July 24, 1923. 1,462,531

M. C. BAUMANN

RUDDER CONTROL

Filed Aug. 23, 1920 2 Sheets-Sheet 1

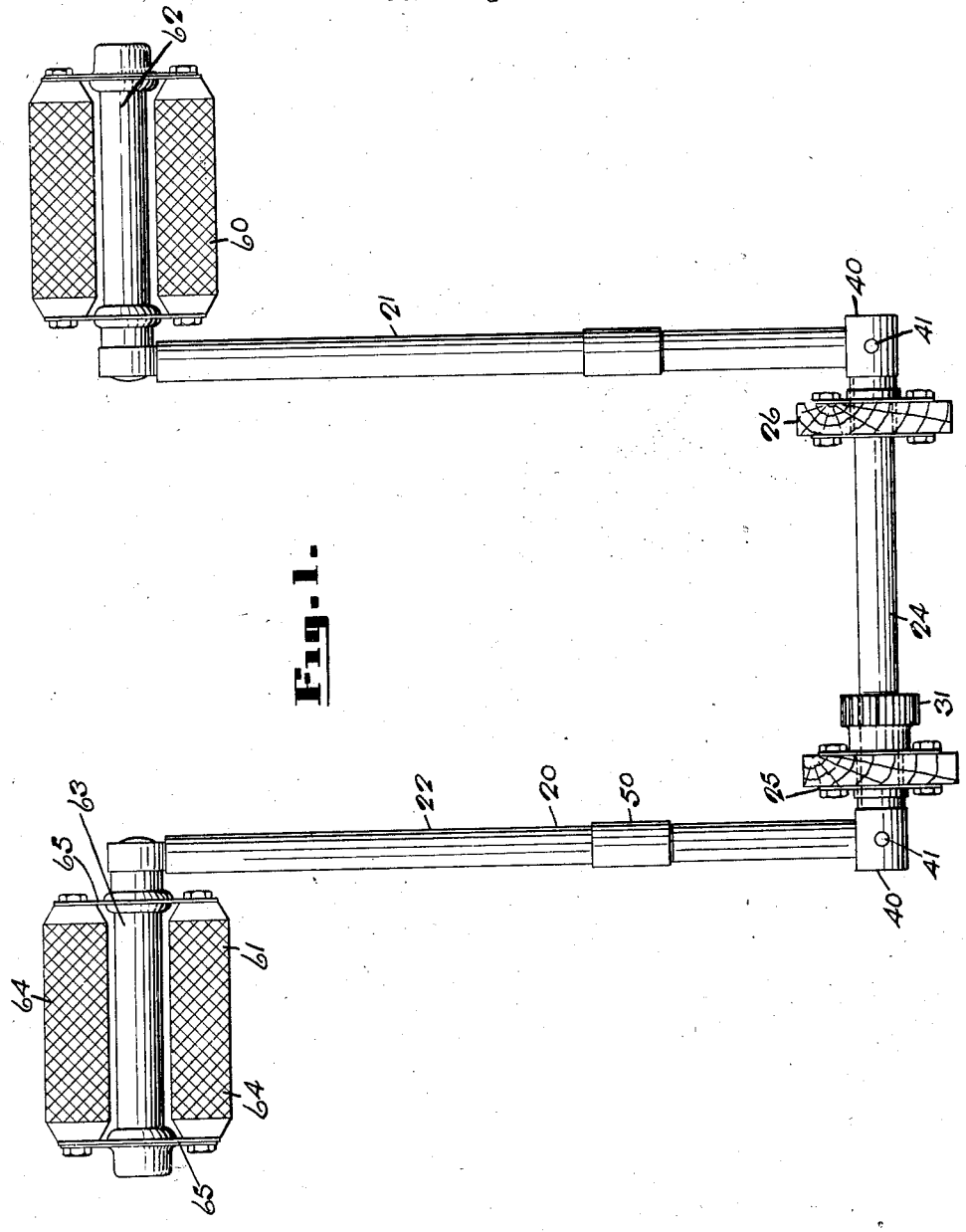


Fig. 1.

Witnesses
L. Hale Emrick
Robert E. Smith

By

Inventor
Milton C. Baumann

Francis D. Hardesty
Attorney

July 24, 1923. 1,462,531

M. C. BAUMANN

RUDDER CONTROL

Filed Aug. 23, 1920 2 Sheets-Sheet 2

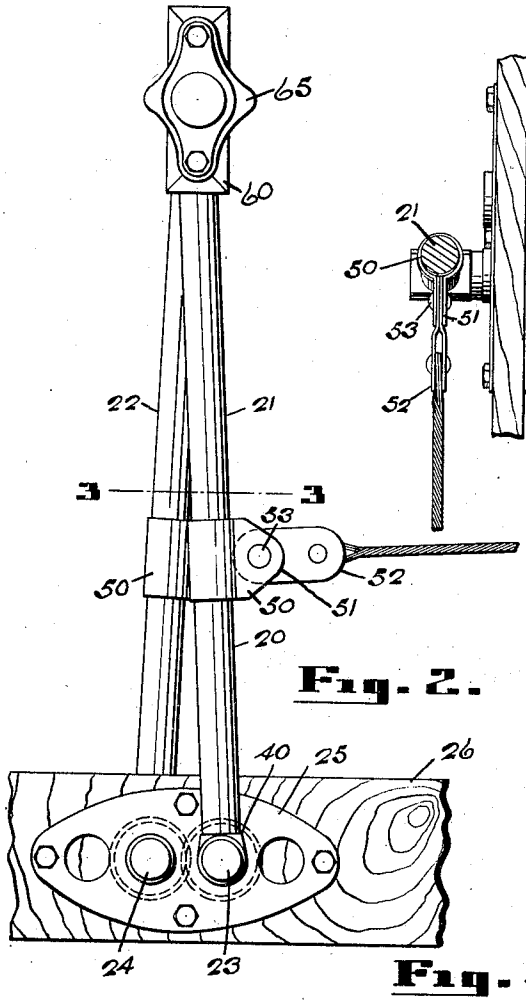


Fig. 2.

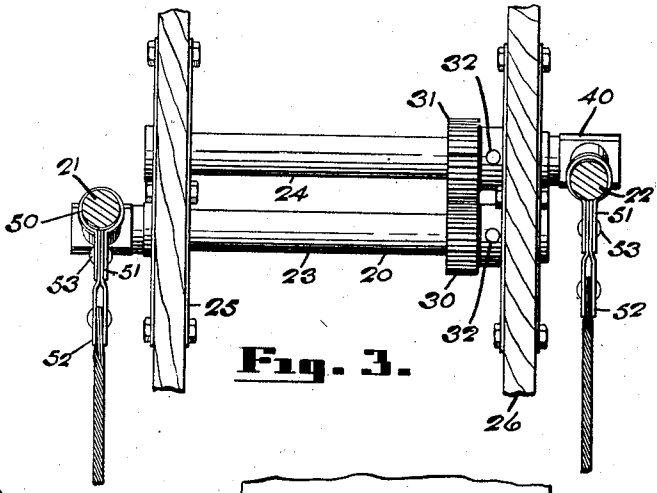


Fig. 3.

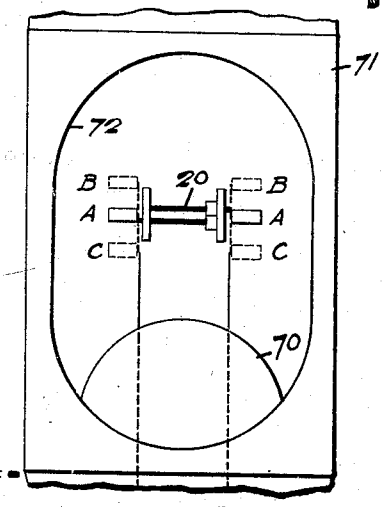


Fig. 4.

Witnesses
L. Hale Emrick
Robert E. Smith

Inventor
Milton C. Baumann

By Francis D. Hardesty
Attorney

Patented July 24, 1923. 1,462,531

UNITED STATES PATENT OFFICE.

MILTON C. BAUMANN, OF DAYTON, OHIO, ASSIGNOR TO DAYTON-WRIGHT COMPANY, OF DAYTON, OHIO, A CORPORATION OF DELAWARE.

RUDDER CONTROL.

Application filed August 23, 1920. Serial No. 405,391.

To all whom it may concern:

Be it known that I, MILTON C. BAUMANN, a citizen of the United States of America, residing at Dayton, county of Montgomery, State of Ohio, have invented certain new and useful Improvements in Rudder Controls, of which the following is a full, clear, and exact description.

The present invention relates to improvements in aeroplane control and more particularly to a control for the rudder, a preferred form of which has been chosen as convenient for the purposes of description and explanation.

It is a well known fact that considerable difficulty has been experienced in the aeroplane art with control devices for the rudder, wherein the general type of control is adapted to be manipulated by the operator's feet. With this type, there have been occasions when the operator's feet have slipped from the treads of the control, often catching in the control cables and other mechanism with deleterious results. It is desirable, therefore, to have a control with the treads constructed so as to overcome any tendency for the operator's feet to slip off. Further, it is evident that it would be very desirable to adjust the control at times so that, with the rudder in its normal position, the treads might be moved closer or farther from the operator's seat, to suit the different lengths of limb of different operators.

It is among the objects of the present invention, therefore, to provide a control which is safe, sure, and sufficient in operation and which is adapted for adjustment so that its treads may be set at different distances from the operator's seat.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 is a view of the control device in elevation, looking in the direction of the rudder.

Fig. 2 is a side elevation of the control showing, more particularly, the position of the control levers for normal position of the rudder, and means for connecting the control to the rudder.

Fig. 3 is a top view of the control partly in section along the line 3—3 of Fig. 2.

Fig. 4 is a diagrammatic top view of the control showing the treads adjusted for different distances from the operator's seat.

In the drawings, and more particularly in Figs. 1, 2, and 3, the control device, designated as a whole by the numeral 20, comprises a lever 21 to be operated by the left foot of the operator, and the lever 22 to be operated by his right foot. The lever 21 is provided with a shaft 23 and the lever 22 with a corresponding shaft 24. These shafts are separate from each other and act as axes for the levers.

The levers are supported by brackets 25, two pairs of which are secured to the framework 26 of the aeroplane by suitable bolts and nuts. Each pair of brackets is adapted to form suitable bearings for the shafts. Thus the shafts are adapted for rotation but are caused to have a fixed position in the aeroplane relative to aeroplane structure, and more particularly to the operator's seat.

The shafts 23 and 24 are provided with suitable intermeshing gears 30 and 31 respectively, secured firmly thereon, for example by means of pins 32. These gears are located, preferably, between the pairs of brackets in order to economize space. Outside the brackets the shaft 24 extends on the right and the shaft 23 on the left for securing the levers thereto. These levers have socket members 40, fixed on their lower ends, to enable their being secured to the shafts, utilizing for example, the pins 41.

At a point intermediate the ends of the levers, are secured connecting straps 50 having extended portions 51 adapted for connecting to the links 52. These links have attached thereto flexible cables or cords connected at their other ends to the rudder (not shown), and are pivoted in the extended portions 51 at 53.

At the top of the levers 21 and 22 are secured pedals 60 and 61 respectively. The pedals are of the ordinary bicycle type and extend outwardly from the sides of the levers. It will readily be recognized that as the levers are operated about their axes that

the shaft 62 of pedal 60 will remain substantially parallel to shaft 63 of pedal 61 and that both shafts 62 and 63 will remain substantially parallel to shafts 23 and 24. The pedals are provided with rubber treads 64 and guides 65. The fact that the pedals are so constructed and installed will prevent the operator's feet from slipping off the treads, since as stated, the shafts of the pedals remain substantially parallel, and the rubber treads present friction surfaces of contact, and further, the guides 65 retain the operator's feet in firm contact with the treads.

The control is adapted for adjustment whereby the pedals 60 and 61 and consequently the treads 64 may be set at different distances from the operator's seat 70. This is shown diagrammatically in Fig. 4 wherein 71 is the fuselage of the aeroplane and 72 is the cock-pit in which the control 20 is installed. The control is shown in three different positions: A, B, and C. Position A is for an operator of average length of limb; position B is for an operator of long length of limb; position C is for an operator of short length of limb. In order to adjust for these different positions, it is sufficient that the gears 30 and 31 be separated in some suitable manner, for example by removing pin 32 from either of the gears, permitting sliding of this gear on the shaft and unmeshing it from the other gear. The levers then may be moved to any desired position, for instance, for a short limbed operator, toward the seat, and for a long limbed operator away from the seat. The gears are then remeshed and the length of the cables is changed to correspond to the new position of the levers for normal rudder position, thus completing the adjustment.

In operating the rudder, as lever 21 is pushed forward the lever 22 will be pushed back, or in the opposite direction, by the action of the gears 30 and 31. Correspondingly, if the lever 22 is pushed forward the lever 21 will be thrown in the opposite direction by the action of the gears.

It is thought that further description of the operation of the control is unnecessary in view of the above description and explanation. Further, from the description set out above, it is evident that a control has been devised which is safe, sure and sufficient in operation; which gives positive motion to the rudder; which is simple and compact in structure; and which permits satisfactory adjustment of the treads for setting them at different distances from the operator's seat. It is also obvious that other forms of controls may be devised without differing in any way from the fundamentals of the construction set out above.

While the form of mechanism herein shown and described, constitutes a preferred embodiment of the invention, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow:

1. In an aeroplane, a rudder control comprising a pair of operating levers substantially in lateral alignment for normal rudder position; a pivotal mounting for each lever; and means positively interconnecting said levers and permitting the adjustment of the position of both levers relative to the operator's seat, whereby the lateral alignment in the new position, for normal rudder position, is retained.

2. In an aeroplane, a rudder control comprising a pair of operating levers substantially in lateral alignment for normal rudder position; a pivotal mounting for each lever; and means, positively connecting the levers, permitting the adjustment of the position of both levers relative to the operator's seat, whereby the lateral alignment in the new position, for normal rudder position, is retained.

3. In an aeroplane, a rudder control comprising a pair of operating levers substantially in lateral alignment; a shaft secured to each lever, and forming an axis therefor; and means, operably connecting the two shafts, permitting the adjustment of the position of both levers relative to the operator's seat, whereby the lateral alignment in the new position, for normal rudder position, is retained.

4. In an aeroplane, a rudder control comprising a pair of operating levers substantially in lateral alignment; pedals for the levers; a shaft secured to each lever and forming an axis therefor; and gears, operably connecting the two shafts, adapted for disengagement to permit the adjustment of both levers about their axes, relative to the operator's seat, whereby the lateral alignment in the new position, for normal rudder position, is retained.

5. In an aeroplane, a rudder control comprising a pair of operating levers substantially in lateral alignment; pedals for the levers; means secured to each lever for connecting to the rudder, a shaft secured to each lever and forming an axis therefor; fixed bearings for the shafts; gears secured to and operably connecting the two shafts; and means adapted to disengage the gears for permitting the adjustment of the position of both levers about their axes, relative to the operator's seat, whereby the lateral alignment in the new position, for normal rudder position, is retained.

6. In an aeroplane having a control surface, an operating mechanism for said control surface including a pair of operating levers having pivotal mounting and being positively interconnected to rotate in oppo-

site directions, and means independent of the positive interconnection for transmitting the motion of the levers to said control surface.

7. In an aeroplane having a control surface, an operating mechanism for said control surface including a pair of manual levers positively interconnected to rotate in opposite directions, and means for adjusting the positive interconnection whereby the position of the levers for the normal position of said control surface may be varied.

8. In an aeroplane having a control surface, an operating mechanism for said control surface including a pair of manual levers positively interconnected to rotate in opposite directions and in substantially parallel planes, and means for adjusting the positive interconnection whereby the position of the levers for the normal position of said control surface may be varied.

9. In an aeroplane having a control surface, an operating mechanism for said control surface including a pair of manual levers having pivotal mounting, toothed-gear means between said levers for positively rotating the levers in opposite directions, and means for adjusting said toothed gear means whereby the position of the levers for the normal position of said control surface may be changed.

In testimony whereof I hereto affix my signature.

MILTON C. BAUMANN.

Witness:

H. C. MANGEY.