

Who can resist this classic old machine that has antiquity for its first name. Open structure, classic landing gear all are part of our history.

ORIGINAL CESSNA

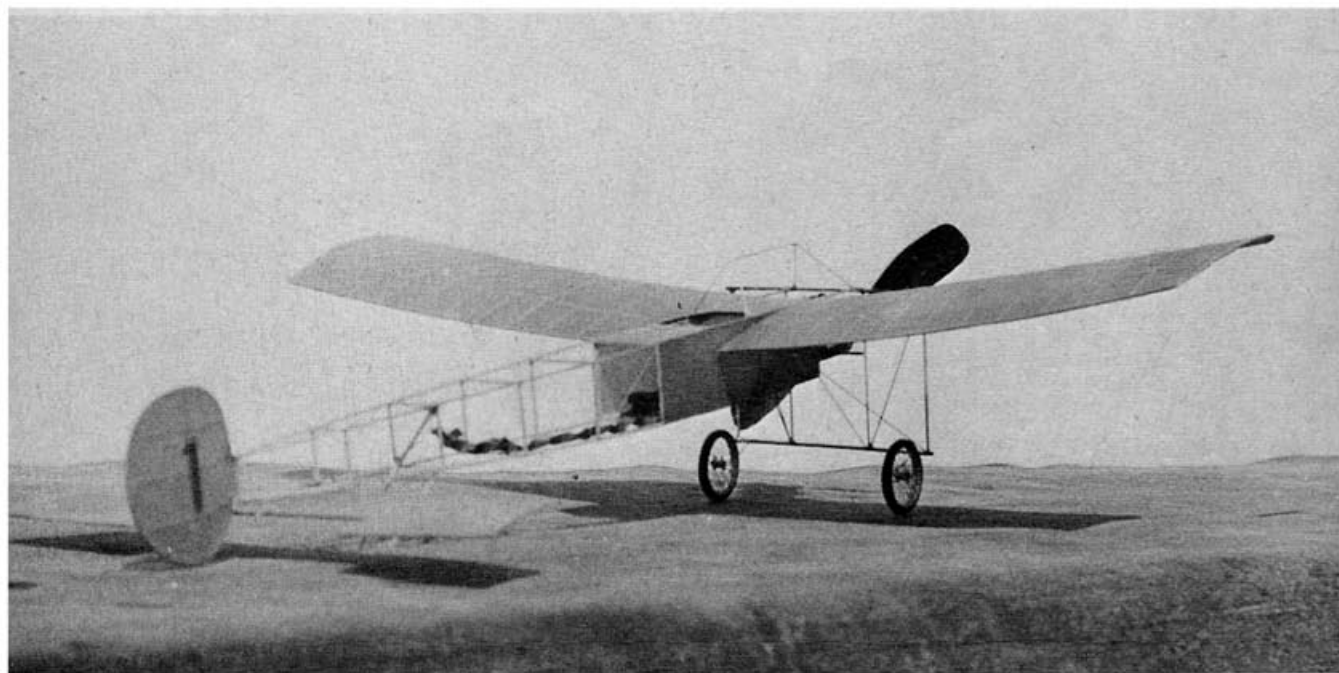
By HENRY STRUCK

► The first of the 50,000 Cessna monoplanes was built by Clyde Cessna in 1911. Use of the term monoplane instead of aircraft is deliberate, as from the first Cessna was convinced that the single wing was the only proper way to support a flying machine. While attending an air show he discovered pilots received as much as \$1,000 per exhibition. Right at the show Cessna sketched the

details of a Bleriot monoplane and labored through the winter to build his first airplane. During 1911 he not only taught himself to fly this machine, but even gave a couple of exhibitions by fall.

The model is a reproduction of this original Cessna Flyer, and has probably flown more consistently than the full size machine, — perhaps Clyde Cessna should have also used rubber power in-

Famous old timer, who has won Nats Flying scale more than once has added a Famous Old timer to his fleet of rubber powered winners. Built in 1911 our antique bird is a natural for scale and with our full size plans in the magazine you can be ready for indoor/outdoor competition.



Highly undercambered wing and stabilizer, plus paddle blade propeller all indicate performance and it boasts three indoor and four outdoor flights.

stead of the constantly overheating, temperamental 60 H.P. Elbridge engine.

Indoors the model has done 1 min. 19 sec. R.O.G. under 40 feet of altitude. An outdoor flight of 5 min. 9 sec. at the Flying Aces Club contest finally lost the model, without even name and address on it,—for shame!

To obtain maximum indoor performance, cover with condenser paper, shave down the weight of all parts, especially the tail group to bring the total weight under a 1 oz. total. Then 5/32 rubber should provide sufficient power and the increase in possible turns to almost 2000 should result in a duration of over 1 min. 30 sec. If primarily intended for outdoor flying, weight is not so critical, as altitude will determine the duration, rather than prop run.

FUSELAGE: Build up the fuselage sides on the full size plan. Select four hard strips of 1/16 sq. balsa for longerons. Protect the plan with plastic wrap and position longerons on plan between pins. Assemble both sides at

the same time, one atop the other. Note the upper longerons extend 1 5/8 beyond the front upright. When dry remove from plan and separate sides by carefully sliding a double edge razor blade through cement at uprights.

Erect sides on upper longerons on a flat surface. Cut cross pieces of 1/16 sq. balsa and join sides at forward parallel section. Check assembly for squareness, draw together at rear and install cross pieces. Cement 1/32 sheet firewall to front of fuselage. Fit 1/32 sheet inside fuselage, behind firewall, to support motor bearers and control post C-5. Install 1/8 x 1/4 balsa motor bearers, adjusting to project 2 1/8 forward of firewall. Back up upper portion of firewall with angles F-6, positioned to meet at center line behind engine crankcase.

LANDING GEAR: Assemble landing gear frame of 3/64 dia. bamboo uprights and 1/16 x 3/16 spruce cross members. Drill cross members to receive uprights. With fuselage resting on

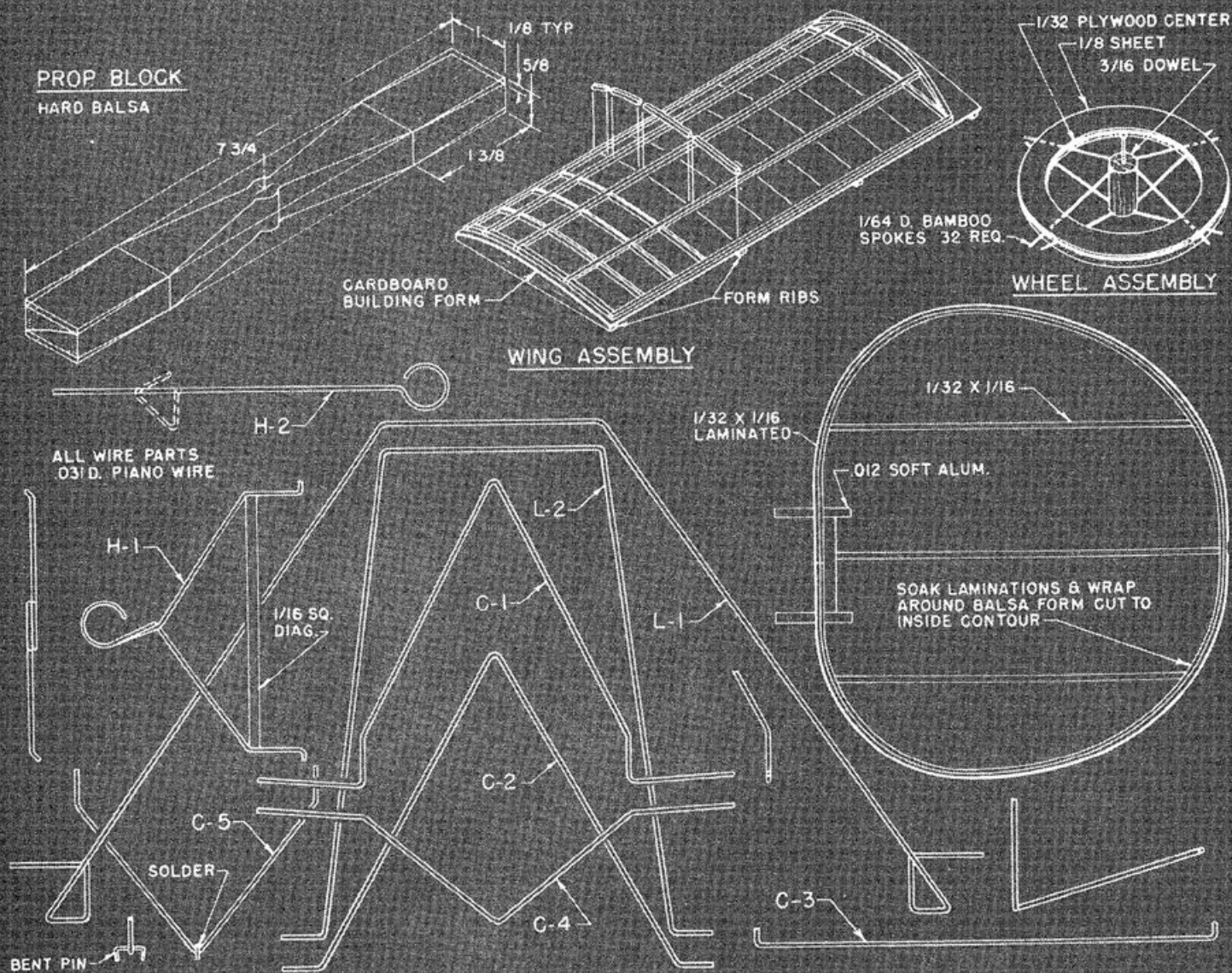
upper longerons cement landing gear frame to ends of longerons and tie to engine bearers with 1/16 x 3/16 cross piece between inner bamboo uprights.

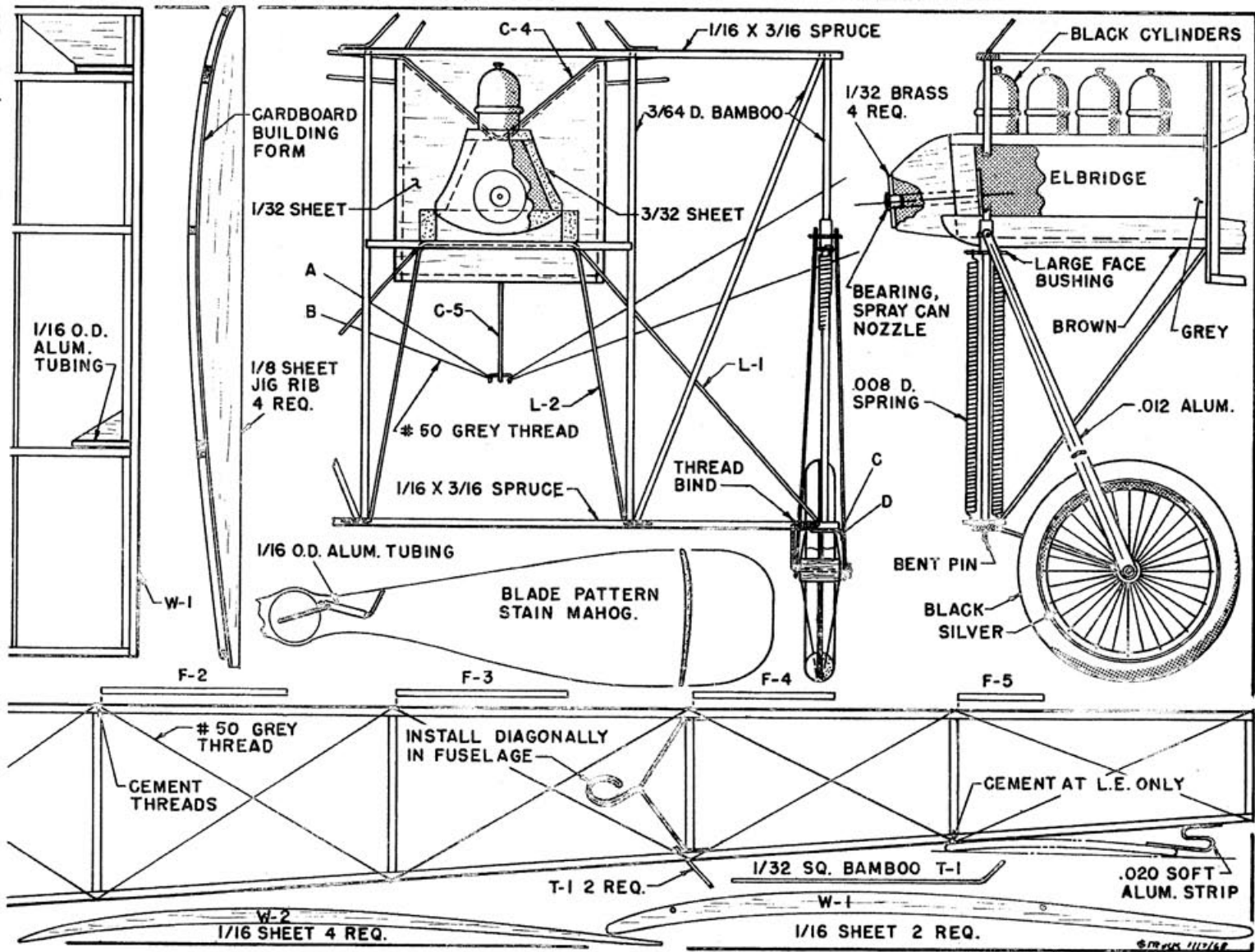
Form the landing gear braces L-1, L-2 of .031 dia. piano wire. Cement braces to firewall under motor bearers and to lower spruce cross member. When dry wrap L-1 to cross member with light thread and re-cement all joints. This arrangement provides a smooth shock absorbing wheel mounting, even though the full scale spring system may not be used.

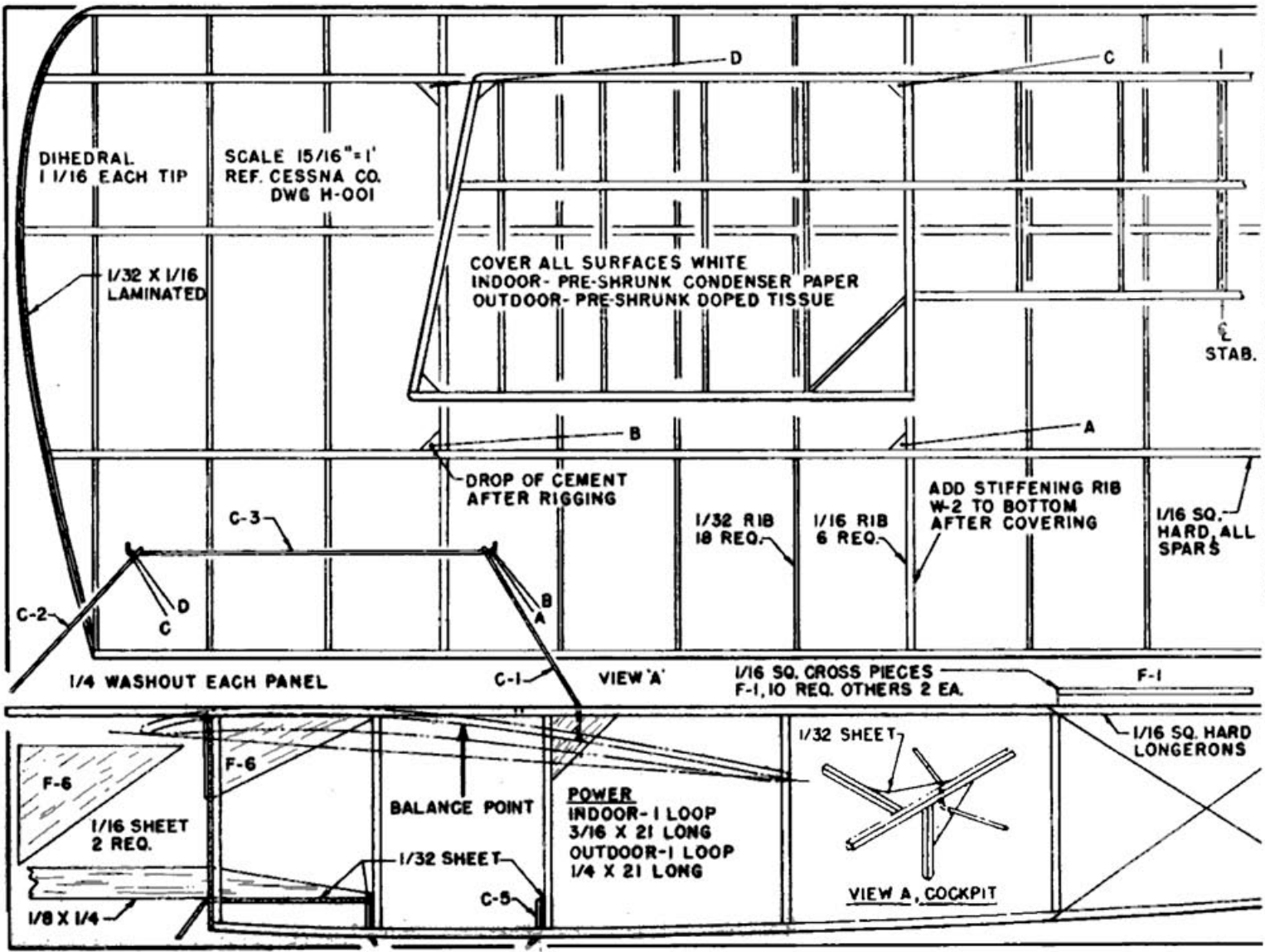
Form the rear rubber hook of .031 dia. piano wire and install diagonally in fuselage, fitting a 1/16 sq. strip between ends of hook.

FUSELAGE BRACING: Brace the uncovered rear section of the fuselage with #50 grey thread. Run the thread from the front, in a continuous length around the fuselage, from station to station to the tail. Do not over tighten the bracing to avoid twisting the fuselage. Run a second (Continued on page 74)

BALANCE OF FULL SCALE PLANS ON FOLLOWING TWO PAGES ▶







DIHEDRAL
1/16 EACH TIP

SCALE 15/16"=1'
REF. CESSNA CO.
DWG H-001

1/32 X 1/16
LAMINATED

COVER ALL SURFACES WHITE
INDOOR- PRE-SHRUNK CONDENSER PAPER
OUTDOOR- PRE-SHRUNK DOPED TISSUE

STAB.

DROP OF CEMENT
AFTER RIGGING

ADD STIFFENING RIB
W-2 TO BOTTOM
AFTER COVERING

1/16 SQ.
HARD ALL
SPARS

1/4 WASHOUT EACH PANEL

VIEW 'A'

1/16 SQ. CROSS PIECES
F-1, 10 REQ. OTHERS 2 EA.

F-1

BALANCE POINT

POWER
INDOOR- 1 LOOP
3/16 X 21 LONG
OUTDOOR- 1 LOOP
1/4 X 21 LONG

1/32 SHEET

1/16 SQ. HARD
LONGERONS

VIEW A, COCKPIT

1/16 SHEET
2 REQ.

1/32 SHEET

1/8 X 1/4

Original Cessna

(Continued from page 17)

length from the opposite longeron to equalize the pull as much as possible. Check the fuselage for twist, then apply a drop of cement to the points where the bracing crosses the longerons.

WING: The thin airfoil of the wing and stabilizer requires the preparation of a simple building form. Cut four jig ribs of 1/8 sheet balsa and cement to a 12 in. length of thin cardboard. Make a metal template to the shape of the airfoil. Cut along the edge of the template, slicing 6 ribs from 1/16 sheet and 18 ribs from 1/32 sheet.

The drawing shows the left panel only. Assemble the right panel opposite with the root rib to the left and the tip to the right, with the intermediate ribs in the same order from the root as the left panel. Position drawing on form and protect with plastic. Select hard lengths of 1/16 sq. balsa for the spars and position on the plan between pins. Cut each rib into sections to fit between spars. Cement sections of 1/16 O.D. aluminum tubing to spars at the inboard rib and reinforce with scraps of 1/16 sheet. Make a form of 1/8 balsa to the shape of the wing tip. Soak two strips of 1/32 x 1/16 balsa in hot water. Hold in place on form with matching piece of 1/8 balsa until thoroughly dry. Cement strips together and replace in form to dry.

STABILIZER: Construct the stabilizer in similar manner. Pin spars on plan, overhanging center line sufficiently to make a one piece stabilizer. Assemble left half of stabilizer on plan. Remove when dry and position center rib on outboard rib, and assemble right half of stabilizer.

RUDDER: Cut a form of 1/8 sheet balsa to the inside contour of the rudder. Soak strips of 1/32 x 1/16 balsa in hot water and wrap around form until thoroughly dry. Keep some tension on strips when wrapping around form to avoid breakage. A little kinking can be tolerated and sanded off after laminations are cemented together. Assemble ribs in laminated outline on plan. Remove from plan and install soft aluminum hinge straps through leading edge of rudder.

Re-cement all joints of frames lightly. Round edges of surfaces with fine sandpaper.

WING MOUNTING: Cement 1/16 root ribs W-1 to inboard ends of wing panels. Carefully form wing mounting fittings C-1, C-4 of .031 dia. piano wire to match full size patterns. Mark position of holes through gusset in fuselage for C-1. These should be oversized to permit shifting of C-1 to correctly locate wing root ribs.

Slide wing panels on fittings and check for alignment by resting leading and trailing edges of root ribs on parallel blocks of balsa. Raise assembly and sight wing panels for alignment. This is always a critical part of the mounting of separate panel wing assemblies since a slight difference in angle between the root ribs obviously results in a condition equivalent to a considerable warp.

Install C-1 from inside fuselage top through holes. Slide wing panels on fittings and carefully work assembly around until root ribs are properly positioned. Check by sighting from front and measuring down from upper longerons to leading and trailing edges. When satisfied, spot cement fittings in place. Re-check and secure fittings with several coats of cement.

COVERING: Due to the light structure some extra precautions are required in

covering. If the ship is to be flown indoors and condenser paper used for covering, the tissue must be pre-shrunk. Build up a stiff frame somewhat larger than a wing panel and cover with tissue. Spray with water, allow to dry and cut paper free. Adhere to frame with tissue cement used for indoor work, or microfilm solution may be used.

For outdoor flying use lightweight tissue also pre-shrunk on a frame. Finish with thin nitrate dope plasticized by the addition of 5% T.C.P. Small local wrinkles can be removed after covering by brushing the area lightly with water.

ENGINE: Build up the engine crankcase of 3/32 sheet balsa sides and 3/16 sheet bottom. Shape the cylinders of balsa to 13/32 dia. Angle the front of the crankcase to provide 5 deg. down thrust. Notch one end of a 1 x 1 x 11/16 long block of balsa to fit into the crankcase. Shape the noseplug to blend with the crankcase lines. Drill a hole through the nose plug to fit bearing salvaged from the nozzle of an expended spray can. This material is quite slippery and seems to end the search for a bearing that can be drilled to nicely fit any particular diameter of shaft. Thick brass plates, drilled to fit the shaft freely, are cemented to the nose plug and propeller to obtain proper balance for flight. These are furthest from the center of gravity, and the most effective ballast with our short nose.

PROPELLER: Layout the propeller on a block of hard balsa. Drill the shaft hole, preferably on a drill press to assure true running. Carve the blades with a sharp knife to about 1/16 thickness, with about 3/64 undercamber. Finish back of blades with a curved sanding block to fit undercamber. Smooth with fine sandpaper to the airfoil section shown, and trim blades to the outline of the propeller blade pattern. Cement 1/32 thick brass plates to each face of propeller hub.

Form rubber hook end of .031 dia. piano wire prop shaft, H-2. Slip shaft through nose plug, add three small brass or teflon washers and slide on propeller. Form front end of shaft into hook for winding and free wheeling engagement. Position the Garami type free wheeling on the prop with the inboard end of wire projecting forward to arrest the shaft hook when the rubber is wound up. After unwinding the rotation of the propeller during the glide will deflect the wire out of the way. Apply several coats of cement over tubing after operation of free wheeling has been checked.

Seal grain of balsa engine parts with several coats of clear dope. Finish crankcase grey and cylinders black. Cement engine to firewall, notching crankcase slightly to fit over wing mount C-4. Stain propeller blades mahogany and finish with two coats of shellac.

WHEELS: The spoke wheels are conversation pieces, but really easy to make. Cut a center ring from 1/32 plywood and face each side with rings of 1/8 sheet with grains crossed. Shape to round section to stimulate tire and rim. Cut hub from 3/16 diameter and drill for 1/32 dia. wire axle. Draw a 1-13/16 diameter circle on a small block of wood. Drill a 1/32 dia. hole at center and erect hub on a short piece of wire pushed into hole. Position the finished tire within the circle drawn, shimming up to bring tire central with the hub. Force a pin through the tire at four points along-

side the plywood center, aiming to the hub. Insert slivers of bamboo and cement to tire and hub. Remove from jig and reposition with installed spokes at bottom. Inert four more spokes in similar manner, displacing these approximately 10 deg. from first set. Repeat process, dividing remaining spaces in half until wheel is complete. This is a great project for those times when you don't really feel like working.

A piece of heavy thread may be doped in place to simulate the rim flange. Finish the spokes and rim silver and the tire black. Make the landing gear scale details of light wire springs and aluminum strips, if desired for added realism. Retain wheels on the axle with a drop of cement.

RIGGING: Force aluminum rudder hinge strips in rear of fuselage and cement in place. Cement stabilizer under fuselage at leading edge only. Attach trailing edge with "S" shaped strip of soft aluminum to permit angular adjustment for flight trim.

Form front cabane strut C-2 of .031 dia. piano wire and cement to upper landing gear cross member. Solder spreader C-3 to apex of cabane struts C-1, C-2. Solder bent pin hook to control post C-5 and cement assembly to 1/32 webs in bottom of fuselage. Cement hooks of bent pins to outboard end of lower landing gear cross piece to carry flying wires.

Slide wings in place. Thread needle with #50 grey thread and knot one end. Pierce reinforcement in wing from bottom at A, and pull thread through to knot. Run thread over rear of spreader C-3 and bring back through top of wing at B. Run thread to control post C-5 and return through original hole at A. Follow the same procedure in rigging the forward set of wires, starting at C in the wing. Secure threads in the wings after checking panels for dihedral and warps.

For power, make up a loop of 3/16 Pirelli rubber for indoor flying, or 1/4 Pirelli rubber for outdoor flying. To avoid bunching at the rear of the fuselage the rubber may be braided to take up most of the slack. Wind the single strand of rubber approximately 44 in. long about 100 turns, then fold in the middle and tie ends together. The stored turns will bunch up along the length of the motor, thereby shortening the motor to fit between the hooks. Lubricate motor with rubber lube and install in fuselage.

Balance the model 3% from the leading edge. Add bits of lead if necessary in holes drilled in bottom of nose plug. Total weight for indoor flying may be under 1 oz., while the outdoor version should be under 1 1/2-oz.

FLYING: Hand glide in calm air. Adjust stabilizer angle to obtain a smooth descent by bending aluminum strip at trailing edge. Bend rudder to obtain slight turn to right during glide.

Wind motor about 250 turns, hand launch gently and model should cruise slowly in right circle. Increase turns gradually, adjusting rudder for an easy circle. The 21 in. loop of 3/16 Pirelli can take about 1600 turns when lubricated and broken in, while the 1/4 Pirelli should take about 1200 turns.

Under full power old Clyde shows remarkable stability even in windy contest weather, while the long prop run doggedly piles up the time.