

W. D. McCORMACK.
 INCLINOMETER FOR USE ON AIRCRAFT.
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1,308,795.

Patented July 8, 1919.

Fig. 1.

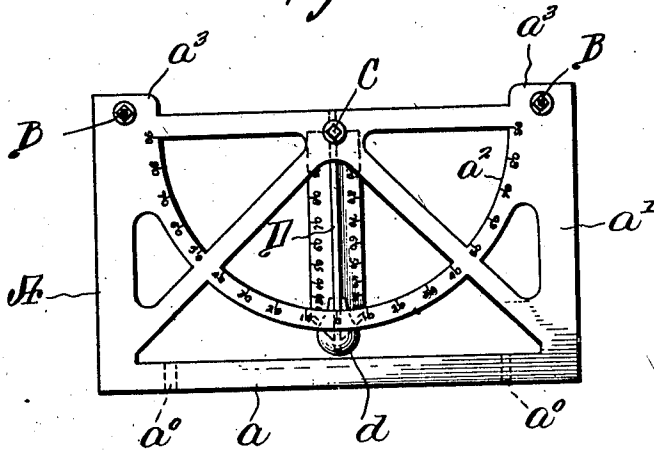


Fig. 3.

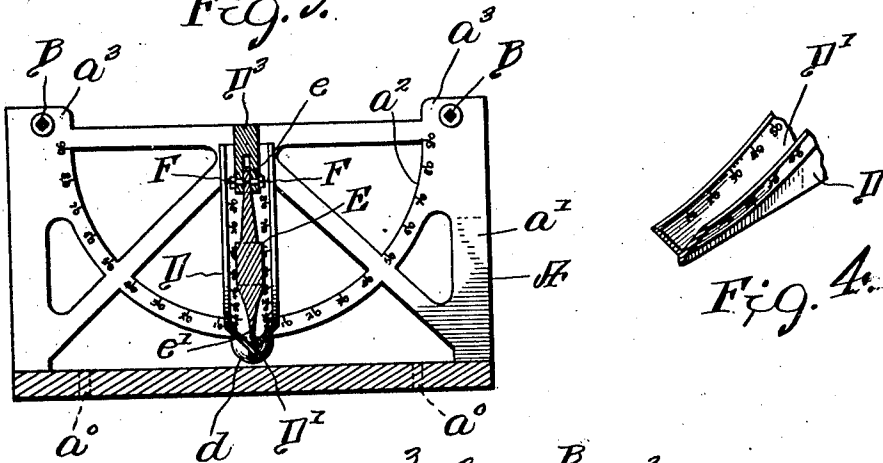
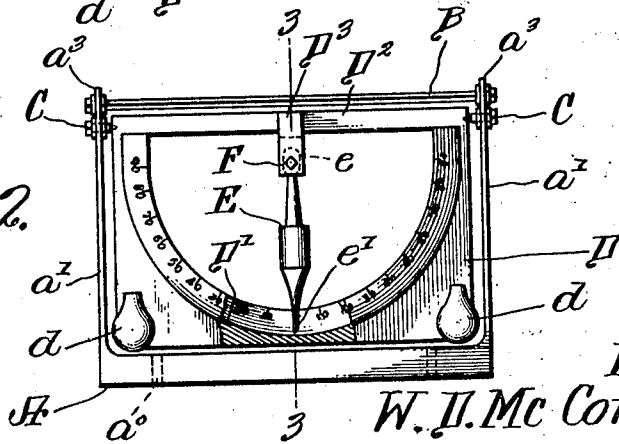


Fig. 4.

Fig. 2.



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INCLINOMETER FOR USE ON AIRCRAFT.

1,308,795.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM D. McCORMACK, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Inclinerometers for use on Aircraft; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in inclinometers for use on aircraft. With such craft it is desirable at all times to know the angle or inclination of both the longitudinal and transverse axes, and this is especially difficult when the aircraft is in the clouds, or above the clouds, or at night.

According to my invention I provide a simple, cheap and effective device for this purpose, which is not likely to get out of order, and yet which may be quickly and conveniently read by the aviator when desired.

My invention will be more readily understood after reference to the accompanying drawings, in which:—

Figure 1 shows a side elevation of the complete device.

Fig. 2 shows an end view of the device, parts being broken away.

Fig. 3 shows a section along the line 3—3 of Fig. 2; and

Fig. 4 is a perspective view showing the V-shaped trough in which the point of the pendulum travels.

A represents the main frame which may be of metal, glass, or other suitable material, but preferably of metal, which main frame is provided with a face a , provided with bolt holes a^0 for conveniently attaching the same to the aeroplane.

Projecting upward from this face are the two sides a' which are provided with graduated arcs a^2 . These sides a' are preferably cut away, as shown, to lighten the parts, and especially to emphasize the shape of the graduated arcs. These sides a' are shown as provided with upward projections a^3 connected together by the tie bolts B. These tie bolts are preferably located somewhat above the 90° mark at each end of each graduated arc, so that the full tilt of 90° may be indicated.

Projecting through the side frames a' are the pivot pins C, from the points of which the plate D is pivotally suspended. This plate D is provided with weights d , and is cut away in its center in the form of an arc of a circle, as shown in Fig. 3, and the inner face of the cut away portion is provided with a V-shaped trough D' , which trough is preferably graduated inside and out on both faces.

The upper portion of the recess in the pivot plate D is spanned by the cross rib D^2 , and projecting downwardly from this cross rib is the arm D^3 carrying the bearing points F to which the head e of the pendulum E is swiveled. The point e' of the pendulum projects down into the V-shaped trough, and this trough serves as a guide for said point as the pendulum swings about its bearing points F.

The operation of the device is as follows:—

Assuming the instrument, as indicated in Figs. 1 and 2, to be mounted parallel to the longitudinal axis of the machine, and assuming that the instrument, as shown in Fig. 3, is parallel to the transverse axis of the machine, if the machine tilts fore and aft, the plate D will swing over the two arcs a^2 , and the angle of fore and aft tilt may be read at a glance.

In a similar way, if the machine be tilted laterally, the point of the pendulum E will swing in the trough D' , and the angle of lateral tilt may be read from the graduations on said trough. Thus, it will be practicable for the aviator to note at all times the angle through which his machine is tilted, either in fore and aft, or in a lateral direction.

In order to render the device suitable for night work, the graduations and numerals may be made of radium paint, or any other illuminating compound, such as is common with compasses, watch faces, or the like.

It will thus be seen that I provide a cheap, simple and effective device which may be applied to or removed from an aeroplane, and which will enable the aviator at all times to determine the angle of tilt either in the fore and aft, or in the lateral direction.

In order to insure accurate results, it is important that the pivot pins C should be in the mathematical centers of the arcs a^2 , and the pivot pins F should be in the mathe-

mathematical centers of the arcs forming the sides of the trough D'.

While I have shown the embodiment of the invention in its preferred form, it will be obvious that various modifications might be made in the herein described construction, and in the combination and arrangement of parts which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. In an inclinometer, the combination with a main frame having parallel sides with graduated arcs carried by said sides, and pivot pins at the centers of said arcs, of a heavy plate suspended from said pivot pins and provided with a segment-shaped recess therein, with radial graduations below said recess, and a pendulum suspended from a pivot above and having its point adapted to swing over said radial graduations, substantially as described.

2. In an inclinometer, the combination with a main frame having parallel sides with graduated arcs carried by said sides, and pivot pins at the centers of said arcs, of a weighted plate suspended from said pivot pins and provided with a segment-shaped recess therein, with an arc-shaped trough, V-shaped in cross section, forming the bottom and sides of said recess, said trough being provided with radial graduations, and a pendulum suspended from a

pivot concentric with said trough and having its point adapted to swing over said radial graduations, substantially as described.

3. In an inclinometer, the combination with a main frame having parallel sides with graduated arcs carried by said sides, and pivot pins at the centers of said arcs, with tie bolts connecting said sides above the centers of said arcs, of a heavy plate suspended from said pivot pins and provided with a segment-shaped recess therein, with radial graduations below said recess, and a pendulum suspended from a pivot above and having its point adapted to swing over said radial graduations, substantially as described.

4. In an inclinometer, the combination with a main frame having parallel sides with graduated arcs carried by said sides, and pivot pins at the centers of said arcs, with tie bolts connecting said sides above the centers of said arcs, of a weighted plate suspended from said pivot pins and provided with a segment-shaped recess therein, with an arc-shaped trough, V-shaped in cross section, forming the bottom and sides of said recess, said trough being provided with radial graduations, and a pendulum suspended from a pivot concentric with said trough and having its point adapted to swing over said radial graduations, substantially as described.

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