June 22, 1954 F. A. HARRINGTON 2,681,980

CONSOLE LAMP ASSEMBLY FOR EDGE LIGHTING OF INSTRUMENT PANELS

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Fig. 1.

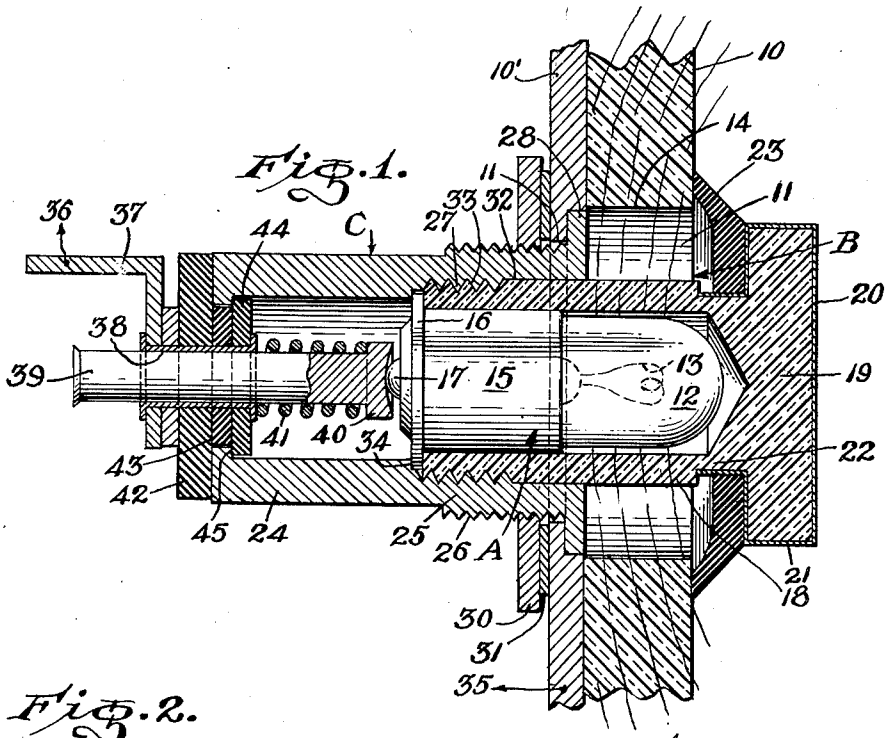


Fig. 2.

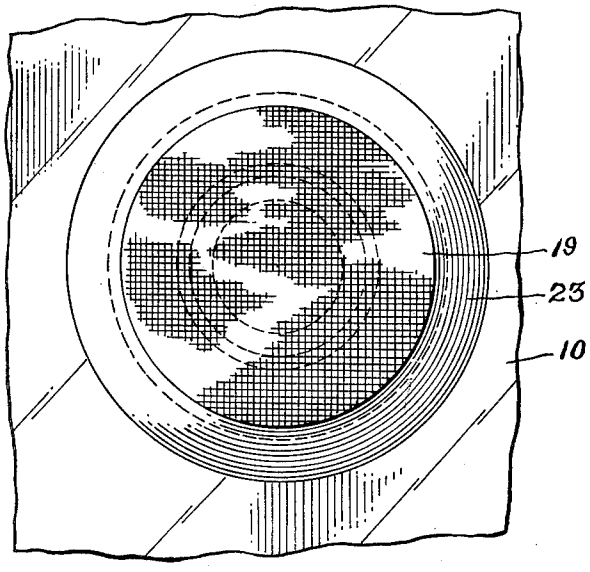
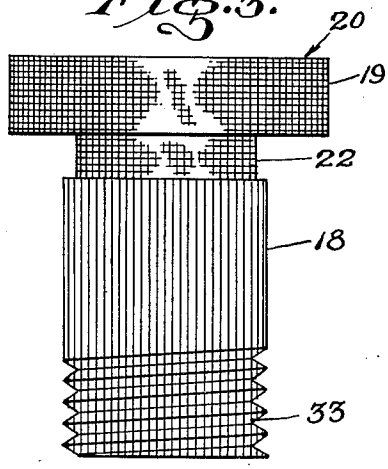


Fig. 3.



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Fig. 4.

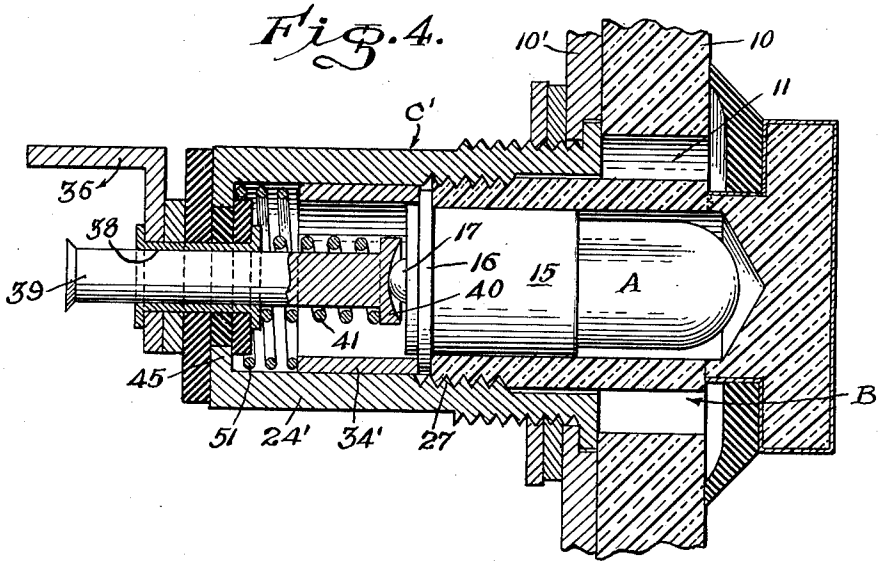
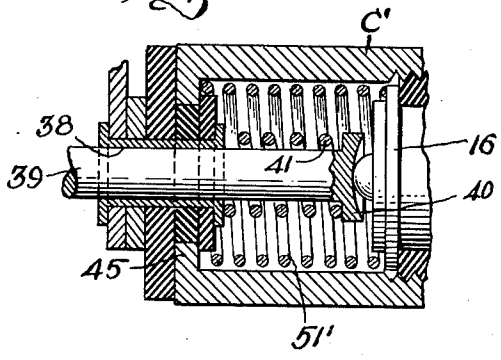


Fig. 5.



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CONSOLE LAMP ASSEMBLY FOR EDGE LIGHTING OF INSTRUMENT PANELS

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Application February 13, 1951, Serial No. 210,752

7 Claims. (Cl. 240—8.16)

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This invention relates to console lamp units for the edge lighting of instrument panels. Edge lighting is utilized for various purposes, such as, for example, in military aircraft, wherein a primary factor is the avoidance of any illumination that would be visible to an enemy plane or anti-aircraft ground crew. The customary method of edge lighting the dials of an instrument panel is to utilize an instrument panel of transparent or translucent synthetic resin plastic material (having light transmitting properties such as those of the plastic material commonly known under the trade name "Lucite") to engrave in the surface of the panel, the letters and figures that are to be illuminated, and to fill the engraved recesses with a light pigment. The pigment picks up the light rays that are transmitted edgewise through the panel and the engraved characters are thus made sufficiently luminous to be easily read by the pilot without projecting any light rays of an intensity such as to be visible at a distance.

It is customary to employ, as the source of illumination, a small electric lamp bulb received in an opening in the instrument panel and having its filament disposed in the plane of the panel. The light rays are projected laterally from the lamp, traverse the opening around the lamp, and enter the panel through the circular edge thereof which defines the opening. The forward end of the lamp is covered by a light shield which prevents any direct rays from the lamp being projected beyond the plane of the instrument panel. The lamp assembly now in common use has one drawback which the present invention proposes to overcome, namely, the light shield head portion thereof is of sufficient dimensions and projects sufficiently beyond the base of the panel to resemble an instrument knob and occasionally a pilot will accidentally grasp the same (when intending to grasp one of the instrument knobs) and pull it loose.

With the foregoing in mind, a primary object of the invention is to provide a console lamp assembly for instrument panel edge lighting, having a head portion that is as small, inconspicuous and hard to grasp as possible.

A further object is to provide such a lamp assembly which is easily installed and removed.

Another object is to provide such a lamp assembly having a minimum number of parts and of relatively inexpensive construction.

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A further object is to provide a lamp assembly adapted to afford a full 360° dissemination of light rays into the panel.

Other objects will become apparent in the ensuing specification and appended drawings in which:

Fig. 1 is an axial sectional view through a console lamp assembly embodying the invention, shown on a magnified scale;

Fig. 2 is a plan view thereof;

Fig. 3 is a side view of the lamp holder or case;

Fig. 4 is an axial sectional view of a console lamp embodying a modified form of the invention; and

Fig. 5 is a fragmentary axial sectional view of a console lamp assembly embodying another modification of the invention.

Referring now to the drawings in detail, I have illustrated, in Figs. 1, 2 and 3, as an example of one form in which the invention may be embodied, a console lamp unit for edge lighting of an instrument panel of transparent or translucent material which is indicated generally by the numeral 10. Panel 10 is mounted against a sheet metal bulk-head or frame member 10', which may function as a ground in the electrical circuit of which the lamp unit forms a part. The lamp unit extends through an aperture 11 in the panels 10 and 10', and embodies a midget lamp A having a glass bulb portion 12 which is disposed approximately in the plane of panel 10, so that the light rays from its filament 13 may be projected across the opening 11, in the plane of the panel and enter the panel through the edge 14 thereof which defines opening 11. The lamp includes a base portion 15 having at its end a radially extending flange 16 and a button 17, the latter constituting one of the electrical contacts of the lamp. Flange 16 is utilized as the other contact. The lamp is of conventional design and does not in itself constitute a part of the invention.

My improved lamp unit includes, in addition to the lamp A, a two part casing therefor including, in general, a filter jacket B and a socket jacket C, in which the inner end of filter jacket B is adapted to be mounted.

Filter jacket B includes an intermediate filter

tube portion 18 of transparent or translucent material. I prefer to employ a ruby red high temperature plastic, so that the light rays, with the exception of the red rays, are filtered out, and only the red rays are transmitted into the panel 10, red being at the low intensity end of the visibility range. The use of plastic material makes it possible to perform accurate machining operations on the filter section, or to mold it accurately and inexpensively.

The jacket B has a closed forward end portion 19 which is masked so as to function as a light shield to cut off all direct light rays projected forwardly from the lamp A. The masking is preferably accomplished by coating portion 19 with a black coating 20 of plastic or any other suitable opaque coating material, although it is possible to construct the portion 19 separately from a body of opaque plastic material and adhesively secure it to the forward end of filter tube 18. In either case, portion 19 is, in effect, an integral part of jacket B.

Cap 19 includes a relatively thin head portion 21, preferably of disc shape, and a reduced diameter neck portion 22 joining the same to filter tube 18. A resilient masking collar or washer 23, encircling reduced neck portion 22, is interposed between head 21 and the forward face of panel 10, to provide a clearance space, axially, between head 21 and panel 10, and to close that space against the transmission of any light rays therethrough from opening 11. Collar 23 is constructed of a freely flexible material, such as soft rubber or an equivalent plastic material, so that the clearance space between head 21 and panel 10 may be freely adjustable to compensate for irregularities in the panel assembly 10, 10', and also to provide for ample manufacturing tolerances in the sections B and C of the lamp unit. Neck portion 22 is of smaller external diameter than filter tube 18, whereby there is defined, between the latter and head 21, an annular groove in which the inner portion of collar 23 is captive so as to retain the collar on the filter jacket B as a part thereof. The material of the collar is of a material that is sufficiently resilient to allow stretching of the collar over filter tube 18.

Socket unit C includes a plain tubular rear section 24, an intermediate section 25 having external threads 26 and internal threads 27, and, at its forward end, a radially extending flange 28 which is adapted to bear against the forward side of panel 10'. A lock nut 30, threaded upon external threads 26, through an interposed washer 31, establishes pressure against the rear face of panel 10' to hold flange 28 securely mounted in the panel assembly.

Filter tube 18 is receivable snugly in a counterbore 32 in the rear end of socket member C, and the rear end portion thereof is provided with external threads 33 for engagement with socket threads 27.

Threaded portion 27 of socket unit C is of larger diameter than the inner wall of forward portion 24 of socket unit C, and is separated therefrom by an offset shoulder 34. Shoulder 34 functions as an abutment against which flange 16 of lamp A is pressed when filter unit B is screwed home in socket threads 27. Thus a solid electrical connection is established from flange 16 to the ground side of the circuit for energizing lamp A, which ground side is indicated at 35 in Fig. 1, being carried through socket unit C to panel 10'. The other side of the circuit, indicated at 36, is established through a terminal member 37 in which is secured one end of a metal bushing 38. A yieldable contact pin 39 is axially slidable in bushing 38, its forward end having a head 40 adapted to press against contact button 17 of lamp A. Such pressure is developed by a coil spring 41 surrounding pin 39 and engaged under compression between head 40 and the forward end of bushing 38. Head 40 has a forward face which is dished to establish a centering bearing engagement against button 17. The dished face provides for automatic centering of button 17 on head 40, resisting any tendency of the two to skid laterally and pass each other (which would result in shorting the circuit).

Bushing 38 extends through terminal 37 and through a series of washers including insulating washers 42, 43 and 44 mounted in the rear end portion 24 of socket unit C. Rear end portion 24 has an inwardly projecting flange 45 which is embraced between washers 42 and 44, with intermediate washer 43 filling the end opening defined inside the flange 45. The ends of bushing 38 are flanged outwardly to retain terminal 37 and washers 42, 43, 44 in assembly.

It will now be apparent that filter tube 18 and end member 19 cooperatively define a tubular recess, closed at the forward end, in which lamp A is received. Base portion 15 of the lamp, of slightly larger diameter than bulb 12, is snugly received in this recess.

Head 21 is relatively thin, and collar 23 has a bevelled rim extending outwardly from the periphery of head 21, so that a minimum peripheral area is presented, minimizing the likelihood of the pilot or operator grasping the head 21 in mistake for an operating knob of his instrument panel.

The lamp assembly may be assembled readily in the instrument panel by passing socket unit C through opening 11 (which is sufficiently large to receive flange 28) and attaching lock nut 30. With the socket member C thus mounted in the panel, filter unit B may be removed at will by simply unthreading its rear end from thread 27. In removing the filter jacket, lamp A, being snugly supported within filter tube 18, is withdrawn along with it. Thus is becomes easy to replace a burned out lamp. Also, the assembly of the filter jacket B and lamp A through opening 11 and into socket unit C is facilitated by the simultaneous insertion of the lamp and the filter jacket, with the latter enclosing and supporting the former.

In the modified form of the invention shown in Fig. 4, the inner wall of forward portion 24' of socket unit C' is of substantially the same diameter as thread 27, and a metal sleeve 34' is pressed against flange 16 by a coil spring 51 engaged under compression between the rear end of sleeve 34' and flange 45 of socket unit C'. This provides for yielding bottoming of the assembly of lamp A and filter jacket B against the shoulder defined by the forward end of sleeve 34', so as to establish a good electrical contact without the necessity for screwing the filter jacket B tightly to an exactly pre-determined point. Other features of this modified assembly are the same as shown in Fig. 1.

Fig. 5 illustrates a further modification in which, instead of sleeve 34', there is utilized a coil spring 51' of sufficient length to extend, under compression, from flange 45 to flange 16. Fig. 5 is a preferred form of the invention.

I claim:

1. In a console lamp assembly for the edge lighting of a light transmitting instrument panel having an opening therein, by means of an electric lamp having a base provided with a radially projecting contact member and an axially projecting central contact, in combination: a socket unit having means for mounting the same in said panel and having an open end adapted to register with said panel opening; means within said socket unit providing an electrically conductive abutment for engagement by said contact member, said socket unit having an internal thread disposed intermediate said abutment means and said open end thereof; contact means mounted in the other end of said socket unit, having a contact end for engagement with said central contact, and having spring means for urging it yieldingly toward such engagement; and a filter jacket receiving said lamp and embodying an imperforate tube of light filtering material adapted to transmit the light rays from said lamp radially across said panel throughout a full 360° arc opening and into the panel, said tube being receivable through said panel opening, having a threaded end portion adapted to be threaded into said internal thread of the socket unit and to press said radially projecting contact member into engagement with said abutment means, and having at its other end an integral, light shielded, closed end portion for arresting the rays of light directed forwardly from said lamp and permitting only the said radially directed rays to escape, said closed end portion including a thin disc-like head having a flange portion projecting radially from said filter tube; said assembly further including a yieldable collar of opaque compressible material of washer form interposed between the under side of said flange and the forward face of said panel to prevent the forward emission of light rays from said panel opening around the periphery of said closed end portion.

2. In a console lamp assembly for the edge lighting of a light transmitting instrument panel, having an opening therein, by means of an electric lamp having a base provided with a plurality of contact members, in combination: a socket unit having means for mounting the same in said panel and having an open end adapted to register with said panel opening; means within said socket unit providing electrical contacts for engagement respectively with said contact members; a filter jacket receiving said lamp and in turn received in said socket and through said opening, said jacket and socket having interengaging means for detachably connecting the jacket to the socket; said jacket embodying an imperforate tube of light filtering material adapted to transmit the light rays from said lamp radially across said panel throughout a full 360° arc opening and into the panel, said tube passing through said panel opening in the installed position of said assembly, said jacket having at its other end an integral, light shielded, closed end portion for arresting the rays of light directed forwardly from said lamp and permitting only the said radially directed rays to escape, said closed end portion including a thin disc-like head having a flange portion projecting radially from said filter tube; said assembly further including a yieldable collar of opaque compressible material of washer form interposed between the under side of said flange and the forward face of said panel to prevent the forward emission of light rays from said panel opening around the periphery of said closed end portion, said closed end portion including a neck portion joining said head to said filter tube, said neck portion having an external diameter smaller than that of said filter tube so as to define between said filter tube and said head an annular recess, said yieldable collar having its inner portion received in said recess whereby said collar is captive on said jacket, the light filtering translucency of said tube extending substantially to the rear face of said washer.

3. A lamp assembly as defined in claim 2, wherein said recess is shallow and said collar is stretchable so as to allow said filter tube to be passed therethrough in the assemblying of said lamp assembly.

4. A lamp assembly as defined in claim 3, wherein said collar is of dished diametrical cross section, having in its inner face a dished recess and having a peripheral face which is bevelled from a minimum diameter starting substantially at the periphery of said flange and extending outwardly substantially to the plane of said rear face, whereby to define a thin, peripheral, generally conical rim that is readily yieldable to conform to the surface of said panel to effect a light seal.

5. A lamp assembly as defined in claim 2, wherein said disc-like head has a coating of opaque material uniformly covering the same and providing the light shielding characteristics thereof.

6. A lamp assembly as defined in claim 2 wherein said disc-like head is uniformly of opaque material throughout the body thereof and is bonded to the forward end of said jacket.

7. In a console lamp assembly for the edge lighting of a light transmitting instrument panel having an opening therein, by means of an electric lamp having a base provided with a radially projecting contact member and an axially projecting central contact, in combination: a socket unit having means for mounting the same in said panel and having an open end adapted to register with said panel opening; means within said socket unit providing an electrically conductive abutment for engagement by said contact member, said socket unit having an internal thread disposed intermediate said abutment means and said open end thereof; contact means mounted in the other end of said socket unit, having a contact end for engagement with said central contact, and having spring means for urging it yieldingly toward such engagement; and a filter jacket receiving said lamp and embodying an imperforate tube of light filtering material adapted to transmit the light rays from said lamp radially across said panel opening and into the panel throughout a full 360° arc, said tube being receivable through said panel opening, having a threaded end portion adapted to be threaded into said internal thread of the socket unit and to press said radially projecting contact member into engagement with said abutment means, and having at its other end an integral, light shielded, closed end portion for arresting the rays of light directed forwardly from said lamp and permitting only the said radially directed rays to escape, said closed end portion including a thin disc-like head having a flange portion projecting radially from said filter tube; said assembly further including a yieldable collar of opaque compressible material of washer form interposed between the under side of said flange and the forward face of said panel to prevent the forward emission of

light rays from said panel opening around the periphery of said closed end portion, the translucency area of said tube extending substantially to the rear face of said washer; said socket unit terminating at the plane where its said mounting means meets the plane of said panel; and said tube being of smaller diameter than said socket unit and therefore of smaller diameter than the panel opening, whereby to provide for an annular air space between said tube and the edge of the panel defining said opening, across which the light rays will traverse before entering the panel.

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