United States Patent

Dupree et al.

[15] **3,665,459**

[45] **May 23, 1972**

[54] ANNUNCIATOR LIGHT HINGED COVER

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[73] Assignee: **Dupree, Inc.**, El Monte, Calif.

[22] Filed: **Dec. 17, 1970**

[21] Appl. No.: **98,979**

[52] **U.S. Cl.** .....**340/381**, 40/132 R, 40/331, 240/7.7, 240/8.16

[51] **Int. Cl.**.....**G09f 9/00**, B60q 3/04

[58] **Field of Search**.....240/7.7; 340/381, 366 G, 366 F, 340/366 E; 40/132 D, 331

[56] **References Cited**

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Primary Examiner—Louis R. Prince
Assistant Examiner—Daniel M. Yasich
Attorney—Harris, Kiech, Russell & Kern

[57] **ABSTRACT**

A light housing for mounting in an instrument panel or the like and carrying a legend for illumination when lamps are energized. An annunciator light requiring small frontal panel space, while providing a maximum legend area and high intensity. In the housing one end of a plate is hinged to a removable front cap with the other end hinged to the housing providing access to lamps carried in sockets fixed in the housing.

11 Claims, 7 Drawing Figures

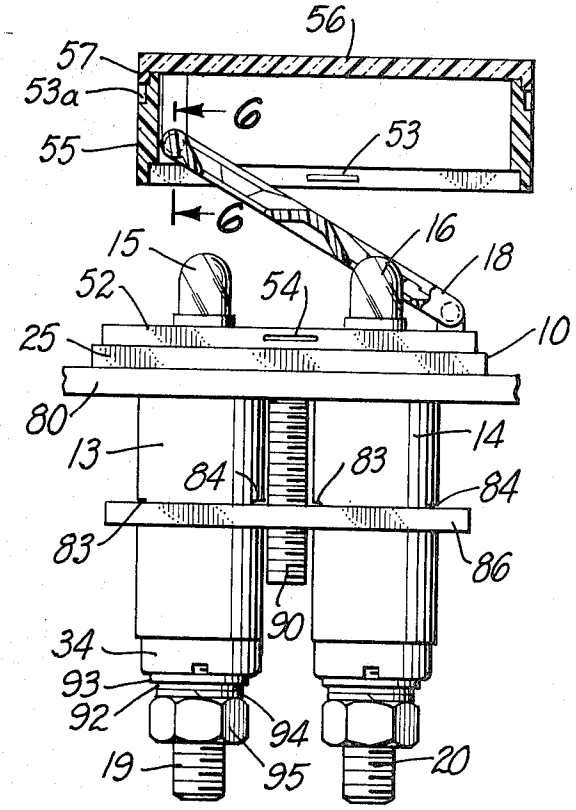


FIG. 1.

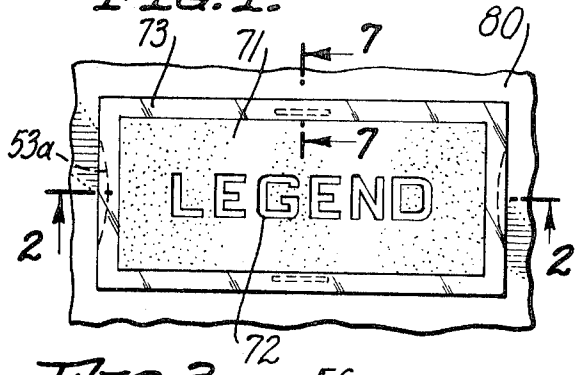


FIG. 2.

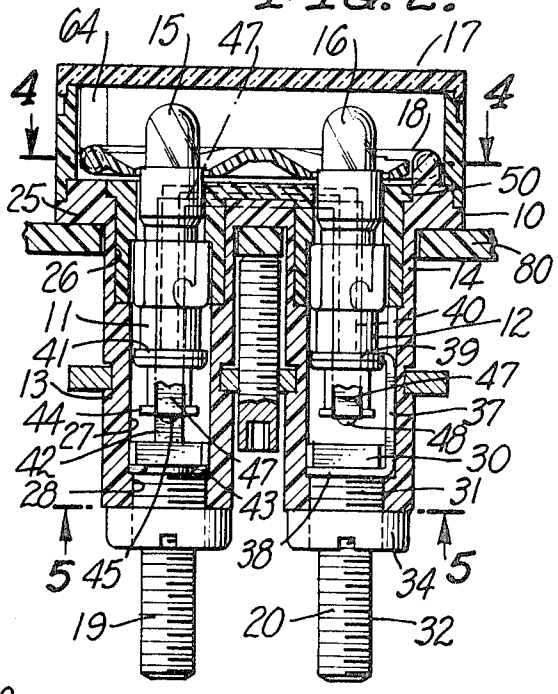


FIG. 3.

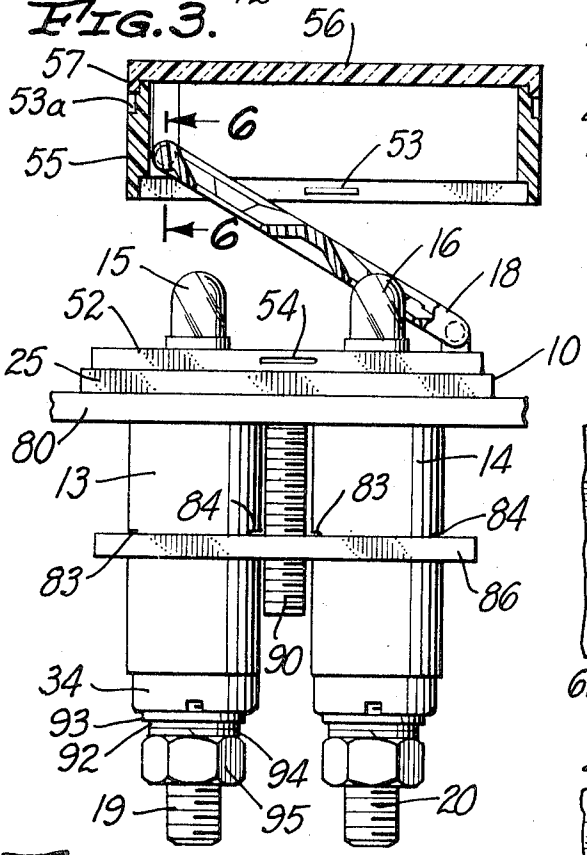


FIG. 4.

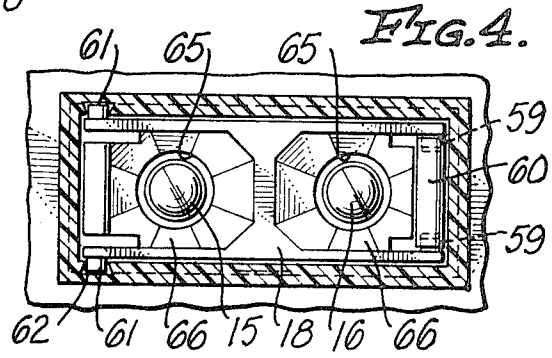


FIG. 5.

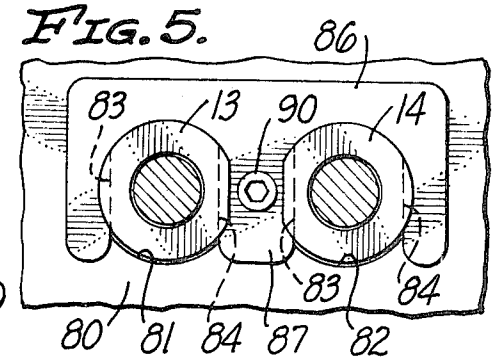


FIG. 6.

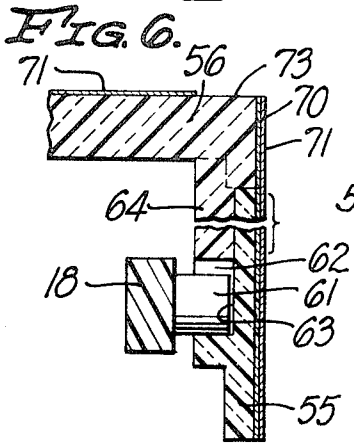
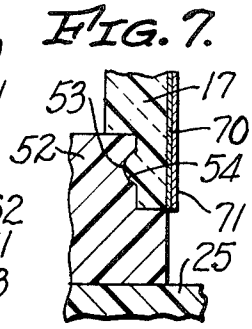


FIG. 7.



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ANNUNCIATOR LIGHT HINGED COVER

This invention relates to lights for installation in instrument panels and the like for providing messages. Lights of this type are usually referred to as annunciator lights and will carry a legend on the front thereof which is made highly visible when one or more electric lamps therein are energized. Often, the legends will also be readable when the lamps are unenergized.

A variety of annunciator lights are manufactured and in use at the present time. The present invention is particularly directed to a miniature style of annunciator light especially adapted for use in the instrument panels of aircraft, but is suitable for many other display applications also. The desirable characteristics of annunciator lights include minimum frontal area, maximum legend space, high intensity light output with low power, high legibility, ease of installation and maintenance, ease of lamp change, and trouble-free operation.

Objects, advantages, features and results of the present invention will more fully appear in the course of the following description. The drawing merely shows and the description merely describes a preferred embodiment which is given by way of illustration or example.

In the drawing:

FIG. 1 is a top or front view of an annunciator light incorporating a preferred embodiment of the present invention;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2 showing the cap removed from the light housing;

FIG. 4 is a sectional view taken along the line 4—4 of FIG. 2;

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 2;

FIG. 6 is an enlarged partial sectional view taken along the line 6—6 of FIG. 3; and

FIG. 7 is an enlarged partial sectional view taken along the line 7—7 of FIG. 1.

The light includes a housing 10 carrying lamp sockets 11, 12 in housing tubes 13, 14, respectively. Lamps 15, 16 are mounted in the sockets 11, 12 respectively, with the lamps being enclosed by a cap 17 coupled to the housing 10 by a hinge plate 18. Electric power for energizing the lamps is connected at terminals 19, 20 carried in the ends of the tubes 13, 14, respectively.

The tubes 13, 14 preferably are formed integrally with a flange 25 of the housing 10, the housing typically being molded of a plastic insulating material. Each tube has an outer bore 26, a middle bore 27, and an inner bore 28. Each of the terminals 19, 20 has a head 30, a central threaded section 31, and an end threaded section 32. The terminal head 30 is positioned in the middle bore 27, with the threaded section 31 passing through the bore 28 and with the terminal clamped in position on the tube by a nut 34.

The socket 12 is supported within the tube 14 on a conductor 37 which is generally U-shaped, with one arm 38 positioned over the middle section 31 of the terminal 20 and clamped in place by the terminal head 30, and with the other arm 39 affixed to the outer conducting sleeve of the socket. Various lamp sockets may be utilized in the light described herein, the socket shown in U. S. Pat. No. 3,506,943 being the preferred socket. Various lamps may also be used in the light described herein, the lamp shown in U. S. Pat. No. 3,530,330 being presently preferred. The conductor 37 includes the portion 40 which extends up the tube 14, laterally to the tube 13, and down the tube 13 for connection to the outer sleeve at 41 of the socket 11.

A similar construction is utilized for conducting the terminal 19 to the inner conducting pins of the sockets. A conductor 42 is generally U-shaped with an arm 43 on the pin 19 and with the other arm 44 fixed to the center pin 45 of the socket 11. The conductor 42 includes an extension 47 which extends up the tube 13, across to the tube 14 and down the tube 14 to the center pin 48 of the socket 12.

In a typical assembly operation, the sockets 11, 12 are affixed to the conductors 37 and 42, the terminals 19 and 20 are inserted into the arms 43 and 38, respectively, and this socket-conductor-terminal assembly is slid into the housing 10. The nuts 34 are positioned on the terminals and a retainer plug 50, typically molded of a plastic insulating material, is inserted into the housing, sliding into the bores 26 of the tubes and engaging the upper ends of the sockets. The retainer 50 may be cemented in place, and is provided with openings for the lamps 15, 16.

The flange 25 of the housing 10 preferably is stepped with an upper section 52 for receiving the cap 17. The cap 17 typically has the configuration of a box with an open bottom and a closed top, with the cap being a push fit onto the housing section 52. Ribs 53 may be provided in the side walls of the cap for engagement with grooves 54, FIGS. 3 and 7, in the housing section 52 for retaining the cap in position on the housing. Notches 53a may be provided at opposite ends of the cap to provide fingernail grip for lifting the cap off the housing.

The cap 17 preferably is made of a transparent material, and typically is molded of transparent plastic in two pieces, a four-sided case 55 and a cover 56, with the case and cover being stepped, as at 57, to provide alignment during assembly.

The hinge plate 18 has pins 59 at one end for pivoting in a bracket 60 formed in the housing 10. The hinge plate 18 also includes pins 61 at the opposite end for riding in openings 62 in the cap 17, the openings 62 being formed by a groove 63 in the inner wall of the case 55 and a tongue 64 of the cover 56 which slides into and partly fills the groove 63. The plate 18 typically is molded of a plastic material with some resiliency, so that the plate can be squeezed together at the pins 61 for insertion into the openings 62 and so that the plate can be spread apart at the pins 59 for insertion into the bracket 60.

The hinge plate 18 has clearance openings 65 for the lamps 15, 16 permitting the lamps to be positioned within the cap 17 when the cap is on the base, as best seen in FIG. 4. The portions 66 of the hinge plate 18 about the openings 65 preferably are concave and preferably, the upper surface of the hinge plate is coated with a reflective material (such as vacuum deposited aluminum) to provide maximum light reflection toward the cover 56 of the cap.

The cover 56 of the cap may be made of a transparent or translucent material with an opaque coating on the outer surface and with the legend engraved through the coating. Alternatively, the legend could be applied in an opaque material. The cover 56 may be of a colored plastic to serve as a color filter if desired. In the preferred embodiment illustrated herein, both the cover and the case of the cap are made of transparent material. The outer surface of the four sides of the case 55 preferably are covered with a reflective coating 70, typically aluminum or white paint. Then an opaque coating 71, typically a dark paint is applied over the reflective coating 70 and over the cover 56. The desired legend 72 is engraved in the cover. An uncoated band or rim 73 is provided around the edge of the cover 56 in many applications of the annunciator light. The light described and illustrated herein provides for high intensity illumination at this edge band 73. This is accomplished by use of the transparent case 55 with the outer opaque coating 71, as well as the reflective coating 70. With this arrangement, a considerable quantity of light is directed through the case into the cover at the edge of the cover resulting in a high intensity light band around the legend area.

The annunciator light may be installed in a panel 80 by inserting the tubes 13, 14 through openings 81, 82 in the panel 80. Parallel grooves 83, 84 are provided on opposite sides of the outer wall of each of the tubes 13, 14, with the grooves lying in a plane perpendicular to the axes of the tubes. A mounting plate 86 having an E configuration is inserted into the grooves 83, 84, with the center arm 87 of the plate 86 entering grooves in both tubes. A locking screw 90 is threadedly inserted into the center arm 87 and is screwed down against the panel 80, clamping the light in position in the panel. The E-shaped plate 86 exerts uniform clamping force on both sides

of both tubes of the housing, without putting any loading on the electrical terminals and without distorting the housing or its contents.

After installation in the panel, electrical connections are made to the terminals **19, 20** by any conventional means, as by positioning lug-type terminals **92** over the terminals **19, 20,** with flat washer **93** and lock washer **94,** and holding them in place with threaded nuts **95.** Lamps are readily inserted into the sockets and removed from the sockets by lifting the cap **17** upward from the housing, from the position of FIG. **2** to the position of FIG. **3.** The hinge plate **18** permits movement of the cap to one side providing complete clear access to the lamps. At the same time, the hinge and reflector mechanism is self-contained within the cap and does not consume any panel space leaving the entire frontal area of the light available for the legend. The sockets are fixed in the housing and rigid conductors may be used throughout the light avoiding the use of spring-loaded components in the housing and avoiding any requirement for movement of the sockets within the housing.

While a specific embodiment of the annunciator light designed for use in aircraft instrument panels has been illustrated and described herein, it will be understood that other configurations of the light can be prepared for aircraft and other uses incorporating the features of the invention and without necessarily departing from the spirit of the invention.

We claim

1. In an annunciator light for an instrument panel or the like, the combination of:

a housing;

means for mounting said housing on a panel;

means for fixedly mounting a lamp socket in said housing for supporting a lamp projecting from said housing;

a cap removably mounted by a hinge plate on said housing and enclosing said lamp; and

said hinge lamp pivotally mounted at one end to said housing and pivotally mounted at the other end to said cap, said plate having an opening for said lamp, with said plate pivotally insertable within said cap with the lamp projecting through said opening in said plate when said cap is mounted on said housing.

2. A light as defined in claim **1** in which said hinge plate has a concave reflective surface about said lamp opening.

3. A light as defined in claim **1** including means for mounting two lamp sockets in said housing in side by side arrangement, each supporting a lamp within said cap,

with said hinge plate having an opening for each lamp with a concave reflective surface about each lamp opening.

4. A light as defined in claim **1** in which said cap comprises a box with four sides defining an open bottom, and a closed top carrying a legend.

5. A light as defined in claim **4** in which said cap and housing are dimensioned so that the open bottom is a push fit onto said housing.

6. A light as defined in claim **4** in which said cap is formed of a transparent material with an opaque coating on the outside of said sides and top with a non-opaque rim around said top.

7. A light as defined in claim **6** including a reflective coating on said sides of said cap under said opaque coating.

8. A light as defined in claim **1** in which said housing includes first and second tubes;

a lamp socket for each tube for supporting a lamp projecting from the outer end of each tube;

a terminal mounted at the inner end of each tube; and

first and second conductors, with said first conductor fixed to the socket and terminal in said first tube and with said second conductor fixed to the socket and terminal in said second tube.

9. A light as defined in claim **8** wherein each of said sockets has an inner conductor and an outer conductor, with said first conductor being generally U-shaped with one arm fixed to the terminal and the other arm fixed to the outer conductor of the socket, and with said second conductor being generally U-shaped with one arm fixed to the terminal and the other arm fixed to the inner conductor of the socket.

10. A light as defined in claim **9** in which said first conductor includes an extension of said other arm disposed in said first and second tubes interconnecting the outer conductors of the sockets, and said second conductor includes an extension of said other arm disposed in said first and second tubes interconnecting the inner conductors of the sockets.

11. A light as defined in claim **1** in which said housing includes first and second parallel tubes, with each tube having parallel grooves in the outer walls thereof all lying in a plane transverse to the axes of the tubes;

a lamp socket for each tube for supporting a lamp projecting from the outer end of each tube;

an E-shaped plate with the arms of the E positioned in said grooves; and

a screw threadedly mounted in the center arm of said plate with the axis of the screw parallel to the axes of said tubes.

* * * * *

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,665,459 Dated May 23, 1972

Inventor(s) James N. Dupree & Frank A. Walker

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Address of Assignee:

Should read--South El Monte--

Column 3;

Line 36, "lamp" should read--plate--

Signed and sealed this 9th day of January 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents