Canada.

BOILING Spring Lakes—America's Greatest Real Estate Value. 1/3 acre vacation or retirement homesites only \$995 cash price. Ten-year terms available. Money-back inspection guarantee. Carolina coast multi-million dollar, 14,000 Acre development. 50 fresh water lakes, private ocean beach, golf course, motel, and country club. Free literature. Dept. 1-Y, Boiling Spring Lakes, North Carolina 28461. (Registered under Federal Land Sales act but not offered to residents of states requiring separate registration.)

CANADIAN Vacation lands: Full price \$385.00. 40 acres. \$10 month. Suitable cottage sites, hunting, fishing, investment. Free information. Land Corporation, 3768-C Bathurst, Downsview, Ontario, Canada.

\$1.00 ACRE! USA and Canada. Lists, photographs mailed. Government Lands, 220 Delaware Ave., Buffalo, New York 14202.

(Continued on next page)

REAL ESTATE AND FARMS

(Continued from preceding page)

SURPLUS Forest, Mountain, Desert, Waterfront Land. Neglected Estates, Farms, Groves, Cabins. Throughout United States, Canada, Mexico. Low Prices. Easy Terms. Information 25¢. Box 6498, Dept. 46, Santa Ana, California 92706.

FREE Catalog! **PHOTOS!** Coast to coast farms, business, retirement. All types, sizes & prices. **SAFE-BUY** Real Estate, Box 589-PM, Little Rock, Ark. 72203.

FREE . . . 280-page **SUMMER** catalog of over 2,500 top real estate values coast to coast! **UNITED FARM AGENCY**, 612-PM West 47th St., Kansas City, Mo. 64112.

FARM AND GARDEN EQUIPMENT

RIDING LAWNMOWERS 1974 Models. 7 Horsepower Briggs and Stratton Powered \$209.00. Free Brochure, Tomco, Box 72, Oak Grove, Missouri 64075.



FLOWERS, PLANTS AND NURSERIES SUPPLIES

LEARN Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. A-623, 2251 Barry Avenue, Los Angeles, California 90064.

BUILDING AID BOOKS

POPULAR MECHANICS CATALOG Of plans, publications and projects. Covers shop and home projects. Want to build a plane, a hovercraft, boats, swimming pools, patios and garden furniture. Fireplaces, kitchen cabinets. 32 pages crammed full of fascinating and useful projects. Send for this illustrated catalog to: **POPULAR MECHANICS**, Dept HE, 224 W. 57th St., New York, N. Y. 10019. Price 25¢

CONSTRUCTION PLANS, BLUEPRINTS

"A" FRAME Study Plan 50¢. Family House, Box 251, Westfield, New Jersey 07091.

HYDRO-PONIC GARDEN. Save \$1500. Build your own \$220. 3-Times yield/3-Times faster. Fresh vegetables year around; Sell for profit. Plans/Specifications \$21.50. Box 474, Tempe, Arizona 85281.

HOUSE EXPANSION PLANS And detail instruction book provide anything from an extra room to 1000 s/f addition. Build what you need at big do-it-yourself saving. Book with 1 set working blueprints \$14.50! With 4 sets (required by contractors) \$20.00. Money-Saver Projects, Box 303-44B, Chappaqua, New York 10514. Information available.

LOG CABINS

STONE house. Gather rocks free. Build one summer, no experience. We did—for \$2,000! "House of Stone" booklet shows, tells how. \$3.00. Stonehouse 7, Sweet, Idaho 83670.

BUILD Log Cabins. Rustic furniture, Fireplaces! Complete manual \$3.00 . . . "A" Frame plans, \$2.00 . . . Guaranteed. . . . Beels, 956 Springdale, Atlanta, Georgia 30306.

HOME CRAFTSMEN

VENEER Bargain! 25 Square Feet Walnut Veneer, \$7.00 Postpaid, USA. Exciting New Instruction Manual/Catalog Colorful Veneers, Butts, Burls, Crotches, Inlays, Supplies, 25¢. Morgan, Department P01K2, Box 18169, Louisville, Kentucky 40218.

101 PATTERNS of Smart Gifts, Novelties, Shelves, Action Windmills, Plus "Make Money Jig Sawing". \$2.00. Mastercraft, 65M, 7041 Olcott, Chicago 60631.

CABINETMAKING MADE EASY And "How to Make Formica Counter Tops." Two excellent guides let you build kitchen cabinets and counter tops like professionals. Extraordinary guides bring master craftsmen's shortcut methods. Satisfaction guaranteed. Write: Japs, 126-P Seventh North, Hopkins, Minn. 55343.

CATALOG FULL SIZE FURNITURE PLANS —\$1.00 Refunded with first order. Traditional. Early American, over 150! Furniture Designs, 1425 Sherman, Dept. CP-74, Evanston, Illinois 60201.

PICTURE Framing—Profitable full or spare-time business. Easy to learn with handbook-course "Guide To Picture Framing Profits." \$2.00 Guaranteed. Free framing-supplies catalog included. Japs, 126-PM Seventh North, Hopkins, Minnesota 55343.

POPULAR MECHANICS MASTER SHOP GUIDE. Greatest product offered to a man with a workshop. All information printed on heavy boards, punched and ready to hang above his workbench. Covers wall fasteners, nails, screws, bolts, twist drills, abrasives, lumber, moulding patterns, plywood grades, hardboard, dry-wall plumbing supplies, electrical supplies. Plus information on score of other subjects. Send \$3.95 to: **POPULAR MECHANICS**, Dept. HE, 224 West 57th Street, New York, New York 10019.

BUILD RUGGED WOOD LATHE from washing machine motor for \$7, simple construction. Plans \$2.00. Gledhill, 3633 Torino Drive, Santa Barbara, Cal. 93105.

EXOTIC LUMBERS from Abarco to Zebra-wood. Very reasonable. Send 25¢ for brochure. Guaranteed. Austin Hardwoods, 2125 Goodrich, Austin, Tex. 78704.

WOODWORKERS! Unique New Item Plans \$5.00. Jessee, Box 892, Lewiston, Idaho 83501.

SOLAR HOT WATER is free. Easy to follow, up to date plans, five installations \$3.00. Pool heating plans \$3.00. W. Gleason, 4050 8th. Ave. North, St. Petersburg, Florida 33713.

GUN, CHINA cabinets, round dining tables, chairs, cheap. Factory direct. Details \$1.00. Stamped addressed envelope: Turner Cabinets, Route 2, Box 235, Alton, Missouri 65606.

CONTEMPORARY Plexiglas grandfather clock kits. Write: Cottage Plastics, 1624 Harmon, Minneapolis, Minn. 55403.

NEED Storage Space? Build 8'x12'x11' High **BARN.** Loft—Gambrel Roof—Dutch Doors!! Detailed Plans/Material List. Send \$2.98—Guaranteed! JaBar, PM6, 1448W Strasburg, West Chester, Pa. 19380.

WOODWORKERS Patterns. Over 1500 Sales Tested Projects. 1974 Catalog 50¢. Walters, 207-PM French, Utica, New York 13502.

DO-IT-YOURSELF

RENO DIVORCE—Book, Instructions, Legal Forms. Mail \$5.00. Reno Divorce Council, Box 8477, Reno, 89507.

CENTRAL AIR CONDITIONING FOR AS LITTLE AS \$500*. Install it yourself in your forced air furnace with ordinary hand tools—save up to \$200 on installations costs. Free brochure illustrates step-by-step procedure. McGraw-Edison Co., 746D N. Clark St., Albion, Michigan 49224. *Cost varies according to size and construction of home.

YOUR creek can produce usable electricity. Details: \$2.00. Write: Weathers, Box 133, Greensboro, North Carolina 27402.

SAVE Heating fuel with a flue gas heat exchanger. Plans \$4.95, Check or Money Order only. Tomasch, P.O. Box 341, Boalsburg, Penna. 16827.

TELEPHONES Unlimited, equipment, supplies. Catalog 50¢. Box 1147-B, San Diego, California 92112.

NEED A WORKBENCH? Here's a dandy one anyone can build in a weekend. It's 5-ft. Long, Sturdy as can be, complete with tool panel. Plan and instructions \$1.00. Way-Mar, 58 Underhill Road, Scarsdale, N. Y. 10583.

SYNTHETIC GASOLINE! Make it yourself from common trash! Chemist gives complete, simple instructions \$2.00. Kenneth Burchette, Box 1114, Spring Valley, California 92077.

SELL Home Yourself. Pay No Commission. Guaranteed Instructions. Details, Quali-Post, Box 91P, Hamel, Minn. 55340.

MAKES Wood Look Like Wood—1 coat does a professional job for fine wood finishing . . . Authentic Sat'n Oil . . . old world formula. 15 oz. \$3.95, 30 oz. \$4.95 prepaid. Authentic Products, Box 742B, Sheboygan, Wis. 53081.

BURGLAR-FIRE Alarm Supplies and Information. Free Catalog. Protecto Alarm Sales, Box 357A, Birch Run, Michigan 48415.

1400 CATALOGS Listed and Described Sources for **EVERYTHING** Imaginable! Rush \$2.00. **MASTERLOG**, Box 24413-VF, Oakland, California 94623.

CONVERT MOWER Engines into air compressors. Write: Showalter, Box 409, Abilene, Kansas 67410.

PLANNING AN UNDERGROUND SPRINKLER SYSTEM? INSTALL YOUR OWN AND SAVE. World famous do-it-yourself Rain Jet Sprinkler equipment. Millions already installed. Available nationally. Send 25¢ for How to Install pamphlet to: Rain Jet Corporation, Dept. SWZ, 301 So. Flower St., PO Box 627, Burbank, California 91503.

CONVERT TV to 6-ft. wide screen! B&W/Color. Do-It-Yourself—easy! Kit, instructions, lens, \$12.95 ppd. Free illustrated details. Macrocoma, Box CFA, Washington Crossing, Penna. 18977.

SOLAR Swimming Pool Heater Inexpensive—Easy to Build. Plans \$5.00. Micron Engineering, 2802 State, Santa Barbara, CA 93105.

"SOLAR ENERGY". The complete, Illustrated Booklet of Solar Energy Collectors. Explains How Solar Collectors Work, What Materials to Use, and How to Design and Build Collectors for: **SPACE HEATERS, SWIMMING POOL HEATERS, PORTABLE AND FIXED WATER HEATERS.** \$3.00—Primary Energy Systems, Box 76, Ann Arbor, Michigan 48197.

TRACTOR Plans. Old Car Parts. Free Information-Pictures. Stamp please. Davenport, 8520 Cherry, Fontana, Cal. 92335.

WINDMILL 110v Power, \$5.00. Automobile battery power conversion, \$3.00. 65% Savings building constructions, \$3.00. Near free house heating, \$2.00. Solar heating, cooling, power, \$3.00. Solar Thermoflex Motor, \$15.00. Make your own, \$4.00. Guaranteed. Instructions Illustrated. Energycraft, 2350 W47P, Denver, Colo. 80211.

CONVERT TV to 5' X 6' Screen. Inexpensive! Free Details. Thompson Enterprises, 5309 Riverdale Rd. #105, Riverdale, Maryland 20860.

SIMPLY, Turn any Junked Refrigerator into a Powerful Air Compressor and Other Useful Equipment Cheaply. Complete plans \$3.00. Lukasz, P. O. 3684, Baltimore, Maryland 21214.

PEA SHELLER—YOU CAN BUILD with Common Hardware Materials. Detailed Plans, Simple Instructions, \$1.00. Thompson's Plans, Box 283, Cairo, Ga. 31728.

(Continued on next page)

DO-IT-YOURSELF

(Continued from preceding page)

SOLAR POOL HEATER. Fabrication Plans, Materials List, Installation Instructions, Schematic, Photos, Data, Fabricated and Tested. \$3.00. Solar-Tech, 6702 Marilyn, Huntington Beach, Calif. 92647.

GASOLINE Shortage. Run Your Car On Charcoal Etc. Proven, Ten Chapters, Illustrated \$3.50. Jerome Ames, Box 9M, Dearborn Hts., Mich. 48127.

ELECTROPLATING. Complete amateur's textbook All metals Electroplate metallic/nonmetallic items \$7.00. Details free. Tropic, Box 95P3, Palm Bay, Fla. 32905.

SOLAR Energy Water Heating System. Details: \$2.00. Steele, 221 Hyline Rd., Jensen Beach, Fla. 33457.

SENSITIVE Relay. Automation, Control, Safety, Monitoring. Secure Electronics, 32 Warren, Waban, Mass. 02168.

REPAIR MINIBIKES, LAWNMOWERS, BICYCLES, Sewing Machines, Auto Engines, Mazda/Wankel, Motorcycles, Magic boats. Over 100 How-To-Books. Free Brochure. Sincere, Box 10422, Phoenix Arizona, 85064.

ARTS AND CRAFTS

PROFESSIONAL CANDLE DYE 6 COLORS. Enough For 200+. LBS Wax, \$4.85 Postpaid. Guaranteed Quality. Instructions. Candleworks, Chiloquin, Oregon 97624.

LIQUID LATEX Paratol 706-G compound for making rubber mold. Toughest, finest quality. Instructions. Money-back guarantee. Postpaid \$3.95 quart, \$12.00 gallon. TESTWORTH, 139 Commercial, Addison, Ill. 60101.

"GETTING Started in Stained Glass" 25¢. Whittemore, Box 2065Y, Hanover, Mass. 02339.

FREE LITERATURE For sculptors showing how to make molds, cast plastics. Adhesive Products Corporation, 1660 Boone Avenue, Bronx, N.Y. 10460.

FREE: New handicraft catalog. Supreme Handicrafts, Box 395-PM, Sioux Falls, South Dakota 57101.

MAKE Figurines, plaques, lawn ornaments, Molds, plastercraft kits, liquid rubber. Sample and catalogue 25¢. Woolley Company, Box 29-B, Peoria, Illinois 61601.

GLASS BLOWING Kits and Supplies—Literature Upon Request—Willis Glass, P.O. Box 3460, Anaheim, California 92803.

FREE—Sample and Price List of Natural Tooling and Carving Leather Direct From Factory. Highlands Leather Company, Box 348, Sebring, Florida 33870.

DRAW Expertly, Immediately, How? Stamped envelope. Hearings, Madison, South Dakota 57042.

MAKE Tiffany Lamps, Authentic, Simplified, Foil Construction. Information Includes 14 Page Instruction Manual \$1.00. Howard Worden, Granger, Wash. 98932.

BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

FREE Binocular, Riflescope catalog. Discount sale. Save 50%. Free gift with order. Write: United Binoculars, BN-8308, 9043 So. Western, Chicago 60620.

CAMERAS AND EQUIPMENT

WEDDING PHOTOGRAPHERS! Handbook of 70 tips. Things you wanted to know about photography, but no one would tell. Tricks the pros use. \$1.00. Studio WM, 6713 Wildwood, Westland, Michigan 48185.

FREE! FREE! BARGAIN BOOK. Central Camera Co., Dept. 361, 230 S. Wabash, Chicago, Ill. 60604.

BUY Photographic Equipment at Great Prices. Free Catalog. House Of Cameras, 115 E. Fifth, Olympia, Wash. 98501.

PHOTOS AND PHOTO SUPPLIES

SELL Your Photos. Report tells How, Where. Color Slide Markets. Only \$1.00. Millstream Manor, Dept. B, 516 E. Third, Ottawa, Ohio 45875.

PHOTO FINISHING

LOOK!—Special Money Saving Offer! Kodacolor Rolls developed with Jumbo Size Prints \$1.60. B&W 49¢. Big Discounts on supplies. Enclose advertisement. Wisconsin Film Service, LaCrosse, Wisconsin 54601.

COLOR SLIDES

35MM COLOR Slides, 10,671 Individually Sold, described encyclopedia catalog. 25¢. Wolfe Worldwide, Dept. 14-64, Los Angeles, Calif. 90025.

MOTION PICTURES AND SOUND EQUIPMENT

SUPER 8, 8mm, 16mm, 35mm, B&W and Color Film, Supplies, Processing Equipment. Send 25¢ for 84-page catalog refundable with order. Superior, 448 N. Wells, Chicago 60610.

8MM—SUPER 8—16MM MOVIES! Biggest Selection! Lowest Prices! Free Catalog! Cinema Eight, Box PM, Chester, Connecticut 06412.

UNUSAL Movie supplies. Free circular. Esor, 47th Holly, Kansas City, Missouri 64112.

SUPER 8MM, 16MM, 8MM Sound and Silent Classic Films. Free Catalog. Niles, 1019-PM, So. Michigan, South Bend, Indiana 46618.

175-FT. 8MM. CLASSIC SAMPLER . . . ONLY \$1.99. Highlights from heyday of the silents! Chaplin, Laurel & Hardy, Fairbanks, Keystone Kops, Gish, Pickford, Chaney, the first Indianapolis 500 and more. Order today . . . specify standard or super-8. Free catalog: 8MM. & 16MM. movies & 35MM. 2" x 2" color slides. Blackhawk Films, 491 Eastin-Phelan Bldg., Davenport, Iowa 52808.

"FREE" Catalog—Castle—Columbia—Home Movies. G & G Film Library, Box 321, Syosset, N. Y. 11791.

RADIO, TELEVISION AND HAM EQUIPMENT

HEAR POLICE/FIRE DISPATCHERS! Catalog shows Receivers; Directories of "Confidential" Channels. Send 10¢ stamp. Communications, Box 56-PM, Commack, New York 11725.

36¢ RADIO & TV Tubes. Free catalog. Cornell, 4213-17 University, San Diego, California 92105.

GIANT Canadian Electronics Surplus Catalog. \$1.00. Etc PM, Box 741, Montreal.

GOVERNMENT Surplus receivers, transmitters, snooperscopes, parts. Catalog 25¢. Meshna, Nahant, Mass. 01908.

CONVERT TV to 6-ft. wide screen! B&W/Color. Do-it-Yourself—easy! Kit, instructions, lens, \$12.95 ppd. Free illustrated details. Macrocoma, Box-CFD, Washington Crossing, Penna. 18977.

HIFI, TAPES, RECORDS & ELECTRONICS

OLDIES. 45RPM. Free Catalog. Corny's Record Shop, Box 335DH, Mason, Ohio 45040.

ORIGINAL Radio Broadcasts. Catalogue \$1.00. (Refundable). Box 9032-M, Wyoming, Michigan 49509.

OLD Radio Programs on Tape. Thousands available. Six hours, \$8.00. Catalogue, 50¢. Nostalgic Radio, Box 29-P, Peoria, Ill. 61601.

OLDIES 45 RPM Original Hits—Catalog 50¢. C&S Record Sales, Box 197, Wampsville, New York 13161.

FREE Catalogues, 2000 hard to find unusual records. Rose's Records, Box 7216, Louisville, Ky. 40207.

FREE Catalog—Electronic Kits—Amplifiers—Preamplifiers—Psychedelic Strobes—SCA Adaptors—Color Organs—Digital Instruments—Guitar Amplifiers. **FREE** Subscriptions, SWTPC, Box PM32040, San Antonio, Texas 78284.

GOLDEN Age Radio. Complete taped Shows. Box 25215-M, Portland, Oregon 97225.

REDD FOX comedy 8 track tape \$3.50. Any year Oldies, any old radio show, \$3.50 each. Complete list with order. DiWan, Box 1302, Springfield, IL 62705.

RECORD PHONE CONVERSATIONS AUTOMATICALLY! Parts for activator unit under \$30. Plans \$7.00. Jensis, 7275 Euclid, Cincinnati, Ohio 45243.



MUSIC AND MUSICAL INSTRUMENTS

ACCORDIONS and Amplifiers! New—Used. Cordovox, Excelsior—Top Makes! Save to 50%. Direct factory dealer. Terms. Trades accepted. 5 day home trial. Free catalog—Discount prices. Write: Accordions Unlimited, Dept. R, 3147 North Luna, Chicago 60641.

CASSETTES from a major record collection: nostalgia, history, listenable music. Free catalog. Wetzell's Cassettes, 523 DuBois, Barrington, N.J. 08007.

10 MUSICAL INSTRUMENTS in kit form. Selection of wood. 90-100% Precut. Catalog 40¢. RemBrand Company, RR3, Newton Iowa 50208.

PLAYER PIANOS; PUMP ORGANS—books; repair manuals. Catalog \$1.00, refundable first order. Vestal Press, Box 97, Vestal 11, NY 13850.

ACCORDIONS Manufacturing, 6846-P North, Chicago 60635. Concertinas-Chromatics-Heligons-Hohners-New-Used-Repairing-Wholesale Catalogs Free.

EASY To Play And Make. Quality Dulcimers. Banjos, Thumb Pianos; Instruments And Kits. Can Be Profitable Hobby. **HERE,** Inc., #P. 410 Cedar Avenue, Minneapolis, Minn. 55404.

ELECTRIFY Player Pianos, Pump Organs Quickly. Inexpensively with Lee Silent Suction Units. Write: Lee Music, 525F Venezia Avenue, Venice, California 90291.

30% TO 50% DISCOUNT! Any Model: Guitar, Amp, Drum, Banjo, Dobro! Free Catalog! Warehouse P46, Box 11449, Fort Worth, Texas 76109.

POEMS Wanted for songs. Nashville Music Productions, Box 40001-P, Nashville, Tennessee 37204.

VIOLIN And Guitar makers—send for latest Free Catalogue of woods & accessories. International Violin, PM1, 414 East Baltimore St., Baltimore, Md. 21202.

WHOLESALE! Professional Guitars, PA Systems, Altec Speakers, 240W RMS Amplifiers. Free Catalog. Carvin, Escondido, Calif. 92027.

RECONDITIONED Accordions for sale—Save \$\$\$, Top Brands. Write for free descriptive folder. A-1 Rebuild Accordions, 31 E. 18th St., N.Y.C. 10003.

ACCORDION Top brands. Buy direct. Tremendous discounts. Trades accepted. Free brochure PM. Accordion-O-Rama, 874 Broadway, N.Y.C. 10003.

GUITAR, Banjo, Violin, Mandolin Making Materials, Accessories, Books. Catalog 25¢. Guitar Center, Box 15444, Tulsa, Oklahoma 74115.

(Continued on next page)

MUSIC AND MUSICAL INSTRUMENTS

(Continued from preceding page)

LEARN Banjo. 5-String Bluegrass. No music. Makes learning easy. Free details. Blaylock, Box 25-M, Marietta, Georgia 30060.

FREE—Fully Illustrated Music Catalog. Accessories. Instruction Books. Repair Parts. Marina Music, Box 718-C, Marina Del Rey, California 90291.

30% DISCOUNT Name Brand Musical Instruments. Free Catalog. Freeport Music, 455F Route 110, Melville, N.Y. 11746.

POEMS Songs wanted. Recording. Publishing guaranteed. Royalties. Radio-TV release. Broadway Music, Box 11647-PM Sarasota, Fla. 33578.

KITS! Build Dulcimers, Guitars, Balalaikas, Thumb Pianos, Harps. From \$2.95. Finished Dulcimers from \$19.95. 8665 West 13th Avenue-PM, Denver, Colorado 80215.

CLASSIC GUITAR making book, 360 pages 8 1/2 x 11" \$12.95. Guitar making tools. Overholzer, 618 Orient, Chico, Calif. 95926.

SWISS Finest Music Boxes, Movements. Spielman, 55 West 42nd, New York, 10036.

BUILD 5-STRING BANJOS from Frypans and Other Inexpensive Materials—full scale plans—\$5.00 ppd. Kendall, 505 South Fir, Roswell, New Mexico 88201.

WHOLESALE. Musical Instruments—Accessories. Allied, 573 Route 17, Paramus, New Jersey 07652.

EDUCATION AND INSTRUCTIONS

WELDING TRAINING Basic and advanced training for major welding processes—Arc, Gas, Pipe, TIG, MIG, plasma. Hobart, a non-profit school, is accredited by NATTS. Approved Ohio 70-12-0064 HT. Write for school bulletin and course schedule. **HOBART SCHOOL OF WELDING TECHNOLOGY**, Box 74, Troy, Ohio 45373.

HOME Study Courses in **PRINTING** Trade. Beginning or Advanced. Lessons by mail. Litho Training Program, Box 1798, Denver 80201.

STUTTERERS! Learn fluent, normal speech quickly at home. Tremendous future! Certified Speech Pathologists. Free information: Emery Institute, Box 867-PM1, Winter Park, Florida 32789.

FREE Catalog! Unique Inexpensive Books. Racoa, Box 372, Agawam, Mass. 01001.

BECOME AN ORDAINED MINISTER. FREE Ministerial Credentials Legalize your Right to the Title "Reverend". Write: Church of Gospel Ministry, 3804 National Avenue, San Diego, Calif. 92113.

COLLEGE DEGREES AT HOME! Complete Directory Accredited Universities Offering Correspondence Courses \$2.00. Research, Box 48533PM, Los Angeles, Calif. 90048.

"SCUBA"—BELIZE SCHOOL, P. O. Box 164, Belize City, Belize.

IF YOU can drive a car, we can give you basic training needed to drive giant Diesel rigs crosstown, cross country. Train in as few as 4 weeks. Exciting, lifetime career opportunity. Start with home study. Finish with 2 weeks of "in the cab" field training. Details FREE. United Systems, Inc. School, 1600 W. Oliver, Dept. 314, Indianapolis, Indiana 46221.

COMPLETE YOUR HIGH SCHOOL at home in spare time. Texts furnished. No classes. Diploma. Our 77th year. Free Brochure. American School, Dept. XA45, Drexel at 58th, Chicago 60637.

EARN ELECTRONICS DEGREE by correspondence. Free brochure. Grantham, 2004 Stoner, Los Angeles, California 90025.

LEARN Sewing Machine Repairing. Men. Women. Lucrative profits. Profession with bright future. Gresslin Correspondence School, Box 927, Spencer, Iowa 51301.

LEARN Auctioneering. Term soon. Free catalog. Reisch Auction College, Box 850, Mason City, Iowa 50401.

EXTENSION And Post-Graduate Awards in Philosophy, Art, Sciences, Botanic Medicine, Homeopathy, Radionics and others. 30 subjects. Curricular free (airmail \$1.00 refundable). Registrar, Sussex College of Technology, Highfield, Danehill Sussex, England.

RELIGIOUS VOCATION? Write: Church Of Holy Light Inc., P.O. Box 4478, Pittsburgh, Pa. 15205.

USED Courses! Books Catalog 10¢. (Courses Bought). Lee Mountain, Pisgah, Alabama 35765.

AUTOSUGGESTION. Sleep-learning headquarters! Tapes, records, books, Gigantic catalog free. Research Association, Box 24PM, Olympia, Washington 98501.

DETECTIVE Course. Free Information. Universal Detectives, Box 8180-F, Universal City, California 91608.

LEARN To Fix Typewriters. Desperate shortage trained men. Hundreds needed. Make up to \$25 in one hour. Learn at home in spare time. Industry Approved course. Facts Free. Send name. Typewriter Repair School, (homestudy), Dept. 3310-064, Little Falls, New Jersey 07424.

PIANO Tuning quickly learned with home study course. Diploma granted. American Tuning School, 17050 Telfer Dr., Morgan Hill, California 95037.

USED Courses! Books! List 10¢. Smith's, 124 Marlborough, Salem, Massachusetts 01970.

UNLOCK Your Future. Become professional Locksmith by spare time homestudy. Make up to \$6 per hour. All tools, equipment inc. Facts free. Send name. Locksmithing Inst. (Homestudy), Dept. 1310-064, Little Falls, New Jersey 07424.

DETECTIVE Profession, Easy home study; free tie-tack or lapel pin, certificate, future. GI approved. Professional Investigators, Box 41345, Dept. CP, Los Angeles Calif. 90041.

COLLEGE Degree at home. Your choice of subjects incl. Law. Easy tuition plan. Williams College, 915 Cerrillos Road, Santa Fe, New Mexico 87501.

ORDINATIONS. Lifetime! Church chartered 1887! Write! 708 Bragg, Monroe, North Carolina 28110.

OWN Collection agency. "Little Gold Mine!" Franklin Credit, Roanoke, Virginia 24004.

FREE Book tells how you can learn camera repair and service. Home study or classroom. Write today! National Camera, Dept. EAD, Englewood, Colorado 80110.

WATCH REPAIRING. 35 Lesson Home Study Course. Free sample. Diploma awarded. Chicago School of Watchmaking, Dept. YF, Fox River Grove, Illinois 60021.

AUCTIONEERING. Resident or home Study Course. Free Catalog. Nashville Auction School, 1921 West End, Nashville, Tennessee 37203.

PIANO Technology—Electronic organ servicing, learned easily at home. G. I. Approved. Free booklet. Niles Bryant School, Dept. P, 3631 Stockton, Sacramento, California 95820.

IMPROVE Your I.Q.!! Send \$2.00 Today! —For Book—"27 Ways To Improve Your I.Q." Craig-4D6, 8614 1/4 Troy, Spring Valley, California 92077.

DEGREE Program in Electronics Engineering. Our 29th Year! Free Literature. Cook's Institute, Dept. 10, Box 20345, Jackson, Miss. 39209.

LEARN Asleep or awake! Records, tapes, equipment! Free catalog! Drawer PM-400, Ruidoso, New Mexico 88345.

SHORTCUTS To Success! Highly Effective. Profitable Short Courses. (75 Choices). Study At Home. Diploma Awarded. Our 29th Year. Free Literature CIEE-25, Box 20345, Jackson, Miss. 39209.

VETERINARY ASSISTANT—Train at home for exciting animal care career. Send for **FREE "Career Kit"**. North American School of Animal Sciences, Dept. PBC44, Newport Beach, California 92663.

PROBLEMS? There's an Answer! Free Home Study by Mail in the Torah or Confraternity New Testament. Please state your Religion. Lamplight Studies, Box 88-D, Brooklyn, New York 11229.

FREE Lifetime Ordination. Become Chaplain Missionary. Bishop, Box 744, McKeesport, Pa. 15134.

ANYONE Can Write!" Free Authorship information . . . Academy, 1629-A1 Bell, Chicago, Illinois 60647.

ENTER Ministry. Sincerity Essential. Way, Box 4842, San Francisco, Cal. 94101.

EARN OFFICIAL HIGH SCHOOL Equivalency diploma from your state. Business, college accepted. Fast, simplified home study course guarantees you pass GED. Brochure mailed free: Bright Futures Corporation, Box 514PMG, Jackson Heights, N.Y. 11372.

BECOME RICH, happy, successful applying Universal Laws of Success! Free Details! SuccessA-6, 101 Halcott, Lafayette, Louisiana 70501.

HIGH School Graduates Study at Home for Better Paying Positions. Free Information, Byrne Sales, 5445A West 64th Street, Chicago, Ill. 60638.

IT COSTS Nothing To inquire About Accounting Career. Many Make \$1,200 Monthly. You start, only 20 lessons, \$5.00 each. Pay as you learn and earn. State Approved. Certificate. Start by mailing \$5.00 for first lesson. Jenkins, Box 571, Taft, California 93268.

FOR INVENTORS

INVENTORS—If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturers requirements, royalty rates. Kessler Corporation, C-56FI, Fremont, Ohio 43420.

PATENT Application Financing. Free patent search plan. Global Patent Division, 2354 Telegraph, Oakland, California 94612.

U.S. PATENT Office Searches, 234 Broadway, Room 3615, New York 10007. Free invention certificates.

INVENTORS: Your ideas and inventions (patented; unpatented) expertly searched, developed for commercial appeal and cash/royalty sales to manufacturers by professional Invention Developer with excellent record of experience. B. S. Industrial Engineering; United States Patent Office former Patent Examiner, United States Government former Patent Advisor. Second decade reliable service! Member: United States Council International Chamber Commerce. Free "Invention Record" and "Recommended Protection Procedure." Airmailed! Write: Raymond Lee, Invention Developer, 230P-Park Ave., New York, New York 10017.

FREE PAMPHLET: "Tips on Safeguarding Your Invention." Write: United States Inventors Service Company, 501-P Thirteenth Street N.W., Washington, D.C. 20004.

INVENTORS—UNITED STATES PATENT OFFICE SEARCHES. PATENT DEVELOPMENT Engineering and **MARKETING** of your inventions, ideas with **MANUFACTURER CONTACTS.** Send for **FREE INVENTION CERTIFICATES** and Invention Information. Serving inventors since 1948. **GEORGE SPECTOR, LICENSED PROFESSIONAL ENGINEER—PATENT ENGINEER.** Former **UNITED STATES PATENT OFFICE EXAMINER**—3615 Woolworth Building, New York, New York 10007.

(Continued on next page)

FOR INVENTORS

(Continued from preceding page)

PATENT Searches including maximum speed, full airmail report and closest patent copies. Quality searches expertly administered with complete secrecy guaranteed. Free Invention Protection Form and "Patent Information." Write: Dept. 15, Washington Patent Office Search Bureau, Benjamin Franklin Substation, P.O. Box 7167, Washington, D.C. 20044.

FILE Your own Patent Application. Complete Information and Materials. Write: Inventor's Guide, 468 M Goodspeed Road, Virginia Beach, Virginia 23451.

MR. INVENTOR: Inventions Needed by Manufacturers. Development Assistance and Patent Searches. Free "Proof of Invention" Forms and other Pertinent Information. Write: Charles S. Prince and Associates, Invention Consultants, 509-A 5th Avenue, NYC 10017.

INVENTORS—IDEA MEN—SUCCESS SEEKERS We will promote your patented unpatented inventions or ideas for **CASH/ROYALTY** sales to manufacturers. If you have an idea, take **ACTION!** Write for **FREE** information on how to **PROTECT** and **MARKET** your idea/invention! Northern Michigan Inventors Service, RT 5, Box 78, Shebovgan, Michigan 49721.

INVENTORS and Thinkers—We need inventors. Membership through COM may entitle inventor to patent work, advertising and employment information. For more information send \$1.00 to: COM, 911 Atkinson, Detroit, Mich. 48202.

NEEDING Assistance? **INVENTION DEVELOPMENT FOUNDATION**, 155 Kent Street, Ottawa, Canada K1P 5P3.

PROSECUTE Your Own Patent Application. All Material Necessary—Write: Inventors Service, Box 3574, Washington, D.C. 20007.

INVENTIONS WANTED

INVENTIONS Wanted immediately for promoting on cash or royalty. Patented, Un-Patented. Free booklet outlines royalty rates, requirements. Write Kessler Corporation, C-561W, Fremont, Ohio 43420.

CASH-Royalties for patented, unpatented Inventions. Global Marketing Service, 2354G Telegraph, Oakland, California 94612.

INVENTORS! Protect your ideas! Free "Recommended Procedures." Washington Inventors Service, 422F Washington Building, District of Columbia 20005.

WE EITHER sell your invention or pay cash bonus. Write for details. Universal Inventions, 28E, Marion, Ohio.

NEW PRODUCTS—INVENTIONS—IDEAS Researched/Developed/Marketed by Professional Organization for Cash/Royalty Sales. **FREE EXAMINATION** and **CONFIDENTIAL REPORT** of the Commercial Features of your Patented/Unpatented Invention. **FREE COPY** "How to Safeguard and Market Inventions to Industry." Write: **LAWRENCE PESKA ASSOCIATES**, 500-C Fifth Avenue, New York City 10036.

FREE "Directory Of 500 Corporations Seeking New Products." For information regarding Development, Sale, Licensing of your patented/unpatented invention, write for Free "Inventor's Kit No. A-63." Raymond Lee Organization, 230 Park Avenue, New York, N.Y. 10017.

EUROPE. You Don't Pay Us A Penny Until We Have Sold Your Invention. Europatent Marketing Service, Safirgatan 2, V. Frolunda, Sweden.

INVENTORS! Don't se'l or license your invention until you receive our offer. Eagle Development Company, Dept. H, 82 Wall Street, New York City 10005.

INVENTORS! Either we will sell your invention before you or anyone else does, or we will pay you a cash bonus. Get Free Invention Evaluation and information write: Gilbert Adams Organization, Invention Brokerage, Dept. 15, 80 Wall St., New York, N.Y. 10005.

PRODUCT DEVELOPMENT! Star Bronze Company, Manufacturer of nationally known Zip-Strip Paint, Varnish and Stain Remover is seeking marketable products and/or inventions for national distribution. Experience development and growth in all prime market areas. Full time sales force and warehousing available for promotable products. **FOR FURTHER INFORMATION, CONTACT: MR. GEORGE HUDSON, DIRECTOR OF MERCHANDISING, STAR BRONZE COMPANY, BOX 568, DEPT. PM, ALLIANCE, OHIO 44601.**

BUY IT WHOLESALE

MAGNETIC AUTOMOBILE SIGNS—WHOLESALE. Give Size of Sign and Size of Letters. We Will Send You Quotations and Colors. Damar 1, 1428 State Street, Sarasota, Florida 33577.

195 FREE Wholesale Catalogs! Mailorder Dropshippers. Your Business Imprint. Automobile Discounts. Free "Digest." Vault International, Box 7284W, Lexington, Kentucky 40502.

WORLD'S Largest Wholesale Supply. 7853 American, European, Japanese wholesalers. Hongkong clothes. Rockbottom prices. Automobile discounts. Free Details. International Buyers, Box 16386-M Portland, Ore. 97233.

400,000 BARGAINS Below Wholesale: Many Free! Liquidations... Closeouts... Job Lots... Single Samples. Free Details. Bargainhunters Opportunities, Box 730-A, Holland, Michigan 49423.

DRAFTING Equipment, Templates, Catalog \$0.30, **AMBER**, Box 122, Mt. Holly, N.J. 08060.

HEARING Aids, batteries, Wholesale. Catalog 25¢. Fiston, Box 1444, New Preston, Conn. 06777.

WATERBEDS. Accessories. Free Brochures, Wholesale Prices. Box 4423 P, Pasadena, Cal. 91106.

FREE! Wholesale Dropship Catalog 25¢ Postage Handling. Capital, 629 Lvall, Dept.-PM1, West Covina, California 91790.

BARGAIN MERCHANDISE, Catalog 25¢. Bargain Catalog, 1800 4th Avenue South, Minneapolis, Minn. 55803.

ATTENTION, Ladies, Gentlemen, Swiss Calendar Watches \$10.50—Digital Watches \$12.50, Written Guarantee, Star Sales, 260 Broadway, Brooklyn, N.Y. 11211.

EXPORT—IMPORT

MAILORDER, Importing. Fantastic directory, \$3.00. Hettick, Lockbox 1495, Bismarck, North Dakota 58501.

OIL Paintings, Originals, \$6.00 Each, Mimano, PM64A, Box 169, Hainesport, New Jersey 08036.

ORIGINAL Oil Paintings \$96.00 Dozen. McDaniel, 3632 Topax, Claymont, Delaware 19703.

JAPAN: 1200 Products directory. Illustrated Manufacturers' names, addresses. \$5.00. Send cash. Yamagata Office, 814 Togin Bldg., Marunouchi, Tokyo.

HONG KONG'S 2000 Products. Manufacturer's Names, Addresses, Send \$5.00 Cash. CHU, 58A, Shung Ching San Tsuen Yuen Long Hong Kong PM64.

WHOLESALE IMPORT Catalog. Send \$1.00 for Postage and Handling Deductible On First Order \$5.00 Or More To: H. R. Davis, 2950 N. Kolmar, Chicago, Ill. 60641.

FOR THE HOME

AMAZING, new apartment size smoke, fire, alarm. For complete information write: Seaton House, 142 Sterling Street, Dept. PM1, Brooklyn, N.Y. 11225.

HOW TO Install a Central Cleaning System in Your Home. Wal-Vac's New 24-page Booklet Offers all You Need to Know About Installation and Maintenance of a Central Vacuum Cleaning System. Shows Step by Step Installation. Send 25¢. Wal-Vac, Inc., 2851 Buchanan S.W., Grand Rapids, Michigan, 49508.

GIANT Magnifier—This item should be in every American home and office. \$5.95. Domestic Distributors, 621 Peachtree Battle Avenue, Atlanta, Georgia 30327.

OF INTEREST TO WOMEN

LEARN Flower Arranging and Floristry. Start business or hobby. Free information on home study course. Lifetime Career Schools, Dept. B-777, 2251 Barry Avenue, Los Angeles, California 90064.

LADIES: \$6.00 dozen paid lacing Baby Boots! This is our 20th year! Write: Cowboy-9, Warsaw, Indiana 46580.

\$500 MONTHLY Possible clipping items from your newspaper. Experience unnecessary. Details, send stamped addressed envelope, American, Excelsior Springs, Mo. 64024.

WANT A new car, color TV, new clothes? Learn hundreds of ways to make money. 5 month subscription **FREE.** Write: Salesman's Opportunity Magazine, Dept. 006, 1460 Hancock Center, Chicago 60611.

HOW TO MAKE MONEY ADDRESSING, MAILING LETTERS. OFFER DETAILS 10¢. Lindbloom, Dept PM, 3636 Peterson, Chicago 60659.

\$800 MONTHLY Possible addressing—stuffing envelopes (longhand-typing) your home. Experience unnecessary. Details, send stamped addressed envelope, American, Excelsior Springs, Mo. 64024.

\$100 WEEKLY Possible. Sewing—spare time. Unlimited need for handsewn items. Rush—stamped addressed envelope. Enterprises, Box 8-PM, East Rockaway, N. Y. 11518.

NUDE panty hose. Multi-Filament 20 denier yarn lasts 5 times longer. Beige, taupe, spice, \$23.40/dozen. Guaranteed. Eternaproducts, 6 Connecticut Avenue (195MM), Enfield, Connecticut 06082.

EARN Up to \$150.00 Weekly—home addressing for us. Details 25¢. Lily, Box 4967-P46, NYC 10017.

\$700 MONTHLY Possible Addressing At Home (longhand-typed) or Clipping Newspaper Ads. Free Information: DJ's Services, Box 564-P, Franklin, Michigan 48025.

ATTENTION For The Man who has Everything. Free information. Byrne Sales, 5445 W. 64 Street, Chicago, Ill. 60638.

GIFT SHOPPING

GIFTS GALORE. EXCITING GIFTS FOR ALL OCCASIONS. SEND FOR FREE CATALOGS. AVERY, 34 W. FIFTH ST., OSWEGO, NEW YORK 13126.

SOSLITE Combination Flashlight Siren Light Focuses 300 Yards, Siren Audible 1/2 mile, \$10.75 Postpaid. Free Color Brochure. Variety House, Dept. 50, Sun City, California 92381.

HIGH QUALITY SPECIALTY IMPORTS. CATALOG \$1.00. INCLUDED FREE GIFT. SHAWNS, BOX 228, MAHOPAC, NEW YORK 10541.

FREE Catalog! Gifts-Novelties, Sutton, 181, Box 41607, Sacramento, California 95841.

PERSONALIZED THERMOMETER \$2.00; Catalog \$5.00—Titus Press, Box 267, Maysville, Kentucky 41056.

NOW! FREE! New Illustrated Catalog, Unique and Distinctive Gifts—Yours For The Asking. Write: Ryan, 14920 Leadwell, Dept. F2, Van Nuys, California 91405.

DISTINCTIVE Gifts 32 Page Illustrated Catalog **FREE.** 120 Quality Tested Products. Hewllyn, 122A So. Franklin Ave., Lynbrook, N.Y. 11563.

CLOCKS, WATCHES, OLD GOLD AND JEWELRY

HIGHEST CASH For Gold, Jewelry, Gold Teeth, Rings, Diamonds, Watches, Silver Platinum. Mail Articles Today: Free gift with information. Chicago Gold Precious Metals, 6 E. Monroe, Dept. 1058, Chicago 60603.

(Continued on next page)

CLOCKS, WATCHES AND OLD GOLD, JEWELRY

(Continued from preceding page)

WANTED—Gold, silver, platinum (any form). Coins. Information free. Wilmot's, 345 South Glassell, Orange, Calif. 92666.

CASH Immediately for Old Gold, Jewelry, Gold Teeth, Watches, Diamonds, Spectacles, Silver, Platinum. Free Information. Rose Industries, 29-A East Madison, Chicago 60602.

WATCH and Clock repairing books, tools, materials. Free catalogs. North American, Box 77-AS, Fox River Grove, Illinois 60021.

GENUINE Oriental Jade Pendant \$18.00. J. Low, 247-A, Commonwealth Drive, Block 70, Singapore 3.

INDUSTRIAL SURPLUS

RECYCLED WORKCLOTHES 75% BELOW NEW PRICES. Industrial strength Work-pants Workshirt set—\$2.95. Moneyback guarantee. Order free Catalogue from: Industrial Surplus, 133DP West Tulpehocken, Philadelphia, Pennsylvania 19144.

WEARING APPAREL

PERSONALIZED T-SHIRT. Name Imprinted (up to 12 letters) \$4.95; two for \$7.95. Print Name Desired and Garment Size. Send to: Shirt Offer, Box 448, Lima, N.Y. 14485.

HEARING AIDS

HUGE SAVINGS. Eliminate dealer mark-ups. Free Trial. Batteries Wholesale. Terms arranged. Lloyds-PMC, Rockford, Ill. 61108.

HEARING Aids, Batteries, Discount Prices. Free Trial. Write: Rhodes, Brookport, Illinois 62910.

JOIN Co-Op! Aids! Batteries! Repairs! Wholesale! Drawer Z-12, St. Petersburg, Florida 33731.

FREE Hearing Aid Catalog. Tremendous BARGAINS! Write: "MONEYSAVERS", 9530PM5 Langdon, Sepulveda, California 91343.

LEGGITT Electric Tube Scientifically keeps your Hearing Aid Battery usable. Write: Luther Leggett, 518 Mercantile, Vista, California 92083

TOBACCO

SAVE-SAVE money on cigarettes, make your own and for only half the price. Complete starter kit only \$16.95 or send \$5.00 and pay postman \$11.95 plus shipping charges. Denny's Specialty Merchandise, 5635-Dumfries, Vancouver 15, B.C. V5P-3A5.

DO YOUR pipe a flavor. Factory-fresh, pure tobacco. Natural and aromatic custom blends. For free sample write: Green River Tobacco, Box 1313-PMT, Owensboro, Ky. 42301.

MEERSCHAUM Pipes—Free Catalog. Conner Imports, Box 9574-PM7, San Jose, Calif. 95157.

FREE Blending Formulas for "Do It Yourself" Pipe Smokers. Imported and Domestic Tobaccos. Tobacco Blenders Supply, 1237 1/2 Cook, Denver, Colorado 80206.

SWEET Smoking-Chewing Samples 50¢. Jolley Farms, Dresden, Tenn. 38225.

HAND Carved MEERSCHAUM Pipes. Free Catalog. Bacchus Imports, 1570 Sander Road, Northbrook, Ill. 60062.

RAZORS

"OF INTEREST TO MEN AND WOMEN" How to get a fantastic, close, and irritation free shave. Send \$1.50 to: Cashier Publications, P.O. Box 791, Hillside, New Jersey 07205.



SCIENCE AND CHEMISTRY

HYDROGEN Generator, Fuel of the Future Generator. Plans \$5.00. Hydrogen, Box 217, Troutdale, Oregon 97060.

COMPLETE line of laboratory supplies, chemicals. Hobby ideas and educational kits. Extensive NEW catalog. Send 75¢ to: Dept. S, Merrell Scientific Div., Empire Mail, Rochester, New York 14608.

LASER TUBE, HE-NE—\$24.50. TOY LASER TUBE—\$5.00. 5 LASER PLANS—\$4.00. EXCITING Catalog—\$1.00. Plasma Systems, PM74, Box 5823, Pasadena, Calif. 91107.

TRANSMISSION Of Electrical Energy Without Wires. Large Amount Of Horsepower Possible Anywhere. Unparalleled. No Gimmick. For Full Details Send \$3.—To: Tesla Research, Coldwater Road, Box 38, Merritt, B.C. VOK 2B0, Canada.

SOLAR ENERGY EXPERIMENTER'S KIT! Oven, water heater, steam boiler. Stamped addressed number 10 envelope. Box 357-E, Lakeside, California 92040.

CATALOGUE Of Those Ver-ry Hard-To-Find Chemical Products, 500 How-To Books. Laboratory Experiments, Supplies, Information. Special Attention to Beginners. Formulas Of Every Conceivable Mixture In Science and Industry. 50¢. Kenrus-C, Box 205, Staten Island, New York 10306.

DISCOUNTED! Laboratory Chemicals, Glassware-Apparatus. Catalog-50¢. Deluxe Scientific. 507 Huron. Manitowoc, Wisconsin 54220.

AMAZING! Scientific-Apparatus-Glassware-Chemicals. Catalog-50¢. Hagenow Laboratories, 507-A Huron Street, Manitowoc, Wisconsin 54220.

CHEMISTRY And Biology Catalog 35¢. Boulevard Laboratories, Suite 302, 3114 E. 83rd St., Chicago, Ill. 60617.

CONVERT TV to 6-ft. wide screen! B&W/Color. Do-It-Yourself—easy! Kit, instructions, lens, \$12.95 ppd. Free illustrated details. Macrocoma, Box CF8, Washington Crossing, Penna. 18977.

FORMULAS, PLANS, ETC.

ANY Formula \$5.00. Catalog—Manufacturing Treatise 25¢. Belfort, 192 N. Clark, Chicago 60601.

PLASTICS

CASTOLITE pours like water, hardens like glass without heat. Crystal clear, colors. Embed flowers, seashells, mementos, anything. Make fine gifts. Form flexible molds over any pattern, size. Reproduce your own designs in plastics, candle-wax, metal, plaster, cement. Send 10¢ postage for illustrated profitable facts and figures. CASTOLITE, Dept. 74G/PM, Woodstock, Il. 60098.

TREASURE FINDERS

DON'T DIG TRASH! Owners report our "Selectmatic" Detector best. Differentiates treasure faster; deeper. Patented against imitations. Treasure Electronics, Rt. 1, Box 56MN, Benton, La. 71006 CALL 318-965-0277.

TIRED OF DIGGING UP TRASH? The All New "Coinshooter" Rejects Bottle Caps, Tin Foil, Nails and Shallow Trash. Detects Gold, Silver Coins and Jewelry. Free Literature. D-TEX ELECTRONICS, Box 451-U, Garland, Texas 75040.

FAMILY Fun! Outdoor Adventure! Find valuable coins and treasure with world famous metal detectors. Free illustrated booklet. Detectron, Dept. PM, Box 243, San Gabriel, California 91778.

FIND buried treasure with patented metal detectors that distinguish metallic trash from treasure, have push button and automatic tuning, ground pickup eliminate feature, great range, etc. Free catalogue. Gardiner Electronics, Dept. 9, 4729 N. 7th Avenue, Phoenix, Arizona 85013.

POWERFUL Metrotech locator detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California 94025.

TREASURE Finder locates buried gold silver, coins, treasures. 6 powerful models. \$19.95 up. Instant financing available. Write or call for free catalog. Phone (713)-682-2728 day or night. Dealer inquiries invited. Relco, Dept. A-40, Box 10839, Houston, Texas 77018.

PRECIOUS STONES & MINERALS

500 POLISHED Gemstones \$5.00. Tumblecraft 5401 James North, Minneapolis, Minn. 55430.

GET Free catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free new catalog just off the press, yours for the asking. Write: Grieger's, Dept. C-12, 900 South Arroyo Pkwy., Pasadena, California 91105.

CARTOONING, COMMERCIAL ARTS, SHOWCARD AND SIGN PAINTING

"HOW TO MAKE MONEY WITH SIMPLE CARTOONS"—Informative book sent FREE tells way to big income. Cartoonists' Exchange, 96, Pleasant Hill, Ohio 45359.

COMPACT 23 lesson Cartoon Course and Cartoonist's Magazine. \$2.00. Hartman, Box 30367, Lincoln, Nebraska 68510.

MODERN Cartooning taught by mail. Write for free brochure. Cartoonorama—Box 263-PM6, Branford, Conn. 06405.

CARTOON For Money!! Bip Free Book: Success, Box 885-C, Dearborn, Mich. 48121.

LEARN Sign painting at home. Free Talent test. Ben Kerns, Box 812-PM, Greenville, S.C. 29601.

FASCINATING Systems. Sign Painting-Cartooning. Straley, 1704 South Center, Springfield, Ohio 45506.

SIGN Painting—\$1000 per Month Part-Time. Free Catalogue. Kaufmann Supply, Centertown, Missouri 65023.

CARTOONING Self-Taught. Free Details. Elcarr, 2532 Superior, Chicago, Ill. 60612.

ADVERTISING AGENCIES, ADV. SERVICES, MAILING LISTS

SHOES, 300 Styles. Catalog \$1.00. Refundable Sorrells, 6059 9th Street North, Arlington, Virginia, 22205.

50,000 MAILORDER buyers names \$5.00 per 1,000. Gemco, B-212/44A, Indianapolis 46221.

INCH AD "Hall's Advertiser"—\$2.00. Hall's, Box 275PM, Bronx, N.Y. 10460.

MAILING List, Most all Kinds, \$9.00 1000 Gummed, Circulars mailed \$5.00 1000. Dixmailers, King, North Carolina 27021.

ADVERTISING Ratebook leading newspapers, magazines. 50¢. Chicago Advertising Agency, 28-E Jackson, Chicago 60604.

MAIL Order Ads circulars letters mailers camera ready. Counseling. 40 Years. "Ed", 329 Gunckel, Dayton, Ohio 45410.

EXCLUSIVE Gummed Mailing List 1973-1974 \$10.00 M prepaid. Fast delivery! Four Winds Enterprises, Cohocton, New York 14826.

CLASSIFIED Advertisers!! Use new weekly TV tabloid. Low rates; proven results. Copy, rates \$1.00. Liebig, Cold Springs Road, Huntington, Pa. 16652.

"INCH AD"—25,000 Circulation—\$11.99. McKelvey, 312PM Shepard, Englewood, N.J. 07631.

(Continued on next page)

TYPEWRITERS, DUPLICATORS, OFFICE EQUIPMENT

PROFITS FROM CLASSIFIED ADVERTISING! Booklet shows you how to start your own business with Classified Advertising. Only \$1.00 (Refundable with first order.)
H. E. KAPPEL, POPULAR MECHANICS, DEPT. P, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.

RUBBER STAMPS

FREE catalog—Rubber Stamps—Signature Stamps—Business Cards. Youngers Stamp Shop, Princeton, Iowa 52768.

FREE Catalog, Self Inking Stamps, Labels. Rush Stamps, 132 Farmcrest, Rush, New York 14543.

3-LINE Stamps, \$2.50. Signature Stamps, \$5.95. Tabco, Tomkins Cove, New York 10986.

FREE stamp catalog. 45 type styles. Fast Service, low prices. Jackson's, Box 443A, Franklin Park, Ill. 60131.

OFFICE SUPPLIES

MAILORDER RECORDS Help get increased business! Complete 32 Page Record Book shows your inquiries, orders, advertising, expense, etc. Only \$1.00. **H. E. KAPPEL, POPULAR MECHANICS, DEPT. R, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.**

AUTOMATIC Calculator. This item should be in every American home and office. \$6.95. Domestic Distributors, 621 Peachtree Battle Avenue NW, Atlanta, Georgia 30327.

PRINTING PRESSES, RUBBER STAMP OUTFITS

SIMPLE-X RUBBER STAMP PRESSES. Hydraulic operated, electrically heated. Sizes 5"x8", 8"x12", 10"x15". Starting outfits, Orders for presses, supplies shipped day received. Free catalog low supply prices. Send \$1.00 for postage and handling (refundable on first order). Custom Manufacturers, 406-P East Elm, Springfield, Missouri 65801.

WRITE Us First . . . for Low Cost Superior Quality Rubber Stamps For Home and Business. Postage, 522 Fulton, Port Clinton, Ohio 43452.

PRINTING Presses, type, Supplies Lists, 10¢. Turnbaugh Service, Mechanicsburg, Pennsylvania 17055.

NEW Catalog No. 13, 120 Pages, hand printing presses, type fonts, supplies. Send \$1.00 deductible first order. Acme Type, 732 Federal, Chicago, Illinois 60605.

PRINTING MACHINES. Offset, Mimeograph, Typewriters, Composing, Machines, Dixgraph, King, North Carolina 27021.

SAME Day shipment on rubber stamp supplies. Revised wholesale price list No. 10 free. Star Stamp Supply, 732 Federal, Chicago, Ill 60605.

PRINT YOUR OWN—Printing Presses, type, supplies direct from factory. Send 25¢ for catalog and samples to: Kelsey Co., DM, Meriden, Conn. 06450.

LOW Priced Rubber Stamp Manufacturing Supplies, Starting Outfits, Martin, 1432 Major, Jefferson City, Missouri 65101.

RUBBER Stamp manufacturers supplies. Presses, starting outfits. Best prices, service. Catalog, Jackson Supply, Box 443A, Franklin Park, Ill. 60131.

RUBBER Stamp Manufacturers Supplies. Jesson Press, Box 97-P, Geneva, New York 14456.

MAKE Your own Self-Molding Rubber Stamps and Printing Cuts. Pixirubber, Arvle (A) Wisconsin.

10¢ STAMP Brings Brochure of Logotypes, Triangle Type, 650 Lake, Chicago, Illinois 60606.

RUBBER Stamp Outfits, Supplies, Literature 25¢. Kiewiet, 2025 Barney Road, Kalamazoo, Michigan 49007.

PRINTING AND SUPPLIES

200 BUSINESS Letterheads, 200 envelopes! **BOTH!** \$9.00 Total! Haldeman's, Girard, Kansas 66743.

EMBOSS Business Cards \$4.95. Agents Wanted. Printers, Box 2426, Alderwood Manor, Wash. 98036.

PRINTING Supermarket Short Run Specials. 1000-\$4.75, 5000-\$22; 1000 Envelopes \$8. Shipping 9 hours. Get Free Printing Specials Price List "Do You Make These 27 Mistakes When You Buy Printing." Speedy Offset Printers, 23882 Aurora, Bedford, Ohio 44146.

PRINTING For The Small Businessman. Free Samples. Watson's, Phillips, Neb., 68865.

SAVE! Get printing price list. Sweeny, R1-467, Hopewell Junction, N.Y. 12533.

BUSINESS CARDS Raised Letters \$5.65 Thousand. Like Engraved. Free Samples. Kavanagh, Box 1222, Brooklyn, N.Y. 11202.

1000 EMBOSS Business Cards \$5.75 Postpaid. Agents Wanted. Elco, 181-A, Sylvania, Ohio 43560.

FREE Literature, Business Cards, Letterheads, Labels, Rubber Stamps. Geer's, 111 North Drive, Ottawa, Ohio 45875.

FREE Literature: Business Cards—Rubber Stamps, Address Labels, Printing. Jordan's, 552 West O'Connor, Lima, Ohio 45801.

QUICK Copy Offset Printing. Free Introductory Offer, Nationwide Printing, 614 North Main, Bloomington, Illinois 61701.

LETTERHEADS, envelopes, cards, fliers, duplicating. Lithocopy, POB 15130, Cincinnati, OH 45215.

DISTINCTIVE Embossed Letterheads, Envelopes, Cards Inexpensive. Postpaid. Universal, 226-J Myrtle, Scotch Plains, New Jersey 07076.

QUALITY Printing. Novelty and Imported Items. Catalog 25¢. John G. Robeson, Box 2316, Hyattsville, Maryland 20784.

BUSINESS Cards \$5.25. Meacham, 609 Springer Terrace PM-4, Los Altos, Calif. 94022.

QUALITY Business Cards \$4.75 1000. **UNIVERSAL**, 11828 Wright, Lynwood, Calif. 90262.

STATIONERY—Personalized 100 6" X 8" sheets 50 envelopes white, blue, green, pink. \$5.95. Jayco, Box A-13, Wantagh, New York 11793.

1000 BUSINESS CARDS \$4.95 **POSTPAID**. POB 33351, San Diego 92103.

1,000—"RAISED Printed" Business Cards —\$5.95. McKelvey, 312PM Shepard, Englewood, N.J. 07631 (Agents Wanted)

PRINTING TYPE, 8 to 48 point. \$4 per font. Free list. Superior Lino, Box 12324, North Kansas City, Mo. 64116.

MULTIGRAPH, MIMEOGRAPH

PROFITS FROM CLASSIFIED ADVERTISING! Booklet shows you how to start your own business with Classified Advertising. Only \$1.00 (Refundable with first order.)
H. E. KAPPEL, POPULAR MECHANICS, DEPT. P, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.

NEED AN INEXPENSIVE COPY MACHINE? Make a dry printer yourself. Buy a photocopy of the plans as they appeared in P.M. Price 75¢. Send orders to Popular Mechanics, Dept. HE, Box 1014, Radio City, New York 10019.

GUMMED LABELS

1,000 GUMMED ADDRESS LABELS \$1.00. FREE LITERATURE, Acme, 1238 Voskamp, Pittsburgh, Pennsylvania 15212.

1000 GUMMED Address Labels \$1.00. Walt's, Box 960A, South Bend, Indiana 46624.

REMAILING SERVICE

PITTSBURGH Remails-Forwarding, 25¢. House of VI, Box 436, McKees Rocks, Pa. 15136.

CANADIAN Remails 50¢. We Pay Postage. Emkay, Box 5815A, Toronto, Ontario M5J1A2.

SEATTLE—Far Out! 25¢. Woods, Box 4011, Seattle, Washington 98104.

CONCEAL your location; use our address. Wright, CN-2112, Asheville, NC 28802.

COLORADO Remails—25¢. Confidential, reliable. Mailmine, Box 302, Loveland, Colorado 80537.

CONFIDENTIAL—Receiving-Forwarding. Remails 25¢. Hillegas, Box 169-P Hainesport, New Jersey 08036.

SECRET. Receiving—forwarding. Discreet and confidential. Remail 25¢ single. Mail Forwarding Service, 8050 S. Main, Houston, Texas 77025.

PHOENIX Remails, 25¢. Sutherland, Dept B, Box 21112, Phoenix, Ariz. 85036.

CONFIDENTIAL California Address. Receiving-Forwarding. Single Remails 25¢—Business—Personal. **MERLIN** Remail Service, Suite 318, 206 West 4th Street, Santa Ana, California 92701.

WASHINGTON Remails 25¢. Prompt Service. Cameron, Box 247-M, Centreville, Va. 22020.

CONFIDENTIAL New York Mail Address \$3.00 Month. Telephone Service \$5.00. Re-mails 25¢. Details Free. Birnhan, 130 West 42, New York 10036.

IRFA Member. Singles 25¢. Monthly rates. Edwards, Box 60889, Oklahoma City, Okla. 73106.

INTERNATIONAL MAIL SERVICE. Miami remails 25¢. Letters mailed from 130 foreign cities-300 U.S. cities. View cards on hand. Stamped envelope for rates. Marle, Box 1266P, Miami, Florida 33134.

HONG KONG Remailing Anywhere, \$1.00. CHU, 58A, Shung Ching San Tsuen Yuen Long Hong Kong PM64.

CONFIDENTIAL—Receiving, Remailing—Forwarding. Raven Mt. Enterprises, Box 334, Elizabethtown, NY 12932.

FLORIDA Confidential 25¢ letter, \$2.50 monthly. Souvenirs, Vitamins, Macks Products, Box 1562, Ft. Lauderdale 33302.

REMAILS From the Nation's Capitol. Send 25¢ to Whitford, Department A, P.O. Box 5605, Washington, D.C. 20016.

DISCRETION GUARANTEED!! "Immediate" Remails-Forwarding. Executive House B5-M6, Bend, Oregon 97701.

CONFIDENTIAL, Remails 25¢. DeeJay, Dept. D, Box 11913, Phoenix, Ariz. 85061.

PROMPT Confidential Mail Service. Write: National, Box 587PM, St. Petersburg, Florida 33731.

EUROPEAN Confidential Remails. Orders Acknowledged, Singles \$1.25. Martha Taylor, 6520 Worms/Herrnsheim, Herrnsheimer 122, West Germany.

FAST Remail-Forwarding Service. Pony Express, 1391 Archer, Live Oak, California 95953.

REPAIRS AND SERVICING

AIR Conditioning—Simplified Booklet Makes It easy. Service, Repair, All Systems. \$1.00. Hill, Rt. 11, Box 145-B San Antonio, Texas 78213.

BE YOUR OWN SERVICEMAN. You can handle most small engine repairs. Here's the guide you need to insure quick-starting, smooth-running gas engines on your yardpower equipment. Photocopy of articles as they appeared in P.M. available for \$2.50. Send orders to Popular Mechanics, Dept. HE, Box 1014 Radio City, New York 10019.

(Continued on next page)

SPECIAL SERVICES

INFORMATION On anything. Ferguson Research Specialists, 72-25 Woodside, Woodside, New York 11377.

POPULAR MECHANICS INDEX AND SHELF WRAPPER 1971 and 1972 editions now available. You will be able to find any article that appeared in P. M. covering those years in seconds. These annual indexes will make your copies of P. M. even more valuable! Each \$1.49. Send checks to: Popular Mechanics, Dept. HE, Box 1014, Radio City, New York, New York 10019.

LOST KEYS? Keyguard Returns Postpaid, \$1.00. Key Enterprises, Box 253, Germantown, Ohio 45327.

STOP HURRICANES AND TORNADOES. Free Details—Nature Control, Box 1874, Clarksburg, W. Va. 26301.

BETTER HEALTH

IMPROVE YOUR FIGURE! Finally, a diet plan that works. Included are delicious menus and special recipes. Send \$1.00. Mathias', Ada, Minnesota 56510.

WORLD'S Most Outspoken Publication. Natural Health, Healing, Organic Gardening. Free Copy. Provoker Press, St. Catharines 102, Ontario.

FEEL HEALTHIER, Live Longer. Learn How The Body's Aging Process Can Be Slowed Down. Report Shows How To Remain Healthy And Mentally Alert At 80. . . 90. . . Even 100. Send \$1.00. L & L Pope Company, 206 Houston, Queen City, Texas 75572.

"NEW URETHANE" Foam Back Pillow, Cordless, Gentle VIBRATION. Relieves Tension, Aches, Pains, Portable Guaranteed \$11.95. TROH Enterprise, 228 South Lincoln, Westmont, Illinois 60559.

LOANS BY MAIL

BORROW by Mail! Up to \$1500.00. Convenient Terms. State Licensed. Postal Finance, Dept. 17-04, 6018 Military Ave., Omaha, Nebraska 68104.

CASH LOANS By mail! Up to \$2,500 on signature alone. No collateral! Secret! Union Finance Company, 3608 No. 16th St., Dept. PM, Phoenix, Ariz. 85011.

PERSONAL

SECRET LOANS BY MAIL. BORROW \$100 TO \$3000 FOR ANY GOOD REASON IN ABSOLUTE PRIVACY. NO INTERVIEWS. NO ENDORSERS. NO CO-SIGNERS. FAST SERVICE. WRITE DIAL FINANCE CO., DEPT. 3748, 418 SEVENTH STREET, DES MOINES, IOWA 50309.

SAUNA Cabinet \$39.95 complete. Free information. Roco Mail Mall, P.O. Box 25687, Albuquerque, New Mexico 87125.

FREE MILLIONAIRE Secret! Cassette Player Owners Only. New Method! Motivation M-4, 953 Eighth, San Diego, Cal. 92101.

WILLS. Write your own, save money. Legal, binding forms \$1.98 each. Shirts-N-Such, Box 841, Covington, Kentucky 41011.

SUFFER Heart Disease, Psoriasis, High-blood Pressure? Write-Roseco, Box 8491-KM, Richmond, VA. 23226.

ENJOY A-1 Credit, without investigation! Credit cards galore in 30 days! Vajella, Box 126, Dewitt, N.Y. 13214.

PROTECT Your Loved Ones. Prepare your own will. Send \$2.00. Casey's Collectables, Dept 1-E06, 7649 Manchester Manor, Hanover Park, Ill. 60103.

PSORIASIS SUFFERERS: DISCOURAGED? Write for Free important information that is helping thousands. Pixacol, Box 29277-PM, Parma, Ohio 44129.

NONRESIDENT DEGREES! Recognition for learning. Nationwide Faculty. Catalog \$3.00. UNITED STATES UNIVERSITY OF AMERICA. Box 4552-PM, Washington, D.C. 20017.

INSTANT DEBT RELIEF Without borrowing. Without Bankruptcy. Have excellent credit in 45 days. Free!!! Wealth Building, Dept. B-6, 1996 Hoyt Street, Lakewood, Colorado 80215.

NEED Money-Debts Too Big? Consolidate Bills. Free Emergency Loans. Write: Interstate, 28 E. Jackson, Suite 1204-X3, Chicago 60604.

BIBLE Questions answered. Stamped envelope. Bylon, 17167 Bentler, Detroit, Michigan 48219.

INVESTIGATORS. Latest electronic Aids. Free Literature. Clifton, 11500-P NW 7th Ave., Miami, Florida 33168.

RECORD Telephone Conversation automatically. Leave Recorder Unattended. Robert's, Box 49-PM6, Parkridge, Illinois 60068.

DON'T DIE without a Will!!! Blank Will form Protects your family! Two forms only \$2.00—Guaranteed! Order Today! Craig-2D6, 8614 1/4 Troy, Spring Va.ley, California 92077.

LOSING HAIR? BALDING? DANDRUFF? Free copyrighted booklet. Dr. Shiffer Laboratories, Dept. 536, Box 398, Punta Gorda, Florida, 33950.

MIND-STIMULATOR Changes Your Life . . . Fast! Tibolt, 2819M Carmel, Glenside, Penna. 19038.

HOW To Stop Smoking! Learn Four Basic Rules. Send \$1.00. Sylvia Beatty, Chestnut Street, Eau Claire, Pa. 16030.

TELL Fortunes accurately—Immediately! ESP Aids, Box 21-PM, Olympia, Washington, 98501.

COMPUTERS—Understand Computers, Decipher Your Bills. \$1.00 Free Gift Included. Dataproducts, 261 Congressional Lane 303, Rockville, Maryland 20852.

YOU Can be one of The Great One Million, helping you, helping others. Write: Taxpayers Aid Society, TD8, Pembroke, North Carolina 28372.

COLORFUL Gift Catalog! Unique items. Free Bonus gifts with or without Purchase! Guaranteed! Send \$1.00 today! Simba Enterprises, 1603 Solano Ave., Berkeley, Calif. 94707.

NEED \$500-\$1,000 Without Borrowing? Details \$1.00. BLW, 1454 Ross, Pomona, California 91767.

MEMOTIMER—Fits on Keyring, Prevents Parking Tickets, Large Phone Bills. Set for One to 60 Minutes. \$4.95. Free Brochure. M. Thompson, 129 W. 74, New York, N.Y. 10023.

AUTOMATIC telephone recording and debugging equipment, Top quality. Lowest wholesale prices. Viking International, Box 632M2, Newhall, California 91322.

MAKE MONEY Registered Investment Adviser Picks Five Low-Priced Speculative Stocks To Buy NOW. Could double investment by year-end. \$1.00. Nathan I. Cohen, 28 Francis Drive, Randolph, Mass. 02368.

I HELPED Thousands Wipe Out Debts. Clear credit. Immediate relief to \$25,000. Free details. Counselor-7, Kerrville, Texas 78028.

SOCIAL SECURITY PLATES

BEAUTIFUL Lifetime Guaranteed non-tarnishable colored engraved Social Security Plates. Two flag, gold, silver; \$2.00. Model art; \$2.50 with naugahyde case. Salesmen wanted. Free Details. Bryant's Sales, 1634 Mentor, Dallas, Texas 75216.

WANTED—MISCELLANEOUS

MERCURY, Gold, Silver, Platinum: Ores assayed. Wholesale Terminal, Norwood, Mass. 02062.

WINEMAKING AND OTHER OTHER RECIPES

TROPICAL fruit proven wine recipes. 12 For \$3.00. F. Warden, 446-P Kea, Kahulu; Hawaii 96732.

HOW to make wine and champagne at home with standard kitchen and household equipment. Send \$3.00 to: Booklet, P.O. Box 522, Warren, Texas 77664.

HOW to make wine and champagne—using kitchen equipment. Instructions, \$2.00. **FREE BONUS.** Wine Cellar, Box 21-PM, Jensen, Utah 84035.

HOME WINEMAKING—Send \$1.00 for **INFORMATIVE CATALOG** of **RECIPES, EQUIPMENT, and INGREDIENTS.** Brewer's yeast, malt extracts, dry malt, bottle caps, barrels, chemicals, concentrates, over 300 items. \$1.00 refunded with your first order. Write to **DANENBERGER'S**, Box 276-M, New Berlin, Ill. 62670.

WINE, CHAMPAGNE—Amazingly delicious Recipes, instructions. Use Kitchen Utensils. \$2.00. Bill Herbert, Box 262, Whitmire, S.C. 29178.

WINEMAKERS FREE Supply Catalog. Excellent Selection of Fruit & Grape Concentrates. Kraus, Box 451-L, Nevada, Missouri 64772.

WINEMAKERS. Free illustrated catalog of yeasts, equipment, Sempex, Box 12276R, Minneapolis, Minn. 55412.

WINEMAKER'S Supply Catalog—Free. Bacchanalia, 273 Riverside Ave., Westport, Conn. 06880.

WINEMAKER'S! Free Illustrated Catalogue of Quality Products. Brant's Wine Rack, Box 3256-M, Orange, California 92665.

WINEMAKERS . . . Free Illustrated Supply Catalog of Yeast, Equipment, Recipes. Continental, Box 18223-PM, Indianapolis, Ind. 46218.

LARGEST Stock Supplies and Equipment. We have the Know-How. Write for Catalog, Advice, Consultation . . . Jim Dandy Wine Supplies, 8454 Beechmont, Cincinnati, Ohio 45230.

WINEMAKING KIT. Complete equipment, instructions and minerals. Enough for **FIVE GALLONS.** Just add your own fruit juice, sugar and water. **GUARANTEED!** \$12.50. We pay postage. ENDEVCO, Rt 3, Box 21-L, Colbert, Washington 99005.

EXCELLENT Wine and Champagne, inexpensive, No Expensive Equipment. Recipes and Instructions \$2.00. Carters, PO Box 1826, Lancaster, Pa. 17604.

MAKE Wine from your Favorite Fruit. Complete Instructions plus 5 Recipes only \$2.00. D. Burnham, P.O. Box 6502, Providence, R.I. 02940.

CORDIALS! Save 50% And More! Now You Can Mix Delicious Cordials In Your Kitchen. Anisette, Rock & Rye, Strega, Etc. No special equipment needed. Easy, safe and legal. Send \$2.00 For Complete Recipe and Instructions To: Burnet Co., 1018 Brighton St., Union, N.J. 07083.

MISCELLANEOUS

HOW INTELLIGENT Are You? Test reveals I.Q. in 45 minutes! Accuracy better than 99.9%. Send \$2.00 today—Guaranteed!! Vanguard, Dept. 1AB1, Vinings, Georgia 30080.

MAKE money playing poker! Expert reveals inside secrets. Learn how to become a constant winner. Only \$1.00. Cadillac Centre, 1505 Cadillac, Kokomo, Indiana 46901.

REDUCING Diet Report. Conservative. Relatively easy. \$4.00. Guaranteed. Free details. DSOC, 858 Glencoe, Denver, Colorado 80220.

INCREASE Gas Mileage 20%! Power-spark installs without tools. Send \$9.95 today—guaranteed!! Powerspark, 350 Thompson #221-E, Ann Arbor, Michigan 48108.

HOW To Stop Smoking. Unconditionally Guaranteed. \$1.00 SAIS, Box 65-A, Royalston, Mass. 01368.

ORNAMENTAL Iron designs. Book of 1600 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 3881 South 3200 West, Box 20005, Salt Lake City, Utah 84120.

(Continued on next page)

MISCELLANEOUS

(Continued from previous page)

BOTTLE Price Guide—\$1.00. Fred's Bottles, Box 1423-PM, Cheyenne, Wyo. 82001.

PRE-PACKAGED Toys complete with free self-selling display rack. Free Details. Toys, 1916 Fifth, Sacramento, California 95814.

SLEEPATRON. New device for inducing sleep. Gardiner Electronics, Dept. C, 4729 North 7th Avenue, Phoenix, Arizona 85013.

IDENTIFICATION CARDS. Send stamped self-addressed envelope for samples. NIPCOM, 727 North Main, Las Vegas, Nevada 89101.

HEARING Aid batteries wholesale. Free list. Habs, Box 51, York, Penna. 17405.

CIGARETTES at half the cost. Roll plain, filtertip or king with our rollers and blended tobaccos. Free Sample. Write Green River Tobacco, Box 1313PM, Owensboro, Ky. 42301.

1400 CATALOGS Listed and Described! Sources for EVERYTHING imaginable! Rush \$2.00. MASTERLOG, Box 24413-UF, Oakland, California 94623.

HOW INTELLIGENT are you? Test reveals I.Q. in 45 minutes! Accuracy better than 99.9%. Send \$2.00 today—Guaranteed!! Craig-3D6, 8614 1/4 Troy, Spring Valley, California 92077.

UNIQUE Digital watch. Swiss made. Brushed gold case, black-face, suede band. Women's and Men's!! Guaranteed—Order now 19.95. Mailhous 1A9, 358 E. Weiler, West Point, Nebr. 68788.

MAKE Your Own Gas. Plans and list of parts. Send \$2.00 to: Advanced Tek, P. O. Box 6505, St. Paul, Minn. 55106.

INSTANT RELAXATION! Sauna mist portable steam bath. Combine spare time with pleasure in your own home!! Only \$39.95—guaranteed!! Order today! J.R. Michaels Co. Dept. (156) Chicago 60639.

WINEMAKING KITS: TWO GALLON SIZE \$2.50, Shipping 50¢. Guaranteed!! Atrima, Box 41 PMB, Grove City, Ohio 43123.

COPY Swap & Sell, New Orleans Viewcard, etc., 25c. Burkhardt, 2819 Marais, New Orleans, La. 70117.

100 FOR \$3.00 Postage Stamp Size Black and White Photographs Made From Your Snapshot or Photo. Original Returned. TRI STATE, 128 W. North Ave., Baltimore, Maryland 21201.

DOZEN Quality Happydog Chewsticks \$1.50. Solann, Box 1024, Merchantville, N.J. 08109.

BINGO Play to win, Secrets \$2.00. Suchin, Box 4877, Huachuca City, Ariz. 85616.

BUSINESSMEN Owner/Operators—Service Station Managers etc., unique—inexpensive monthly automated accounting system. Details \$3.00 Mikki's, National Accounting Service, Box 9859 Dept. A, Cleveland, Ohio 44142.

INTELLIGENCE-CAREER APTITUDE TESTING, Send \$5.00, Includes returned grading and analysis. Sieracke Testing, 4161 South 13th, Sheboygan, Wisconsin 53081.

SAVE POSTAGE. Directory—Lists Offers of 75 + Mail Order Ads. \$2.95. Clearinghouse, Box 441, Orem, Utah 84057.

TATTOOING: Complete Inventory of Equipment and Supplies for Professional and Amateur. Transistor Driven Machines. Illustrated Information. Paul's, Box 8073, LaCrescenta, California 91214.

SEA Shells! 20 different colorful Pacific shells. Fascinating youngster starter. \$1.50. A. Wallace, Box 628, Montreal, Canada, H3C 2T8.

DON'T DIE Without A Will!! Blank Will Form Protects Your Family. Only \$2.00. Guaranteed! Order Today! Athen, Box 24383, Dept. 1AG, San Jose, Calif. 95154.

WHAT'S YOUR I.Q.? Easy, Self-scoring Test Reveals Amazing Facts About Your Mental Personality and Abilities in 45 minutes. Send \$2.00 today. Guaranteed. Dept. 6P774, Sioncarl Enterprises, 215-23 102nd Ave., Jamaica, N.Y. 11429.

DON'T DIE without a will! Blank form protects your family. Only \$2—Guaranteed! Order Today!! DMI, Box 3458, Dept. 1A6, Torrance, Calif. 90510.

SPANISH Galleon! Beautiful hand-crafted Columbus ship reproduction. \$4.00. A. Wallace, Box 628, Montreal, Canada, H3C 2T8.

DON'T DIE WITHOUT A WILL! Protect your Family. Order Today 2 Blank Will Forms plus Instructions. Only \$1.75. Send to: M. Fedan, Advertising, 11 Stewart St., Bayshore, L.I., N.Y. 11706 Dept. 1A.

RAZOR Blades, Double Edge, Stainless Steel. 20 for \$2.20: Elwick, Dept. 203, 230 Woods Lane, Somerdale, New Jersey 08083.

HOW to make Delicious Wine, Champagne at Home. No Special Equipment Needed. Fantastic Taste. **SATISFACTION or MONEY BACK.** Send 2.98 to E. West, Box 343A, Aurora, Colo. 80010.

MONEY SECRET Revealed! Get all the cash you want without borrowing or risking a dime! I'm doing it. Why not you? Free details. CTS, Box EA-4322, North Hollywood, CA 91607.

DON'T Die Without A Will!—We Will Send You Simple But Binding Will Form. Send \$2.00. Yash's Forms, Box 247, Frenchtown, N.J. 08825.

EYEGASSES wholesale—Free Catalog. A-Z Optical Company, Box 175, Dept. R26, Bay Station, Brooklyn, N.Y. 11235.

BURGLAR ALARMS & HOME PROTECTION

FREE attractive hooklet. "How to secure your home from thieves, fire". Trades of Hawaii, 1106 Hassinger AA-301, Honolulu, Hawaii 96822.

LOCKSMITHING Supplies—Buyers Guide \$1.00. Despubs, Box 22005H, Phoenix, Arizona 85028.

FREE Catalog on Burglar-fire Alarm Equipment. Protecto Alarm Sales, Box 357-D, Birch Run, Michigan 48415.



BUILD PM'S 'BOONIE BUG'! LOTS OF GO ON LITTLE GAS! Based on a VW bus chassis, this go-anywhere camper has the ruggedness of an ATV, the sleeping and camping facilities of an enclosed van and the smooth-riding qualities of a conventional station wagon. Sleeps two adults with room to spare for two youngsters. **Make it yourself from PM plans.** To order fill out the coupon below.

To: Popular Mechanics, Box 1014, Dept. BBF, Radio City, New York 10019.

Please send me the Boonie Bug plans. Enclosed is payment of \$14.95.

Name _____

Address _____

City _____ State _____ Zip _____



This easy-to-build model flies on CO₂

Whether you are a typical model builder or an ace at the local model-plane meets, here is an unusual little plane to add to your squadron. It's sophisticated but fairly easy to build and is powered by a simple, smokeless, almost silent CO₂ engine.

The **PM-BEE** can be built as a free-flight or radio-controlled flier. Full-scale patterns are available. Just fill out the coupon below.

To: Popular Mechanics
Box 1014 Dept. BEE
Radio City
New York, New York 10019

Please send me complete plans and patterns for building the PM Bee. Enclosed is payment of \$3.49.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Beat the high cost of leaving.

Whether you're taking a long trip or just a 50-mile jaunt, Thermos® jugs, chests and vacuum bottles can hold down your costs.

Thermos chests are so efficient they'll keep ice frozen for three days. So you can take along enough food for the family to eat in high style without high prices. And a Thermos

jug holds enough cold drinks to satisfy the thirstiest kids...Next time you travel, take Thermos along. We'll give you your money's worth.

FREE. 8-page booklet containing dozens of ways to beat the high cost of leaving. Write Thermos, Box B-100, Norwich, Conn. 06360.



THERMOS DIVISION, KING SEELY & COMPANY, THERMOS CO., NORWICH, CONN.

Thermos is the registered trademark of King Seely Thermos Co. and its subsidiaries Thermos Limited and Canadian Thermos Products Limited in over 90 countries of the world.

Can you spot the Camel Filters smoker?



© 1974 R. J. Reynolds Tobacco Co.



Almost everyone going fishing today has a gimmick. Pick the one who doesn't. **1.** No. He's called "The Ole Skipper" by his landlord and the finance company. Gimmick: Never sails without a good tide, fair winds, and his rubber duckie. His hard-drawing cigarettes are like a cheap lighthouse—they blink twice, then go out. **2.** Nope. He's Tim Idsol, known as "The Godfather." Gimmick: Takes no chances. Even smears shark repellent all over himself—doesn't know it's really meat tenderizer. His "Long-long" cigarettes send the smoke so far, it carries an overnight bag. **3.** No. He's Stu Mack Paump. Makes all sea trips "by rail." He even gets seasick watching his shorts go around in the laundromat. His cigarettes have so much charcoal in the filter, he's had to join the miners' union. **4.** Right. He's here to catch fish—not the latest fads and gimmicks. Wants no nonsense in his cigarette, either. Camel Filters. Good taste. Honest tobacco. **5.** He's the cook, Phil Layasol. His meals are so bad, African pygmies come to dip arrows in his soup. **6.** & **7.** No and No. They're porgie and bass.

Camel Filters.
They're not for everybody
(but they could be for you).



Warning: The Surgeon General Has Determined
That Cigarette Smoking Is Dangerous to Your Health.

19 mg. "tar", 1.3 mg. nicotine av. per cigarette, FTC Report SEPT. '73.