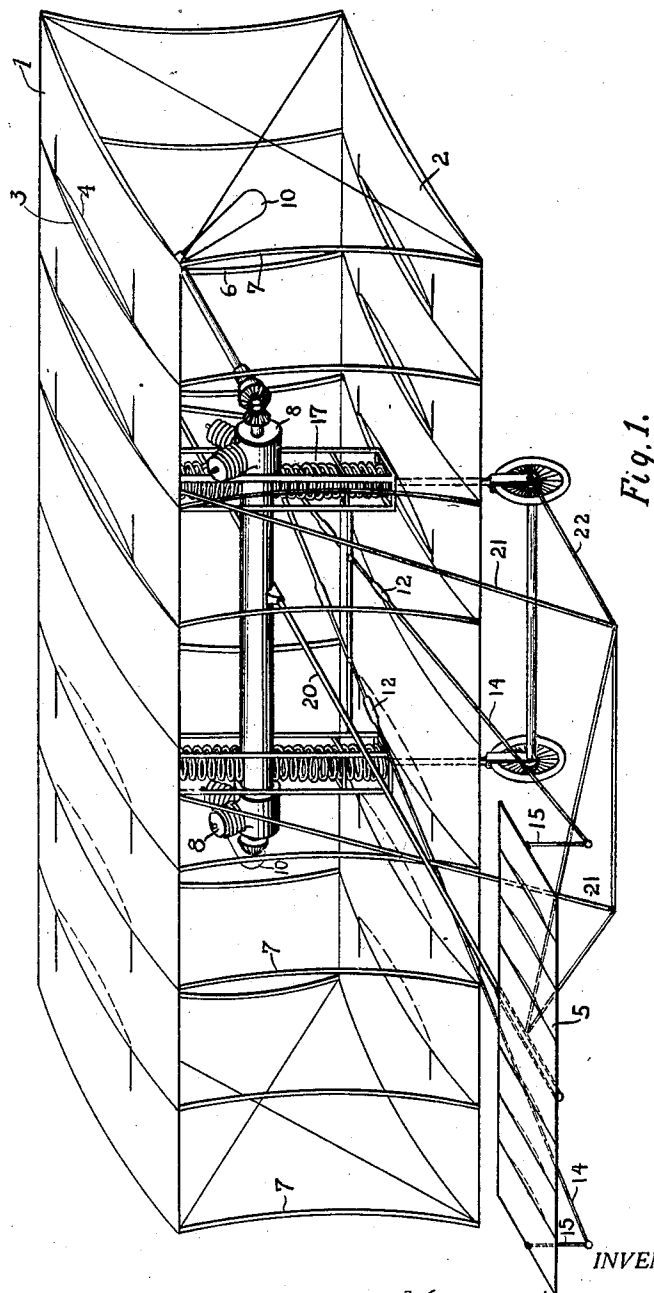


W. G. HAMILTON.
 FLYING MACHINE.
 APPLICATION FILED AUG. 8, 1910.

1,013,840.

Patented Jan. 2, 1912.

2 SHEETS—SHEET 1.



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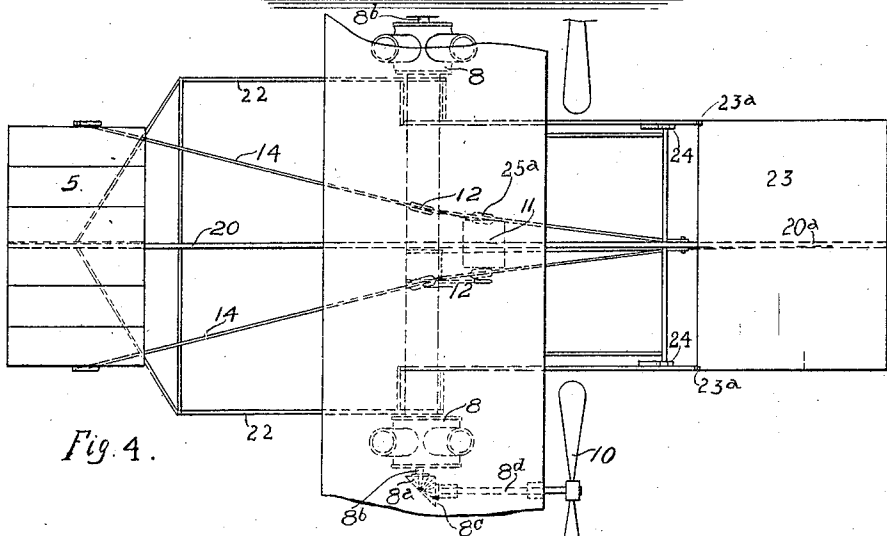
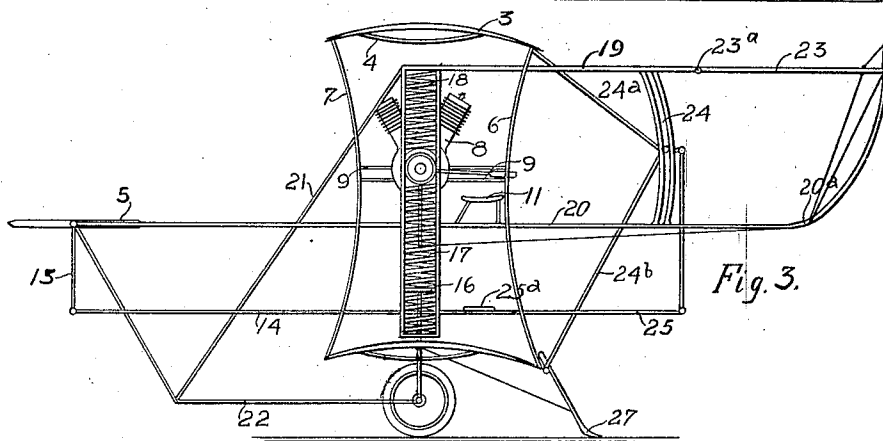
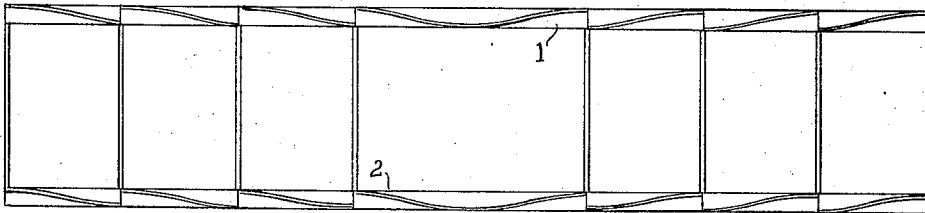
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2 SHEETS-SHEET 2.

Fig. 2.



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FLYING-MACHINE.

1,013,840.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed August 8, 1910. Serial No. 576,220.

To all whom it may concern:

Be it known that I, WILLIAM G. HAMILTON, a citizen of the United States, residing at San Diego, in the county of San Diego, State of California, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention relates to that class of flying machines in which the weight is sustained by the reaction resulting when one or more aeroplanes are moved through the air edgewise at a small angle of incidence either by mechanical power or by the utilization of the force of gravitation.

The objects of my invention are: first to provide means for maintaining the equilibrium or lateral balance of the apparatus said means being in the peculiar construction of said apparatus, second, to provide means for guiding the machine both vertically and horizontally.

With these and other objects in view which will appear in the detailed description hereinafter my invention consists of certain novel features of construction, combination and arrangement of parts set forth in the following specification and more particularly pointed out in the appended claims, and which are illustrated in the accompanying drawings in which:—

Figure 1 is a perspective view of the machine complete. Fig. 2 is a sectional elevational view of the main planes. Fig. 3 is a side elevational view of the machine complete and Fig. 4 is a plan view showing the principal construction of the machine including the guide planes and with a part of each side broken away.

Similar characters of reference refer to similar parts throughout the several views.

In flying machines of the character to which this invention relates the apparatus is supported in the air by reason of the contact between the air and the under surface of one or more planes. Usually these plane surfaces are solid. The relative movement of the air and aeroplane may be derived from the amount of air in the form of wind blowing in the direction opposite to that of which it is traveling or by combined downward and forward movement of the machine as in starting from an elevated position or by combination of these two things and in either case the operation is that of a

soaring machine while power applied to the machine to propel it positively forward will cause the air to support the machine in a similar manner. In either case owing to the varying conditions to be met there are numerous disturbing forces which tend to shift the machine out of the position which it should occupy to obtain the desired results, and to provide for remedying this difficulty there is usually provided means for changing the angles of a portion of these planes, or separate means for maintaining the lateral equilibrium of the machine.

The chief object of my invention is to provide the supporting planes of such construction that in case the machine tilts sideways the sustaining force is decreased on the upper side and increased on the lower side, thus it will naturally maintain its equilibrium and I will now proceed to describe the construction by which these results are accomplished.

In the accompanying drawings I have shown a bi-plane but the same construction of plane can be used for the mono-plane or any other machine where planes are used for supporting purposes.

Numerals 1 and 2 represent the upper and lower planes. These planes are solid on their front and rear sides and are provided with a plurality of bows 3 for supporting the principal portion of the plane in a bowed position. To each of these bows is attached another and shorter bow 4 which bows downward. These bows 3 support the plane and from the center of the machine outward the plane covering of each section is attached at its inner edge to the lower bow 4 and at its outer edge to the upper bow 3 in the next section outward from the center. This leaves an open space between the two bows 3 and 4 in adjoining sections and that portion of the plane is on an angle to the main plane laterally in these sections so that upon the tilting of a plane laterally these spaces between the bows provide no support while on the opposite side of the center the angle is in the opposite direction causing greater support than if the plane was horizontal. The front guide plane 5 is constructed in the same manner as the main planes. The main planes 1 and 2 are connected by means of curved standards 6 and 7 which are rigidly connected to said planes 1 and 2 and pivotally mounted be-

tween pieces 6 and 7 are engines 8 supported by cross pieces 9. These engines operate in unison and are directly connected to each other by means of shaft 8^b and on each end of said shaft adjacent to the engine are bevel gears 8^a adapted to engage with other bevel gears 8^c which are rigidly attached to shafts 8^d upon the extended end of which are mounted propellers 10. These engines 8 and a guide frame are pivotally mounted on supports 9, adapted to swing thereon. Said frame is composed of vertical spring guides 16, one on each side, springs 17 and 18 therein, top horizontal supports 19, central horizontal support 20, braces 21 and supports 22. On the rear end of supports 19 is pivotally mounted rudder 23, pivoted at 23^a and the rear end of support 20 is curved upward at 20^a and acts as a guide for said rudder. This rudder may be rigidly attached to the upper end of support 20 in the position as shown in Fig. 3, or if desired said rudder may be pivotally manipulated on pivot point 23^a by means of cables attached thereto and extending to the operator. Between supports 19 and 20 are provided guides 24 in which slide the connected ends of rods 24^a and 24^b from the main planes, extending from these rods and connecting with spring guide 16 are rods 25 on which are mounted foot pieces 25^a upon which the operator steps when desiring to tilt the rear end of the frame downward and extending forward to guide plane 5 and connecting with the frame are rods 13 and 14 upon which are foot pieces 12 for the operator's feet. It will be obvious that all of the frame including the front guide plane and the rudder are pivoted between these two planes and that the operator by shifting the weight of his body forward or backward on the seat 11 causes the front plane and the rudder to simultaneously tilt with the shifting of his weight. The front plane is revolvably mounted on rod 20 and there are provided rods 14 which are connected to plane 5. By the pressure of the operator's feet on foot pieces 12 the front plane may be revolved on said rod 20 for slight lateral tilts of the machine and for turning it. Both above and below said engine 8 are provided springs 17 and 18 and on the lower end of said frame 16 are provided wheels 26 and on the rear of the lower plane is attached a supporting skid 27, the wheels and said skid are for supporting the machine on the ground until it has attained a sufficient speed to cause it to rise into the air.

It is obvious that with the planes constructed as described that the machine will maintain its lateral equilibrium at all times, that the manipulation of the machine is made by the shifting of the weight of the operator forward or backward as desired

and that the foot pieces 12 in connection with rods 13 and 14 operate the front plane, that the guiding mechanism is so constructed and connected that the moving of any part of it causes all the guiding parts to act simultaneously and in unison.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a flying machine, a normally horizontal main plane comprising a plurality of sections on each side of the center thereof, the central portions of each of said sections inclining upwardly laterally with normally vertical openings between the inclined parts of said sections, all substantially as set forth.

2. In a flying machine, two normally horizontal parallel aeroplanes superposed one above the other, each composed of a plurality of sections on each side of the center thereof, the central portion of each of said sections inclining upwardly laterally and normally vertical openings between the inclined parts of said sections, all substantially as set forth.

3. A flying machine comprising a plurality of parallel aeroplanes, superposed one above the other, each comprising a plurality of sections, the front and rear portions of said sections in each plane being in the same horizontal plane, and the central portions of each section inclined upwardly and from the longitudinal center of the machine laterally with openings between said sections, all substantially as set forth.

4. A flying machine comprising two superposed aeroplanes each comprising a plurality of inclined sections with each section inclining upwardly and laterally from the center of said main planes, upright standards bowed inwardly connecting the margins of said aeroplanes, driving means pivotally supported on said upright standards; and a guide frame pivotally mounted therewith, all substantially as set forth.

5. A flying machine comprising superposed and connected aeroplanes, each comprising a plurality of sections, each of said sections being inclined upward laterally from the center of the main plane, a horizontal rudder, means for controlling the movement of said rudder, a guide plane revolvably mounted on said machine, and a foot lever means for controlling and guiding said guide plane, all substantially as set forth.

6. A flying machine comprising two superposed aeroplanes each of which is composed of a plurality of sections, upwardly and laterally inclined from the center, a plurality of curved standards connecting said aeroplanes, engines mounted thereon, a guide plane frame pivotally mounted on said standards, a horizontal rudder pivotally mounted on said frame, a horizontal

guide plane pivotally mounted on said frame, means for operating said rudder, means for operating said guide plane, means for tilting said frame, and means for supporting said machine when on the ground, all substantially as set forth.

7. A flying machine comprising superposed aeroplanes, each of which comprises a plurality of sections, the outward portions of each of said sections being inclined from the middle of said aeroplanes, laterally and upwardly, and curving upwardly, so that the middle portion of the outer edge of each section is raised above the inner edge of the adjoining section, a plurality of curved standards connecting said aeroplanes, crossbars mounted on said standards, a front guide plane, a rudder, means for operating said guide plane, means for operating said rudder relatively with said aeroplanes, all substantially as set forth.

8. A flying machine comprising a plurality of laterally balancing superposed aeroplanes, each comprising a plurality of sections laterally and upwardly inclined

from the horizontal plane of each of said main planes from the middle of said main planes, a frame pivotally mounted thereon, means on said frame for raising and lowering said machine, and means for supporting said machine when on the ground, all substantially as set forth.

9. A flying machine comprising aeroplanes composed of a plurality of sections divided by double bows, covering connecting the lower portion of one bow with the upper portion of the next bow from the center of said aeroplane, open spaces between the two portions of said bows, means for propelling said aeroplanes through the air and means for guiding said flying machine both horizontally and vertically, all substantially as set forth.

In testimony whereof, I hereunto subscribe my name in the presence of two subscribing witnesses.

WILLIAM G. HAMILTON.

Witnesses:

MARY A. BOWMAN,
ELMER E. RODABAUGH.