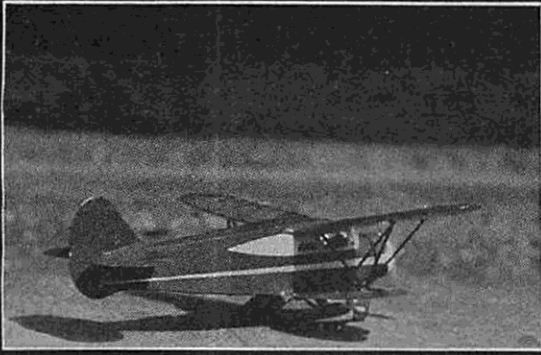


By Alan D. Booton



The take-off! The ship scoots along on its novel tricycle landing gear preparatory to easing off in climb.

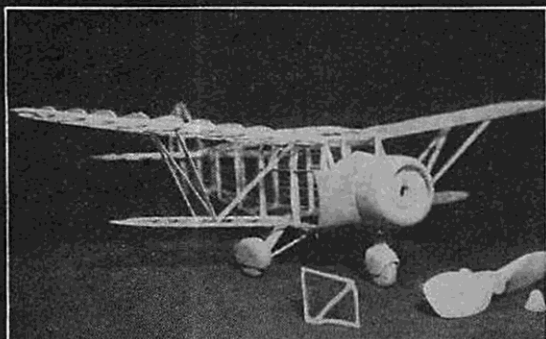


This unposed picture of the miniature "N" shows it climbing. Stability is the keynote of its design.

THE WACO THREE-WHEELER



How the model is built. Note the simple, practical construction. Framework is very similar to real ship.



This photo of the framework shows the "tricycle" landing gear to advantage. The model lands neatly.

The Waco "N" series, incorporating the tricycle landing gear, are to be desired by sportsmen or businessmen who prefer an airplane that they can safely handle on take-offs and landings with apparent finesse, and still without the skill required by the conventional types of planes. It is claimed that the Waco "N" can be handled in departures and arrivals more easily than an automobile in traffic.

So get busy and build the model and see for yourself. The "little brother" gathers speed on a smooth runway and eases off in a low, climbing turn. Because of the simple construction, the model weighs less than two ounces, making longer flights possible.

For the builders' information, the design was taken directly from factory scale drawings, so the model, with scale tail surfaces and scale diameter propeller, is eligible for flying scale contests.

FUSELAGE

Build the two fuselage side frames of $\frac{1}{32}$ " square strips. $\frac{1}{32} \times \frac{3}{32}$ " square spacers are used at the front and rear. The stabilizer supports are $\frac{1}{16}$ " sheet. Assemble the two sides with $\frac{3}{32}$ " square spacers measured from the top view. Be sure that this much lines up before continuing.

A really interesting flying model; simple, rugged and an unusually stable performer.

Cut all formers and instrument panel from $\frac{1}{16}$ " sheet and the ring "A" from $\frac{1}{4}$ " sheet, and cement them in their respective positions.

Note on the perspective drawing how the window "sills" have been filled out flush with the formers with $\frac{1}{16}$ " sheet. After that is done, cover the front with $\frac{1}{32}$ " sheet and add the $\frac{1}{16}$ " window frames. The filler blocks at the lower wing bases (at C and D), shown in heavy broken lines on the side view, and as finished on the perspective, may be carved when the wings are in place temporarily.

$\frac{1}{32}$ " bamboo fairing strips are heavy enough for a lightly doped, colored-tissue model, but $\frac{3}{64}$ " square strips should be used if several coats of dope are anticipated. Embed the strips in the wood where they start from the front, then cover the formers, to rest flush at the rear.

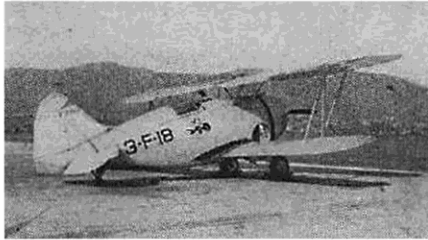
COWL

The front portion of the cowl is laminated with $\frac{1}{8}$ " sheet glass and disks cut to the (Turn to page 95)

WACO "N"

(Continued from page 60)

sections shown. A compass is needed to do a good job. Cement the two rear disks together and carve the base-relief cylinders in the front face, then cement the two undercut rings on. Assemble the back ring to the front assembly with $\frac{1}{16}$ " spacers, and when dry cover with $\frac{1}{32}$ " sheet. Let dry again and sand to



Grumman Navy fighter.

the finished shape. The push rods are rounded bamboo. The nose plug (crankcase) must fit snugly in the hole and should have a $\frac{1}{16}$ " aluminum-tube shaft bearing. Carve the propeller and finish the nose-prop assembly.

WINGS

The wings are of the simplest design and should be assembled completely on the left original and facsimile right drawings. Line up all parts in their proper positions with the aid of pins and blocks, and then apply cement to every joint. Instead of building the ailerons separately, wait until the top wing assemblies are dry, and then slot the ribs for the aileron spars and cement them in with the extra-short ribs. #20 copper wire makes suitable hinges. The flaps are simulated with black ink on the finish.

TAIL SURFACES

Make an opposite sketch for the stabilizer and build it as a unit with a continuous spar. The simplest method of assembling the tail frames is to use plain stock as designated. Block up the edges to center with the rib stock. When the assemblies are dry, it is much easier to shape the ribs and edges by sanding than to assemble odd, pre-shaped parts so small.

LANDING GEAR

Pin the wing frames to the fuselage and check the line-up carefully. The dihedral in the top wings should be approximately $\frac{5}{8}$ ", and the corresponding angle in the lower ones. Fit and fix the wing struts on with an ample amount of cement. Right and left struts should match.

The finished landing-gear parts are cemented and pegged together with

bamboo, then cemented to the model. The front strut cements to "A"; the main rear struts are slotted and cemented to the first ribs and spars of the lower wing, as per detail. Check the line-up before the cement dries. Do not cement the diagonal braces on until after covering. Apply several heavy coats of cement to the main struts and pants. Pin the first rib of each wing to the fuselage with two bamboo pins about $\frac{1}{4}$ " long, from the inside of the wing frames, and cement to the ribs only, so the ribs can now be removed and replaced "as was" after covering. Do not be alarmed when it is found that the top and bottom wings are fastened together with the struts, and that the landing gear is still attached. That is the way it should be, and should be covered "as is."

ASSEMBLY

Cover the remainder of the model. If a tissue color scheme is to be followed, cover all wood parts with the desired colors, otherwise the colored dopes will do, and only the exposed frames need to be covered.

Reassemble the model with cement and spray the tissue with water. After a light coat of clear dope, carefully apply the tissue fillets on the tail surfaces and wing roots and continue the color scheme if colored dope is desired. The colors are optional. The windshield and suggested detail are the last items to be added.

FLYING

Power the model with four strands of $\frac{1}{8}$ " flat rubber and make the adjustment flights in tall grass until an R. O. G. flight seems justified. More power may be added after the novelty of the long take-off on the tricycle landing gear wears off.

MATERIAL LIST

Miscellaneous	Blocks
2 oz. cement	1 $\frac{5}{8} \times 1 \times 1\frac{1}{2}$ "
1 oz. clear dope	2 $\frac{5}{8} \times 1 \times 2\frac{1}{2}$ "
(1 oz. each of colored dope optional)	1 $\frac{1}{4} \times \frac{1}{2} \times 5$ "
	1 $1 \times 1\frac{1}{4} \times 6$ "
	Sheet
2 sheets tissue	2 $\frac{1}{2} \times 2 \times 18$ "
2 loz. shredded bamboo	2 $\frac{1}{16} \times 2 \times 18$ "
	1 $\frac{1}{8} \times 2 \times 18$ "
12' #12 music wire	1 $\frac{1}{4} \times 1\frac{1}{4} \times 2\frac{1}{2}$ "
6" #20 copper wire	Strips
	4 $\frac{1}{16} \times \frac{1}{16} \times 18$ "
3 $1\frac{1}{2}$ " air wheels	1 $\frac{1}{16} \times \frac{1}{8} \times 18$ "
4x6" sheet celluloid	2 $\frac{1}{16} \times \frac{3}{16} \times 18$ "
	12 $\frac{3}{32} \times \frac{3}{32} \times 18$ "
assorted friction washers	2 $\frac{1}{8} \times \frac{1}{8} \times 18$ "
	4 $\frac{1}{8} \times \frac{3}{16} \times 18$ "
	3 $\frac{1}{8} \times \frac{1}{4} \times 18$ "
48" $\frac{1}{8}$ " flat rubber	1 $\frac{1}{4} \times \frac{1}{2} \times 12$ "