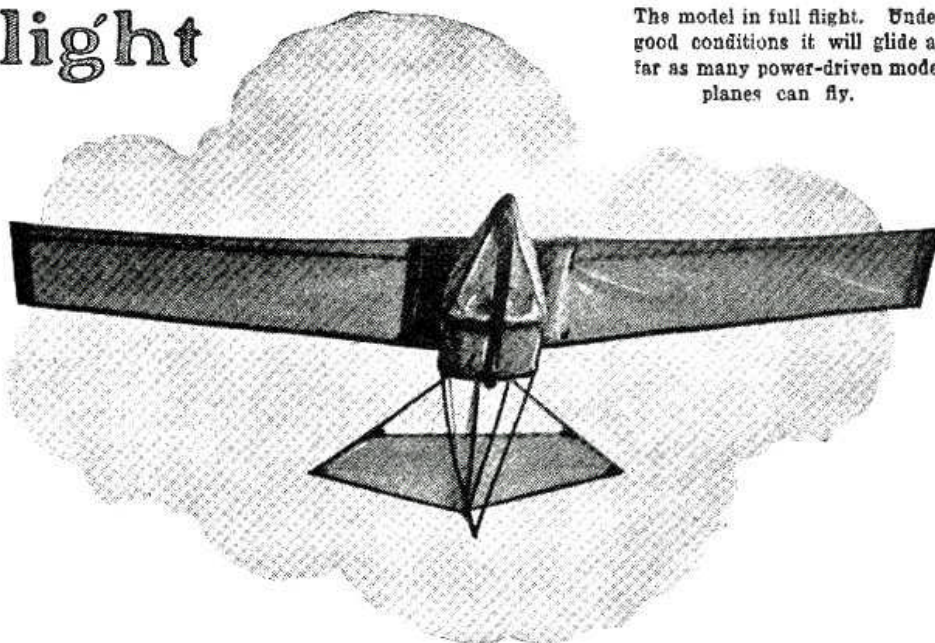


A Long-Flight Model Sailplane

The model in full flight. Under good conditions it will glide as far as many power-driven model planes can fly.



Specially designed for EVERY BOY'S HOBBY ANNUAL, this ripping model sailplane is made from materials that cost—at most—little more than a shilling

You need only two tools for making this model—a pair of scissors and a very sharp pen-knife. That gives you an idea how simple its construction is.

The materials required are: Four lengths of strip-wood, each about 4 ft. long; a tube of Croid glue; a small roll of cheap linen tape, $\frac{1}{2}$ in. wide; a sheet of good tracing paper or greaseproof paper; a sheet of stiffish, springy white cardboard; a piece of pliable wood, 7 in. long by $\frac{5}{8}$ in. wide and $\frac{1}{16}$ in. thick; and a reel of strong thread.

If you are unable to obtain these materials locally, write to The Editor, EVERY BOY'S HOBBY ANNUAL, The Fleetway House, Farringdon Street, London, E.C.4, for the name and address of a firm which will send supplies by post.

The piece of pliable wood should be heated over a gas-jet until very hot, then bent into the curve shown in the side elevation diagram and held in that shape until cold. The bend will then be permanent.

The next thing to do is to trace carefully two fuselage sections from the pattern given, using a piece of greaseproof paper for the purpose. Afterwards retrace the designs on to a piece of your cardboard.

Cut these sections out with the utmost care and neatness, as much of the success of your model depends on this. Take especial precautions that you do not cut the spar slots too large or unevenly.

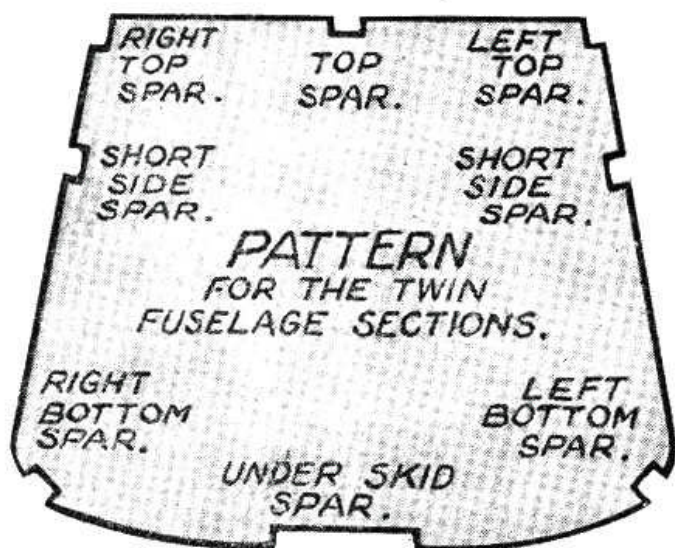
There is one more part to be traced—the wing centre-piece. This is done in exactly the same way as the fuselage sections, and the completed part laid on one side until you start the wing construction.

The fuselage is built up next, so you must cut your stripwood up into spars, numbering them with a pencil according to the numbers given. They will be as follows:

Two spars, $11\frac{1}{4}$ in. long (No. 1); two spars, $11\frac{3}{4}$ in. long (No. 2); two spars, 12 in. long (No. 3); two spars, $5\frac{1}{2}$ in. long (No. 4); one spar, 7 in. long (No. 5); two spars, $7\frac{1}{4}$ in. long (No. 6); three spars, $10\frac{1}{2}$ in. long (No. 7); two spars, $12\frac{1}{4}$ in. long (No. 8); two spars, $5\frac{3}{8}$ in. long (No. 9); one underskid, 7 in. long, already made according to directions above (No. 10); one spar, $8\frac{1}{2}$ in. long (No. 11); one spar, $5\frac{1}{4}$ in. long (No. 12).

You will also need two short pieces, each $2\frac{3}{8}$ in. long, for the wing-tips.

The first building operation is to glue the two fuselage sections on to the underskid. The rear one



This pattern is exactly the right size for the fuselage sections. It should be traced on to cardboard.

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should be at a distance of $\frac{1}{2}$ in. from the rear end of the underskid, and the front one 2 in. from the rear one. Leave these joins to set hard before proceeding.

Now for the assembly of the rest of the fuselage. The two spars marked No. 7 are glued into the top slots of the fuselage sections so that the front ends both project $\frac{3}{4}$ in. beyond the first fuselage section. Fix pair No. 9 in a like manner so that there is a frontal projection of $3\frac{1}{4}$ in.

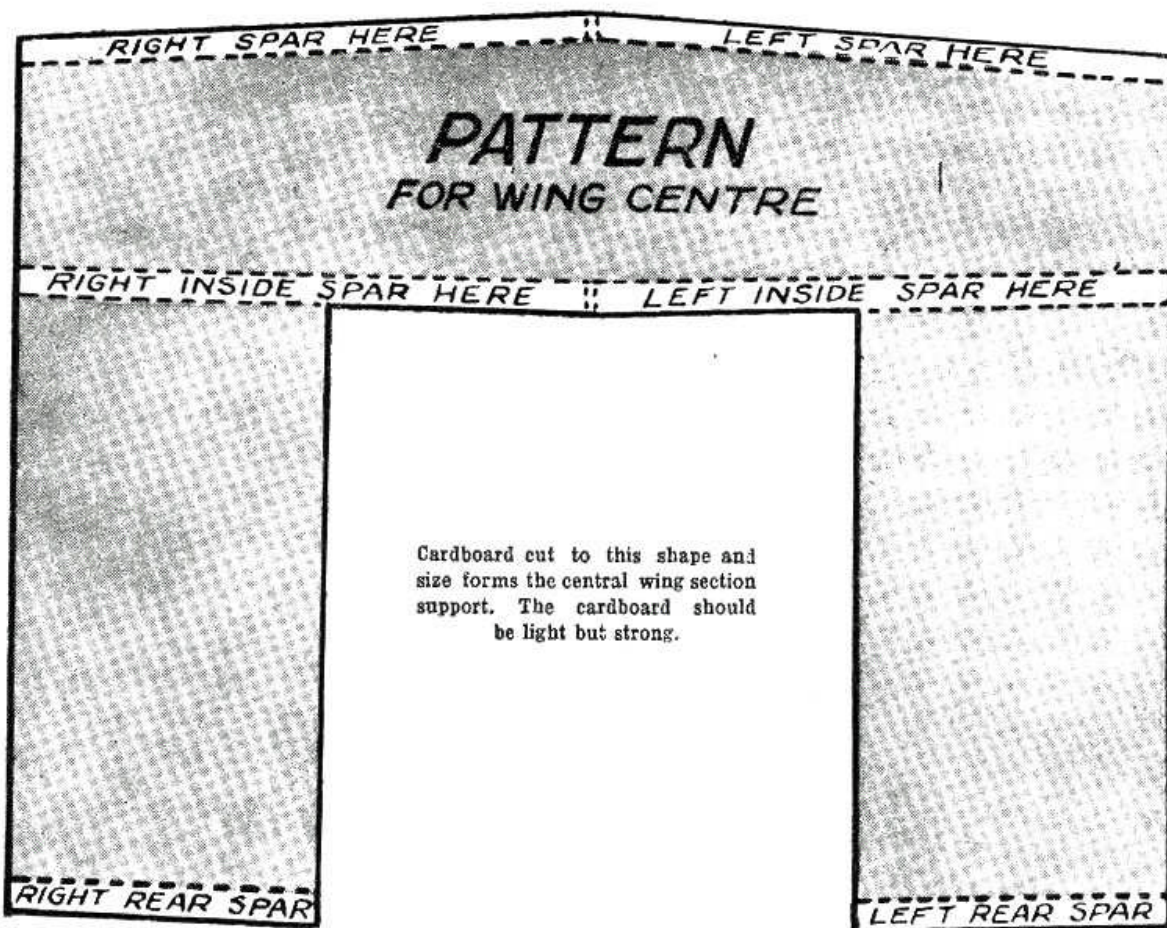
Pair No. 8, the lowest in the fuselage construction, are fixed so that when bent upwards they meet the front ends of pair No. 9.

whole structure is upright when viewed directly from the rear.

Soak a length of your tape with Croid and bind it right around each of the fuselage sections as shown. Allow the whole to set before proceeding to join the front and rear ends of the fuselage spars.

Spar No. 11, which is part of the stabiliser fin, should not be fixed until the tail unit has been made.

The next step is to take your wing centre section and, having given it a liberal coat of Croid where the wing spars are to be glued, take spars Nos. 1, 2, and 3 and fix each pair end to end.



Now take the odd spar left from No. 7 and fix this in the top centre slots, so that when drawn together all three ends of No. 7 meet at the rear, the centre spar being trapped between the others, and so caused to move slightly forward. It thus projects very slightly at the front.

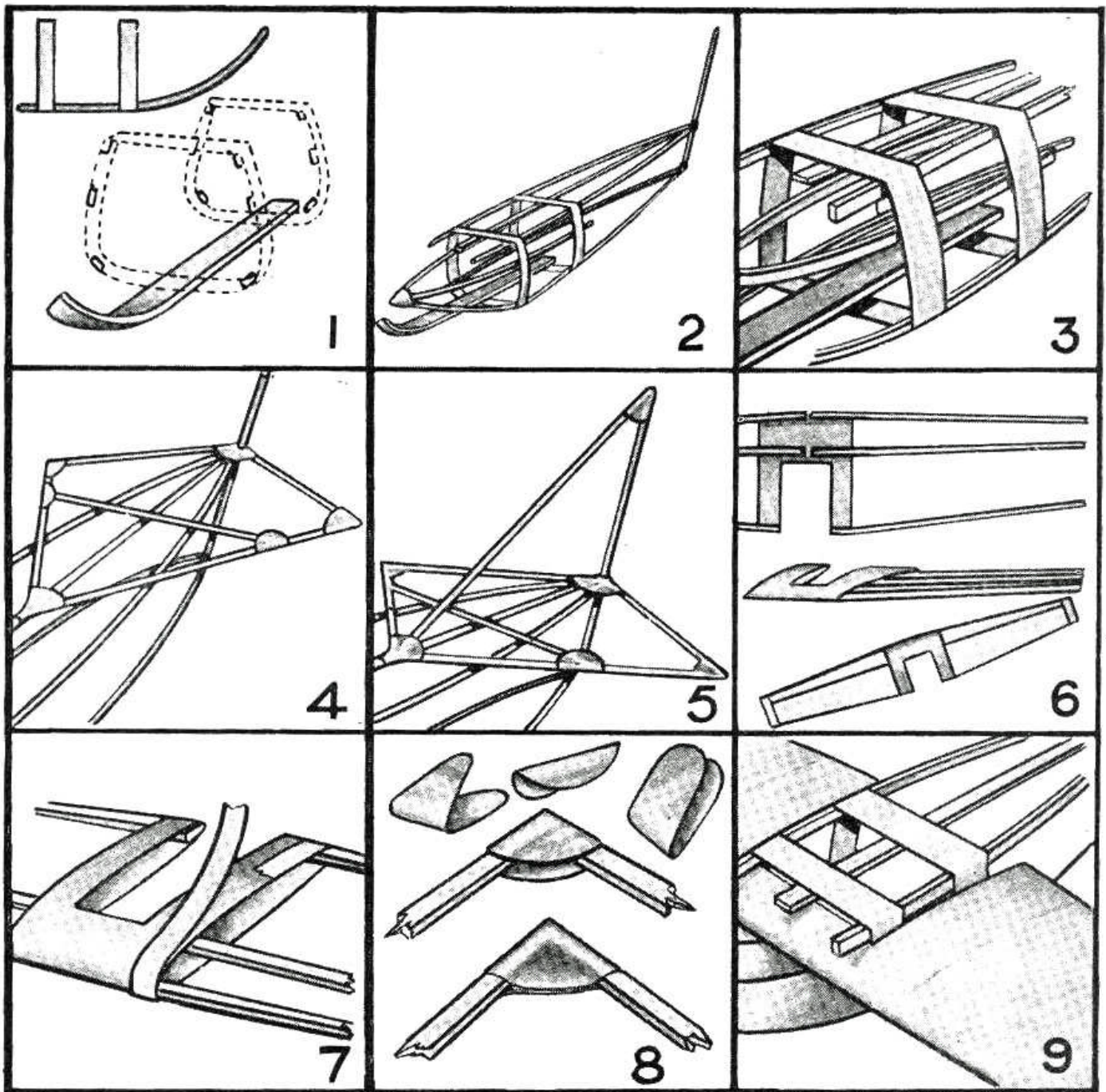
After allowing your fuselage spars to set firmly into their respective slots, take all four front ends and draw them together, binding with thread to keep this nose firmly held together until the glue has set.

Spar No. 12 should be lashed into place between the rear ends of the fuselage spars. See that the

Cover this joint all over with gummed tape so as to guarantee its strength. On this part of the structure most strain will ultimately fall.

At the ends of the two short end-spars wrap a covering of a half-width of your linen tape (cut your tape down the centre with scissors to get this half-width). Having allowed this to set firmly, you must now proceed to bend with extreme care (so as not to crack your cardboard wing centre-piece) the portion of the front of the wing at the area bounded by the inside wing-spars.

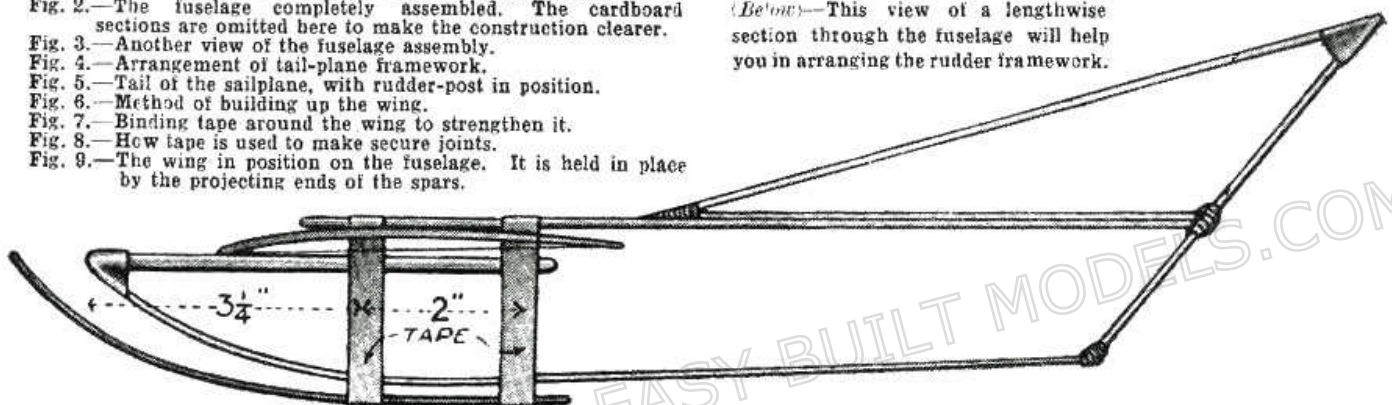
Having done this evenly, proceed to take two lengths of linen tape and bind carefully in such a



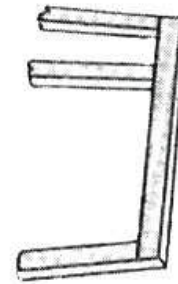
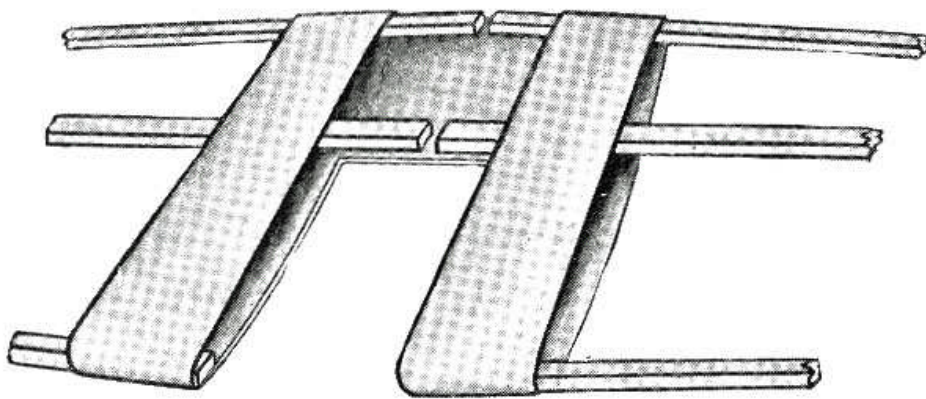
Detail sketches of the construction of various parts of the model :

- Fig. 1.—How the underskid is fitted to the fuselage sections.
- Fig. 2.—The fuselage completely assembled. The cardboard sections are omitted here to make the construction clearer.
- Fig. 3.—Another view of the fuselage assembly.
- Fig. 4.—Arrangement of tail-plane framework.
- Fig. 5.—Tail of the sailplane, with rudder-post in position.
- Fig. 6.—Method of building up the wing.
- Fig. 7.—Binding tape around the wing to strengthen it.
- Fig. 8.—How tape is used to make secure joints.
- Fig. 9.—The wing in position on the fuselage. It is held in place by the projecting ends of the spars.

(Below)—This view of a lengthwise section through the fuselage will help you in arranging the rudder framework.



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Sketch showing construction of the wing framework. The central section is strengthened by tape bindings.

way as to hold the wing in the shape illustrated, and to the general angle illustrated in the side view diagram.

While this is setting it should be watched to see that the tape bindings do not slip or pull the curve any higher than it was first moulded.

The appearance of a well-made wing should be as in the front view diagram, the two extreme tips drooping very slightly to the rear.

The sketches show how the tail unit is made and fixed. Beyond liberally coating the spar ends, pairs Nos. 4 and 6 and No. 5, with glue, no other fixing than small tape joints is necessary, as this portion of the sailplane rarely comes in for any rough usage. The surfacing also helps by acting as a strong binder for covered parts.

The model is now ready for surfacing. This operation is quite simple if you take pains and do not try to rush the job.

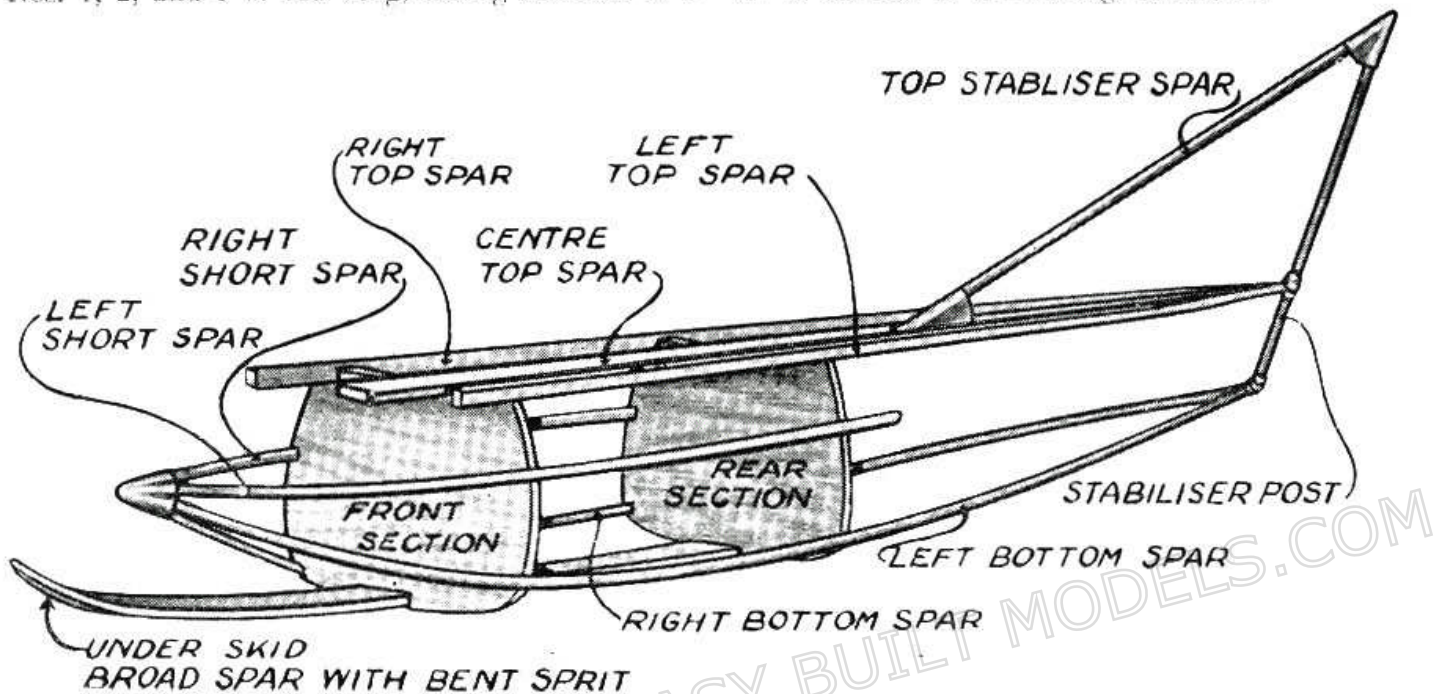
The best method is to run Croid all along spars Nos. 1, 2, and 3 of the wing, taking one side at a

time. Work the glue into a smooth coating with your fingers, and at the same time coat in a similar manner the entire cardboard wing centre-piece.

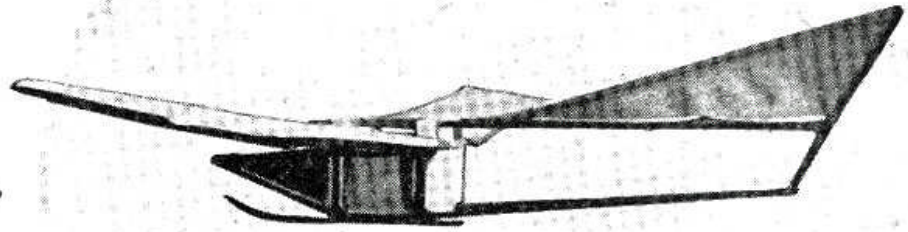
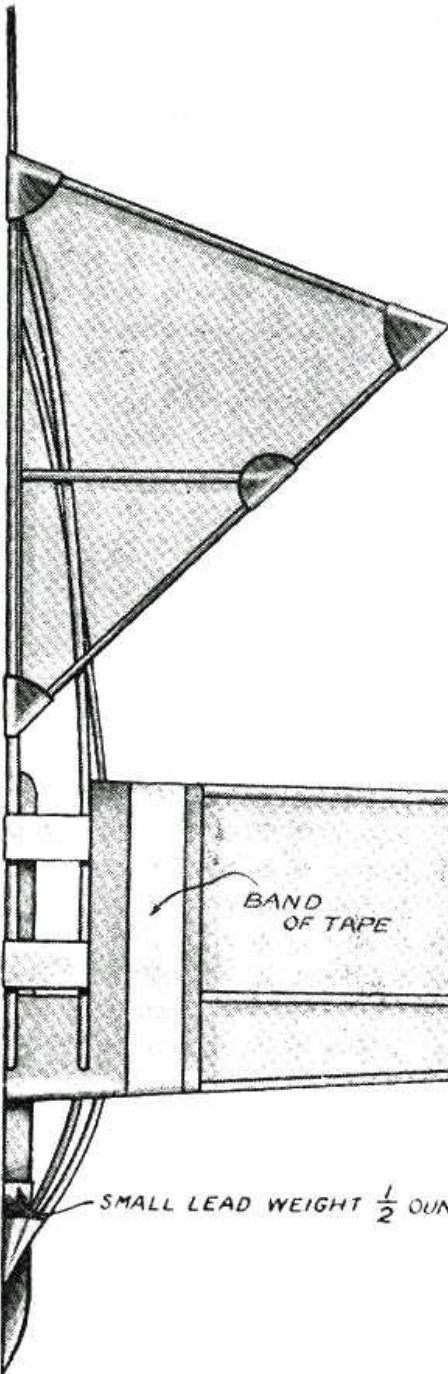
Now get your covering and, seeing that there are no wrinkles in it, lay this on to the glued surfaces. At the same time gently smooth the paper out. When the glue has set slightly cut off waste edges (leaving sufficient to wrap round the underside of the spars).

The body may be a little more difficult, but not if you measure your pieces for the sides and bottom. The sides should have the covering brought over the top and stuck along the inside of the frontal spars. Only the area of the fuselage up to the rear fuselage section is covered, the tail-spars being left bare from this point.

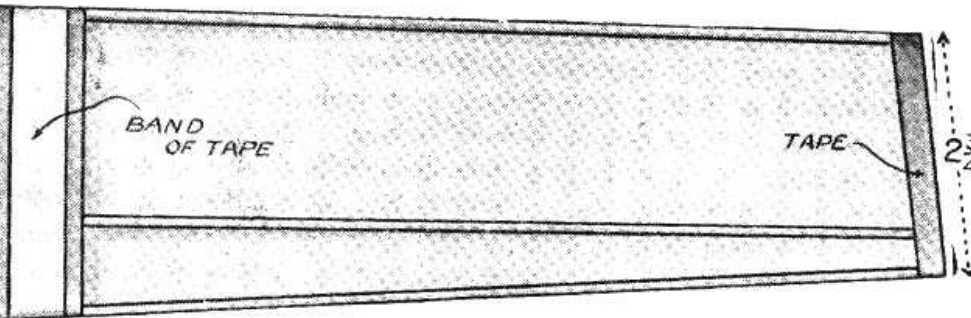
The tail surface is easy. Lay the tail structure (well-glued) upon a piece of fabric and trim off when the glue has set. The tail may now be lashed on to the rear of the fuselage as shown.



All the parts of the framework of the fuselage are named here.



Our model in full career. It can make ordinary gliding flights, or, in a moderate breeze, can be flown kite-fashion by means of light string attached to the nose.



" Half-view of the underside of the model. Only the top surface of the wing and tail-plane is covered with paper.



Gliding to earth after a long-distance flight. The model lands on the underskid and is thus prevented from damaging its framework.

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When this has been done, you may finish off by fixing the last spar, No. 11, into place, using a tape joint.

To cover the stabiliser, or tail-fin, take a double piece of paper and glue the front edge on spar No. 11. Then carefully trim off the waste level with the tail surface, taking care not to cut the tail surface itself. Finally, glue the tail-fin covering to rear spar No. 12.

The model is now complete, and the wing is passed into the receiving groove formed between spars Nos. 7 and 8. It should fit very tightly. If by some slight inaccuracy you have got too tight a fit here, it will be necessary to pare a little off from each side of the wing centre-piece.

Before flying, the model should be given a preliminary glide, in order to ascertain what extra weight is necessary in absence of a passenger. About half an ounce of lead, or other heavy material, should be glued into the nose, being hidden for appearances' sake by a tape cover.

There are no strict rules as to how to fly the glider. The main thing to avoid is a too windy day, but a little wind will help the fun.

Launch into the wind, or, better still, take the remainder of your reel of thread, or even a ball of string, and fly the model up against the wind kite fashion. In this manner you can keep your glider up indefinitely.