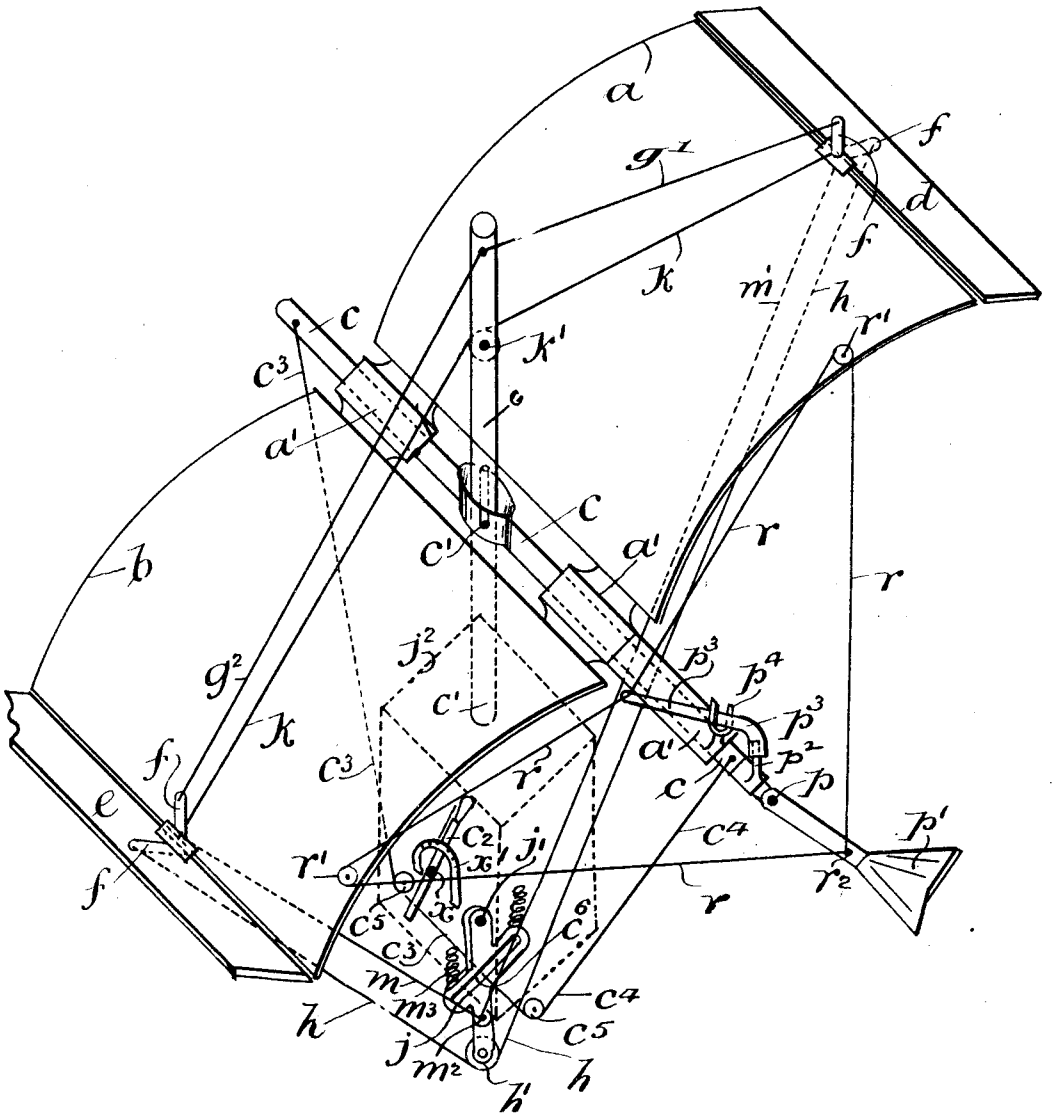
R. McMULLEN.
AUTOMATIC BALANCING AEROPLANE.
APPLICATION FILED SEPT. 13, 1910.

1,037,651. Patented Sept. 3, 1912.



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ROBERT McMULLEN, OF FREMANTLE, WESTERN AUSTRALIA, AUSTRALIA.

AUTOMATIC-BALANCING AEROPLANE.

1,037,651. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed September 13, 1910. Serial No. 581,876.

To all whom it may concern:

Be it known that I, ROBERT McMULLEN, a subject of the King of Great Britain, and residing at Fremantle, Western Australia, Commonwealth of Australia, have invented new and useful Improvements in Automatic-Balancing Aeroplanes, of which the following is a specification.

This construction of aero plane is on the monoplane type and results in automatic stability being imparted to the plane as a whole as the wings owing to the wind influence act as the automatic balancing agents and without any aid from the aviator.

A special feature of my monoplane and one of great value and advantage resides in the ease of detachability of the operative parts.

The construction will now be explained by the aid of the attached diagrammatic and perspective drawing as looking from the rear of the machine and said drawing shows the novel features of my monoplane as a whole.

In same *a* and *b* denote the companion wings which as a whole are axially secured by the sleeves or bosses a^1 to the back bone *c*. The outer edges of these wings carry the hinged blades as *d* and *e* whose function is to prevent side slide to the monoplane as they automatically present their faces to the air currents and thus act as shields to either the upper or lower surfaces of the wings and thereby prevent the wind currents from being exerted on said surfaces that is to say when the wing *a* is in the raised position as seen in the drawing its blade *d* is depressed and thereby shielding the lower surface of the said wing while the reverse action and result holds good for the other wing *b*. The axis of said blades *d* and *e* carry a double armed lever as *f* whose upper terminals are rigidly secured to the mast head *g* by the stay ropes g^1 and g^2 while said levers are also connected at their lower ends by the rope *h* which passes over the runner h^1 said runner being mounted at the bottom end of the swinging frame *j* which is pivoted at j^1 to the underside of the car j^2. These double arms *f* act as the agents for raising or lowering the wing blades as *d* and *e*. The wings are stayed together by the roof rope *k* running on the wheel k^1 mounted in the mast *g* said wings being also stayed by the lower ropes *m* and m^1 and which are rigidly made fast at m^2 to the swinging frame or arm *j*. This radially swinging frame is provided with cushion springs m^3 interposed between it and the underside of the car. The function of said springs is to cushion the wings at each end of their pendulum like movement through the medium of the rope *h* attached to the blades and engaging the runner at the bottom end of the swinging frame *j*. The wings have an axial movement on the backbone in unison and in a mutually dependent manner.

To the stern of the back bone at the point *p* is hingeably secured the rudder or governor p^1 and this rudder is automatically controlled by and immediately responds to the raising or lowering of the wings in manner as follows: The rudder stem carries a post p^2 placed in front of the rudder pivot and upon this post radiates the tiller or lever p^3 and on the sleeve a^1 of the wings is rigidly attached an upstanding rod p^4 having its upper end bifurcated and engaged by the tiller and by the axial motion of the wings the rudder is actuated by means of the rod p^4 and the tiller p^3. To the tiller is secured the tiller ropes *r* passing over the runners r^1 on the wings and then made finally fast at the point r^2 on the rudder stem. The rudder follows or leans to the rising wing as seen in the drawing therefore having the tendency to bring the wings automatically to a position of equipoise. To modify the direction of the travel of the monoplane the rudder may be manually operated in the usual manner. The back bone as *c* is pivoted at c^1 to the mast *g* and the fore and aft radial motion is imparted thereto by the manual control lever c^2 and its ropes c^3 and c^4 said ropes being respectively made fast to the front and stern ends of the back bone. These ropes pass over the runners as c^5 and the swinging frame is made with the open slot as c^6 so as to give freedom of movement for the stern rope c^4. The lever c^2 is pivoted at *x* and works on the notched quadrant x^1 so as to hold the lever as desired. By means of this fore and aft radial movement the monoplane is enabled to safely parachute or zig zag when descending as any desired cant or incline is effected by the throw over of the lever c^2 on its pivot so that the aviator can easily maintain the horizontal or other desired plane or level. By way of example in the event of a break down of the engine or

propeller the aviator would safely descend by operating the lever c^2 and so counteract or oppose the inclination of the monoplane to slide either backward or forward in other words he would always maintain a level plane.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In an aeroplane, a backbone running longitudinally of the same and having rising and falling wings mounted thereon, a transverse axis upon which said parts are pivoted to permit the aeroplane to be tilted fore and aft, a control lever for tilting the aeroplane, the wings having outer hinged blades one of said blades being raised when the other is depressed upon the rise or fall of the wings to prevent side slide, each of said blades having lever arms, a swinging spring cushion frame having a runner mounted thereon, flexible devices connecting said levers, for operating the said hinged blades, the connecting flexible devices passing over the runner of the cushion frame.

2. In an aeroplane, a backbone running longitudinally of the same and having wings mounted to axially move on the said backbone to rise and fall, a transverse axis upon which said aeroplane is pivoted to permit it to be tilted fore and aft, a control lever for operating the backbone, and operating connecting ropes for the said backbone and wings.

3. In an aeroplane, a backbone running longitudinally of the same and having wings axially movable thereon, a transverse axis on which said aeroplane is pivoted to permit tilting movement of the latter both fore and aft, a fulcrum operatively associated with said wings, a pivoted rudder provided with a tiller, and means for connecting the rudder and the wings and actuated by said fulcrum.

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

ROBERT McMULLEN.

Witnesses:

RICHARD SPARROW,

VICTOR DEVERELL.

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