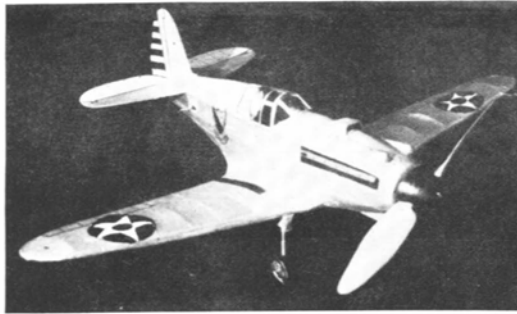


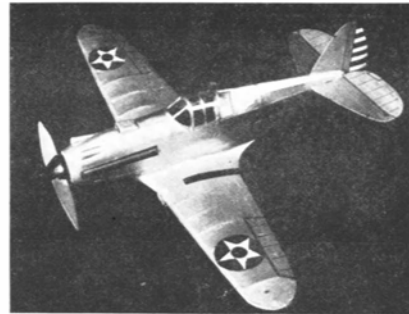
The XP-40 Takes to the Air

A Realistic Scale Model of a High Speed Curtiss Pursuit Plane Designed in Careful Detail That Will Fly For 25 Seconds

By Herbert K. Weiss



The completed model is a fine flyer in spite of its small size



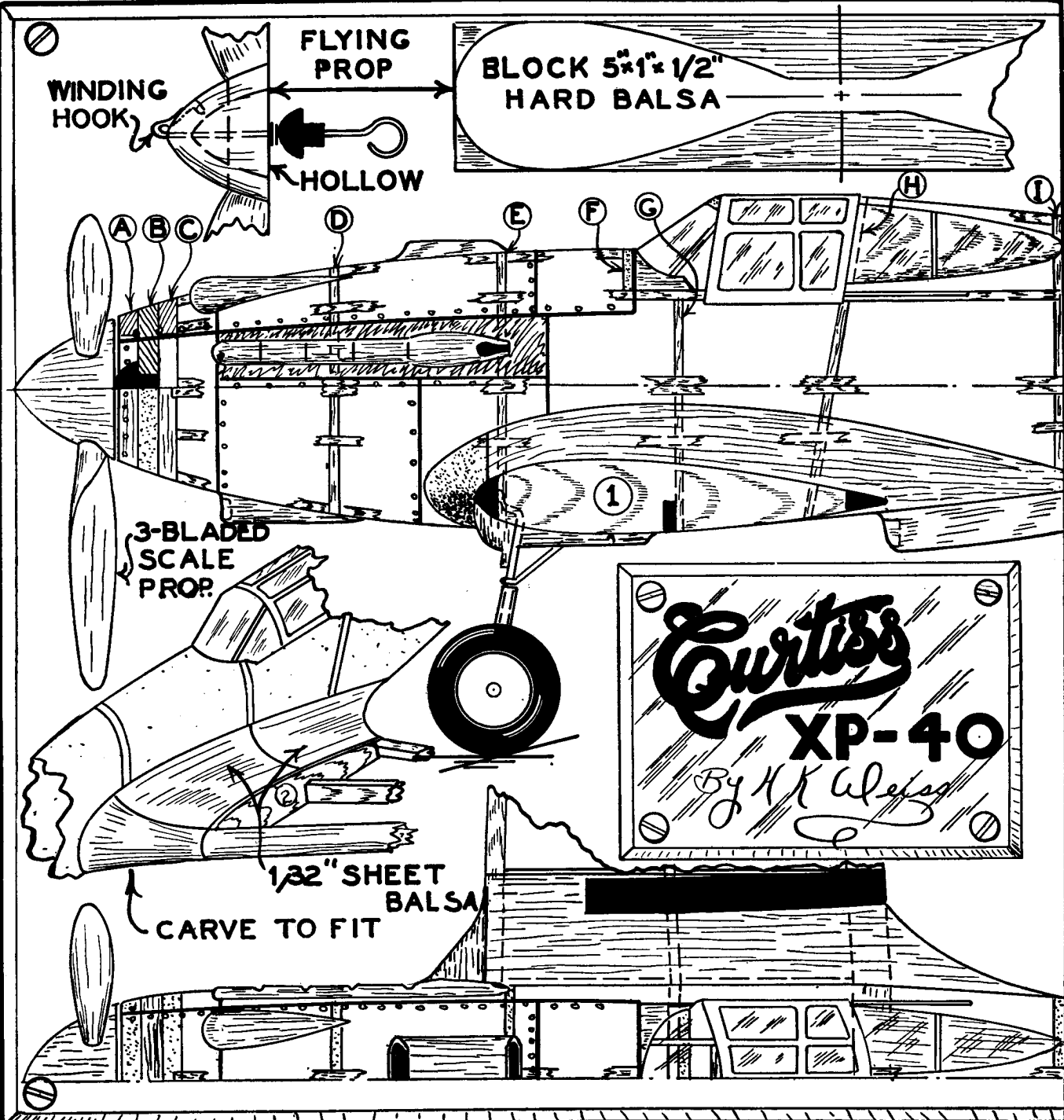
It has graceful lines and realistic appearance

FOR several months we've been planning to work up a model for this series that would have considerably more detail than the simpler layout of the past. We were willing to sacrifice a little performance in the interests of, say, closer wing spacing and a couple of coats of dope. To offset the increased weight, we wanted a very clean ship with low frontal area; this, of course, eliminating the radial engined prototypes. Our ideal was a mid-wing ship with liquid cooled engine, slim fuselage and reasonable tail area. But somehow we couldn't find quite the plane.

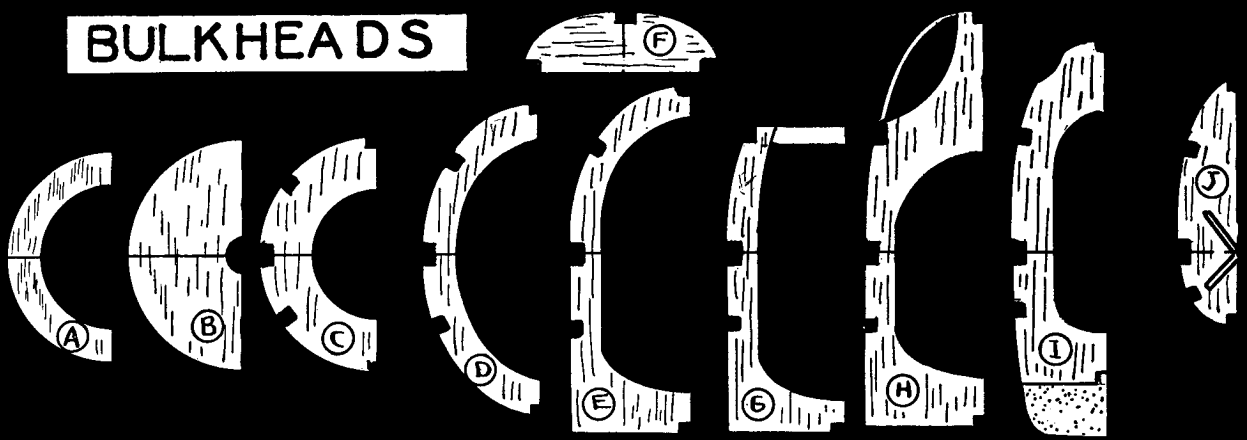
We'd pretty nearly given up the United States and were all set to have another look at Jane's "All the World's Aircraft," when we picked up a newspaper . . . and there was a picture of the XP-40. She was low-winged rather than mid-winged, but otherwise she was just what we wanted, and after a good deal of scurrying after data we were able to lay her out on the drafting board and begin building the model.

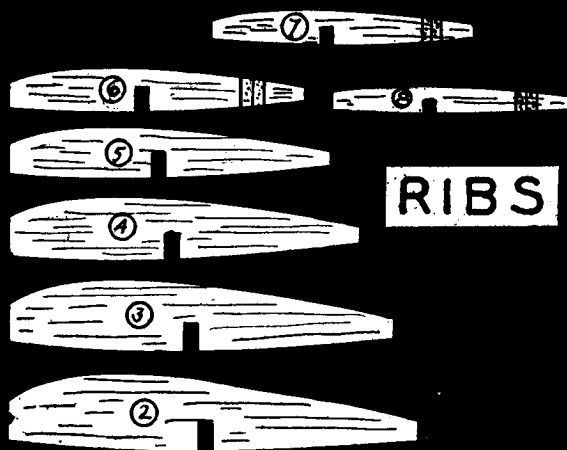
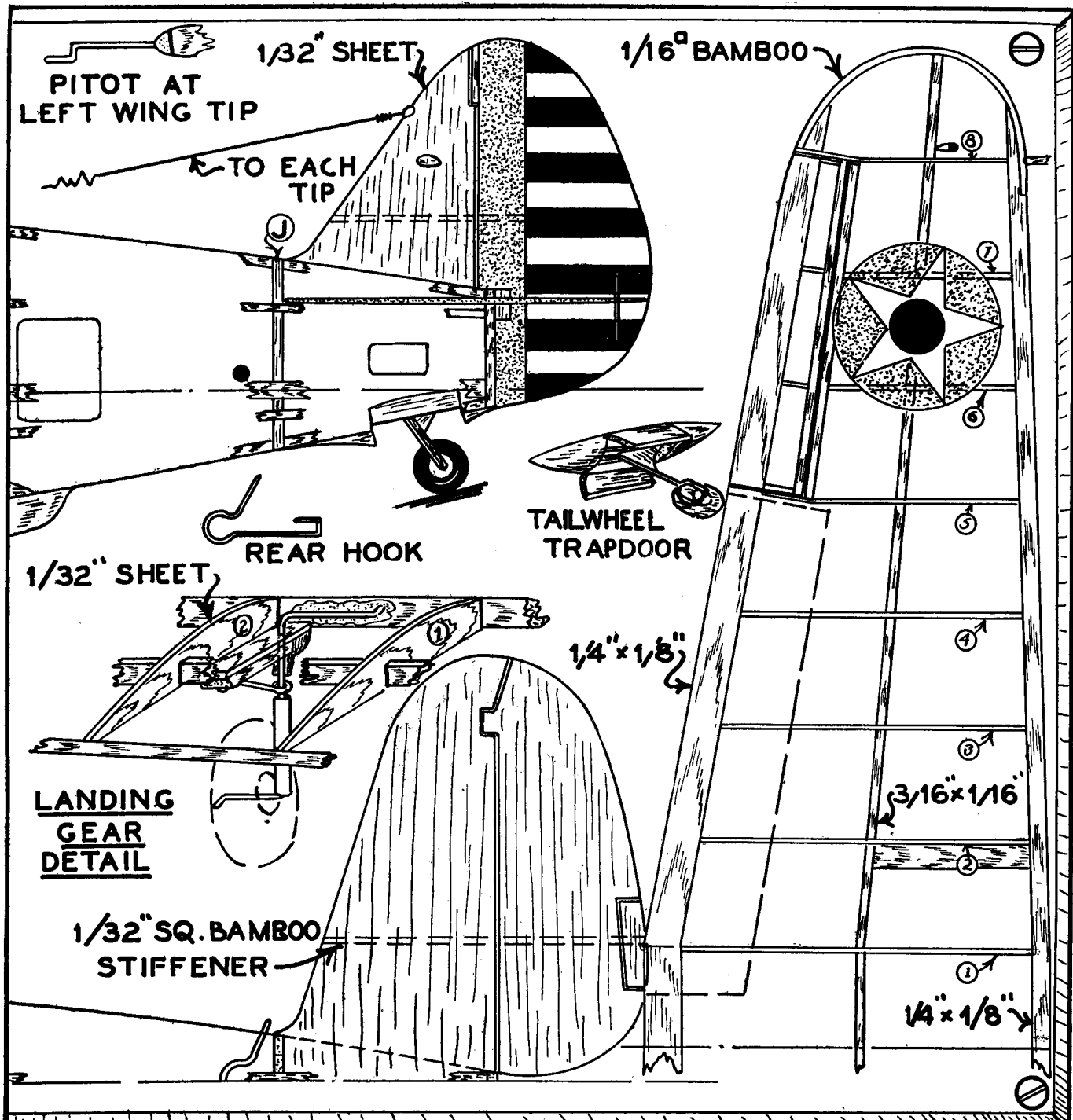
We might say something here about the original large plane. Several years ago, the Curtiss company was developing its model "77" low-wing fighter. Pictures that slipped out of the plant occasionally showed a great deal of experimentation going on to determine the effects of many design changes.

Every engineer knows the value of trying every design combination in hopes that there may be one which will be

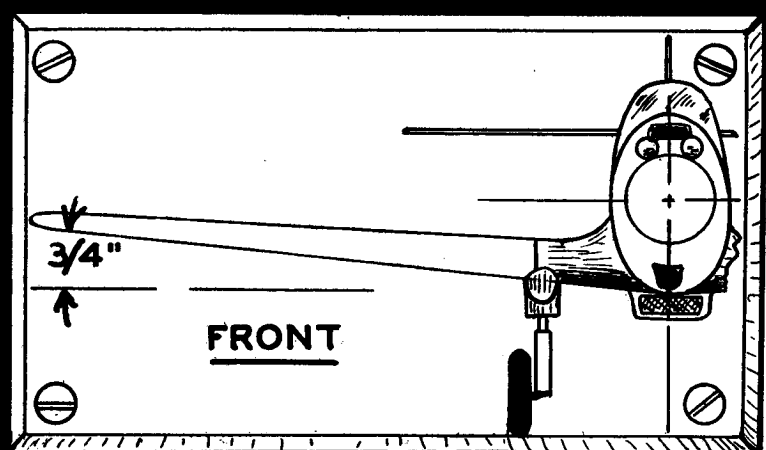


BULKHEADS



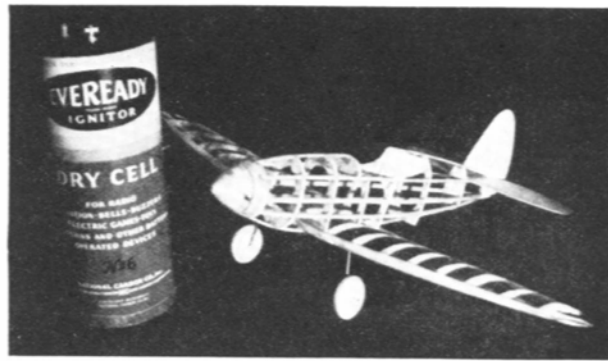


RIBS



outstanding from the rest, but very few have the patience to apply this principle to the small features of a project; such as windshield contours, vent locations, landing gear fairings and the multitude of possible variations of detail design.

Model builders who have followed the old Hawk bi-plane series are well acquainted with the thoroughness with which Curtiss engineers investigate the possibilities of design changes. Hawks were built with straight wings, tapered wings, wing radiators, fuselage radiators; with inverted, radial and V-engines; with air-cooled, water-cooled and liquid-cooled engines. Landing gears with split axles, single struts, pants, spats, unfaired struts, faired struts and fully retractable gears were built. The same principle of trying everything was advanced to the "77" monoplane. And so when the ship finally emerged successfully from U.S. Army tests, it became the already famous Hawk P-36, which needs no introduction to any model builder.



The battery indicates the relative size of the plane. Note the strong construction of the frame.

But the engineers were still not satisfied. In collaboration with the Army Air Corps specialists at Wright Field they produced a P-36 with co-axial props, the P-37 with Allison engine and finally the XP-40, which flies over 390 m.p.h., and can climb almost a mile a minute.

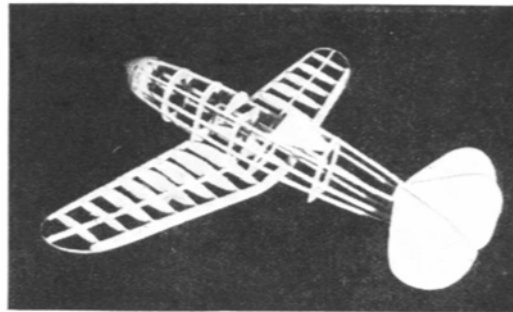
Those of you who are interested in the constructional details of the XP-40 will find them in the February issue of MODEL AIRPLANE NEWS. And we'd like to point out that Curtiss already had a good ship in the P-36; but they tried again and produced an even better one. It's a good thought for model builders.

WING

The wing of the model is laid out in one piece. Don't be alarmed if the size of the leading and trailing edge stock seems excessive. After you've shaped the wing to airfoil section, you'll find that most of the leading and trailing edge pieces have been cut away. Ailerons are optional. We'd suggest that you omit them on a flying model, as they add considerable weight and spoil the smooth wing surface.

A very simple way to bend the bamboo for the wing tips is to hold it against the end of a lighted cigarette. If you hold the bamboo just within the ash, but not quite touching the burning end, the bamboo will bend very nicely without charring.

In assembling the wing, leave the leading and trailing edges square-cornered until the wing is assembled and the cement has dried thoroughly. Then carefully trim them to shape with a sharp knife and finish with a sandpaper block. At this time you can sand sharp edges and bumps of cement from the other parts of the wing frame.



The plane is easy to build yet has many realistic details.

FUSELAGE

With a razor or a sharp knife cut out two halves of each fuselage bulkhead. All bulkheads except A, B and C are 1/16" sheet; A, B and C are 1/8" sheet. Cement corresponding halves together with short pieces of 1/32" bamboo across the joints for strength.

Cement bulkheads E, G and H to the wing center section and add the two 1/8" x 1/16" balsa side stringers. To these add the remaining bulkheads and the tail post which is also 1/16" x 1/8" balsa. The remaining stringers can now be put in place.

TAIL SURFACES

The tail surfaces are cut from 1/32" sheet balsa. We have found these sheet balsa tails to be much more satisfactory on small models than built-up surfaces, for they are lighter and much less liable to warp, to say nothing of the time saved by their simplicity.

Choose a firm grade of medium balsa. Do not use soft brittle material. The bamboo stiffeners on one side of each surface help to keep the balsa from splitting. Sand the pieces to a smooth surface.

PROPELLER AND LANDING GEAR

Note that a low pitched propeller is designated for flying. This is important, for unless your model is very light, it will mush badly when equipped with a propeller of too high a pitch.

The landing gear has been simplified somewhat from the original, in that the cover plates have been omitted. These I would only be a hindrance on a flying model. Model builders desiring an exact model can obtain this detail from pictures of the full scale XP-40.

Cement the landing gear struts in place before covering the wing. The balsa fairings are added after the wing has been covered.

They are cut to fit from small pieces of scrap balsa.

The propeller spinner can also be carved from a small block of balsa, but in constructing the test model, we found it simpler to build it up from rings of 1/8" sheet balsa, sanding the final assembly to conical shape. Diameters of the rings are easily obtained by directly measuring from the plan.

FAIRING

The wing fairing on the model gave us something to worry about for a while. We thought of using bond paper, but didn't like either the appearance or the weight.

Finally we used 1/32" sheet balsa with excellent results. Fitting the fairing is pretty much a "cut and try" proposition which takes patience, but is not at all difficult. Probably the easiest way is to cut and sandpaper a piece of 1/32" sheet balsa which is somewhat larger than necessary, then pin and cement it in the desired position. When the cement is dry trim the edges of the fairing. We used two pieces on

each side of the model, one between bulkheads E and G, and one between bulkheads G and I. The front end of the fairing curves too sharply for sheet balsa, so we carved this piece from scrap balsa, again using the "cut and try" method. When the fairing was in place we sanded the whole assembly smooth, doped it with clear dope, and then sanded it again.

Try fitting a piece of paper first, until you see how the fairing is to go, and then use sheet balsa.

COVERING AND DOPING

Cover the whole model, except for the tail surfaces, with silver tissue. Then mix some thin scale model dope by using half thinner and half a good grade of silver model dope. Dope the model with this, giving three coats all over except on the tail which only receives two coats. Sand the model lightly between coats of dope. Dope the tail surfaces quickly on both sides, so that uneven drying will not cause them to warp.

Paint a blue stripe and seven red and six white stripes on the rudder, with the usual U.S. Army stars on the wing. Cement the tail and the small details in place. Markings may be added in India ink. The cockpit housing is covered with celluloid and then outlined in silver. Air scoops and radiators are carved from balsa, doped several times with silver dope, sanded smooth again and cemented in place. String the radio aerial from the rudder to each wing tip. Add the pilot tube to the left wing tip and the tail wheel under the tail.



In full flight, climbing for altitude

FLYING

Use two strands of 1/8" rubber for flying. If the model does not climb on this amount use two strands of 3/16" rubber. Correct any tendency to spiral dive by applying opposite rudder. In general you will find that every model flies best when circling in one direction, and this may be left for one model or right for another of the same design. Try to detect the natural turning tendency in your model and aid it as much as possible. If, after applying opposite rudder, your model "crabs," or slides side-ways, relieve the rudder and warp the trailing edge of the inside wing down; that is, the wing which tends to drop. And, of course, if the model stalls, add weight to the nose; while if it dives sharply, warp the elevators up.

The secret of obtaining good flights with flying scale models is simply great patience. It is very improbable that your model will fly perfectly on its first flight. Treat your model carefully until you've learned something about its characteristics, then begin trying for long flights,—and you *can* get them with the XP-40.

MODEL AIRPLANE NEWS, JUNE 1939