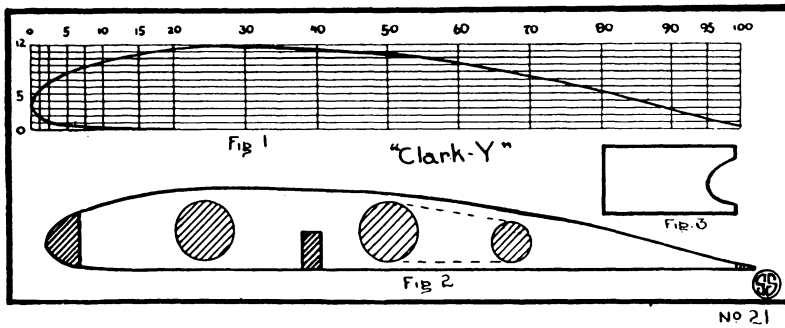


Building and Flying Model Airplanes



Wing of the "Lindy" Model

This is the sixteenth of a series of articles by Paul Edward Garber. Mr. Garber is in charge of aeronautics at the Smithsonian Institution.

As explained in THE SCIENCE NEWS-LETTER for October 8, the wings of modern aircraft are patterned with every means taken to secure efficiency. The shape of a wing surface determines the airworthiness of the completed airplane. The designers of "The Spirit of St. Louis" adopted a shape known as the Clark Y for Lindbergh's plane, because it imparts to an aircraft the two desired properties of speed and lift.

In the article above mentioned, I explained how to draw a wing section from data given. In that article the ordinates (or points determining the shape) were given in fractions. This time we will list them as decimals, for it is in this manner that they are given in all journals on aeronautics. After you have built this model of Lindy's plane you may want to make other models and when you come to duplicate the wing section you will use references that list the ordinates in decimals.

Aeronautical books quote close fractions to insure absolute accuracy in making the large ribs for man-carrying aircraft. A difference of a fraction of an inch will often change the properties of the wing. In making your model try to place your intersection marks as close as possible to the correct position in order to derive the most efficient results.

Figure 1 shows a screen or graph which you are to make $5\frac{1}{2}$ inches long. Having drawn a line of that length you divide it into ten parts. Another line is to be drawn below it as a distance of one-tenth of five and a half inches. This space is also divided into ten parts and lines drawn horizontally from each subdivision. Two extra lines are added. Vertical lines are to be drawn downward from each division in the top line, to be numbered from zero to 100. The space between zero and ten is to

be subdivided at points 1.25; 2.5; 5 and 7.5. Similarly marks are to be made at 15 and 95, and lines are to be drawn downward from all these points. The graph is now ready for use. The table below shows at what points on the vertical lines marks are to be made to indicate the intersection of the upper and lower surfaces. When these marks are joined the Clark-Y outline will result.

| Vertical Line | Upper Surface | Lower Surface |
|---------------|---------------|---------------|
| 0 | 3.5 | 3.5 |
| 1.25 | 5.45 | 1.93 |
| 2.5 | 6.5 | 1.466 |
| 5 | 7.9 | .933 |
| 7.5 | 8.85 | .629 |
| 10 | 9.6 | .42 |
| 15 | 10.685 | .15 |
| 20 | 11.36 | .033 |
| 30 | 11.7 | .0 |
| 40 | 11.4 | .0 |
| 50 | 10.515 | .0 |
| 60 | 9.148 | .0 |
| 70 | 7.35 | .0 |
| 80 | 5.216 | .0 |
| 90 | 2.802 | .0 |
| 95 | 1.494 | .0 |
| 100 | 0.12 | .0 |

The piece of paper upon which this section has been drawn is now to be pasted on a piece of tin and the outline cut out, making a pattern. Cut off the nose of this pattern $\frac{1}{4}$ inch from the front and the tail $\frac{1}{8}$ inch from the rear, eliminating the shaded portions in Figure 2. Cut out the $\frac{1}{8} \times \frac{1}{4}$ inch opening in the bottom $2\frac{1}{2}$ inches from the original front and mark the center of the holes for lightening where shown. Now procure 17 slats of wood $5\frac{1}{8} \times \frac{3}{4} \times \frac{1}{16}$ inches. Balsa wood is preferable but pine may be used. On each of these trace the pattern and cut out the shape, excepting that in two instances, the slats are to be cut to the original outline. The holes can be made by burning with a piece of hot tube, and the rear two may be joined as shown by the dotted lines to further eliminate weight. Figure 3 shows a piece of tin or other metal

which has one end ground out to the shape of the nose of the rib shown shaded in Figure 2. This is to be used in making the rest of the wing.

Science News-Letter, December 3, 1927

ZOOLOGY

Pet Deer at Grand Canyon

The pet problem has been solved for the children of the Government staff at Grand Canyon National Park. Denied the customary cats and dogs through park regulations, they have been given ten fawns from the deer herd in the Kaibab National Forest north of the Park, and are now quite happy.

Dogs and cats are forbidden within the park partly because they are predatory animals and likely to kill, or at least annoy, the native wild population. The substituted fawns were provided by arrangement between the U. S. National Park Service and the U. S. Forest Service, and were transported from the North Rim to the South by truck. One of the ten escaped, and one died not long after its arrival at park headquarters, but the surviving eight are thriving and have become very tame.

Science News-Letter, December 3, 1927

EUGENICS

Dodo and Ginkgo Tree

Sprung of the men who found this land,

Sprung of their sons who tilled it,
Sprung of their sons whose rigid hand
Reined it, whose strong loins filled it
With sinister and dexter kin,
We stand, these lords' descendants,
Gaunt, gone to seed, misfitted in
An ailing superintendence.

Grace we have, of decaying kind,
Wit to greet any scourging,
A warped will and a hectic mind,
And a weak body's hot urging.
And the dodo went, and the ginkgo tree

Goes slowly, pampered and coddled:
And so, scions of the past, are we,
With souls and bodies addled.

Sprung of the men who lorded it
Over a new world's wonder,
We dodder with our sunset wit,
And never a clap of thunder
To mark this lessens, this dims, this goes,

This echo of a splendid
Hour that crumbles with Eden's rose,
Its last long agony ended.

Prince, let me summon your spectre out,

Gall's no unmanly quaffing;
We faint erect beneath the knout,
Laughing, still laughing.

Clement Wood, in the Commonwealth

Science News-Letter, December 3, 1927