

Feb. 26, 1924.

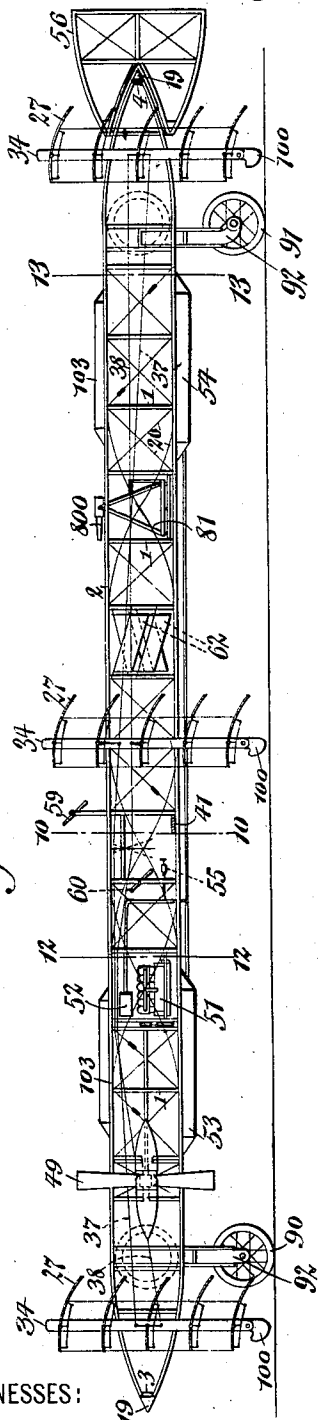
1,485,349

G. F. MYERS

AIRCRAFT

Original Filed Aug. 23, 1909 2 Sheets-Sheet 1

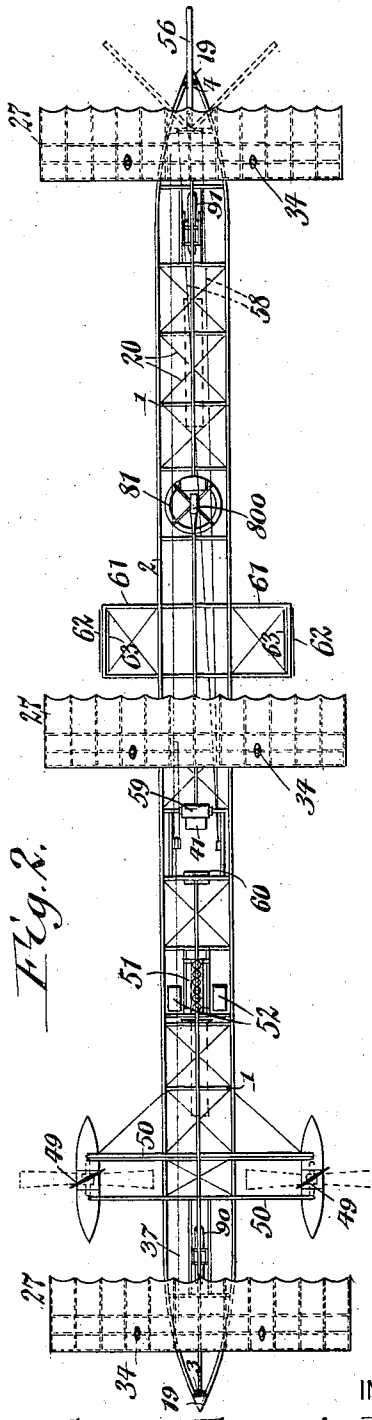
Fig. 1.



WITNESSES:

John H. Shoemaker
Walter H. Popp.

Fig. 2.



INVENTOR

George Francis Myers,

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ATTORNEYS.

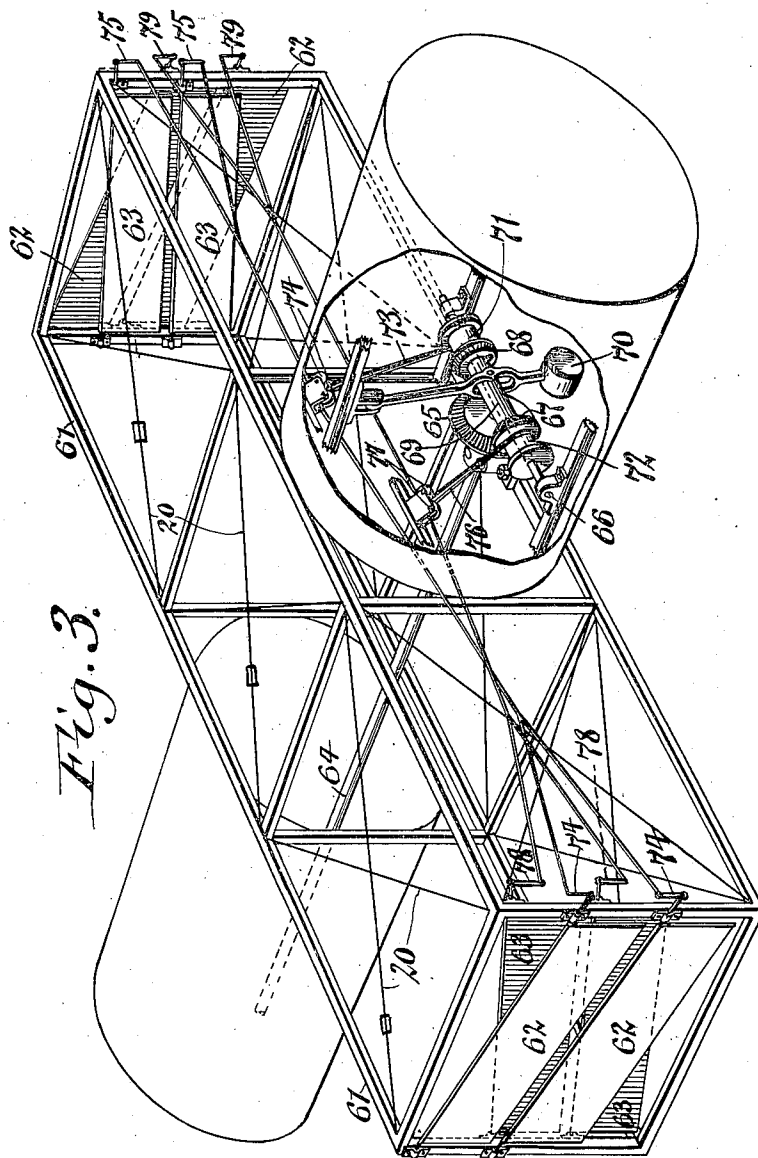
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UNITED STATES PATENT OFFICE.

GEORGE FRANCIS MYERS, OF NEW YORK, N. Y.

AIRCRAFT.

Application filed August 23, 1909, Serial No. 514,165. Renewed February 13, 1920. Serial No. 358,434.

To all whom it may concern:

Be it known that I, GEORGE FRANCIS MYERS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Aircraft, of which the following is a specification.

This invention relates to a flying machine and has the object to provide improved means for stabilizing the machine, and to improve the machine in several details of construction.

In the accompanying drawings, Figure 1 is a side elevation of a flying machine embodying my improvements. Figure 2 is a top plan view thereof. Figure 3 is a fragmentary perspective view showing the stabilizing means.

Similar characters of reference indicate corresponding parts throughout the several views.

The construction of the aircraft is substantially and preferably as follows:

The main frame or body of the machine has the general form of a hollow or tubular horizontal cylindrical body which is provided with conical front and rear ends and comprises a plurality of transverse circular girders 1 arranged axially in line, a plurality of longitudinal girders 2 connecting the several circular girders at different parts of their peripheries, and front and rear heads 3, 4 with which the front and rear ends, respectively, of the longitudinal girders are connected.

In order to complete the conical formation at each end of the frame a conical nose or nose piece 19 of sheet metal or other suitable material is secured with its base to the outside of the flat head of the frame, as shown in Figures 1 and 2.

For the purpose of stiffening the girders of the frame, tension members, ties, guys or wires 20 are provided which extend diagonally or obliquely relatively to different parts of the frame in all available directions and which are secured at suitable points to the frame work, so as to rigidly connect different members of the frame and securely unite them.

If desired, a skin or covering may be applied to the outside of the frame to protect the parts within the frame, which covering may be transparent either wholly or in part to permit of looking either into the

frame or out of the frame without necessitating removal of the covering.

Near the front, rear ends and the center of the frame the same carries front, rear and central sets of planes 27,—whereby the machine is raised in the air. Each of these sets of planes contains two complete upper and two complete lower planes which extend transversely above and below the frame, and a divided intermediate plane the sections of which are arranged on opposite sides of the frame, on masts or uprights 34.

The operator is able to turn the planes of each set in one direction or the other for causing the machine either to rise or descend in the air by means of two cords or lines 37, 38 connected with diametrically opposite arms on the pivot rib of one or more of the planes and leading to the operator's compartment which is arranged near the center of the frame and provided on its bottom with a seat 41 for the operator.

In addition to tilting the planes at different angles the lifting effect of the same may be varied by flexing the front and rear edges of each plane downwardly and presenting a curved concave face or side to the wind.

49 represents a pair of propellers which move the machine forwardly and which are mounted on brackets 50 projecting laterally from opposite sides of the machine in rear of the foremost set of planes. The motor 51 for driving the propellers is preferably arranged within the main frame between the operator's compartment and the propellers and may be operatively connected with the latter in any suitable manner. This motor is preferably of the internal combustion or hydrocarbon type and its gasoline supply or liquid fuel tanks 52 are arranged above the same within the frame. Suspended from the underside of the main frame near opposite ends thereof are two gasoline storage tanks or reservoirs 53, 54 from which the gasoline may be withdrawn as required and delivered to the supply tanks 52 by means of a pump 55 in the operator's compartment. By this means the weight of the main supply of gasoline is distributed over the length of the main frame and prevents unbalancing the machine.

56 is the upright rudder for steering the machine which is pivoted vertically to the rear part of the main frame and bifurcated, so that it can straddle the conical rear end

of the frame or body, as shown in Figure 1. The pivot of the rudder is provided on diametrically opposite sides with arms 57, which are connected with cords 58 leading to the operator's compartment to permit the operator to turn the rudder as desired.

For the purpose of enabling the operator while seated in his compartment to observe the space ahead of the machine without necessitating turning his head toward either side of the machine two mirrors 59, 60 are employed one of which is mounted at an angle in the frame in the front part of the operator's compartment while the other is arranged on top of the frame, the angular relation of these mirrors being such that the scene in front of the machine will be reflected by the upper mirror 60 above the frame to the lower mirror within the frame and thus be visible to the operator while looking straight ahead, as shown. These mirrors are pivoted on supports carried by the main frame, so that the mirrors can be adjusted to various angles desired and may be held in position by making the pivotal joints sufficiently tight that the mirrors are held frictionally in their adjusted position.

One of the important problems to be solved, in aerial navigation, is that of the stability of the aerodyne, both as regards its longitudinal axis, and transversely; i. e., to keep it from pitching and rolling.

The means shown for maintaining stability of the machine while flying in the air are constructed as follows:—

61 represents lateral extensions of the main frame arranged in rear of the central set of planes. On the outer part of these frame extensions are mounted two sets of stabilizing planes or wings 62, 63 which are pivoted lengthwise of the machine and adapted to operate in opposite directions. The outer set 62 contains two planes which are arranged one above the other and are pivoted at their upper edges, so that their axes incline downwardly from their front ends toward their rear ends while the other inner set 63 contains two planes which are arranged one above the other and are pivoted at their upper edges, so that their axes incline upwardly from their front ends toward their rear ends.

Normally both sets of stabilizing planes are in a vertical pendent position and do not affect the flight of the machine. If the machine should turn downward abnormally at one side on that side of the body the outer planes 62 are turned outwardly, so that their undersides incline from their front ends downwardly to their rear ends whereby the wind acting against these sides tends to lift this side of the machine. If the machine should turn upward abnormally at one side on that side of the body the outer stabilizing planes would be lowered into a

pendent position and the inner stabilizing planes 63 would be turned inwardly, so that their upper sides would incline from their front ends upwardly toward their rear ends and thus cause the wind operating on the upper sides of these planes to depress this side of the machine.

These planes for stabilizing the craft may be operated either manually or automatically. In the drawings means are shown for automatically shifting the stabilizing plane to right the machine and comprise a longitudinal shaft 64 which may be driven by the motor 51 or otherwise and which is provided with a main driving bevel gear wheel 65. 66 is a transverse shaft capable of sliding transversely of the machine and provided with oppositely facing driven bevel gear pinions 67, 68 which are adapted to engage alternately with opposite sides of the main gear wheel 65. 69 is a shifting sleeve loosely mounted on the transverse shaft between said gear pinions. 70 is a pendulum or weighted lever pivoted at its upper end on the main frame to swing vertically crosswise of the body or frame and having its lower part pivotally connected with the shifting sleeve. 71, 72 are drums arranged on opposite ends of the transverse shaft, cords or lines 73 passing with their intermediate parts around guide pulleys or wheels 74 on the frame and wound at one end around the drum 71 in one direction while their opposite ends are connected with arms 74, 75, secured respectively to the downwardly inclined outer stabilizing planes on one side of the machine and the upwardly inclined inner stabilizing planes on the other side of the machine. 76 are cords or lines passing with their intermediate parts around guide pulleys or wheels 77 on the frame and wound at one end around the drum 72 while their opposite ends are connected with arms 78, 79 secured respectively to the upwardly inclined inner stabilizing planes on one side of the machine and the downwardly inclined outer stabilizing planes on the other side of the machine.

When the machine is flying on an even keel the pendulum is arranged in its central position and both bevel gear pinions are out of mesh with the main or master gear wheel. If, however, the machine careens or lists toward one side or the other, the movement of the pendulum in the same direction causes one of the gear pinions to be moved into mesh with the main gear wheel, so that one set of shifting cords are wound up on one drum and the other set of shifting cords are unwound from the other drum, whereby the outer downwardly inclined stabilizing planes on one side of the machine and the inner upwardly inclined planes on the opposite side of the machine

are turned laterally so as to present their flat operative sides to the action of the wind and thus cause the machine to be righted. When this occurs the action of the pendulum again disengages the active gear pinion from the main gear wheel thereby permitting the stabilizing planes which have just been active to again drop by gravity into their vertical inoperative position. When the machine careens or lists toward the opposite side the automatic shifting mechanism operates to turn the other stabilizing planes from their pendent inactive position into their lateral active position for righting the machine, the parts being again restored to their normal position after such righting has been effected in the manner described.

For use in warfare the flying machine is provided with a cannon 800 on rotatable carriage 81.

90, 91 represent wheels arranged below the front and rear parts, respectively, of the body, and each pivoted on the lower end of the lower vertically movable main slide 92.

In order to aid the front and rear wheels in supporting the machine and prevent the same from tipping sidewise auxiliary supporting means 100 are provided.

As my invention is in some of its aspects generic I do not limit myself to the particular construction shown or described, but also contemplate the employment of such equivalents as fairly fall within the scope of the claims.

Therefore it will be understood that various changes may be made in the form, proportion, size and detail of the several structures shown, the number and position of certain elements used, as well as the character of the motive power employed, without departing from the spirit of the invention.

I claim as my invention:

1. A flying machine comprising a body, a stabilizing plane connected with the said body by a pivot which inclines downwardly from its front end to its rear end lengthwise of the machine, and a stabilizing plane which inclines upwardly from its front end to its rear end lengthwise of the machine.

2. A flying machine comprising a body, a pair of stabilizing planes one connected with the said body by a pivot which inclines downwardly from its front end to its rear end lengthwise of the machine, and another one of which inclines upwardly from its front end to its rear end lengthwise of the machine a pair of the said stabilizers being mounted one on each side of the longitudinal center line of the machine.

3. A flying machine comprising a body, and two sets of stabilizing planes each set having a plane on one side of the said body

which has a longitudinal pivot inclining downwardly from its front end toward its rear end and a plane on the other side of the body which has a longitudinal pivot inclining upwardly from its front end toward its rear end the planes of both sets on the same side of the said body having their pivots inclined in opposite directions.

4. A flying machine comprising a body, a stabilizing plane connected with the said body by a pivot which inclines downwardly from its front end to its rear end lengthwise of the machine, a stabilizing plane which inclines upwardly from its front end to its rear end lengthwise of the machine, and means for moving either one or the other of the said planes from its vertical inactive to its laterally projecting active position relatively to the said pivots thereof.

5. A flying machine comprising a body, two sets of stabilizing planes, each set having a plane on one side of the body which has a longitudinal pivot inclining downwardly from its front end toward its rear end and a plane on the other side of the body which has a longitudinal pivot inclining upwardly from its front end toward its rear end, the planes of both sets on the same side of the said body having their pivots inclined in opposite directions, and means for shifting either set of the said stabilizing planes into operative position independently of the other set.

6. A flying machine comprising superposed aeroplanes, uprights connecting and spacing the same, and a plurality of reversely operable stabilizers mounted one on each side of the longitudinal center line of the machine and each presenting but one of its sides to the impinging air at an angle one above and one below the horizontal.

7. An aeroplane provided with lateral stabilizing vanes on each side, mounted on fore and aft extending pivots oppositely inclined to the horizontal, and means to simultaneously move the vanes to opposite angles of incidence, said means being normally vertical.

8. In combination with a flying machine, of a car of tubular shape mounted normally at a zero angle of incidence, an aeroplane elongated transversely and normally inclined to the horizontal, a plurality of stabilizers comprising smaller aeroplanes mounted one on each side of the longitudinal line of the said car and pivoted on axes oblique to a vertical line said axes standing upwardly and backwardly in a plane substantially parallel to the line of flight and normally out of action, means for placing the said stabilizers in action, and connections between the said stabilizers whereby the same may be operated simultaneously and reversely automatically.

9. A steering device for aeroplanes, con-

- sisting of the combination of an aeroplane, a rudder at each side thereof pivoted on an axis, oblique to a vertical line, said axis standing upwardly and backwardly in a plane substantially parallel to the line of flight, operating means and operating cables for said rudders.
- 5 plane substantially parallel to the line of flight, operating means and operating cables for said rudders.
- 10 10. A flying machine comprising a body, a rudder mounted at each side thereof and opposite a closed portion thereof pivoted on an axis oblique to a vertical line said axis standing upwardly and backwardly in a plane substantially parallel to the line of flight, and operating means for the said rudders.
- Witness my hand this 19th day of August, 1909.
- 15

GEORGE FRANCIS MYERS.

Witnesses:

THEO. L. POFF,
ANNA HEIGIS.