

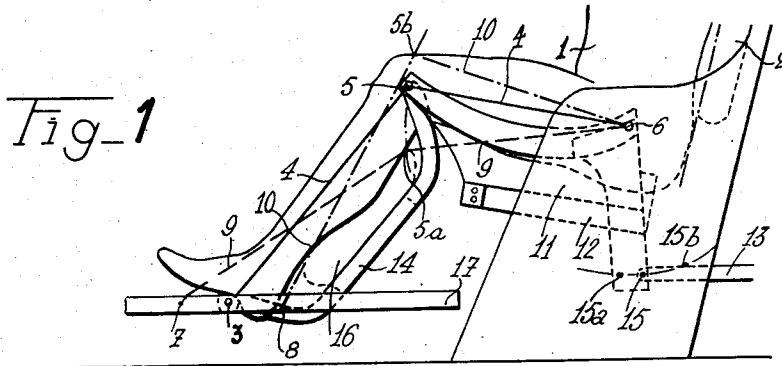
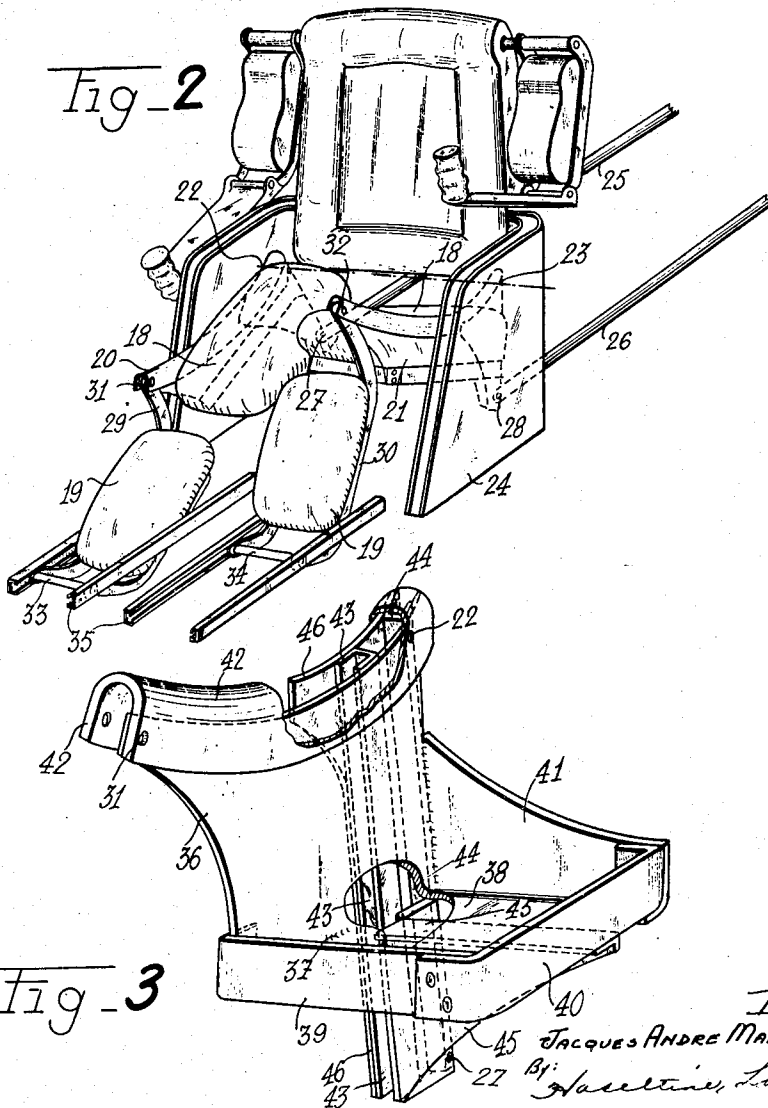
May 12, 1953

J. A. M. LECARME

2,638,290

CONTROL MEANS FOR FLYING MACHINES

Filed Feb. 9, 1949



INVENTOR
JACQUES ANDRE MARIE LECARME
By: HAZELTINE, Lohr & C.
AGENTS

UNITED STATES PATENT OFFICE

2,638,290

CONTROL MEANS FOR FLYING MACHINES

Jacques André Marie Lecarme, Aix-en-Provence,
France, assignor to Societe Anonyme dite: So-
ciete Nationale de Constructions Aeronautiques
Du Sud-Est, Paris, France

Application February 9, 1949, Serial No. 75,426
In France February 18, 1948

2 Claims. (Cl. 244—86)

1

My invention has for its object improvements in the control means for flying machines, more particularly for the actuation of the rudders.

The object of the present invention is to improve the comfort of the pilot and to provide for complete freedom of the space located in front of his feet through the omission of the conventional rudder bar system. To this purpose, the means controlling the control surfaces and the transmission of movements thereto are brought back inside the pilot's seat and underneath said seat, the control members replacing the rudder bar appearing as supports for the thigh, leg and foot of the pilot and being pivotally arranged so as to carry the lower limbs of the pilot throughout their length and in all their possible positions. Said arrangement enables a reduction of efforts that the pilot may have to exert and gives him the possibility of resting his lower limbs permanently which gives him a sensation of comfort that is of particular interest in modern machines having a large range of operation and a considerable weight.

The following description of an embodiment illustrated in the accompanying drawings by way of example and by no means in a limiting sense will indicate readily how the invention may be executed in practice. In said drawings:

Fig. 1 illustrates diagrammatically the joints of the pilot's limbs and the pivotal connections of the steering control device associated therewith according to the invention.

Fig. 2 is a perspective view of an embodiment of a pilot's seat provided with the improvements according to the invention.

Fig. 3 is a perspective view of the carrier provided for the cushion underlying the right hand thigh.

The seat of the pilot having for instance the shape of an armchair, Fig. 1 shows the pilot seated in said armchair in a position corresponding to the mean position of steering control. He leans then against the back rest 2. His feet rest on the foot rests 3 and the axis 4 of his legs passes through the pivotal connections of the foot rests 3 and through the joints 5 of his knees and 6 of his hips.

In the same manner as in a conventional steering control system, when the pilot shifts for instance his left foot up to 7, his right foot returns rearwardly up to 8 and conversely. His legs may reach during such movements extreme positions wherein the theoretical axes 4 are located in the positions illustrated in the drawings by the interrupted lines 9 and 10.

2

The part of the armchair forming the actual seat includes two cushions 11 carried by two movable supports 12 pivotally secured at 6 to the stationary frame of the armchair. Each support 12 carries pivotally on one hand at 15 a link 13 adapted to control the rudder and, on the other hand, at 5 the movable support 14 that carries the cushion 16 forming a support for the leg calf. At its other end, the support 14 is pivotally secured to the foot rest 3. When the foot is shifted from 7 to 8, the pivot 5 is shifted from 5a to 5b and the pivot 15 from 15b to 15a.

During the above described displacements, the foot rest 3 is guided in grooves 17 that are illustrated as being horizontal or parallel to the flooring but they may as well be more or less slopingly arranged towards the front so that the foot sinks when it is urged forward.

This guiding through slideways as disclosed by way of example may be replaced by any suitable arrangement of levers that allows a front to rear and rear to front shifting of the foot along a substantially rectilinear path in a horizontal plane or in a plane sloping slightly forwardly.

It is apparent from the above disclosure of the principle illustrated in Fig. 1 that the space to the front of the feet of the pilot is entirely free and that the pilot benefits permanently by perfect comfort by reason of the different cushions carrying his thighs and legs.

In Fig. 2 is illustrated in perspective view a practical embodiment of a piloting armchair according to the invention. In said figure, the thigh carrying cushions are shown at 18 and those for the calves at 19. The supports 20 and 21 of the thigh cushions 18 are pivotally secured at 22 and 23 to the stationary frame 24 while the links 25 and 26 of the steering control are pivotally secured to said supports 20 and 21 at 27 and 28. The supports 29 and 30 of the calf cushions 19 are held through the pivots 31 and 32 that secure them to the thigh supports 20 and 21 and they are held at their other end by the foot rests 33 and 34 that are guided in their reciprocation by the slideways 35.

The stationary support 24 of the armchair may be made either of wood or metal or any other suitable material.

The supports 20 and 21 are made in this embodiment of folded sheets of light alloy.

Fig. 3 illustrates the support 20 of the right thigh cushion. It includes a sheet of metal 36 folded at its lower end along a straight line 37 so as to form a bottom 38 that is folded in its turn along its edges to form flanges 39, 40 and

41 enclosing a recess adapted to hold the cushion for the thigh. The metal sheet 36 is riveted or welded to a member 42 assuming the shape of an inverted U and bent to match the curve formed by the upper edge of the metal sheet 36. The pivots 22 and 31 are carried by said arcuate member 42.

Two elements 43 and 44 having a U-shaped cross-section are secured to the metal sheet 36 and form a lever the lower end of which carries the pivot 27 for the link 25 forming the elevator control. These U-shaped members 43 and 44 are connected so as to form a box structure firstly by the metal sheet 26 and beyond the bottom 38 thereof by a metal sheet 45 folded at 90° so as to form a supporting bracket while the surface of said members opposed to that corresponding to the metal sheet 36 is reinforced by a metal sheet 46.

The device controlling the rudder bars forming the object of the present invention may be associated with any elevator and warping control means and in particular with those disclosed in my copending application Serial No. 726,802, filed February 6, 1947. This association enables in particular the construction of the armchair, including its control means, as a single unit adapted to be mounted directly in the flying machine and which may also be produced in mass production under particularly economical manufacturing conditions.

What I claim is:

1. In a control device for a flying machine having at least a vertical control surface, a pilot seat comprising a frame fixedly mounted on the flying machine and which carries a back-rest, a pair of first supports on which respectively bear the under parts of the pilot's thighs, said supports being independently pivoted on said frame around a common horizontal axis located under said back-rest and being respectively formed with substantial vertical and downwardly directed extensions which act as levers, a pair of second supports on which respectively bear the pilot's calves, said second supports being pivotally secured respectively to the outer ends of said first supports, foot-rests respectively carried by the outer ends of the supports of said second pair, guiding devices for guiding the outer ends of said last supports along lines which are substantially parallel to the longitudinal axis of the flying ma-

chine, and bars pivotally mounted at the free ends of said extensions, said bars being directed toward the back of the seat for connecting said extensions with the vertical control surface, whereby a pilot being seated on said seat and having his lower limbs supported by said supports controls said vertical control surface by simultaneous displacements in reverse directions of the outer ends of the supports of the second pair under the action of corresponding movements of his legs.

2. In a control device for a flying machine having at least a vertical control surface, a pilot seat comprising a frame fixedly mounted on the flying machine and which carries a back-rest, a pair of first supports on which respectively bear the under parts of the pilot's thighs, said supports being independently pivoted on said frame around a common horizontal axis located under said back-rest and being respectively formed with substantial vertical and downwardly directed extensions which act as levers, a pair of second supports on which respectively bear the pilot's calves, said second supports being pivotally secured respectively to the outer ends of said first supports, cushions carried by said first and second supports, foot-rests respectively carried by the outer ends of the supports of said second pair, guiding devices for guiding the outer ends of said last supports along lines which are substantially parallel to the longitudinal axis of the flying machine, and bars pivotally mounted at the free ends of said extensions, said bars being directed toward the back of the seat for connecting said extensions with the vertical control surface, whereby a pilot being seated on said seat and having his lower limbs supported by said supports controls said vertical control surface by simultaneous displacements in reverse directions of the outer ends of the supports of the second pair under the action of corresponding movements of his legs.

JACQUES ANDRÉ MARIE LECARME.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,844,607	Sikorsky	Feb. 9, 1932
2,411,770	Zimmerman	Nov. 26, 1946
2,433,146	Odell	Dec. 23, 1947