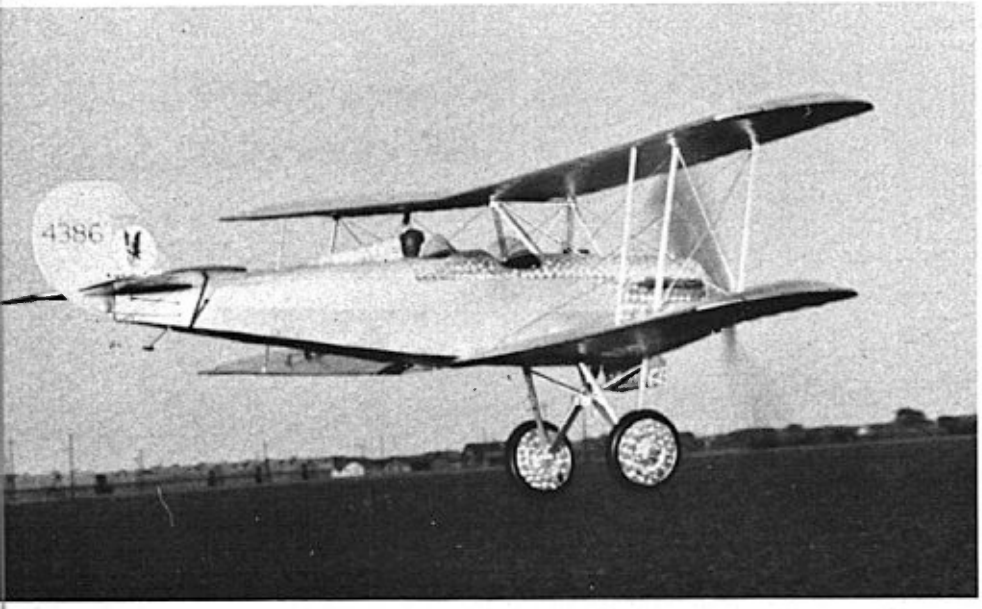


# American Eagle

by George Meyer

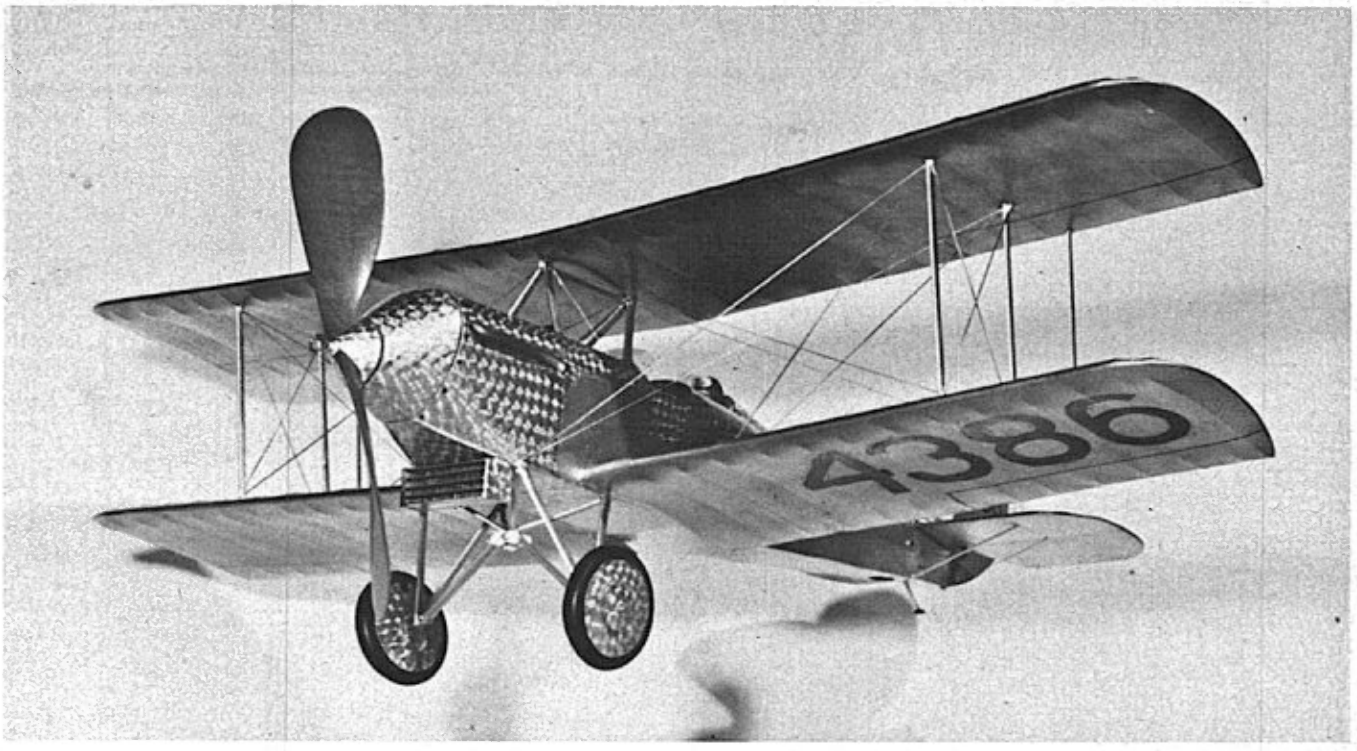
**This 1929 biplane in Rubber Scale combines design and detail in a memorable model.**

The popular "American Eagle" biplane as powered with the Curtiss OX-5 engine had been built in good number throughout 1928, and at least 300 of these craft were already flying in all parts of the country. The likable "American Eagle," though never hailed as a truly outstanding airplane, was a pretty good average for that time; it flew well and had no great vices and though it never enjoyed the popularity of the "Waco" or the "Travel Air," it was well liked by a great many. There are some of these old "eagles" in existence even yet, and one or two are known to be flying. Possibly someday more will be rebuilt and will fly again. The model A-1 was built by the American Eagle Aircraft Corp. at Kansas City, Missouri, an enterprise that was deftly guided into being by E.E. Porterfield Jr. as the President, who in later years organized the Porterfield Aircraft Co., which built the popular "Porterfield" light monoplane of the "thirties."

Listed below are the specifications and performance data for the OX-5 powered "American Eagle" model A-1; span upper and lower 30', chord both 62.5", wing area 300 sq. ft., airfoil "Aeromarine 2A Mod., length 24'1", height 8'4", empty wt. 1227, useful load 814, payload 350, gross wt. 2041 lb., max. speed 99, cruise 85, land 35, climb 500, ceiling 10,000 ft., gas cap. 35-42 gal., oil 4 gal., range 385-425 miles. Late in 1927 the price at the factory was $2450, then $2515, in mid 1928 it was $2825 and later on raised to $2985.

The fuselage framework was built up of welded chrome-moly steel tubing, faired to shape with wood fairing strips and fabric covered. The wing framework was built up of solid spruce spars and wood built-up ribs, also fabric covered. The landing gear was built up of welded steel tubing of streamlined section. The tailskid was a steel tube with a hardened "shoe" on the end to offset rapid wear, it was also rubber shock-cord sprung. The standard color

Photos by Tom Meyer




scheme of the "Eagles" was all silver with burnished "swirls" on the engine and cockpit cowling, prop spinner, and wheel fairing discs. The "American Eagle" really was a handsome airplane and looked very nice done up this way. It has ideal proportions for a Free-Flight scale model with plenty of area in the tail surfaces and a good wing rib airfoil for a rubber scale model.

## Construction Techniques

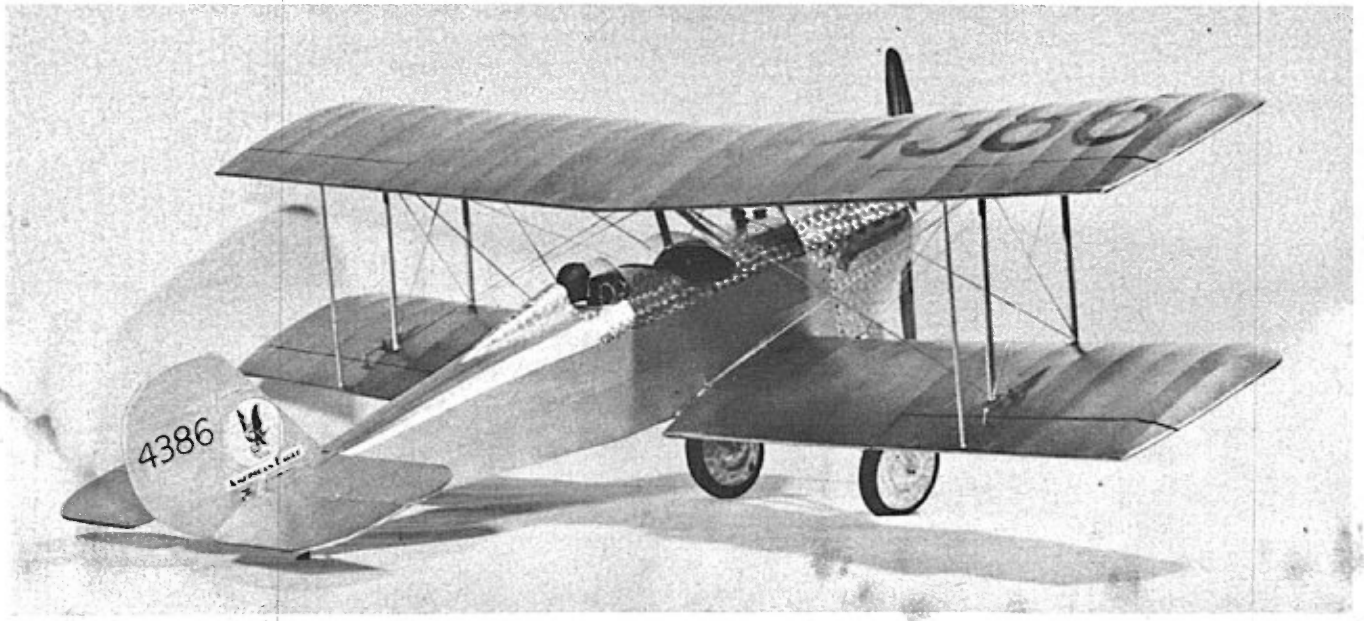
Build the fuselage first in the conventional manner using 1/16" sq. basswood or very hard balsa. Construct both sides, one on top of the other. After they are dry, slice them apart with a razor blade back to the tail post. Put in the cross-pieces as shown on the top view. Cut the bulkhead of 1/32" sheet balsa and install the 1/32"x 1/16" balsa stringers and the 1/32" sheet balsa on the front section of the fuselage as shown on the plans.

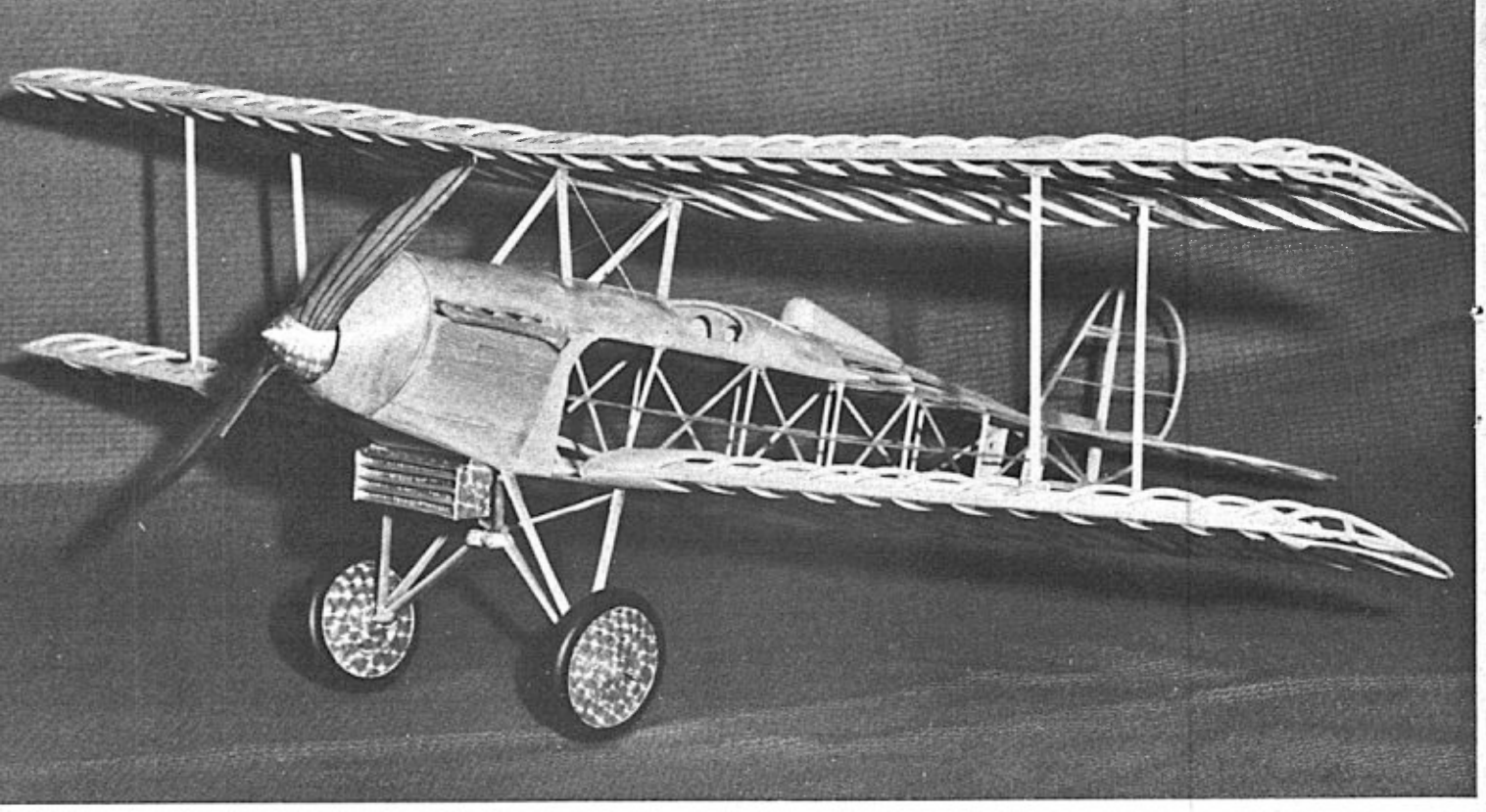
The wheels are built up of 1/32" plywood and 1/8' sheet balsa all glued together on a 1/4" dia. dowel. The dowel is used as a mandrel to hold in the lathe or drill press to turn the correct contours (note the offset in the wheel side plates). When finished shaping, cut the 1/4" dia. dowel off flush with the wheels and drill and glue the 1/16" dia. aluminum bearing in place.

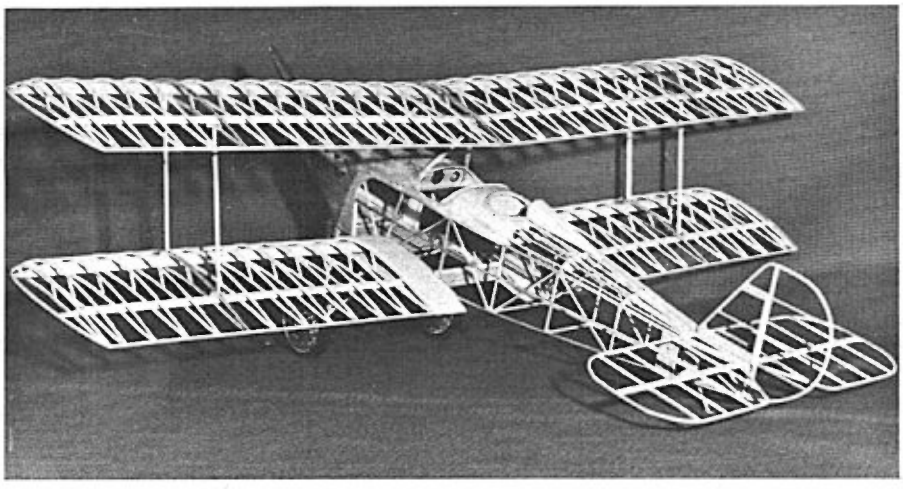
The tailskid is 1/16" bamboo with a shoe made of a puddle of epoxy glue on the end.

The landing gear legs are 1/16" plywood stacked together and sawed, then sand to streamlined shape. The wheel axles are 1/32" dia. wire with a one turn coil at the lower end for landing shocks. Bend and glue the wire to the landing gear cabane struts. Assemble the landing gear wire to the side landing gear struts with two pieces of 1/8" dia. dowel on the lower ends with a saw cut to clear the landing gear coil shocks. Securely glue all joints of the landing gear, but be careful that no glue gets on the coils so they can work freely. Streamline the wire to the cabane with 1/16" sheet balsa with a groove to accommodate the wire. Install the dowels at the center of the gear and wrap with heavy string to simulate the rubber shock cords.

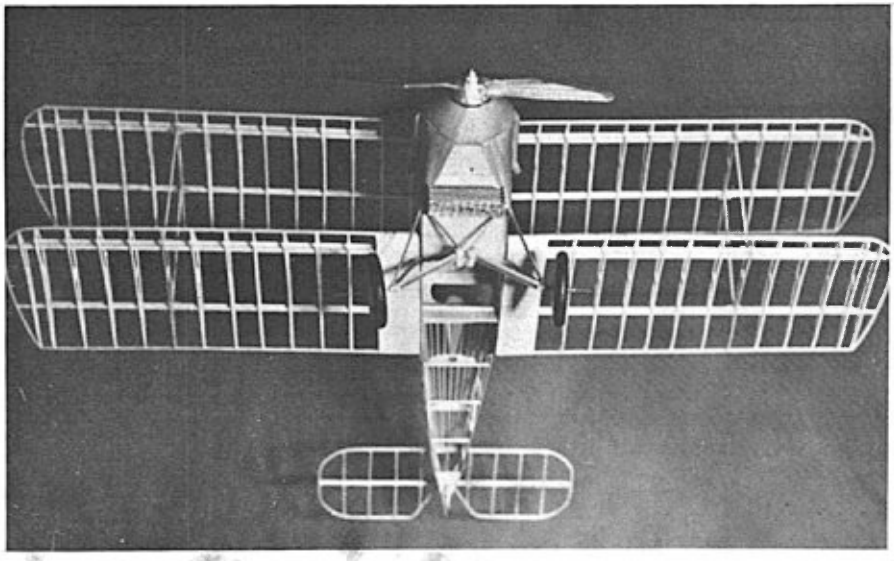
**At top:** Vintage bird, and an inspiration to a modeler. Fly it tenderly. **Facing page:** You can't find fault. Model is a fair size, indoors or out. The finished crate is fit food for any camera, freeze it in full flight. **Below:** Some turns of the prop and the tail is up and flying, you're off.







It's for people who take a pleasure in building. Superb craftsmanship is the name of the game. **Below:** Realistic rib spacing, cowling and gear layout. Spars within the ribs for neater coverage.

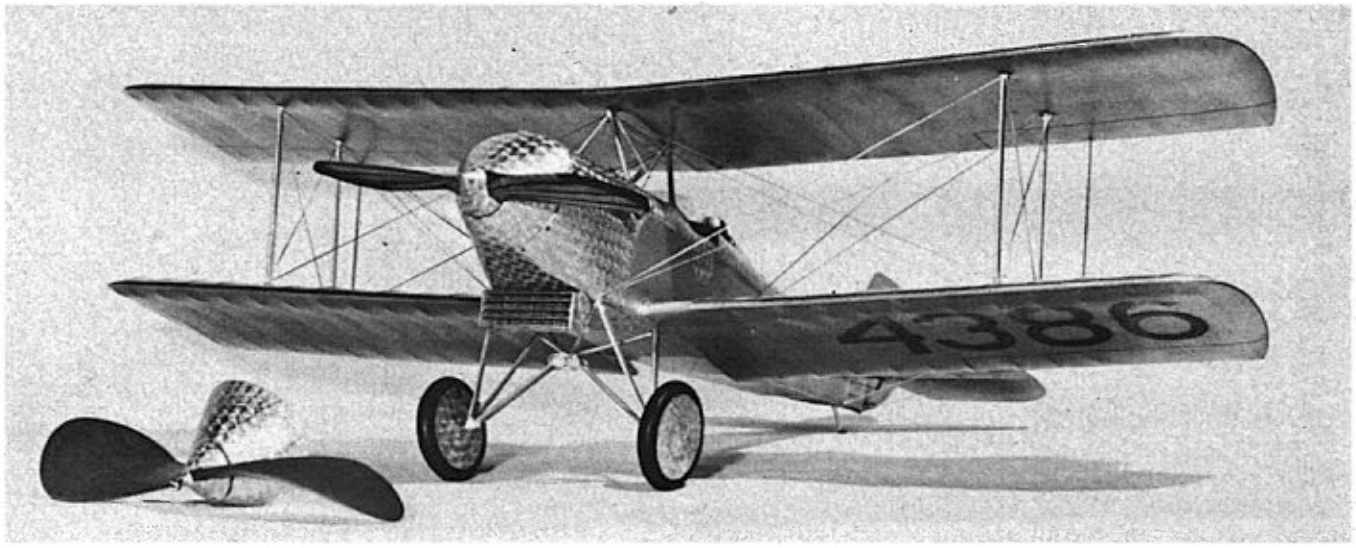


Make the radiator out of 1/32" sheet balsa. Score the front and back with a black ball point pen and then rub them with a copper rub and buff. After assembly, install the 1/32" sheet balsa shutters on the front of the radiator box. Now make the balsa nose block as shown on the plans. Make the exhaust pipes of 1/8" plywood.

The tail surfaces are conventional with 1/32"x1/16" basswood or hard balsa, laminated outlines glued with Titebond Glue, 1/16" sq. balsa spars and 1/32"x1/16" balsa ribs. Use soft aluminum wire for hinges on the elevators and rudders.

Now build the wings. Make an aluminum template of the ribs as shown on the side view of the plans. Slice enough top and bottom ribs of 1/32" sheet balsa (1/32"x1/16") and 1/16"x1/16" sliced ribs to be used on the inboard ends of the lower wings and at the strut attach points. Laminate the wing outlines of 1/32"x1/16" basswood (railroad stock) or balsa around a cardboard template. Curve the template so the tips have a gentle curve as shown on the side view. Your wood will probably be too short, so join them on the leading edge with about 1/2" overlap of the laminations. This is done by cutting one 1/32"x1/16" lamination about 1/2" short and the joining one about 1/2" long so they stay flush.

There should be no problem of short wood on the lower wing. Add a piece of 1/16" square balsa on top of the lamination at the leading edge to form 1/16"x1/8". Sand the outlines and round off the trailing edge and shape the leading edge to match the airfoil. Pin the outlines to the plans on your building board and glue in the top sliced ribs. When dry, remove and install the lower ribs. Mark the ribs at the correct spar locations and fit the spars 1/16" sheet balsa. Mark the spars for proper fit to the tips, then remove, trim, reinstall and glue in place. Be sure to cut the spars and lead-




ing and trailing edge at the center-sections for dihedral at the wing tips. This is necessary for a good flying model. Plank the first bay of the lower wings with 1/32" sheet balsa top and bottom. The wing struts are made of 1/16" basswood as shown on drawing. Sand to streamline shape.

Cover the model with the lightest tissue you can find, or condenser paper for a real light job. I covered mine with black tissue and then after water doping and one coat of 50-50 nitrate dope and thinner, I sprayed all parts with aluminum powder dissolved in clear lacquer, thinned to spraying consistency. Carefully spray with an air brush just enough to get a silver color. Spray one light coat of clear lacquer on top of this to get a little shine. Make the numbers for the wings out of black tissue and glue to the wings with thinned Titebond Glue.

To make the "American Eagle" look like it should with swirls on the wheels, engine cowling, radiator and prop spinner, take some aluminum foil backed with paper from about a half dozen packs of Raleigh cigarettes and tape the aluminum foil paper to a small piece of very smooth wood or metal. Get a pencil with a coarse ink eraser with about 1/4" dia. and clamp in the drill chuck of a drill press. Now carefully just touch the revolving pencil to the foil in a pattern overlapping each swirl about 1/2" dia. When you have completed enough sheets of foil backed with paper, carefully cut them to shape to fit over the head rest, fuselage and other areas to be covered with swirl foil and glue with 50-50 thinned Titebond Glue and water. Allow to dry about 24 hours and then give the foil a light coat of clear lacquer to stop it from tarnishing.

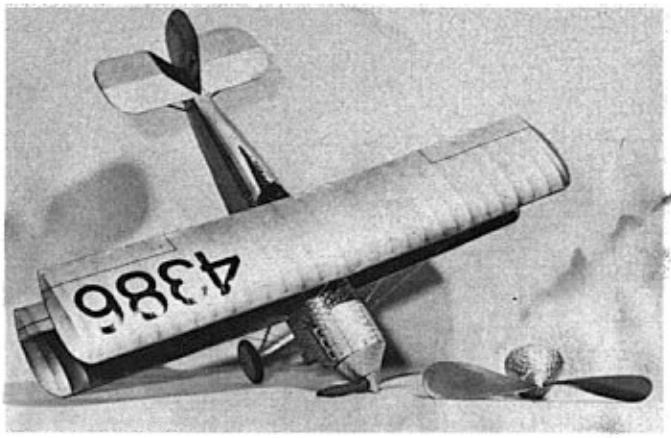
For the exhibition propeller, make up seven laminations of birch glued together with Weldwood Resourcinal glue. This glue is a dark color and makes the laminations really show up when carved. The tips are .005 brass shim stock fastened to the prop with epoxy glue. The spinner is balsa or white pine.

Now, assemble the wings to the fuselage and cabane struts. Be sure to attach the struts at the points on the spar where the 1/16" ribs are located. Drill the fuselage uprights with a 1/32" dia. drill where the flying wires attach and drill the wing struts at the top and bottom ends with the 1/32" dia. drill. Make a needle threader out of .010 dia. wire long enough to go completely through the fuselage. Use Cortland monofilament flat fish line for rigging, rubbed with Silver Rub'n Buff to make them look like stainless wires. Use your long needle threader and pull two wires through the front of the fuselage and two at the rear above the lower wing as shown on the drawing. Then string them through the struts until you have all the areas rigged. Tie off at the strut ends and glue the knots so they do not come loose. Caution, be sure as you string the wires that they do not become twisted, but stay streamlined with the aircraft.

Use a Guillow 9 1/2" wood prop, cut to 8" for your flying prop. Be sure to check the prop to be sure both blades have the same pitch. If they do not, heat the blade that has the less pitch near the hub and twist it and hold it until it cools. I have found this method is easy to get both blades the same pitch. Make your rubber motor of four strands of 3/16" flat rubber 20" long. The model should balance just above the forward edge of the front cockpit. If necessary, add weight to the nose block until it does balance.

When you are ready to test fly, use about 200 turns until the model is adjusted and you will see how impressive the "American Eagle" is in flight.

The first three paragraphs of this article were taken directly from the U.S. Civil Aircraft volumes I and II by Joseph P. Juptner.


**Above:** Neat! George delves into the finer points, swirls on the cowling and points to ponder. A beautiful scale prop and flying screw nearby. **Left, Below:** Oops, a little too realistic on nose-over. Ask any pilot.