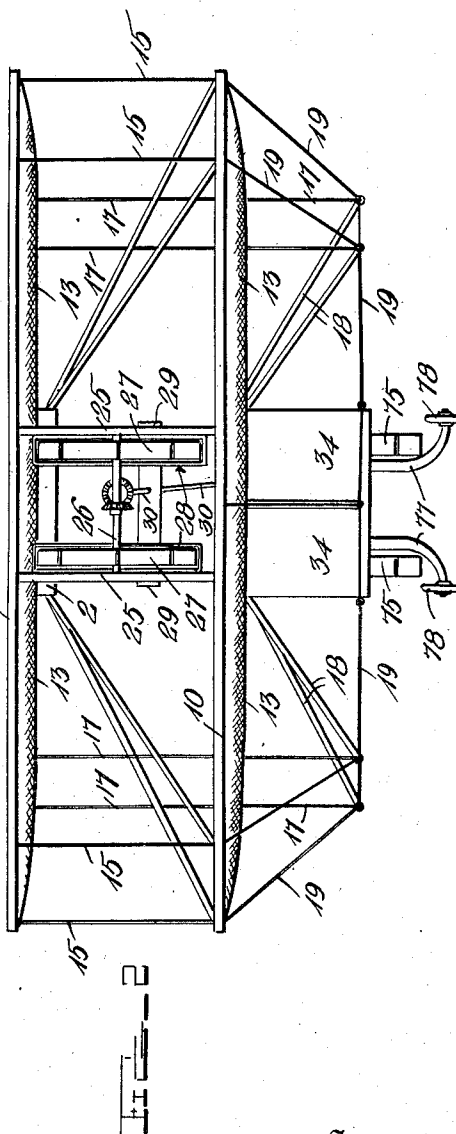
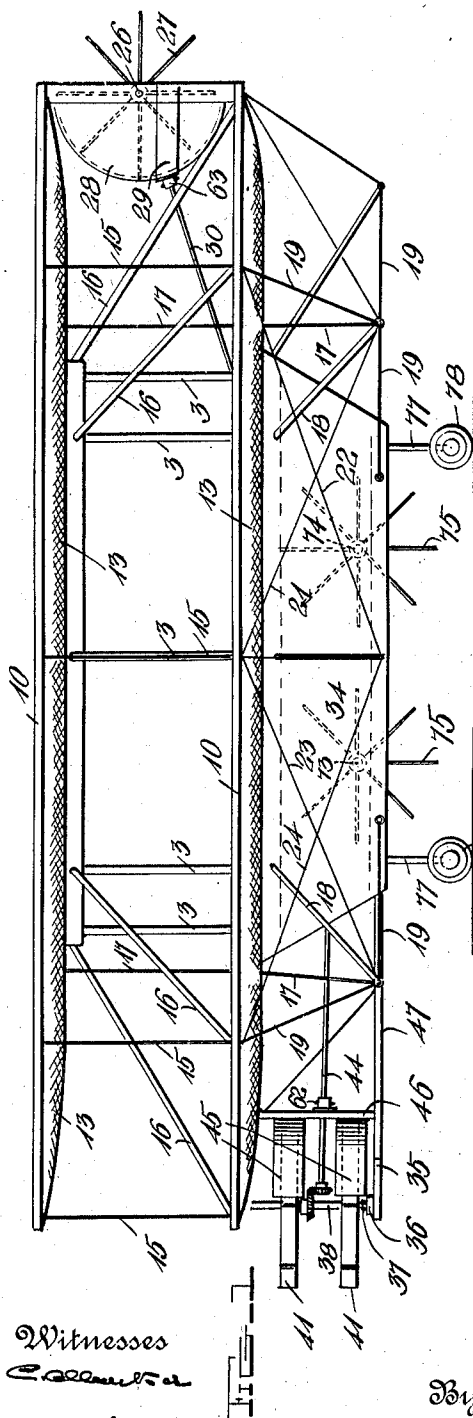


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AEROPLANE.
APPLICATION FILED NOV. 9, 1908.

Patented May 25, 1909.

4 SHEETS—SHEET 1.



Witnesses
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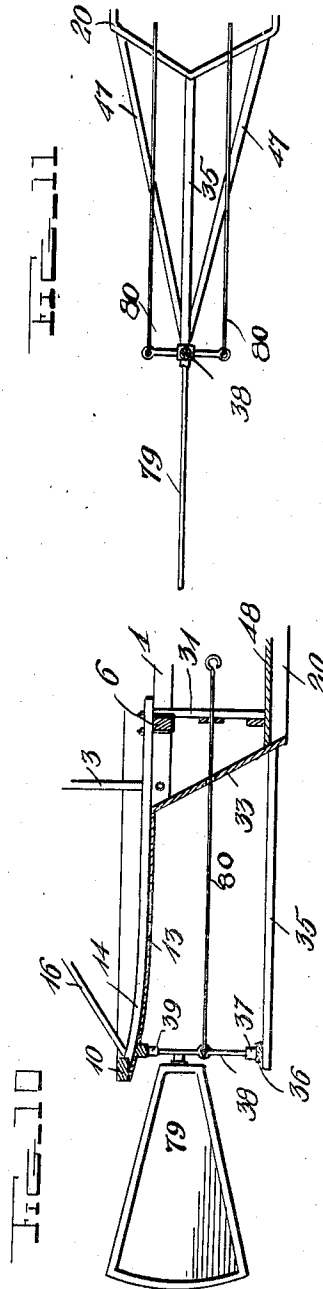
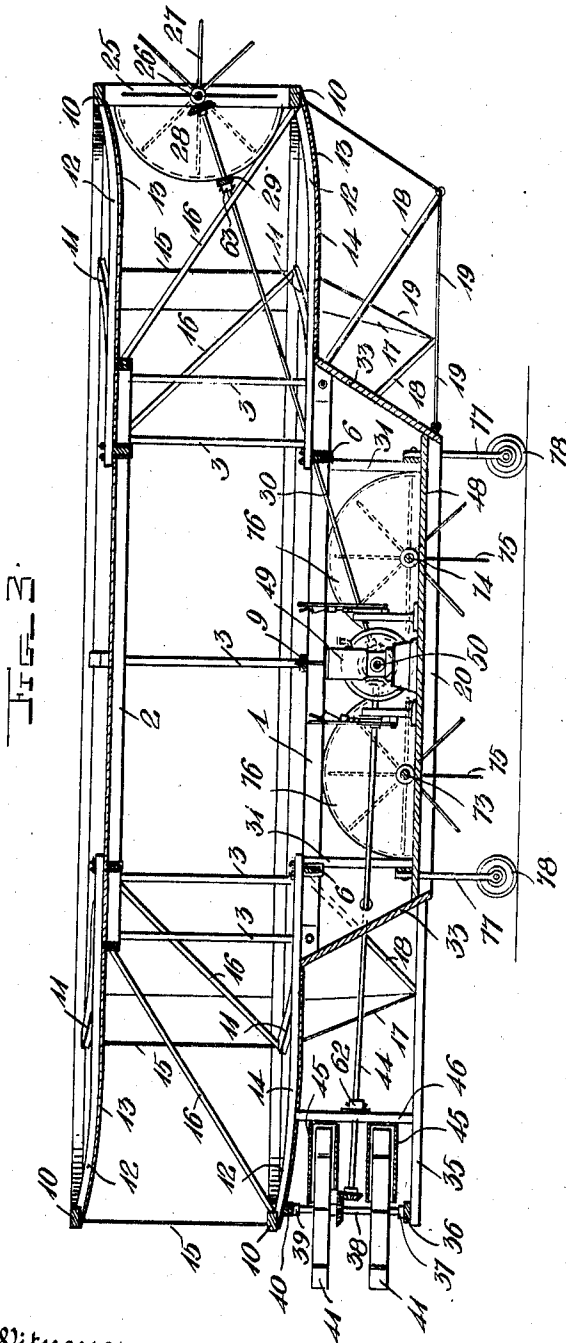
Attorneys

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4 SHEETS—SHEET 2.



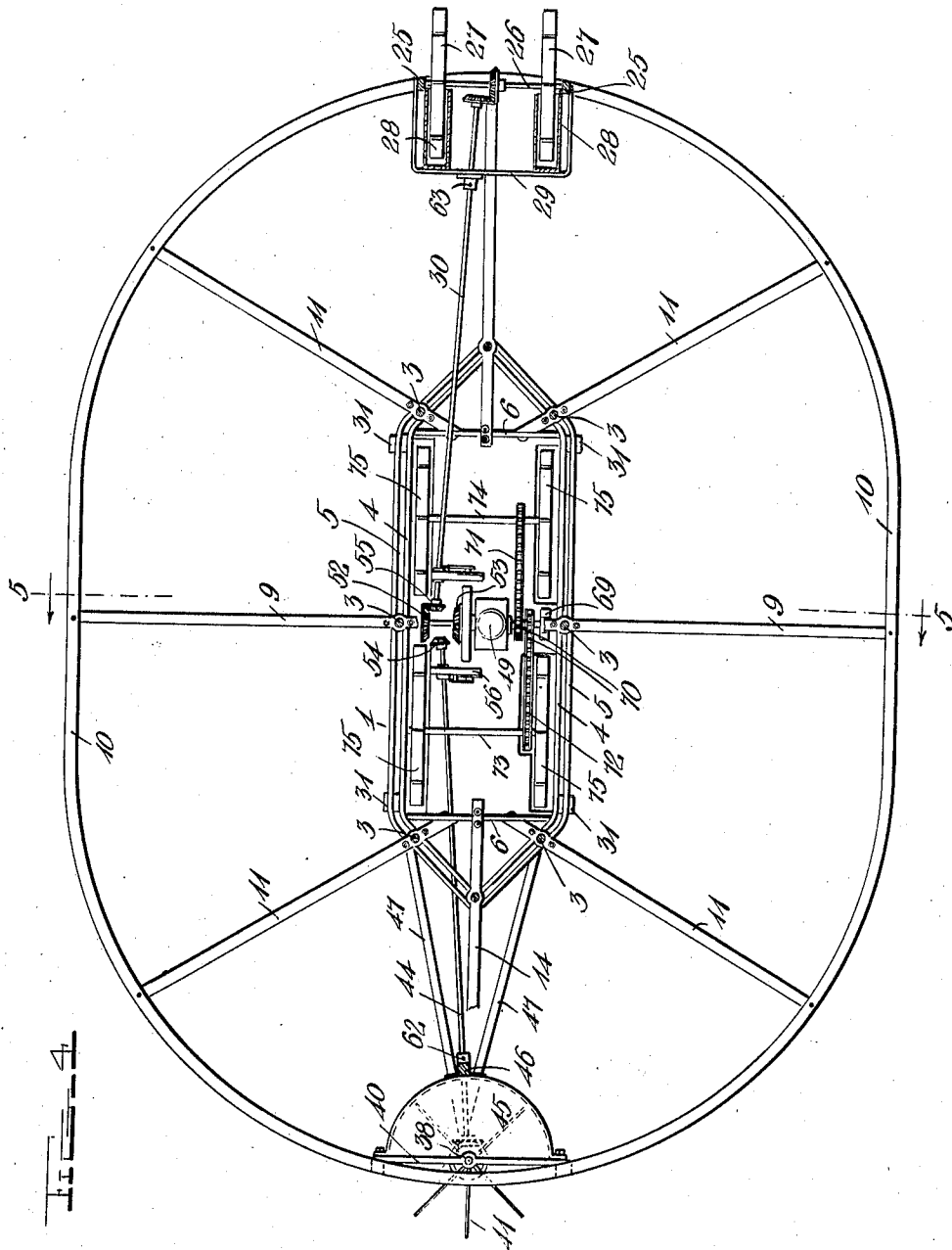
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4 SHEETS—SHEET 3.



Witnesses

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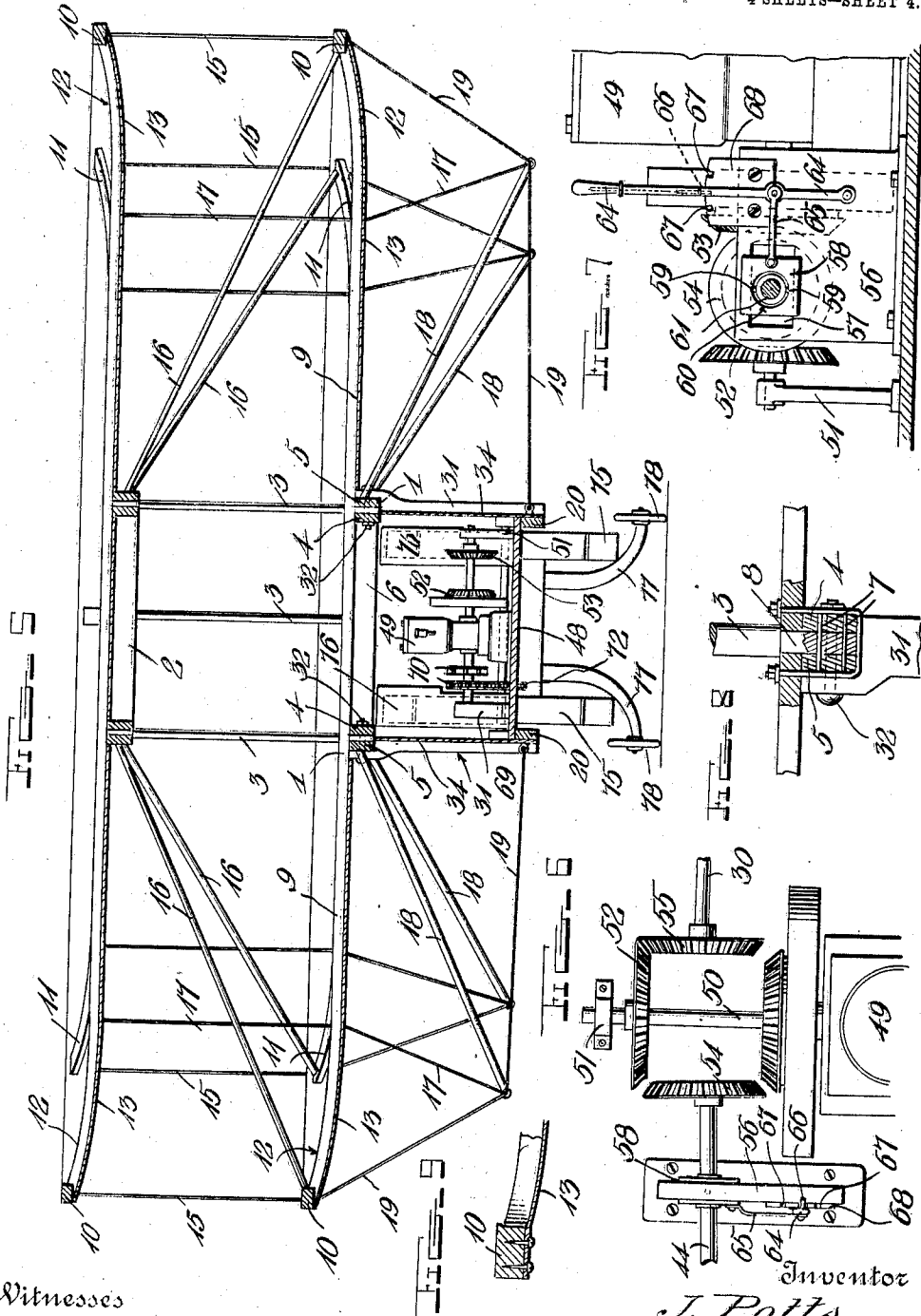
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4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN POTTS, OF WINCHESTER, OHIO.

AEROPLANE.

No. 923,075.

Specification of Letters Patent.

Patented May 25, 1909.

Application filed November 9, 1908. Serial No. 461,724.

To all whom it may concern:

Be it known that I, JOHN POTTS, a citizen of the United States, residing at Winchester, in the county of Adams and State of Ohio, have invented certain new and useful Improvements in Aeroplanes; 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.

My invention relates to airships and particularly to that type known in the art as aeroplanes.

The object of the invention is to provide a device of this character which will have its center of gravity so well established in the machine that its equilibrium is always assured, thus preventing excessive tilting by reason of cross currents or head currents of air.

A further object of the invention is the provision of novel mechanism by which the device is elevated, propelled and its direction controlled.

A still further object of the invention is the construction of the frame which enables me to produce a relatively light machine of this character whereby less power is required to sustain the machine in the air.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawing, Figure 1 is a side elevation; Fig. 2 is a front elevation; Fig. 3 is a longitudinal section; Fig. 4 is a plan view with the upright frame removed and parts of the machine in section; Fig. 5 is a cross sectional view on the line 5—5 of Fig. 4; Fig. 6 is a detail fragmentary plan view of the shaft shifting mechanism; Fig. 7 is a side elevation looking in the direction of the arrow in Fig. 6; Fig. 8 is a detail longitudinal section of the center brace bar disclosing the connection of these parts with the frame; Fig. 9 is a detail sectional view showing the manner of attaching the canvas; Fig. 10 is a detail side elevation of a modification with parts in section; Fig. 11 is a plan view partly in section of the modifications shown in Fig. 10.

Referring more especially to the drawings, 1 and 2 represent the main frames of the machine which are connected together by up-

rights 3 spaced around the frames and passing through their parallel members 4 and 5, as shown in Fig. 8. Both frames are substantially alike in every respect and are spaced apart as is shown in Fig. 4 by cross bars or struts 6 arranged adjacent the ends of the frames for a purpose to be hereinafter described.

As before stated, the main frames 1 and 2 each comprise a pair of parallel members 65 through which the uprights 3 pass and are secured therein by means of cross rivets or bolts 7 passing through the reduced ends 8 of the uprights.

Extending outwardly from each frame adjacent its center are cross bars 9 which are bridged from side to side of the main frames as shown in Fig. 5, and are connected at their outer ends to the central portion of an elliptical rim 10. These cross bars are supplemented by similar outwardly projecting members or supports 11 extending diagonally from either end of the frame and are connected at their outer ends as shown to the rim 10. Each of the cross bars 9 and 11 are curved at their outer ends as at 12 in order to elevate the rim from the normal plane of the frame to which it is connected in order that an inclined surface may be given to the canvas 13 which is secured to the rim, preferably in the manner shown in Fig. 8. At this point, it may be well to state that canvas has been herein specified as the material is light, strong and durable, but it will be understood that any other material which may better serve the purpose may be employed in its stead. The inner ends of the cross bars 11, as well as the inner ends of similar cross bars 14, are connected to the struts 6 as is clearly shown in Fig. 4 so as to prevent any wobbling of the cross bars and the rims to which they are connected.

In order to form a rigid structure and to prevent the parallel relation of the rims from changing, I provide suitable uprights 15 arranged at intervals around the circumference of the rim so as to connect the same, and in order to prevent the rims from sliding, I provide strain bars 16 which extend diagonally from the upper frame 2 to the lower rim 10 and intermediate the length of these bars connect the two vertically opposite cross bars and the strain bar 16 with torsion cable 17 which is connected to the bar 16 intermediate its length. This torsion cable extends downwardly from its connection with the lower cross bar to which it is attached and

terminates in a connection with a diagonally projecting strut 18 connected at its upper end to the lower frame 1 and at its outer lower end to the cable 17, and also to a strain cable 19 which is stretched from the lower rim 10 to a connection with the lower end of the strut 18, and from thence in a horizontal direction is carried to the engine frame 20. A plurality of these struts 18 are arranged around the lower frame 1 and are connected in a similar manner to the one just described to the engine frame 20 by the cables 19.

Suitable strain wires 21 and 22, 23 and 24, assist in holding the struts 18 in proper position so as to maintain the strain of the cable 19 taut and thus assure the proper position of the lower rim. In the structure to be described hereinafter, applicant will refer to the upper and lower planes as including the rims, cross bars and canvas, which covers them, for purposes of convenience.

In the forward end of the machine and arranged between the two planes, I provide two parallel uprights 25 which are connected to the upper and lower rims 10 and have journaled intermediate their length the fan shaft 26, upon which the two fans 27 are keyed adjacent the ends thereof and are adapted to rotate in a vertical plane. Each fan has its rear half incased in a suitable casing 28, which is supported at its top and bottom by the rims 10 and intermediate its height by a rigid bail 29, which is arranged for the purpose of supporting the driving shaft 30 to be hereinafter described.

As shown in Figs. 3 and 5, the engine frame is supported upon hanger members 31 which depend from the lower main frame 1, being secured thereto in the manner shown in Fig. 8 by bolts 32.

The frame is braced by diagonal braces 33 and the entire engine frame and its cooperating mechanical parts are covered by a canvas shield 34 as is shown in Fig. 1. Extending rearwardly from the engine frame 20 is a shaft support 35 upon the end of which is supported a bridge piece 36 carrying a step bearing 37 in which the lower end of the vertical fan shaft 38 is journaled. The upper end of this fan shaft is journaled in a bearing 39 carried by the lower face of a cross bar 40 bridged across the under side of the lower rim.

Keyed to the fan shaft 38 is a pair of fans 41 which are separated some distance apart so as to make room for the driving shaft 44. The fans 27 as will be hereinafter described are adapted for rotation in either direction for the purpose of raising or lowering the forward end of the machine, while the fans 41, as will be hereinafter described, are adapted for rotation in either direction to determine the direction of horizontal movement of the machine. The fans 41, as well as the fans 27, are incased in casings 45 and the shaft 43

is supported in an upright 46 bridged between the rear cross bar 14 and the member 35.

The member 35 is further braced with relation to the lower plane by a diagonally arranged truss bar 47 which extends from the engine frame 20 merging to a point at the end of the member 35 to which they are connected.

On a platform 48 carried by the engine frame 20 I mount the driving engine 49 which may be of any suitable type, and as shown in Figs. 4, 5, 6 and 7, said engine is provided with a transversely extending shaft 50 journaled in its outer end in an upright bearing standard 51 carried by the platform 48. The shaft 50 is provided with a pair of oppositely disposed beveled gears 52 and 53 which are keyed thereto on opposite sides of the beveled pinions 54 and 55, the former being carried by the shaft 44 and the latter being carried by the end of the shaft 30, and both being adapted to be swung laterally by mechanism which will now be described. As both of these shifting mechanisms are the same, I shall describe only one. Extending upwardly from the platform 48 is a bearing plate 56 having a slide way 57 in which the bearing member 58 is adapted to reciprocate, as will be clearly understood from an inspection of Figs. 6 and 7. This bearing member is provided with downwardly extending pins 59 arranged on opposite sides of a central opening 60 and adapted to engage a bearing sleeve 61 in which the guiding shaft is adapted to rotate. This construction is adapted to permit the free swinging of the shaft without binding in its supporting bearings.

A similarly arranged bearing is indicated at 62 carried by the upright 46 and adapted to support the shaft 44 and another similar bearing indicated at 63 is carried by the bail 29 and adapted to support the shaft 30. The teeth of all the beveled gears meshing with each other are made relatively deep so as to provide for slight differences of the relative positions of meshing gears so that there will be no danger of slipping.

The bearing elements move laterally to shift the gears 54 and 55 in their accompanying driving shaft, each by a lever 64 which is pivoted at its lower end to the bearing plate 56 and is connected to the bearing member 58, intermediate its length by a link 65. At the upper end of the lever, a pawl 66 is adapted to engage any one of the adjusting notches 67 formed in the upper part of the segmental rack 68. It will thus be seen that the pinions 54 and 55 may be readily shifted and held in shifted position by the mechanism just described so as to reverse the rotation of the fans 27 and 41.

The opposite side of the engine shaft 50 is journaled in bearings 69 carried by the platform 48 and intermediate the bearings 69 and the engine, there is secured to the shaft a

pair of belt or sprocket wheels 70, both of which carry the driving chains 71 and 72 leading in opposite directions to the driven shafts 73 and 74, respectively. These shafts are journaled in bearings supported upon the platform 48 and carry at each opposite end the propelling fans 75, which are incased by casings 76 covering their entire upper half. To reverse the direction of rotation of these fans, it is necessary to reverse the engine, as shown in the drawings herewith, but it will be clearly understood that I may provide suitable clutch mechanism for reversing their rotation, such addition being the result of expediency in practice and mechanical skill only and not forming a part of this invention.

Depending from the engine frame at either end thereof and on opposite sides of the same, I provide supporting wheels supporting brackets 77 upon which the wheels 78 are journaled so as to support the device when running along the ground in rising or when descending.

In the modification shown in Figs. 10 and 11, the steering wheels 41 have been substituted by a rudder 79 mounted upon the shaft 38 and controlled by steering rods 80 which extend forwardly to the engine platform and may be controlled by the operator.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended claims.

I claim as my invention:—

1. In a device of the class described, a pair of parallel planes, a frame supported from the lower plane, propelling means carried upon said frame, means for maintaining the parallel relation of the two planes, means for bracing the lower plane to the frame, steering mechanism carried by the frame and means arranged between the planes for determining its elevation.

2. An aeroplane comprising a pair of parallel planes, a supporting frame depending from the lowest plane, a driving element mounted upon said frame, propelling means operated by said driving element and carried by said frame, means for determining the elevation of said aeroplane, said means arranged between the planes and being driven by said element and means arranged below the planes for steering the device.

3. In a device of the character described, a pair of parallel planes, an engine supporting frame depending from the lowest plane, a platform thereon, an engine on the platform, a plurality of propelling wheels arranged on either side of the engine and mounted in bearings on the platform said propelling wheels being driven by the engine, a plurality of elevation determining fans arranged between the planes, means for driving said fans, a plurality of steering fans arranged below the lowest plane, means for driving said steering fans, and means controlled by the operator for reversing both the steering and the elevation determining fans.

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

JOHN POTTS.

Witnesses:

B. G. COWL,
E. EDMONSTON, Jr.