E. L. AULT.

AEROPLANE.

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992,470. Patented May 16, 1911.

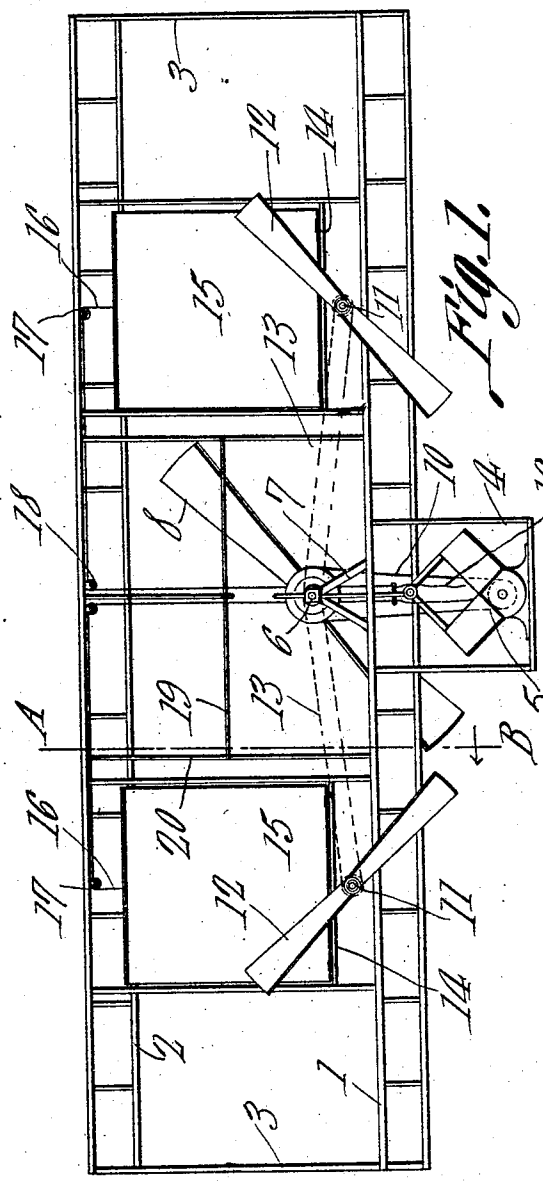

Fig. 1.

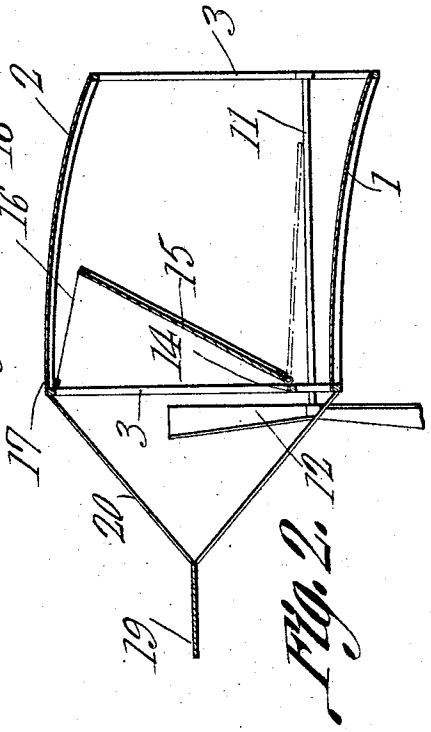

Fig. 2.

Witnesses

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EDWARD L. AULT, OF IOLA, KANSAS.

AEROPLANE.

992,470. Specification of Letters Patent. Patented May 16, 1911.

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To all whom it may concern:

Be it known that I, EDWARD L. AULT, a citizen of the United States, residing at Iola, in the county of Allen and State of Kansas, have invented a new and useful Aeroplane, of which the following is a specification.

This invention relates to aeroplanes and more particularly to means whereby the lateral balance of a machine of this type may be maintained irrespective of any change in the direction or velocity of the wind, the motor, passenger, and any objects constituting the load of the machine, being located in such a position relative to the sustaining planes, as to automatically restore said planes to their proper positions should they be momentarily shifted therefrom as the result of atmospheric disturbances or the like.

Another object is to provide supplemental propellers for use in addition to the usual driving propeller, said supplemental propellers constituting means whereby the machine may be steered, thus obviating the necessity of utilizing a vertical rudder such as commonly employed.

A still further object is to provide supplemental deflecting planes to be used in connection with the supplemental propellers for the purpose of directing upwardly against one of the sustaining planes, the air displaced by the supplemental propellers, thus facilitating the movement of the machine off of the ground at the beginning of a flight, said supplemental planes also serving as means for use in emergencies to restore the lateral balance of the machine when the weight of the contents of the balancing car is insufficient for this purpose.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a front elevation of a machine embodying the present improvement. Fig. 2 is a section on line A—B Fig. 1.

Referring to the figures by characters of reference, 1 and 2 designate the lower and upper sustaining planes respectively of the machine, these planes being mounted in the usual or any preferred manner and being connected by standards 3 or the like. A car 4 is suspended below the middle portion of the lower plane 1 and carries the motor 5 and also has sufficient space to accommodate the aviator and any necessary supplies.

The main propeller shaft 6 is journaled in suitable bearings 7 secured on the middle portion of the lower plane 1, the propeller 8 being arranged at the rear end of the machine. The shaft is driven from the motor through a chain 10 or the like. Additional shafts 11 are journaled upon suitable bearings located on the lower plane 1 at points between the ends of the plane and the car 4, these shafts being equal distances from the two ends of the plane and each carrying, at its front end, a supplemental propeller 12 preferably smaller than the propeller 9 and designed for use in steering the machine. Shafts 11 may be driven from shaft 6 through chains 13 or the like and any suitable mechanism, not shown, may be provided whereby motion may be transmitted to the two shafts 11 or said shafts may be maintained stationary during the rotation of the shaft 6.

A cross strip 14 is secured to the frame of the machine directly back of each of the supplemental propellers 12 and between the front edges of the planes 1 and 2. A supplemental plane 15 is hingedly connected at its lower edge to each of these strips 14 and an actuating cord 16 is attached to the upper end of each supplemental plane and extends forward into engagement with a guide sheave 17 connected to the front edge portion of the upper plane 2. The two actuating cords are then extended toward the center of the upper plane and pass over guide sleeves 18 thence downwardly to a point within the car 4 where said cords can be operated either separately or simultaneously.

It is to be understood that under normal conditions the supplemental planes 15 are arranged as indicated by dotted lines in Fig. 2 so that, during the forward flight of the machine, these planes will not offer any resistance to the air. The direction of flight can be controlled by means of the propellers 12, it being apparent that when the two

propellers rotate at the same speed, the machine will move straight ahead whereas, should one propeller be moved at a greater speed than the other, the machine will be caused to move along a curved path. As the load carried by the machine is located at a considerable distance below the center of the lower sustaining plane, it will be apparent that the machine cannot tip laterally without shifting the load and, therefore, should such tilting occur as a result of any change in the direction or velocity of the wind, or from any other cause, it will be apparent that the car will operate to promptly restore the lateral balance. Should the weight of the car be insufficient to accomplish this result, the supplemental plane 15 at the elevated side of the machine can be raised out of its normal position (indicated by dotted lines in Fig. 2) so that the pressure of air thereagainst will tend to force said side downwardly.

While the supplemental planes are useful for the purpose of assisting in the restoring of the lateral balance of the machine, they are particularly useful when starting the machine from the ground. Heretofore it has been necessary to run the machine a considerable distance along the surface of the ground until the displacement of air has been sufficient to cause the elevation of the machine. By setting the supplemental planes 15 so that they will deflect upwardly against the upper plane 2, the air displaced by the supplemental propellers 12, the runway necessary in order to cause the machine to leave the ground is materially reduced. This is due to the fact that the propeller 9, by driving the machine forward, causes an upward pressure of air upon the two sustaining planes 1 and 2, as ordinarily. At the same time, the propellers 12 displace air rearwardly against the inclined supplemental planes 15 and these planes deflect the air against the upper sustaining plane 2.

As shown in the drawings, the machine may be provided with a horizontal balancing plane 19 supported in front of the planes 1 and 2 by means of forwardly converging arms 20.

What is claimed is:—

1. An aeroplane including upper and lower fixedly connected sustaining planes, shafts extending therebetween, propellers carried by the shafts and in front of the planes, cross strips supported above the front edge of the lower sustaining plane, said strips being arranged close to the propellers, a supplemental plane hingedly connected to each of said strips and mounted to swing about an axis extending transversely of the machine, and means for separately shifting said supplemental planes to partly or entirely close the space between the cross strips and the front edge of the upper sustaining plane.

2. An aeroplane including upper and lower fixedly connected sustaining planes, cross strips fixedly supported above and parallel with the front edge of the lower plane and close to said plane, rigid supplemental planes hingedly connected to the cross strips, propellers mounted for rotation in front of said supplemental planes and the lower sustaining plane, a car suspended from the middle portion of the lower sustaining plane and fixed relative thereto, said propellers being located at both sides of the car, guide devices carried by the upper sustaining plane, and flexible means mounted on said devices and extending downwardly into the car for shifting the supplemental planes toward or away from the upper sustaining plane to partly or entirely open or close the spaces between the cross strips and the front edge of the upper sustaining plane.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

EDWARD L. AULT.

Witnesses:
J. D. ARNETT,
FRANK R. FORREST.