

A. J. HELM.
AERODROME.

APPLICATION FILED JULY 11, 1911.

1,023,150.

Patented Apr. 16, 1912.

3 SHEETS-SHEET 1.

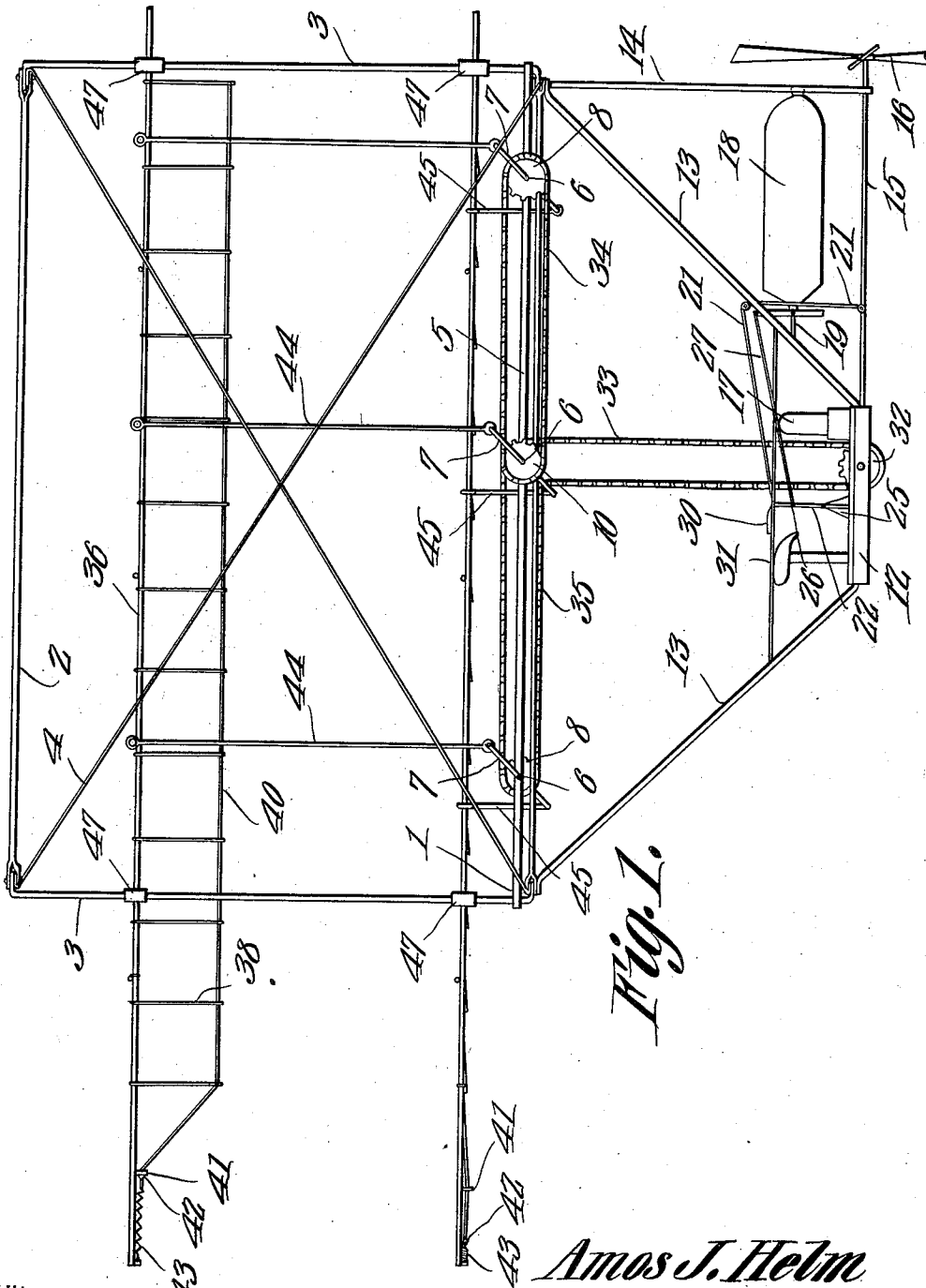


Fig. 1.

Witnesses

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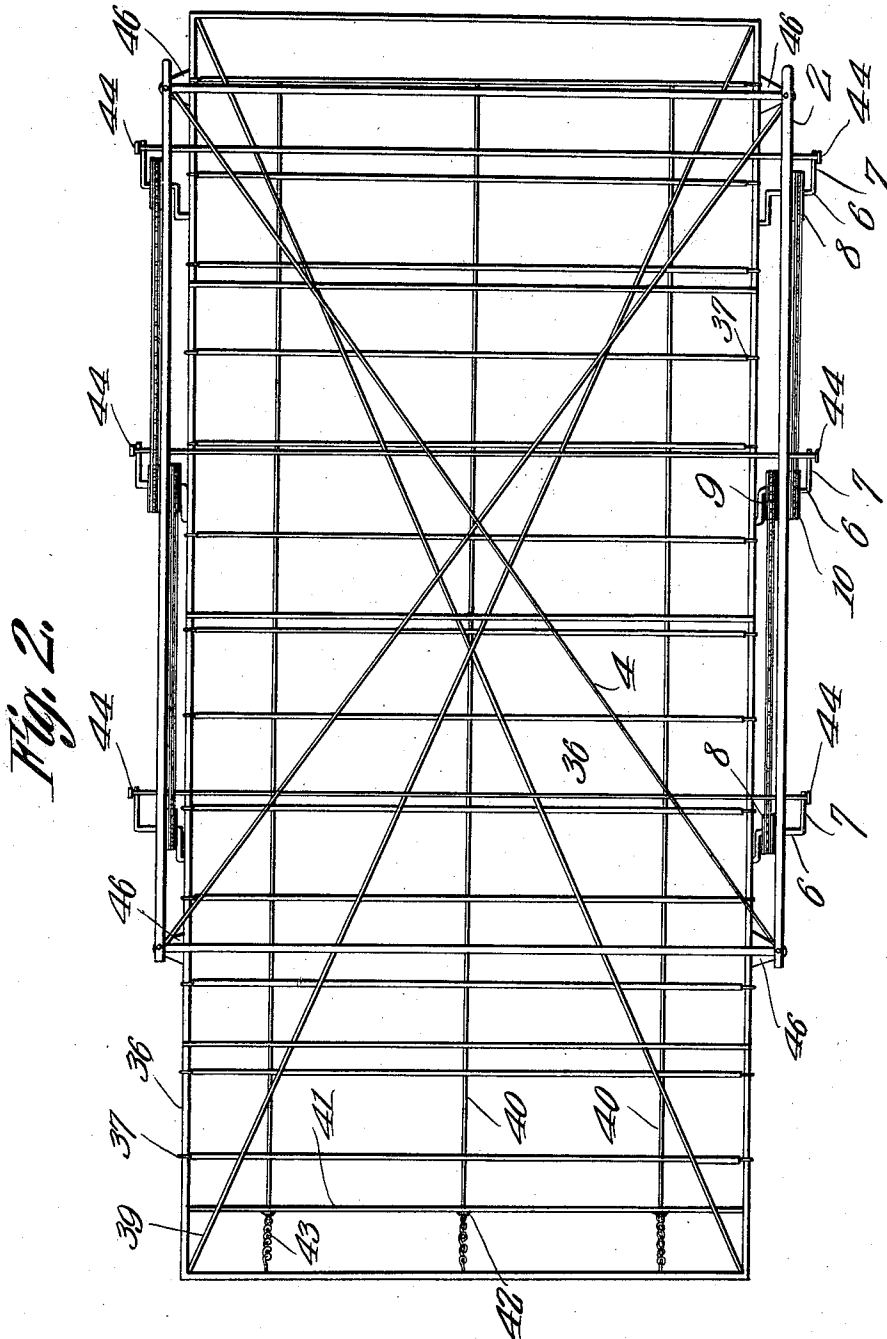
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

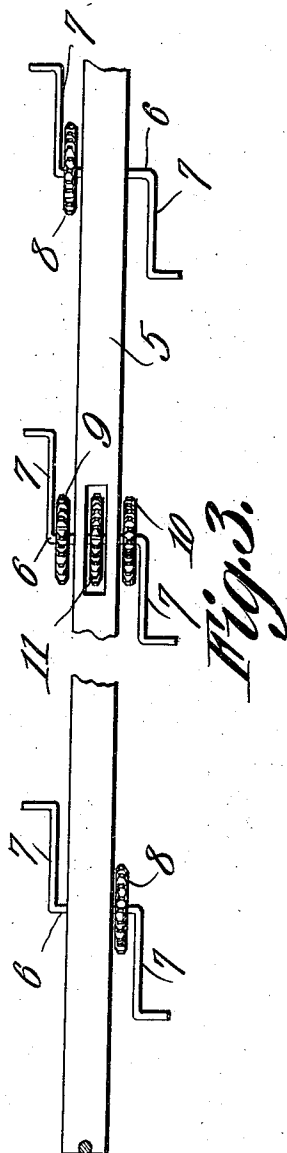


Fig. 3.

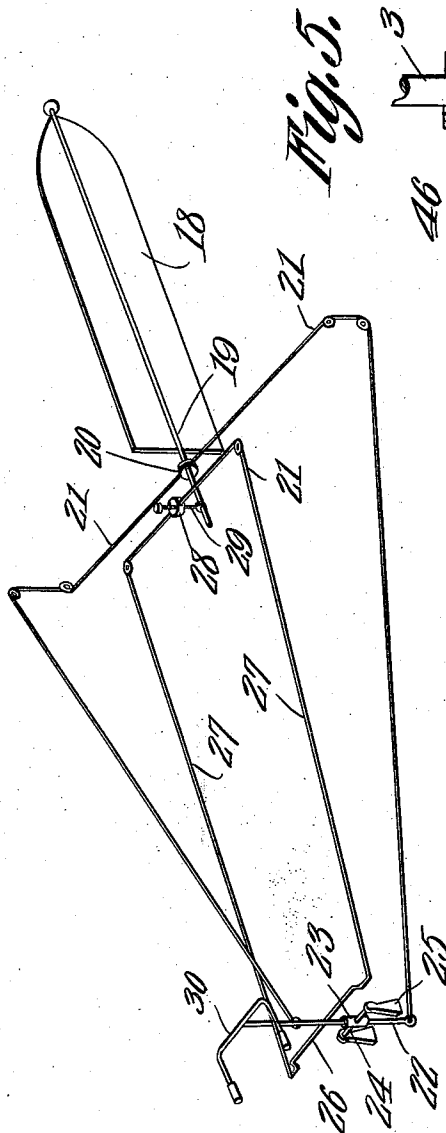


Fig. 4.

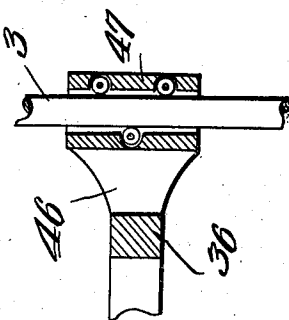


Fig. 5.

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UNITED STATES PATENT OFFICE.

AMOS J. HELM, OF FLOYDADA, TEXAS.

AERODROME.

1,023,150.

Specification of Letters Patent.

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Application filed July 11, 1911. Serial No. 637,962.

To all whom it may concern:

Be it known that I, AMOS J. HELM, a citizen of the United States, residing at Floydada, in the county of Floyd and State of Texas, have invented a new and useful Aerodrome, of which the following is a specification.

This invention relates to aerodromes or flying machines of the heavier than air type, one of the objects of the invention being to provide a machine of this character having upper and lower elevating planes mounted for relative movement, each of said planes being made up of a plurality of flaps or valves adapted to automatically close during the downward movement of the plane and to open automatically during the upward movement thereof so that air is free to flow through the plane during such upward movement but will be displaced downwardly by the plane when said plane is moved downwardly.

A further object is to provide a machine of this character having light and durable mechanism whereby the elevating and sustaining planes can be operated together, the mechanism being of such a character as to simultaneously shift the planes in opposite directions so that said planes will successively displace the air downwardly and thus operate both to elevate the machine and to maintain it at a desired elevation.

Another object is to provide an aerodrome which can be readily controlled in its flight, the parts being so arranged and proportioned that, in the event of the failure of the motor or any other vital part of the machine to properly work, the said machine can descend gradually and without injury to the aviator.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings; Figure 1 is a side elevation of the machine. Fig. 2 is a plan view thereof. Fig. 3 is a detail view of one of

the side members of the frame. Fig. 4 is a view showing diagrammatically the means for controlling the rudder. Fig. 5 is an enlarged vertical section through one of the corner guides of a plane.

Referring to the figures by characters of reference 1 designates a bottom frame and 2 designates a top frame, the two frames being connected at their corners by posts 3 and there being any suitable arrangement of brace wires or rods 4 whereby the posts and the upper and lower frames are held rigid. The bottom frame 1 has side strips one of which has been indicated in plan in Fig. 3, each of these side strips, 5, being provided with a series of shafts 6 extending transversely thereof and each shaft having oppositely extending crank arms 7. A sprocket 8 is connected to all but one of the shafts 6 and the remaining one of said shafts has preferably three sprockets thereon, said sprockets being indicated by the numerals 9, 10 and 11 respectively.

A car 12 is supported below the frame 1 by hangers 13 and another hanger 14 extends downwardly from the front portion of the frame 1 and in front of the car 12 and constitutes a bearing for a propeller shaft 15. The propeller 16 is arranged at the front end of shaft 15 and said shaft is preferably connected directly to the motor 17 which can be of any desired type. A vertical rudder 18 is connected at its front end to the hanger 14 by a ball and socket joint or the like whereby said rudder is free to swing in any direction relative to the hanger. A stem 19 extends rearwardly from the rudder and through a ring 20 which is loosely mounted thereon, this ring having cords 21 extended in opposite directions therefrom and past suitably arranged guide sheaves, the ends of the cords being connected to an operating lever 22 above and below the fulcrum thereof. This lever is mounted for rotation within a sleeve 23 having oppositely extending trunnions 24 mounted in suitable bearings 25 and arms 26 extend in opposite directions from the lever and with their terminals in alinement with the trunnions 24, these arms being connected by cords 27 or the like to a loop 28 arranged adjacent the stem 19. An arm 29 extends radially from the stem and into the loop 28 and it will be apparent that, by rotating lever 22, one or the other of the arms 26 will be caused to pull on one

of the cords 27 and thus shift loop 28 so as to pull on the arm 29 and therefore rock stem 19 and the rudder 18 secured thereto. By swinging lever 22 with trunnions 24 as a fulcrum, one or the other of the cords 21 can be caused to pull on the ring 20 and thus shift the rear end of stem 19 so as to swing the back end of the rudder to the right or to the left as desired and thus guide the machine in flight. Handle bars, such as used on a bicycle may be connected to the upper end of lever 22, as indicated at 30 and the aviator's seat 31 is preferably disposed adjacent these handle bars.

A sprocket 32 is actuated by the motor 17 and transmits motion, through a chain 33, to the sprocket 11 hereinbefore described. A chain 34 transmits motion from sprocket 9 to sprocket 8 and another chain 35 transmits motion from sprocket 10 to the other sprocket 8. It will thus be apparent that all of the shafts 6 located at one side of the machine will be rotated together and in the same direction. It is designed to have a sprocket 32 at each side of the machine and the same arrangement of sprockets 8, 9, 10 and 11 at both sides of the machine so that, when motor 17 is in operation, all of the shafts 6 at the two sides of the machine will rotate together.

For the purpose of elevating the machine and sustaining it, two planes are provided, one being arranged above the other and both of them being located between the frames 1 and 2. Each of these planes consists of a frame 36 having cross rods or wires 37 on which flaps 38 of any suitable material are hung. These flaps extend from one side to the other of the frame 36 and each of them is sufficiently wide to lap the next adjoining flap when all of the flaps are swung upwardly to substantially horizontal positions. Combined brace and backing wires 39 are connected to the frame 36 and may be extended diagonally thereon, these wires constituting means for holding the frame 36 rigid and also constituting abutments against which the flaps 38 will move. All of the flaps 38 are connected to a cord 40 or the like extending longitudinally of the frame and secured at one end to one of the end flaps while its other end is extended through a guide bracket 41. Said cord has a stop projection 42 upon it adapted to move against the bracket 41 so as to limit the movement of the cord in one direction and correspondingly limit the swinging movement of the flaps relative to the frame 36. A spring 43 may be attached to the cord 40 and this spring is adapted to be placed under stress when the flaps are swung downwardly to open position and operates to start the flaps back to closed position when the air is to be displaced downwardly by them. As shown in Fig. 2 three of these

cords 40 may be provided, each having a spring 43, a bracket 41 and a stop 42, but it is to be understood that more or less cords can be utilized. As heretofore stated two of these planes are employed one being arranged above the other. The upper plane is connected, by pitmen 44, to one set of crank arms 7 while the lower plane is connected by short pitmen 45 to the remaining cranks 7.

It is to be understood that when the sprockets are set in motion, the crank arm 7 will be rotated with the shafts 6 and while the pitmen 44 are being drawn downwardly thereby, the pitmen 45 are being moved upwardly. During the downward movement of each of the planes, the springs 43 will start the flaps 38 toward their closed positions after which the pressure of air against the flaps will cause them to fold against each other and thus completely close the spaces within the frame. Said flaps will thus operate to displace air downwardly and the car 12 will be elevated toward the said plane. During this displacement of air and the resulted elevation of the car, the other plane is being moved upwardly, the pressure of air upon the upper faces of the flaps 38 causing them to open downwardly so that the said plane can move upwardly with the minimum resistance from the air. It will thus be seen that the two planes will alternately displace the air downwardly and will thus operate successively to raise the car, the speed with which the elevation takes place being dependent upon the speed of reciprocation of the planes.

Each of the frames of the planes 36 has projections 46 carrying roller-bearing sleeves 47 that slide up and down on posts 3 of the main frame. This will prevent the planes from toppling forward or backward, confining them to a straight upward and downward movement.

What is claimed is:—

An aerodrome including upper and lower frames, parallel connections between the corner portions of the frames, a series of crank shafts journaled upon each side of the lower frame, the cranks of each shaft being oppositely disposed, means for rotating all of the shafts in unison, sleeves mounted to slide along the connections, upper and lower elevating planes connected, at their corners, to the sleeves, each of said planes including a frame, flaps extending transversely thereof and adapted to hang downwardly therefrom, a flexible connection between the lower ends of the flaps, an elastic device secured to one end of the connection and to the rear end of the frame, said device constituting means for holding the flaps normally folded together to close the space within the frame, pitman connections between the sides of the lower plane and one set of cranks at each

side of the lower frame, pitman connections
between the sides of the upper plane and the
remaining cranks, said cranks and pitmen
operating to move the planes in opposite
5 directions simultaneously, and steering and
propelling means supported below the
frames.

In testimony that I claim the foregoing
as my own, I have hereto affixed my signa-
ture in the presence of two witnesses.

AMOS J. HELM.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
