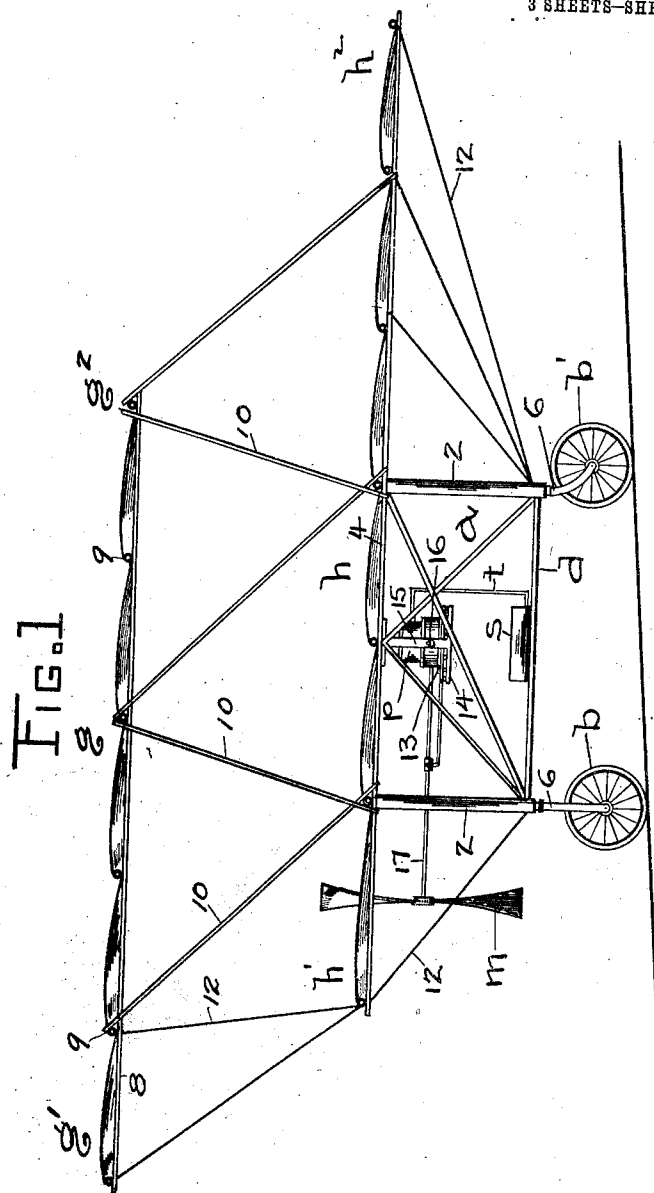


1,043,781.

P. LEVINS, DEC'D.
G. L. LEVINS, ADMINISTRATRIX.
AEROPLANE FLYING MACHINE.
APPLICATION FILED MAY 18, 1909.

Patented Nov. 5, 1912.

3 SHEETS—SHEET 1.



WITNESSES:

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M. Regner

INVENTOR

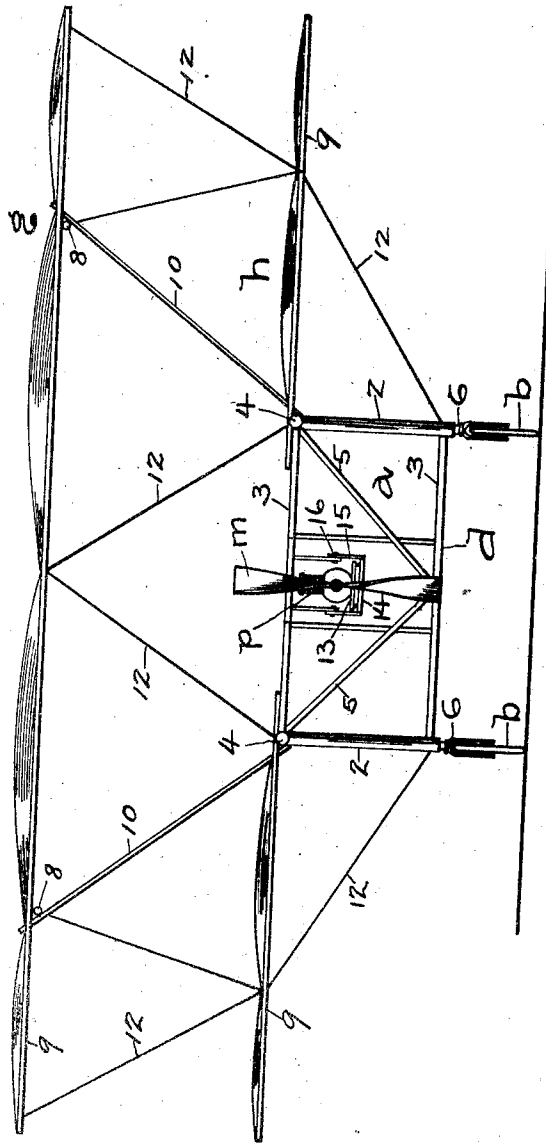
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3 SHEETS-SHEET 2.

FIG. 2



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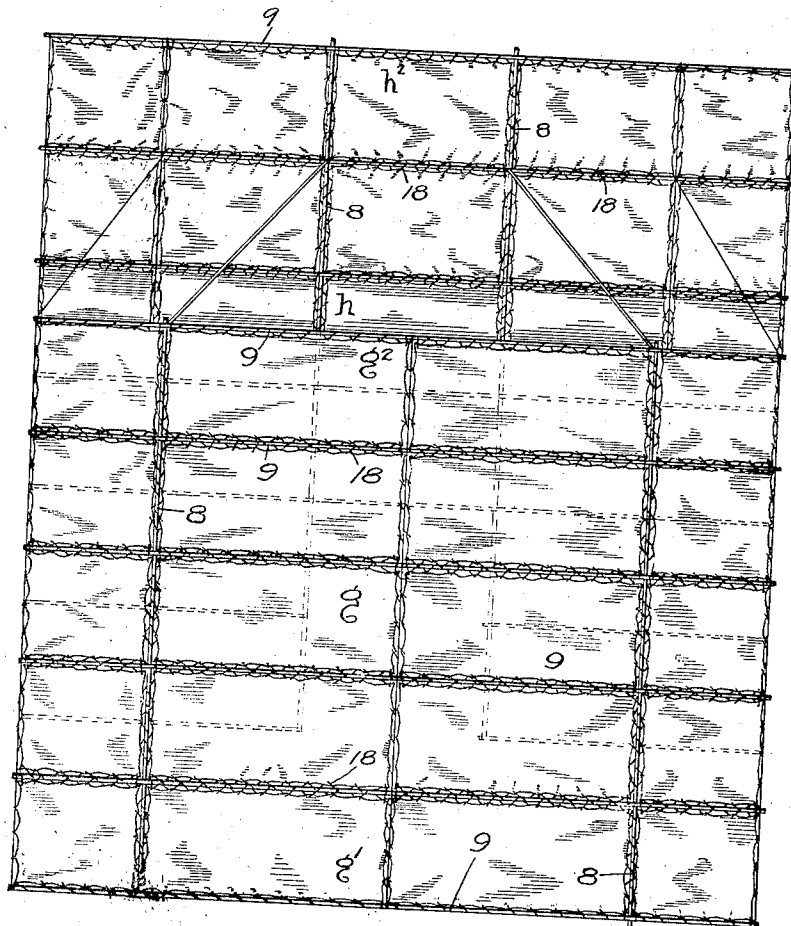
[Signature]
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3 SHEETS-SHEET 3.

FIG. 3



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BEST AVAILABLE COPY

UNITED STATES PATENT OFFICE.

PETER LEVINS, DECEASED, LATE OF SAN FRANCISCO, CALIFORNIA; GRACE L. LEVINS,
ADMINISTRATRIX.

AEROPLANE FLYING-MACHINE.

1,043,781.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed May 18, 1909. Serial No. 496,846.

To all whom it may concern:

Be it known that I, GRACE L. LEVINS, administratrix of the estate of PETER LEVINS, deceased, in his time a citizen of the United States, and a resident of the city and county of San Francisco, State of California, make application for Letters Patent of the United States for new and useful Improvements in Aeroplane Flying-Machines, invented by the said PETER LEVINS, deceased, of which the following is a specification.

The invention relates to an improved flying machine of the type in which a car or body containing the propelling apparatus and providing accommodation for the operator is sustained in its flight and its movements are controlled through the medium of aeroplanes, the machine being distinguished thereby from air ships and other apparatus of the kind in which the car or body is sustained by an inflated bag or other gas-holding compartment.

The improvements comprising the present invention relate chiefly to peculiar and novel arrangement of aeroplanes and a car or body suspended therefrom; and more particularly to the combination and arrangement of aeroplanes in parallel relation one above and in advance of the other; the same having as their object chiefly to secure greater stability during flight, and to obviate or reduce to a minimum the danger of overturning under abrupt or sudden variations in the force or the direction of the wind. These and other objects are sought to be attained in and by the construction, combination and arrangement of parts as hereinafter described and shown; the accompanying drawings to which reference is had illustrating a flying machine containing the several novel features of this invention.

Figure 1 of the drawings is a side-view of the machine; and Fig. 2 a front-view. Fig. 3 is a plan or top view of the machine showing the method of attaching the sails to the frame.

In two figures of the drawings the machine is represented at rest on the ground on a sloping surface and at such an angle with relation to the horizon that the planes are substantially horizontal.

The car or body *a* in this machine is an open structure composed of upright posts 2, transverse and longitudinal rails 3—4,

and such diagonal bracing 5 as is necessary to secure proper stiffness and preserve the rectangular shape of the frame under all strains to which it will be exposed. The corner posts 2 are composed of tubes to combine the two qualities of strength and lightness, and to furnish besides sockets for forked posts or spindles 6 of the wheels *b*. These last-named members 6 are removably fitted to the tubular posts, and may be unshipped for packing the machine. Each wheel carrying post has also a limited play or movement longitudinally in the tubular post, and between its end and the closed head of the tube a spring or other form of cushion is interposed to absorb the shock when the wheel strikes the ground in the descent of the machine.

It will be noticed that as the wheels *b*¹ under the rear end are set nearer to the bottom of the frame than the front wheels *b*, the body of the machine will be elevated at the front, and the aeroplanes consequently will have an upward slant or inclination with respect to the horizon when the wheels are resting on level ground. The effect of such position is to present the under surfaces of the planes at such an angle to the wind that in propelling the machine over the ground preparatory to making a flight the air impinging against the forwardly moving planes causes the machine to rise from the ground and continue to ascend as the machine acquires motion and the speed increases.

The open sides of the body should be closed in by netting to afford protection to the occupants in flight, although the frame is shown in the drawings without such protection; the bottom *d* is floored, but the top is open except for such portions over which the sails or fabrics of the lower aeroplanes may extend.

A novel feature of this invention consists in arranging aeroplanes in a machine of this type one above and in advance of the other in such manner that the front or leading end of the upper plane projects over the front end of the plane beneath; while at the rear the conditions are reversed, and the lower plane extends rearwardly beyond the end of the upper plane. As embodied in the present machine the two planes *g—h* having substantially the same superficial dimensions are fixed one over the other with

sufficient space between them for the air to impinge, and set against the upper plane from beneath without being cut off or modified too much by the lower plane and with the upper plane set parallel with the plane beneath, but also in advance of it, thereby setting the forward end g^1 of the upper plane g over and in advance of the corresponding end h^1 of the lower plane h . The same condition also is produced at the rear end, with the difference that the lower plane extends rearwardly beyond the upper plane. At the rear therefore, the lower plane extends in the tail h^2 beyond the end g^2 of the plane above. Each plane is similarly constructed of a light frame-work of longitudinal bars 8 and transverse bars 9 fastened together and braced by rods or wires to secure proper stiffness, and over this frame, a covering of some light closely woven fabric suitably impervious to air, such as silk fabric which may be varnished or coated to secure requisite strength and durability.

The frame-work of the planes $g-h$ is attached to the car or body by tie-rods and wires 10-12 carried and arranged at various angles to secure the best and most effective resistance to the strains and forces that the planes and the structure supported and carried by them are subjected. To resist the wind pressure against the planes from beneath, the guy-rods or wires 12 are carried from the car or body at varying angles to the outer sides or edges of the lower plane; for the supports and connections for the upper plane rods 10 are used; preferably of tubular structure on account of the greater strength obtained over solid rods of equal weight. As embodied in the present machine also, the covering of fabric on the frame of the lower plane h is omitted from the central portion, or that part which is directly over the car or body, and is carried across the frame both in front of the body and also behind it. In the upper plane, on the contrary, its entire frame is covered, presenting a continuous surface for the length and breadth of the plane, both planes having interstices at intervals to allow the air to escape under excessive pressure.

A novel feature in this invention consists further in mounting a propeller m and a motor p therefor on a turn-table or rotatably movable bed-plate 13 and in suspending the base or stationary bed 14 of the turn-table from the upper structure of the car or body by links or hinged or pivoted supports 15 in such manner that the bed 14 is adjustable in a vertical arc and may be set at varying angles, while the rotatable bed 13 itself is movable on its pivot or axis and may be turned in an arc about its center from side to side.

As the shaft 17 giving motion to the pro-

PELLER is connected directly with or into the motor on the rotatable bed and is mounted on the same bed, it will be seen that the propeller may be set to operate in any plane above or below the horizontal and at any angle within an arc of a greater or less number of degrees both in a vertical plane and in one perpendicular thereto. Thus the one adjustment by virtue of which the propeller m is set at varying angles in a vertical direction with respect to a horizontal plane, is effected and the angular position is varied by changing the position of the suspended bed on its centers 16 at which points the bed is movable in a vertical arc, or by turning the bed-plate 13 on its center the position of the propeller may be changed to various points of the compass from side to side within a limited arc. By virtue of such adjustment in both vertical and horizontal arcs the propeller is given the function of a rudder, serving the two fold purpose of propelling the machine or changing its course in varying directions and of driving it in whatever course or at whatever angle it may be required to travel whether diverting from a straight course to the right or the left, or in an ascending or a descending direction. Under such conditions of suspending the propeller and its motor, connection is readily made between the motor and the agent or medium from which the power is generated to run the motor; as for example, in employing a gas engine or a gasoline or other internal combustion motor, the supply of gas or motive power can be taken from a tank and carbureter s on the bottom d of the car through a connecting pipe t carried up to the motor. Or in using a storage battery, where the motive power is electricity, the motor is connected with the battery on the platform below by conductors in the well known manner.

As shown in the drawings the sails or coverings of the planes are composed of separate units or smaller sections each of proper dimensions to cover the space inclosed by any two longitudinal bars and any two transverse bars of the frame, to which the sail unit or section is fastened by cords 18 passing through eyes in the sail unit and around the bars, allowing the section to be removed when rent or rendered useless. This feature of construction with respect to the plane covering possesses the advantage of permitting repairs to be made to any portion of the sail surface in case of accident without removing the entire covering, and in addition thereto, it enables the character of the covering to be changed when conditions may render it desirable or prudent to substitute a sail or covering of one quality for one of a different quality, as for example where a heavier and stronger quality of fabric would be more serviceable

or contribute to greater safety in the exposure of the machine to strong winds than a lighter quality of fabric; and, also, this dividing of the sail surface permits escape of the air under excessive pressure and thereby relieve the plane.

It should be mentioned that the sail units of the aeroplanes of this invention are not restricted to any special dimensions, and are regulated in that respect only by the size of the open spaces between the bars of the frame-work.

I claim:—

A flying machine including two aeroplanes one situated over and in advance of the other and of such dimensions respectively that the forward end of the upper

plane projects over the lower plane and the rear end of the lower plane extends beyond the corresponding end of the upper plane, a body beneath the lower plane, and propelling means thereon comprising a suspended turn-table rotatable in one plane, and movable by virtue of its suspending means in an arc perpendicular to the plane of rotation, a motor and a propeller mounted on the said turn-table.

GRACE L. LEVINS,
Administratrix of the estate of Peter Levins, deceased.

Witnesses:

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M. REGNER.