G. W. THOMPSON.

AEROPLANE.

APPLICATION FILED NOV. 18, 1910.

1,010,986.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 1.

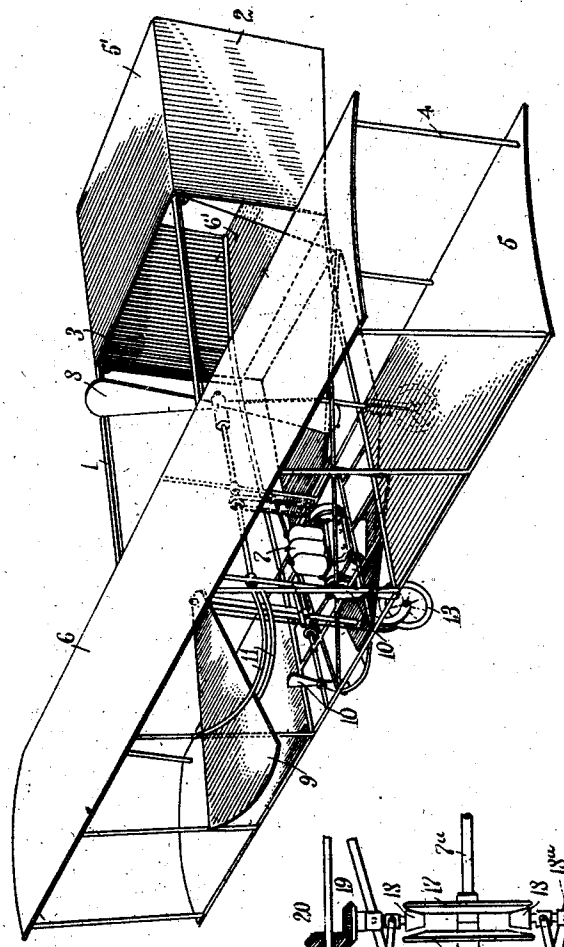


Fig. 1.

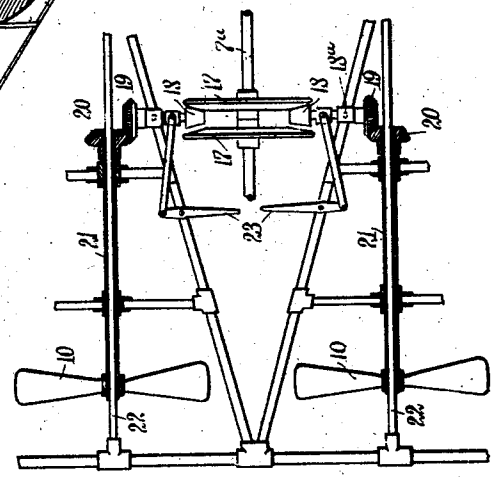


Fig. 4.

WITNESSES

INVENTOR

George W. Thompson

BY Munn & Co

ATTORNEYS

G. W. THOMPSON.

AEROPLANE.

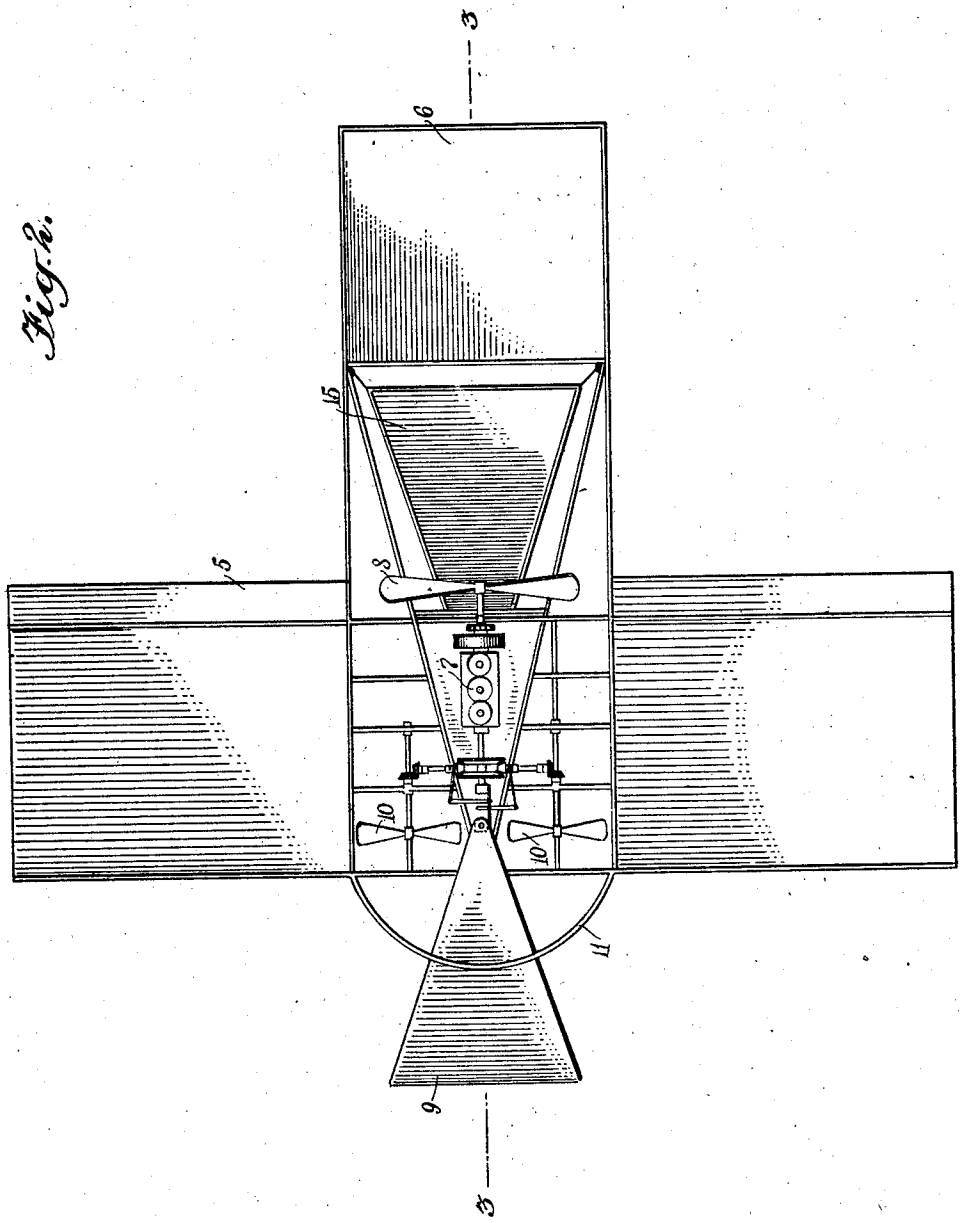
APPLICATION FILED NOV. 18, 1910.

1,010,986.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

Geo. Waylor

A. L. Rollhaus

INVENTOR

George W. Thompson

BY Munn & Co

ATTORNEYS

G. W. THOMPSON.

AEROPLANE.

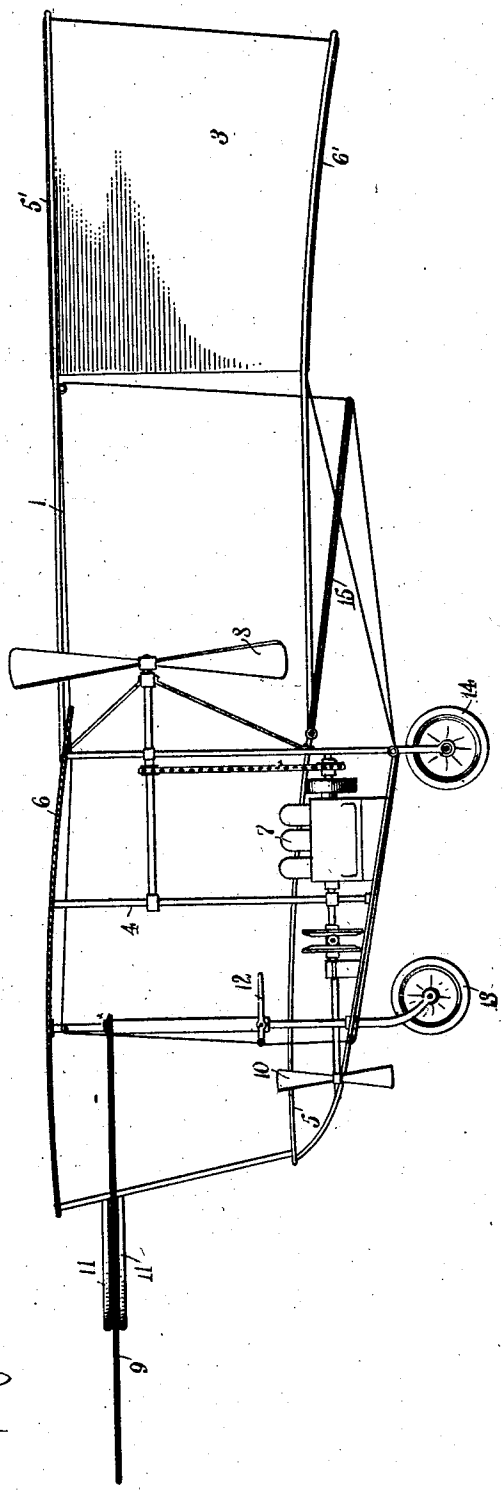
APPLICATION FILED NOV. 18, 1910.

1,010,986.

Patented Dec. 5, 1911.

3 SHEETS—SHEET 3.

Fig. 3.



WITNESSES

Geo. W. Naylor

T. D. Rollhaus

INVENTOR

George W. Thompson

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON THOMPSON, OF KINGSTON, OKLAHOMA.

AEROPLANE.

1,010,986. Specification of Letters Patent. Patented Dec. 5, 1911.

Application filed November 18, 1910. Serial No. 592,993.

To all whom it may concern:

Be it known that I, GEORGE W. THOMPSON, a citizen of the United States, and a resident of Kingston, in the county of Marshall and State of Oklahoma, have invented a new and Improved Aeroplane, of which the following is a full, clear, and exact description.

My invention relates to flying machines of the heavier-than-air type, and my object is to provide a machine of this class which has its propellers so arranged that they not only drive the machine but steer it also. By such a construction I minimize the necessity of using movable rudders heretofore used to control the machine's course of travel.

A further object of my invention is to arrange the parts so as to keep the machine properly balanced and prevent it from becoming top-heavy. This I accomplish by locating the power plant directly below the center of gravity of the supporting planes, and by the manner in which the planes are tilted with reference to the line of travel.

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 views.

Figure 1 is a perspective view of my improved aeroplane; Fig. 2 is a plan view of the lower half of the machine, showing the engine and the propellers; Fig. 3 is a longitudinal section through the middle of the aeroplane; and Fig. 4 shows the steering propellers and their controlling gear.

The aeroplane illustrated in the accompanying drawings is in the form of a biplane having forward lifting planes 5 and 6, which are connected to each other by a suitable framework 4. My aeroplane is also provided with a tail portion to the rear of the lifting planes 5 and 6, and spaced therefrom, but connected to the body of the machine by suitable framework 1. This tail portion has horizontal planes 5′ and 6′ and vertical planes 2 and 3. The upper lifting plane is continuous, but the lower lifting plane is cut away in the middle to accommodate the engine or motor 7, the same being located below the level of the plane 5 so as to have its center of gravity below the center of gravity of all the planes of my flying machine. The open spaces between the engine and the lower planes give room for the propellers and their control mechanism.

In order to propel the aeroplane use is made of a driving propeller 8 and for steering purposes use is made of steering propellers 10, 10, the said propellers 8 and 10, 10 being mounted on the framework 4. The propeller 8 is driven by the motor, directly or through sprocket gearing, as shown; and the propellers 10 are connected to the motor by transmission mechanism which includes reversing mechanism, so that the propellers 10 can be rotated forward or backward, as will be described later.

Numeral 9 indicates a balancing rudder which is preferably fan-shaped or sector-shaped and is mounted to be moved by means of suitable levers around a vertical axis passing centrally through the front part of the planes 5 and 6. This rudder is guided and supported near its outer end in a guideway formed of curved bars 11, one above and one below the rudder, and connected at their ends rigidly to the vertical trusses of the framework. The rudder 9 is, of course, supported at the necessary angle to the horizontal, so that the air will react against its surface and enable the rudder 9 to assist in supporting the machine exactly as in the case of the planes 5 and 6.

15 is the elevating rudder arranged at the rear of the lower plane 5. This rudder is mounted to be swung to some extent around a horizontal axis transverse to the direction of travel, the said axis being preferably about on the same line as the rear edge of the lower plane 5. By lowering the rear end of the rudder 15 (which can be done by levers or cords), the vertical component of the reactive force can be increased, causing the rear of the aeroplane to rise, and thus keep the machine horizontal.

Referring to Fig. 3, it will be noted that the lifting plane 6 and tail plane 6′ are tilted to a greater extent than the lifting plane 5 and tail plane 5′. The lifting moment of the front planes 5 and 6 with reference to the center of gravity of all the planes will be approximately balanced by the lifting moment due to the two rear planes 5′ and 6′ and to the elevating rudder 15. Therefore, the machine will not tilt upward or downward along its line of flight, and the center of gravity of the planes will always be kept directly above the engine.

At the same time the sideward sweep of the forward wings 5 and 6, together with the rudder 9, will provide all the conditions of lateral equilibrium, and the aeroplane will be always perfectly and easily balanced.

The main shaft 7^a shown in Fig. 4 has two friction gears 17 fixed thereon. 18 are friction wheels mounted on shafts arranged to swing on pivots 18^a on the framework. Each shaft 18 bears a miter gear 19, meshing with a gear 20 on a hollow shaft 21. These hollow shafts are supported on parts of the framework 22 and transmit power to the steering propellers 8. The friction gears 18 are controlled by levers 23. The gears 19 and 20 have a loose fit, so that the friction wheels 18 can be moved into contact with either friction gear 17, without disengaging the gears 19 and 20. By this construction either or both the propellers 10 can be rotated forward or backward, or they can be thrown out of action entirely by moving the gears 18 to a position midway between the two wheels 17. The two propellers 10 are of course equidistant from the main shaft 7^a.

The rear rudder 15, being located between the front and rear lower planes, serves to equalize the fore and aft lift of the planes. It is so connected that it cannot be raised above the level of the rear plane 6, and it does its work by being pulled down at its rear to a sufficient extent to keep the machine from climbing into the air, and to help the lift of the rear planes to keep the body of the machine substantially on a level. By raising the rear end of the rudder 15, the opposite effect is produced and the aeroplane permitted to rise.

In operation, the propeller 8 drives the machine and the aeroplane is turned to the right or left by means of one or the other of the steering propellers 10. The speed can be increased if desired by starting both propellers 10 and causing them to assist the main propeller 8, or the speed can be decreased by starting them both in the opposite direction. All these results can be obtained without in any manner interfering with or adjusting the engine. If the machine tilts to one side, the balancing rudder is swung over to the side that is sinking, thus increasing the lifting surface on that side and righting the machine. If the rear of the machine sinks, the rudder 15 is lowered, and if it be desired to fly upward, the rudder 15 is pulled slightly upward, causing the machine to travel upward. The rudder 9 is controlled by a lever 12, which also controls the guide wheel 13. Supporting wheels 14 are also provided.

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

1. In an aeroplane, the combination of superposed lifting planes and superposed tail planes, the lifting and tail planes being spaced apart, the upper lifting and the lower tail plane being tilted at a different angle from the other planes.

2. In an aeroplane, the combination of superposed lifting planes and tail planes spaced apart, the upper lifting and the lower tail plane being tilted at a different angle from the other planes, and an elevating rudder between the lifting and tail planes.

3. In an aeroplane, the combination of superposed lifting and superposed tail planes spaced apart, the upper lifting and the lower tail plane being tilted at different angles from the other planes, a balancing rudder and an elevating rudder to swing up and down, adjustably mounted on a transverse horizontal axis between the lifting and tail planes.

4. In an aeroplane, the combination of a lifting plane, a balancing rudder pivotally connected to said aeroplane to be adjusted around a vertical axis and extending forward of the plane, and a pair of curved bars carried by said aeroplane, said balancing rudder passing between said curved bars to be guided thereby when the rudder is moved to adjusted position.

5. In an aeroplane, the combination of a lifting plane and a tail plane spaced apart from the lifting plane, the lifting plane and the tail plane being tilted at the same angle, an elevating rudder located between the lifting plane and the tail plane, and a motor carried by said aeroplane beneath the center of gravity of the said planes and said rudder, the lifting moment of the lifting plane being equal to the lifting moment of the elevating rudder and the tail plane.

6. In an aeroplane, the combination of superposed lifting planes and superposed tail planes spaced apart, the upper lifting and the lower tail planes being tilted at different angles from the other planes, the angle of tilting of the said upper lifting and the lower tail planes being equal, and an elevating rudder located between the lifting planes and the tail planes.

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

GEORGE WASHINGTON THOMPSON.

Witnesses:
J. A. BEAMS,
I. P. CRABTREE.