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AEROPLANE.

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1,388,620. **Patented Aug. 23, 1921.**

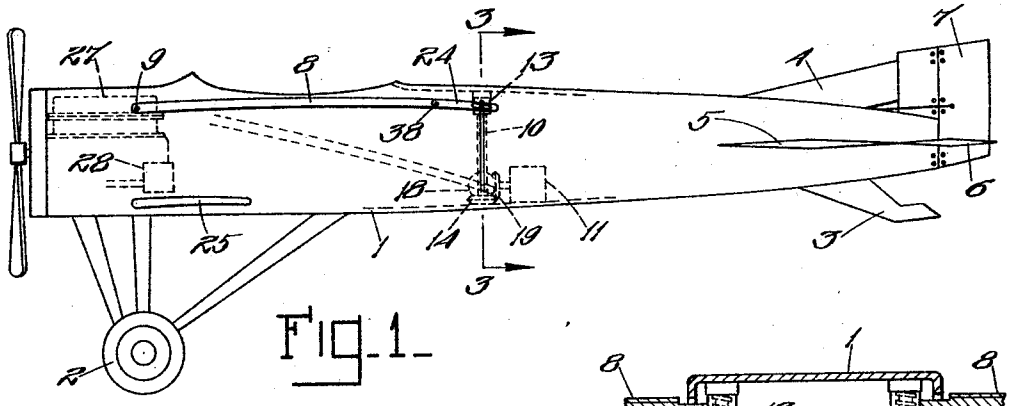


Fig. 1.

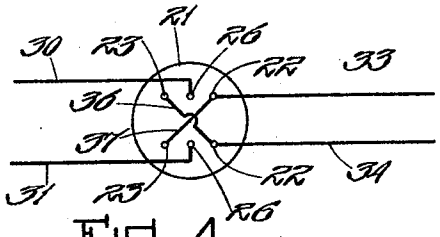


Fig. 4.

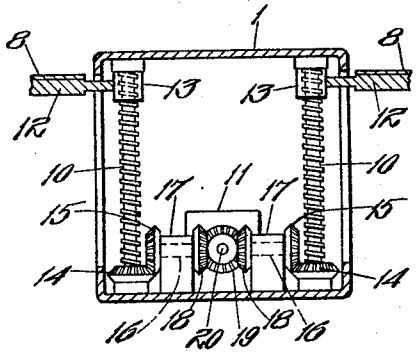


Fig. 3.

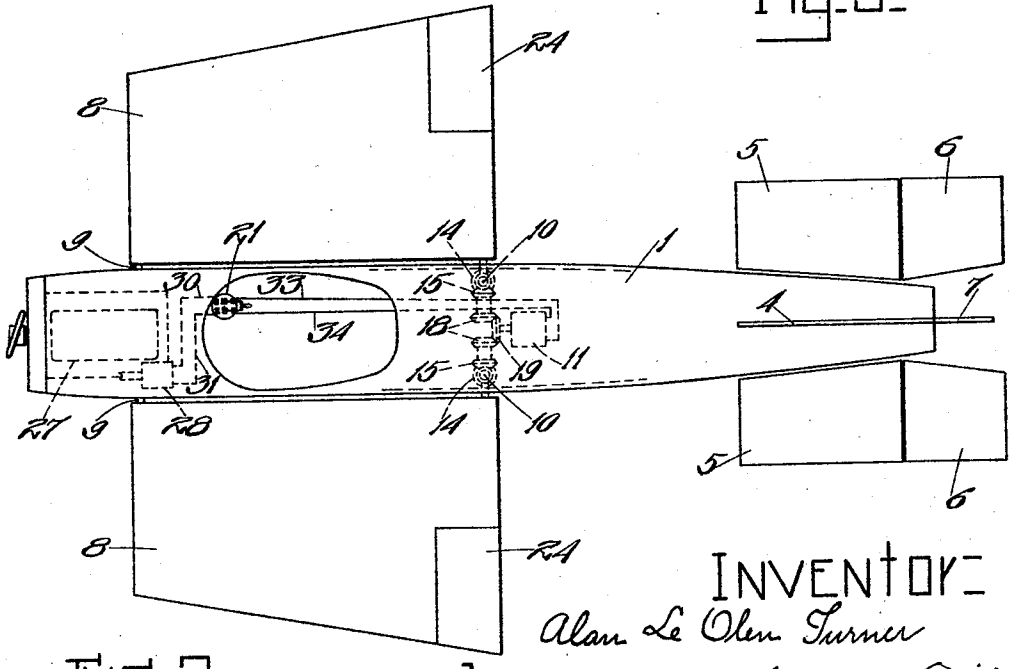


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALAN LE OLEN TURNER, OF CARSON CITY, NEVADA, ASSIGNOR OF ONE-FOURTH TO CHARLES M. HARTT, OF HARTFORD, CONNECTICUT, ONE-FOURTH TO FREDERICK E. SKINNER AND ONE-FOURTH TO EDWARD N. TRIPP, BOTH OF CARSON CITY, NEVADA.

AEROPLANE.

1,388,620. Specification of Letters Patent. Patented Aug. 23, 1921.

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To all whom it may concern:

Be it known that I, ALAN LE OLEN TURNER, a citizen of the United States, residing at Carson City, county of Ormsby, State of Nevada, have invented a certain new and useful Improvement in Aeroplanes, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to an improvement in aeroplanes. In aeroplanes as usually constructed a considerable length of space is required for the take-off and for landing. For this reason it has oftentimes been difficult to secure suitable take-off places or suitable landing places at the location desired. It has also for this reason been difficult to send an aeroplane up from a vessel or to make a landing on a vessel. It has been a great desire of aeroplane designers to devise some means whereby the aeroplane may make a quick start in a restricted area and also to make the descent quickly and in a restricted area.

The object of the present invention is to provide means whereby the above-mentioned results may be obtained. The invention consists substantially in providing the machine with laterally extending wings, each of which is pivotally connected at its forward end to the body or fuselage, the rear end being movable up or down, and providing means whereby the operator may quickly move the swinging end of the wings either up or down, as desired, by mechanical means.

The invention will be fully understood from the following description when taken in connection with the accompanying drawings, and the novel features will be pointed out and clearly defined in the claim at the close of this specification.

In the drawings, Figure 1 is a side elevation of a machine embodying the invention.

Fig. 2 is a plan view of the machine shown in Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 shows the reversing switch in conventional form.

Referring now to the drawings, 1 represents the fuselage, which is provided on its under side with wheels 2, and a trailing support 3 to support the machine while running on the ground. It is also provided with the usual vertical stabilizer 4, horizontal stabilizers 5, elevator 6 and a rudder 7, all of which may be of any well known form of construction. The engine is represented at 27 and the electric current generator at 28. The wings which embody the invention are indicated at 8—8. Each of said wings 8—8 is pivoted near its forward end as at 9 to the fuselage or body of the machine, and its rear end is movable up or down as previously stated. The means for moving it up and down consists of a worm screw 10 which is actuated by means of an electric motor 11, and intermediate connections as will be more particularly described. Any suitable connection between the worm screw 10 and the wing 8 whereby the wing may be moved up and down by the rotation of the screw according to the direction of rotation of the motor may be employed. The particular form of connection shown is as follows:

One of the ribs 12 of the wing is extended for connection with a block 13, which has a threaded inner periphery to fit the worm screw 10 which passes up through the block. When the worm screw is rotated in either direction it will cause the block 13 to rise or fall according to the direction of rotation of the worm screw, and thereby raise or lower the rear end of the wing.

The worm screw may be rotated by connection with the motor in any suitable manner. The particular driving connection shown is as follows:—Mounted on the worm screw at its lower end is a beveled gear 14 which engages with a beveled gear 15 on a shaft 16 journaled in suitable bearings 17. The other end of said shaft 16 carries a beveled gear 18 which engages with a beveled gear 19 on the motor shaft 20.

The motor is a reversible motor so that the shaft 20 may be rotated in either direction, thereby correspondingly rotating the worm screw 10 and raising or lowering the rear end of the wing 8.

The direction of rotation of the motor shaft is controlled by a switch 21 which is shown installed on the aeroplane in Fig. 2 and in conventional form in Fig. 4. This switch 21 is reversible and when it is set so that the current from the generator flows through the electric motor in one direction, the motor shaft will be rotated in the corresponding direction and when the switch is reversed so that the current flows through the motor in the other direction, the rotation of the shaft will be reversed.

It is not deemed necessary to show in detail the mechanism whereby the motor shaft is reversed because it is a well-known form of construction.

The switch 21 is shown as a two-bladed knife switch, the two blades of which are in electrical contact with wires 30 and 31 from the generator through the two contact points 26, 26. Wires 33, 34 lead from contact points 22, 22 to the motor 11. When the switch is thrown to bring the two blades in contact with the points 22, 22, electrical connection is made between the wires 30 and 31 respectively and the wires 33, 34 and this operates to turn the motor shaft in a direction to move the wings downward. When the switch is thrown to the left as viewed in Fig. 4, it makes contact with the points 23, 23 and thereby through the crossed wires 36, 37 which contact with the contact points 22, 22 reverses the current through the wires 33, 34 and causes the shaft to rotate in the reverse direction.

The worm screws and the gearing are threaded in a manner so that both wings are moved together in the same direction.

It is not deemed necessary to show the mechanism for operating the rudder 7 or the elevator 6, as it is understood that they will be controlled by the joy stick in the ordinary manner.

Preferably each wing 8 is provided with an aileron 24 at its outer rear corner hinged to the wing 8 at 38. Preferably the wing is formed with a recess of the right form and size to receive the aileron so that the aileron will not project outside of the marginal lines of the wings. It is also preferable to have the outer edges of the wings flare rearwardly so that the wings narrow toward the front. Preferably also there are additional wings 25, one on each side of the machine, at some distance below the wings 8, said wings 25 being stationary and preferably being of the same span as the upper wings 8.

In operating the machine, if the control switch is set at the neutral position there will be no current through the motor and the worm screws will be held against rotation and the wings will be then maintained in whatever position they may be at the time. By pressing down on the switch, the wing will be tipped down to an angle varying with the amount of depression, and if it is then desired to maintain the wing at that angle, the switch will be quickly moved back to neutral position; then if it is desired to swing the wings up again, the switch will be moved up to the contact point 23 so as to turn the screw to bring the wing back to its horizontal position, or by throwing the switch to neutral before the wing has moved its entire limit up or down the wings may be held at any intermediate angle.

When it is desired to start the machine and to make a quick rise, the engine is started and the switch is thrown down so as to lower the rear ends of the wings, and this has a tendency to throw the nose up into the air, thus making a quick or sharp ascent. When it is desired to make a quick landing, that is by a sharp drop, the switch is also thrown to lower the rear ends of the wings, and this has a tendency to quickly check the speed and thus effect a quick landing. The principle on which the turning down of the wings operates to make a quick ascent and a quick descent is the same as that by which a bird by similarly turning its wings makes a quick ascent or descent.

While I have shown and described an electric motor as being the preferred form of driving mechanism, it is obvious that any other suitable form of driving mechanism, whether electrically operated or otherwise, may be employed, which is constructed in such manner that it is under the control of the operator.

While in the apparatus shown above wings are always operated together, it is obvious that the wings could be connected up with separate driving mechanism so as to operate independently of each other, although it is preferable to have the two wings operate as one.

What I claim is:—

An aeroplane having two laterally extending side wings, one on each side, which are pivotally connected with the machine at their forward ends, and which are vertically movable at their rear ends, a worm screw for operating each of said wings to turn them on their pivots, a threaded block with which said worm engages, and connection between said block and the wing, whereby the rotation of the worm will actuate the wing to turn it up or down on its pivot, a motor having driving connection with each of said worms, and means under the control of the operator for making driving connection between the motor and the worms, for reversing the direction of rotation and for breaking the connection at will.

In testimony whereof I affix my signature.

ALAN LE OLEN TURNER.