

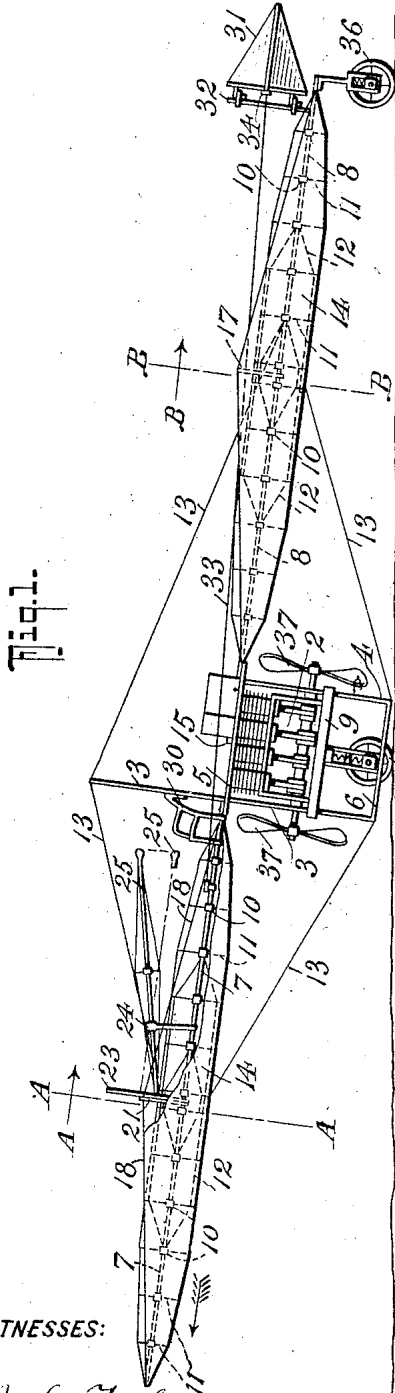
W. W. GIBSON.
FLYING MACHINE.

APPLICATION FILED MAR. 11, 1910.

978,732.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.



WITNESSES:

John T. Schrott.
Charles H. Wagner.

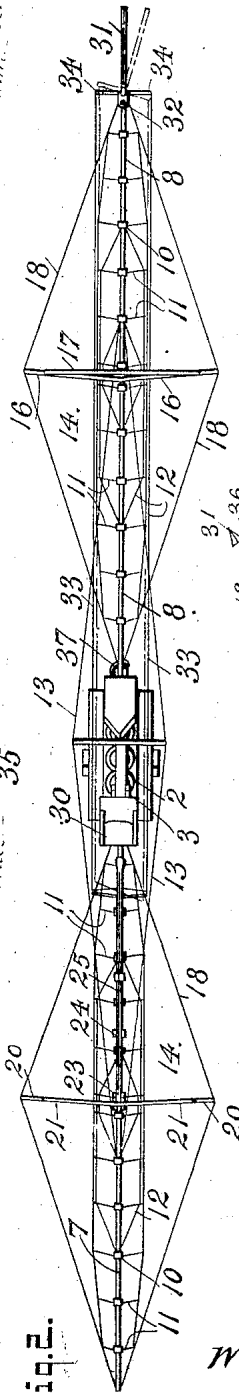


Fig. 7.

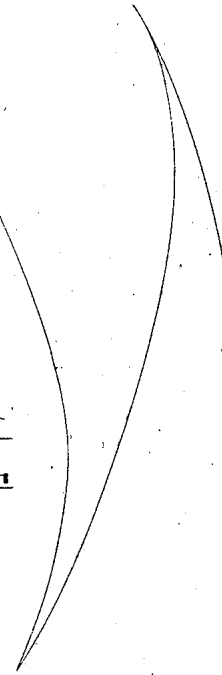


Fig. 2.

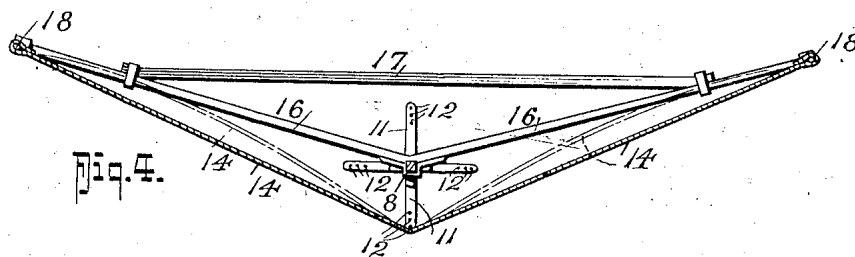
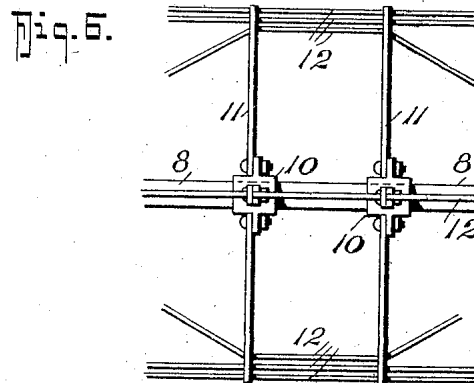
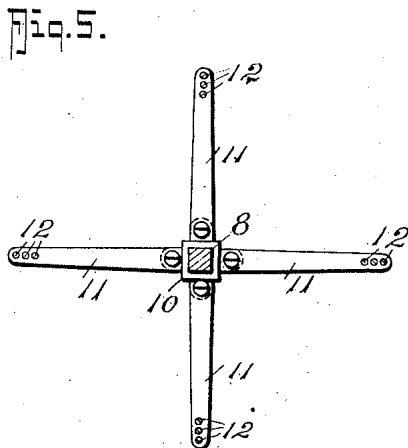
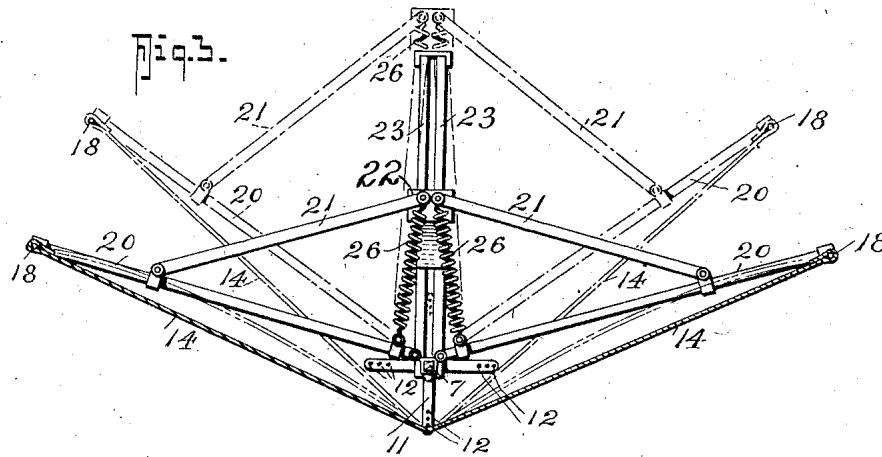
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM WALLACE GIBSON, OF VICTORIA, BRITISH COLUMBIA, CANADA, ASSIGNOR
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FLYING-MACHINE.

978,732.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed March 11, 1910. Serial No. 548,631.

To all whom it may concern:

Be it known that I, WILLIAM WALLACE GIBSON, citizen of the Dominion of Canada, residing at Victoria, in the Province of British Columbia, Canada, have invented a new and useful Flying-Machine, of which the following is a specification.

This invention relates to a flying machine or aeroplane particularly designed to confer advantages in stability and in simplicity of structure in machines of this class.

The machine embodies an important novel feature of design in the use of vanes which are lengthwise extended in the line of flight in distinction to the customary practice of lateral extension across that line. This longitudinal extension of the vanes not only renders the aeroplane more stable under the propelling effort of the engine and during the inclination of the machine in ascent or descent, but in the particular form adopted enables the ascent or descent to be controlled without the requirement of supplementary vanes for that purpose thus materially simplifying the structure of the machine. A further advantage of this form of vane is that the air currents to and from the propellers which are in the middle line and under the vanes act upon the vanes throughout their length, and tend to maintain the stability of the machine and the directness of its flight. There is also the obvious advantage that the longitudinal vanes offer less resistance to the air in the direction of flight and can therefore sustain the flight of a machine with less horsepower of engine or enable a higher speed to be attained with the same horsepower. In applying this principle of longitudinally disposed vanes I have found that the best results in stability are attained by the adoption of two structurally separate vanes one projecting forward and the other backward from the central frame within which is the engine and these forwardly and backwardly directed vanes are angled upward from the middle line toward the edges and have their greatest width in their mid-length. The structurally simplest form is that of an elongated diamond as shown in the drawings but the form of an elongated ellipse or oval may be satisfactory. The angle of the backwardly projected vane is definitely fixed in the structure, but that of the forward one is variable within set limits and by the variation of the

angle the ascent or descent of the machine is controlled in a manner that will be explained.

The invention is particularly described in the following specification, reference being made to the drawings by which it is accompanied, in which:

Figure 1 is a vertical longitudinal section through the middle line of the machine, Fig. 2, a plan, Fig. 3, a cross section on the line A A in Figs. 1 and 2 taken in direction of the arrow A, Fig. 4, a cross section at B B in Fig. 1 taken in the direction of the arrow B, and Figs. 5 and 6, cross section and side elevation of the vane frame showing the construction of cross which carries the truss wires, Fig. 7, represents the line of descent of the aeroplane when falling free.

The main central frame within which the engine 2 is secured is preferably constructed of two forward uprights 3 and after uprights 4, the forward uprights 3 extending above the height of the after ones to form a mast or strut to receive the truss wires which brace the forward and after vane frames in their attachment to the central frame. From the upper end of 4 and between each pair of uprights 3 and 4 a horizontal frame member 5 extends, and between the lower ends of 3 and 4 is a bottom member 6 which, with the member 9 to which the engine is secured, form the central frame. Extending forward and backward from the upper horizontal member 5 of this central frame and in direct alinement with it, are the mid-members 7 and 8 of the forward and after vanes. These mid-members 7 and 8 are stayed and braced by high carbon steel wires 12 which pass from each end and from intermediate positions, through the ends of crosses formed of thin flat steel springs 11 secured to light metal hubs 10 through which the members 7 and 8 pass, the flexibility of the members 11 being lengthwise toward the ends of the vanes.

From the approximate mid-length of each member 7 and 8 steel wires 13 extend to the top of the uprights 3 and downward under 3 and 4 also, see Fig. 2, to the ends of a member 15 secured across the horizontal member 5 and extending laterally on each side therefrom. By these wires 13 the vane frames are effectually braced vertically and laterally to the central frame of the machine. By this manner of trussing, a strong elastic

vane frame is furnished for the support of the fabric which is stretched over it.

At the mid-length of the rear vane two stretchers 16 are secured to the mid frame 8 and are maintained at a fixed angle by a cross brace 17, and from the ends of the central member 8 a steel wire 18 is stretched over the ends of 16 forming an elongated diamond shaped frame over which the fabric 14 is stretched to form the vanes, the fabric passing under the bottom wire 12 which trusses this vane. Between 12 and 18 the fabric is not supported, so that when sustaining the machine in the air it assumes a curve as shown in Figs. 3 and 4, forming somewhat of a keel which is considered to increase the stability of the machine and maintain the directness of its flight. The fabric of the forward vane is supported in a similar manner but the members 20 which keep it stretched, as they are required to be adjustable in their angular relation to one another, are supported by struts 21 pivotally connected to 20 toward their outer ends, and to a slide block 22 which is vertically movable between uprights 23 secured and stayed to the vane frame 7. The slide block 22 is raised and lowered to lessen and enlarge the angle of this forward vane by a light trussed lever 25 which is fulcrumed at 24 and pivotally connected to the slide block 22. The slide block 22 is lifted by the lever 25 against the resistance of springs 26 secured between the ends of 20 and those of 21, which springs thus maintain the stretchers 20 of the vane in the spread position the object of which is that while soaring the pressure on the blades does not come on the arm of the aviator unless he desires to change his elevation.

The handle end of the lever 25 reaches adjacent to the seat 30 of the aviator which is shown in the drawings as in the upper forward part of the central frame but may be moved to a more convenient position.

A triangular rudder 31 is pivoted to a rudder post 32 projecting upward from the rear end of the back vane member 8, lines 33 being carried from the tiller 34 to a position so that it can be operated by the feet of the aviator.

A pair of wheels 35 provided with springs are placed immediately under the central frame to sustain the weight of the engine and a spring wheel 36 is under the extreme outer end of the rear vane so that the machine, when on the ground, is supported in an angled position ready for ascent as shown in Fig. 1 by the ground line.

An engine 2 of approved design is secured within the central frame, on the forward and after end of the driving shaft of which a propeller 37 is secured, the crank shaft passing through between the pairs of uprights 3 and 4. The current of air to and

from the propellers will thus act upon the under side of the vanes.

I do not desire to be confined to the particular manner of constructing the framework of the aeroplane as set forth in this application, as such may be modified within wide limits without departing from the spirit of the invention, the essential features of which lie, I consider, in the use of long narrow vanes projecting in the line of movement forwardly and backwardly from the central frame to which the engine is secured each of these vanes being angled upward from their middle line toward their edges and tapered toward each end from a maximum width approximate to their mid-length and means for varying the angle of one of them.

Owing to the fact that the leading vane encounters undisturbed air and is therefore better sustained thereon that the following vane can be on the air which is broken up by the passage of the forward part of the machine, the aeroplane has a natural tendency to tilt upward in front which tendency by the provision for varying the angle of the leading vane is made use of to control the ascent or descent of the machine.

This form of aeroplane is phenomenally stable without the central frame and engine. It will, if overturned, right itself and in falling from a height it moves lengthwise and follows a series of reversed inclined convex curves somewhat as illustrated in Fig. 7. This inherent quality of angling its fall is obviously advantageous in that the machine will of its own accord fall in an oblique line.

Having now particularly described my invention and the manner of its use, I hereby declare that what I claim as new and desire to be protected in by Letters Patent, is:

1. In a flying machine, relatively narrow elongated vanes extended in the line of flight one from the forward and one from the after part of a central frame within which the engine is secured said vanes being angled upward from the middle line toward their edges, and means for varying the angle of the forward vane.

2. In a flying machine, vanes elongated in the line of flight each vane tapered toward each end from its mid-length and angled upward from the middle line toward their edges and means for varying the angle.

3. In a flying machine, the combination with a central frame to which the propelling engine is secured having two propellers one in front of and one behind the central frame, of central vanes projecting in the line of flight one over the forward propeller and one in the same line over the backward propeller said vanes being tapered from their mid-length toward each end and angled upward from the middle line to their edges.

4. In a flying machine, a central frame
within which the propelling engine is se-
cured having two propellers one on the front
and one on the back end of the engine shaft,
5 elongated narrow vanes extending longitu-
dinally from the central frame one over the
forward and one over the backward pro-
peller said vanes being angled upward from
the middle line toward their edges, means
10 for securing and staying the frames of these

vanes to the central frame and means for
varying the angle of the forward vane from
the seat of the aviator.

In testimony whereof I have signed my
name to this specification in the presence 15
of two subscribing witnesses.

WILLIAM WALLACE GIBSON.

Witnesses:

A. S. INNES,

ELIZABETH M. PRATT.