R. F. GARDNER.

AEROPLANE.

APPLICATION FILED OCT. 19, 1910.

1,000,252.

Patented Aug. 8, 1911.

4 SHEETS—SHEET 1.

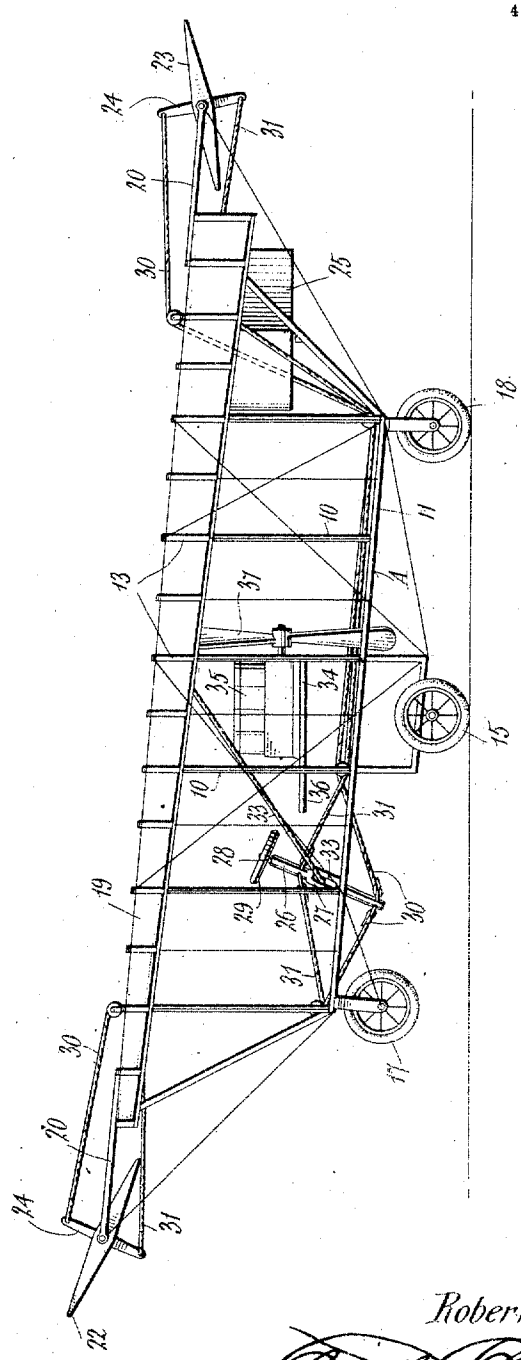

FIG. 1.

Witnesses
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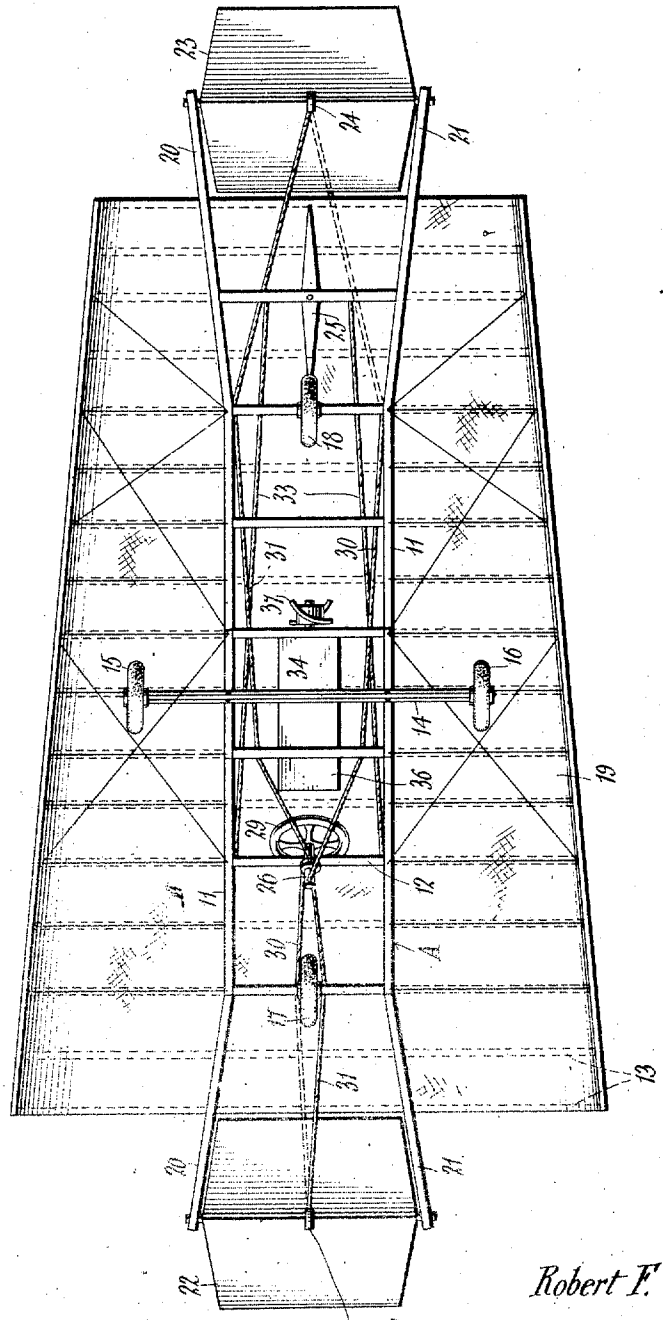

FIG. 2

Witnesses

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4 SHEETS—SHEET 3.

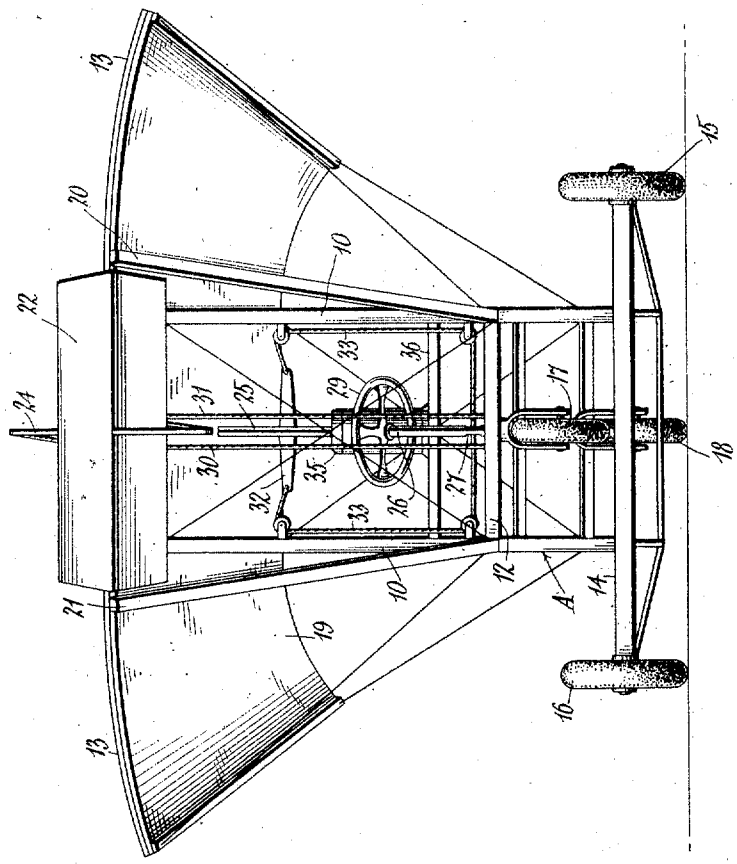

FIG. 3.

Witnesses

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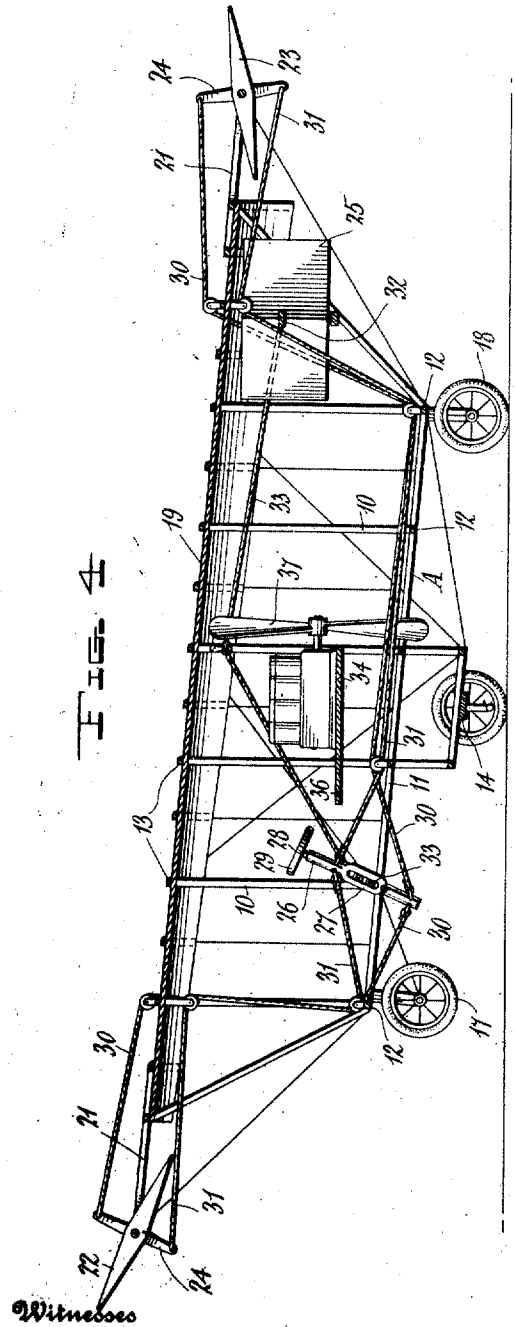

FIG. 4

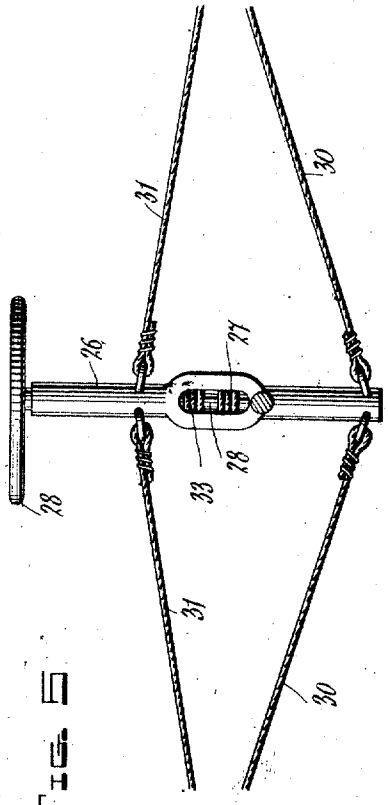

FIG. 5

Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT F. GARDNER, OF VALLEJO, CALIFORNIA.

AEROPLANE.

1,000,252. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed October 19, 1910. Serial No. 587,952.

To all whom it may concern:

Be it known that I, ROBERT F. GARDNER, a citizen of the United States, residing at Vallejo, in the county of Solano, State of California, have invented certain new and useful Improvements in Aeroplanes; and I do hereby 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.

This invention relates to aeroplanes.

The object of the invention resides in the construction of an aeroplane in which the lateral equilibrium thereof can be maintained without the use of ailerons and without rendering the plane flexible at its side ends.

Another object of the invention resides in so constructing the aeroplane that it will possess a maximum lifting power for a given area of supporting plane.

A still further object of the invention resides in the provision of pivoted lifting planes at the front and rear of the aeroplane and a pivoted steering plane intermediate said lifting planes together with improved means whereby said lifting and steering planes may be operated from a single mechanism.

With the above and other objects in view, the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully described and particularly pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings, wherein like characters of reference denote corresponding parts in the several views; and in which,

Figure 1 is a side elevation of an aeroplane constructed in accordance with the invention; Fig. 2, a bottom plan view of same; Fig. 3, an end view looking at the front of the aeroplane; Fig. 4, a vertical longitudinal section of the aeroplane; and Fig. 5, a detail view of a portion of the mechanism for operating the lifting and steering planes.

Referring to the drawings, the aeroplane is shown as comprising a frame A formed of the uprights 10, side members 11, bottom cross members 12 and transverse plane supporting ribs 13 located at the upper ends of the uprights 10. This frame A is provided centrally with a transverse axle 14, upon which is mounted wheels 15 and 16. The front and rear ends of the frame A are also provided with wheels 17 and 18 respectively. The wheels 17 and 18 are so positioned that when the wheel 18 and the wheels 15 and 16 are upon the ground, the wheel 17 will be elevated; and when the wheel 17 and the wheels 15 and 16 are upon the ground, the wheel 18 will be elevated. Disposed upon the ribs 13 is the supporting plane 19. These ribs are curved transversely to the line of flight of the aeroplane; the curvature thereof constantly increasing from the front to the rear of the frame A so as to impart a corresponding shape to the supporting plane 19. This plane 19 is shaped so that the long axis thereof is disposed in the direction of the line of flight of the aeroplane and at the same time tapers from the front to the rear of the aeroplane, the narrowest portion of said supporting plane being at the point of its greatest transverse curvature. It has been found in practice that this peculiar formation of the supporting plane will not only elevate the aeroplane at a less speed but will also enable it to lift considerably more weight. Extending from the front and rear ends of the supporting plane 19 is a pair of spaced members 20 and 21 and between the opposite ends of these members are pivotally mounted lifting planes 22 and 23, each of which carries a cross arm 24 at right angles to their axis of rotation. Pivoted in the frame A intermediate the lifting planes 22 and 23 is a vertically disposed steering plane 25.

Pivoted in the frame A near its forward end for rocking movement in the direction of the line of flight of the aeroplane is a tubular member 26 which has its intermediate portion provided with an opening 27. Rotatably mounted in this tubular member 26 is a shaft 28 which carries at one end a hand wheel 29. This shaft, as will be apparent, is accessible through the opening 27. The tubular member 26 is connected to the upper ends of the cross arms 24 of the lifting planes by means of cables 30, said cables traveling over suitable pulleys mounted in the frame A and being secured to the tubular member 26 at a point beneath the pivotal connection with the frame A. The lower ends of the cross arms 24 are also connected with the tubular member 26 by means of cables 31, which extend over suit-

able pulleys in the frame A and are secured to the tubular member 26 at a point above its pivotal connection with the frame A. The steering plane 25 is provided with a cross arm 32 transverse to its axis of rotation and this cross arm has its terminals connected to the shaft 28 by means of cables 33 which extend through the opening 27 so that the rotation of said shaft by the operation of the hand wheel 29 will in turn rotate the steering plane 25 in order to change the direction of the aeroplane during flight. By this construction, it will be apparent that both the lifting planes and the steering plane are under the control of the operator when his hands are upon the hand wheel 29 as he can then effect both the rocking of the tubular member 26 on its pivot and the rotation of the shaft 28.

A suitable platform 34 is mounted in the frame A and upon this platform is disposed the motor 35 and the operator's seat 36. Connected to the shaft of the motor 35 is a propeller 37, through the instrumentality of which the aeroplane is driven.

The various parts of the frame A are strengthened by means of steel stay wires connected to the frame at the most advantageous points and constructed with a view to lightness and strength.

What is claimed is:—

An aeroplane comprising a frame, a supporting plane carried by said frame, lifting planes pivotally mounted in said frame and disposed at each end of the supporting plane, a tubular member having an intermediate portion thereof pivotally connected to the frame and provided with a transverse opening above its pivot point interrupted by its bore, a shaft rotatably mounted in said tubular member, a hand wheel on one end of said shaft for rotating the latter, a pair of cables having one end connected to the tubular member below its pivot point and their other end respectively connected with said lifting planes, a second pair of cables having one end connected to the tubular member above its pivot point and their other end connected respectively to the lifting planes whereby the rocking of the tubular member on its pivot will move said lifting planes so as to present different angles of incidence to the atmosphere, a vertical steering plane pivoted in the frame, and connections between the steering planes and the shaft whereby the rotation of the latter will move said steering plane on its pivot, said connections leading to the shaft through the transverse opening in the tubular member.

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

ROBERT F. GARDNER.

Witnesses:

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N. E. REDDAN.