

MODEL AEROPLANES

By F. J. Camm, M.Ae.S.

Last month I pointed out the advantages of balsa wood as a new material for modelling purposes, and appended are some particulars of a model with a solid built-up fuselage and solid tail made from this wood by Mr. H. C. Ellis.

The fuselage of this simple tractor model is cut from a piece of balsa 21 in. long, 3 in. wide and $\frac{1}{2}$ in. in thickness. A portion of the fuselage is cut away as shown in the drawing to admit the rubber motor. This is best accomplished by using a sharp chisel, and care should be taken in cutting the balsa or too much may be cut out, thereby weakening the fuselage.

The propeller is 8 in. in diameter and has



a pitch of 22 in., and therefore a pitch angle of 42 deg. Sheet brass, $\frac{1}{16}$ in. thick, is used for the propeller bearing, and is shaped and bound to the fuselage as shown in the drawing. A plain bearing and propeller shaft is used as a mounting for the propeller. The rear rubber hook is of $\frac{1}{16}$ in. steel rod, which is bent to shape, and fastened to the rear of the fuselage by binding and glueing as shown in the drawing. Ten feet of $\frac{1}{8}$ in. flat rubber is used for the motive power.

The landing gear is constructed of $\frac{1}{8}$ in. bamboo, and is shaped and bound to the fuselage at the points shown in the drawing. A $\frac{1}{16}$ in. steel axle, threaded and fitted with nuts, is bound and glued to the landing gear. The wheels are 2 in. in diameter.

The fuselage is drilled at the points shown to take the tail skid, which is $\frac{1}{8}$ in. bamboo.

The stabiliser and rudder are cut from $\frac{1}{4}$ in. balsa. Small nails or brads and glue are used to fasten them to the fuselage. Solid ribs of 1-16 in. spruce or balsa are used in the construction of the main plane. The edges of the main plane are of $\frac{1}{8}$ in. bamboo. Care should be taken in assembling the main plane so as not to have it warped.

The ribs should be glued to the spars and bamboo wing edges. After the glue is dry, cover the planes with silk, which may be purchased from several of the model supply houses selling model aeroplane supplies. After the wing is covered the dope should be applied. The main plane is fastened to the fuselage by a rubber band, a simple and secure method of fastening that has the advantage of economy and yet that permits the main plane to be shifted to secure correct balance.

After the rubber motor has been placed on the motor and propeller hooks, the sides of the fuselage may be covered over with bamboo paper, which is doped or varnished, to seal the opening in which the rubber motor is placed and obtain a smooth, unbroken fuselage with minimum air resistance.

Winding Propellers

It is unwise to wind new rubber to its full elastic limit. Modellers have frequently written to me complaining of the fact that "the rubber I bought from So-and-So's broke the first time I used it." Investigation has found that the reader has been using well-worn rubber that he knew would stand about 1,000 turns, and upon replacing it with the new has given it 1,000 turns straight away. No rubber can be expected to stand this; the machine should have been given several flights with only 300 turns, several more at 400, and so on up to the limit. With twin-screw machines do not place all the turns on one screw at once; place 100 on one, then 100 on the other, and so on alternately up to the limit.

Erratum.—The last line of the first paragraph in this section last month was by an oversight omitted. It should read "remaining open during the up-stroke."

J. N. (Shipley).—The model must have been flying at an altitude of 408 ft., as the following calculation will show:—

$$\begin{aligned} DB &= AB \cot 32. \\ CB &= AB \cot 42. \\ CD &= DB - CB = AB \cot 32 - AB \cot 42. \\ &= AB (\cot 32 - \cot 42). \\ 200 &= AB (1.6003 - 1.1106). \\ AB &= \frac{200}{1.6003 - 1.1106} = \frac{200}{.4897} = 408\text{ft.} \end{aligned}$$

A. B. (Northumberland).—Your suggestion is entirely impossible, and we advise you to dismiss it from your mind.

