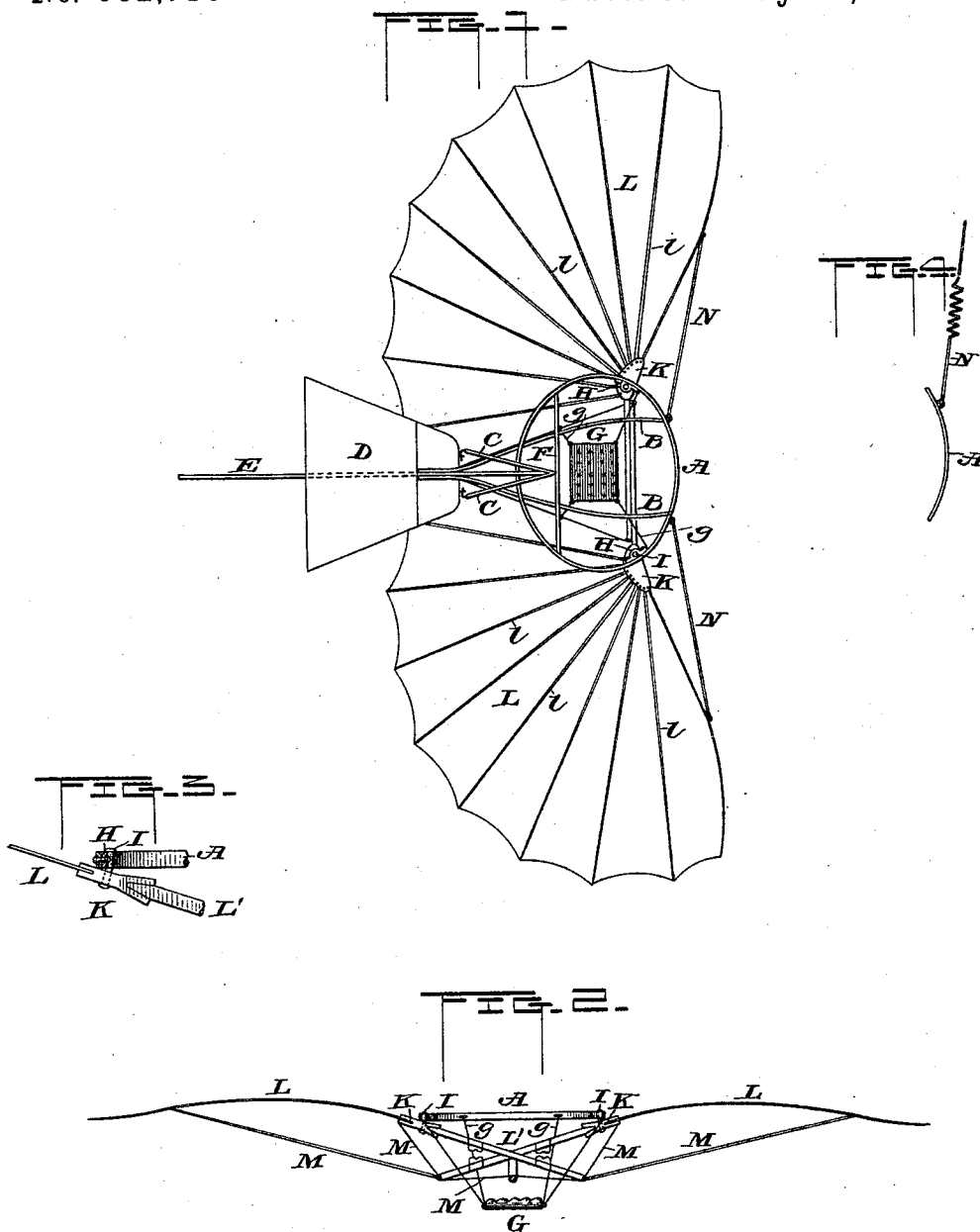


(No Model)

O. CHANUTE.
SOARING MACHINE.

No. 582,718.

Patented May 18, 1897.



Witnesses
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UNITED STATES PATENT OFFICE.

OCTAVE CHANUTE, OF CHICAGO, ILLINOIS.

SOARING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,718, dated May 18, 1897.

Application filed December 7, 1895. Serial No. 571,366. (No model.)

To all whom it may concern:

Be it known that I, OCTAVE CHANUTE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Soaring-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to flying-machines which resemble in their construction the structure of birds' wings.

The object is to imitate the soaring of birds, which is accomplished while the wings are held rigidly still, so far as any flapping movement is concerned. It is necessary, however, to provide for a fore-and-aft movement of the wings in order to preserve the equilibrium, as discovered by Mr. Mouillard.

The present invention is an improvement upon the flying-machine recently patented to Otto Lilienthal, in which he provides a pair of wings fastened rigidly to a hoop and composed of fabric stretched over hinged ribs, so as to allow of the wings being folded for transportation. The aviator must keep his balance by moving his body so as to displace the center of gravity of the machine. In my invention I provide a stationary seat and pivot each wing on an upright pintle, so that it can be moved bodily forward and backward, as may be required to preserve the balance of the machine and the aviator. I also provide a strong spring or springs exerting a constant tendency to pull the wings forward.

In the drawings, Figure 1 is a top plan view of my improved flying or soaring machine. Fig. 2 is a front sectional view. Fig. 3 is a detail of the wing-pintle, and Fig. 4 shows a modified spring.

I make use of any suitable frame—such, for instance, as the one shown by Lilienthal—that is, a hoop A, rearwardly-extending rods B, united at their rear ends, diverging rods C, on which is hinged the horizontal tail D, and

a vertical rudder E, fastened to the rods B and the hoop A.

A cross-bar F is arranged near the back of the hoop, to which the rods B and C are attached. A seat G is suitably suspended below the frame, as by wires g, from the bar F and the hoop A.

At opposite points on the hoop near its front are secured the blocks H, in which are inserted the upright pintles or pivot-pins I, to the lower ends of which are secured the pocket-plates K, in which are hinged the ribs of the wings L, to which are secured the handle-bars L', which cross below the hoop, as shown in Fig. 2. Wire braces M keep the handles and wings in proper position, but permit them to be turned forward and backward on the upright pintles I.

A strong spring or springs exert a constant forward pull on the wings. I prefer to use a separate spring for each wing, such as a contractile member N, attached at one end to the hoop A and at the other end to the front rib of the wing. This contractile member may be an elastic cord, as shown in Fig. 1, or I may use a metallic helical spring, as shown in Fig. 4. In any event it lies substantially in the plane of the wings, so as to move them in a plane transverse to the upright pintles.

In operation the springs are arranged to yield sufficiently to allow the machine to be properly balanced when soaring in a wind of ten or twelve miles per hour. If the wind strengthens, the wings are forced farther backward. If the wind lessens, the springs pull the wings farther forward. In each case the shifting of the wings compensates for the change in the center of the wind-pressure due to the change in the velocity and operates to keep said center of pressure coincident with the center of gravity, thereby automatically preserving the equilibrium. By positively moving the wings the aviator can cause the machine to tilt up or down by the action of the wind, and so make it glide upward or downward at will. This mode of operation is the one originated by Mr. Mouillard and I lay no claim thereto.

It is evident that the details of construction can be somewhat varied without depart-

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ing from the spirit of my invention. Thus while I have described the pocket-plates as secured to the lower ends of pintles working in blocks secured to the hoop any other
5 equivalent construction adapted to secure the same freedom of movement of the wings may be used.

I do not claim to be the inventor of a soaring-machine consisting of two wings, each
10 hinged upon a vertical axis, and a spring attached to said wings.

What I claim as my invention is—

1. A soaring-machine having a rigid frame comprising a hoop A, plates K pivoted to said
15 hoop, on upright pintles, wings L attached to said plates, and contractile members N lying

in the plane of the wings and attached at one end to the hoop and at the other end to the fronts of the wings, substantially as described.

2. In a soaring-machine, the combination 20 with the framework comprising the hoop A, of the plates K pivoted thereto on the pintles I, the wings L having ribs *l* hinged in said plates, and the elastic cords N connecting the front ribs with the hoop A, substantially as 25 described.

In testimony whereof I affix my signature in presence of two witnesses.

OCTAVE CHANUTE.

Witnesses:

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