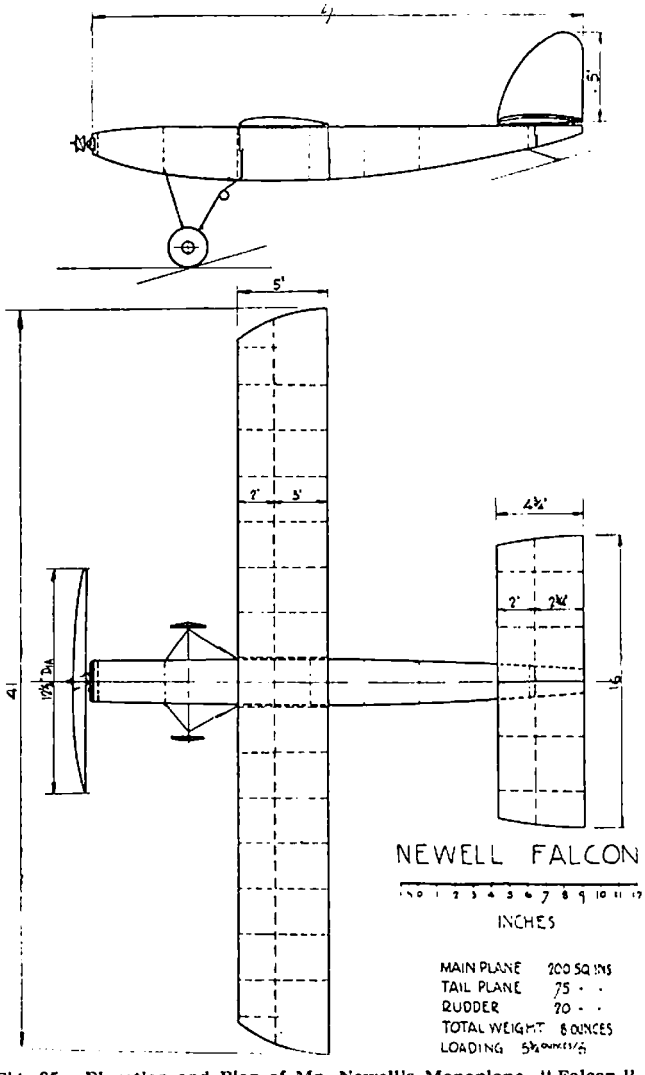


Fig. 85.—Elevation and Plan of Mr. Newell's Monoplane, "Falcon."

CHAPTER XI.

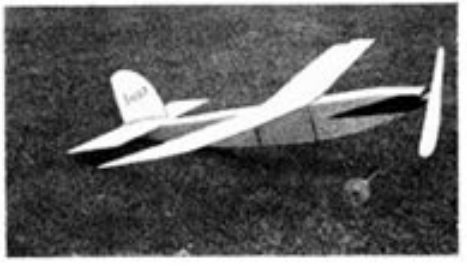
T. H. NEWELL'S MONOPLANE, "FALCON."

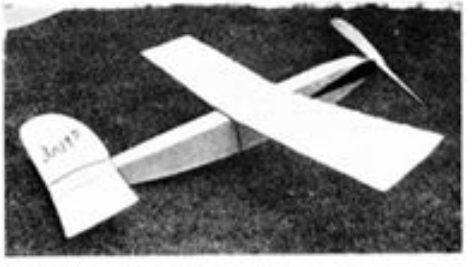
THE extreme simplicity and severity of line would suggest that this is a general-purpose model. But whenever there is a gathering of model flyers and "Falcon" is present, others must be on their guard. From the summer of 1928 until May, 1929, it held the British record for fuselage models rising off the ground under their own power, with a flight of 85 seconds. The model (Figs. 83 and 84) is straightforward in every way. The only striking departure from usual practice is in the side by side arrangement of its three rubber motors in place of the usual vertical arrangement. Possibly this gives greater freedom to the skeins when they run out after about 50 seconds' flight.

The Fuselage.

This is rectangular in section, built up of four silver-spruce longerons, 3-16th in. by $\frac{1}{8}$ in., on plywood birch formers 3-32nd in. thick. Slots are cut in each of the four corners of the formers and the formers are fretted out, leaving verticals and horizontals $\frac{1}{8}$ in. wide. The longerons are glued in position in the corner slots of the formers and bound with silk thread. The nose former, measuring $2\frac{1}{4}$ ins. across by 1 in. deep, is fretted out to take the nose-piece and gear. The fuselage is 27 ins. long, and there are formers at 4 ins., 8 ins., 12 ins., 15 ins., 18 ins., 24 ins., and, lastly, at the stern. The outside dimensions of each of these formers (giving the horizontal dimension first) are $2\frac{3}{4}$ ins. by $2\frac{1}{4}$ ins., 2 9-16th ins. by $2\frac{1}{4}$ ins., $2\frac{1}{4}$ ins. by $2\frac{7}{8}$ ins., 2 7-16th ins. by $2\frac{3}{4}$ ins., $2\frac{1}{4}$ ins. by $2\frac{3}{4}$ ins., $1\frac{3}{8}$ ins. by $1\frac{1}{4}$ ins., and $1\frac{1}{4}$ ins. by $\frac{3}{8}$ ins. The last former at the stern is not fretted out, but has two holes $\frac{3}{4}$ ins. apart to take the fitting made of 20-gauge wire, which has the three hooks for holding the fixed end of each of the rubber

motors. This fitting has eyelets which pierce the stern former through the two holes just mentioned, and is fixed in position with a sliding pin. Excepting the last 3 ins. of the top surface, fuselage is covered in Jap silk and doped. This opening gives access to the motor hooks and in flight is covered by the tail plane. For drawings see Figs. 85 and 86.





Figs. 83 and 84.—The Monoplane "Falcon."

The Gear and Motor.

The gear is composed of three $\frac{1}{2}$-in. diameter gear wheels, and these are mounted side by side at the back of the nose-piece. The nose-piece is built up of three pieces of wood. One is that which is fretted out of the nose former. This is glued to a piece of 3-16th-in. plywood, which, in turn, is

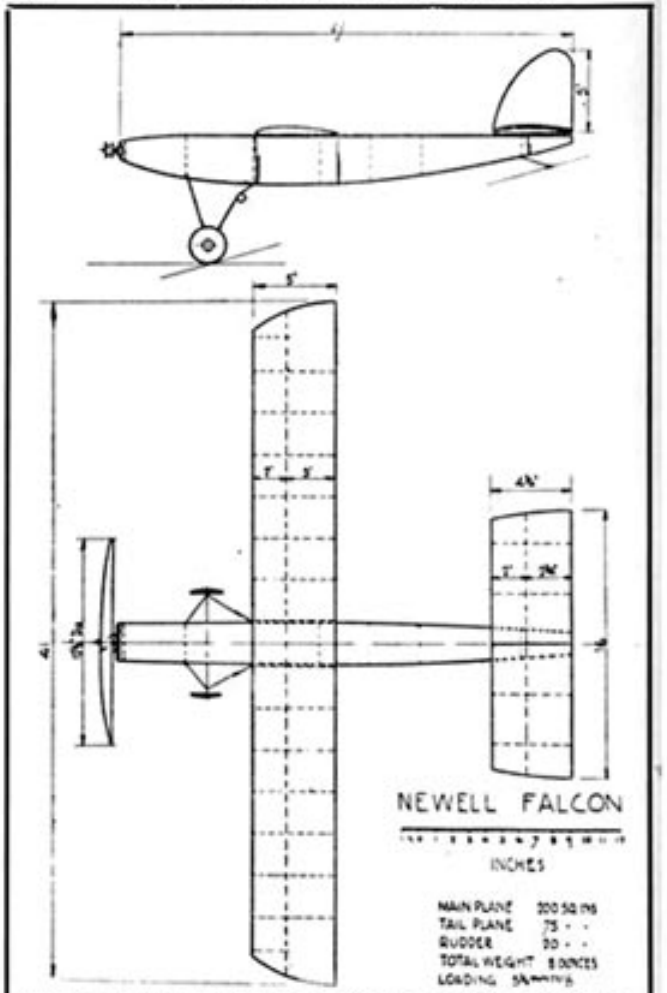


Fig. 85.—Elevation and Plan of Mr. Newell's Monoplane, "Falcon."

faced with a piece of 3-16th-in. satin walnut. This composite unit is shaped to fit the front of the fuselage and carry on the lines. In it clearance holes are drilled for the three spindles and two 10 B.A. plate-fixing bolts. Two steel plates ¼ in. wide are drilled similarly. The centre hole is 3-32nd-in. clearance and the remaining four (two for the shafts and two for the 10 B.A. bolts) are 1-16th-in. clearance. After drilling, these plates are separated, one being put on the front of the nose-piece and one on the back, then bolted up and the gears assembled. The propeller spindle is made of 3-32nd-in. silver steel, and is cut sufficiently long to allow 1½ ins. to project forward of the nose-piece when the gears are in position. The two other gear spindles are made from

Fig. 86.—Port Front View of the Monoplane "Falcon."

1-16th-in. silver steel and project 3-16th in. through the nose-piece. Collets are soldered on to each spindle with the convex side bearing on the steel faceplate. A short length of 20-gauge steel wire is wound tightly, spiral fashion, round the front of the propeller (or central) spindle and soldered close to the bearing collet. The other end is bent at right-angles, forming a dog for clutching the propeller. The fuselage ends of each of these three spindles are hooked to hold the rubber motors and covered with valve tubing to protect the motors.

The Undercarriage.

This is of V form, and is composed of two pieces of 18-gauge wire, with an axle also of 18-gauge wire. The front struts are in one piece, commencing at the axle, passing through fuselage at 4 ins. from the nose, where the wire is held in small metal fittings on lower longerons, then down to the axle at

the other side. Each of these legs is 4⅛ ins. long. They are soldered at the axle 5¾ ins. apart by being turned inwards for ½ in., bound with florists' wire and soldered. The rear legs on each side are also made of one piece of wire, but a single loop ⅜ in. diameter is formed in each of these and make very efficient shock absorbers. This piece of wire does not pass through the fuselage, but is connected underneath at 8 ins. from the nose by two 10 B.A. bolts passing through tin clips clamped round the wire. The bottom ends of these struts are only looped round the axle so that by releasing the two clips the whole undercarriage folds up and makes packing easy. The wheels are 2 ins. diameter fretted out of the 3-32nd-in. plywood lightened by cutting away unnecessary wood. A disc of ⅛-in. plywood ½ in. diameter is glued on to one side of each wheel and the centre bushed with ¼-in. brass tubing threaded externally. The wheels are then covered with Jap silk and given two coats of dope. After slipping the wheels on to the axle they are held in position by a wrapping of florists' wire sweated to the axle.

The Main Plane.

The main plane is made in one unit from tip to tip, 41-in. span, 5-in. uniform chord, and of approximately "Clark Y" section. The front spar at the leading edge is 3-16th-in. by ¼-in. silver spruce, the front edges of which are rounded off. At 2 ins. from the leading edge are two spars of ¼-in. square birch. The trailing edge is ¼-in. by 1-16th-in. birch. There are fourteen full ribs cut from 1-16th-in. birch plywood. Slots are cut in these to take the spars, one at the leading edge, one at the trailing edge and two (one at the top of the rib and one at the bottom) 2 ins. from the leading edge. The ribs are lightened by fretting out the centres. I can best describe the wing section in this way. The deepest portion is 2 ins. from the leading edge. The under surface from this point is flat to the trailing edge. Forward of this it rises ⅛ in. to the leading edge. From the round nose the upper surface rises to its maximum height of ½ in. at 2 ins. from the leading edge and then curves downwards to the trailing edge. A dihedral of 2½ ins. is given to the main plane by steaming the spars before assembly. The centre ribs are 2¾ ins.

apart and the remainder are at intervals of 2½ ins. At each wing tip and 2 ins. from the last full rib is a half-rib connecting only the leading edge and central main spars. The tips are made of 18-gauge steel wire glued and bound to the ends of the spars.

Two wire saddles secure the main plane to the fuselage. These are 20-gauge steel wire bound to the leading and trailing edges and bent to fit the fuselage at the widest part. The bottom ends of these are hooked as shown in the side elevation of the machine and take small rubber bands which run under the fuselage; thus allowing the position of the plane to be adjusted and protecting it in case of a bad landing. The plane is covered top and bottom with Jap silk and then doped.

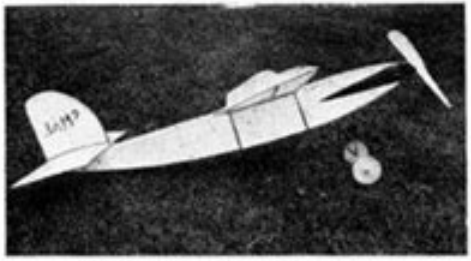


Fig. 87.—The "Falcon" Aground.

The Tail Plane and Rudder.

The tail plane is built in much the same way as the main plane, though of shallower section. The fixing is rather different. Two short 20-gauge steel wire prongs connected to the leading edge slip into eyelets on the top fuselage longerons, while a saddle similar to those used on the main plane is bound to the bottom centre spar, this, in turn, being held to the fuselage by a rubber band. Pieces of 1-16th-in. tubing ¼ in. long are bound to the leading and trailing spars of the tail plane to which the rudder is attached. The rudder is a simple frame of 18-gauge steel wire covered with silk and doped. The bottom ends of this wire frame are bent horizontally and slipped into the short tube just described.

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