July 24, 1956 F. A. HARRINGTON 2,756,412

MOISTUREPROOF CAP ASSEMBLY WITH PILOT LIGHT TEST MEANS

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Fig. 3

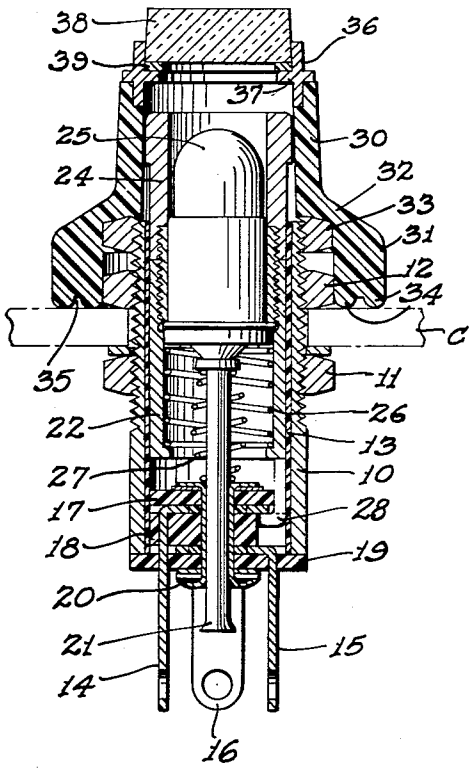


Fig. 2

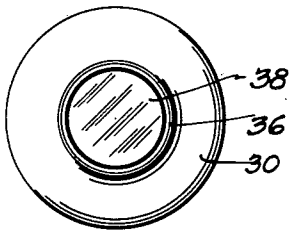


Fig. 1

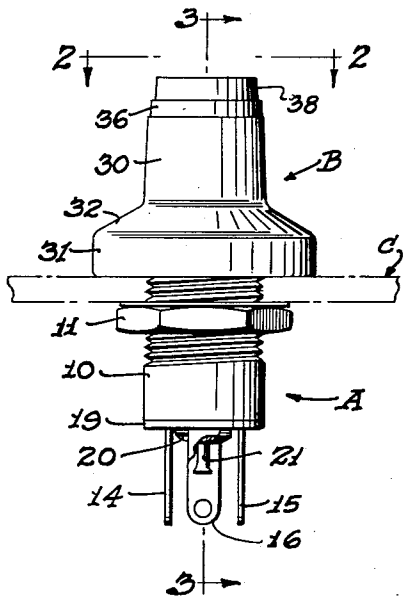
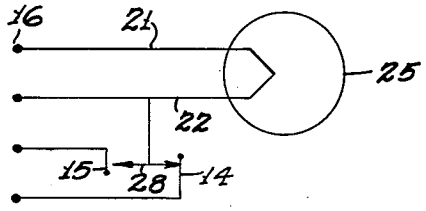


Fig. 4



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MOISTUREPROOF CAP ASSEMBLY WITH PILOT LIGHT TEST MEANS

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11 Claims. (Cl. 340—252)

This invention relates to indicator lights such as are used, for example, on instrument panels of airplanes and on control panels of various kinds. A general object of the invention is to provide a moisture-proof lens cap assembly for such an indicator light.

A specific object is to provide a sealed cap embodying a jewel lens for transmitting light rays from a light bulb sealed with the cap.

The invention relates further to an indicator light of the type which, by pressing upon its lens cap, will establish a test circuit for testing its operative condition; defects such as a burned-out bulb or a defective connection between the light and its source of electric power, being thus detected.

A specific object is to provide an indicator light having its bulb disposed within an axially shiftable sleeve which functions as a circuit closer for the test circuit when pushed inwardly in the barrel of the light, together with a lens cap which provides a sealed enclosure for the outer end of the light, and is adapted to yield to finger pressure so as to engage the sleeve and to transmit to it the axial movement required for closing the test circuit.

More specifically, the invention contemplates an arrangement wherein a lens cap has a skirt of compressible material, such as soft rubber which provides a hermetically sealed connection to the outer end of an indicator light barrel and at the same time is collapsible under finger pressure, to bring the lens ring into pressure-transmitting engagement with an axially shiftable circuit closer sleeve in which the light bulb is mounted.

Other objects and advantages of the invention will be apparent from the ensuing specification and appended drawing in which:

Fig. 1 is a side view of a "press-to-test" indicator light embodying the invention;

Fig. 2 is a face view of the lens cap;

Fig. 3 is an enlarged axial sectional view of the indicator light; and

Fig. 4 is a circuit diagram of the indicator light in a typical installation.

Referring now to the drawings in detail, Fig. 1 illustrates the indicator light of my invention, including barrel assembly A and lens cap B, installed in a control panel, indicated in phantom at C.

Referring now to Fig. 3, barrel assembly A comprises a barrel 10 having a threaded portion to extend through an aperture in panel C, equipped with retainer nuts 11 and 12 for securing it to the panel, and having an insulator lining sleeve 13. Mounted in its rear end is a sandwich of terminal and spacer parts including terminals 14, 15 and 16, of L-form, together with insulator washers 17 and 18, fitted within lining 13, and an end disc 19, the sandwich being tied together by a metal bushing 20, which electrically connects the terminal 16 to a contact stud 21 that is slidably mounted therein. Slidably mounted within lining 13 is a bulb mounting sleeve in three sections including an inner section 22, a connector ferrule 23, and an outer collar 24, the ferrule 23 being threaded into the

sections 22 and 24 to join them together. A bulb 25 is mounted in this composite sleeve, with its base flange positioned against the end of ferrule 23. Collar 24 projects beyond the tip of bulb 25, for engagement by the lens cap, which will presently be described. A spring 26, seated against an end flange on sleeve section 22, provides cushioning support for bulb 25. A small spring 27, engaged under compression between bushing 20 and a head on the outer end of stud 21, maintains the latter in yielding contact with the center contact of bulb 25.

Referring now to Fig. 4, bulb 25 has one side of its filament connected through stud 21 to terminal 16; and through sleeve section 22 and a shiftable contactor 28, its other side is normally connected to terminal 14. Contactor 28, as disclosed in Fig. 3, constitutes an extension of sleeve section 22.

Movement of sleeve section 22 into proximity to washer 17 will move contactor 28 out of contact with terminal 14 and into contact with terminal 15, to 26 set up the test circuit. The normal, functioning circuit of the indicator light is through terminal 14.

The present invention provides the improved lens cap B, which comprises a skirt 30 of relatively soft, compressible resilient material such as soft rubber, either natural or synthetic. Skirt 30 has an enlarged rim portion 31, joined to the smaller body portion thereof by an offset shoulder portion 32 in which is embedded a nut 33, by means of which the cap B can be threaded onto the end of barrel 10. The end of rim portion 31 is formed with concentric beads 34, defining between them an annular face groove 35. As the cap is threaded onto barrel 10, beads 34 are flattened against panel C with a suction cup effect which hermetically seals the cap to the panel.

In the outer end of skirt 30 is a lens ring 36, having an internal flange 37 against which is seated a jewel lens 38, with an interposed gasket 39 for hermetically sealing the lens in the ring. Ring 36 is sealed in skirt 30 by being molded therein.

In the operation of the device, finger pressure against lens 38 will cause skirt 30 to collapse, whereby lens ring flange 37 will engage the outer end of collar 24 to cause the sleeve 22—24 to shift axially within liner sleeve so as to bring contactor 28 into contact with terminal 15, without destroying the hermetic seal around the outer end of barrel 10. Such hermetic seal completely excludes moisture and dust from the interior of the barrel, thus preserving the mechanism at full efficiency.

I claim:

1. In an indicator light, in combination; a lamp bulb; a barrel; a pair of terminals mounted in the rear end of said barrel, for establishing alternative circuits to said lamp bulb; a sleeve slidably mounted in said barrel and having means for establishing alternative connections between said bulb and the respective terminals, means yieldingly urging said sleeve to a forward limit position wherein one of said connections is established; and a lens cap including a lens covering the forward end of said sleeve, a lens ring mounting said lens, and a skirt of compressible elastic material attached to the outer end of said barrel and collapsible axially to provide for transmission of movement from said lens ring to the outer end of said sleeve whereby to effect movement of said sleeve rearwardly to establish the other of said connections.

2. In an indicator light: a barrel having an externally threaded forward end portion to extend through a panel and having means threaded thereon for securing it to the panel with said forward end portion projecting; a sleeve slidable axially in said barrel; a lamp bulb mounted in the forward end portion of said sleeve; means in the rear end portion of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp bulb; and a lens cap including a lens covering the

forward end of said sleeve, a lens ring mounting said lens, and a skirt of compressible elastic material in the forward end of which said lens ring is mounted, said skirt at its rear end including a rim portion, and a nut embedded in said rim portion and adapted to be threaded onto said projecting forward end portion of the barrel, said skirt being collapsible axially to provide for transmission of movement from said lens ring to the outer end of said sleeve whereby to effect movement of said sleeve rearwardly to establish said test circuit.

3. In an indicator light: a barrel; a sleeve slidable axially therein; a lamp bulb mounted in the forward end portion of said sleeve; means in the rear end portion of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp bulb; and a lens cap including a lens covering the forward end of said sleeve, a lens ring mounting said lens, and a skirt of compressible elastic material in the forward end of which said lens ring is mounted, said skirt being collapsible axially to provide for transmission of movement from said lens ring to the outer end of said sleeve whereby to effect movement of said sleeve rearwardly to establish said test circuit.

4. In an indicator light: a barrel; a sleeve slidable axially therein; a lamp bulb mounted in the forward end portion of said sleeve; means in the rear end portion of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp bulb; and a lens cap including a lens covering the forward end of said sleeve, and a skirt of compressible elastic material in the forward end of which said lens is mounted, said skirt being collapsible axially to provide for a transmission of movement from said cap to the outer end of said sleeve whereby to establish said test circuit.

5. A lens cap for an indicator light having a barrel, the forward end portion of which is threaded and adapted to project through a mounting panel, having a lamp and a sleeve containing said lamp and slidable axially in said barrel, and having means in the rear end of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp; said lens cap comprising: a lens, a lens ring mounting said lens, a skirt of compressible elastic material in the forward end of which said lens ring is mounted, said skirt at its rear end including a rim portion, and a nut embedded in said rim portion and adapted to be threaded onto said projecting forward end portion of the barrel, said skirt being collapsible axially to provide for transmission of movement from said lens ring to the outer end of said sleeve whereby to effect movement of said sleeve rearwardly to establish said test circuit.

6. A lens cap for an indicator light having a barrel and a lamp carrying sleeve axially slidable therein and means in the rear end of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to the lamp carried by said sleeve, said lens cap comprising: a lens to cover the forward end of said sleeve, a lens ring mounting said lens, and a skirt of compressible elastic material in the forward end of which said lens ring is mounted, said skirt being collapsible axially to provide for transmission of movement from said lens ring to the outer end of said sleeve whereby to effect movement of said sleeve rearwardly to establish said test circuit.

7. A lens cap for an indicator light having a barrel, a lamp carrying sleeve axially slidable therein and means in the rear end of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to the lamp carried by said sleeve, said lens cap comprising: a lens to cover the forward end of said sleeve, and a skirt of compressible elastic material in the forward end of which said lens is mounted, said skirt being collapsible axially to provide for transmission of movement from the outer end of said cap to said sleeve whereby to effect movement of said sleeve rearwardly to establish said test circuit.

8. In a lens cap for an indicator light having a barrel the forward end portion of which is threaded and adapted to project through a mounting panel having a lamp and a sleeve containing said lamp and slidable axially in said barrel, and having means in the rear end of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp; said lens cap comprising: a lens; a lens ring in which said lens is mounted; a skirt of elastic compressible material in the forward end portion of which said lens ring is mounted, said skirt having at its rear end a rim of larger diameter than said forward end portion; and a nut embedded in said rim and having an internal thread to mate with the thread of said barrel, whereby said cap may be attached to the forward end portion of the barrel with said barrel end portion received within the cap, said skirt being collapsible axially to provide for transmission of movement from said lens ring to said sleeve to establish said test circuit.

9. In a lens cap for an indicator light having a barrel the forward end portion of which is threaded and adapted to project through a mounting panel, having a lamp and a sleeve containing said lamp and slidably axially in said barrel, and having means in the rear end of said barrel, operated by rearward movement of said sleeve, for establishing a test circuit to said lamp; said lens cap comprising a lens; a skirt of elastic compressible material in the forward end of which said lens is mounted, said skirt having at its rear end a rim of larger diameter than said forward end portion; and an offset shoulder portion between said rim and said forward end portion; and a nut embedded in said offset shoulder portion and having an internal thread to mate with the thread of said barrel; said rim projecting beyond said nut for fluid sealing engagment with said panel when said cap is threaded onto the projecting end portion of said barrel, whereby said cap will constitute a sealing cover over said projecting end portion, said skirt being collapsible axially to provide for transmission of movement from said cap to said sleeve to establish said test circuit.

10. In a lens cap for an indicator light having a barrel the forward end portion of which is threaded and adapted to project through a mounting panel: a lens ring in which said lens is mounted; a skirt of elastic compressible material in the forward end portion of which said lens ring is mounted; and a nut embedded within said skirt and having a thread to mate with the thread of said barrel, said skirt at its rear end having a rim projecting axially beyond said nut for sealing engagement with said panel when the cap is threaded over the end of said projecting forward end portion of the barrel, whereby said cap will constitute a sealing cover over said projecting end portion.

11. A cap as defined in claim 10, wherein said rim has, in its rear end face, a pair of concentric, radially spaced beads for establishing sealing contact with the panel.

References Cited in the file of this patent

UNITED STATES PATENTS

2,099,405	Langdon	Nov. 16, 1937
2,424,573	Marco	July 29, 1947
2,610,237	Benner	Sept. 9, 1952