

1,039,457.

3 SHEETS-SHEET 1.



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T. N. SMITH.
FLYING MACHINE.
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Patented Sept. 24, 1912.

3 SHEETS—SHEET 2.

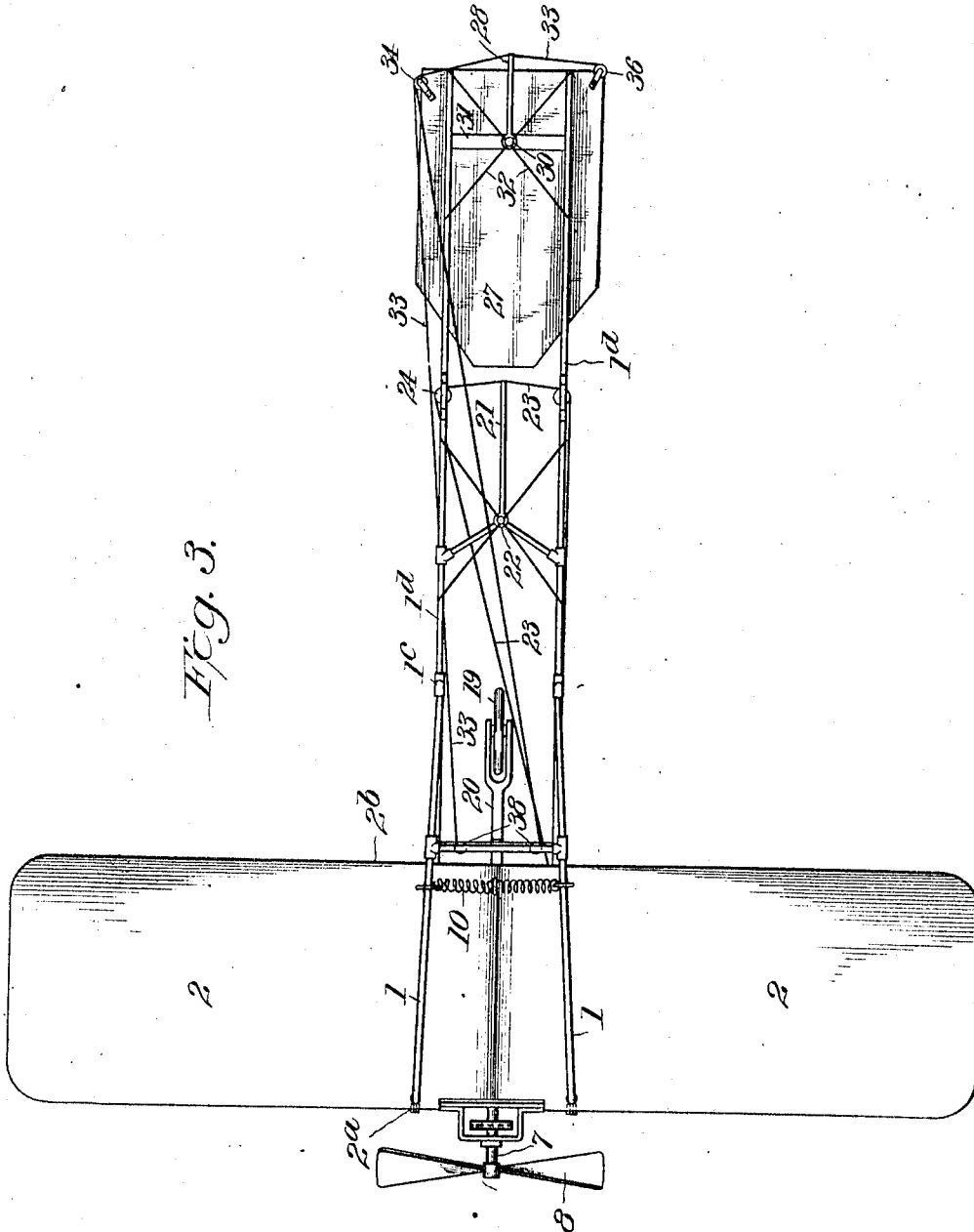


Fig. 3.

Witnesses

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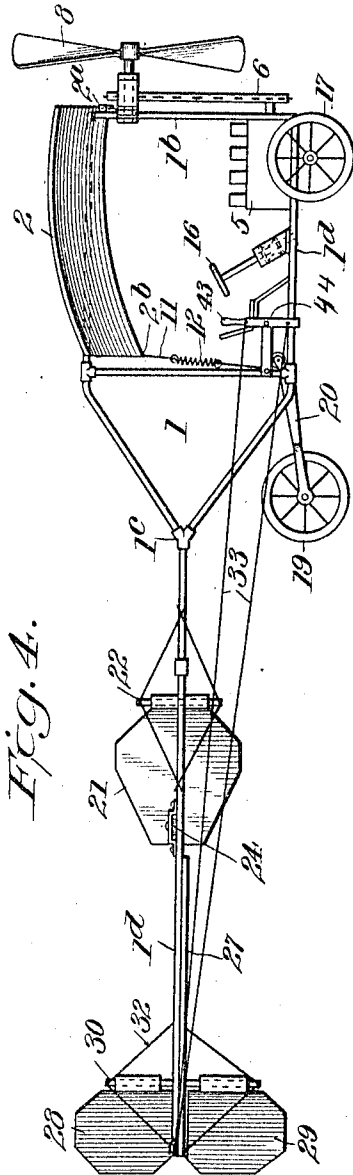


Fig. 4.

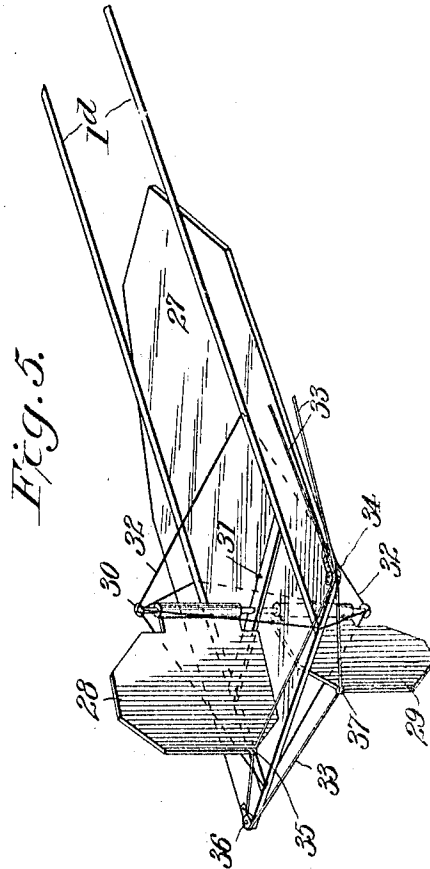


Fig. 5.

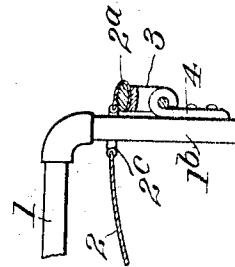


Fig. 6.

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UNITED STATES PATENT OFFICE.

THOMAS NOAH SMITH, OF SAN ANGELO, TEXAS.

FLYING-MACHINE.

1,039,457.

Specification of Letters Patent.

Patented Sept. 24, 1912.

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To all whom it may concern:

Be it known that I, THOMAS NOAH SMITH, a citizen of the United States, residing at San Angelo, in the county of Tom Green and State of Texas, have invented certain new and useful Improvements in Flying-Machines, of which the following is a specification.

My invention relates to flying machines, and more particularly to that type known as "heavier-than-air" machines, in which a car or body containing the motive power, and provided with propelling devices driven thereby, is sustained and controlled in its flight wholly by means of aeroplanes.

One object of the invention is to provide a machine of the monoplane type which shall possess great stability, and which may be controlled with certainty.

Another object is to provide improved and simplified means for guiding the machine, such means comprising mechanism for moving the main supporting plane itself.

A further and important object of the invention is to provide means for preserving the machine on an even keel, such means comprising leveling devices automatically brought into operation by the tipping of the machine.

With the above and other objects in view and to improve generally upon the construction of such machines, my invention consists in the construction and arrangement of parts hereinafter described and illustrated in the accompanying drawing, in which,

Figure 1 is a side elevation of my complete machine. Fig. 2 is a transverse section, on an enlarged scale, substantially on the line 2-2 of Fig. 1 looking in the direction of the arrow; Fig. 3 is a plan view of the machine; Fig. 4 is a side elevation of the opposite side of the machine from that shown in Fig. 1, illustrating a different method of operating the leveling planes; Fig. 5 is a detail perspective view on an enlarged scale of the leveling planes located at the rear of the machine and hereinafter described; and, Fig. 6 is a detail view, partly in section, showing the method of attaching the main plane to the frame.

Referring to the drawings in detail, reference character 1 designates the frame of my machine, which may be made of hollow tubing or other suitable material. As shown, the frame comprises a bottom por-

tion 1^a, uprights 1^b connecting such portion with the upper part of the frame, and two rearwardly extending horizontal members 1^c, joined to the front part of the frame as at 1^d. The main lifting or supporting plane is indicated by the character 2 and, as shown in Fig. 2, it projects a suitable distance on each side of the frame, extending upwardly and outwardly from the center. Also, as shown in Fig. 1, this plane is curved or concave transversely in the direction of flight, to give it the necessary lifting power. The front edge 2^a of this plane is rigidly supported by the frame and is pivotally connected thereto, as illustrated in Fig. 6, such pivotal connection comprising hinge members 3, 4, secured to the edge 2^a of the plane and to the vertical post 1^b of the frame, respectively. The plane may be provided with eyelets 2^c through which pass the vertical posts 1^b of the frame. While I have shown, in this figure, the above described method of attaching the plane to the frame, it will be understood that other details of construction may, if desired, be employed, the main point being that a pivotal connection is provided.

Supported by the part 1^a of the frame, immediately below the main plane 2, is the motor 5, which, as shown, may consist of a multiple cylinder internal combustion engine. This motor is geared, as by means of a sprocket chain 6 to a shaft 7, journaled in a bracket secured to the upper part of the frame, to the forward end of which shaft is attached a propeller 8. Under the plane 2 is also arranged an operator's seat 9.

The rear edge 2^b of the main plane is resiliently supported from the frame 1 by means of springs 10. These springs are attached at one end to the frame and at the other end to the plane adjacent its rear edge, in such a manner that the rear part of the plane is suspended by these springs. Although I have shown two springs in the drawing it will be understood that they may be replaced by a single spring or by any suitable number, as may be desired. Extending downwardly from the rear edge of the plane 2 and secured thereto at a point adjacent the point of attachment of the springs 10, is a cable or flexible connection 11 which extends around a pulley 13, and thence to a winding drum 14 mounted on a shaft 15, provided with a hand wheel 16,

and so located as to be readily accessible from the operator's seat. Included in the flexible connection 11 between the plane and the winding drum is a spring 12 which acts in opposition to, and serves to balance the pull of the springs 10.

The machine is preferably mounted on wheels to permit of it getting up the necessary speed before leaving the ground. As shown in the drawing I have provided at the front of the machine a pair of wheels 17 mounted on an axle 18 suitably journaled in the frame and, at the rear of the machine, a single centrally disposed wheel 19 journaled at the end of a bracket 20.

For guiding the machine so as to cause it to turn to one side or the other, I provide a vertically disposed rudder 21. This is mounted as at 22 on a pivot supported by means of suitable brackets between the rearwardly extending parallel members 1^a. In order to move this rudder as may be necessary it is connected to a cable 23 which passes around pulleys 24 at opposite sides thereof, and has its two ends connected to a hand lever 25 above and below the pivot pin 26 thereof, such hand lever being located in a position to be readily grasped by the operator. At the extreme rear of the machine, and also supported by the parallel members 1^a of the frame, I provide a small horizontal steadying plane 27, the function of which will be apparent.

In order to correct any tendency which the machine may have to tip or tilt to one side or the other and to preserve it on an even keel, I provide leveling planes 28 and 29, particularly shown in Fig. 5. By reference to this figure it will be seen that these planes are vertically disposed and are located above and below the plane 27, being mounted on a vertical rod or shaft 30 braced in the middle as by means of a cross bar 31, and at each end by means of suitable stays 32. Other details of construction may be employed if found more desirable. A cable 33 passes around a pulley 34 at one side of the machine and thence, after being secured to the rear edge of the plane 28, as at 35, around another pulley 36 at the opposite side of the machine, thence, after being secured to the rear edge of plane 29 as at 37, around pulley 34 again. It will thus be seen that when the cable 33 is moved it will serve to swing the planes 28 and 29, simultaneously in opposite directions, the plane 28 moving to the left and the plane 29 moving to the right as shown in Fig. 5, or vice versa. The two ends of the cable 33 are led forwardly over the machine and after passing around pulleys 38, are both secured to the upper end of a lever 39. This lever is pivoted at 40 to a cross bar 41 which also serves to support the pulleys 38, and carries at its lower end a weight 42. It will, there-

fore, be apparent that the arrangement just described is in the nature of a pendulum, and that, when the machine tips to one side or the other, the weighted lever 39 will correspondingly swing on its pivot and thus move the cable 33 one way or the other, thereby rocking the planes 28 and 29 as above described. These planes when moved to a position such as indicated in Fig. 5 react with the air in such a manner that they tend to correct or oppose the tendency of the machine to tilt. It is obvious that the effect of the air on the planes above and below the plane 27 will be equal and opposite, and that the reaction will constitute a couple which will tend to turn the machine about a horizontal axis.

As shown in Fig. 4, I may, if desired, dispense with the automatic mechanism for operating the leveling planes and operate them manually by means of a lever 43 pivoted at 44 to a support within reach of the operator, to which lever the ends of the cable 33 are secured on opposite sides of the pivot. The control of the machine as regards ascending or descending is effected wholly by manipulation of the main plane 2. It will be seen that by winding the cable 11 more or less upon the drum 14, the rear edge of the plane may be lowered, and when the cable is released, the springs 10 will raise the plane again. Thus the inclination or angular position of the plane relative to the frame may be changed as desired and its lifting power varied accordingly. I regard the supporting of the rear edge of the main plane on springs arranged both above and below the same as an important feature, since it imparts a resiliency to the machine and induces steadier flying qualities. In other words, every fluctuation in wind pressure on the plane is not transmitted to the frame of the machine but is taken up in the springs, in the same manner that vibrations caused by irregularities in a road bed over which a vehicle is passing is absorbed by the vehicle springs.

It will thus be seen that I have provided a very simple and practical form of machine embodying a single supporting plane and automatically operated leveling means therefor, and it is thought the numerous advantages of my invention will be readily appreciated by those skilled in the art.

What I claim is:—

1. In a flying machine, a frame extended longitudinally in the direction of flight, a fixed steadying plane or tail rigidly secured to the rear end of said frame, and a main supporting plane pivoted at its front edge to the forward end of said frame, a spring extending upwardly from the rear edge of said main plane to a part of the frame and serving to support said plane, a second spring extending downwardly from the rear

edge of said plane and connected with a part of said frame, and means for adjusting the tension of the latter of said springs, whereby the angular relation of said plane and frame may be varied.

2. In a flying machine, a frame extended longitudinally in the direction of flight, a main supporting plane attached to said frame at the forward end thereof, a horizontal steadying plane or tail secured to the rear end of said frame, a vertically arranged rudder pivoted to said frame intermediate said main plane and tail, a pair of vertically disposed balancing planes pivoted about a common axis, one above and one below said tail, said rudder and balancing planes all lying normally in the same vertical plane parallel with the line of flight, and means for simultaneously turning said balancing planes about their common axis in opposite directions.

3. In a flying machine, a substantially

horizontal single main supporting plane, a frame to which said plane is attached, a motor and operator's seat carried by said frame immediately beneath said plane, a framework extending rearwardly from the main frame, a pair of vertically disposed leveling planes pivoted about a common axis at their forward edge to said framework, said leveling planes normally lying in the same vertical plane, such plane passing through the center of gravity of the machine, means for simultaneously swinging said leveling planes on their pivots in opposite directions, and a fixed horizontal plane extending between said vertical leveling planes.

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

THOMAS NOAH SMITH.

Witnesses:

PENROSE N. IORES,
JOE R. WRIGHT.

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