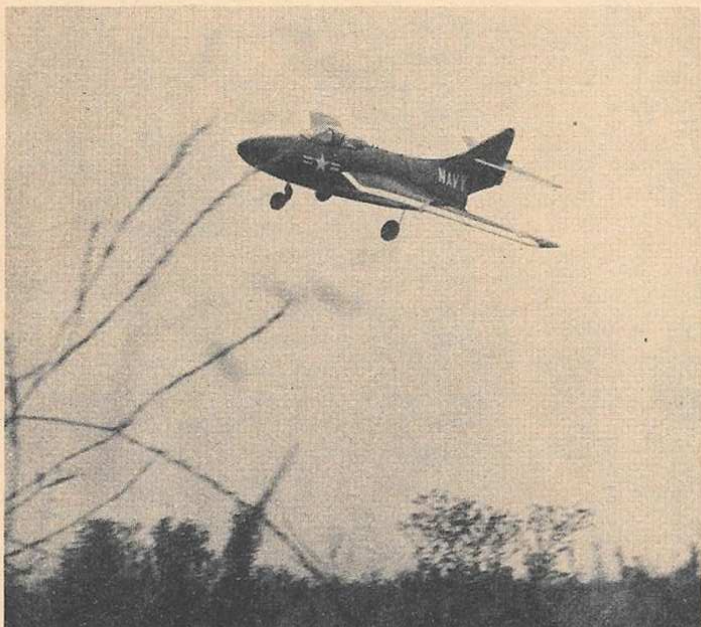


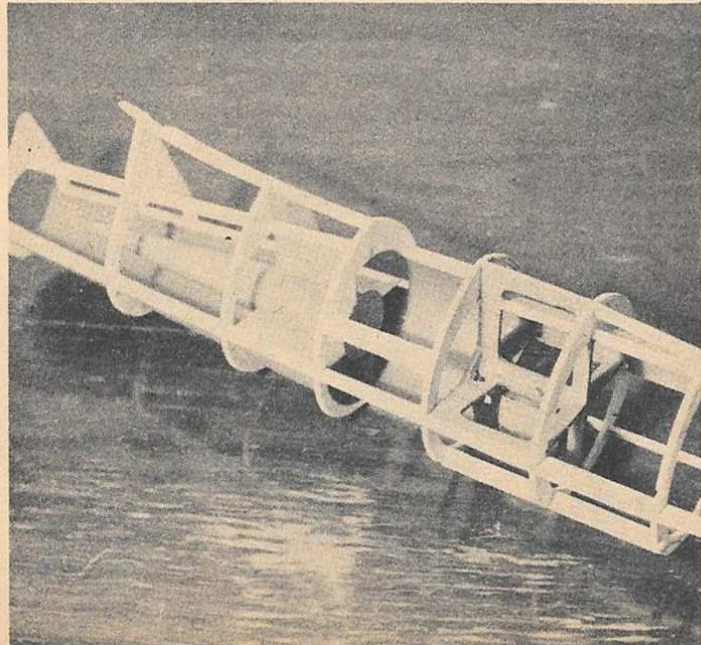


Taking off, the little Cougar looks amazingly like real Grumman. An ability to rise off ground unassisted an exception in ducted fan jobs.



Over the fence, on true fighter approach, is the model—absence of the landing gear doors proves it a model. Doors, etc., would damage easily.

Check this picture with cutaway drawing and the plan. It gives useful details on the amidships construction, tank installation, tail cone.



## DUCTED FAN

# GRUMMAN COUGAR

*Realism, a good flight performance, are combined in this beautiful scale job.*



*Why not fly the jet!*



Relative size of the flying model is indicated by nine-year-old Bill Paxton, author's son. Performance good enough to allow painted finish.

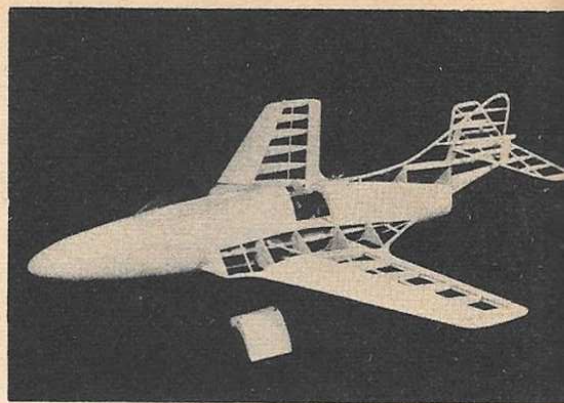
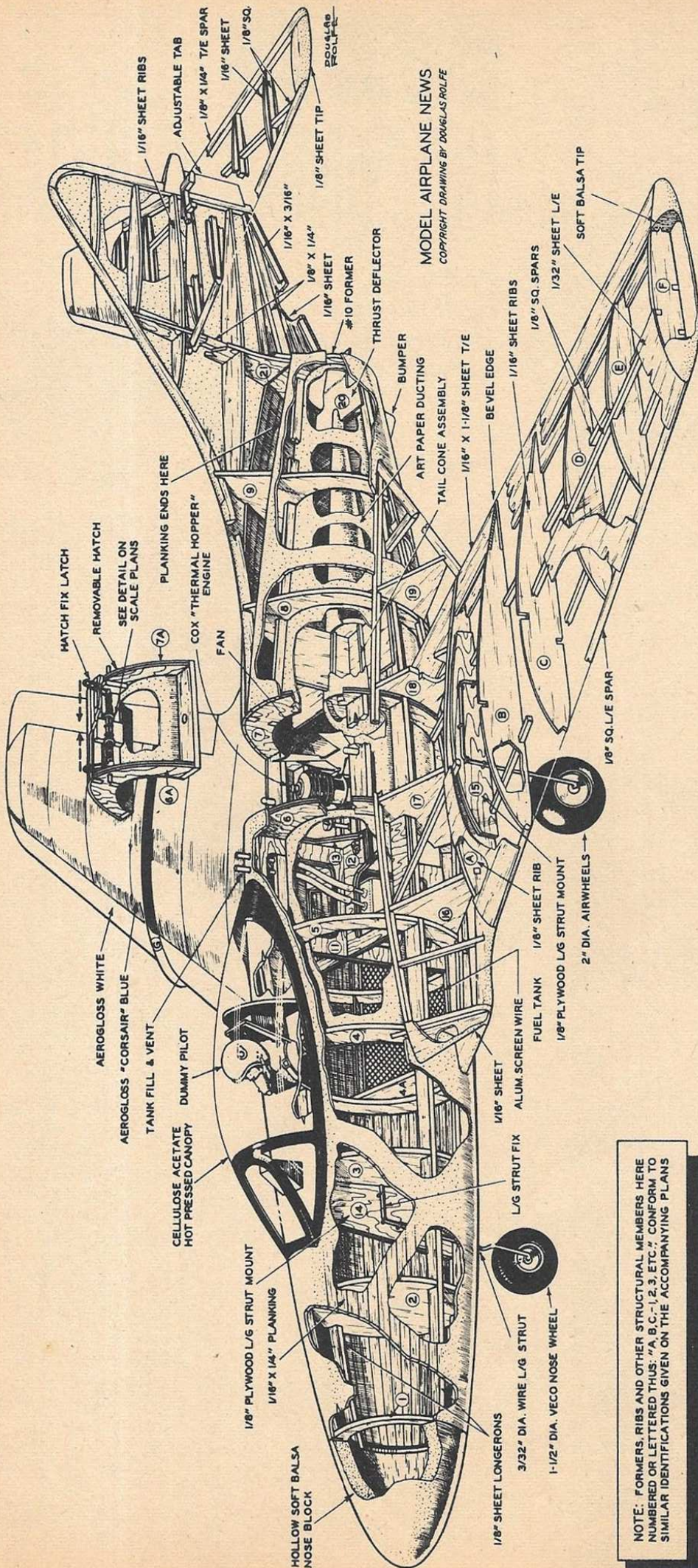
**By W. H. PAXTON, JR.**

► To those of you fortunate enough to have seen the Navy Blue Angels perform their fantastic precision-flying act at the Nationals, no introduction to the Cougar is necessary. To the rest of you, well—maybe the pictures of this model will speak for themselves. The wing span is  $28\frac{1}{2}$  in.; length,  $33\frac{1}{4}$  in.; flying weight is about  $13\frac{1}{2}$  oz. Power is supplied by the new Cox Thermal Hopper free flight engine, selected because of its terrific speed which was measured by strobe light with the metal fan shown at 17,200 rpm!

Construction of the model is not conventional but neither is it difficult if you take the time to study the plans and photographs and follow these step-by-step assembly sequence instructions:

1. In order to keep the weight to a minimum, be careful to select straight soft balsa for all bulkheads, ribs and for planking; medium soft balsa for all spars and longerons.
2. Cut out -11, -12 and -13 engine mount and supports from  $\frac{1}{8}$  basswood plywood. Add tin mounting plate with 3-48 nuts for engine.
3. Subassemble these using Ambroid cement and tie with thread the -13 mount to the -11 and -12 supports. Give

MODEL AIRPLANE NEWS  
COPYRIGHT DRAWING BY DOUGLAS ROLFE



Ready for covering. Canopy added last. The fin and stabilizer are covered before the assembly.

entire assembly four coats of red Aero Gloss dope.

4. Tie and cement fuel tank in place.  
5. Cut out top, side and bottom longerons and all bulkheads marking or notching locations of all attaching parts.

6. Pin top and bottom longerons to plans and cement one-half of bulkheads -2, -3, -4, -8 and -9 in place. Remove and cement other half of bulkheads.

7. Locate engine mount assembly between top and bottom longerons and cement in place.

8. Cement remaining bulkheads in place, including -4A.

9. Side longerons, screen wire support members and internal 1/8 x 1/4 members may now be added.

10. Tie and cement nose landing gear wire to 1/8 plywood support and cement assembly to top and bottom longerons and to -3 bulkhead.

11. Build up hatch assembly within the fuselage and then cut top longerons to allow hatch to be removed for installation of the latch mechanism.

12. The inner tail cone is assembled in two halves as noted to allow easy installation. Apply four coats of red Aero Gloss dope before installing.

13. Interior of the fuselage is now lined with red Art Paper which has previously been given three coats of clear Aero Gloss. Note that, forward of the engine, only the top half of the fuselage is lined in order to allow entrance of air.

14. The

Bottom view shows air recess opening in belly. Opening is covered with an aluminum screening.



NOTE: FORMERS, RIBS AND OTHER STRUCTURAL MEMBERS HERE NUMBERED OR LETTERED THUS: "A, B, C, -1, 2, 3, ETC." CONFORM TO SIMILAR IDENTIFICATIONS GIVEN ON THE ACCOMPANYING PLANS

## 'PERM-A-PROP'

### POWER - DIVED INTO GROUND WITHOUT BREAKING

Perma-a-Prop is an amazing combination of plastics engineering, model flying and design! Gives optimum performance, durability—is practically indestructible! Extensive bench tests proved that Perm-a-Prop gave 40% more static thrust than popular prop "A". These results were obtained with a Fox 35 engine and a 10 x 6 Perm-a-Prop turning at slower rpm's than the "A" 10 x 6 popular props.

Perma-a-Prop features amazing resiliency! Absorbs shock! Fuel proof! Will give lowest prop cost per flight! It's the perfect prop for both experts and beginners. Read what veteran flyers say about Perm-a-Prop:

"Higher thrust gives hottest performance with all engines and planes. Has plenty of reserve thrust for sharp stunt performance."

Pete Ross, Burlington, N. J.

"Tops for combat flying. Gives plenty of pull. It does not break."

Terry Hoy

Levittown Aero-Bugs, Pa.

"With rich setting, Perm-a-Prop can easily execute stunt pattern—can't with wooden prop. Perm-a-Prop is tops for contest competition."

Red Engle, Jr.

Highway Glo-Bugs,

Haddonfield, N. J.

"Perm-a-Prop is an engine saver. Have more fun flying. Don't lose time replacing props. Hot performance . . . especially for beginners."

George, Bo and Harry Kimble  
Falsington, Pa.

"Has lot more thrust—really made my Monoline Trainer go. My sister power dived it into gravel and the prop did not break!"

Bob Hemmingway, Highway

Glo-Bugs, Haddonfield, N. J.

Don't Be Satisfied with second best—Order your Perm-a-Prop Now! Only \$1.49

R/C fans—Perm-a-Prop will be available on written request

#### Dealer Inquiries are Invited

**WINDSOR ENGINEERING CO.**

214 THORNBRIDGE DRIVE • LEVITTOWN, PA.

Enclosed is \$\_\_\_\_\_ For 10" 6-P. \_\_\_\_\_ 9" 6-P. \_\_\_\_\_  
(Check Which)

Name \_\_\_\_\_ Please Print

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## DEALERS!

Send for a  
free sample Copy  
of the hobby industry's leading  
trade magazine.

Packed full of information designed  
to help you sell more hobby merchandise.

**CRAFT, MODEL & HOBBY  
INDUSTRY**

30 E. 29th St. New York 16

## Grumman Cougar

metal thrust deflector is next installed in the aft end of the fuselage by slitting the paper as necessary and recementing.

15. Fuel tank filler and vent lines made from 1/16 dia. aluminum tubing and plastic tubing are tied and cemented in place with Ambroid cement.

16. Cut out wing rib A and wing fillet members -16 through -19, carefully marking or notching attaching structure locations.

17. Using rib A to assist in alignment, cement wing fillet members to fuselage bulkheads.

18. Add 1/8 sq. strips in wing fillet members to outline the wing and fuselage intersection.

19. The entire fuselage and hatch are now planked with 1/4 in. strips cut from soft 1/16 sheet balsa. See Sept. '55 issue of MAN for further details on how to plank.

20. Rudder and fin members marked X are laid out on the plans, cemented together and then located on the fuselage along with -21 vertical rudder spar.

21. Rudder ribs are cut to fit following which the entire rudder including the slot for the stabilizer is covered with Silkspan tissue and given two coats of clear nitrate dope.

22. After assembling and covering stabilizer, cut out slot in fin and rudder and cement stabilizer in place. Fairing strips cut from Art Paper are then cemented in place.

23. The wings are now assembled over the plans using a template to set rib A to the correct angle to produce 8° dihedral on the bottom of the wing.

24. After trimming wing spars to fit the fuselage intersection, the wings are cemented in place. Fairing strips between fuselage and wing leading and trailing edges are now added.

25. Main landing gear wire and plywood assemblies are cemented to rib A.  
26. Cover wings and fillet area with Silkspan and apply two coats of nitrate dope.

27. The white areas along the wing and empennage LE's are next sprayed with Aero Gloss and then masked off for spraying of the entire airplane with Aero Gloss Corsair Blue.

28. The pilot's head and cockpit details are carved from balsa, painted to suit and cemented in place.

29. The cockpit canopy is heat-formed over a wooden block from .020 cellulose acetate sheet and cemented in place with Ambroid.

30. Main landing gear wheels are 2 in.

## CLEVELAND

3/4" Scale Kits To Build Beautiful Models  
Of World Famous Historic Airplanes

FOR THE "MAKE-THEM-YOURSELF" FANS

These are the same World Famous Cleveland Designed "SF" Master Kits you have heard so much about, made up the same as they were in the past. Kits include: authentic full size well detailed plans, printed out (not diecut) parts on balsa wood, Stripwood, special blocks, tissue, wire, wheels, label insignia, etc. (No cement, dopes or rubber bands included)



### MR. MULLIGAN

3/4" SCALE "SF" SERIES KITS

No.	NAME AND WING SPAN	Price
SF-21	Army Curtiss "Hawk" P6-E Biplane 23-5/8"	4.95
SF-34	'18 Falke DB "Flying Razor" Fighter 20-3/4"	3.50
SF-37	'33 Waco "C" Cabin Biplane 24-3/4"	5.50
SF-41	Navy Vought V-65 Corsair Biplane 26-7/8"	5.95
SF-44	Page's Navy Curtiss High-Wing Racer 23-5/8"	4.95
SF-46	'30 Laird "Solution" T.T. Racer 15-7/8"	3.50
SF-47	'33 Wedell's Wedell-Wms T.T. Racer 19-1/2"	3.95
SF-49	'32 Curtiss F11C-2 "Goshawk" Biplane 23-5/8"	5.95
SF-52	'35 "Mr. Mulligan" T.T. Racer 23-1/2"	4.50
SF-60	Army Boeing P26-A Low-Wing Fighter 21"	4.95
SF-63	'36 French Caudron T.T. Racer 16-5/8"	3.50
SF-71	'37 Kling's Folkerts "Special" T.T. Racer 12"	3.50
SF-72	'38 or '39 Turner's "Pescos Special" 18-3/4"	4.75
SF-74	German Messerschmitt ME-109 Fighter 24-1/2"	3.95
SF-75	Navy Grumman Twin-Motored "Skyrocket" 31-1/2"	6.50
SF-77	Curtiss P40 "Warhawk" Fighter 28-1/8"	4.25
SF-81	P47 "Thunderbolt" Fighter 30-3/4"	5.95

MANY OTHER KITS ALSO AVAILABLE  
ORDER BY MAIL — Minimum Order \$3.50

Be sure to add 10% extra for pack-post. Foreign customers add 20%. Ohioans only, add 3% for sales tax. Credit given for any over payments if pack-post, is less.

SEND 10c FOR COMPLETE CATALOG

### CLEVELAND MODEL & SUPPLY COMPANY

World's Oldest Model Manufacturers "Since 1919"

4512 E1 LORAIN AVE. • CLEVELAND 2, OHIO

### NEW at NEWX

**P** MEANS  
POWERFUL

IN THE NEW

P-12 ESCAPEMENT

This is the most powerful escapement of 1/2 ounce weight ever built. Here is greater safety and positive control for even larger ships. 2 volts min. **\$7.49**

**6** ARM ESCAPEMENTS Are now available  
Just the thing for motor control.  
Snap off arms for special effects.

#### TRANSISTORIZED CONTROL

UNITS ARE NOW AVAILABLE TO DRIVE THE T700 escapement. This is the only escapement that operates on a transistor and NO relay. NEWX ESCAPEMENTS ARE GUARANTEED FOR 1,000 FLIGHTS -- UNLESS DAMAGED. Returned to Newx correct they will be adjusted free in case of failure.



Newx products  
box 643 union, new york



### DIL-BOD "A Little Jewel" on any Flying Field

- 14 inch Wingspan • 1/2A Team Racer • Powered by .049 Engine
- Weight 4.5 ozs. • Built-up Fuselage
- Solid Wing • Capable of 60 M.P.H. • Hot Take-off and Silk Smooth Landings.

**\$2.50**

At your Dealer  
Order Direct, add  
25c Postage

Southwestern Model Mfrs.  
P.O. Box 9571  
W. Tulsa 7, Okla.

**FUEL  
TEES**  
**\$1.00**  
pr.



Use with Bonner Motor  
Control Escapement and  
all 2 Needle Valve Engines

dia. air wheels which save about 1¼ oz. weight over solid wheels; however, nose wheel is solid rubber-tired to absorb the landing shocks. Attach by soldering washers to axles.

31. Cut aluminum screen wire to fit bottom opening, paint Corsair Blue and cement in place with Ambroid.

32. Wing insignia may be purchased in a hobby shop or may be made from Trim Film decals as is necessary with the fuselage lettering and insignia.

33. The Thermal Hopper engine is installed, using 7/16 long spacer tubes and 1 in. 3-48 screws. A special screw driver made from a piece of 1/16 diameter music wire long enough to reach the screws through the tailpipe from the rear will assist you greatly in tightening the screws.

34. The metal, six-bladed fan should be made as accurately as possible, filing edges and rounding corners to eliminate drag and reduce the danger of injury while starting the engine.

35. Install the starter spring and fan and—let's go flying!

36. You will find that the Cougar has a fast glide so for Pete's sake get into some tall grass or alfalfa to do your test gliding. Trim for a right or left turn, after which you are ready for the first power flight.

I strongly recommend that this be made from a take-off rather than hand-launching by following these directions: bend the metal thrust deflector down about 10° which will keep the nose down, and then *gradually* bend it up after each attempt until the ship takes off. You can then continue until the optimum climbing angle is reached. Happy Landings!

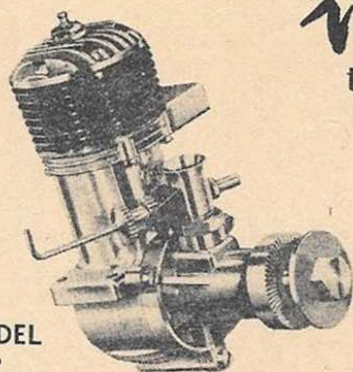
## ADVT. INDEX, MAY, 1956

A-J Aircraft Co. ....	4th cover
American Telasco .....	34
America's Hobby Center .....	5, 6, 7
Austin Craft .....	40
Aviation Photo Exchange .....	48
Babcock Radio Engineering .....	8
Berkeley Models .....	54, 55, 56
Bonner Specialties .....	43
Cleveland Models .....	50
Cobb Hobby .....	44
Comet Model Hobbycraft .....	43
Craft, Model & Hobby Industry .....	50, 53
DeBolt Model Engineering .....	44, 53
Dynamic Products .....	43, 44
Ectron Products .....	38
Electronic Specialty Supply .....	35
Forster Brothers .....	51
Fox Mfg. Co. ....	44
Francisco Laboratories .....	53
Great Lakes Battery .....	53
Paul K. Guillow .....	45
Harjo Sales .....	46
Henry Engineering .....	33
Herkimer Tool & Model Works .....	3
Kay Specialties .....	46
K & B Allyn Co. ....	3rd cover
Lafayette Radio .....	39
Master Modelcraft .....	48
Minnesota Engine Works .....	46
Model Trains .....	51
Monogram Models .....	1
Newx Products .....	50
Ohlsson Mfg. Co. ....	46
Pactra Chemical Co. ....	2nd cover
Pan American World Airways .....	49
Radiomodels .....	42
W. J. Ruscoe Co. ....	42
Scientific Mfg. Co. ....	36, 37
Southwestern Model Mfg. ....	50
Sterling Models .....	47
Stits .....	42
Sullivan Products .....	48
Testor Chemical Co. ....	28, 29
Topflite Models .....	40, 41
Wilshire Model Center .....	48
Windsor Eng. Co. ....	50
X-Acto, Inc. ....	41

# HIGH-POWERED HONEY

with the low-down price tag

Now is the Time!  
to get the most for your money!



MODEL  
"35"  
\$13.95

Best  
**FORSTER**  
Yet

**BUY DIRECT and SAVE!**

**\$5.00 TRADE-IN ALLOWANCE ON YOUR OLD ENGINE,**—no matter what make, size or condition! Just mail it to us, together with \$8.95 plus 35c to cover postage and insurance and your new FORSTER "35" front rotary valve glow engine will be on its way! A lapped, cast iron piston, forged aluminum connecting rod, square rotary ports etc.. give it the power of a "C" class engine with the weight of a "29". It is the finest engine made by the oldest established model engine manufacturer in the U.S.A., known the world over for outstanding quality.

WRITE US FOR FREE LITERATURE.

FORSTER BROTHERS MFG. CO., 7E. Lanark Ave., LANARK, ILL.



Like to run trains?

Then you'll like . . .

## MODEL TRAINS

. . . the monthly magazine that shows you the easy way to have more fun with all kinds of model trains.

Model Trains brings you track designs for O, O-27, S and HO; photos of other fellows' layouts; facts and photos on real railroads; plus articles on easy-to-make layouts, simplified wiring, ready-to-run scale equipment . . . everything to make model railroading easy and more fun.

### SPECIAL OFFER

Get a 1/3 year's subscription to Model Trains PLUS this picture-packed book "Fun with Model Trains" that tells all about getting started in this fascinating hobby—a \$1.55 value for only \$1. This offer is limited, so mail the coupon with \$1 today!



MODEL TRAINS, Milwaukee 3, Wis. Dept. 517-AN

Please send me the 32-page book "Fun with Model Trains" and the next four issues of MODEL TRAINS at the special price of \$1. My \$1 is enclosed.

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City, Zone, State \_\_\_\_\_