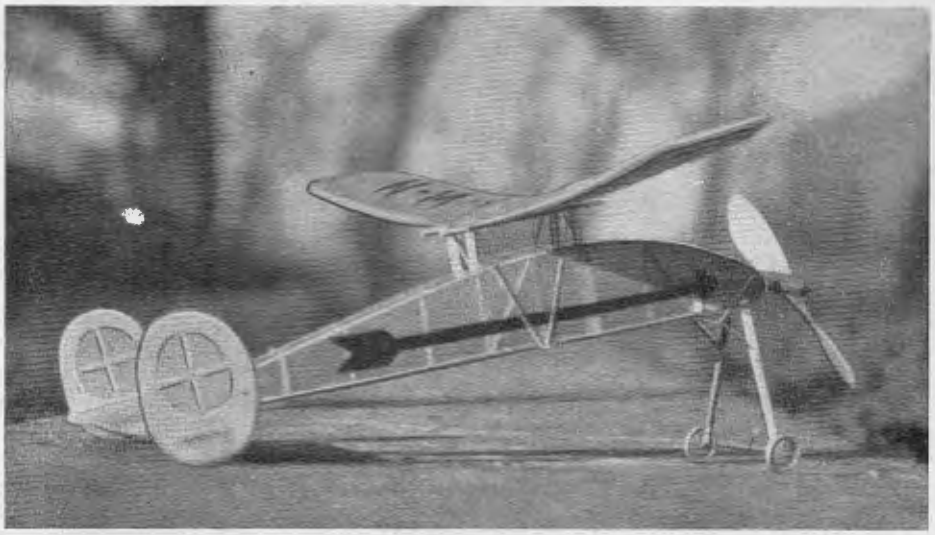

THE BLACK ARROW

By W. E. MOLE

AN UNUSUAL BUT EASY MODEL

Fuselage.

A full-size plan should be drawn of this and the two sides built on it in the usual manner, and then joined across by the cross members. All longerons and fuselage struts are of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa, and the first bay is filled in with $\frac{1}{16}$ in. sheet balsa. Aluminium tubes are cemented through these as on plan to take the undercarriage fixings.

The wing supports are then added, these being four uprights of $\frac{1}{4}$ in. × $\frac{1}{8}$ in. hard balsa, and which are slotted to fit over the cross braces on the top and bottom of fuselage. Where these project above the fuselage they are sanded to a streamline shape. Two runners of $\frac{1}{8}$ in. × $\frac{1}{8}$ in. balsa are then firmly cemented into place on the top of these by being let into a right-angled slot.

Main-plane.

This is a simple structure, and is made in three pieces which are then joined into one. The first is the centre section, and consists of two ribs joined across by pieces of $\frac{1}{16}$ in. balsa, as shown.

The main wings are then made, these consisting of $\frac{1}{16}$ in. balsa ribs on two spars of $\frac{1}{8}$ in. × $\frac{1}{16}$ in. balsa, and with a $\frac{1}{4}$ in. × $\frac{1}{16}$ in. balsa trailing edge. The leading with a · in. × $\frac{1}{16}$ in. balsa trailing edge. The leading edges is $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa, and is sanded on the front is cut in the rib twice as deep as the spar, and then the gap filled in with a small piece of balsa. This will prevent a ridge forming along the top of wing when it is covered, which would reduce the efficiency and the appearance of the finished job. Wing tips of $\frac{1}{16}$ in. sheet are added with cut-outs. If the builder so desires he may make the wing of twice as many ribs of $\frac{1}{32}$ in. balsa.

Empennage.

This is built as a unit and fits into the rear of the fuselage in the manner of a nose block, and is held in with rubber bands passed round small pins in the fuselage and tail group. The elevator is built of $\frac{1}{16}$ in. balsa ribs on a $\frac{3}{32}$ in. × $\frac{3}{32}$ in. spar with a leading edge of the same size, and a trailing edge of $\frac{1}{4}$ in. × $\frac{1}{16}$ in. balsa. The block, which fits into the rear of the fuselage, is built on to this, and the contour of the fuselage is carried through by adding two pieces of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa running from the top of this to a point on the trailing edge. The rear hook of 18 s.w.g. wire is inserted through and bent behind it and well cemented. The twin rudders are built of $\frac{1}{16}$ in. sheet balsa, with cut-outs and cross struts of $\frac{1}{16}$ in. × $\frac{1}{16}$ in. balsa. These are cemented (when covered) to the end ribs of stabiliser, which must be perfectly parallel and upright.

Undercarriage.

This is simply two lengths of $\frac{1}{4}$ in. × $\frac{1}{16}$ in. bamboo streamlined and braced by 18 s.w.g. wire and stub axles and fuselage fittings bound and cemented on 1 in. wheels of aluminium are put on and held in place by turning up the ends of the stub axles.

Nose Block.

One-eigth in. sheet balsa is laminated to form the nose block, and a brass bearing, pushed through to take an 18 s.w.g. piano wire prop. shaft. The prop. is an 8 in. "Paulowinia" type, and held in place with an 18 s.w.g. wire clip as shown. A free-wheel may be addded if so desired.

Covering.

This is done in the usual manner, but care must be taken to stick the tissue to the under side of the ribs. The whole is given two coats of dope. On the original an arrow of black tissue was doped to the sides of the fuselage.

Flying.

A motor of four or six strands of $\frac{1}{4}$ in. flat rubber three or four inches longer than the distance between the hooks is installed, and the wing held in place by two rubber bands being passed round the wing and stretched to the bottom of the fuselage on each side, where they are held by a small length of bamboo.

The model is got into trim by gliding, and this may be obtained by altering the angle of the elevator if necessary by packing with small sections of balsa. In the same manner the model may be made to circle in either direction. The twin rudders are extremely sensitive, and need only small sections of packing pieces. When it is well lubricated and run in the motor may be given 350 to 400 turns, which will give a very satisfactory flight.

A full list of materials for building this model is given on page 321