F. L. SCHAUFLER.

FLYING MACHINE.

APPLICATION FILED FEB. 2, 1911.

1,037,800.

Patented Sept. 3, 1912.

5 SHEETS—SHEET 1.

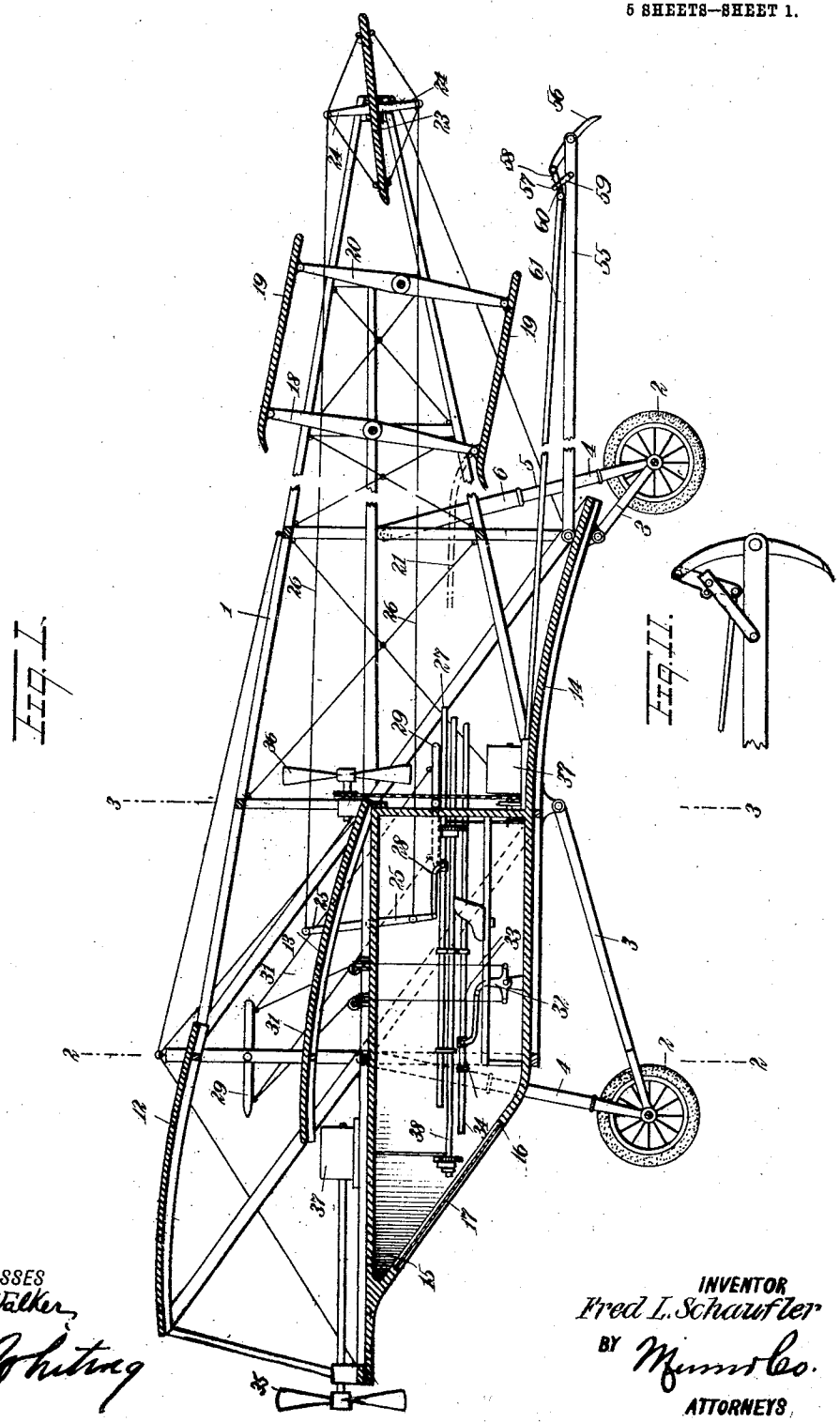

Fig. I.

Fig. II.

WITNESSES

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5 SHEETS—SHEET 2.

Fig. 2.

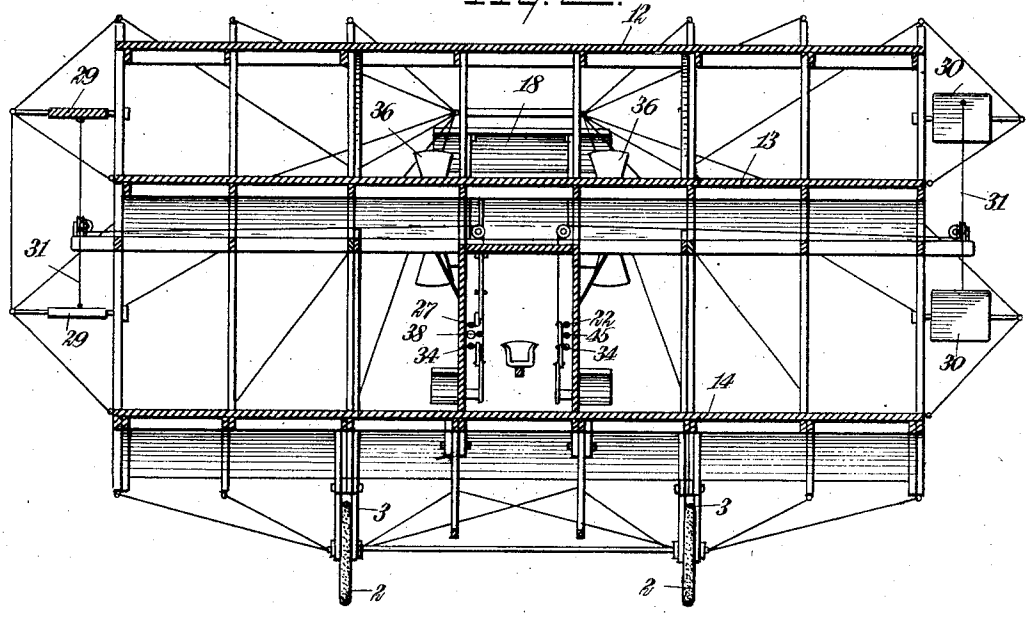
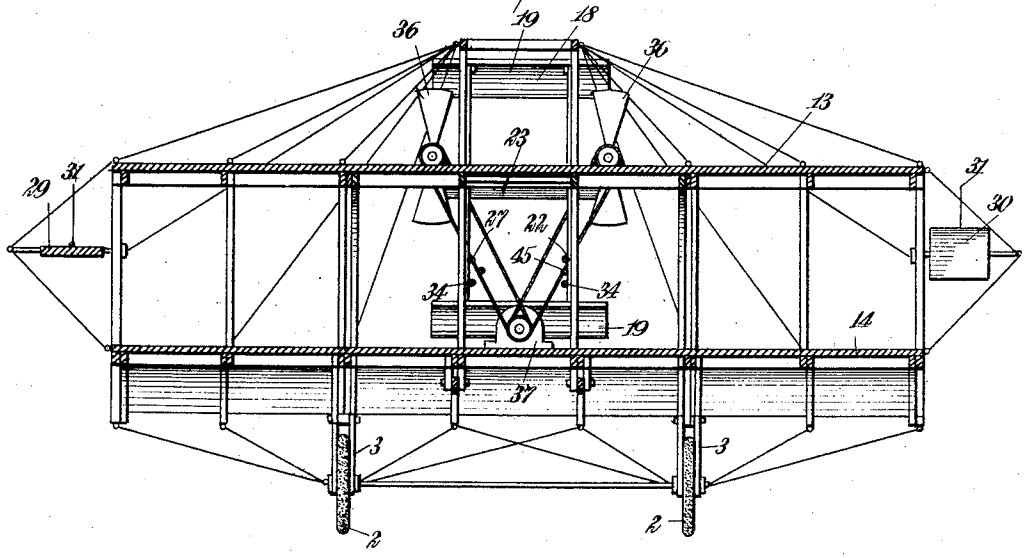


Fig. 3.



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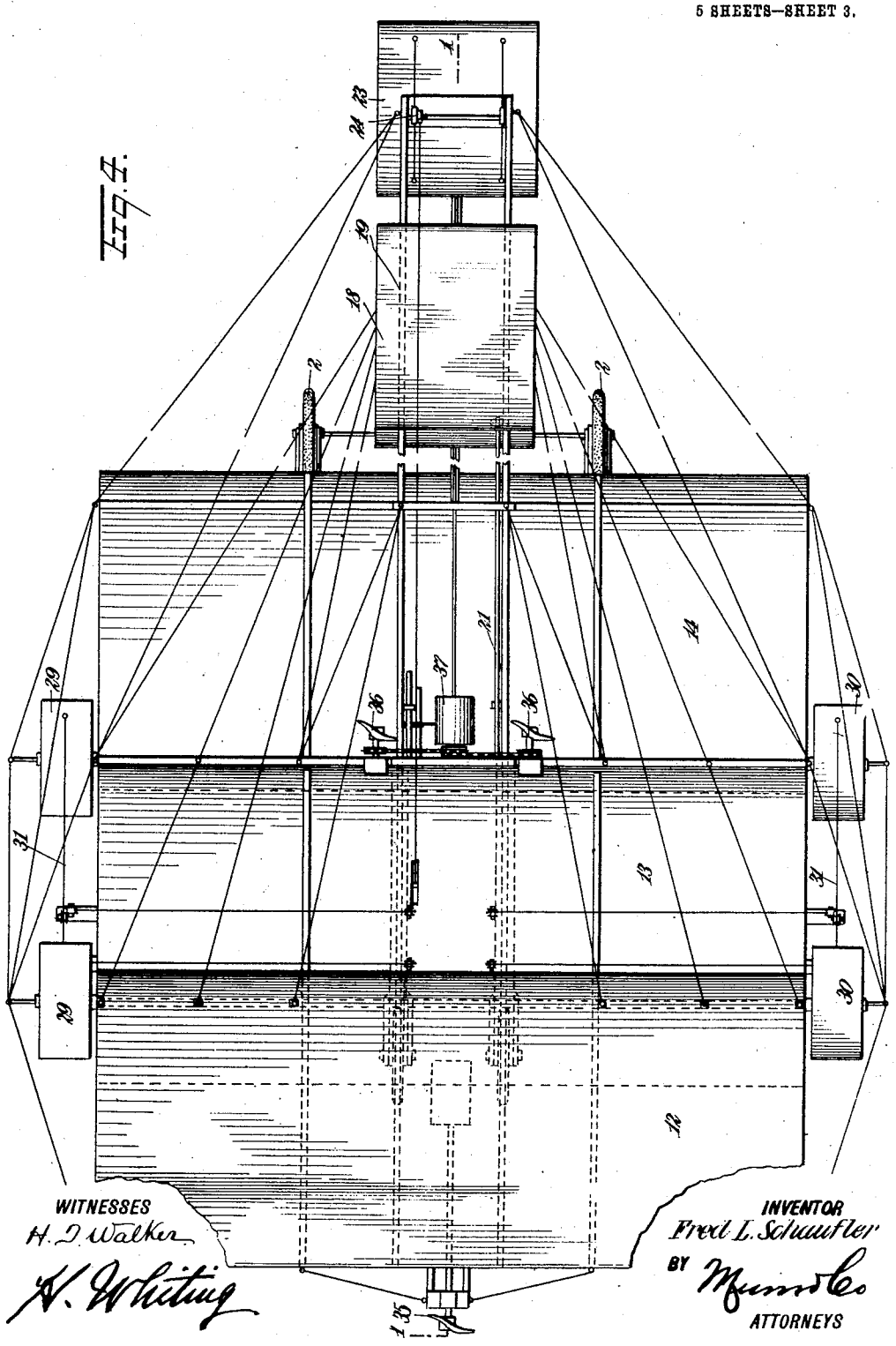
5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

Fig. 5.

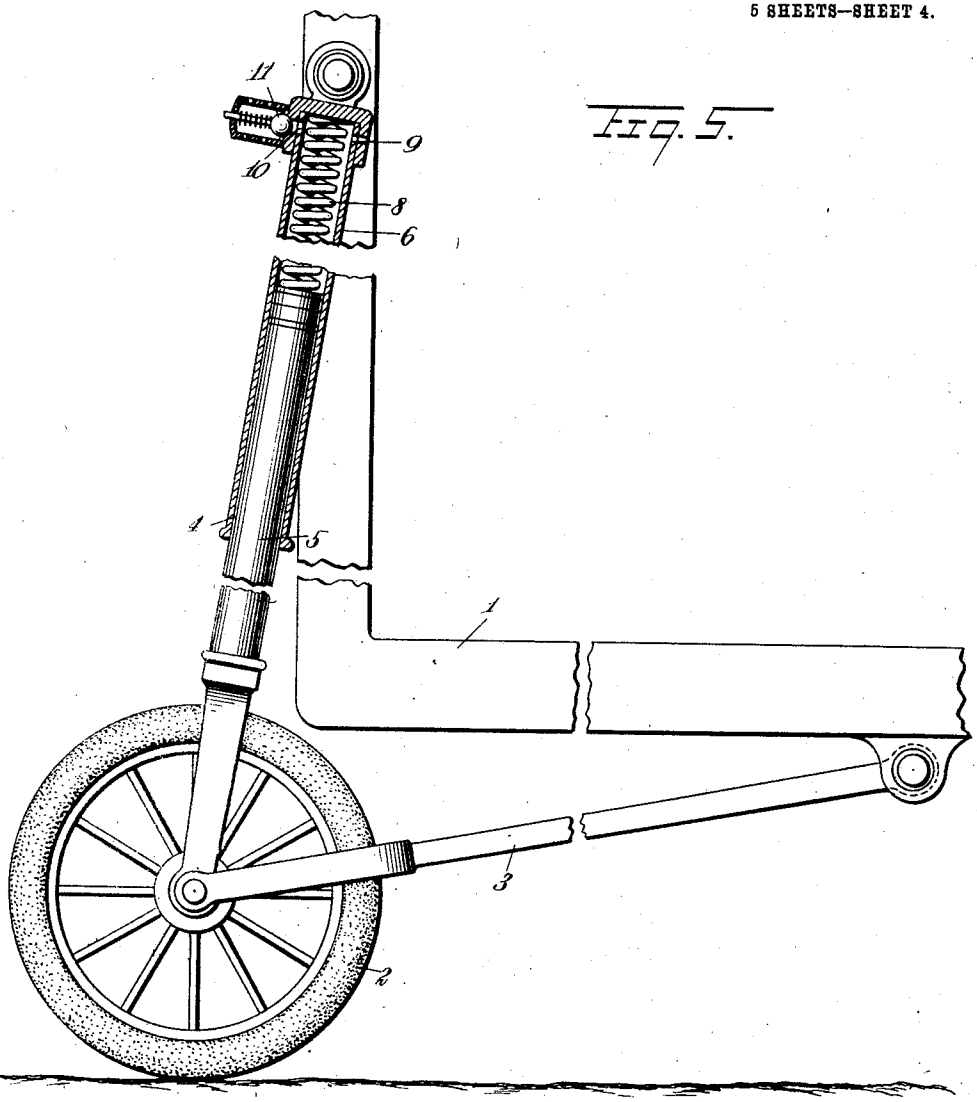
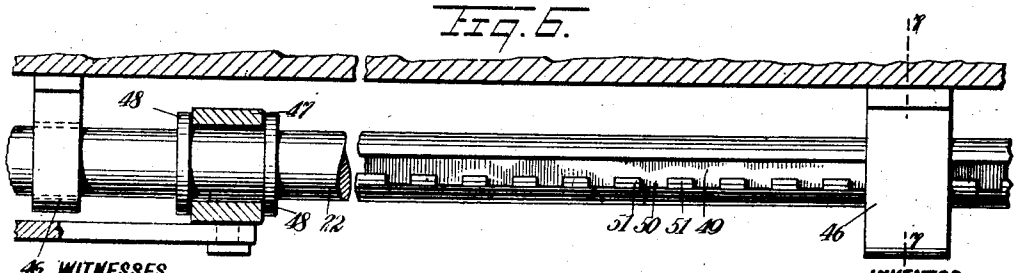


Fig. 6.



WITNESSES

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5 SHEETS—SHEET 5.

Fig. 7.

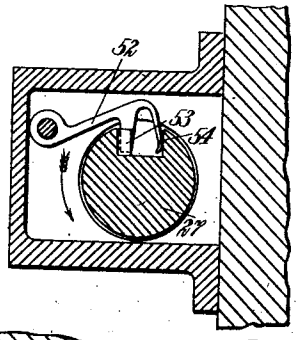
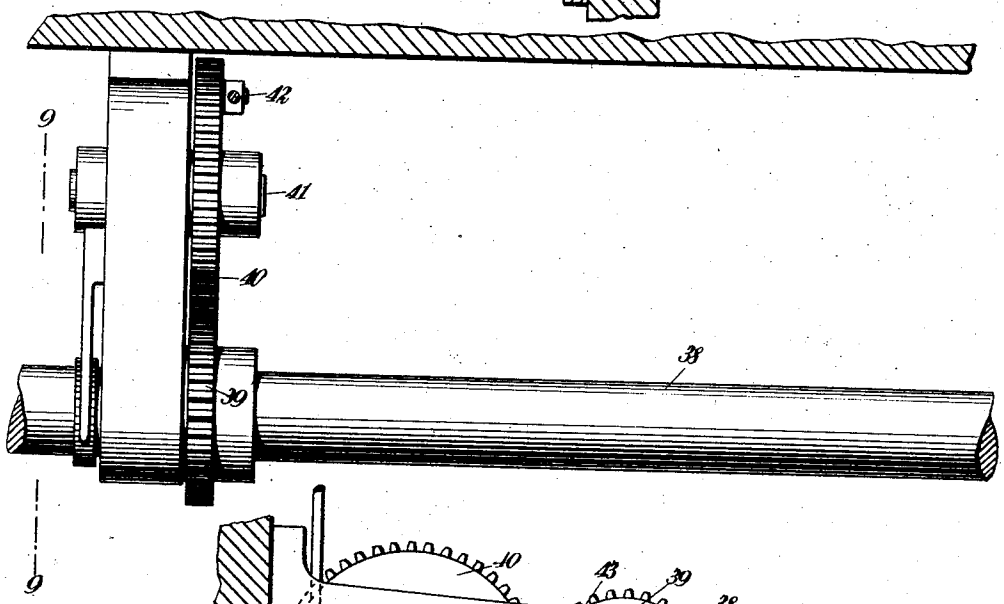


Fig. 8.



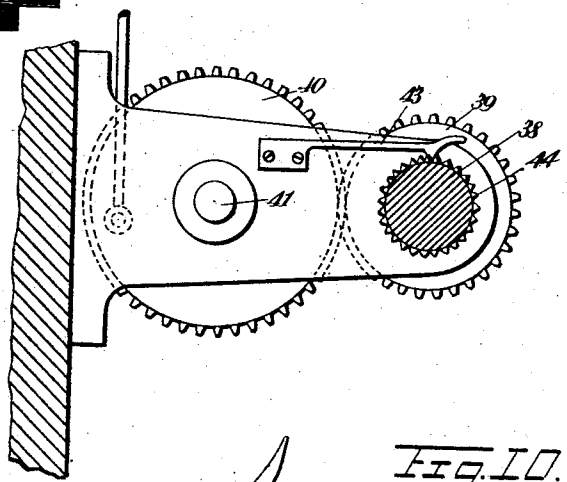
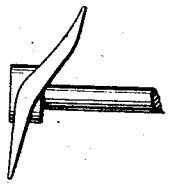


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

FRED LOUIS SCHAUFLER, OF MATTOON, ILLINOIS, ASSIGNOR TO NATIONAL AERIAL NAVIGATION & EQUIPMENT CO., OF CULLMAN, ALABAMA, A CORPORATION.

FLYING-MACHINE.

1,037,800. Specification of Letters Patent. Patented Sept. 3, 1912.

Application filed February 2, 1911. Serial No. 606,114.

To all whom it may concern:

Be it known that I, FRED L. SCHAUFLER, a citizen of the United States, and a resident of Mattoon, in the county of Coles and State of Illinois, have invented a new and Improved Flying-Machine, of which the following is a full, clear, and exact description.

This invention relates to a new and improved flying machine of the heavier-than-air type commonly known as aeroplanes.

An object of this invention is to provide a flying machine with a plurality of superposed planes offset relative to each other, so as to offer a more stable and better supported machine.

Another object of this invention is to provide a flying machine with a balancing member having one or more planes whereby the supporting surface of the flying machine, as a whole, may be controlled, with an elevating plane for controlling the vertical movement of the flying machine.

A further object of this invention is to provide a flying machine with an automatic shock-absorber for minimizing the jar due to alighting from a flight in the air.

A further object of this invention is to provide an anchor, whereby the flying machine may be held from movement, even after the propellers are started, which can be released so as to suddenly launch the flying machine in flight.

A still further object of this invention is to provide a flying machine with a cabin, having means for controlling the various steering, balancing and equilibrium planes and the engine, from the cabin, so that the operator can manipulate the same in any position in which he may happen to be.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—Figure 1 is a vertical longitudinal section; Fig. 2 is a vertical transverse section on the line 2—2 of Fig. 1; Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1; Fig. 4 is a top plan adjusted position; Fig. 7 is an enlarged section showing the action of one of the shock-absorbers; Fig. 6 is an enlarged view, showing the means for adjusting the various movable planes and locking them in their adjusted position; Fig. 7 is an enlarged section showing a detail of the lock for the mechanism shown in Fig. 6; Fig. 8 is a fragmentary view showing the means for controlling the sparker of the engine; Fig. 9 is a fragmentary section on the line 9—9 of Fig. 8; Fig. 10 is a fragmentary detail view of the special type of propeller; and Fig. 11 is a detail view of the anchor.

Referring more particularly to the separate parts of this invention as embodied in the form shown in the drawings, 1 indicates a suitable framework, which may be of any suitable light, strong structure and material, and may be supported so as to travel on the ground, by suitable wheels 2.

In order that the flying machine may not be unduly jarred in alighting from a flight, and further, for the purpose of adding to the safety in alighting, the connection between the wheels 2 and the frame 1 is preferably of a resilient and automatic character, so as to absorb the shock. For this purpose, each wheel may be pivotally connected to the frame by means of a pair of arms 3 and 4, which are hinged to the frame 1 in any suitable manner. The arms 4 preferably consist of telescoping members 5 and 6, the former sliding within the latter and being resiliently held from movement relative thereto in any suitable manner, as by means of a spring 8 located within the member 6. The member 5 preferably forms a piston-tight joint with the member 6, so as to prevent the air from passing between them. This feature is taken advantage of to prevent the sudden rebound of the member 5 relative to the member 6, due to the sudden compression of the spring 8, by permitting air to enter into the chamber above the piston member 5 through a comparatively small passage 9, and permitting it to exit from the chamber in the member 6 through a comparatively large passage 10, which is normally closed by a spring-pressed valve 11, so as to automatically close under all conditions except when the air is compressed within the chamber formed in the member 6. It will thus be seen that the shock due to alighting is absorbed almost entirely by the spring 8, and the valve 11 yielding sufficiently to allow air in the chamber occupied by the spring to

pass out through the comparatively large passage 10. However, as soon as the member 5 starts to shoot out under the action of the spring 8, the valve 11 closes the passage 10, and air can only enter the chamber above the piston member 5, through the small passage 9, so that the outward movement of the member 5 will be comparatively slow, thus preventing any dangerous rebound after alighting.

The frame 1 may be provided with a plurality of main planes 12, 13 and 14, which are superposed relative to each other, the upper planes being offset forwardly relative to the lower planes, whereby the stability and supporting surface of the flying machine is increased.

A cabin 15 may be provided intermediate any two of the supporting planes, preferably between the two lower planes, and this cabin itself may have an inclined front 16, so as to aid in the supporting of the flying machine in air. The front 16 may also be provided with a transparent member 17, whereby the operator within the cabin can see the direction in which he is going, and yet be protected from the cold winds.

For the purpose of balancing the flying machine in the fore and aft directions, and to a certain extent control its effective horizontally-projecting area, there is provided a balancer 18, which is provided with a plurality of planes 19, pivotally secured in parallel spaced relation to a frame 20, which comprises rods pivotally secured to a rearwardly-extending portion of the main frame 1. This balancer may be operated so as to vary the relative superposed relation of the planes 19, by means of a pitman 21 (see Figs. 1 and 4), which extends to a rod 22 extending through the cabin 15, so that the operator can have access thereto, no matter in what portion of the cabin he may be located. It will be seen that this varies the location of the supporting area at the rear, and effects thereby the balancing of the machine. Thus the operator, by manipulating the balancer, may compensate for his movements in the cabin, and may maintain the machine in proper position in accordance with both his position in the cabin and the presence or absence of forceful air currents and, in fact, any other conditions tending to destroy equilibrium, either by an increase or decrease in the resistance offered the supporting planes and cabin or otherwise.

For the purpose of controlling the up-and-down directional movement of the flying machine, there is provided an elevator 23, which may be of any suitable form, but preferably consists of a plane pivotally supported on the frame 1, preferably adjacent the rear thereof, and capable of swinging about its transverse horizontal axis, so as to offer either a downwardly-inclined or an upwardly-inclined surface to the air through which the flying machine is rushing. For the purpose of controlling this plane, there are provided arms 24, extending to opposite sides thereof, which may be braced in any suitable manner to the plane, and are connected to a lever 25 by any suitable means, such as flexible connections 26, on opposite sides of the pivot thereof. The lever 25 is connected to a collar in any suitable manner, as by means of a link 28 on an operating rod 27, extending through the cabin so as to be accessible to the operator at any point in the cabin.

In order to control the transverse equilibrium of the flying machine, and to aid in steering to the right or left, there are provided two sets of equilibrium planes 29 and 30, comprising vertically-spaced planes pivotally connected to the frame 1, so as to tilt about a horizontal axis, and suitably braced on the frame. These planes are preferably connected in superposed pairs, so as to move simultaneously in the same direction, by means of suitable connections, such as the flexible connections 31. Inasmuch as the planes 12 to 14 are offset with respect to each other, it is considered advisable to have the equilibrium planes in each set offset relative to each other also. Each set of equilibrium planes may be controlled by means of a double bell crank lever 32, two arms of which are connected to opposite sides of the pivot of one of the equilibrium planes, by any suitable means, such as flexible connections 33, and the other arm of which is connected in any suitable manner to a collar on a rod 34, also extending through the cabin. Of course, there is one of these rods for each set of equilibrium planes, that is to say, there are two rods extending through the cabin in such a position that they will be accessible in any part thereof.

The flying machine may be driven in any suitable manner, as by means of propellers 35 and 36, the former of which, 35, is shown as located at the extreme front of the flying machine, and the latter, 36, are located adjacent the rear of the cabin of the flying machine. These propellers may be of the peculiar structure shown in Fig. 10, where it will be seen that one half of each blade of the propeller has a suitable pitch, and the other half has preferably no pitch, but rotates in substantially the same plane, so as to create no propelling force, but generates a gyratory equilibrating force, tending to steady the flying machine. These propellers may be driven by the same or individual motors 37 of any suitable character, such as gasolene engines. In order to control these engines, there is provided a rod 38, which extends through the cabin, and is connected

to the sparker of the engine by a particular arrangement, more clearly shown in Figs. 8 and 9.

The rod 38 is rotatably supported in suitable bearings, and is provided with a gear 39, which is adapted to mesh with a gear 40 on a stub shaft 41. The gear 40 has secured thereto a pitman 42, connected to the sparker of the engine in any suitable manner. It will thus be seen by rotating the rod 38, that the advancement of the sparker can be controlled. The rod 38 may be locked in any adjusted position of rotation against accidental movement, by means of a spring pawl 43, which engages a ratchet wheel 44 on the rod 38, the connection being such that the pawl 43 will yield to a forced rotation of the rod 38 in either direction, but will hold the same against accidental rotation. Besides the rods previously mentioned, in the cabin, there is also a rod 45, which is adapted to control the supply of explosive mixture to the engine, and may be connected thereto in any suitable manner. The rods for controlling the various movable planes, which have been designated by the numerals 22, 27 and 34, are slidingly mounted in the cabin 15 in any suitable manner, so as to move in the direction of their length. A particular means is used so that these rods can be locked in any position of adjustment, and can be operated from any point in the cabin, or even if desired, outside of the cabin. This particular arrangement will be seen by reference to Figs. 6 and 7, where one of the rods, such as the rod 22, is shown. Here, it will be seen that the rod is rotatably and slidingly mounted in suitable bearings 46, and is provided with a collar 47, loosely mounted thereon, but prevented from lengthwise movement relative to the rod by means of fixed collars 48. In each instance, this loose collar 47 is used to operate the particular connection to the particular plane or planes which the rod controls. The rod is provided with a groove 49, extending longitudinally thereof, with recesses 50 communicating with the groove and forming therebetween a series of teeth 51. These recesses are adapted to be engaged by a lock 52, more clearly shown in Fig. 7, which is provided with a rigid tooth 53 and a spring tooth 54. Under normal conditions, the spring tooth 54 is adapted to force the rigid tooth 53 into one of the recesses 50, between juxtaposed teeth 51, so that the rod is locked against endwise movement. It will be seen, however, that by rotating the rod in the direction of the arrow in Fig. 7, the spring tooth 54 will be compressed, permitting the rod to rotate to such a position that the rigid tooth 53 will be in the slot 59, so that the rod can be moved lengthwise to adjust the planes to any desired position. As soon as the rod is released, however, the spring tooth 54 will rotate the rod, so as to force the rigid tooth 53 into one of the recesses 50, thus locking the rod in its adjusted position.

It is often desirable to start the propellers and warm up the engine before it is desired to start the flight. In such an event, it is usually necessary to have a number of men to hold the flying machine. In this invention, an anchor has been devised which will securely hold the flying machine during such preliminary operations, without danger of its running away, and which can be readily released at the desired moment. This anchor is more clearly shown in Figs. 1 and 11. It will be seen that there is provided an extension support 55, on which is pivotally secured intermediate its ends a fluke 56, which is adapted to be locked in its anchoring position by means of a toggle 57, comprising links 58 and 59, which are adapted to pass slightly beyond their dead center when the fluke is in its anchoring position, and prevented from further motion in this position by means of a lug 60, so that the fluke will securely anchor the flying machine until the toggle links are sprung to the opposite direction, as shown in Fig. 1. One of the links 58 is provided with an extension, to which is secured a connection 61, extending into the cabin, whereby the toggle joint can be pulled to the position illustrated in Fig. 1, when the fluke will be released from its anchoring position, permitting the flying machine to travel under the force of its propelling mechanism.

It will thus be seen that there is provided a simple and efficient flying machine, which can be securely anchored until it is desired to fly, and when once in flight, can be readily controlled by the operator, no matter what his position in the flying machine. The controlling planes can be locked in any adjusted position, automatically, as above described. The peculiar arrangement of the supporting planes will render the effective supporting area of the flying machine greater, and aid in the stability of the same. In alighting, the peculiar shock-absorbing connection of the wheels to the flying machine will prevent any damage, and lessen the jar, to an appreciable extent.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof, but desire to be protected in various changes, alterations and modifications which may come within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a flying machine, the combination with a frame, of one or more supporting planes on said frame, a movable plane on said frame, a rod operatively connected to

said movable plane, said rod having a considerable length, whereby it can be operated from a plurality of points, and automatic locking means for automatically securing said rod and said movable plane in any adjusted position.

2. In a flying machine, the combination with a frame, of one or more supporting planes on said frame, a movable plane on said frame, a rotatable and slidingly-mounted rod operatively connected to said movable plane so as to operate the same, said rod having a considerable length, whereby it may be operated from a plurality of points, and an automatic lock adapted to be operated by the rotation of said rod, and adapted to automatically lock said rod in any position of adjustment.

3. In a flying machine, the combination with a frame, of one or more supporting planes on said frame, a movable plane on said frame, a rotatable and slidingly-mounted rod operatively connected to said movable plane so as to operate the same, said rod having a considerable length, whereby it may be operated from a plurality of points, said rod having a groove extending longitudinally thereof, with recesses extending into said groove to form teeth therebetween, and a pawl adapted to automatically engage said recesses to lock said rod in any position of adjustment, and adapted to be moved out of said recesses by the rotation of said rod.

4. In a flying machine, the combination with a frame, of one or more supporting planes on said frame, a balancer mounted adjacent the rear of said frame and comprising a plurality of parallel planes connected to arms in parallel spaced relation, said arms being pivotally connected with said frame, an elevator, comprising a plane pivotally connected to said frame, equilibrium planes mounted on said frame and adapted to control the transverse equilibrium of said flying machine, a cabin mounted on said frame, and means for controlling said equilibrium planes, said balancer and said elevator from any point in said cabin.

5. In a flying machine, the combination with a frame, of one or more supporting planes on said frame, a pair of equilibrium planes pivotally mounted on each side of said frame, said equilibrium planes being operatively connected in pairs so as to act in unison, the uppermost of said equilibrium planes being longitudinally offset relative to the lowermost, and means for operating said equilibrium planes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRED LOUIS SCHAUFLER.

Witnesses:
JACOB STUMP, Jr.,
NAOMI V. BAILEY.