Sept. 8, 1931. A. R. NOVO 1,822,782

AERONAUTIC DEVICE

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FIG. 1.

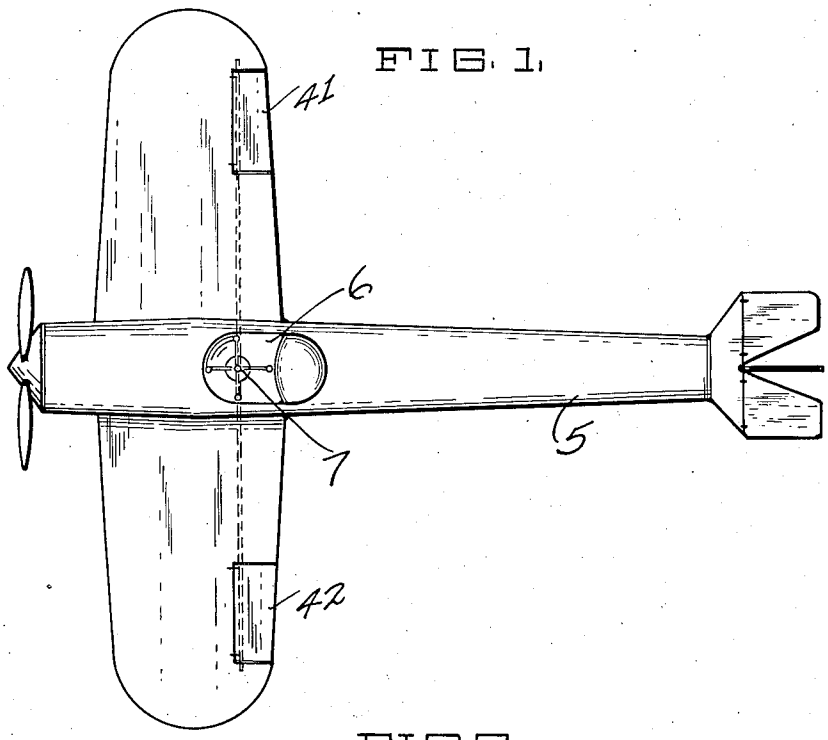
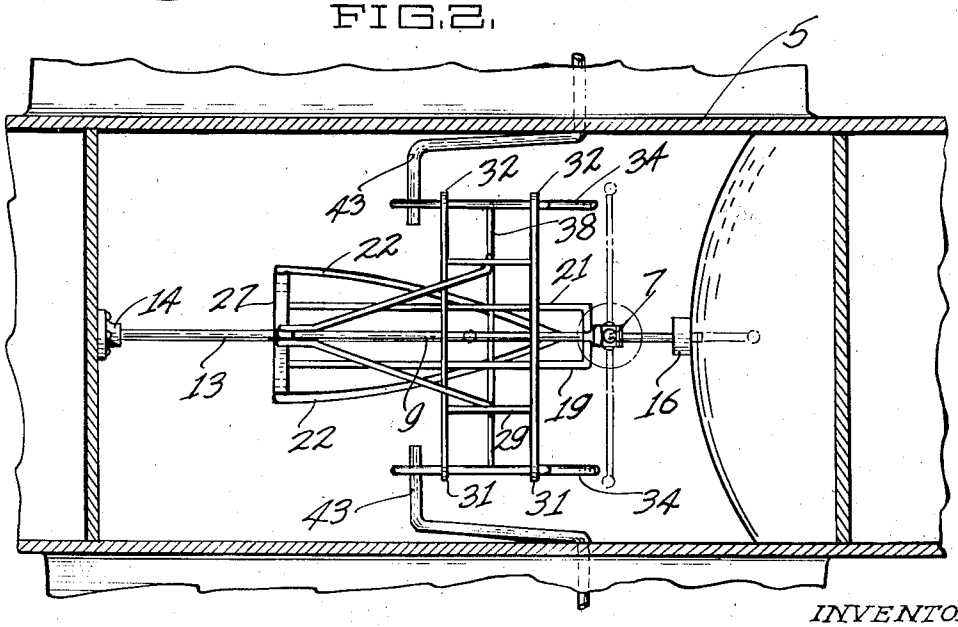


FIG. 2.



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FIG. 3.

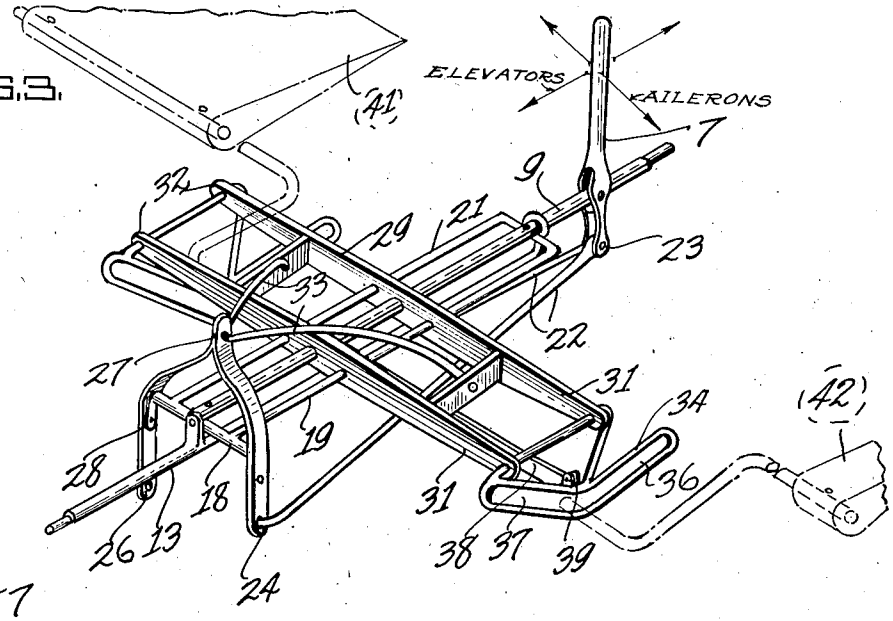


FIG. 6.

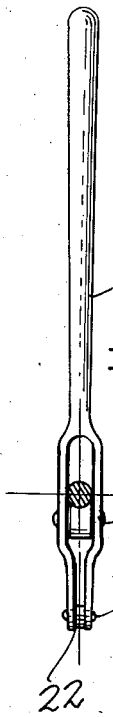


FIG. 4.

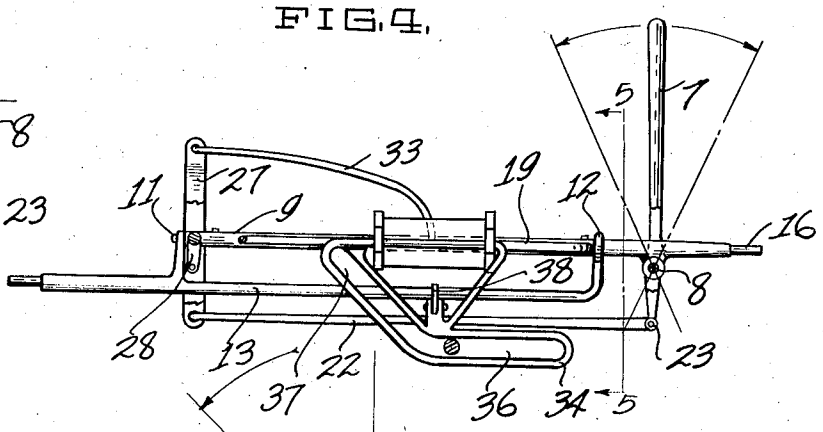
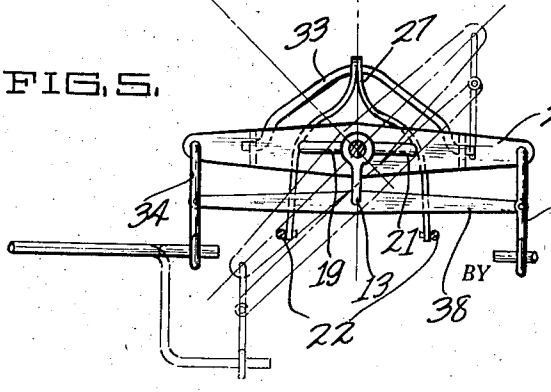


FIG. 5.



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UNITED STATES PATENT OFFICE

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AERONAUTIC DEVICE

Application filed January 26, 1931. Serial No. 511,414.

This invention relates to improvements in aeronautic devices and has particular reference to means for actuating the ailerons of an airplane.

The principal object of the invention is to provide means for increasing the lift of the plane and rising from the ground and to also permit of a decreased landing speed.

Another object is to provide means whereby full control of the ailerons is maintained through the normal actuation of the stick.

A further object is to produce a device of this character which may be incorporated in the usual airplane without altering its construction.

A still further object is to produce a device which is economical to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the acompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a top plan view of an airplane having my invention applied thereto,

Figure 2 is an enlarged fragmentary view of an airplane showing my device in detail,

Figure 3 is a detail perspective view of my device,

Figure 4 is a side elevation of Fig. 3,

Figure 5 is a cross-sectional view taken on the line 5—5 of Fig. 4, and

Figure 6 is a detail view on an enlarged scale showing the mounting of the stick.

In the steering of an airplane the stick with which the plane is steered functions to control the up and down movement of the ailerons when the stick is moved from side to side and to control the tail for elevating or diving when the same is moved forward and backward. With applicant's device the same functions are performed with the exception that during a portion of the rearward movement of the stick, the ailerons are also depressed so as to increase the lifting effect of the wings. This depressing of the ailerons does not, however, effect their individual movement in opposite directions as for steering purposes.

In the accompanying drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 designates an airplane fuselage having the customary cock pit 6 in which the stick 7 is positioned. This stick is pivoted as at 8 to a shaft 9 which is journalled as at 11 and 12 in a bracket 13 which is supported as at 14 to the fuselage. The shaft 9 is also journalled as at 16 (see Fig. 2). It is understood that the bracket 13 is held against movement with respect to its support 14. The shaft 9 has a T-head 18 to which are secured parallel rods 19 and 21. These rods are in turn secured to the shaft 9 at their free ends.

At 22 I have shown a forked link which is pivoted as at 23 to the lower end of the stick 7. The opposite ends of this link are pivoted as at 24 and 26 respectively to a yoke 27 which yoke is pivoted to downwardly turned ends 28 of the T-head 18. A slider frame 29 consisting of a rectangular frame having spaced end portions 31—31 and 32—32, is movable on the shaft 9 and parallel members 19 and 21 and is connected to the yoke 27 by a forked member 33. Pivotally supported from the ends 31 and 32 are saddles 34 having slots 36 formed therein, a portion of the slots being angularly disposed as shown at 37. In order to keep these saddles parallel with each other at all distances a walking beam 38 is pivoted thereto as at 39 and is slidable upon the bracket 13. The ailerons 41 and 42 are each provided with a pintle which terminates in a crank arm 43 at a point within the fuselage and having their ends entering the slots 36 in the saddles 34.

The result of this construction is that when the stick is in the full line position, as best illustrated in Figures 1 and 4, the ends of the cranks 34 will lie in position in the slots as shown in these views with the result that the ailerons will lie parallel with the winged surfaces and will not exert any effect upon the flight of the airplane. When the stick is moved to the right or left so as to rotate the shaft 9 the slider will be dipped as illustrated in dotted lines which will cause the

ailerons to move one up and the other down in the usual manner.

When the stick is moved forward there will be no effect upon the movement of the ailerons as the cranks will slide in the horizontal portion of the slot 36. When the stick is moved toward the rear the cranks 43 will be moved into the inclined portion 37 of the slots 36 and as a result both of the ailerons will be depressed. When in this position the ailerons will exert a greater resistance to the air stream and will therefore assist in the climb of the plane and while the ailerons are still in this position if the operator desires to turn, the stick is thrown to one side and the ailerons will operate so as to lift one of the ailerons and depress the other which is the customary function when turning, it being understood that the relative movement by the ailerons remains the same at all times as would customarily take place, the only difference being that the angular pitch between the ailerons and the surface of the wings will be varied so as to create a greater lifting force.

This same principle may be applied when landing in that when throwing the ailerons to their lowest position a backing action will take place and consequently a slower landing speed may be realized. This braking action or lifting action will not in any manner affect the facility with which the plane may be steered.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In a device of the character described adapted to be secured to an airplane having a pair of spaced ailerons, of a shaft rotatably positioned in the vehicle at a point between said ailerons, of a slider movable on said shaft, means for actuating said slider, a pair of yokes supported from said slider and having slots formed therein for the reception of crank arms secured to said ailerons.

2. In a device of the character described adapted to be attached to an airplane, having a pair of spaced ailerons, a bracket positioned between said ailerons, a shaft rotatably supported by said bracket, a pair of spaced rods mounted parallel to said shaft and secured thereto, of a slider movable on said shaft and said rods, a saddle supported from each end of said slider, said saddles each having a slot formed therein, a portion of said slot being horizontally disposed, a portion of said slot being angularly disposed with respect to the horizontal portion, each of said ailerons having a crank arm, the end of which is slidably secured in said slots and means for moving said slider on said shaft, and means for rotating said shaft.

3. In a device of the character described adapted to be attached to an airplane, having a pair of spaced ailerons, a bracket positioned between said ailerons, a shaft rotatably supported by said bracket, a pair of spaced rods mounted parallel to said shaft and secured thereto, of a slider movable on said shaft and said rods, a saddle supported from each end of said slider, said saddles each having a slot formed therein, a portion of said slot being horizontally disposed, a portion of said slot being angularly disposed with respect to the horizontal portion, each of said ailerons having a crank arm, the end of which is slidably secured in said slots, means for moving said slider on said shaft, means for rotating said shaft, said means including a stick pivoted to said shaft, a yoke pivoted to said shaft, a link extending between said stick and said yoke, and a fork extending between said yoke and said slider.

In testimony whereof I affix my signature.

ANGELO R. NOVO.