

C. WINSTON.
FLYING MACHINE.
APPLICATION FILED SEPT. 20, 1909.

997,727.

Patented July 11, 1911.

4 SHEETS—SHEET 1.

Fig. I

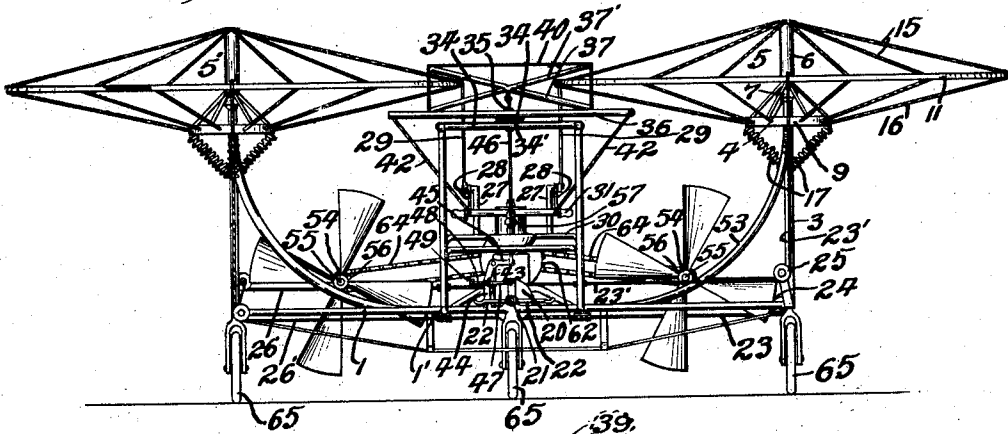
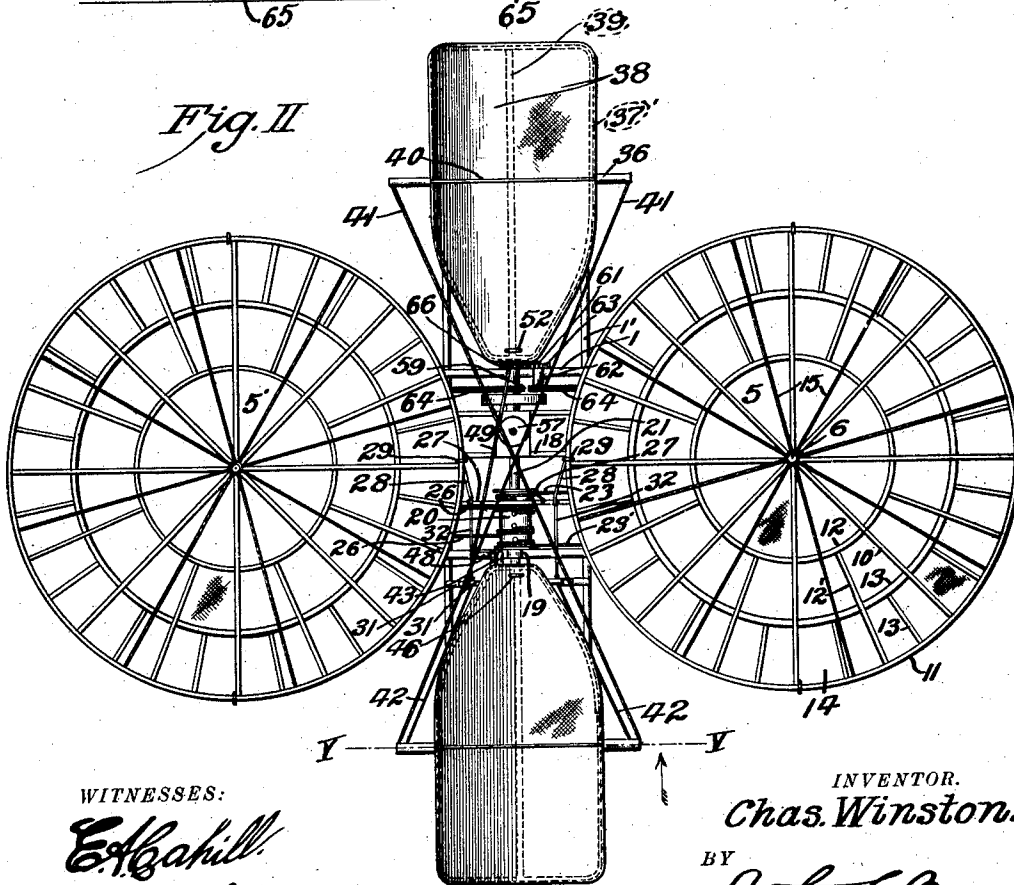


Fig. II



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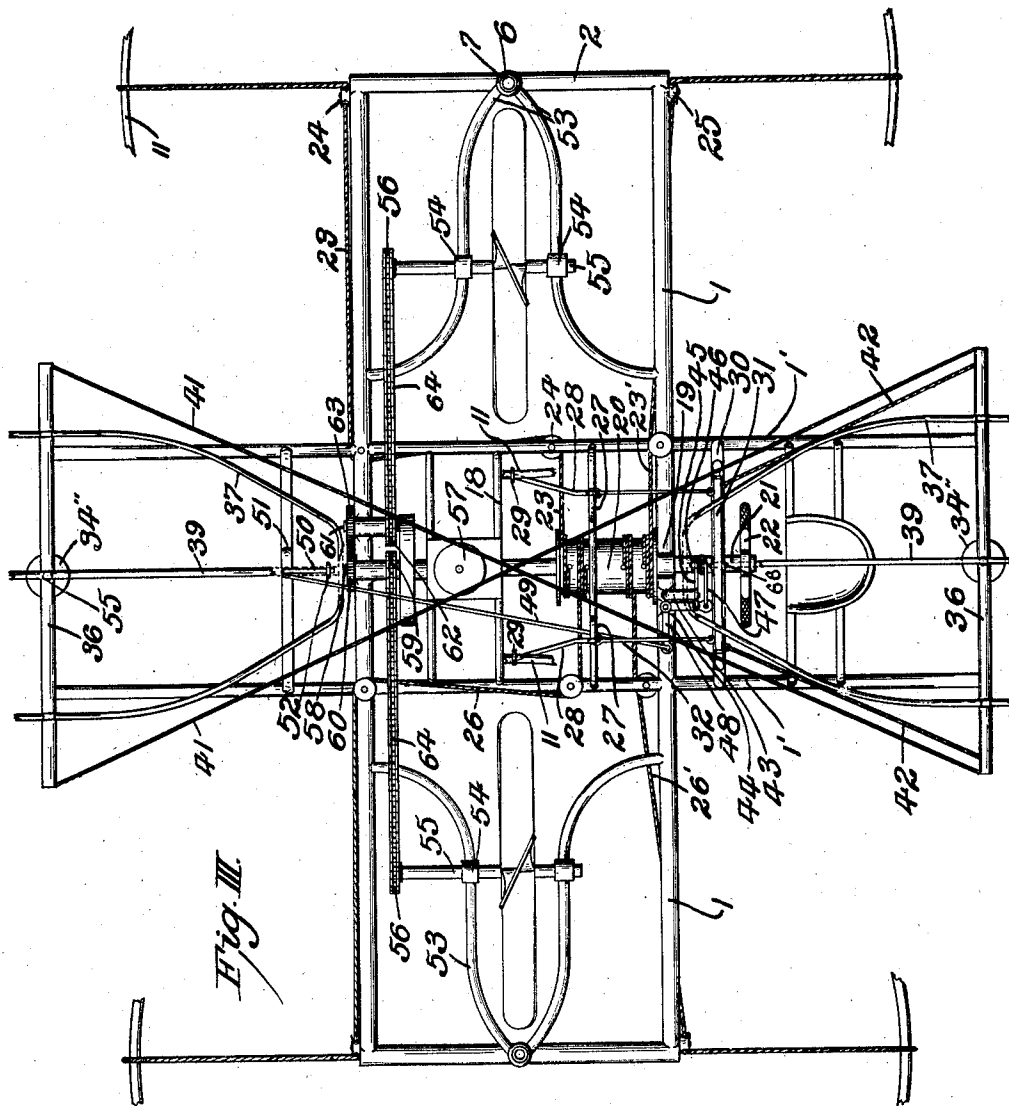


Fig. III.

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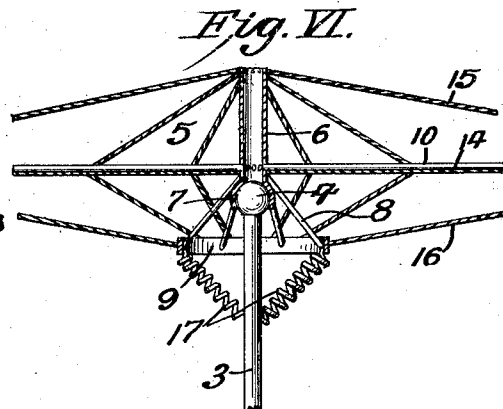
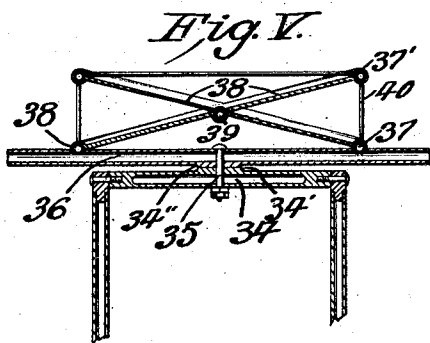
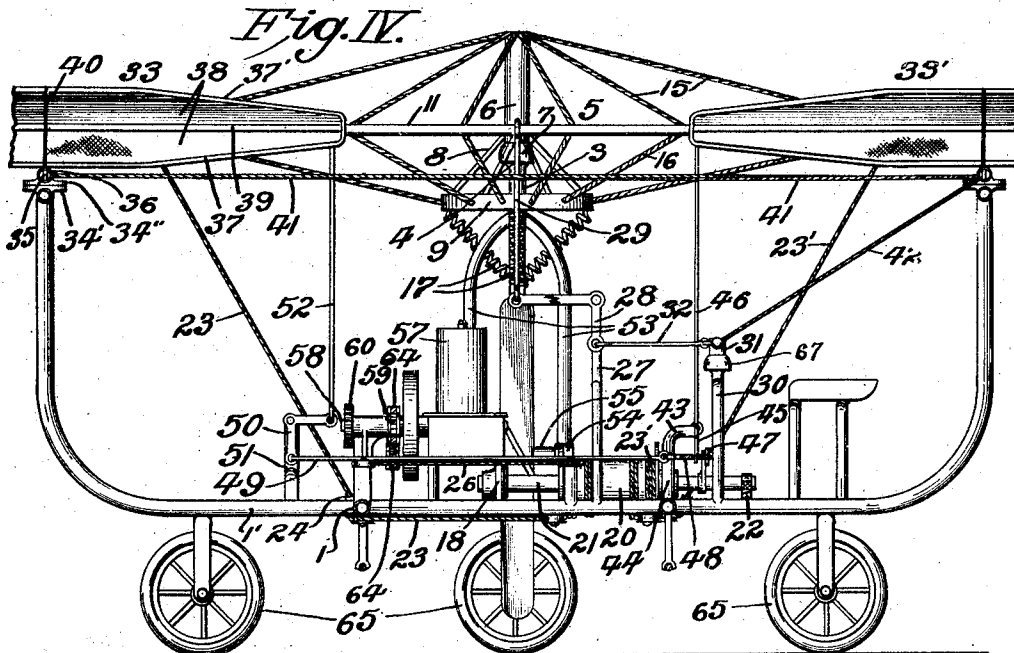
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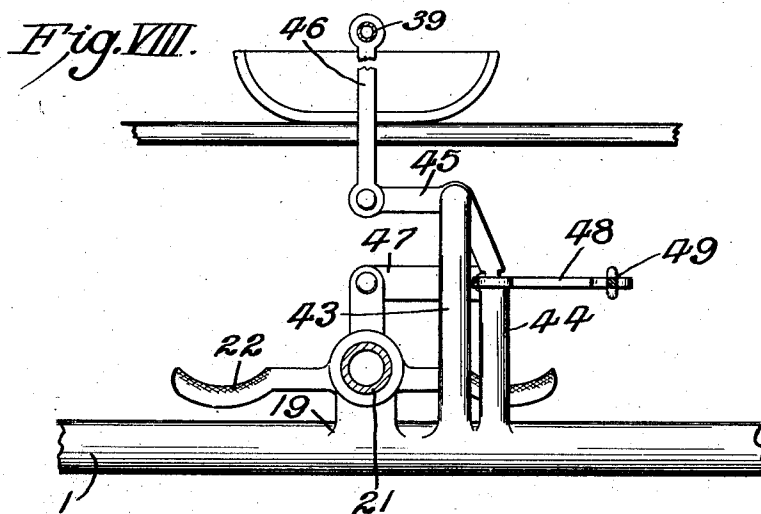
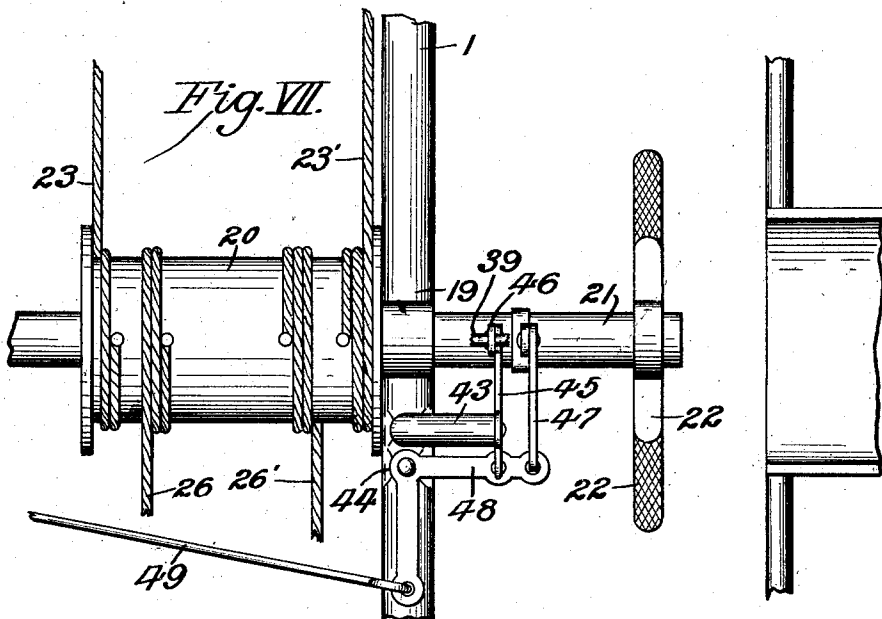
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4 SHEETS—SHEET 4.



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FLYING-MACHINE.

997,727.

Specification of Letters Patent. Patented July 11, 1911.

Application filed September 20, 1909. Serial No. 518,666.

To all whom it may concern:

Be it known that I, CHARLES WINSTON, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Flying-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to aerial navigation and particularly to a flying machine or air ship of the "heavier than air" class.

In some of the machines of the class mentioned the aeroplane or planes are rigid with the supporting frame, motor and "basket," so that when the vertical or horizontal angle of the planes is changed, the motor and basket move at the same angle, thereby decreasing the difficulty of control.

It is the principal object of my invention to provide a flying machine in which the planes are movably connected with the frame so that they may work in either direction without altering the position of the operator, and so that they may automatically turn to horizontal position and "right" the machine in case of accident.

It is a further object of my invention to provide an improved rudder mechanism and plane construction, and improved combination of the various parts with the supporting frame and controlling devices, and improved controlling mechanism.

These and other objects of my invention will appear from the following detailed description, wherein reference is had to the accompanying drawings, in which;—

Figure I is an end view of a flying machine constructed according to my invention. Fig. II is a plan view of same. Fig. III is an enlarged plan of the frame and controlling mechanism, parts of the planes and rudders being illustrated. Fig. IV is an enlarged longitudinal section of the machine. Fig. V is an enlarged detail view of one of the rudders, in cross section on the line V—V, Fig. II. Fig. VI is an enlarged vertical section of one of the plane hubs. Fig. VII is an enlarged plan view of the windlass for controlling the front and back angles of the planes, together with the rudder

controlling cranks. Fig. VIII is an end view of the same parts, the windlass being removed.

Referring more in detail to the parts:— The machine frame comprises tubular members 1—1' which are arranged in pairs that cross on the frame center. The members 1 are straight and are joined at the ends by a cross piece 2. Rising from the piece 2 is a standard 3, having a ball 4 on its upper end.

5—5' designate the planes, one of which is arranged at each side of the machine, but inasmuch as each is a duplicate of the other in construction, but one will be described in detail with the understanding that such description relates equally to both. The plane is provided with a central post 6, which is preferably tubular and is enlarged at the bottom to provide a socket 7, within which the ball 4 is adapted to rest, so as to support the plane and allow universal movement thereof. Suspended from the standard 6, by the ribs 8, is a ring 9. Extending radially from the standard 6 are the ribs 10 which support the outer ring 11, and intermediate rings 12—13.

12', 13' designate ribs which connect the rings 12, 13 with the outer ring and add stability to the circular frame. Secured to the under sides of the rings and ribs is a sheet of canvas or heavy fabric 14.

15 designates ropes which connect the outer ribs 10 with the top of the standard 6, and 16 designates ropes which connect the ring 11 with the lower ring 9, for the purpose of bracing the plane when it is under strain. Fixed at one end to the ring 9 and at the other end to the standard 3 are the expansion springs 17 which are arranged to yieldingly retain the plane in a horizontal position but yield under pressure when it is desired to change the angle of the plane.

Supported on the forward and back tubes 1, at the rear of the machine, is the operator's seat. Supported on the cross tubes 18—19 is a windlass 20, the shaft 21 of which extends back to a point slightly forward of the seat and carries the step bar 22.

23 designates a rope, one end of which is run under and fixed to the windlass 20 and the other end run over pulleys 24 and fixed to the front of the outer ring of plane 5, and 23' a rope, one end of which is run over and fixed to windlass 20 and the other run over pulley 25 and fixed to the rear of said ring, so that either end of the plane may

be canted according to the direction the windlass is turned.

26—26' designate ropes which are in the same manner fixed to the windlass and to the plane 5', so that plane 5' may be operated simultaneously with plane 5. It will be noticed that the ropes connected with the same ends of the planes wind together on the windlass, so that the planes when actuated move in the same direction.

Rising from the tubes 1' is a standard 27, to which the bell crank levers 28 are pivoted. Connecting the forward arms of the levers 28 with the inner edges of the rings 11 of the planes 5—5' are the rods 29. Rising from the tubes 1', in front of the operator's seat, is an arch 30, upon which a steering bar 31 is pivotally mounted, upon an upper pivot 66, Fig. III, and also upon a ball-and-socket pivot 67, Fig. IV.

32 designates rods which connect opposite ends of rod 31 with the rear arms of the respective bell crank levers 28. It is apparent that when the bar 31 is turned on its pivot, the inner edge of one plane will be raised and the other lowered, so that the planes may be moved simultaneously in the same direction, and that they will always be parallel with each other.

I will now describe the rudders 33—33' which are mounted on the front and back ends of the tubes 1', and as both of the rudders are alike, but one will be mentioned, with the understanding that its description relates equally to both.

Pivotally mounted between the ends of the tubes 1', is a rod 34, having a boss 34' at its center.

36 designates a bar having a boss 34'' which is seated on the boss 34' of rod 34 and is pivotally connected with the rod by a king bolt 35.

37—37' designate the rudder frames, which are substantially rectangular and are covered with canvas sheets 38. The frames are crossed at their centers at an angle to give the combined body materially greater breadth than thickness, and to provide a double supporting face at each side of its longitudinal center, a result which would not be attained with the frames crossed at a right angle.

39 designates a strengthening rod which passes through the center of the rudder and unites the ends of the frames, and 40 designates stay rods, which are connected with the frames and serve to space same apart.

The ends of the bars 36 project laterally beyond the sides of the rudders, and are connected by crossed ropes 41, so that when one rudder is rocked laterally on its pivot, the other rudder will be simultaneously rocked in the opposite direction, through the rope connection. Fixed to the ends of the rear rudder bar 36 are the ropes 42, which

connect with the ends of the steering bar 31, so that when the steering bar is turned to alter the side angle of the planes, the rudders will be turned in a direction to cooperate with the planes in steering the machine.

Fixed on one of the frame tubes are the posts 43—44. Pivotally mounted on the post 43 is a bell crank lever 45, one arm of which is connected with the inner end of the rear rudder through a rod 46 and the other arm of which is connected with the horizontal bell crank 48.

47 designates a link which is pivotally connected to an arm on the windlass shaft 21 and the other end of which is connected with the second arm of the bell crank 48, so that the rudder may be raised or lowered according to the direction in which the windlass shaft is turned by the step bar 22. Pivoted on the post 44 is a horizontal bell crank 48, one arm of which is connected with the link 47 and the other provided with a rod 49 which extends toward the front of the machine and is connected with one arm of a bell crank 50 which is pivotally mounted on a standard 51. The second arm of crank 50 is connected with the rear end of the front rudder by a rod 52, so that the rear end of the rudder will be raised when the crank 50 is operated in one direction and lowered when operated in the opposite direction. The rudder steering mechanism is so arranged that the rudders will be tilted simultaneously in opposite directions when the step bar is actuated.

At each side of the body frame is a propeller frame 53, the members of which are bent inwardly from the tubes 1 and then upwardly and outwardly to the standard pieces 6.

54 designates bearings on the frame 53, and 55 shafts revolubly mounted in said bearings and projected laterally at one end to carry the sprockets 56.

57 designates a motor, the driving shaft 58 of which is provided with a sprocket 59 and gear 60.

61 designates an auxiliary shaft, having a sprocket 62 and gear 63, the latter meshing with gear 60 on the main shaft.

64 designates chains which run over the sprockets 56, 59 and 62, and drive the propellers in opposite directions.

65 designates ground wheels which are carried beneath the frame and support the machine before and when alighting from a flight.

In using the machine, the planes are both tilted upwardly, at the front and the rudders at their outer ends, and the machine made to travel rapidly forward by the operation of the propellers. When sufficient speed has been attained, the machine will be lifted from the ground and will continue to rise, until the planes and rudders are brought

to a horizontal position, when it will continue on a horizontal flight. To steer to either side, the planes are tilted laterally and the rudders turned laterally on their pivotal mountings, and to lower the machine the parts are turned to positions the reverse of those described for rising. It is apparent that during any of the maneuvers mentioned, the body frame and operator's seat will remain horizontal.

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

1. A flying machine embodying a framework; having a plane supporting standard; a plane having a central standard pivotally mounted on the supporting standard, ribs radiating from the central standard and provided with a covering, rods connected with said central standard and supporting a ring, stay members connecting the covered body with said ring, and with the upper portion of the central standard, springs connecting the ring with the supporting standard, and steering mechanism connected with the covered body.

2. A flying machine embodying a framework, a pair of planes mounted on the framework and adapted for canting movement, bell crank levers adapted for vertical pivotal movement, a steering bar adapted for horizontal pivotal movement, rods connecting arms of the levers with opposite ends of the steering bar, and rigid connection between the other arms of said levers and the inner edges of the planes, substantially as and for the purpose set forth.

3. A flying machine embodying a framework and plane, a rudder mounted on the framework, and means for actuating the rudder, said rudder comprising covered frames crossed at other than a right angle, for the purpose set forth.

4. A flying machine embodying a framework and plane, the framework comprising side members upturned at their ends and having a cross bar pivotally connected therewith, a cross piece having horizontal pivotal connection with the cross bar, a rudder fixed to said cross piece, a steering bar, and ropes fixed to said bar and to opposite ends of the cross piece.

5. A flying machine embodying a frame-

work, a pair of planes carried by and adapted for canting movement on the framework, cross pieces pivotally mounted at the front and rear of said framework, a steering bar, connection between the steering bar and planes, connection between the steering bar and the cross piece of one rudder, and crossed connection between opposite ends of the front and back cross pieces, substantially as and for the purpose set forth.

6. A flying machine embodying a pair of planes arranged at the sides of the framework and adapted for canting movement, a rudder mounted on the framework and adapted for forward and back canting movement, a windlass carried on the framework and having an extended shaft, ropes wound on the windlass and connected with the planes, a lever on the windlass shaft, connection between the lever and one end of the rudder, and a step bar mounted on said shaft.

7. A flying machine embodying a framework and plane, rudders mounted at the front and back of the framework, a horizontal shaft, a vertical bell crank fixed on said shaft, a second vertical bell crank fixed to the first and connected with one of said rudders, a horizontal bell crank fixed to the first vertical cranks, a third vertical bell crank connected with the horizontal crank, and connection between the third crank and other rudder, substantially as and for the purpose set forth.

8. A flying machine embodying crossed frames having central connection, planes mounted on the lateral frames and adapted for canting movement, rudders mounted on the longitudinal frames and adapted for longitudinal canting and horizontal pivotal movement, means for simultaneously lowering the rear portions of the planes and lowering the inner ends of the rudders, or vice versa, and means for simultaneously canting the frames laterally and moving the rudders on their horizontal pivots.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES WINSTON.

Witnesses:

MYRTLE M. JACKSON,

E. A. CAHILL.