

# Is Your Plane a Record-Breaker?

Make it skim the tree-tops while its rivals are skimming the grass!

**M**ANY a proud owner of a model aeroplane is quite content to wind it up, and let it fly just where chance and the wind take it. This means missing a great deal of fun, because a good model can be made to circle to left or right, cover a greater distance, climb higher, fly faster, or even loop the loop, by means of a few simple alterations.

The only expense is for a few extra yards of strip rubber, and some rubber lubricant.

It is a good plan to carry out your experiments, particularly when trying to loop, over long grass, which breaks the fall splendidly if your machine crashes.

The first step is to learn to fly straight. This is achieved by adjusting all the parts of the model correctly, and overcoming the "torque" or turning tendency of the revolving propeller. In a spar model, this is done by bending the rudder edging at the top, so that when you look at it from the propeller end of the model, you see part of the rudder on the opposite side to the turn. For instance, if your propeller turns to the right, or clockwise, you should be able to see the left hand side of the rudder.

In a fuselage model, the nose-piece is tilted sideways away from the direction of the turn, by gluing a strip of card between the nose-piece and the fuselage on that side, as shown in Fig. 1. A thin nail,  $\frac{3}{16}$  inch long, can be partly driven into each side of the fuselage, near the front where there is solid wood, and the nose-piece held firmly in position by passing a rubber band around it from nail to nail (Fig. 2).

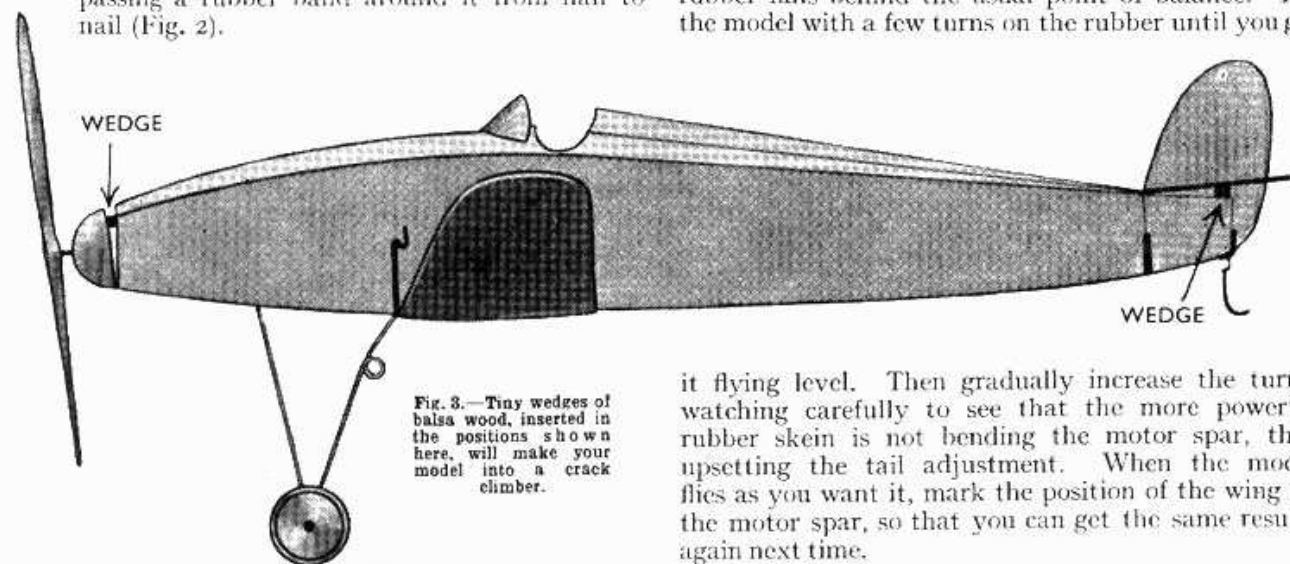


Fig. 3.—Tiny wedges of balsa wood, inserted in the positions shown here, will make your model into a crack climber.

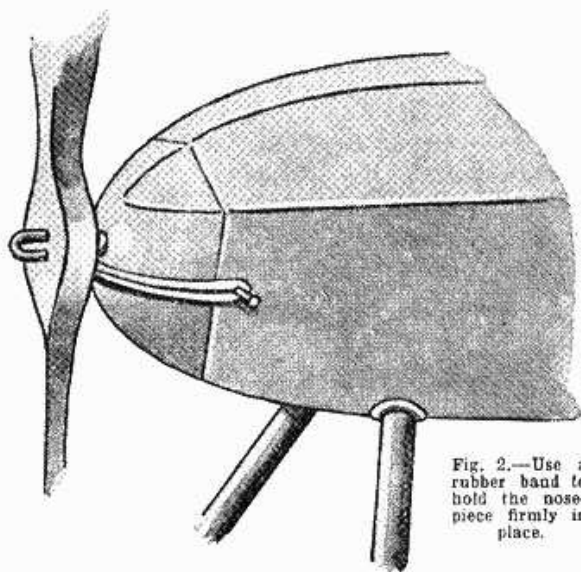


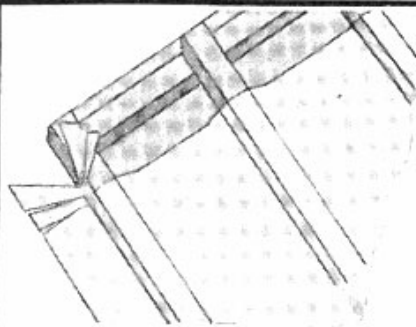
Fig. 2.—Use a rubber band to hold the nose-piece firmly in place.

A spar model can be made to fly in a left-hand circle by bending the rudder in that direction, and bending the rear edge of the *right-hand* wing-tip slightly downwards. Bending the rudder the other way, and the left-hand wing-tip down will give you a right-hand circle. A fuselage model can be made to turn in one direction by removing the card you have inserted between the nose-piece and the fuselage, and in the opposite direction by adding more card.

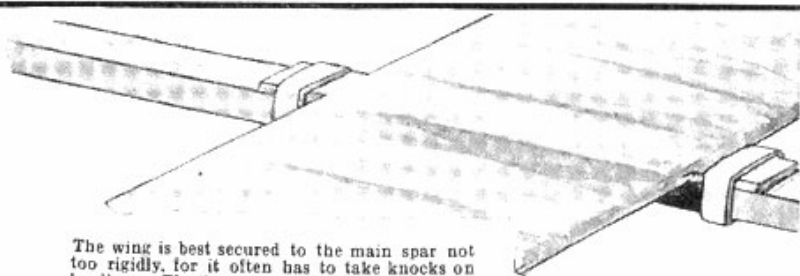
If you want to make your plane cover a greater distance, remove the rubber skein, and fit a new one about 2 inches longer, but composed of the same number of strands. Get the model to fly straight, or the extra distance will not be noticed.

When the other fellow's plane is jogging along just a few feet above the ground is the time to send yours well above the tree-tops! If you are prepared for such an occasion, you can do this very quickly and easily. Slip off your usual rubber skein, and fit another of the same length, but with two extra strands in it. You will need to move the wing back a little, because you will find that the weight of the extra rubber falls behind the usual point of balance. Try the model with a few turns on the rubber until you get

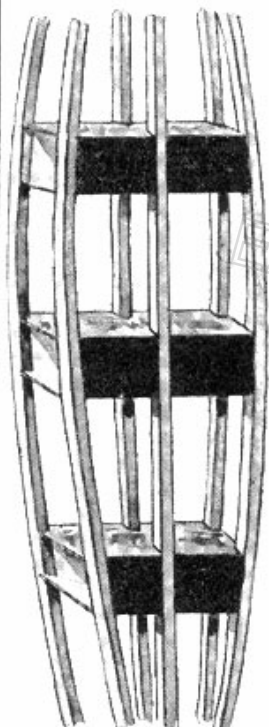
it flying level. Then gradually increase the turns, watching carefully to see that the more powerful rubber skein is not bending the motor spar, thus upsetting the tail adjustment. When the model flies as you want it, mark the position of the wing on the motor spar, so that you can get the same results again next time.



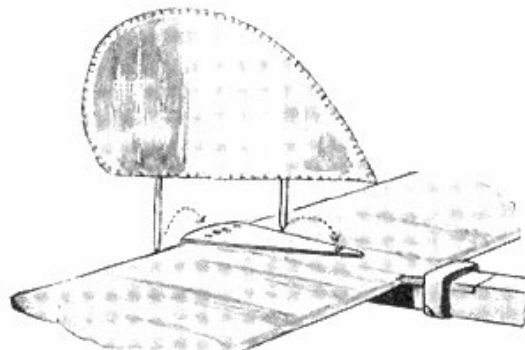
The tricky job of stretching fabric over the wing spars—and of getting the corners neat—is simplified if you tuck the ends over first and then make the cuts shown. These should be stuck down before fastening the side pieces.



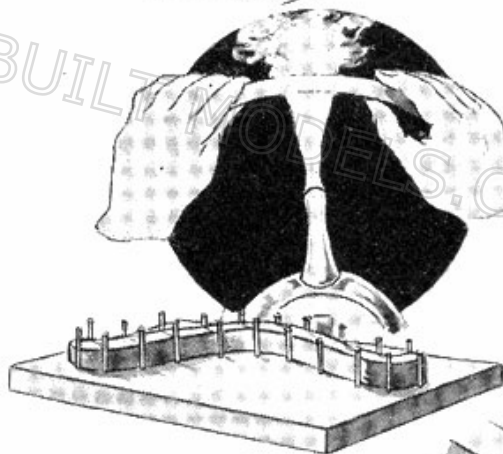
The wing is best secured to the main spar not too rigidly, for it often has to take knocks on landing. Elastic bands are best. Pieces cut from a rubber tube that are an easy fit for the spar will often save a damaged wing.



In larger models the question of frame-rigidity often becomes a problem. This may be solved if you remember the great strength of a matchbox compared with its weight, and take a tip from the diagram. Holes can, of course, be cut in the boxes to accommodate the motor-elastic without sacrificing the strength.



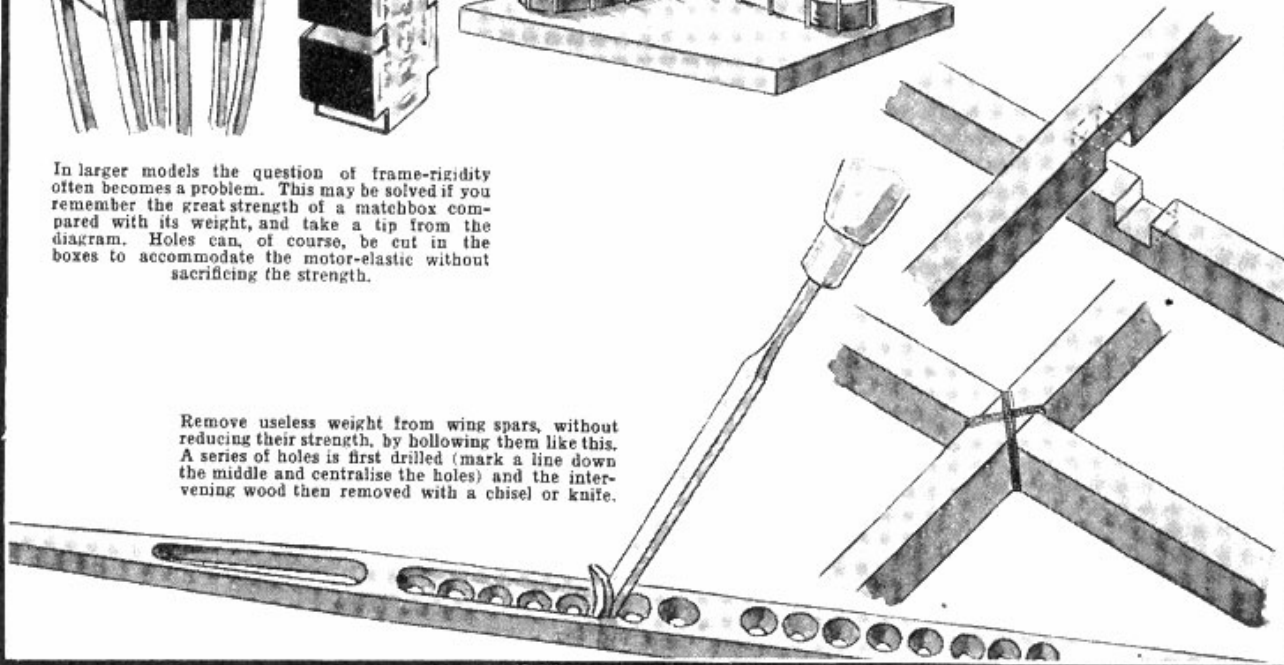
An adjustable rudder is a refinement that doesn't add any real weight. The wire of the rudder-frame is arranged to leave two pins, the front one of which fits in the pivot-hole, the other being inserted in the requisite quadrant-hole.



This is the best way to bend spars or wing-ribs. Steam with a boiling kettle, and then place the spar in a former consisting of nails driven firmly into a board to the exact curve required. Allow some hours for it to set.

The best joint for spars which have to cross is the half-lap, as shown. Bind the joint afterwards with strong thread, which should be glued in place, or varnished.

Remove useless weight from wing spars, without reducing their strength, by hollowing them like this. A series of holes is first drilled (mark a line down the middle and centralise the holes) and the intervening wood then removed with a chisel or knife.



### Tips for Model Plane Builders

## IS YOUR PLANE A RECORD-BREAKER?

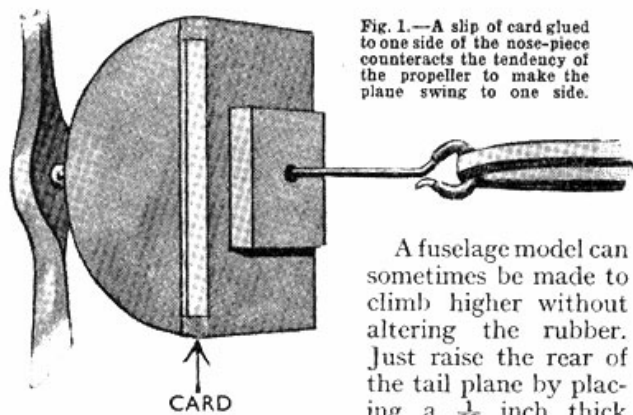


Fig. 1.—A slip of card glued to one side of the nose-piece counteracts the tendency of the propeller to make the plane swing to one side.

A fuselage model can sometimes be made to climb higher without altering the rubber. Just raise the rear of the tail plane by placing a  $\frac{1}{16}$  inch thick piece of balsa wood

between it and the fuselage, and tilt the propeller forward by placing another similar piece between the top of the nose-piece and the fuselage (Fig. 3). Strap the nose-piece into place, or the packing will be shaken out by the vibration of the propeller. If the fuselage model is slow or low-powered, it may be necessary to fit extra rubber, in which case do not forget to move the wing back, and try flying with a few turns before you wind fully.

Another idea is to turn your plane into a racer. All you have to do is to add two strands of rubber to your usual amount, just as if you were trying to improve the climb, but in this case, *do not lengthen the skein*. In fact, it might be better to shorten it by

an inch or two. Move the wing back rather more than you did for climbing, or you will find that the model will gain height, which will reduce its speed. When the plane shows no sign of climbing with 50 turns on the motor, it is correctly adjusted.

Watch the motor spar for any signs of bending under the strain of the fully-wound rubber. The model will not stay aloft as long as usual, but the fine burst of speed is worth it!

To get successful loops a certain amount of skill and experience are required. Even then there is always the risk of a crash through the model hitting the ground before it has time to level out.

With a spar model, add two strands of rubber without lengthening the skein, and get the plane flying straight, or it will fall over sideways at the top of the loop instead of going over cleanly. Tip up the rear edge of the tail plane, and move the wing forward  $\frac{1}{16}$  inch at a time until the model goes over without any tendency to hang at the top and fall back.

A fuselage model can often be made to loop by turning the nose-piece upside down, provided that this brings the propeller shaft lower down than usual. It may be necessary to add more rubber, and to tilt the nose-piece to one side to hold the model level against the increased torque of the more powerful motor.

Probably most fellows who possess a beautiful fuselage model will hesitate to risk loops, since there is always the chance of a crash through faulty adjustment or sheer bad luck! That is where the humble spar model comes in!

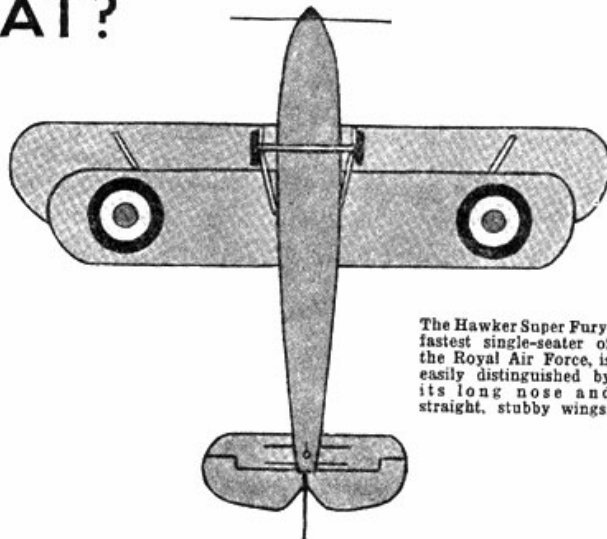
## WHAT PLANE IS THAT?

IF you hear the full-throated roar of a powerful aero-engine overhead, and, on looking up, pick out a plane with these trim lines, you'll know you're seeing the fastest single-seater fighter in the world—the Hawker Super Fury!

There are quite a few Hawker machines of one kind or another in the R.A.F. now, and they are easy to tell from aircraft of other makes because of their stubby round-ended wings and long noses. But telling one Hawker machine from another—a Hart from a Demon, for instance—is much more difficult. In some cases it takes an expert to do it, and even he will be stumped if the planes are flying at any height at all.

Hawker Furies and Hawker Super Furies are almost indistinguishable in the air, but you can tell either of them from Demons and Harts, because in the latter the front edges of the top wings slope backwards from the fuselage, and the tail is a different shape. In Furies the front edges of both wings and tail are dead straight.

Top speed of the Super Fury is a closely-guarded secret, for the plane is on what is known as the Air Ministry Official Secrets list. But the ones which are offered for sale to the air forces of other countries will do 250 miles an hour, so you may be sure those used by our own air force are considerably



The Hawker Super Fury, fastest single-seater of the Royal Air Force, is easily distinguished by its long nose and straight, stubby wings.

faster than that. No other country can match their speed. Actually, Furies are used by the air forces of both Portugal and Jugo-Slavia, and Nimrods—which are Furies adapted for use on aircraft carriers—form an important part of the Japanese Air Arm.

In case you feel like building a scale model of a Fury, the total wing span is 30 feet; the height 10 feet 2 inches; and the length 26 feet 8 inches.