April 15, 1930. O. H. MADORIE 1,755,124

AIRPLANE CONTROL STICK

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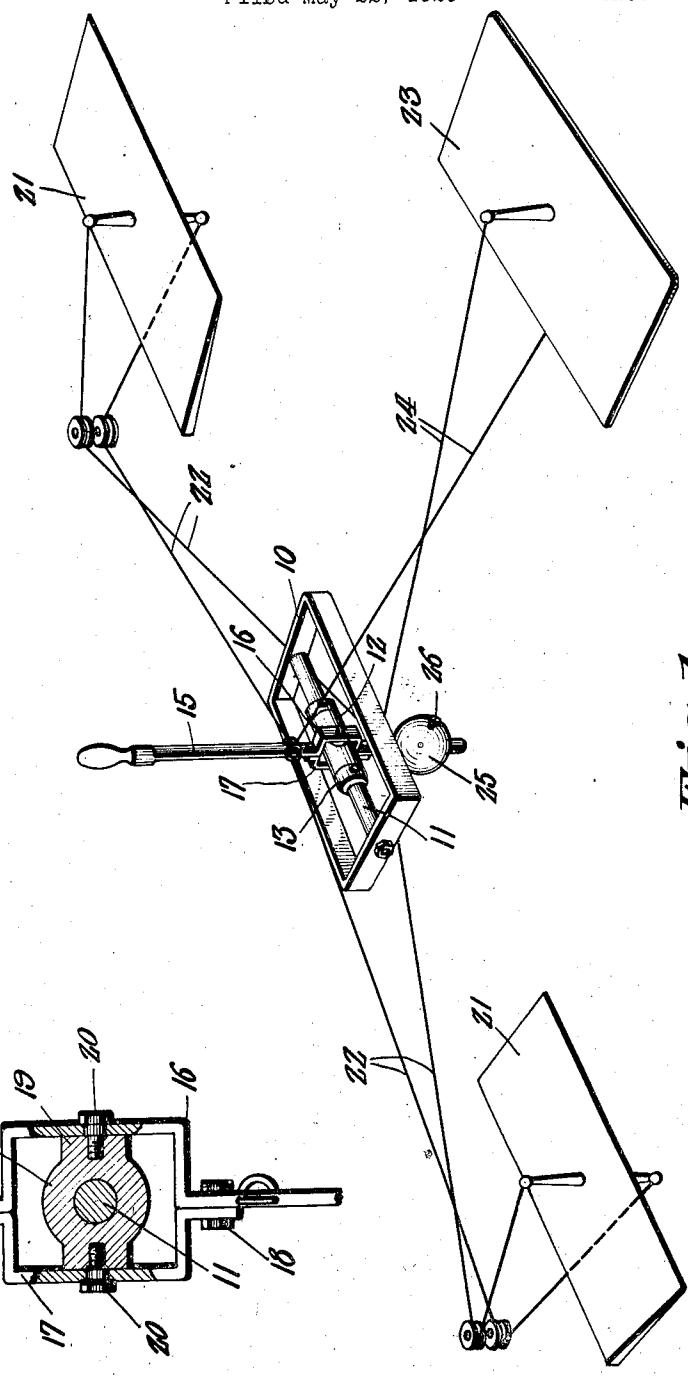

Fig. 1.

Fig. 5.

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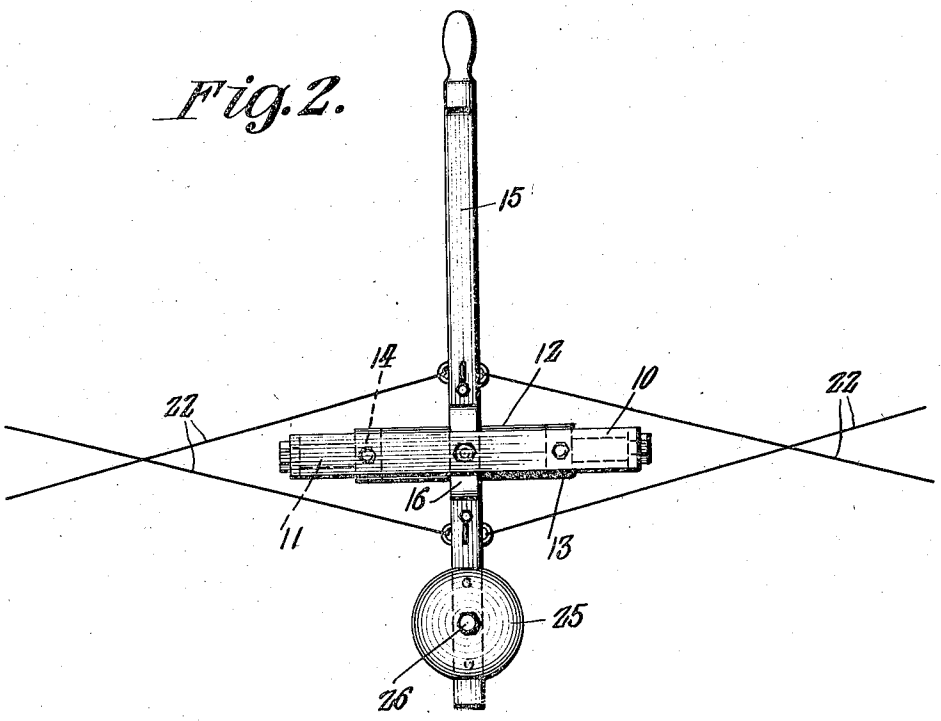
Fig. 2.



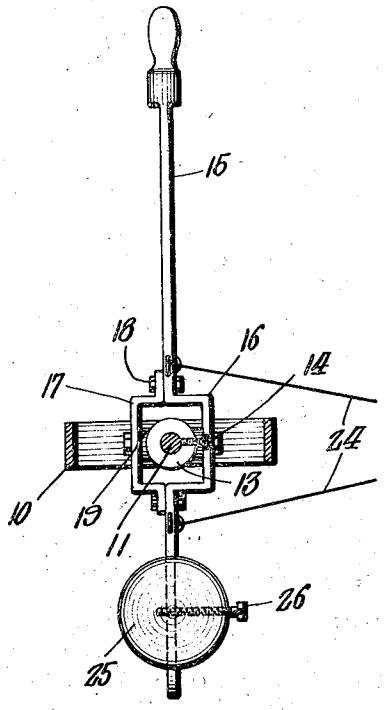
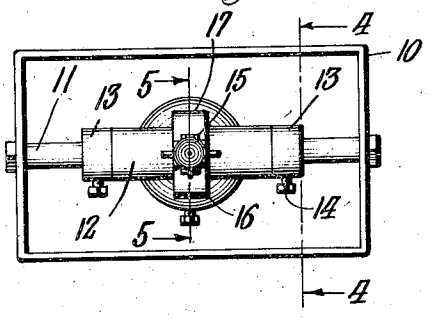


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE

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AIRPLANE CONTROL STICK

Application filed May 22, 1929. Serial No. 365,135.

This invention relates to improvements in controlling means for airplanes and has for an object the provision of a control stick with means for mounting the stick to provide for universal pivotal movement, whereby the ailerons and the elevator of an airplane may be conveniently controlled.

Another object of the invention is the provision of a controlling stick mounting which has been reduced to a minimum number of parts, so as to provide for simplicity, stability and lightness of construction, features which are especially desirable in the construction of airplanes.

Another object of the invention is the provision of an adjustable counterbalance for the stick, which may be adjusted in accordance with the pull of the ailerons and the elevator, so that the stick may be easily manipulated and will automatically assume a neutral position in the event of its release by the aviator.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a skeleton perspective view illustrating a control stick constructed and mounted in accordance with the present invention and shown connected for the control of the ailerons and the elevator of an airplane.

Figure 2 is a fragmentary side elevation.

Figure 3 is a top plan view.

Figure 4 is a section taken substantially on the line 4—4 of Figure 3.

Figure 5 is an enlarged fragmentary sectional view taken substantially on the line 5—5 of Figure 3 with parts in section.

Referring to the drawings in detail wherein like characters of reference denote corresponding parts, the reference character 10 indicates a supporting frame which is adapted to be mounted rigid with the frame of the airplane. This frame 10 supports a shaft 11 which is disposed transversely of the airplane and which has mounted thereon a sleeve 12. This sleeve is capable of rocking movement upon the shaft 11 and is held against axial movement by means of collars 13 which are adjustably secured to the shaft by means of set screws 14.

The control stick is indicated at 15 and is provided intermediate its ends with an offset portion 16. In addition, the stick 15 has secured thereto a substantially U-shaped strap 17 whose ends are secured to the stick adjacent the ends of the offset portion 16, by means of bolts 18. A rectangular frame is thus provided in the stick through which the sleeve 12 passes.

Extending diametrically from the sleeve 12 are bosses 19. These bosses abut the opposed faces of the frame which is formed by the offset portion 16 and the strap 17. Trunnions 20 provide a pivotal connection between the stick frame and the sleeve 12, the trunnions consisting of bolts having relatively large smooth bearing portions upon which the frame may be rocked and threaded portions which enter the bosses 19.

From the foregoing description and accompanying drawings it will be seen that the stick 15 is capable of universal pivotal movement.

In Figure 1 of the drawings, the ailerons of an airplane are indicated at 21 and these ailerons are connected to the stick 15 above and below the pivotal mounting of the stick by means of cables 22, so that when the stick is rocked laterally, the ailerons will be moved pivotally. In addition, the stick is connected to an elevator 23 by means of cables 24 which are also connected to the stick above and below its point of pivotal mounting, so that when the stick is rocked forward or rearward, the elevator will be adjusted for ascent or descent.

Mounted upon the stick 15 below its point of pivotal mounting is a weight 25. This weight is adjustably secured upon the stick by means of a binding screw 26. By properly adjusting the weight upon the stick, the latter may be balanced with respect to the ailerons and elevator, so that in the event the aviator releases his hold upon the stick, the latter will assume a neutral position with

the ailerons and elevator neutral. This action will materially aid in the safety of the airplane.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:—

1. In a control stick for airplanes, a shaft disposed transversely of the airplane, a sleeve mounted for rocking movement upon the shaft, a control stick, an offset portion provided in said stick, a substantially U-shaped strap having its opposite ends secured to the stick at the ends of the offset portion and cooperating with the latter to provide a frame for the passage of the sleeve, means to pivotally secure the stick frame to diametrically opposite sides of the sleeve and means to connect the stick with the ailerons and elevator of the airplane.

2. In a control stick for airplanes, a stationary supporting frame, a shaft secured in said frame, a sleeve mounted for rocking movement upon the shaft, a control stick, an offset portion provided in said stick, a substantially U-shaped strap having its opposite ends removably secured to the stick at the ends of the offset portion and cooperating with the latter to provide a frame for the passage of the sleeve, headed trunnions extending through and having bearings in said frame and threadedly engaging the sleeve to pivotally secure the stick frame to diametrically opposite sides of the sleeve, and means to connect the stick with the ailerons and elevator of the airplane.

In testimony whereof I affix my signature.

OTTO H. MADORIE.