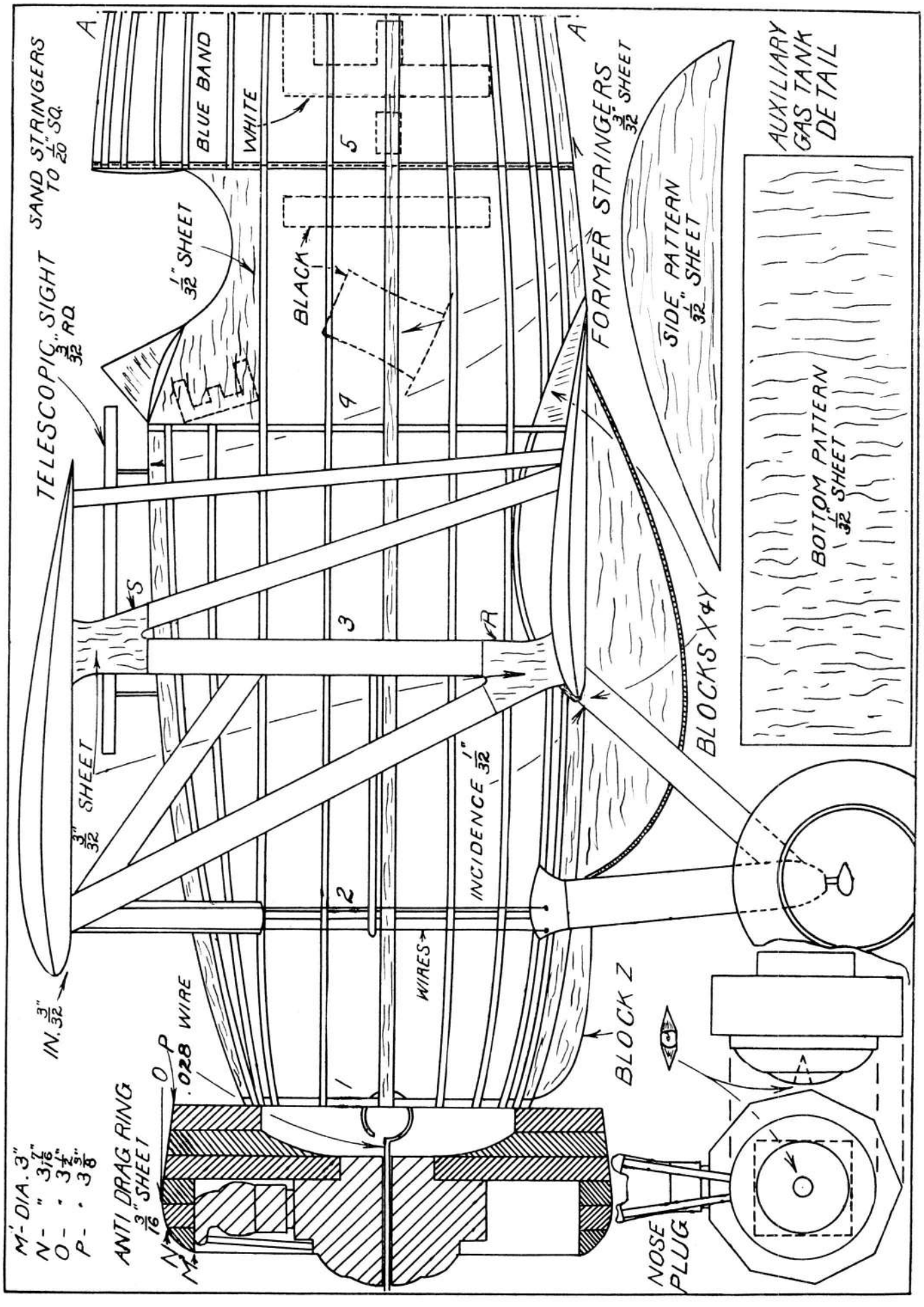
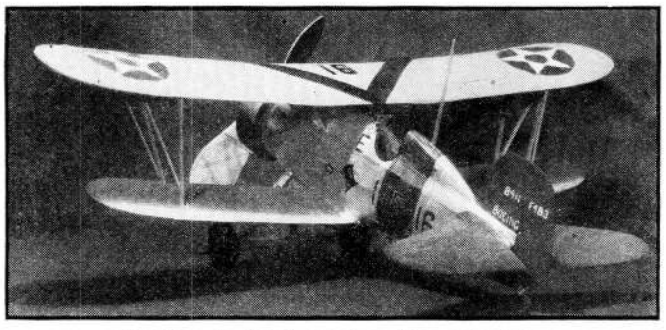
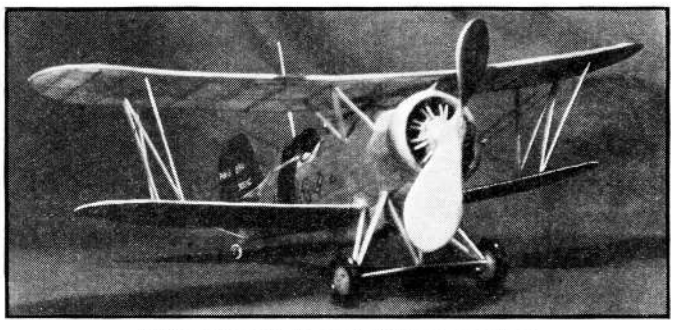

SAND STRINGERS TO 1/20" SQ.
BLUE BAND
WHITE
A
A'
FORMER STRINGERS 3/32" SHEET
AUXILIARY GAS TANK DETAIL
TELESCOPIC SIGHT 3/32" RD
1/32" SHEET
BLACK
SIDE PATTERN 1/32" SHEET
BOTTOM PATTERN 1/32" SHEET
S
R
3/32" SHEET
BLOCKS X & Y
INCIDENCE 1/32"
IN. 3/32"
WIRES
BLOCK Z
.028 WIRE
O P
ANTI DRAG RING 3/16" SHEET
N
M
NOSE PLUG
M - DIA. 3"
N - " 3 1/16"
O - " 3 1/8"
P - " 3 3/8"



Attention to detail creates a fine appearance



This ship will be a credit to your fleet

Build and Fly This Boeing Fighter

How You Can Construct a Flying Miniature of One of Uncle Sam's Greatest Navy Fighters

By WILLIAM WINTER

THE Boeing F4B-4 fighter needs no introduction as it is probably the most popular service ship of the day. Its every line suggests the ruggedness for which it is famous. It is noted in the air for the ease with which it withstands the most violent maneuver. The well known Pratt and Whitney "Wasp" rated at 420-550 hp. reliably meets all the demands of pursuit tactics.

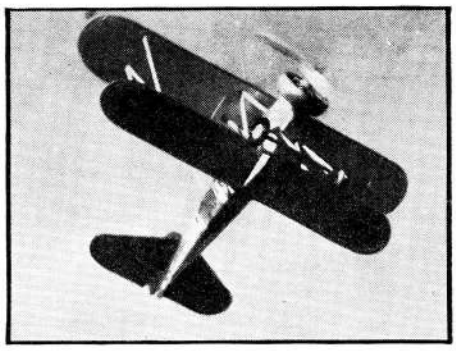
The model like the real ship is synonymous with stamina. Despite the fact that pursuit ships usually make mediocre models, the F4B-4 is an excellent performer. It possesses stability to an unusual degree and will afford many hours of sure-fire flights with little or no repairs.

Fuselage

Cut all the bulkheads from 1/16" sheet balsa. Using the patterns given, cut the former stringers from 3/32" sheet. Cement the two side former stringers in place on all the bulkheads. When dry, attach the top and bottom stringers. The auxiliary stringers are 1/16" sq. sanded to about 1/20" sq. They are placed in the proper notches and cemented. The rudder post is cut from a piece of ¼"x 3/16" and glued in position. The rear hook is bent to shape from .028 music wire and sunk in the rudder post as required. The cockpit is formed by bending 1/32" sheet. The sheet is first cut to the necessary width and length. The lower edge is cemented to the stringer below the cockpit. When dry, the sheet balsa is bent the remaining distance and glued. The cockpit outline is marked with a pencil and cut out with a sliver of a razor blade. A small piece of 1/16" sheet, the pattern of which is given on the bulkhead sheet, is inserted between the extensions of No. 3 and 4 bulkheads and forms the center portion of the fillet.

To cover, use narrow strips of the best grade paper obtainable. Each strip runs the entire portion of the fuselage. The headrest also is covered with numerous narrow strips to avoid wrinkles. The finished covering is lightly sprayed and doped.

Cut fillet blocks X (7/16"x1-1/16"x 7/16") and Y (1-1/16"x1"x1-1/16"). Block X is cemented flush with the front face of No. 3 bulkhead. Block Y is attached in the same manner to the rear face of No. 4 bulkhead. If any care is exercised in the carving of these fillet blocks, no trouble will be had in their attachment.



The model is an excellent flier. The large stabilizer aids performance

The auxiliary gas tank adds very little weight but much in appearance. The side patterns are cut from 1/32" sheet and cemented to the bottom of the fuselage at the required position. The lower covering or bottom of the tank is also 1/32" sheet. It is bent to shape as it is glued in place. Cement one end and allow to dry. Bend a bit further and allow to dry again. In this manner there can be no cracking. Block Z is cut from a soft block 1⅜"x1-3/16"x7/16" and is attached at the position shown in the side view.

The entire fuselage unit, if painting is desired, should be silvered. The markings are easily discerned in the pictures. Though the painting adds weight, the F4B-4 will fly well.

The windshield is celluloid. Directly in front of the windshield at the position noted on the side view, the telescopic sight is located. A strip of 3/32" is cut to the required length and rounded. The sight is painted black.

Landing Gear and Tail Wheel Assembly

The main landing gear strut is cut from ⅛"x⅜" stock and streamlined. The small fillets shown are made from ¼" sheet and attached with bamboo pins and cement. Do not dispense with the pins as they are necessary. The main struts are attached to the fuselage as required. It would be use to cut away a tiny opening in the paper so that the strut will have a firm contact with the wood of the bulkhead. The rear struts, the spreader bar and the struts marked M are all cut to the required lengths and streamlined from hard ⅛"x ¼". The spreader bar is attached to the bamboo pins at the lower extremities of the main struts. There should be a small clearance between the wood of the bar and the main strut. The 1⅞" wheels are mounted on .028 music wire axles. The axles are attached to the spreader bar in such a manner that their ends sink into the wood at a point just below the attachment of the M struts. The axles are bound with thread and cemented.

The ½" tail wheel is mounted on an .014 wire axle. The wood mount seen on the side view is a piece of 3/32" sheet attached to the cut away portion of the rudder post.

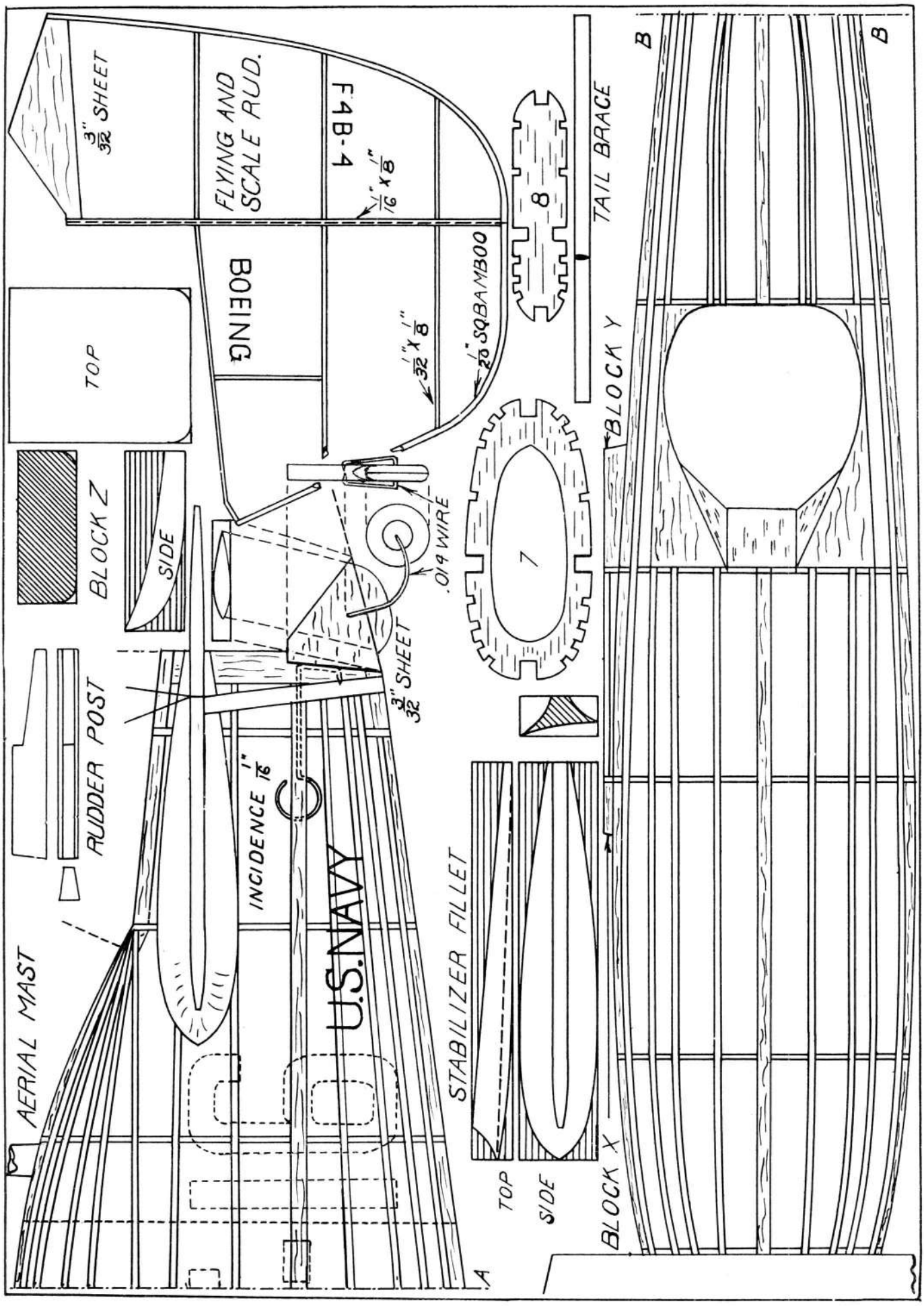
Tail Assembly and Mounting

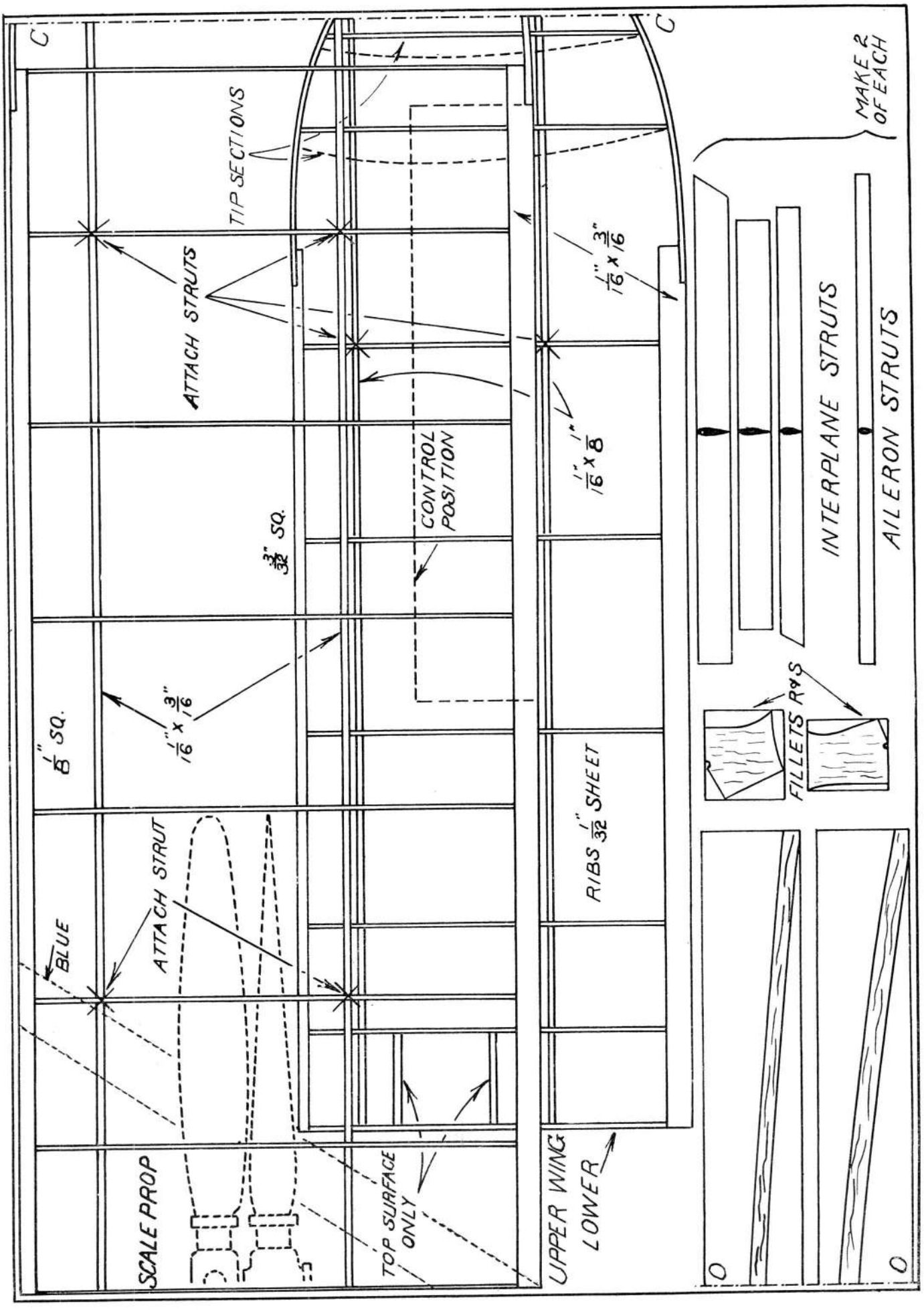
The main spars are 1/16"x⅛" and are pinned directly to the bench. The cross-pieces are cut to the required lengths from 1/32"x⅛" and are cemented in place. The lowest cross-piece of the rudder is cut from 3/32" sheet. The edges of both stabilizer and rudder are formed by bending 1/20" sq. bamboo to shape around a candle flame.

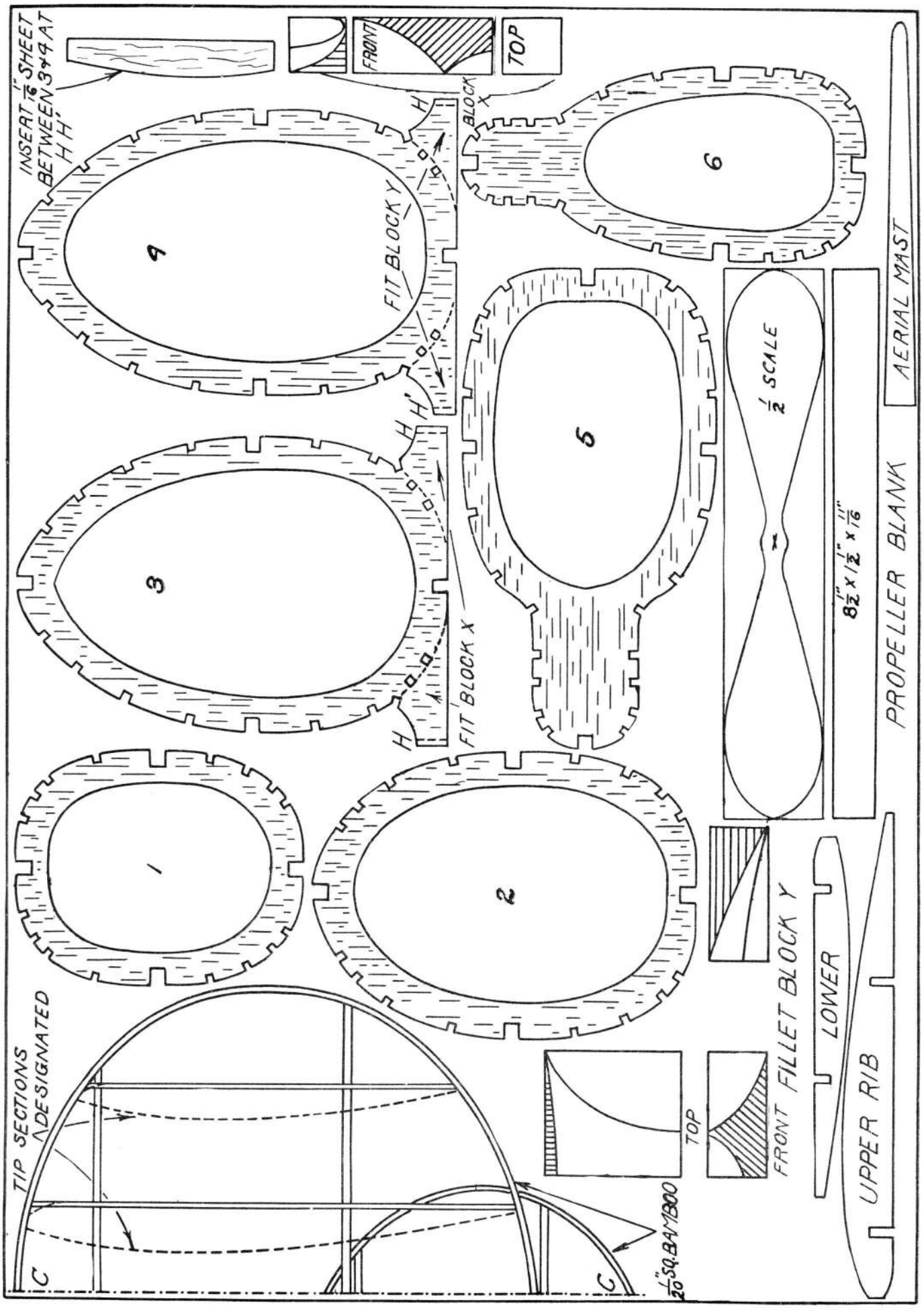
Cover each side of both stabilizer and rudder with separate pieces of tissue. Dope the finished surfaces lightly.

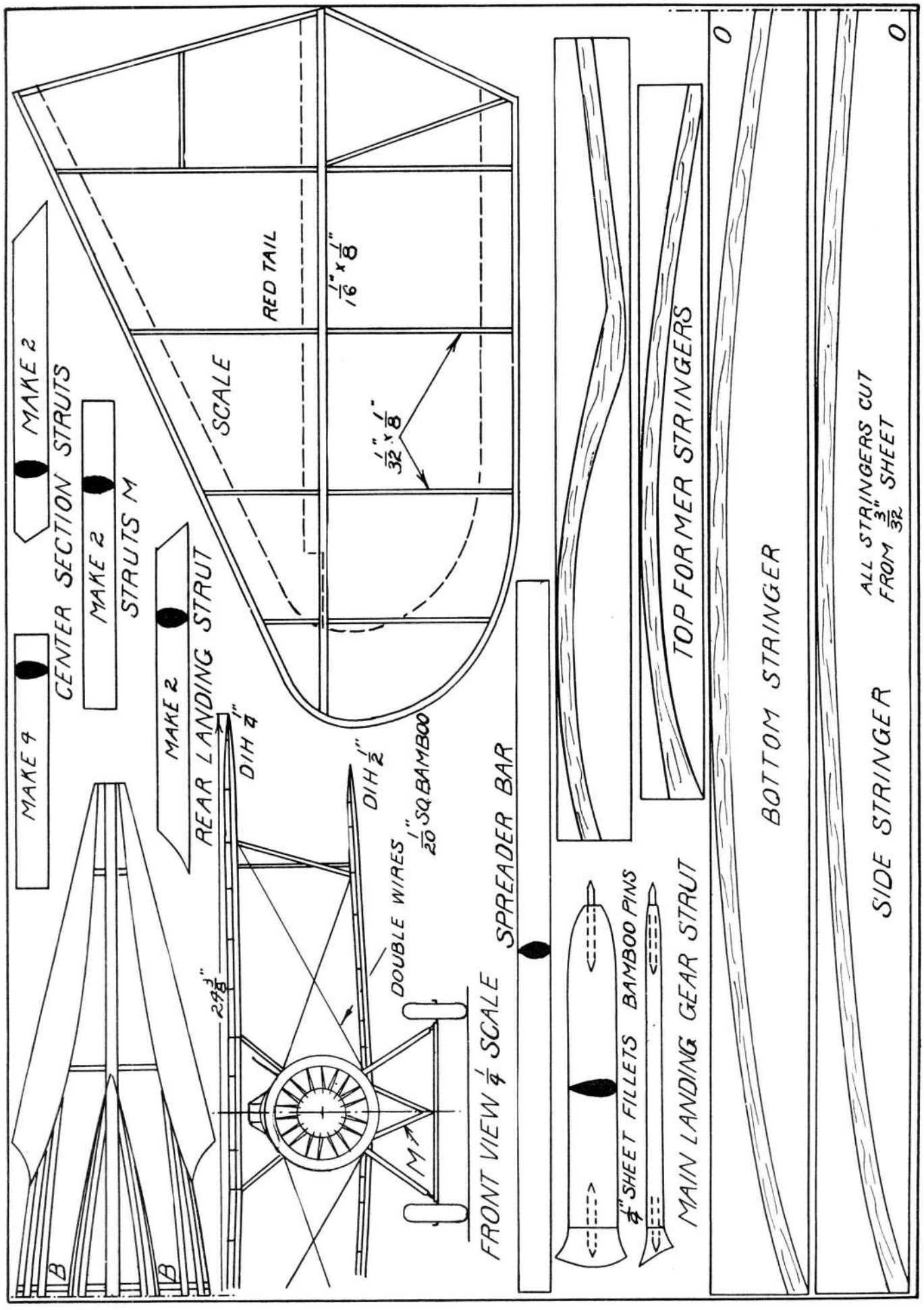
The fillets are cut to shape as shown from two blocks 3-1/16"x⅝"x5/16". They are attached to the fuselage with very thick cement. If necessary, expose a quantity of cement to the air until the desired consistency is attained. If any crevices result from a variation of construction, carefully fill them with this thickened cement as they are to be painted over. Attach the stabilizer halves to the fillets with cement. The tail braces are cut to the given lengths and cemented in position. The rudder is cemented to the top former stringer and braced with black thread.

(Continued on page 38)

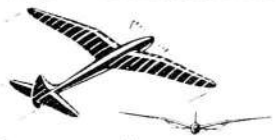

3/32" SHEET
FLYING AND SCALE RUD.
F4B-4
1/16" X 1/8"
BOEING
TOP
1/32" X 1/8"
1/16 SQ BAMBOO
8
TAIL BRACE
B
B
BLOCK Z
SIDE
.019 WIRE
7
BLOCK Y
3/32" SHEET
RUDDER POST
INCIDENCE 1/16"
U.S.NAVY
AERIAL MAST
STABILIZER FILLET
TOP
SIDE
BLOCK X
A


C
C
TIP SECTIONS
ATTACH STRUTS
3/32" SQ.
CONTROL POSITION
1/16" x 3/16"
1/16" x 1/8"
1/8" SQ.
1/16" x 3/16"
RIBS 1/32" SHEET
ATTACH STRUT
BLUE
SCALE PROP
TOP SURFACE ONLY
UPPER WING
LOWER
MAKE 2 OF EACH
INTERPLANE STRUTS
AILERON STRUTS
FILLETS R'S


INSERT 1/16" SHEET BETWEEN 3 & 4 AT H H'
FRONT
TOP
BLOCK X
H
H'
FIT BLOCK Y
FIT BLOCK X
1
2
3
4
5
6
1/2 SCALE
8 1/2" x 1 1/2" x 1/16"
AERIAL MAST
PROPELLER BLANK
FRONT FILLET BLOCK Y
LOWER
UPPER RIB
TOP
1/20" SQ. BAMBOO
TIP SECTIONS AS DESIGNATED
C
C


MAKE 4
MAKE 2
CENTER SECTION STRUTS
MAKE 2
STRUTS M
MAKE 2
REAR LANDING STRUT
RED TAIL
SCALE
1/16" x 1/8"
1/32" x 1/8"
DIH 4"
DIH 1/2"
1/20 SQ BAMBOO
DOUBLE WIRES
2 7/8"
M
FRONT VIEW 1/4 SCALE
SPREADER BAR
TOP FORMER STRINGERS
BOTTOM STRINGER
SIDE STRINGER
ALL STRINGERS CUT FROM 3/32" SHEET
1/4" SHEET FILLETS BAMBOO PINS
MAIN LANDING GEAR STRUT
B
B
O
O

1936 WINNER?



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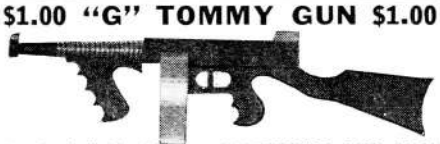

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structure of the plane. However, if the center of the wing is located directly over the C.G., the C. of L. will be about 20% ahead of the C.G. under normal flying conditions. Therefore, you may mark the point directly above the C.G., now indicated by C. of L., as *"center of wing chord."*

In our aerodynamic layout, the factor which influences the directional stability of the model is the fin moment arm. If the fin is given the same length of moment arm as the stabilizer, it will be sufficient and in accordance with good practice. In this case it is twelve inches. In regard to the vertical disposition of the fin, we will follow standard practice and place it above the stabilizer. Thus the point of fin reaction may be located twelve inches to the rear (right) of the C.G. and about 1½ inches (⅛ moment arm) above the stabilizer. Indicate it by a dot on your layout and mark it F.R. (Fin Reaction.)

Lateral stability is obtained in this case to a certain extent by the high center of lift. However, as our plane is to be primarily a stable one, we will definitely establish this quality in it by giving it a dihedral angle of considerable magnitude in addition. An average amount is about one inch per foot of wing span. In order to insure lateral stability, suppose we specify a dihedral of 2 inches per foot of wing span. Later the practical application of this to a wing will be explained.

The position of the center of lateral area is the next consideration. As we explained earlier in this series of articles, the lateral area of a model is the area or surface that would meet the air if the model moved sideways at right angles to the normal direction of flight. It is the area of the projection of the airplane on a vertical plane. One might say it is the shadow of the airplane on a vertical surface held at the side of the ship parallel to the line of thrust. The center of lateral area is in effect the center of this shadow.

In a well designed speed ship, this center should be located about on a line drawn through the center of gravity parallel to the line of thrust or slightly above it. If it is too high, the ship will have a tendency to bank excessively on a turn and "dive in." The faster the plane is the greater the tendency will be. Slow ships which usually assume a climbing attitude under power are affected very little even if the center o. lateral area is high (well above the C.G.). In the case of the plane we are designing, its position is not extremely important as stability is our objective, which characteristic demands a fairly slow ship. However, mark a point on your diagram as the center of lateral area, on a line with the C.G. horizontally and about three inches to the rear or right of it. If a fuselage type of model is finally chosen for your design, it can be shaped so that the center of lateral area will come at this point. If it is decided that a stick model will suit your purpose better, the C. of L.A will be slightly above the "best position", but due to the lack of flight speed its effect will be too small to overcome the action of the low C.G. (relative to the C. of L.).

Next month our discussion of design will continue.

Build and Fly This Boeing Fighter

(Continued from page 17)

The tail unit, including the fillets, were painted a solid red on the model. The lettering was done with white oil paint.

Center Section Struts, Wings and Interplane Struts

The center section struts are cut to the lengths required from ⅛"x¼" and streamlined. The ends are slanted before the struts are cemented in position.

The spars for the top wing are 1/16"x 3/16". They are pinned to the bench as evenly as possible. The ribs are cut from 1/32" sheet, pinned together and sanded to a similar outline. The notches are cut while the ribs are pinned together to insure their accuracy. Cement the ribs in place on the spars. The special tip sections required are shown on the wing plan in dotted lines. The leading edge of the top wing is ⅛" sq. stock, half rounded and cemented in position. The trailing edge is 1/16"x3/16" stock. The tips are 1/20" sq. bamboo, bent by candle flame to the desired shape. To incorporate the ¼" dihedral in the top wing, it is necessary to crack the spars and leading edge at the point of angle. The wing tips are supported at the proper height by small blocks until the cemented cracked portions have dried. There is no dihedral

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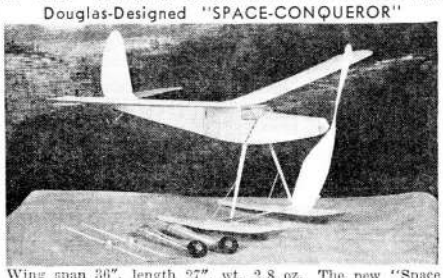
They are designed so that the model can be built by one who has had no experience at model building. Order a Douglas kit and see the difference. NOTE! These three kits contain glue, dope, tissue, rubber, shaped props, free wheeling prop, shafts, parts requiring machine work cut to shape. Other parts clearly printed on "AAA" balsa strips cut to size and M & M Model Wheels, pontoon parts also printed on sheet balsa for the "space conqueror."

Douglas-Designed "SPACE-CONQUEROR"



Wing span 36", length 27", wt. 2.8 oz. The new "Space Conqueror" Hydroplane, Landplane and Skiplane—all in one model—change from one to the other in two minutes. This model has an unofficial record of 19 min. 25 sec., 2500 ft. Altitude with M & M Model Wheels. And two to three minutes with pontoons and skis. It takes off just like a real plane, is very easy to build, and the flights it makes are really amazing.

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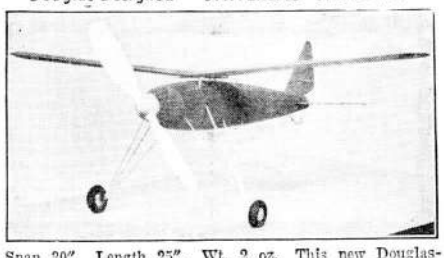

Span 30". Length 25". Wt. 2 oz. This new Douglas-Designed speed model has absolutely EVERYTHING you need. ALTITUDE — SPEED — ENDURANCE, perfect GLIDE and M & M Model Wheels for smooth landings.

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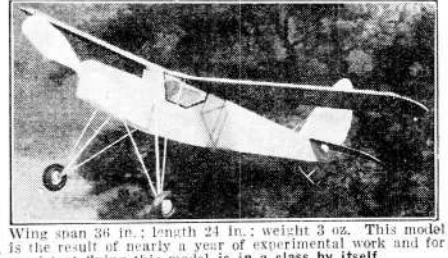
Douglas-Designed "FLYING CLOUD"



Wing span 36 in.; length 24 in.; weight 3 oz. This model is the result of nearly a year of experimental work and for consistent flying this model **is in a class by itself.**

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on the scale Boeing's top wing. The smallest degree advisable has been added to the flying model.

The lower wing panels are built one left and one right hand. It is necessary to slant the innermost rib of each panel to allow for the ½" dihedral. Small pieces of 1/16" stock are inserted between the two inner ribs of both panels to prevent their distortion by covering. The leading edge is 3/32" sq. The spars are 1/16"x⅛" and the trailing edge 1/16"x3/16".

Cover the bottom of the top wing with one piece of tissue. The top surface is covered with three pieces due to the dihedral angle. The top and bottom surfaces of both the lower wing panels are covered with separate pieces of tissue. It would be advisable to cover the tips with narrow strips to avoid wrinkles. The finished covering is lightly sprayed and doped. The upper surface of the top wing is colored yellow. Three inch stars are used.

The top wing is attached to the center section struts and checked for alignment. The lower wing panels are cemented to the fillets built into the fuselage. It is to be noted that the incidence of the top wing is 3/32" and that of the bottom 1/16". The interplane and aileron struts are cut to the required sizes, streamlined and cemented in position. The interplane struts are 1/16"x¼" and the aileron struts 1/16"x⅛". Fillets R and S are cut to the detailed size from 3/32" sheet. Black thread bracing wires are used. All load and lift wires are double. The remainder of the wings and all the struts are painted silver.

Drag Ring, Propeller and Motor

The drag ring is built up of six layers of 3/16" balsa sheet. Each layer is cut to the required outside and inside diameters and glued up cross grain. When dry, the contour of the outside is accomplished by shaping with a razor blade. A thorough sanding is done with fine paper. The main dimensions of the key layers are tabulated on the plan. The hole cut to receive the dummy motor or removable nose plug is square to prevent turning.

The crankcase proper is rounded from a block slightly larger than the 1½" sq. one actually required. The nine spacings for the cylinder attachments are accurately marked. The crankcase must be flattened slightly where each cylinder is to be attached. This is clearly shown in the motor detail. The three circular additions to the front of the crankcase are made from 3/16" and 3/32" sheets as required. The bearing shown is cut from tin and sunk in as well as cemented to the crankcase. The cylinders shown are built up of scraps. The lowest portion of the cylinder is 1/16" sheet. The piece immediately above is ⅜" in diameter and ¼" in thickness. The top of each cylinder is rounded as seen in the cross-section of the ring. The rocker arm housings are small pieces cut to shape and glued into notches cut in the cylinder head. The pushrods can be made by rounding 1/16" sq. balsa. The square plug piece at the rear of the crankcase is a piece of 3/16" sheet.

The propeller blank is cut along the diagonals that run along each side of the blades and extend beyond the confines of the block shown. These diagonals are for a block 2¼" wide. The excess portions are not shown on the plan. Do not shape the tips until the carving has been completed. Sand carefully after the balancing has been completed. The proper balance is essential to the performance of the model. The shaft is bent to shape from .028 wire. It is of course necessary to locate the shaft in the propeller, imbed a bearing in the rear face and to place a loose washer on the shaft as well as the plug before the hook is bent. The front of the shaft is bent U-shaped to permit its firm hold in the prop base. The prop is silver in color as is the drag ring and crankcase. The cylinders are black and the pushrods silver.

The motive power is eight strands of ⅛" flat rubber. Lubrication and winder winding will increase the flight duration if high performance is demanded.

Flight Directions

Balance the model by flying it over deep grass. If none is available, fly the ship on a few turns R.O.G. As the correct balance is ascertained, the number of turns is gradually increased. A small weight is invariably needed in the nose to balance the flying scale model despite

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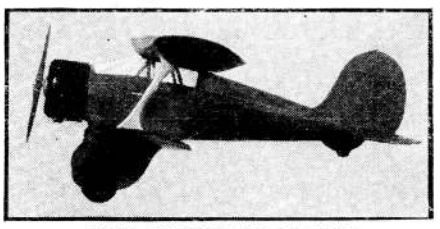
3/16x3/16 6 for .05
1/4x1/4 3 for .05
1/2x1/2 2 for .05
1/2x1 1 for .05
18" Sheets
1/64x2 2 for .10
1/32x2 3 for .10
1/16x2 4 for .10
1/8x2 3 for .10
3/16x2 2 for .10
1/4x2 2 for .10
18" Planks
1x1 1 for .09
1x2 1 for .15
2x2 1 for .20
2x3 1 for .30
2x6 1 for .45
18" Birch Dowels
1/8; 3/16; 1/4 dia. 1c
15" Bamboo
1/16x1/4 .01 ea. 12 for .10
Machine Cut Propellers
5" 3 for .10
6" 1 for .05
8" 1 for .07
10" 1 for .10
Hand Carved Propellers
5" .10 8" .25
6" .12 10" .30
7" .20 12" .35
Aluminum Props
1½" long 4 for .05
1" dia. 3 for .05
Celluloid Motors
1" dia. each .15
2" dia. each .20
3" dia. each .35
Balsa Wheels
½" per pr. .04
1" per pr. .05
1⅛" per pr. .07
1¼" per pr. .08
1½" per pr. .12
2½" per pr. .20
3" per pr. .25
Celluloid Wheels
½" per pr. .07
¾" per pr. .08
1½" per pr. .12
⅞" per pr. .16
Aluminum Wheels
1" per pr. .10
1⅛" per pr. .20
1⅞" per pr. .25
Celluloid Pants
For ½" & 1" wheels per pr. .30
For 1⅛" & 1¾" wheels per pr. .45
Tweezers
Each .15
Brushes
Pointed .05
Flat ⅝" .10
Cast Metal Props
1½" 2 Blades .07
2⅛" 2 Blades .10
3½" 2 Blades .20
1½" 3 Blades .08
2½" 3 Blades .15
Aluminum Motor Nose Plates
⅜" for 1½" Motor .08
1¾" for 2" Motor .10
1¼" for 3" Motor .15
Cast Guns
1" each .05
1½" each .08
2" each .10
Cast Guns with Ring Mount
1½" each .20
2" each .25
Bombs
¾" each .05
1¼" each .10
Wing & Tail Lights
Small 3 for .10
Medium 3 for .20
Large 3 for .25
Hair Wire
34 gauge, per spool .10
Metal Fittings Wing Clips
Large or Small 2 for .05
Prop Hangers
Large or Small 2 for .05
Rear Hooks
Large or Small 2 for .05
Steel Beads
Per doz. .03
Washers
⅛" dia. per doz. .03
¼" dia. per doz. .05
⅝" dia. per doz. .05
Jap Tissue
White 2 for .05
Colored each .05
Black, Orange, Red, Yellow, Green, Brown, (new) Silver
Rubber Motors
.045 30' for .10
1/16 sq. 25' for .10
1/32x1/16 20' for .10
1/32x3/32 25' for .10
1/32x1/8 25' for .10
1/32x3/16 25' for .15
Music Wire
Coils or straight 1 ft. lengths, .014, .024, .028, .034 10 ft. .05
National Cement
Tube .05
1 oz. bot. .10
1 pint can .75
Clear Dope
1 oz. .10
1 pint .75
Colored Dope
1 oz. White, Black, Orange, Brown, Olive, Blue Gray, Red, Green, Yellow .10
Corrugated Paper
Yellow, 4x5" .03
Acetone
1 oz. .05

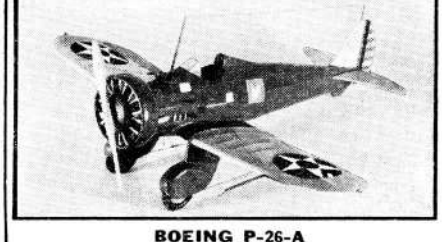
NATIONAL "Flight Tested" KITS
Set the Pace for 1936

Always looking ahead, creating advanced features, National's models are right in line with the New Year, prepared to outclass and outperform as they always have, but with even greater records than ever before. National kits are priced from 25c to $5.00. There are solid and flying models, scaled in detail to ¼", ½", ¾" and 1". See them at your dealer or order direct.

DOUGLAS TRANSPORT
Faithfully detailed ½" scale model of the famous transport, the "Pride of the National line." The kit includes: turned motor cowls, nose block and wheels, 3-bladed props, (flying and scale) printed balsa parts, **flexible shaft gearless transmission**, headlights, windows, doors that open, cement, colored dopes and many other features —3-view plans and instructions. **Wingspan 42½"; Length 29¼"; Wt. 8 oz. Plans only $1.00 plus 15c postage.** plus 50c postage **$5.00**



NEW BEECHCRAFT A-17-F
Authentic ¾" scale model of this popular 4-seater cabin plane. Kit contains many simplified National features: turned cowl, mud wheels, safety motor tube, etc. Colors are red and black, silver trimmed. **Wingspan 25¼"; Length 18"; Wt. 2½ oz. Plans only 50c plus 10c postage.** plus 25c postage **$2.50**



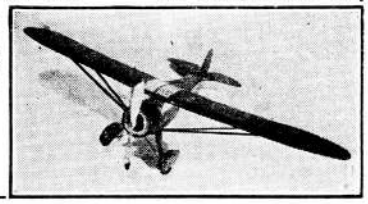
BOEING P-26-A
Pursuit fighting planes now used by U. S. Army; faithfully detailed ¾" scale model; authentic louvres, exhaust pipes, navigation lights, built up detailed motor, etc. Colors: Army olive and yellow. Complete with full insignia, detailed plans and instructions. **Wingspan 21"; Length 17.625"; Wt. 2½ oz. Plans only, 50c plus 10c postage.** plus 15c postage **$2.00**

CURTISS HAWK P-6-E
A ½" de luxe solid scale model. Exhaust ports, gun troughs, Belly Tank, windshield, movable control surfaces, insignia. Wingspan 15.625", Lgth. 11.25" **50c**
Plus P. P. 10c
Also, ½" Boeing P-26-A, Fokker D-7.

HAWKER FURY
A modern fighter of the British Royal Air Forces. Authentic 12" model a real flyer. Complete **50c**
Plus Postage 10c

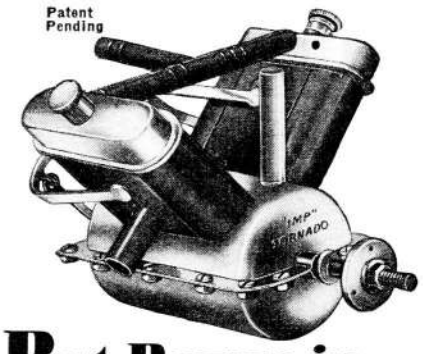
Dealers—Agents: Cash in on the demand for National Models and supplies. Write for dealer discounts and full details. Send 5c (to cover mailing) for latest fall and winter catalog and Bulletin of "National" fleet of over 50 planes. 1000 supply items.

MONOCOUPE
New ½" scale Model. Span 18". Lgth. 10.15". Wgt. ¾ oz. Colors; red, black trim. Realistic and a thrill to fly. **25c**
Plus P. P. 10c
Also in this group are 18" Corbin Ace and Taylor Cub and 12" Curtiss Robin, Heath, Fokker D-8, Puss Moth.



National Model Aircraft & Supply Co.
23 Avenue E. Dept. A-67 New Rochelle, N. Y.

Patent Pending



Put Power in your Models with these New "IMP"

Reg. U.S. Pat. Off.

TORNADO MOTORS

A Complete, Practical, Light Weight Power Plant for Model Airplanes and Boats

Keep up with the newest development in model engineering by powering your models with one of these "IMP" TORNADO MOTORS. You can install it in any type model, with Motor and Generator entirely out of sight. It will swing large propellers at high speed for long, steady flights. Costs hardly anything to operate. Runs on AC:CO Gas, generated in the "IMP" Generator; a new invention that will revolutionize model flying. Will also run on compressed air. Equally efficient for Model Boats.

Model V-4 (shown above) four cylinder. Weight only 3½ oz. Will fly models from 4 to 8 feet. Complete with Generator, Feed Line and Safety Clip..... **$7.50**

Model S-2, two cylinder. Weighs 2½ oz. Flies models 3 to 6 feet. Complete with Generator, Feed Line and Safety Clip..... **$5.00**

(If ordered by mail, add 25c for postage)

Send for Free Circular right now and find out about these Motors.

"IMP"

Reg. U.S. Pat. Off.

Paulownia Wood PROPELLERS

Are as Light as Balsa with Twice the Strength!

Accurately Carved and Carefully finished by hand; true balance; hole drilled for shaft; high lustre varnished. The preferred propellers with thousands of flyers; lighter, stronger, more efficient. Use them on your models and see the difference.

None Genuine Without this Trade Mark

Your regular dealer will supply genuine "IMP" Propellers at these money saving prices; if unobtainable, send your order direct:—

Size	Standard Type	Helical Navy Type	Steel Type
5 in. each	10c	5c	15c
6 in. each	12c	7c	20c
7 in. each	15c	10c	25c
8 in. each	18c	12c	30c
9 in. each	20c	15c	35c
10 in. each	22c	20c	40c
11 in. each	30c	25c	45c
12 in. each	35c	30c	55c
13 in. each	45c	35c	60c
14 in. each	55c	40c	70c
15 in. each	65c	50c	80c
16 in. each	80c		1.00
18 in. each	1.00		1.15
20 in. each	1.25		1.35

Prices Include Postage.
(Add 10c extra on all orders less than 50c)

Send 3 cents for our Latest Propeller Guide with Lowest Prices on Genuine "IMP" Paulownia Wood Props., Propeller Fittings, Celluloid Dummy Motors, Balloon-tire Disc Wheels and other "IMP" Specialties, also installation diagrams for "IMP" TORNADO Motors and big list of Model Kits.

INTERNATIONAL MODELS CO.,
1771 Broadway General Motors Bldg., New York

all the possible methods of design and construction unless the proportions of tail surfaces are interfered with. Though the F4B-4 has a short rubber length, it is capable of flights a few hundred feet in distance if accurately built and wisely flown. You are bound to be pleased with the unexpected distance and stability of this little fighter.

Bill of Materials

1—1/16"x2"x24" sheet balsa Bulkheads.
1—1/32"x2"x24" sheet balsa Wing ribs and cockpits.
1—3/32"x2"x24" sheet balsa Auxiliary gas tank. Former stringers, strut fillets and tail wheel mount.
1—3/16"x2"x24" sheet balsa Drag ring.
7—1/16" sq.x36" strip balsa Stringers.
3—1/16"x3/16"x36" strip balsa Top wing spars and all trailing edges.
2—1/16"x⅛"x36" strip balsa Bottom wing spars, aileron struts and tail spars.
1—1/32"x⅛"x24" strip balsa Tail crosspieces.
1—⅛"x¼"x36" strip balsa Landing gear and center section struts.
1—1/16"x½"x24" strip balsa Interplane struts.
1—⅛"x⅜"x6" strip balsa Landing gear.
2—1 1/16"x1"x1 1/16" Block balsa Fillets Y.
2—7/16" sq.x1 1/16" block balsa Fillets X.
2—5/16"x⅝"x3 1/16" block balsa Stabilizer fillets.
1—1⅜"x⅜"x1 3/16" block balsa Block Z.
1—1⅝"x¼"x3/16" block balsa Rudder post.
1—1½" sq.x½" block balsa Crankcase.
1—8½"x1½"x1 1/16" block balsa Propeller blank.

Miscellaneous

1—1 oz. cement
2—sheets white tissue
1—pr. 1⅞" wheels
1—ft. .028 music wire
1—⅛" washer
1—scrap sheet celluloid
8—ft. ⅛" flat rubber
1—2 oz. clear dope
2—unsplit bamboo (¼"x1/16")
1—½" tail wheel
1—3" .014 music wire
1—scrap tin for bearings.
Black thread for bracing
1—1 oz. yellow paint (laquer or dope)
1—1½oz. silver paint
(bronzing powder and dope)

On the Frontier of Aviation

(Continued from page 11)

about 198 m.p.h. and have a range of 800 miles. Landing speed will be 45 m.p.h. The power plant will be a seven cylinder Wright Whirlwind of approximately 300 hp. There will be room for four parachutes and all necessary baggage. Split trailing edge flaps employing a special automatic control will be used. When the pilot slows the speed of the plane for a landing the flaps automatically drop down. If the pilot then decides not to land, he gives the plane "the gun" and the flaps automatically come up into the wing again. However, they rise very slowly so as to keep the plane from stalling. The first of the Howard sport planes was expected to be completed during this or next month.

Department of Commerce load testing has been completed on the Brown B-3 sport plane, another example of what the National Air Races has given to the commercial aviation industry. Construction of the plane has been delayed slightly to await the completion of a new 300 hp. engine that Menasco is about to add to its line of famous aircraft engines. Both Brown and Menasco are located in Los Angeles, California. Details of the Brown sport have already been published in past issues of this paper. The first of the B-3s, however, will differ from the standard line that will be produced by having only one cockpit. In place of the other cockpit, a large gas tank has been installed for cross-country flights. A sliding glass cowl will enclose the single cockpit. The B-3 has been stressed for 225 m.p.h. Ground and ball bearings are used on all controls. One unique feature of the little plane is that all control cables and horns are within the fabric surfaces. Tabs are employed. The fuselage carries 65 gallons of gas and 8 gallons of oil, with 10 more gallons of gas in the wing. Span is 31′ 10½", length 25′ 10½", and gross weight is 2,300 lb. The wheel pants are five feet long.

One of the most outstanding features of the plane is that Handley Page slots and flaps are to be employed. The B-3 will be the first commercial modern American airplane to use slots. The Curtiss Aeroplane and Motor Company has been the only other user of Handley page slots and flaps in this country. The majority of their military planes are equipped with them, including their new A-14 twin-engined attack ship which is now at Dayton, Ohio, undergoing U.S. Army Air Corps tests.

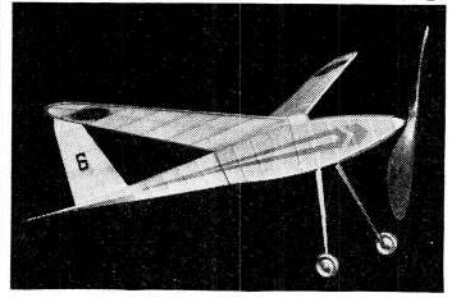
Another likely user of the slot is the Timm Aircraft concern. They will employ it on their new twin-engined transport now under construction and also on a proposed Navy transport for aircraft carriers. The Timm commercial transport is said to have undergone slight revamping since its first details were made public.

The Brown Company has contemplated construction of a twin-engined racer like the DeHavilland "Comet." Two Menascos would be the power plant.

Another plane on the drawing boards of the Brown Company is an Army training ship. It will be a two-place (in tandem) low-wing monoplane of the same general lines as the "Miss Los Angeles."

Work on the Brown Thompson racer was halted on the death of Roy Minor for whom it was to be built. However the designing of the ship has been completed and the company expects to go

CHAMPIONS



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CADET MAJOR—CADET Jr.,

Span 30" Area 102 Sq. In. — Span 20" Area 45 Sq. In.

We are proud to present the CADETS. The CADET MAJOR, a fast climbing high altitude soaring airplane with remarkable duration. The CADET Jr., a snappy pursuit style performance airplane with excellent duration. The latest Bunch designs from truly—The Home of Championship Airplanes.

Last week at the big Los Angeles Junior Birdmen indoor contest, every prize was won by airplanes built of Bunch material. These Model Builders are champions because they know what is best. Donahue, the Grand Prize Winner says to you, "I buy Bunch material. Their uniform high quality enabled me to do the consistent flying that won. I can truly recommend the CADETS."

CADET MAJOR Kit	Postpaid $1.50
CADET Jr., Kit	50c Plus 10c Postage
Both Kits, Postpaid	$2.00

Catalogue 3c Stamp

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