Sept. 27, 1938. L. F. CARTER 2,131,471

ILLUMINATOR FOR INDICATOR DIALS

Filed April 29, 1936

Fig. 1.

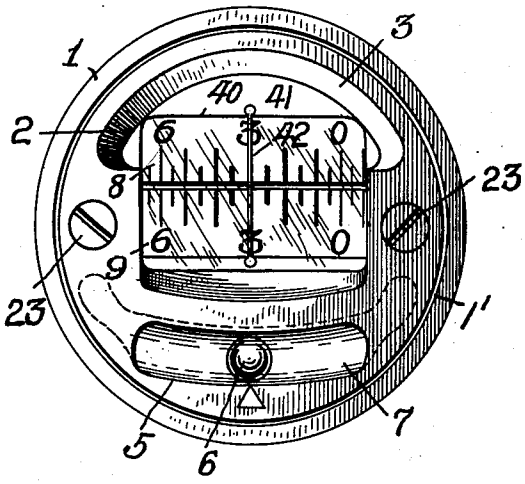


Fig. 2.

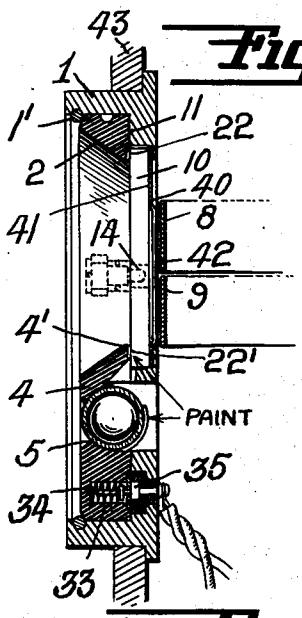


Fig. 3.

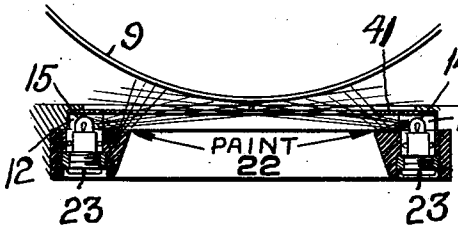


Fig. 4.

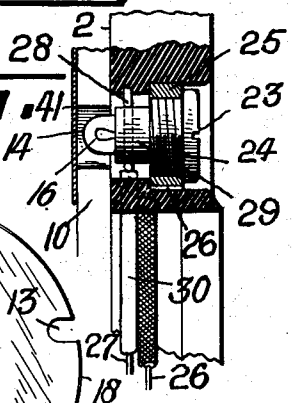


Fig. 5.

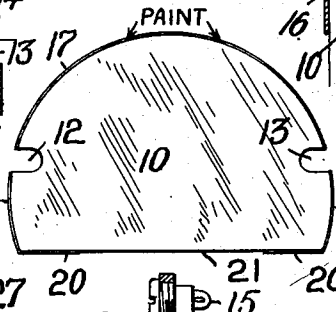


Fig. 6.

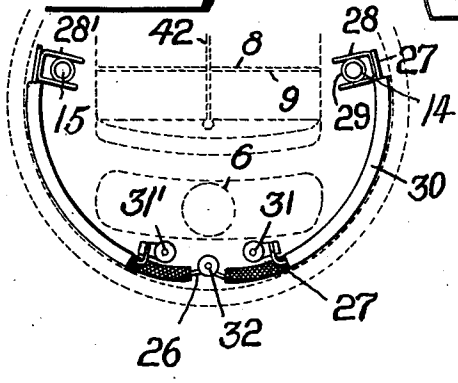
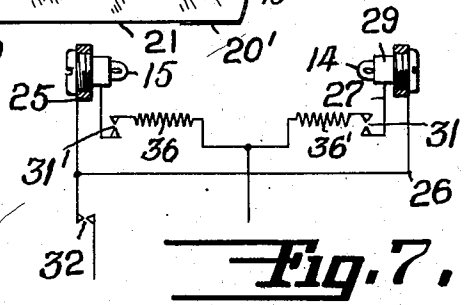


Fig. 7.



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UNITED STATES PATENT OFFICE

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ILLUMINATOR FOR INDICATOR DIALS

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Application April 29, 1936, Serial No. 76,984

2 Claims. (Cl. 240—2.1)

This invention relates to illuminating means for indicators such as employed on the dashboards of automobiles or the instrument panels of aircraft. In both cases a system of indirect illumination is desirable, wherein a minimum amount of light is reflected into the eyes of the observer, but the indications are rendered distinctly visible from the driver's or pilot's seat.

My invention is shown as applied to the form of aircraft instrument known as the directional gyroscope with ball bank attachment, but it is obvious that it may be applied to many other types of instruments.

Referring to the drawing, showing one form my invention may assume,

Fig. 1 is a front elevation of such a directional gyroscope.

Fig. 2 is a vertical section through the face of the same.

Fig. 3 is a horizontal mid-section of the structure shown in Fig. 1.

Fig. 4 is an enlarged sectional view through one of the lamp holders and adjacent parts.

Fig. 5 is a face view of the special glass cover for the device.

Fig. 6 is a rear elevation of the lamps and wiring therefor, the adjacent parts being shown in dotted lines.

Fig. 7 is an elementary wiring diagram of the lamp connections.

As shown, the front window of the device, or face ring 1 of the casing 43 of the instrument is of circular shape, within which is held by spring wire 1' a smaller ring shaped member 2 having an upper opening 3 and a lower portion 4 having a transverse curved slot 5 therein, through which the liquid ball bank indicating tube 7 and its ball 6 are visible. The directional gyro card or cards 8 and 9 are read on reference index 42 and are visible through a rectangular opening 40 in a background plate 41. Index 42 is shown as a fine wire extending across opening 40. A glass window 10, clamped between the bezel 2 and the back plate 41, seals the opening so that the interior of casing 43 may be made air tight.

The glass 10 is shown as circular at the top, but has a flat portion at the bottom which lies below the upper edge 4' of part 4 of ring 2, and the glass is cut out at opposite sides at 12 and 13 to make room for the small illuminating bulbs 14 and 15 which project within these cut-out portions so as to shine the light from the miniature filaments 16 thereof through the thickness of the glass, the direct rays toward the dials being cut off by back plate 41 (see Fig. 3). The circumferential edge or periphery of the glass is ground true and provided with a reflecting interior surface as by painting it with a reflecting paint, such as white or aluminum paint, or by silvering or by frosting the periphery, so that the rays passing through the glass in the plane of the paper in Fig. 5 will strike the edge and be reflected and scattered so that some of the rays will be deflected downwardly onto the indicator card or cards. This paint covers the top 17 and sides 18 and 19 and outer edges 20 and 20' of the bottom, but not the cut out sections 12 and 13 nor the intermediate center section 21, these sections being left clear so that light will penetrate into the glass and a portion emerge from the glass at section 21 and illuminate the ball bank indicator. The back inner portion 11 of the bezel 2 is also painted with a reflecting paint, as shown at 22 and 22', so that the rays striking the same will be reflected onto the dials. Similarly, the rear portion of the ball bank indicating tube 7 is painted a light color, the paint being omitted, however, from the top so that the rays from the lamp will enter the top and illuminate the interior of the tube 7 and the ball 6. All parts mentioned, except the markings and other graduations on the dials, are of a dull, dark color so that no more light will be reflected into the eyes of the observer than is necessary to see the indications. The dial graduations and numerals on cards 8 and 9 and index 42 are preferably painted with radium paint so as to increase their visibility in dim light. The same is true of the back of tube 7.

The lamps proper are of the miniature, low voltage variety such as used in surgical lamps and are shown as mounted with a slotted head 23 with a threaded shank 24 adapted to be threaded in a ring 25 clamped in a hole in member 2, one wire 26 being connected to said ring. The other wire 27 is shown as secured to a spring clip 28 which clamps around a small metal thimble 29 on the base of the lamp, the filament being connected between the thimble and threaded base 24. Both wires are shown as extending downwardly through small metal tubes 30, one wire of one lamp being connected at its lower end to a spring pressed pin 31, the other wire being connected to a spring pressed pin 32. The corresponding wires from the other lamp 15 are similarly mounted and are connected to spring pressed pin 31' and to the same pin 32. The three pins are mounted within sockets or apertures 33 near the bottom of the bezel 2 and are normally pressed outwardly by

springs 34 so that the pins engage live contacts 35 on the bottom of the window frame 1.

As shown in the wiring diagram, the lamps are preferably placed in parallel, although their voltage is much below that of the normal storage battery voltage, and a separate resistance 36, 36' provided for each lamp so that if one lamp or resistance burns out, the other will remain lighted and will not be burned out by the sudden rise in voltage. The resistances are preferably placed in the circuit before the current passes into the wires on the bezel, i. e., on the supply side of the spring contacts 31, 31' and 32, so that heat is not introduced near the glass cover or the indicators.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. In an indicating instrument having an opening therein through which a main and a secondary indicator are visible, a transparent cover for said opening having the major portion of its periphery provided with an interiorly reflecting surface to scatter light over said main indicator but having short sections left clear, certain of said clear sections being indented and another straight, and a miniature electric light bulb projecting beside at least one of said indented clear sections, said second indicator being at one side of the main indicator and adjacent said straight clear section to illuminate the second indicator.

2. In an indicating instrument having an opening therein through which a main and a secondary indicator are visible, a transparent cover for said opening having the major portion of its periphery provided with an interiorly reflecting surface and also having a plurality of cut out portions in its periphery, a miniature electric light bulb projecting within each cut out portion, the surfaces of which cut out portions are transparent for admitting light therethrough, the light rays from the bulbs passing through the surfaces of said cutout portions into the body of said cover, the interiorly reflecting surfaces of said cover periphery serving to scatter the light rays derived from said bulbs for effecting indirect illumination of said main indicator, said secondary indicator lying below said main indicator, the periphery of said cover being left clear adjacent thereto to illuminate the second indicator.

LESLIE F. CARTER.