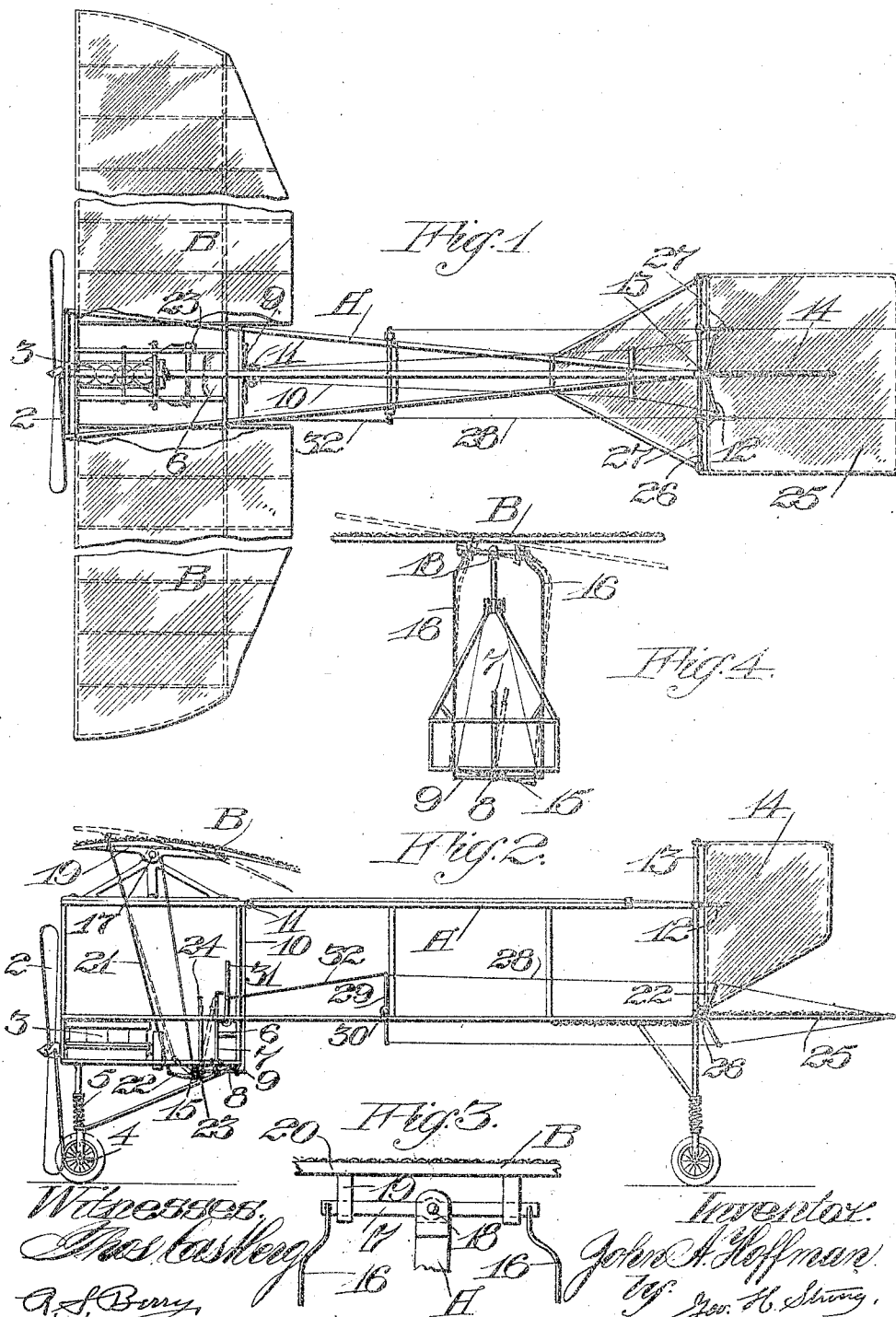


J. A. HOFFMAN.  
AERIAL MACHINE.  
APPLICATION FILED NOV. 21, 1910.

995,004.

Patented June 13, 1911.



Witnesses:  
Charles K. Kuyper  
A. S. Bury

Inventor:  
John A. Hoffman  
By: Geo. H. Strong,  
his Atty.

# UNITED STATES PATENT OFFICE.

JOHN A. HOFFMAN, OF SAN FRANCISCO, CALIFORNIA.

## AERIAL MACHINE.

995,001.

Specification of Letters Patent. Patented June 13, 1911.

Application filed November 21, 1910. Serial No. 593,382.

To all whom it may concern:

Be it known that I, JOHN A. HOFFMAN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Aerial Machines, of which the following is a specification.

This invention relates to aerial machines and is particularly relevant to that class of machine known as monoplanes.

The object of this invention is to provide means whereby the stability of the apparatus during flight may be readily maintained; to provide a monoplane involving a minimum number of operating levers for its control, and particularly to provide means whereby the supporting plane of the apparatus may be simultaneously adjusted longitudinally and may be tilted or rocked, and whereby at the same time the supporting plane is transversely rocked relative to the main frame, the steering rudder will also be moved.

The invention consists of the parts and construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view of the apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a detail of the rocking bearing of the monoplane. Fig. 4 is an end view partly broken away.

In the present embodiment of my invention A represents the main frame, 2 a propeller mounted in suitable journals at the forward end of the frame and to the propeller is suitably connected the driving motor 3.

When at rest upon the ground the structure is supported upon suitable ground wheels 4, which may be carried by resilient members as springs 5, to insure an easy and safe alighting of the machine. At a suitable point in the frame A is erected an aviator's chair as 6, at which position he can conveniently grasp and operate the lever 7 which is mounted upon the rocker shaft 8, upon the rear end of which is secured transversely extending levers 9, to the ends of which are connected suitable cables or cords 10, running upwardly over guide sheaves 11 which are mounted upon the upper, central, longitudinal rib of the frame A. The rear terminals of the cables

10 are connected to a tiller 12 mounted upon the vertical post 13 of a suitable rudder 14. Also mounted upon the rocker shaft 8 at its forward end is a transversely extending lever or beam 15, upon the outer ends of which are connected vertical extending links 16, one of which is on each side of the center of the rocker shaft 8; their upper ends being suitably connected to a transverse gudgeon 17 which is pivoted, or otherwise mounted for oscillation as at 18, upon the upper portion of the frame A. By means of the hand lever 7, the rocker shaft 8 and its connected members, cables 10 and links 16, may be simultaneously actuated so that the rudder 14 may be moved about its vertical axis and gudgeon 17 transversely oscillated upon its fulcrum 18. Upon the gudgeon 17 suitable braces 19 are mounted and to these braces or supports are securely fastened the main longitudinal ribs or bars 20 forming the plane B.

The monoplane supporting braces 19 are adapted to have a rocking motion upon the transverse gudgeon 17 so that the angle of incidence of the plane B may be changed by the aviator at will during the flight of the apparatus, and this adjustment of the plane B is accomplished by means of a link 21 which is connected to the braces 19 forwardly of the gudgeon 17 and which extends downwardly and connects with the outer end of a rocker arm 22 which is secured upon a transverse rocking shaft 23 suitably supported in bearings upon the frame A; and to the rocker shaft 23 is attached an operating lever 24, the upper end or handle portion of which is in close convenient relation to the aviator's chair 6. Thus it will be seen that the operator by pushing or pulling on the lever 24 and actuating the link 21 may rock the plane B axially upon the transverse gudgeon or pivot 17, and at the same time may cause the plane B to tilt upon its pivot 18 which extends longitudinally of the machine so that one side of the plane may be raised as the other side is lowered. This latter movement of the plane is accomplished by manipulating the hand lever 7. Simultaneously with the operation of this lever 7 the rudder 14 will be moved toward that side of the frame A on which the plane B tilts downwardly.

To enable the aviator to cause the monoplane to ascend or descend during its flight, there is pivoted at the rear end of the frame

A, a suitable horizontal rudder 25 upon the rocker shaft 26, on which is secured a pair of levers 27 and from the ends of these levers extend operating cables 28 which are secured at their forward ends to a rocker frame 29 pivoted at 30 upon the lower longitudinal bars of the frame A. The rocker frame 29 to which the cables 28 are secured may be actuated by means of a hand lever 31 mounted adjacent to the aviator's chair and connected to the frame 30 by means of a suitable link 32.

It will be seen that by the provision of the rocker shaft 8, the aviator may simultaneously tilt the plane B upon its fulcrum 18 and synchronously swing the rudder 14, and, if desired, he may operate the lever 24 at the same time to change the relative angle of incidence of the plane B to the frame of the apparatus. By means of these two levers he has absolute, and perfect control of the apparatus during its flight and may operate the horizontal rudder 25 by means of the rocker frame 29 and hand lever 31 whenever it is desired to cause the machine to ascend or descend.

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

1. An aerial apparatus comprising a suitable frame, a transversely disposed supporting plane having ribs or bars provided with braces, said plane adapted to be simultaneously, longitudinally tilted and transversely adjusted, and means whereby the simultaneous adjustment of the plane may be accomplished, said means including a gudgeon intermediate of the ends of the plane, and upon which the plane may rock axially to simultaneously raise and lower its front and rear portions, said gudgeon being centrally pivotally mounted on an axis which extends crosswise thereof, and said braces being rockably connected to the gudgeon at opposite sides of the pivotal center thereof.

2. In an aerial apparatus, the combination of a supporting plane, a gudgeon upon which said plane may be axially rocked to move the portions at front and rear of the gudgeon in opposite directions, said plane having members rockably mounted on opposite portions of the gudgeon, and a pivot extending crosswise of the gudgeon and longitudinally of the machine and centrally be-

tween said members, and upon which the gudgeon may be oscillated allowing the plane to be longitudinally tilted.

3. In an aerial apparatus, the combination of a supporting plane, a gudgeon upon which said plane may be axially rocked to move the portions at front and rear of the gudgeon in opposite directions, said plane having members rockably mounted on opposite portions of the gudgeon, and a pivot extending crosswise of the gudgeon and longitudinally of the machine and centrally between said members, and upon which the gudgeon may be oscillated allowing the plane to be longitudinally tilted, and means including a lever and vertically extending links connecting with the end portions of the gudgeon for rocking the gudgeon about said pivot.

4. In an aerial apparatus, the combination of a supporting plane, a gudgeon upon which said plane may be axially rocked to cause the portions at front and rear sides of the gudgeon to move in opposite directions, a pivot extending crosswise of the gudgeon and longitudinally of the machine and upon which the gudgeon may be oscillated allowing the planes to be longitudinally tilted, means for rocking the gudgeon upon its pivot, and means whereby the plane may be rocked upon the gudgeon, said last named means comprising a lever, a rocker arm connected thereto, and a link connecting the rocker arm with the plane at one side of the gudgeon.

5. In an aerial apparatus, the combination of a main frame, a transversely disposed supporting plane, means for tilting the plane transversely on the frame, said means including a rocking member extending crosswise of the frame and on which the plane is mounted, an operating lever, connections between said lever and the rocking member, and means oscillating the plane upon the rocking member, said last means including a link connected to the plane and a hand lever by which the link may be actuated.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN A. HOFFMAN.

Witnesses:

WILLIAM LOUISON,  
LLOYD W. HORTON.