W. T. WILKINS.

AIRSHIP.

APPLICATION FILED APR. 16, 1914.

1,130,125.

Patented Mar. 2, 1915

2 SHEETS—SHEET 1.

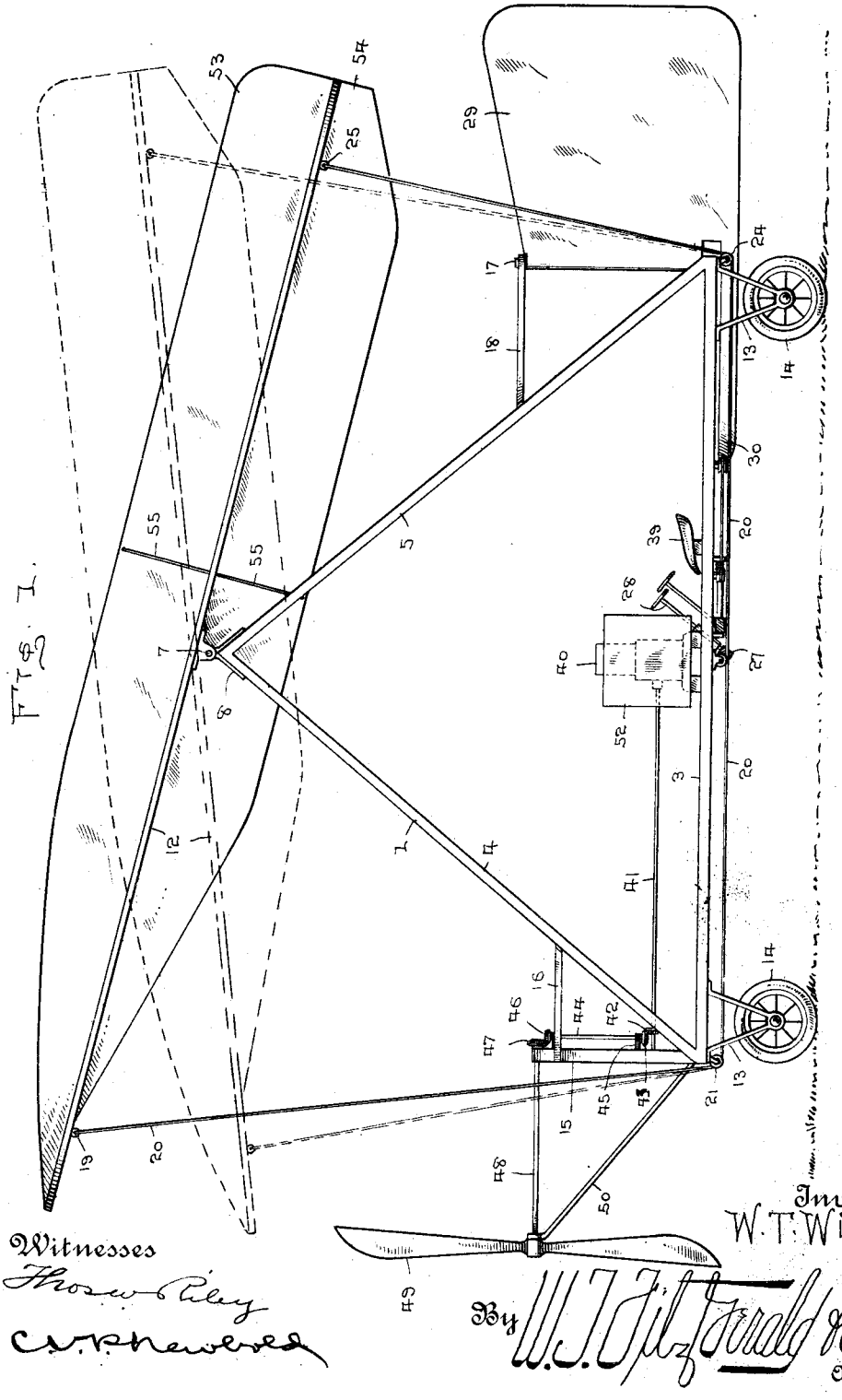


Fig. 1.

Witnesses

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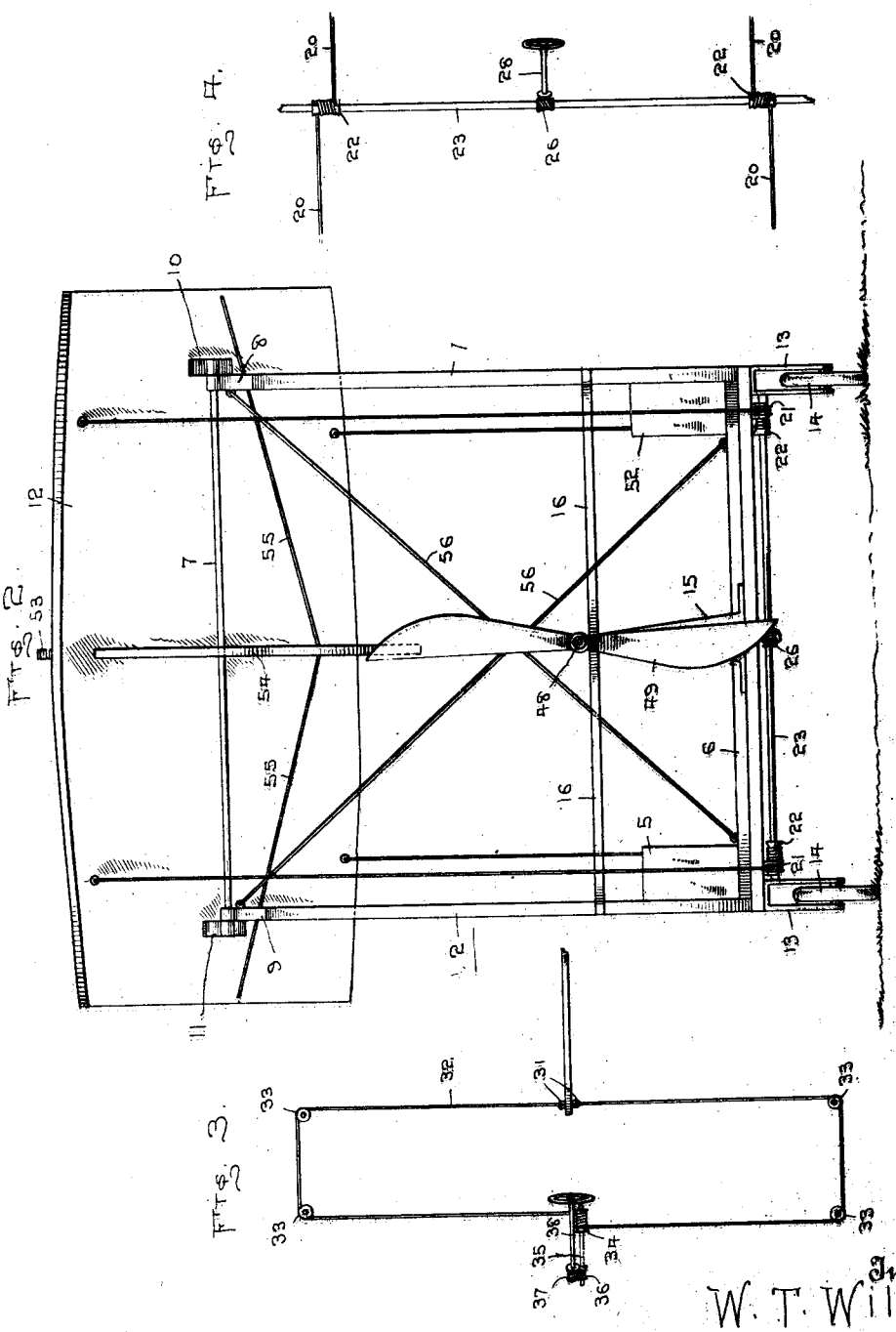
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UNITED STATES PATENT OFFICE.

WILLIAM T. WILKINS, OF SHELLEY, IDAHO.

AIRSHIP.

1,130,125. Specification of Letters Patent. Patented Mar. 2, 1915.

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To all whom it may concern:

Be it known that I, WILLIAM T. WILKINS, a citizen of the United States, residing at Shelley, in the county of Bingham and State of Idaho, have invented certain new and useful Improvements in Airships; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates broadly to new and useful improvements in aeroplanes and has particular reference to that type of heavier-than-air-machines, commonly known as monoplanes, and mainly those to which there is but one aerofoil or lifting surface.

This invention contemplates as its most important object the provision of a flying machine of this character having but one main aerofoil which is, in itself capable of assuming an unlimited number of positions in order to meet varying conditions of wind pressure, in contradistinction to the more widely known machines of this type in which the single tier of lifting surfaces is stationary.

A further object of equal importance as the foregoing is to dispense with the lifting devices of some forms of monoplane and also with the necessity for cambering the aerofoil.

A still further object of this invention is the provision of novel means for controlling the steering mechanism of an aeroplane and at the same time the adaptation of these same means for controlling the movable aerofoil.

The above and additional objects are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and more particularly pointed out in the claims which are appended hereto and form a part of this application.

Before taking up the description of the drawings, I desire to emphasize the fact that while my invention has been designed with particular reference to monoplanes, and has been illustrated and will hereafter be described in that connection, it may nevertheless be applied with equal efficiency to biplanes or triplanes or other form of aerial craft for which it may be fitted.

With reference to the drawings, wherein I have illustrated the preferred embodiment of my invention, as it is reduced to practice, and throughout the several views of which corresponding numerals of reference designate like parts, Figure 1 is a side elevation of the elements composing my invention in their assembled relation. Fig. 2 is a front elevation of the matter shown in Fig. 1. Fig. 3 is a detail of my steering mechanism detached from my monoplane as shown in plan. Fig. 4 is a like view of my controlling means for the aerofoil.

Referring to the drawings and more particularly to Fig. 1 it will be seen that the main elements composing the frame of my monoplane consist of two triangular integral side members designated as 1 and 2; each one of these triangular parts consists of a bottom portion 3, two side portions 4 and 5 angularly inclined to the bottom portion and meeting at a point directly above the center of the said bottom portion. Connecting the ends of these two bottom portions 1 and 2, I provide the transverse beams or struts 6 which, as is also the case with my side portions 1 and 2 may be made of any light and strong metal such as aluminum.

Connecting the apexes of the two triangles formed by the side portions 1 and 2 I provide the pivot shaft 7 which is suitably mounted at the apex of each triangle above referred to in brackets 8 and 9. Mounted upon the ends of this pivot shaft 7, and exterior of the brackets, I preferably provide the supporting bases 10 and 11 to which is secured the main horizontal aerofoil 12. At each of the corners of the lower rectangular frame I have mounted the depending brackets 13 in which wheels 14 are suitably journaled. In the center of the forward members 6 I position the vertical brace 15 which is connected to the two inclined side members 4 of the members 1 and 2 by horizontal braces 16. In a similar position from the rearward cross brace 6 I provide the vertical steering post 17 which is suitably braced at at 18.

Upon a comparison of Figs. 1 and 2, it will be seen that I have provided an aerofoil whose aspect ratio is less than unity or as may be otherwise stated, an aerofoil having its span considerably shorter in length than its chord. This has been done with a view of gaining speed, it being obvious that considerably less surface is presented to resistance of the air, by this method. All attempts however, to accomplish this with the

aerofoils in accepted use have heretofore proved vain for the reason that not sufficient lifting surface was provided to elevate the machine off the ground. But that feature of my invention to be hereinafter more fully described relating to the pivoted areofoil 12, overcomes this obstacle in a novel and effective manner. This aerofoil 12 mounted as it is upon the pivot rod 7 in such manner that an easy elevation or lowering of the entrant portion is possible, carries at its forward end bolts or similar fastening means 19 secured to the ribs (not shown) of the plane. Secured to these bolts I preferably provide the flexible connections 20 adapted to pass down to the ends of the lower frame portion 6 and by running over the pulleys 21 to continue substantially parallel to the lower frame portion but underneath the same. At the center of this under frame portion the flexible connections pass several times around the winding cones 22 which are positioned on the shaft 23 as clearly shown in Fig. 4 and from and thence pass rearwardly over two pulleys 24 similar to pulleys 21 and upwardly to make suitable connections with the aerofoil as at 25 substantially similar to the forward connections 19.

Intermediate the terminals of the shaft 23 I position the worm gear 26 which is adapted to mesh with worm 27 secured on the lower end of a rod 28 similar in all respects to the ordinary steering wheel of an automobile. It will thus be seen that proper manipulation of the steering rod 28 will result in the rotation of the shaft 23 and with it the winding cones 22 resulting in the winding or unwinding of the flexible connections 20 so that a corresponding elevation or lowering of the main aerofoil will be produced.

Turning now to my steering mechanism it will be noticed that my rudder 29 which is similar in all respects to that now commonly used on devices of this character is mounted as is customary on the steering post 17 and is provided with a longitudinal extension 30.

At the outer terminal of this extension 30 there are provided ring bolts or suitable fastening means 31 similar to those used on the aerofoil through which the flexible connection 32 is adapted to pass. This flexible connection 32 travels upon the pulleys 33 which are secured to the lower frame of my monoplane in any desired manner and as is shown in Fig. 3 is wound upon the winding spindle 34. This winding spindle is mounted at one terminal of the shaft 35 which has at its opposite extremity the worm gear 36. This gear 36 is adapted to mesh with the similar worm gear 37 mounted on the lower extremity of the rod 38 which is in all respects similar to my steering rod 28 and directly behind which it is positioned. Immediately behind these two controlling rods I place the driver's seat 39 suitably mounted on the lower frame 3. Immediately in front of the steering rods I provide the motor 40 which may be of any preferred type now commonly used on aeroplanes.

Transmission of the power generated by this motor is affected by the means of the horizontal drive shaft 41 whose outer extremity is journaled in the upright brace 15. Adjacent this outer extremity I preferably place the gear 42 adapted to transmit the power to a gear 43 mounted on a vertical stub shaft 44. This shaft is suitably supported as shown at 45 of Fig. 1 and has at its upper extremity a gear 46 adapted to mesh with a gear 47 mounted on the inner extremity of the propeller shaft 48. The outer end of this propeller shaft 48 carries the propeller 49 which may also be of any approved design. An angular brace 50 serves as supporting and strengthening means for the propeller shaft. It will be obvious that by thus positioning the motor and propeller of my aeroplane, I have provided means whereby the gearing down of the propeller may be effected as it is often desired to have the propeller revolved at a much less speed than the engine. Also it will be noted that the motor 40 is positioned directly in front of the driver's seat so that he may constantly be watching its behavior and having the added advantage that accidents in which the aeroplane falls nose foremost and the pilot is consequently crushed under the engine positioned behind him, will be obviated.

Referring to Fig. 2 it will be seen that I have placed the fuel tanks 51 and 52 on opposite sides of my lower frame work and in a direct line with the engine. It may be noted in this connection that this positioning of the fuel tanks was determined upon to remove them from the proximity of the motor and to also have them serve as stabilizing or ballast elements. It may further be remarked that the gasolene or other fuel is adapted to be drawn from the tanks simultaneously and equally as to do otherwise would destroy the balance of the machine. It will also be noticed in this connection that these tanks, the engine and the driver's seat have been all carefully stationed on the lower platform so as to make the center of gravity of the machine coincide with a geometrical line of symmetry.

In addition to the main aerofoil 12, I preferably provide for my machine the two vertical vanes 53 and 54, these vanes being positioned longitudinally of the main aerofoil and in the center thereof as is clearly shown in Figs. 1 and 2. These additional planes serve as stablizing elements as re-

gards lateral movement of my machine in the air it being apparent that should the machine swerve to one side or the other while making a flight that the broad surface of these vanes would be presented to the head wind which is a reaction of the velocity of the machine. The pressure of this head wind upon the broad surface of these vanes will immediately tend to swing them back to the position of least resistance such as is shown in Fig. 2 and thus aid in keeping the machine on its true course. It will be noted however, that should it be the desire of the pilot to effect a turn the resistance occasioned by the rudder 29 when properly swung to point the machine in the required direction will overcome the tendency of these vanes to keep the straight course and in this connection the vanes mainly serve as the means for enabling the rudder to get a firm "grip on the air." It will be noticed by a perusal of Fig. 1 that the edge, however, there presented of the main aerofoil 12 shows no cambering thereof the necessity for which is eliminated in this invention. It is of course well known that most biplanes and monoplanes of present construction have their supporting surfaces cambered in a hyperbolic curve, this curve increasing as the rear of the surface is approached. This is necessary for the reason that the present day planes are fixed in their relation to the flight of the machine while in my invention, as before stated, the machine with its pivoting of the aerofoil allows for the shift of this lifting surface to meet any and all conditions that may arise in the flight without the necessity of cambering.

It will be noticed that the stabilizing vanes 53 and 54 are suitably connected to the main aerofoil 12 by any desirable form of strut as shown at 55 and that the frame of the aeroplane is further braced as shown at 56. This brace however will not be described at length for the reason that it forms no important part of this invention and may be varied to suit conditions arising in the reduction to practice of my invention.

While in the foregoing I have illustrated in the drawings and description in the specification such combination and arrangement of elements as constitute the preferred embodiment of my invention, I desire to emphasize the fact that I may make such minor changes in the matters of proportion and degree, in later adaptions of my device as shall not alter the spirit of my invention as defined in the appended claims.

What I claim is:

1. In a device of the character described, the combination with an operator's platform of triangular integral side members positioned on said platform and having their apexes in the vertical plane bisecting said platform, brackets located on said apexes, a rod rotatably mounted in said brackets, a movable aerofoil carried by said rod and controlling means for the adjustment of said aerofoil including a transverse shaft carried beneath said platform, winding cones fixed to said shaft, a worm also carried by said shaft, means for manually operating said worm, pulleys mounted upon the underside of said platform in longitudinal alinement with said winding cones and cables wound upon said cones, running over said pulleys and secured at their ends to said aerofoil to exert a vertical downward pull upon the latter when said shaft is manually operated.

2. In a device of the character described, the combination with an operator's platform, triangular side members, supporting brackets carried by said platform and fixed to said side members, a propeller mounted in one of said brackets, a rudder mounted for rotation about a vertical axis in the other of said brackets, a longitudinally positioned shaft carrying a winding cone at one extremity and a worm gear at the other, manually operable means connected to said worm for operating said shaft, pulleys carried by and underneath said platform and a cable wound upon said cone running over said pulleys and having its ends connected to opposite sides of said rudder whereby the latter may be rotated by the operation of said shaft.

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

WILLIAM T. WILKINS

Witnesses:
I. W. REED,
SOREN YORGESEN.