S. J. SANFORD.

AERONAUTICAL CLINOMETER.

APPLICATION FILED JULY 14, 1919.

1,377,442. Patented May 10, 1921.

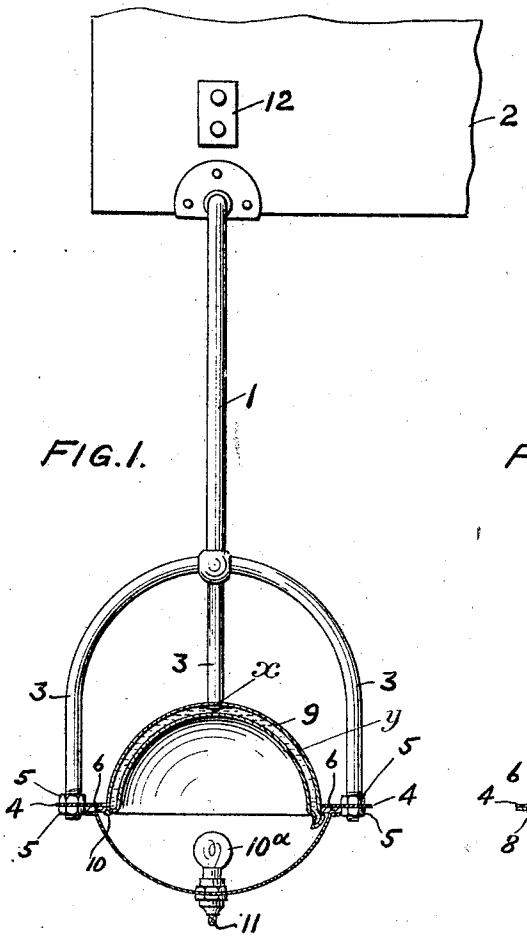


FIG. 1.

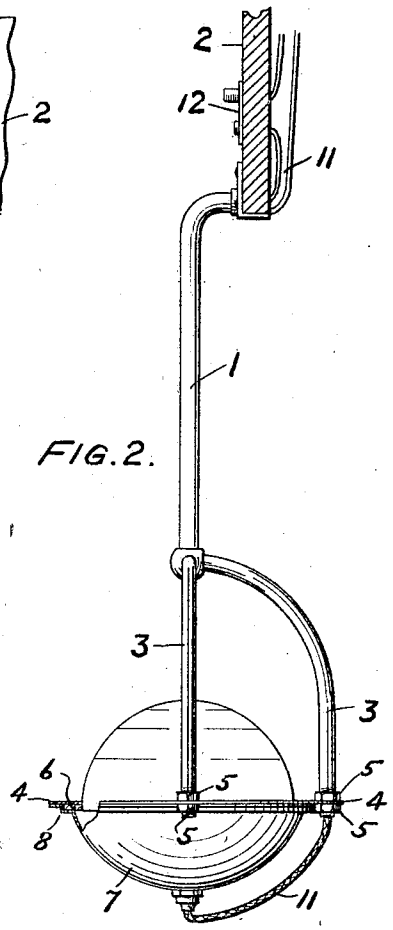


FIG. 2.

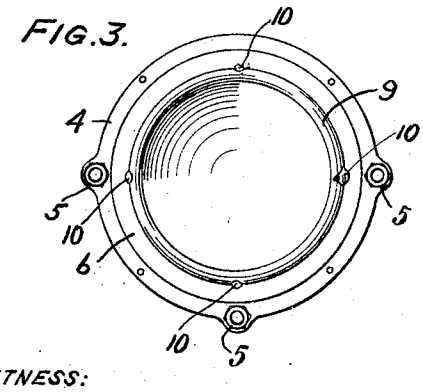


FIG. 3.

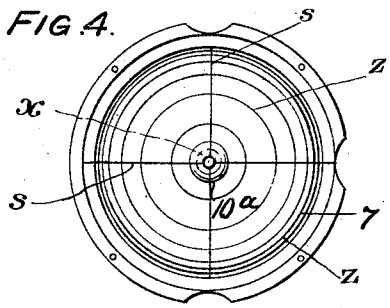


FIG. 4.

WITNESS:

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AERONAUTICAL CLINOMETER.

1,377,442. Specification of Letters Patent. Patented May 10, 1921.

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To all whom it may concern:

Be it known that I, SYDNEY J. SANFORD, a citizen of Canada, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Aeronautical Clinometer, of which the following is a specification.

The principal object of the present invention is to enable the driver or pilot of an aeroplane to ascertain, at all times both by night and by day, the angle in respect to the horizon at which his machine may be tipped in any direction; that is, to ascertain the angle of ascent, descent or sidewise tilt, and another object of the invention is to provide an illuminated aeronautical clinometer which can be readily adjusted and which is well adapted to meet the requirements of use in connection with an aeroplane. Other objects as well as the nature, characteristic features and scope of the invention will appear from the following description which will be given in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1, is a front view, partly in section, of an aeronautical clinometer embodying features of the invention.

Fig. 2, is a side view of the same with parts broken away.

Fig. 3, is a view of the underside of the instrument looking upward in Fig. 1, and

Fig. 4, is a top or plan view of the bowl, shown in Fig. 2, with the superstructure removed.

In the drawings 1, is a frame, shown as depending from the switchboard 2, of an aeroplane or airship. This frame is provided with feet 3, of which three are shown, and these three feet permit one side of the frame, the left-hand side in Fig. 2, to remain open and unobstructed, and these three feet are useful in connection with the adjustment of the instrument as will hereinafter appear. 4, is a carrying ring apertured for the passage of the feet 3, which are adjustably connected with the ring 4, by adjusting nuts 5. 6, is a fiber ring carried by the carrying ring 4. 7, is an opaque reflecting bowl flanged at 8, and like the fiber ring 6, carried by the carrying ring 4. 9, is a double walled translucent hemispherical or dome-shaped container, as of glass. This container 9, is cemented to the fiber ring 6, and forms with the container a light chamber. Pads 10, on the container 9, facilitate the cementing operation and one of these may be the closure of the opening through which there is introduced into the container a fluid y, Fig. 1, which contains the bubble x. 10^a, is a light arranged in the light chamber and shown as mounted through the bowl 7. The connections 11, for this light may pass through one of the feet 3, made hollow for this purpose, to the switch 12, on the switch-board.

When the aeroplane is level, the movable fluid spot or air bubble x, Figs. 1 and 4, occupies a polar position in respect to the spherical or dome shaped surface of the container 9, and this movable fluid spot or air bubble moves freely over that surface to indicate the departure of the aeroplane or airship from its level position in all directions, and the relative movement of the spot and surface may be ascertained by suitable latitudinal and longitudinal graduations Z and S, Fig. 4.

I claim:

1. In an aeronautical clinometer the combination of an opaque bowl, a translucent double walled dome-like container forming with the bowl a light chamber, a source of light in said chamber, and liquid having a bubble therein provided in the container and illuminated by the source of light to emphasize the bubble, substantially as described.

2. In an aeronautical clinometer the combination of a double-walled dome-like container consisting entirely of glass and having a sealed closure for a liquid provided in said container and having a bubble therein, substantially as described.

SYDNEY J. SANFORD.