

May 5, 1953

J. M. ROPER ET AL

2,637,802

LAMP SOCKET FOR INSTRUMENT PANEL LIGHTING

Filed Feb. 4, 1949

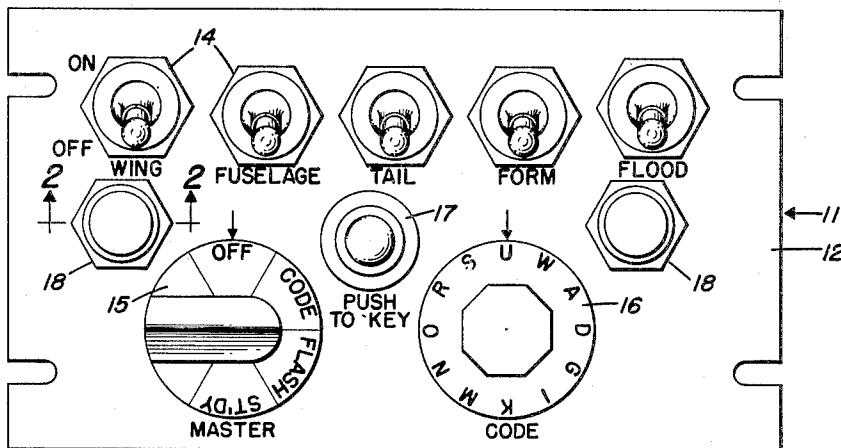


FIG. 1

FIG. 2

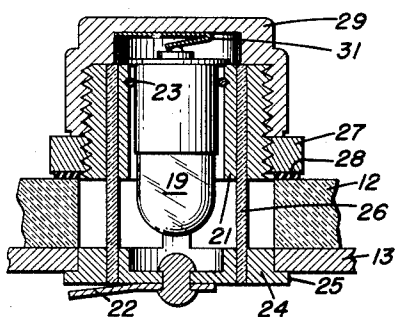


FIG. 3

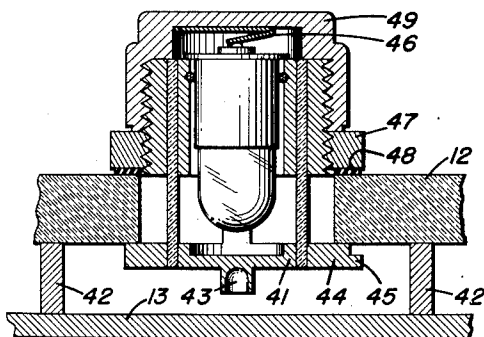
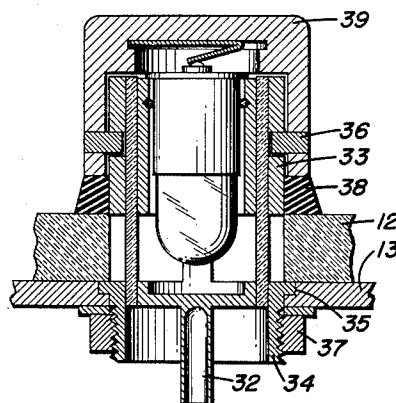


FIG. 4

Inventors
JOHN M. ROPER
THOMAS O. TWIST

F. J. Schmitt
Attorney

334

UNITED STATES PATENT OFFICE

2,637,802

LAMP SOCKET FOR INSTRUMENT PANEL LIGHTING

John M. Roper, Washington, D. C., and
Thomas O. Twist, Chevy Chase, Md.

Application February 4, 1949, Serial No. 74,641

8 Claims. (Cl. 240—8.16)

(Granted under Title 35, U. S. Code (1952),
sec. 266)

1

The present invention relates to a lighting socket and more particularly to a lighting socket for use in transmitting light through the surface of an illuminated plastic sheet.

Plastic surface or edge lighting has become of prime importance in vehicle lighting systems, and particularly for control box and console illumination in aircraft. Lighting of this type is accomplished by transmitting light through the edge of the plastic sheet and then ejecting the light to the eye of the observer by means of engraved or other suitable markings placed on the surface of the sheet, the remainder of the sheet surface being opaque. Utilization of plastic edge lighting has resulted in a more even illumination of the control surface and a greater visibility particularly in night or blind flying.

In the production of plastic edge lighting systems, difficulty has been experienced in obtaining a lamp socket which will satisfactorily illuminate the plastic sheet without utilizing too much of the available space on the panel and without extending too far within the control box or too far beyond the surface of the panel. Furthermore, the socket must be readily accessible so that a defective lamp may be removed, and must be a unitary structure so as to enable quick and ready manufacture and assembly.

Accordingly, an object of the present invention is the provision of a unitary lighting socket for a plastic edge lighting system.

Another object is to provide a lamp socket for a plastic edge lighting system which occupies a minimum of space.

A further object is to provide a lamp socket for a plastic edge lighting system which projects into the control box a minimum distance and projects only a short distance above the illuminated surface.

Still another object is the provision of a watertight socket for a plastic lighting system.

A still further object of this invention is the provision of a lamp socket for a plastic edge lighting system in which the lamp may be readily removed, and the electrical connections to the socket may be readily made.

The exact nature of this invention as well as other objects and advantages thereof will be readily apparent from consideration of the following specification relating to the annexed drawings in which:

Fig. 1 is a front elevational view of an aircraft lighting control box employing plastic edge lighting.

Fig. 2 is a sectional view along the line 2—2

2

of Fig. 1 illustrating one embodiment of the socket of the present invention.

Fig. 3 is a sectional view similar to Fig. 2 illustrating a second embodiment of the socket of the present invention; and

Fig. 4 is a sectional view similar to Fig. 2 illustrating another embodiment of the present invention as applied to a spaced plastic sheet.

Referring now to the drawings, wherein like reference characters designate like or corresponding parts throughout the several views, there is shown in Fig. 1 an aircraft lighting system control box, generally designated 11, which comprises a plastic sheet 12 suitably mounted on the front mounting panel 13 of the box, as shown in Fig. 2. Also mounted on panel 13 are various switches 14 for controlling the lighting at various points of the aircraft, a master switch 15 for controlling the type of lighting at the various points, a coder 16 for automatically coding the lighting, and a manual coder 17.

Suitably marked on plastic sheet 12, which readily transmits light, are the necessary designations of the various components of control box 11. These designations may be marked on sheet 12 in various ways well known in the art, one being to coat the entire surface of sheet 12 black except for the desired designations, so that the light may penetrate therethrough. The portions of the surface of sheet 12 directly beneath switch 15 and coder 16 are also uncoated so that the light may penetrate therethrough and reach the designations on the dials, which are of similar coated plastic material. It is to be understood that the particular method for marking the designations forms no part of the present invention and that any plastic edge lighting system may be used.

Mounted on panel 13 are a pair of lamp sockets 18 which support lamps 19 for illuminating sheet 12 and the markings or designations thereon. One form of socket 18 as shown in Fig. 2 comprises an inner shell 21 having a lead connection 22 at one end thereof, to which is soldered, or otherwise secured, one lead from the power supply, not shown, shell 21 serving as a support for lamp 19 as clearly shown in Fig. 2. An outer shell 24 is positioned in an opening in mounting plate 13 and sheet 12 and extends outwardly thereof, shell 24 being provided with a shoulder 25 which rests on the interior surface of plate 13. Interposed between shells 21 and 24 is a transparent member 26 which completely surrounds lamp 19 and serves as an insulator between the shells. Member 26 is transparent and may be made of glass or plastic for transmitting

light from lamp 19 to sheet 12, the member being molded or otherwise closely inserted between shells 21 and 24. When the member 26 is molded between the shells 21 and 24, the latter are bonded to the member to form a unitary structure, and when the member 26 is preformed and tightly inserted between the shells, the member and shells are held in press fit relationship with each other. If desired, member 26 may be colored so as to act as a filter for transmitting colored light, such as red, to plastic sheet 12.

Outer shell 24 is externally threaded to receive a retaining nut 27 for locking the socket assembly in place on plate 13, nut 27 also serving to watertighten the assembly by compressing a rubber or other flexible gasket 28 interposed between sheet 12 and nut 27. After lamp 19 is inserted in the socket, as shown in Fig. 2, a cap 29 is screwed over the outer end of shell 24, cap 29 having a small compression spring 31 located centrally therein for completing the electrical ground connection for lamp 19 through cap 29, outer shell 24 and plate 13. A small split lock spring 23 is placed in inner shell 21 for retaining lamp 19 in place and preventing it from falling out when cap 29 is removed.

Referring now to Fig. 3, wherein is shown another embodiment of the present invention, outer shell 34 is provided with conventional bayonet slots 33 while cap 39 is provided with retaining pins 36, cap 39 acting directly against flexible washer or gasket 38 to obtain the watertight seal. Outer shell 34 is retained directly upon plate 13 by means of nut 37 which threadedly engages the inner end of shell 34 while shoulder 35 of shell 34 engages the front or outer surface of plate 13. In this manner, the socket is directly secured to plate 13 and any damage to sheet 12 due to mounting the socket thereon is removed. The inner shell of the embodiment of Fig. 3 has a central extension 32 thereon which serves as one terminal for the lamp, the remainder of the socket structure being substantially the same as that of Fig. 2.

Fig. 4 discloses a modified arrangement of the socket of Fig. 2 for use with a plastic sheet 12 which is displaced from mounting plate 13 by means of spacers, or other suitable means, 42. Outer shell 44 is supported directly by sheet 12 and is retained in place by nut 47, gasket 48 being provided for making the socket watertight. Outer shell 44 is provided with a projection 45 adapted to be connected to one terminal of the power supply, while inner shell 41 has a central projection 43 thereon for connection to the other terminal of the supply, the electrical circuit being completed through compression spring 46 within cap 49.

It is understood that the bayonet slot arrangement of Fig. 3 may be used with the arrangement of Fig. 4, and that the spacing between plate 13 and sheet 12 need not be greater than that required to permit passage of the terminals from the power supply therethrough.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. In a plastic edge lighting system having a mounting plate and a plastic light-transmitting sheet mounted on and extending forwardly of said plate, a lamp socket comprising an outer conducting shell mounted on the rear surface of said plate and extending forwardly through said plate and said sheet, said shell having a portion thereof at least partially removed to permit the passage of light therethrough, an inner conducting shell having means for supporting a lamp therein, said inner shell having a portion thereof at least partially removed, said portions being substantially aligned with each other and with said sheet, a light transmitting insulating member interposed between and affixed to said shells, and means including a conducting cap member for enclosing the socket in a watertight condition.

2. In a plastic edge lighting system having a mounting plate and a light-transmitting sheet mounted on and spaced forwardly of said plate, a lamp socket comprising an outer conducting shell mounted on the rear surface of said sheet and extending forwardly therethrough, said shell having a portion thereof at least partially removed to permit the passage of light therethrough, an inner conducting shell concentric with said outer shell and having means for supporting a lamp therein, said inner shell having a portion thereof at least partially removed, said portions being substantially aligned with each other and said sheet, a light-transmitting insulating member interposed between and affixed to said shells, and means including a cap member for completely enclosing the socket.

3. In a plastic edge lighting system having a mounting plate and a plastic light-transmitting sheet mounted on and extending forwardly of said plate, a lamp socket comprising an outer conducting shell mounted in superposed relation with said plate, said shell mounted at least in part rearwardly of said sheet and extending forwardly therethrough, said shell having a portion thereof at least partially removed to permit the passage of light therethrough, an inner conducting shell having means for supporting a lamp therein, said inner shell having a portion thereof at least partially removed, said portions being substantially aligned with each other and with said sheet, a light-transmitting insulating member interposed between and affixed to said shells, and conducting cap means for enclosing the socket.

4. The combination according to claim 1 further defined by said outer shell extending rearwardly beyond said plate and supporting a fastening element securing said socket to said plate, and a bayonet latch removably connecting said cap means to said socket.

5. A lamp socket for a plastic edge lighting system, comprising an open ended outer conducting shell having an intermediate side wall portion thereof at least partially removed to permit the passage of light therethrough, an inner conducting shell having one end closed and having means thereon for detachably securing a lamp therein in electrical contact therewith, said inner shell having an intermediate side wall portion thereof at least partially removed and being positioned at least in part within and spaced from said outer shell, an insulating light-transmitting member interposed between said shells, said both intermediate portions and said light-transmitting member being aligned, a conducting cap

5

member removably connected to said outer shell and having electrical contact means adapted to electrically contact the lamp, said outer shell having means thereon for connection to one terminal of a power supply, and said closed end having contact means thereon for connection to the other terminal of the power supply.

6. The combination of claim 5 further defined by a bayonet latch removably connecting said cap member to said outer shell, and said outer shell extending beyond said closed end to support a fastening element for the lamp socket.

7. In a plastic edge lighting system having a mounting plate and a plastic light-transmitting sheet mounted parallel on and extending forwardly of said plate, a lamp socket comprising an open ended outer conducting shell mounted normal to and in superposed relation with said plate, said shell mounted at least in part rearwardly of said sheet and extending forwardly therethrough, said shell having a side wall portion thereof at least partially removed to permit the passage of light therethrough, an inner conducting shell having means for supporting a lamp therein, said inner shell having a side wall portion thereof at least partially removed, said portions being substantially aligned with each other and with said sheet, a light-transmitting insu-

6

lating member interposed between and affixed to said shells, and conducting cap means for enclosing the socket.

8. The combination according to claim 7 further defined by said outer shell extending rearwardly beyond said plate and supporting a fastening element securing said socket to said plate, and a bayonet latch removably connecting said cap means to said socket.

JOHN M. ROPER.
THOMAS O. TWIST.

References Cited in the file of this patent UNITED STATES PATENTS

Number	Name	Date
1,180,658	Kratz	Apr. 25, 1916
1,739,954	Du Pont	Dec. 17, 1929
1,756,070	Schupp	Apr. 29, 1930
2,022,175	Allee	Nov. 26, 1935
2,130,367	Rylsky et al.	Sept. 29, 1938
2,187,551	Zwack	Jan. 16, 1940
2,207,117	Collins	July 9, 1940
2,262,920	Carbonara	Nov. 18, 1941
2,518,726	Schlenker	Aug. 15, 1950

FOREIGN PATENTS

Number	Country	Date
553,524	France	Feb. 12, 1923