

D. R. DAVIS.
AEROPLANE.
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1,030,772.

Patented June 25, 1912.

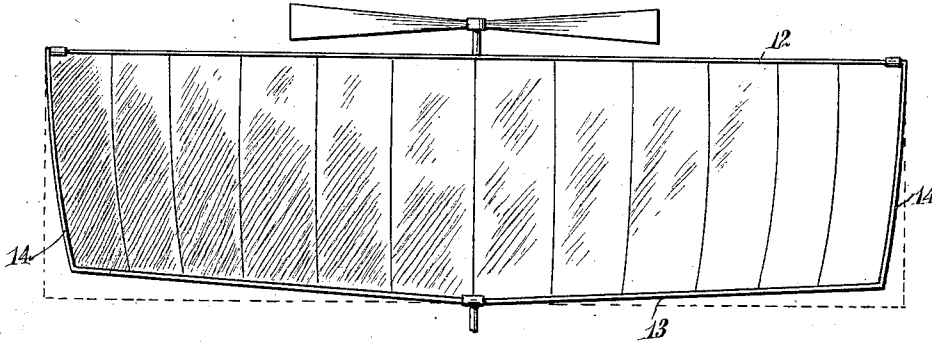


Fig. 1.

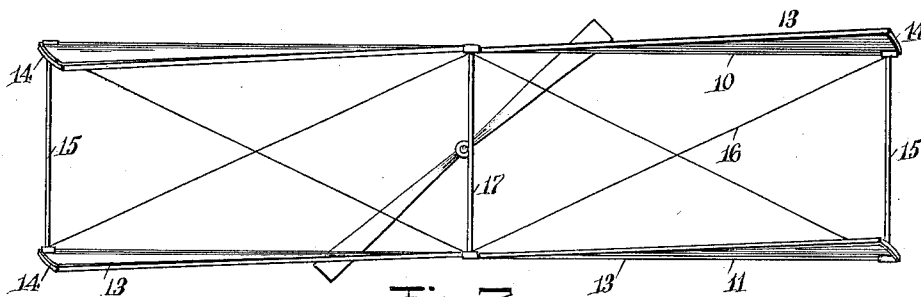


Fig. 2.

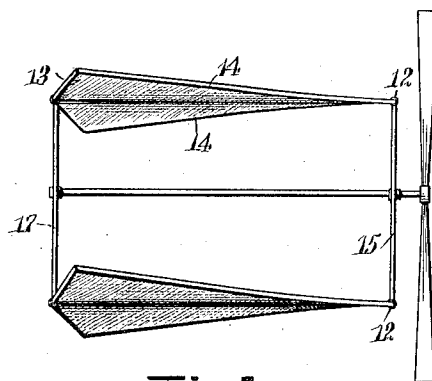


Fig. 3.

WITNESSES:

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DAVID RICHARD DAVIS, OF EAU CLAIRE, WISCONSIN.

AEROPLANE.

1,030,772.

Specification of Letters Patent.

Patented June 25, 1912.

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To all whom it may concern:

Be it known that I, DAVID R. DAVIS, a citizen of the United States, and a resident of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented a new and Improved Aeroplane, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in aeroplanes, and more particularly to the means for supporting and mounting the supporting planes of the structure.

My invention is applicable to various types of aeroplanes, but is particularly applicable to that type in which the balancing is effected by a relative movement of the parts of the main supporting plane. In my improved construction, I support the main plane substantially at three points, two of which are on the forward edge of the plane adjacent the opposite corners thereof and the other of which is upon the rear edge midway between the rear corners. Thus, the rear corners of the plane are free to move vertically the limited distance. By providing the plane with a substantially rigid rear edge, the upward movement of one rear corner of the plane can be effected only by an equal downward movement of the opposite rear corner. By so mounting the plane, the rear portion may act automatically to keep the main body of the aeroplane in its proper position when cross currents or vertically-directed currents of air are encountered. It also affords a means by which the main plane becomes self-righting when carried out of its normal position by such air currents.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a top plan view of a portion of an aeroplane constructed in accordance with my invention; Fig. 2 is a rear view thereof; and Fig. 3 is an end view.

In the accompanying drawings, I have not illustrated a complete machine with engine, rotor and other necessary operating and controlling means, as these constitute no portion of my invention. My invention relates solely to the means for mounting the main planes, and other details have, therefore, been omitted from the drawings. It is, of course, understood that such parts would

be used in connection with the planes illustrated as may be necessary to properly propel and guide the machine.

My invention is illustrated as applied to a biplane in which there are the two superposed main supporting planes 10 and 11. The planes are formed of any suitable thin, flexible material stretched over a frame, which includes a front edge member 12, a rear edge member 13 and ribs 14 connecting the front and rear edge members, and jointed or hinged to said front and rear members. The end ribs 14, having more strain upon them than the intermediate ribs are made of stronger material. The front edge member 12 of one plane is held rigid in respect to the front edge member of the other plane by vertical braces 15 and by diagonal wires or cables 16. The rear edge member 13 of each plane is connected to the rear edge member of the other plane by a vertically-disposed upright or brace 17, which is disposed intermediate the ends of the plane, so as to support said rear frame member at a single point. The rear edge member 13 of each plane consists of two spars jointed or hinged to the ends of the brace 17, so that the outer ends can move forward without bending the spars, as shown in Fig. 1. The hinge connection at the ends of 17 also keep the ends of 13 from sagging, and acts as a fulcrum so that if one of the ends of 13 is forced down the other end will have to move up, as shown in Fig. 2. The uprights or braces 15 of the front edge are at the ends of the planes, so that the entire front edge of each plane is supported. It will thus be noted that the rear corners of the planes are unsupported except by the rear and end members of the frames of the planes. These rear and end frame members are stiff and substantially rigid, but they are so connected to the remaining frame members that there may be a limited relative movement. By pressing down on one rear corner of the plane, the opposite rear corner is raised, due to the stiffness of the rear frame member 13.

The method of action of the planes when in use is substantially as follows: When an upward current of air becomes directed against one end of the plane, the rear corner at that end yields to its pressure, and in so doing relieves the pressure of the air against the plane and prevents the entire machine from bodily tilting laterally. At

the same time, the rear edge of the same plane at the other rear corner is forced downwardly because of the stiffness of the rear frame member 13 and the fact that the
 5 brace or upright 17 constitutes the fulcrum of a lever. In this way, the rear corner at the end not encountering the upward current is forced downwardly to a position where it meets the horizontal current which
 10 the aeroplane may be considered to be encountering because of its forward motion. With this rear corner depressed, the forward motion of the aeroplane automatically raises this end and counteracts the lifting
 15 action exerted on the opposite end by the upwardly-directed air current above referred to. In this way, the two corners are subjected to pressures which automatically equalize and prevent further displacement
 20 of the plane or any of its parts. When one pressure is relieved because of the cessation of the upper current, the air pressure operates to restore the plane to its former position. In this way, the disturbing air cur-
 25 rent is prevented from affecting the equilibrium of the aeroplane, and normal conditions are restored automatically.

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

30 1. An aeroplane having a main plane, and means for supporting the same at three points only, two of said points being on the forward edge of the plane adjacent to the
 35 opposite corners thereof and the other point being upon the rear edge midway between the rear corners whereby the movement of one rear corner of the plane in one direction by a current of air automatically moves the
 40 opposite rear corner of the plane in the opposite direction.

2. An aeroplane having a main plane including a peripheral frame and a cover, the
 45 said frame having a front edge member, a rear edge member, and ribs connecting the front and rear edge members, means for supporting the front edge member of the frame at two points only adjacent to the
 50 ends of the said edge member, and a support for the rear edge member of the frame, at a single point between the outer ends thereof, the said support having a hinge connection with the said rear edge member
 55 at said point, the hinge connection forming a fulcrum for said rear edge member.

3. An aeroplane comprising two superposed supporting planes, each including a
 60 peripheral frame and a cover, means for rigidly supporting the planes at the front side thereof with respect to each other, and a support for the rear sides of the planes and connecting the said rear sides at points
 65 midway between the ends thereof, the said rear sides of the planes having a hinge connection with the said support at said points.

4. An aeroplane having a main plane including a peripheral frame and a cover, means for rigidly supporting the said frame at the front edge portion, and means for pivotally supporting the said frame at the rear
 70 edge at a single point midway between the ends thereof, the said pivotal connection permitting the ends of said rear edge member of the frame to move forward, the said connection also acting as a fulcrum so that if
 75 one of the ends of the rear edge member of the frame is forced down the opposite end is raised.

5. An aeroplane, comprising two superposed main supporting planes, means for
 80 holding the front edge of one plane rigid with respect to the front edge of the other plane, the said means including vertical braces at the ends of the said front edges of the planes, and a single vertically dis-
 85 posed brace connecting the rear edge of one plane with the rear edge of the other plane, the said brace being located intermediate the ends of the planes, and acting as a fulcrum, whereby an upward movement of the rear
 90 edge of one of the planes at one end automatically depresses the rear edge of the said plane at the other end.

6. An aeroplane, comprising two superposed main supporting planes, each consist-
 95 ing of a frame having a front edge member, a rear edge member and end members, and a cover for the frame, vertical braces connecting the front edge members of the frames with each other at the opposite ends
 100 of the frames, a vertical brace connecting the rear edge member of one frame with the rear edge member of the other frame, the said brace being located midway between the ends of the frames, the rear corners of
 105 the planes being free to move vertically a limited distance, the said brace acting as a fulcrum for the rear edge members, whereby an upward movement of one rear corner of one of the planes by the pressure of a cur-
 110 rent of air automatically depresses the opposite rear corner of the said planes.

7. An aeroplane having a main plane, means for rigidly supporting the plane at
 115 one edge portion at the ends thereof, and a supporting brace pivotally connected at its end with the said plane at the opposite edge portion at a single point intermediate the
 120 ends of said edge portion, the said latter edge portion having a limited vertical movement on its pivot whereby when one of the ends of said edge portion is moved upward by the pressure of a current of air, the other end is automatically moved downward.

8. An aeroplane comprising two superposed main planes, means for holding one
 125 edge of one plane rigid with respect to the corresponding edge of the other plane, means for pivotally connecting the opposite edges of the said planes together at a single point
 130

intermediate of the ends of said planes, the ends of said planes at the last mentioned edge having a limited movement relative to the other parts of the planes and adapted to be moved by the currents of air, the movement of one end of one plane in one direction by the pressure of a current of air automatically moving the other end of said plane in the opposite direction.

10 9. An aeroplane comprising two superposed supporting planes, rigidly connected with each other at one edge thereof, and a

support extending between the said planes at the opposite edges thereof, and at a point midway between the ends of the planes, the ends of the said support having a hinge connection with the said edges of the planes. 15

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

DAVID RICHARD DAVIS.

Witnesses:

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C. T. BOYD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
