

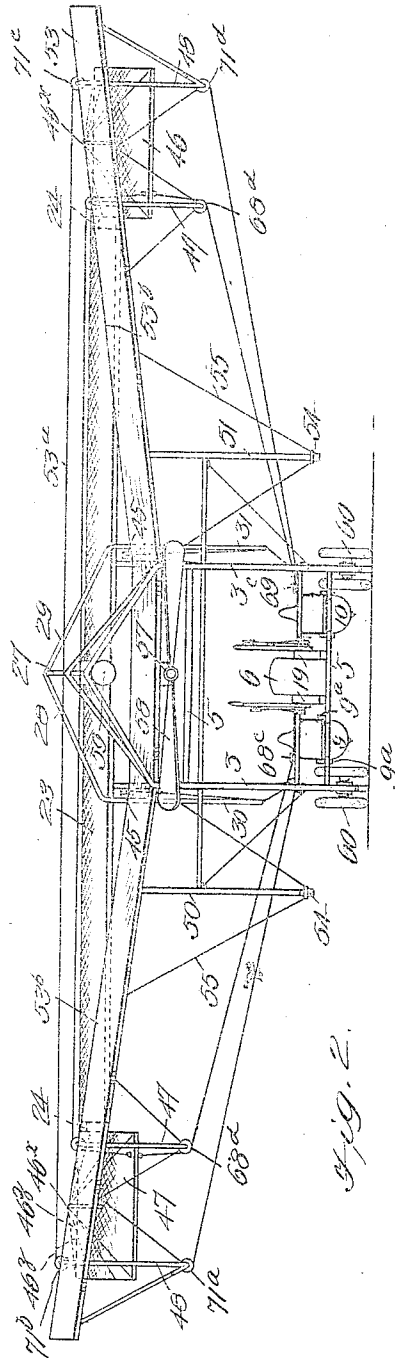
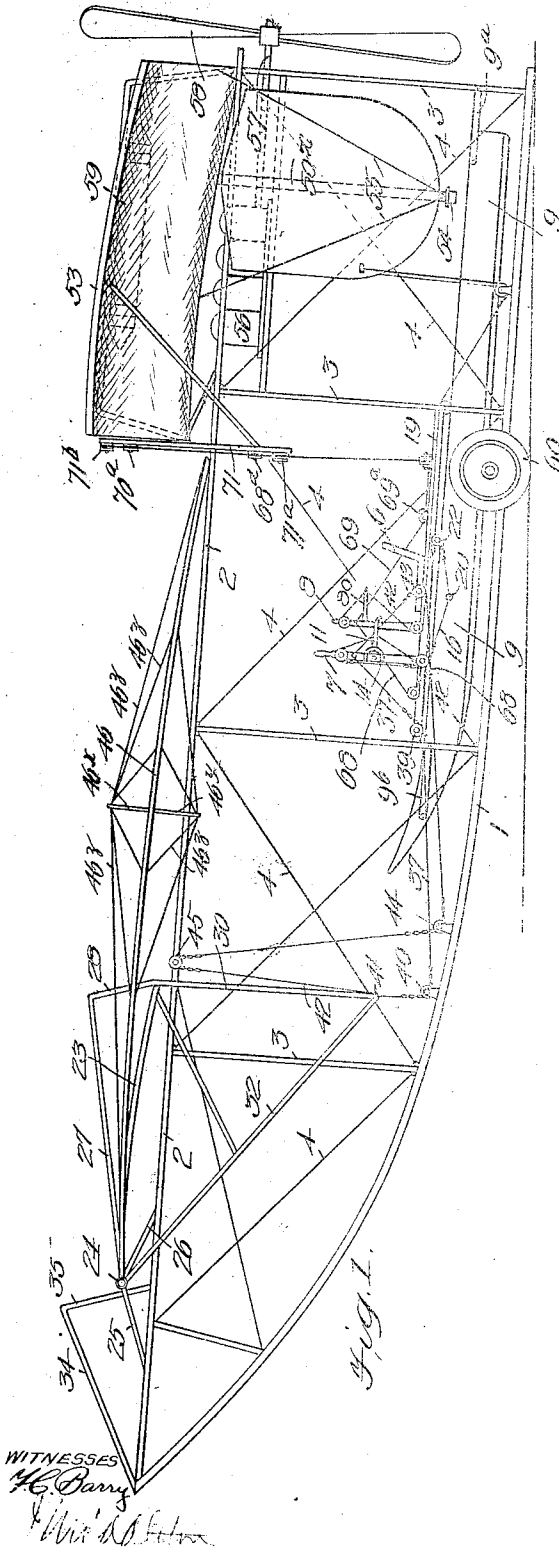
S. S. YARRINGTON.
AEROPLANE.

APPLICATION FILED NOV. 4, 1911.

1,037,704.

Patented Sept. 3, 1912

3 SHEETS—SHEET 1.



WITNESSES
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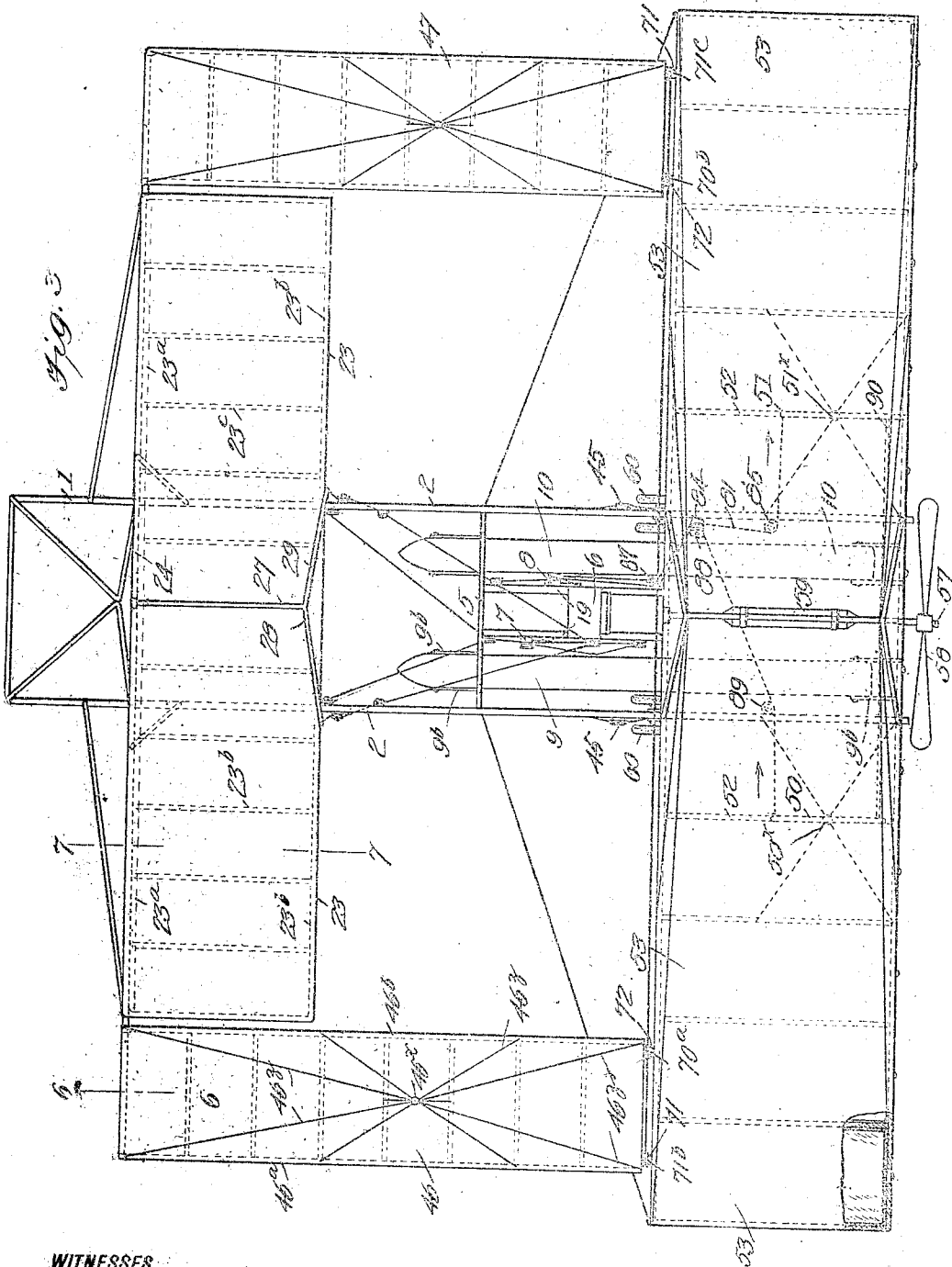
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WITNESSES

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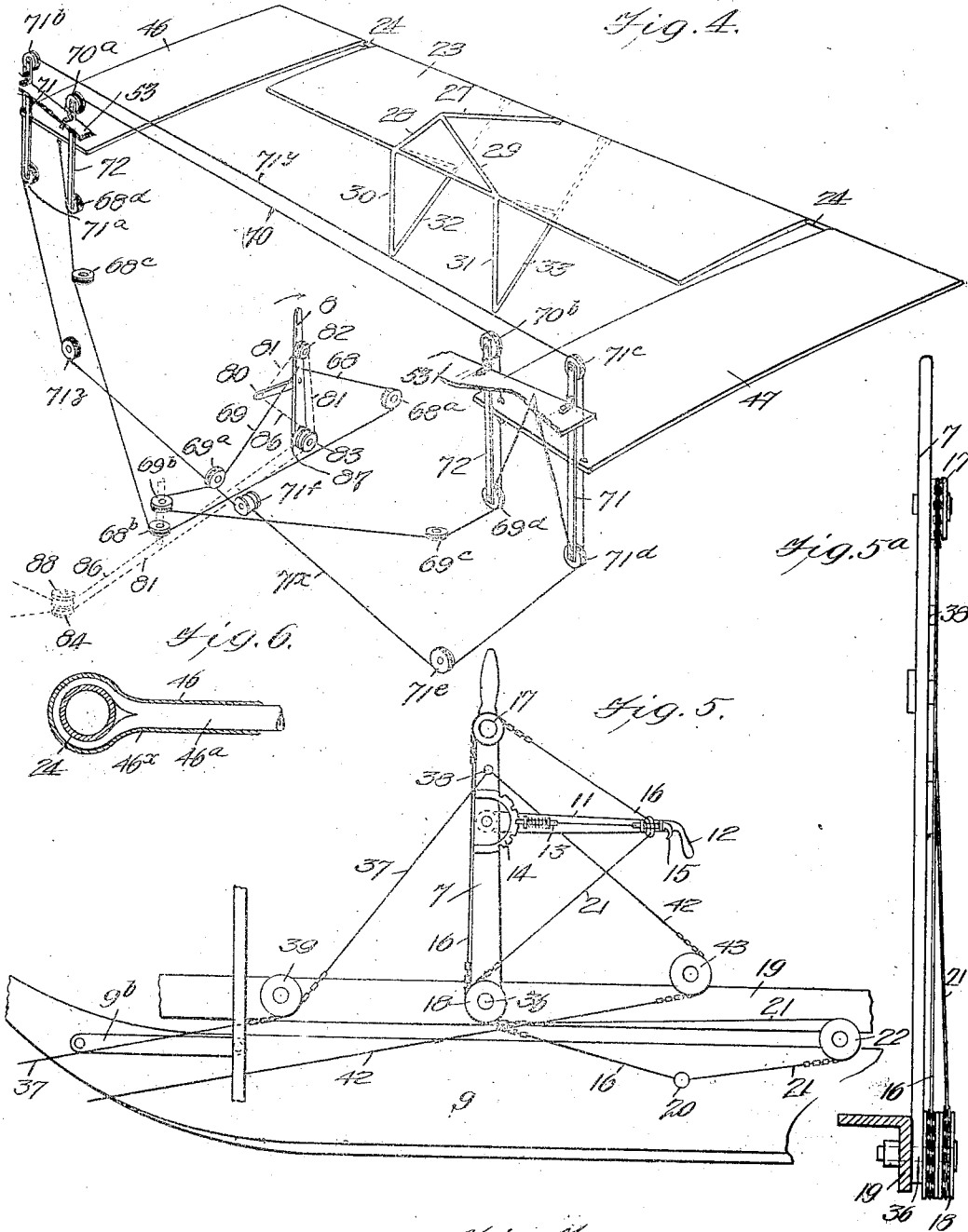
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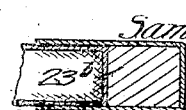
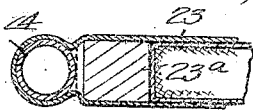
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

SAMUEL S. YARRINGTON, OF WILMINGTON, DELAWARE.

AEROPLANE.

1,037,704.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed November 4, 1911. Serial No. 558,495.

To all whom it may concern:

Be it known that I, SAMUEL S. YARRINGTON, a citizen of the United States, and a resident of Wilmington, in the county of Newcastle and State of Delaware, have made certain new and useful Improvements in Aeroplanes, of which the following is a specification.

My invention relates to improvements in aeroplanes, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a pair of operating levers, each pair of said levers having double functions, thereby reducing the necessary number of operating levers.

A further object of my invention is to provide hydroplanes with means connected with one of the levers for lowering or raising the same.

A further object of my invention is to provide a novel form of elevating plane and of means for manipulating the same.

A further object of my invention is to provide a novel form of rudder and means for supporting the same and for operating it.

A further object of my invention is to provide novel forms of ailerons and means for operating them.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application in which similar reference characters indicate like parts in the several views, and in which—

Figure 1 is a side elevation showing one embodiment of my aeroplane; Fig. 2 is a rear view of the aeroplane; Fig. 3 is a plan view; Fig. 4 is a perspective view of the elevating plane and the ailerons, and the flexible means for operating them; Fig. 5 is a detail view showing one of the levers and the means for raising or lowering the hydroplane; Fig. 5^a is a rear view of the lever shown in Fig. 5; Fig. 6 is a section along the line 6—6 of Fig. 3, and Fig. 7 is a section along the line 7—7 of Fig. 3.

Referring now particularly to Fig. 1, I have shown therein a sled-shaped frame composed of the bottom members 1, the top member 2, and the parallel brace members

3 with the strengthening guy wires 4. Two of these frames are provided and they are joined by the cross members 5, such as those shown in Figs. 2 and 3. The operator's seat 6 is disposed on one of these cross members 5. On one side thereof is a lever 7, and on the other a lever 8, these levers being the means for controlling the various planes and for raising and lowering the hydroplanes. The latter are shown at 9 and 10, respectively. The normal positions of these hydroplanes is that shown in Figs. 1 and 2. In these figures 9 the hydroplane 9 is shown as being pivotally attached to one of the cross members 5 at its rear end by means of bars or links 9^a, while it is attached in a similar manner to a cross bar 5 (see Figs. 1 and 3) by means of the arms or links 9^b. The bottom of the hydroplane 9 is therefore slightly above the runner or bottom member 1 of the main frame. The means by which the hydroplanes are raised or lowered is best shown in Fig. 5. In this figure it will be seen that the lever 7 has pivotally secured to it a laterally extending arm 11 provided with a handle 12 and having a locking device 13 arranged to engage a locking segment 14, the locking device 13 being manipulated by a finger-pull 15 near the handle 12. A flexible cord 16 extends from the upper side of the lever 11 over a pulley 17 on the lever 7, thence downwardly around a pulley 18 on the frame member 19, thence rearwardly, being attached to the hydroplane 9 at 20.

A flexible member 21 is secured to the under side of the lever 11, passes forwardly over a pulley on the same shaft with the pulley 18, thence rearwardly around a pulley 22 secured to the bottom of the frame member 19, thence forwardly, being secured to the hydroplane at the point 20. If now, the lever 11 is moved upwardly on its pivotal connection tension will be placed on the cord 21, while the cord 16 will be slackened up, thereby tending to move the point 20 in the direction shown by the arrow, and permitting the hydroplane to be swung downwardly on its supporting arms 9^a and 9^b beneath the runner 1, so that when striking the water the hydroplanes will be in position to support the device. These planes can be locked in position by means of the locking segment 14.

Referring now to Figs. 1, 3 and 4 I have shown therein the elevating plane 23. The

construction of this elevating plane is best shown in Figs. 3 and 7. It comprises the longitudinal frame members 23^a and 23^b shown in dotted lines in Fig. 3, with the cross braces 23^c. The fabric which forms the body portion of the elevating plane is continued around the tubing 24 (see Fig. 7) which forms the support for the forward edge of the plane. The fabric also surrounds the front and rear longitudinal frame members 23^a and 23^b, as shown in Fig. 7. It will be apparent therefore that the fabric itself is the means by which the elevating plane is hinged to the supporting member 24. The tube 24, as shown in Fig. 1, is not supported directly by the upper frame members 2, but is raised therefrom by means of the supports 25 and 26. In order to strengthen the elevating plane 23 and to provide for its proper manipulation, I make use of a central rearwardly extending brace member 27 which connects with two downwardly and rearwardly extending members 28 and 29 respectively (see Figs. 1 and 4). Where the braces 28 and 29 join the rear edge of the main elevating plane are two downwardly extending members 30 and 31 respectively, the former being hingedly connected with the tube 24 by means of the inclined brace member 32, and the member 31 being similarly connected by the brace member 33. As additional braces for the front end of the aeroplane I provide the inclined truss members 34 and 35.

The means by which the elevating plane 23 is manipulated is best shown in Fig. 5. The lever 7 is pivotally mounted on the shaft 36. A flexible cord 37 is secured to the lever at 38 and passes forwardly underneath a pulley 39 on the frame member 19 under a pulley 40 on the bottom member 1, and is attached at 41 to the brace member 30. A flexible member 42 extends rearwardly from the lever 7 around a pulley 43 on the upper part of the member 19, thence downwardly and forwardly underneath a pulley 44 on the member 1, upwardly and around a pulley 45 (see Fig. 1) thence downwardly being secured to the member 30 at the point 41. It will be apparent that when the lever 7 is pushed forwardly the flexible member 37 will be slackened, while tension will be put on the flexible member 42 thereby raising the elevating plane. A reverse action of the lever, of course, will cause the lowering of the elevating plane.

At 46 and 47, I have shown the ailerons by means of which the machine may be righted if it should tip in a sidewise direction. These ailerons are constructed somewhat similar to the elevating plane 23, but they are provided with longitudinal side strips like that shown at 46^a and 46^b having an eye arranged to receive the tube 24, the resilient fabric 46^x covering both tube and

the frame portion of the aileron, as shown in Fig. 6. The ailerons each have vertically extending braces, such as those shown at 46^a above the plane and 46^b below the plane, to which guy wires such as those shown at 46^x are secured. This forms an exceedingly strong construction. The ailerons are manipulated in the following manner: The lever 8 has attached to it two cords, one a cord 68 which passes around the pulleys 68^a, 68^b, 68^c and 68^d, and is attached to the lower part of the plane 46. The other cord 69 passes around the pulleys 69^a, 69^b, 69^c and 69^d, and is attached to the lower part of the plane 47. A flexible cord 70 is attached at one end to the upper part of the plane 46 and passes over the pulleys 70^a and 70^b, and is attached to the upper part of the plane 47. The construction just described is best shown in Fig. 4. In order to stabilize the planes 46 and 47, I provide strips 71, which may be secured to the frame in any convenient manner that are similar to the strips 72, which bear the pulleys 68^a and 70^a, 69^a and 70^b, these strips 71 being provided with the pulleys 71^a, 71^b, 71^c and 71^d. A cord 71^x is attached to the bottom of the plane 47 and passes around the pulleys 71^a, 71^b, 71^c, 71^d and 71^e, and is attached to the under side of the plane 46. A second cord 71^y is attached to the top of the plane 46 and passes around the pulleys 71^b, 71^c and is attached to the top of the plane 47. From this construction, it will be seen that when the lever 8 is moved in the direction indicated by the arrow in Fig. 4, the plane 47 will be lowered and the plane 46 will be raised.

The purpose of the cord 71^y is to cause the outer edges of the planes 46 and 47 to move simultaneously and to the same extent that the inner edges are moved by the cord 70. It will be apparent that when the cord 70 is manipulated, the outer edges of the planes 46 and 47 must move simultaneously and to the same extent in opposite directions, since they are connected together by the cord 71^x.

At 50 and 51, I have shown the two rudders by means of which the device is steered to the right or left. These rudders are mounted on central axes 50^x and 51^x (see Fig. 3), the upper part of these axes being carried by the cross members 52 of the main supporting plane 53, the lower part turning in bearings 54 which are supported by wires 55. The lower part of each of these rudders is formed on a curve in order to clear the guy wires 55. These rudders are manipulated in the following manner: Attached to the horizontal lever 80 on the vertical lever 8 is a flexible member 81, which passes over a pulley 82 on the lever, and thence downwardly around a pulley 83, thence rearwardly around a pulley 84 (see Fig. 4) thence around a pulley 85 (see Fig. 3) being

attached to the rudder 51. A cord 86 passes around a pulley 87, thence rearwardly around a pulley 88, thence around a pulley 89 (see Fig. 3) and is fastened to the rudder 50. The two rudders 50 and 51 are connected together by a common cord 90. It will be apparent that by raising the horizontal lever 80, the end to which the cords of the rudders are attached will have a movement in the direction indicated by the arrows in Fig. 3, while by moving the lever downwardly the rudders will be moved in the opposite direction.

The engine 56 is disposed beneath the main sustaining plane 53, and in such a position as to balance the machine. The propeller shaft 57 extends rearwardly and the propeller 58 is immediately in the rear of the main sustaining plane 53 and the rudders 50 and 51.

The fuel supply tank 59 is disposed above the main plane, as shown in Figs. 1 and 3. The device is provided with the wheels 60.

From the foregoing description of the various parts of the device the operation thereof may be readily understood.

The two vertical levers with their horizontal levers serve the purpose of lowering the hydroplanes, manipulating the elevating planes, controlling the ailerons, and manipulating the rudder for supporting the device. These levers are directly before the operator, and are therefore instantly accessible.

I am aware that other devices based upon the same general plan might be made, but I consider as my own all such modifications as fairly fall within the spirit and scope of the invention.

I claim:—

1. In an aeroplane, a main sustaining plane, an elevating plane, a pair of rudders, a pair of ailerons, a pair of hydroplanes, a pair of main levers, each lever having an auxiliary lever pivotally secured thereto, means connected with one of said main levers for operating the elevating plane, means connected with one of said auxiliary levers for raising and lowering said hydroplanes, means connected with the other of said main levers for operating the ailerons, and means connected with the other auxiliary lever for operating the rudders.

2. In an aeroplane, a main sustaining plane, an elevating plane, a pair of rudders, a pair of ailerons, a pair of hydroplanes, a pair of main levers, each lever having an

auxiliary lever pivotally secured thereto, means connected with one of said main levers for operating the elevating plane, means connected with one of said auxiliary levers for raising and lowering said hydroplanes and for locking the hydroplanes in their shifted position, means connected with the other of said main levers for operating the ailerons, and means connected with the other auxiliary lever for operating the rudders.

3. In an aeroplane, a main sustaining plane, an elevating plane, a pair of rudders, a pair of ailerons, a pair of hydroplanes, a pair of main levers, each lever having an auxiliary lever pivotally secured thereto, means connected with one of said main levers for operating the elevating plane, means connected with one of said auxiliary levers for raising and lowering said hydroplanes and for locking the hydroplanes in their shifted position, means connected with the other of said main levers for operating the ailerons simultaneously in opposite directions and to the same extent, and means connected with the other auxiliary lever for operating the rudders.

4. In an aeroplane, a main sustaining plane, an elevating plane, a pair of rudders, a pair of ailerons, a pair of hydroplanes, a pair of main levers, each lever having an auxiliary lever pivotally secured thereto, means connected with one of said main levers for operating the elevating plane, means connected with one of said auxiliary levers for raising and lowering said hydroplanes and for locking the hydroplanes in their shifted position, means connected with the other of said main levers for operating the ailerons simultaneously in opposite directions and to the same extent, and means connected with the other auxiliary lever for operating the rudders simultaneously in the same direction to the same extent.

5. In an aeroplane, a frame, an elevating plane pivotally secured to said frame, an aileron pivotally secured to said frame at each end of said elevating plane, said ailerons extending rearwardly past said elevating plane, and means for simultaneously moving the rear ends of the ailerons in opposite directions and to the same extent.

SAMUEL S. YARRINGTON.

Witnesses:

WM. C. GOWER,
HENRY P. JOSLYN.