Oct. 18, 1927. 1,645,928

H. C. A. POTEZ

AEROPLANE FIN

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Fig. 1

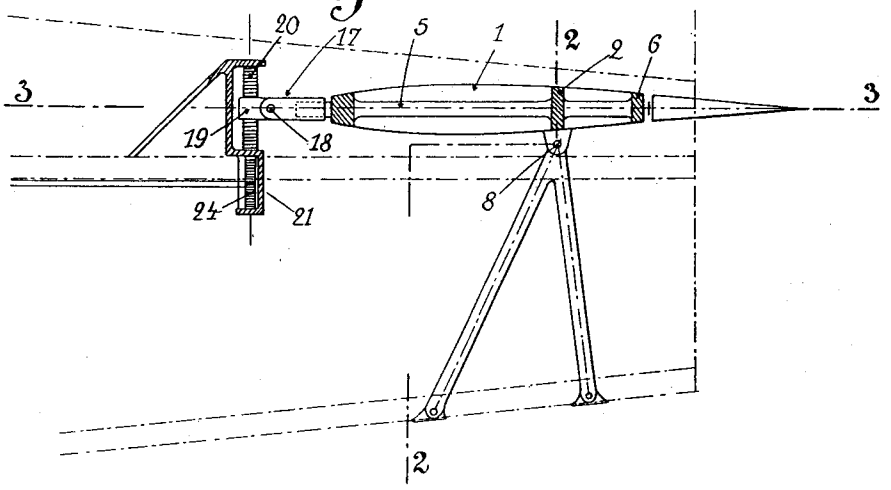
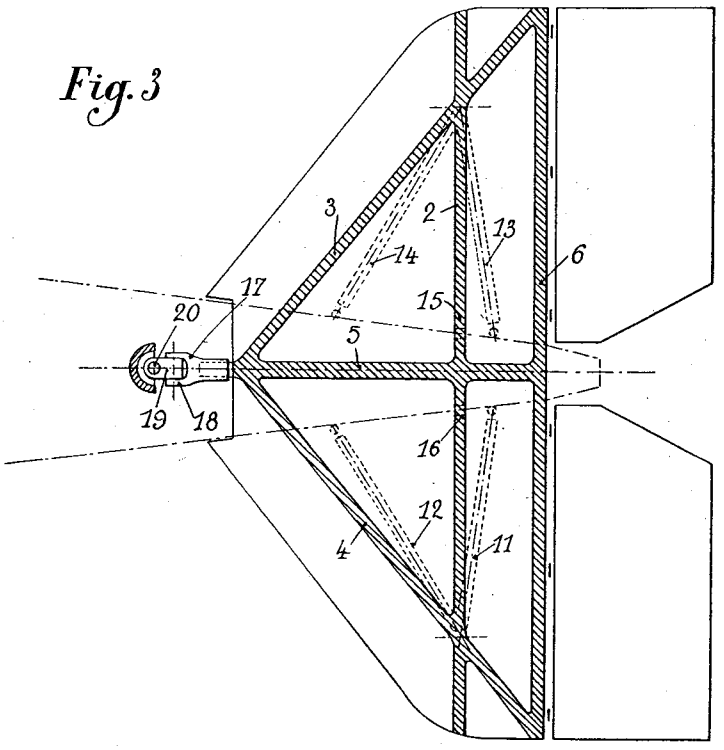


Fig. 3



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Fig. 2

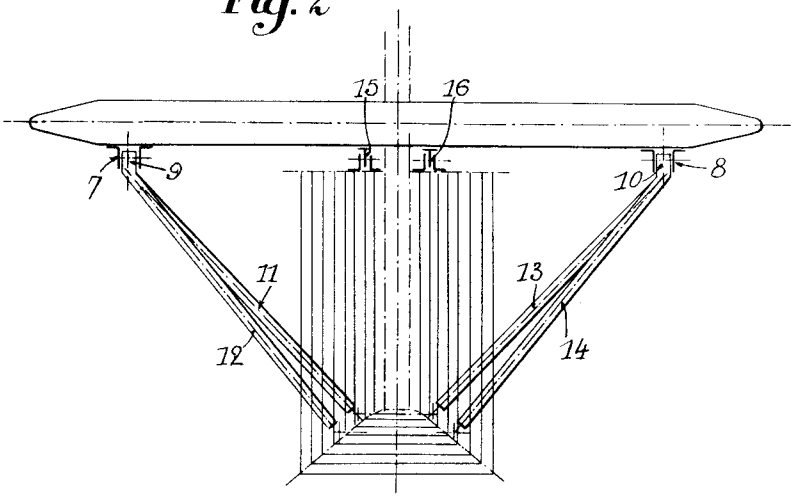


Fig. 4

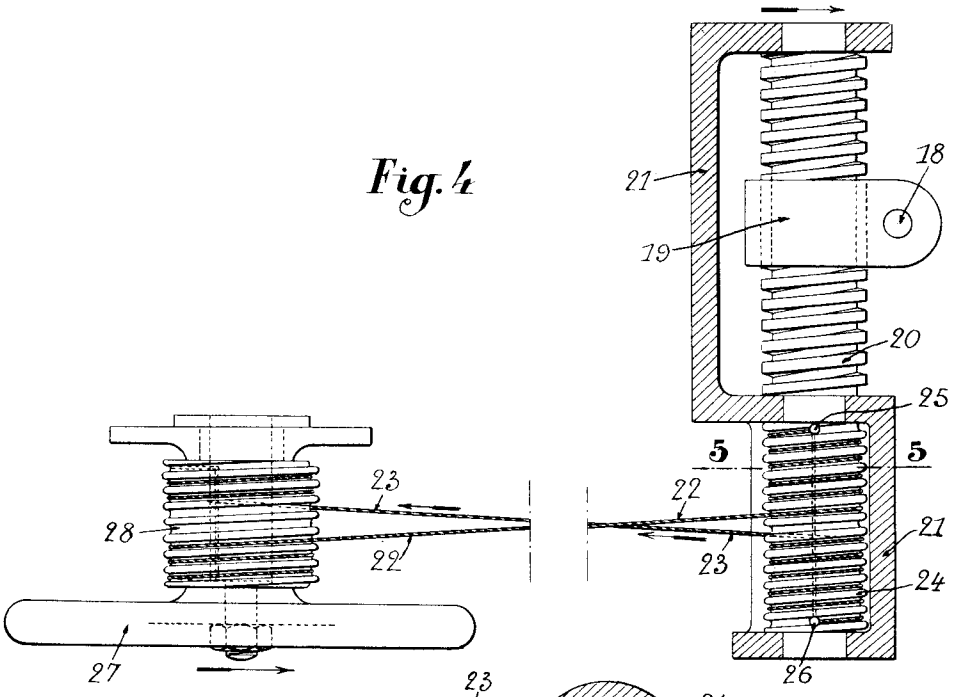
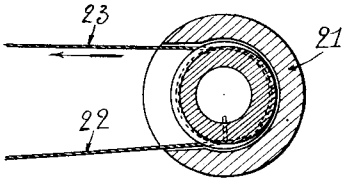


Fig. 5



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UNITED STATES PATENT OFFICE.

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AEROPLANE FIN.

Application filed February 26, 1926, Serial No. 90,978, and in France March 6, 1925.

The present invention relates to an arrangement whereby the incidence of the horizontal fin or tail part of an aeroplane can be regulated when in flight, while at the same time the construction of such parts will have the same strength as that of the stationary tail parts.

The appended drawings show by way of example a practical embodiment of the invention.

Fig. 1 is a section upon the centre line of the aeroplane.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of the same figure.

Fig. 4 is a view of the mechanism on a larger scale.

Fig. 5 is a section, on the line 5—5 of Fig. 4, of the control itself.

The horizontal fin 1, which is now movable, consists of a frame comprising a transverse bar 2 which is secured to the oblique bars 3 and 4 and to an axial bar 5; these latter members are secured to the rear crossbar 6 which carries the pivot members of the stabilizer.

The transverse bar 2 is pivoted by the supports 7 and 8 to the points of connection with the bars 3 and 4, by means of the supporting plates or blocks 9 and 10 which are mounted on the bracing members 11, 12 and 13, 14 which are attached to the main body or fuselage at their lower ends.

The same bar 2 is further pivoted directly to the fuselage at the points 15 and 16. The tail part or fin is thus mounted in such manner as to pivot about an axis parallel with the bar 2. Said bar is mounted between the anterior and posterior edges of the fin at some distance thereof. The oscillations are controlled by the vertical displacements of the front end of the axial bar 5; the use of this rigid axial bar enables it to control the displacements of the fin from a single point and by means of a master part of said fin. For this purpose, the end of the said axial bar 5 is slidable in a sleeve 17 carrying a fork which is mounted by means of an axle 18 upon a nut 19 which is vertically movable in either direction upon the screw 20.

The rotation of the said screw—which is mounted vertically on the fuselage by means of a double support 21—is effected (Fig. 4) by the traction of the cables 22 or 23 which are wound on a helical portion formed on the drum 24 which is coaxial with and below the screw 20 and is secured thereto at 25 and 26. The said support is mounted close to the said drum thereby preventing the escape of any coil of said cables out of the corresponding groove during the controlling operation of the fin and the cables pass through a slot in the support. The screw thread of said helix is cut somewhat deeply into the said cable drum, and the cables have a sufficient diameter whereby they will remain within the screwthread.

The driver is enabled to control the said cables by the use of a hand wheel 27 secured to a screwthreaded drum 28 into the threads of which the said cables are wound, each of the cables being attached to the drum at a suitable point.

The operation is as follows:

The driver turns his hand wheel 27 in the direction of the arrow, thus winding the cable 23 upon the drum 28, while the cable 22 unwinds. The cable 23 is now unwound from the drum 24, thus rotating the said drum, whilst the cable 22 becomes wound in the place which is left free by the cable 23. Due to this arrangement for the simultaneous winding and unwinding of the cables relative to the same drum, the size of the drum can be reduced to a minimum.

By the said arrangement, the driver controls the vertical motion of the nut 19 on the said screw in the direction of the arrow, and thus effects the pivoting movement of the fin.

Obviously, the present invention is not limited to the constructions herein set forth, these being given solely by way of example.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination with an aeroplane fin or rudder comprising a main axial control bar the front part of which is adapted to be moved vertically in either direction, a number of transverse bars, one of them being rockingly mounted on the aeroplane body, and secured to said axial control bar, a double support mounted on the aeroplane body, a screw loosely mounted on said support and adapted to operatively rotate about its own axis, a sliding member adapted to cooperate with the front part of said main axial control bar, a nut rockingly secured to said sliding member and adapted to operatively engage said screw and means under the pilot's control for rotating said screw.

2. In combination with an aeroplane fin or rudder comprising a main axial control bar the front part of which is adapted to be moved vertically in either direction, a number of transverse bars, one of them being located at a distance from the front edge and the rear edge of said fin and rockingly mounted on the aeroplane body and secured to said axial control bar, a double support mounted on the aeroplane body, a screw loosely mounted on said support and adapted to operatively rotate about its own axis, a sliding member adapted to cooperate with the front part of said main axial control bar, a nut rockingly secured to said sliding member and adapted to operatively engage said screw and means under the pilot's control for rotating said screw.

3. In an aeroplane fin or rudder the combination of a main axial control bar the front part of which is adapted to be moved vertically in either direction, a number of transverse bars, one of them being rockingly mounted on the aeroplane body, and secured to said axial control bar, a number of oblique bars, outer rocking supports located at crossing points of said oblique bars and said transverse bars, intermediate rocking supports and means under the pilot's control for moving said axial control bar.

4. In combination with an aeroplane fin or rudder comprising a main axial control bar the front part of which is adapted to be moved vertically in either direction, a number of transverse bars, one of them being rockingly mounted on the aeroplane body, and secured to said axial control bar, a double support mounted on the aeroplane body, a screw loosely mounted on said support and adapted to operatively rotate about its own axis, a sliding member adapted to cooperate with the front part of said main axial control bar, a nut rockingly secured to said sliding member and adapted to operatively engage said screw, a drum coaxial with said screw and rigidly secured thereto, the periphery thereof being provided with deep helical grooves, a rotary control member under the pilot's control, the periphery thereof being provided with similar deep helical grooves, a number of cables adapted to simultaneously and operatively engage the said deep helical grooves on said drum and said rotary control member and to operatively connect said drum and said rotary control member, whereby the incidence of said fin is at any instant under the pilot's control.

5. In combination with an aeroplane fin or rudder comprising a main axial control bar the front part of which is adapted to be moved vertically in either direction, a number of transverse bars, one of them being rockingly mounted on the aeroplane body, and secured to said axial control bar, a double support mounted on the aeroplane body, a screw loosely mounted on said support and adapted to operatively rotate about its own axis, a sliding member adapted to cooperate with the front part of said main axial control bar, a nut rockingly secured to said sliding member and adapted to operatively engage said screw, a drum coaxial with said screw and rigidly secured thereto, the periphery thereof being provided with deep helical grooves, a rotary control member under the pilot's control the periphery thereof being provided with similar deep helical grooves, a number of cables adapted to simultaneously and operatively engage the said deep helical grooves on said drum and said rotary control member and to operatively connect said drum and said rotary control member, whereby the incidence of said fin is at any instant under the pilot's control.

In testimony whereof I have signed my name to this specification.

HENRY CHARLES ALEXANDRE POTEZ.