

B. T. B. HYDE & A. GAUL, JR.  
AEROPLANE.

APPLICATION FILED JUNE 23, 1910.

1,002,203.

Patented Aug. 29, 1911.

2 SHEETS—SHEET 1.

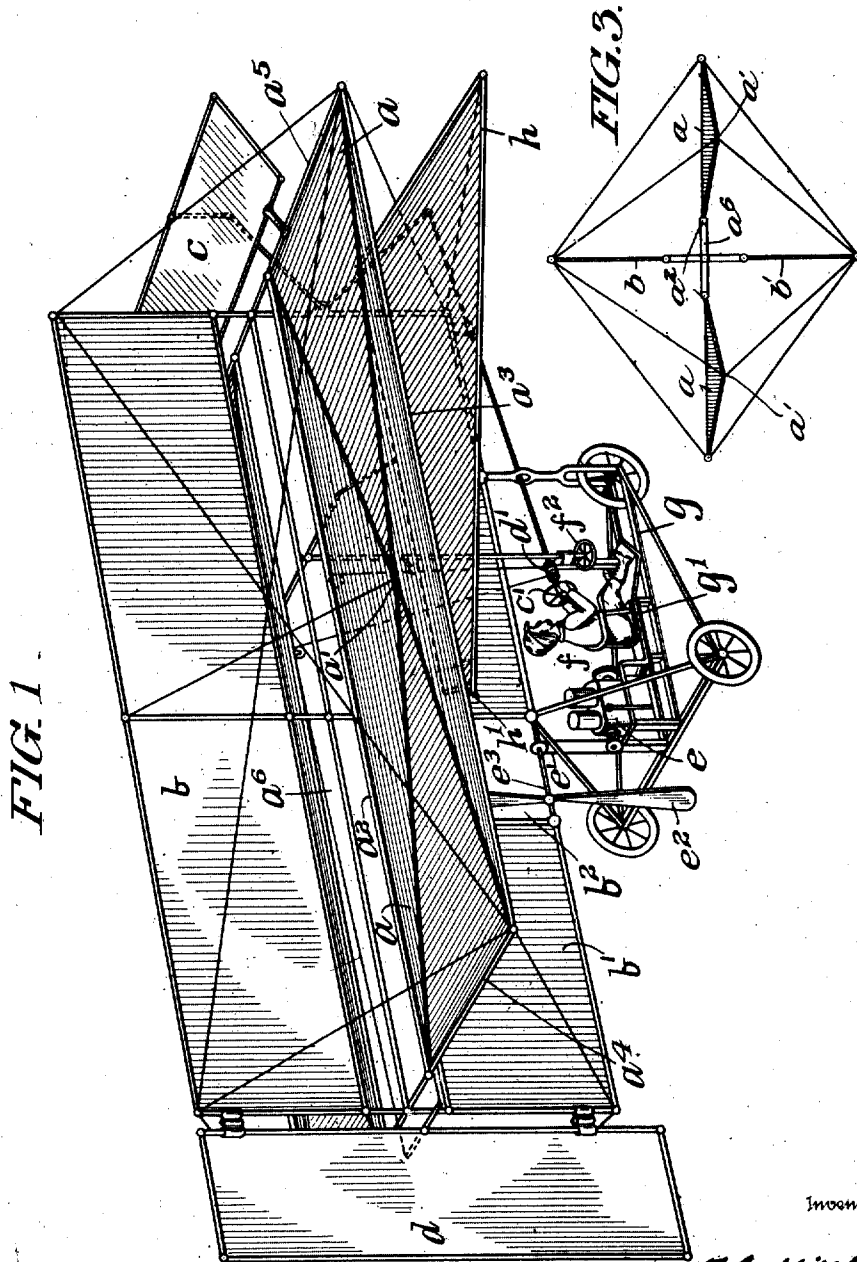


FIG. 1

FIG. 3

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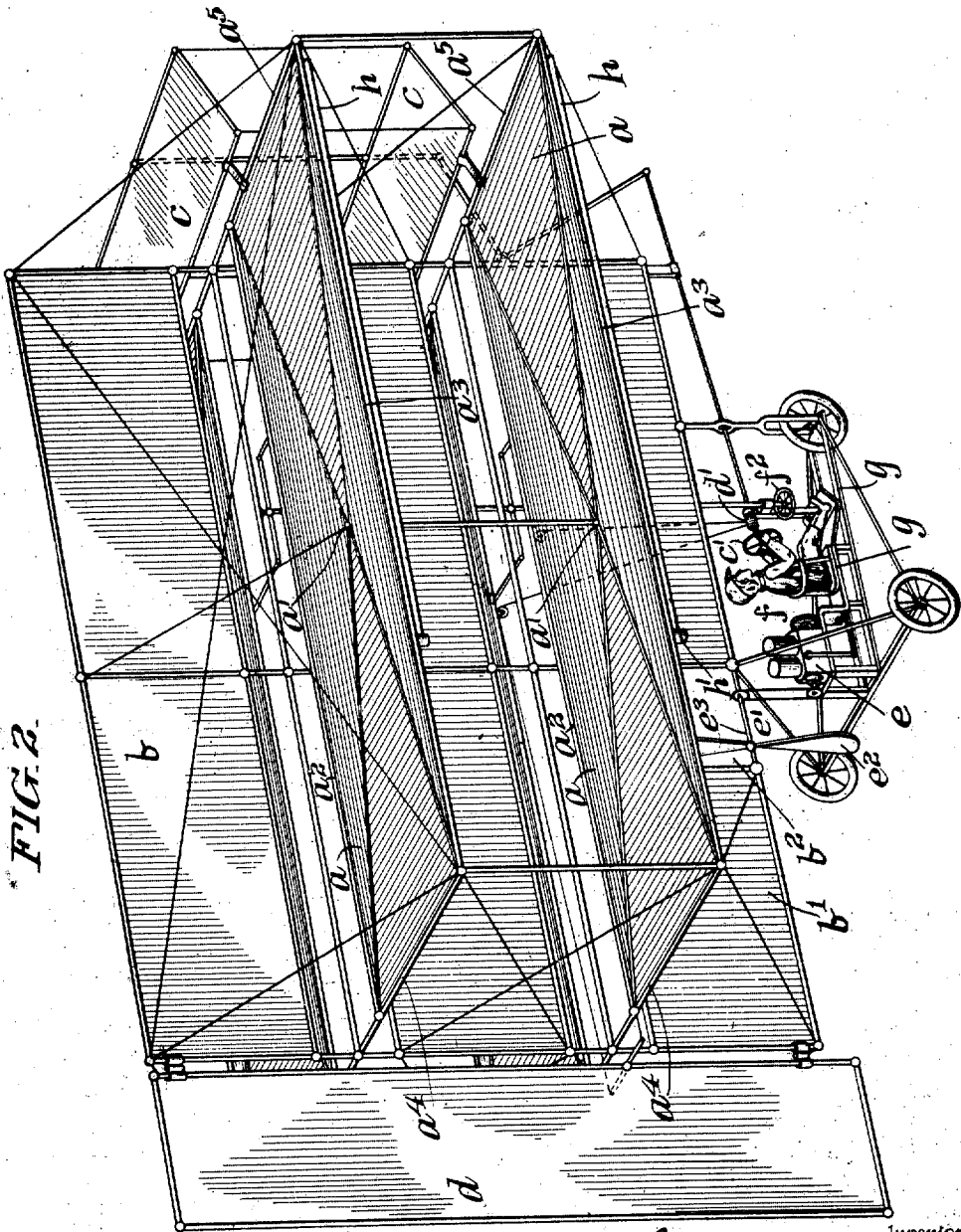


FIG. 2.

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# UNITED STATES PATENT OFFICE.

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## AEROPLANE.

1,002,203.

Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed June 23, 1910. Serial No. 568,433.

To all whom it may concern:

Be it known that we, BENJAMIN T. B. HYDE and ANDREW GAUL, Jr., both citizens of the United States, residing, respectively, at New York, in the county of New York and State of New York, and at Ridgefield, in the county of Bergen and State of New Jersey, have jointly invented certain new and useful Improvements in Aeroplanes, of which the following is a specification.

The present invention relates to aeroplanes, and especially to means for uniformly stabilizing such planes.

Great difficulty in the past has been experienced in making aeroplanes stable under variable air conditions and many accidents have been occasioned by the lack of stability of aeroplanes. In accordance with the present invention, this difficulty is overcome by providing vertical stabilizing planes located above and below a carrying or supporting plane or planes having a central air space and which vertical planes are substantially co-extensive in length therewith, the vertical stabilizing planes effectively stabilizing the aeroplane, under varying conditions, in flights. To further increase the stability of the aeroplane an air space is provided adjacent to the point of intersection of the vertical stabilizing planes with the longitudinal carrying or supporting plane or planes. During flights of the aeroplane the air will be forced by the supporting plane structure toward the free air space and will pass upwardly on both sides of the stabilizing plane structure to thereby prevent undue teetering and gyrations of the aeroplane. To further stabilize, the motive power and controlling mechanism are suspended from the lower stabilizing plane structure at a point about the center of gravity of the said structure.

Figures 1 and 2, are respectively, perspective views of "monoplane" and "biplane" structures, embodying main features of our invention; and Fig. 3, is a vertical central sectional view through the carrying or supporting plane structure of Fig. 1, showing the downwardly bow-shaped constructive arrangement thereof.

Referring to Fig. 1, of the drawings showing a "monoplane" structure,  $a$  is the carrying or supporting plane thereof, of canvas, duck, silk or other suitable buoyant or flexible material, divided by an air space

$a^0$ , into two parts lengthwise of the structure. Each half of the planes  $a$ , is downwardly bow-shaped toward the center  $a^1$ , from the sides  $a^2$ , and  $a^3$  and ends  $a^4$  and  $a^5$ , as clearly shown in Fig. 3. The air space  $a^6$ , extends longitudinally of the structure  $a$ , to permit of a steady volume of air being maintained in the space of which the density in conjunction with sustaining freedom of the air beneath the carrying or supporting plane structure, insures substantial steadiness, in flights of the aeroplane.  $b$  and  $b^1$ , are vertical stabilizing planes arranged at a right angle to the carrying or supporting plane structure  $a$ , and above and below the same to provide a free air space between them. The vertical stabilizing planes  $b$  and  $b^1$ , are preferably arranged as experience has dictated in the longitudinally central axis of the structure, as clearly illustrated in the drawings.  $c$ , is an elevating and deflecting device arranged at the front of the carrying or supporting plane  $a$ , and operative from an aviator station  $f$ , of the aeroplane, to be hereinafter more fully explained.  $d$ , is a rudder arranged at the rear of the structure.  $e$ , is an engine, suspended from the lower stabilizing plane  $b^1$ , immediately fore and aft of a vertical median plane through the combined structure, that is, substantially below the center of gravity of the structure.  $e^2$ , is a propeller located in an opening  $b^2$ , provided in the stabilizing plane  $b^1$ , and connected by a longitudinal shaft  $e^3$ , with a sprocket and chain mechanism  $e^4$ , of the motive power  $e$ . Other means than those shown for actuating the propeller  $e^2$ , may be employed.  $g$ , is a supporting frame for the aviator seat  $g^1$ .  $c^1$  and  $d^1$  are suitable controlling means for the elevating and deflecting device  $c$ , and rudder  $d$ .  $h$ , are wings pivoted at  $h^1$ , to the underside of the carrying or supporting plane structure  $a$ , as shown, these wings being arranged longitudinally of the structure and on both sides of the same. The said wings are adapted to be shifted laterally by means  $f^2$ , operative from the aviator station  $f$ , so as to either extend or retract the same, so as to increase or decrease the sustaining capacity of the structure as desired and in some instances to prevent momentary tendency to pendulous actions of the structure, in flights.

In Fig. 2, the aeroplane structure differs

from that of Fig. 1, in that particular features of our said invention are shown in a biplane structure having two carrying or supporting planes  $a, a$ , and three stabilizing planes  $b$  and  $b^1$ . In other respects the said structure is the same as that explained as regards steadiness, non-teetering and non-pendulous actions in flights.

As to some of the detail arrangements of aeroplanes as hereinbefore explained, modifications therein may be made without affecting the scope of our said invention, and hence, we do not wish to be understood as limiting ourselves to the particular arrangements of the aeroplanes as illustrated, to insure stability in flights as well as safe use and reliable maneuverings.

Having thus described the nature and objects of our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In an aeroplane, a carrying or supporting plane having a central space, vertical stabilizing planes located above and below the central space at or in the plane of the fore and aft axis of the machine, flight controlling means connected with said structure and an aviator station arranged below the lower stabilizing plane about the center of gravity of the aeroplane.

2. In an aeroplane, a carrying or supporting plane, having a central space, wings movably arranged on both sides of the same, vertical stabilizing planes located above and below said central space and coextensive in length therewith, means to control flights connected with said planes and an aviator station arranged from the lower stabilizing plane.

3. In an aeroplane, a divided carrying or supporting plane having a central space, vertical stabilizing planes connected with and located above and below said central space and at or in the plane of the fore and aft axis of the machine, steering-means, an elevating and deflecting device and means to regulate the steering-means and elevating and deflecting device.

4. In an aeroplane, a carrying or supporting plane having a central space, vertical stabilizing planes connected with and located above and below and coextensive in length with the same, said vertical planes adjacent to the point of their intersection with said carrying or supporting plane being separated by an air space, steering means, an elevating and deflecting device, motive power, and mechanism to control the steering-means and elevating and deflecting device, said motive power and mechanism arranged below the lower stabilizing plane about the center of gravity of the aeroplane.

5. In an aeroplane, a carrying or supporting plane, wings in connection therewith on both sides thereof, means to actuate the

same, vertical stabilizing planes connected with and located above and below the carrying or supporting plane and coextensive in length therewith, said planes being provided adjacent to their point of intersection with the supporting planes with a space for air currents so as to steady the structure in flights, steering-means, elevating and deflecting devices and motive power, and mechanism suspended from the lower stabilizing plane about the center of gravity of the aeroplane.

6. In an aeroplane, a divided carrying or supporting plane, wings connected with said plane and laterally movable to and from the same, vertical stabilizing planes connected with and located above and below and coextensive in length therewith, said planes being separated by an axial air space and motive power and mechanism to control flights of the aeroplane.

7. In an aeroplane, independent downwardly bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, said vertical planes being separated by an axial air space, flight-controlling means connected with said structure, an aviator station connected with the lower stabilizing plane and motive power and mechanism at said station, for operating the flight controlling means.

8. In an aeroplane, two independent downwardly bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, said vertical planes being separated by an air space, flight controlling means connected with said structure, an aviator station arranged from the lower stabilizing structure and motive power, and mechanism at said station, for operating the flight controlling means.

9. In an aeroplane, independent downwardly bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, said vertical planes being separated by an air space, flight-controlling means located in front and in rear of the structure, an aviator station located below the lower stabilizing structure and motive power, and mechanism at said station about the center of gravity of the aeroplane for operating the flight controlling means.

10. In an aeroplane, two independent downwardly bow-shaped longitudinal carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, said structures in their connected relation adjacent to their point of intersection, separated by an air space the length of the aeroplane, flight controlling devices arranged from the front and rear of the aeroplane, an aviator station

connected with the lower stabilizing plane and means at said station, for operating the flight controlling devices.

11. In an aeroplane, independent bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, flight controlling means and an aviator station arranged about the center of gravity of the aeroplane.

12. In an aeroplane, independent downwardly bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft axis of the machine, flight-controlling means, an aviator station supported from the lower stabilizing plane and means at said station to regulate the flight controlling means.

13. In an aeroplane, two independent downwardly bow-shaped carrying or supporting planes, vertical stabilizing planes located at or in the plane of the fore and aft

axis of the machine, said planes separated by an axial air space and a suspended aviator station with means thereat to regulate flights of the aeroplane.

14. In an aeroplane, independent downwardly bow-shaped carrying or supporting planes located side by side, vertical stabilizing planes arranged above and below and adjacent to the point of intersection of the carrying or supporting planes providing an air space to steady the stabilizing structure, flight controlling devices and an aviator station supported from the lower stabilizing plane to control said devices.

In witness whereof, we have hereunto set our hands in the presence of two subscribing witnesses.

BENJAMIN T. BABBITT HYDE.  
ANDREW GAUL, Jr.

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