

Chapter XII

A Flapping-Wing Model

HERE is something new for the aero modeller—a simple yet very successful flapping-wing model which really does fly. It is of the Slinn pattern such as is popular in America. This little model flies most steadily and realistically; its duration is not large—from 12 to 15 seconds—but it flies most spectacularly and it is fascinating to watch it in the air. The mechanism is of the simplest character, and is made entirely of bent wire of which full constructional details are given in the illustrations. It is of 17 in. span, and the length of the motor rod is $8\frac{3}{8}$ in., the motive power being provided by 4 strands of $\frac{1}{16}$ in. \times $\frac{1}{32}$ in. elastic. The mainplane is of paper, and the motor rod of spruce. I have made the drawings so complete that I do not think a lengthy description is necessary in order to enable the reader to make it. The wire should be piano wire of 18-gauge throughout. It will be noticed that the crank has a winding handle formed on it, the bearings being provided by two washers soldered to the wing supports.

THE ARTICULATING RODS

These are attached in the manner shown in detail 4, whilst the bearings

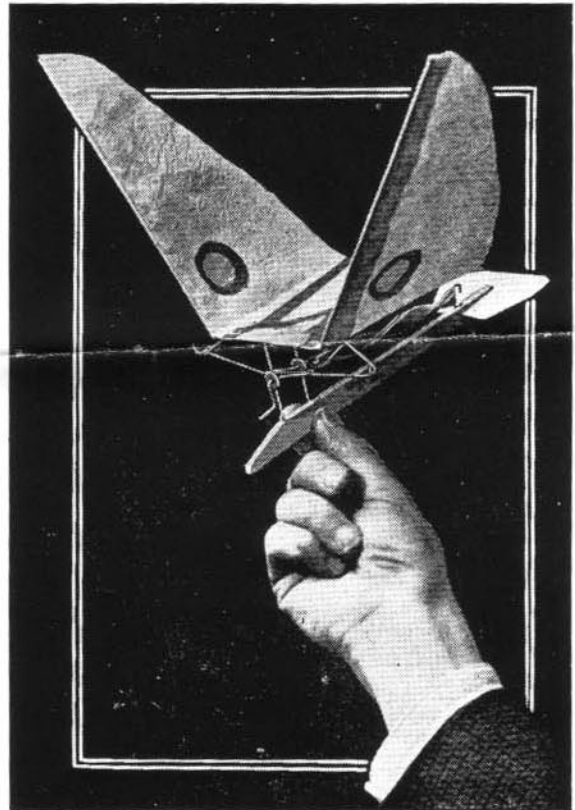


FIG. 232.—The complete flapping-wing model.

are shown in detail 3. Detail 5 is, of course, the rear hook for the elastic, whilst detail 1 shows how the wing supports are attached to the tin-plate wing mounting. The two limbs marked L, which are, of course, made of wire, form the hinge to the wing, whilst J indicates the wire leading edges to which the wing is attached; the paper wing is stitched over this, the rear or trailing edges of the wing being quite flexible. Details of the wings are given on page 148.

I shall be glad to receive details and photographs of any successful flapping wing model which has been built by readers.

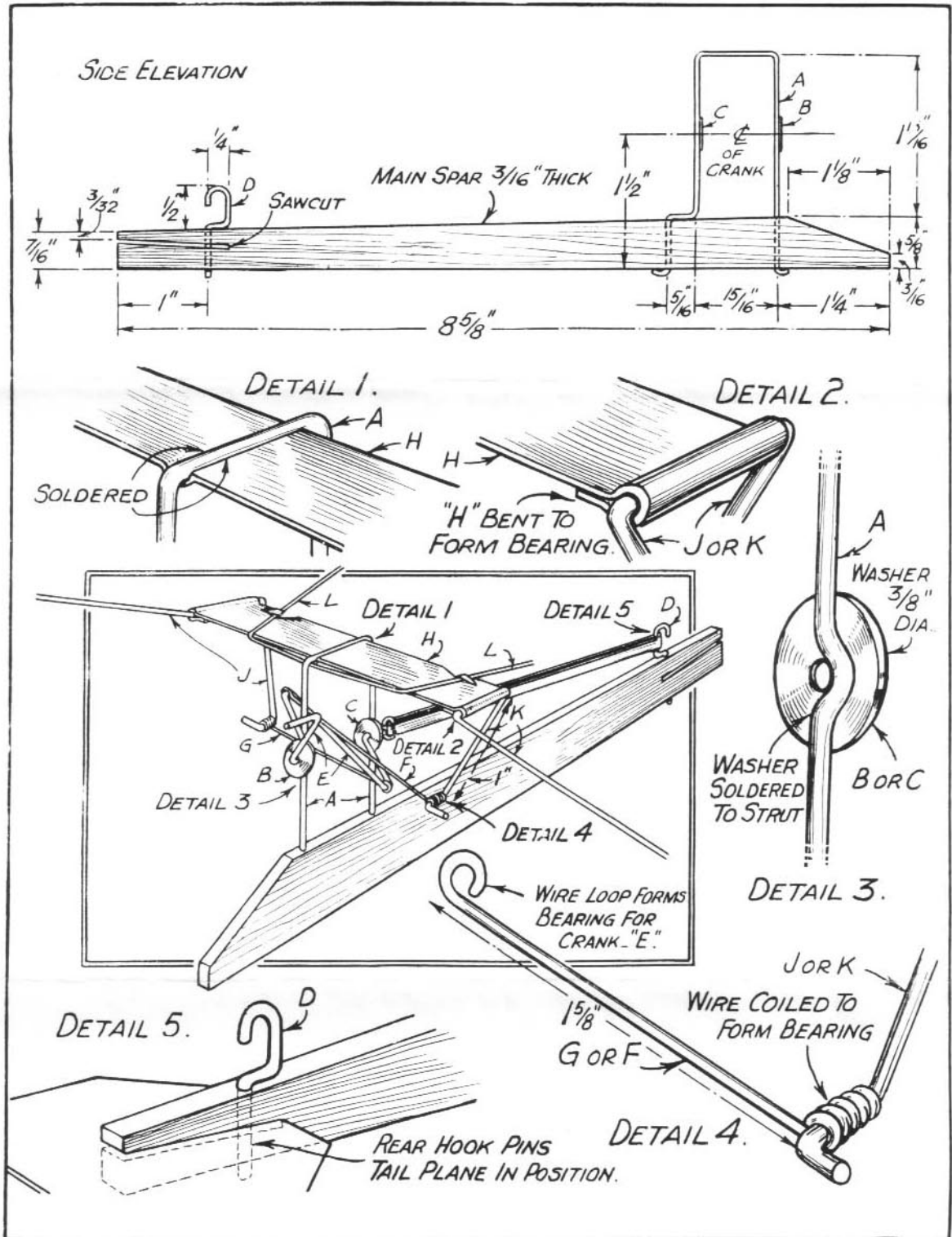


FIG. 233.—Constructional details of the Flapping-wing Model.

One of the chief difficulties encountered with this type of model is to get the model to climb. Usually, they fly at the height at which they are launched, but this one does climb, and the best length of flight obtained at the present (with the model illustrated) is 80 yards. Generally speaking, a flapping wing model requires a stronger down-stroke than up-stroke, and a rate of wing articulation of 80 strokes a minute at least.

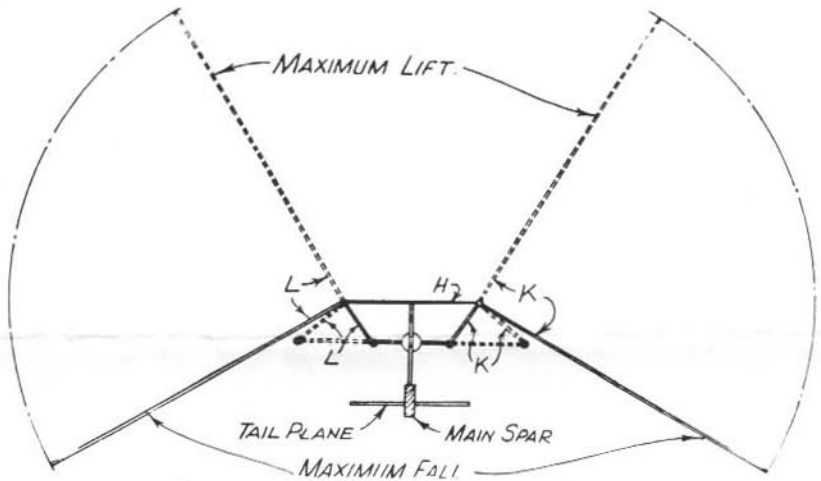


FIG. 234.—Detail of the articulating mechanism.

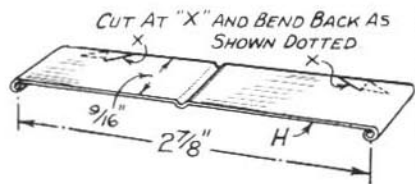


FIG. 235.—The wing anchorage and hinges. They are made from 22-gauge tin-plate.

There are, of course, other means of articulating the wings, and in larger models it may be necessary to use reduction gearing in order to obtain sufficiently powerful wing strokes. Although very little experiment has been conducted with wing-flapping models a few experimenters have obtained successful results, although I cannot trace that any such models have been built powered with a petrol or a compressed-air engine. Some very neat flapping-

wing models were sold in this country (of French manufacture) before the War. No full-size machine on flapping wing lines has yet made a successful flight. I shall be interested to hear from any readers of this book who have built successful models of this type, and to publish details of their machines in "Practical Mechanics."

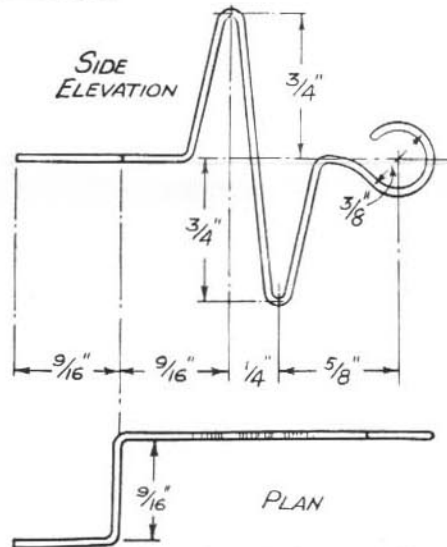


FIG. 236.—The articulating crank with combined winding handle.

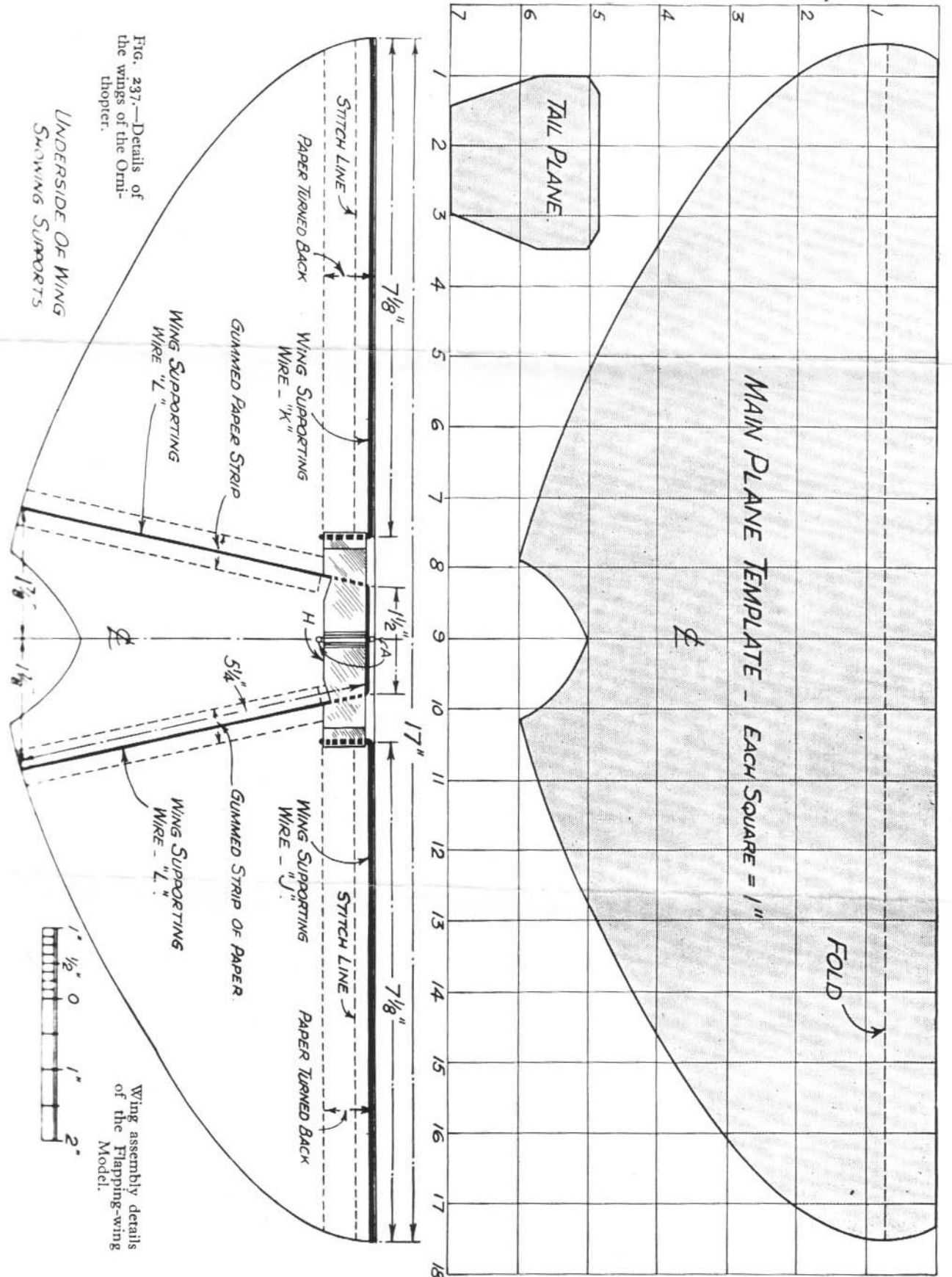


Fig. 237.—Details of the wings of the Orni-thopter.

UNDERSIDE OF WING SHOWING SUPPORTS

Wing assembly details of the Flapping-wing Model.