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2,130,367

ILLUMINATING MEANS FOR INDICATING INSTRUMENTS

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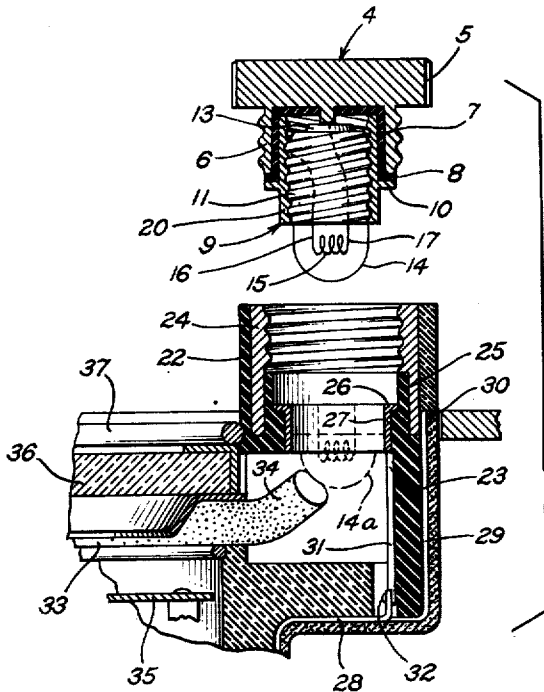


Fig. 1

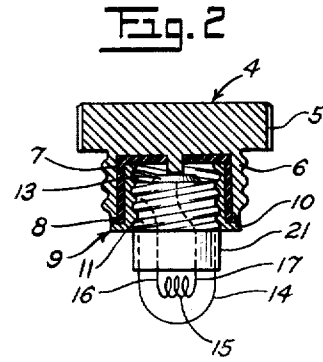


Fig. 2

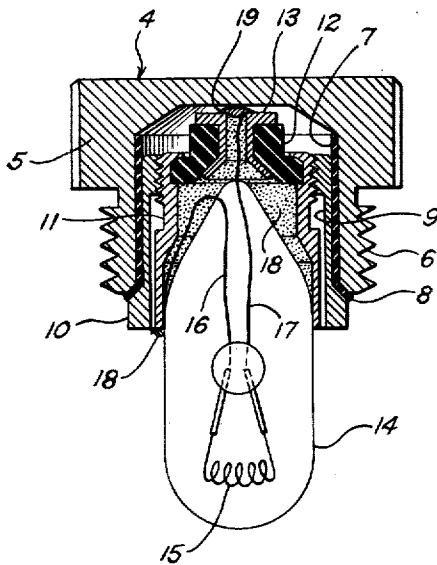


Fig. 3

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UNITED STATES PATENT OFFICE

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ILLUMINATING MEANS FOR INDICATING INSTRUMENTS

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Application December 27, 1937, Serial No. 181,978

3 Claims. (Cl. 176—32)

The present invention relates to illuminating means and more particularly to illuminating means for indicating instruments.

One of the objects of the invention is to provide a novel structure comprising a readily removable lamp support or plug having an easily removable and replaceable miniature electric lamp, in combination with an electric socket for receiving the lamp and its support or plug, especially adapted for use with an indicating instrument and positionable in the instrument case to cooperate with a ring-like light-conducting and light-emitting member of transparent material such, for example, as glass, or quartz, or the new plastic material recently developed, for providing illumination of the indicating means in the manner disclosed in the co-pending application of Gregory V. Rylsky, Serial No. 29,323. It is to be understood, however, that the replaceable lamp, removable lamp-carrying support or plug and the cooperating socket structure for receiving the lamp and plug of the present invention are not limited to their use with only the type of illumination disclosed in said co-pending application of Gregory V. Rylsky but may be used with and in other combinations, whether part of an indicating instrument or otherwise.

Heretofore, miniature electric lamp and socket structures have been provided such, for example, as disclosed in the co-pending application of Wladimir A. Reichel, Serial No. 165,587, including a lamp-receiving socket and a lamp comprising a removable plug base member having a finger-operable gripper portion and providing external electrical contacting metallic screw threads, an elongated miniature lamp bulb having terminal leads, a second contact means around said lamp bulb, said screw threads and second contact means being adapted to engage cooperating screw threads and contact means of a socket when the lamp structure is inserted therein, an insulating sleeve or collar surrounding said lamp bulb and said second contact means to insulate the latter from the screw threaded base member, permanent connections for the terminal leads of the lamp to the metallic screw threads and the second contact means, and insulating plastic material in said plug base member for permanently securing the lamp assembly in said base.

Such an arrangement, as described above, provided a highly satisfactory unitary structure of a lamp and base permanently attached together and not separable without destroying the structure. When the filament of the bulb of such a

structure burned out, however, it was necessary to throw away the entire structure including the screw threaded plug base member and the lamp bulb secured therein. This was found to be rather expensive and uneconomical and, therefore, in accordance with the present invention there is provided a novel structure in which the screw threaded plug base member and the lamp are separable, thereby making it possible to replace only the lamp bulb and save the base member.

Accordingly, another object of the invention is to provide, in combination with an electrical lamp-receiving socket, a novel separable lamp and plug base structure comprising a plug base member having a finger-operable gripper portion and a metallic hollow nipple portion threaded externally to provide a first contact means, an insulating sleeve within said nipple portion and having a flange peripherally engaging the end of said nipple portion, an internally threaded conductive sleeve within said insulating sleeve and having a flange engaging the flange of the insulating sleeve and providing a second contact means, and a removable lamp comprising a bulb having a filament therein, an externally threaded metal base permanently securing said bulb therein and adapted to be removably screwed into the internally threaded sleeve with the bulb projecting outwardly from the nipple portion of the plug base member coaxially therewith, and a metal contact on the inner end of said lamp base but insulated therefrom and providing contact with the first contact means of the plug base member, the filament of the lamp having one end connected to said end contact and its other end connected to said lamp base whereby, when said lamp base is screwed into the internally threaded sleeve, one end of said filament may be connected into an energizing circuit through the end contact on the lamp base and through the metallic screw threads of the plug base member and the other end of the filament through the metal lamp base and the internally threaded sleeve upon insertion of the plug base member into the cooperating lamp-receiving socket which is provided with contact means for engagement with the externally threaded nipple portion of the plug base member and the internally threaded sleeve.

A further object of the invention is to provide a novel separable lamp and plug base structure of the type set forth above and wherein the internally threaded metallic sleeve in the plug base member has a portion extending beyond the

flange of said sleeve to provide an additional contact surface.

A still further object is to provide a novel separable lamp and plug base structure of the class described and wherein the lamp base is extended over the lamp so as to project outwardly beyond the nipple portion of the plug base member, thereby to provide an additional contact surface.

Still another object of the invention is to provide a novel separable miniature lamp and plug base structure which is relatively simple to manufacture and which is easily assembled in the process of manufacture whereby the lamps per se may be made inexpensively in large quantities and when a lamp is burned out it may be thrown away and the plug base member retained to receive a new lamp, thus saving the cost of the plug base member.

The above and other objects and advantages of the invention will appear more fully hereinafter from a consideration of the detailed description which follows, taken together with the accompanying drawing wherein three embodiments of the invention are illustrated. It is to be expressly understood, however, that the drawing is for the purpose of illustration only and is not intended to define the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing wherein like reference characters refer to like parts throughout the several figures,

Fig. 1 is a sectional view of one form of the entire structure including the lamp-receiving socket and the separable lamp and plug base member, showing the lamp and plug base member about to be inserted into the socket which is illustrated as being located in the casing of an indicating instrument, only a portion of the instrument casing being shown;

Fig. 2 is a sectional view of another embodiment of the novel separable lamp and plug base structure per se; and

Fig. 3 is a similar sectional view of still another embodiment of the novel separable lamp and plug base structure per se.

Both of the embodiments of the separable lamp and plug base structure shown in Figs. 2 and 3 may be made for insertion into a lamp-receiving socket such as is shown in Fig. 1.

The invention consists substantially in the construction, combination, location, form and relative arrangement of parts for obtaining the results in accordance with the foregoing objects, as will be more fully hereinafter set forth in the specification, as shown in the drawing by way of example, and as finally pointed out in the claims.

Referring now to the drawing, and more particularly to Fig. 3, there is shown one embodiment of the novel miniature separable lamp and plug base structure of the invention, which comprises in the present instance, as shown, an annular metallic plug base member 4 having a finger-operable knurled gripper portion 5 and an externally screw-threaded nipple portion 6 which forms one of the contact means for the lamp and which is adapted to cooperate with and engage an internally threaded contact means of a socket into which the plug base member is to be inserted as will appear more fully hereinafter.

The plug base member is hollowed out and has inserted therein an insulating sleeve or collar 7 provided with an outwardly extending flange 8 which engages the outwardly projecting

end of the externally threaded nipple portion 6. Pressed within said insulating sleeve or collar 7, to provide a tight and permanent fit therein and with the nipple portion, is an internally threaded metal sleeve or collar 9 having a flange 10 which engages and abuts the flange 8 of the insulating sleeve or collar 7. Said internally threaded sleeve or collar 9 may have the threads only at its inner end as shown in Fig. 3 or the threads may extend from end to end thereof as shown in Figs. 1 and 2. The flange 10 forms the second contact means for the lamp and is adapted to cooperate with an annular contact means of the socket into which the plug base member 4 is to be inserted. It will be noted that the first contact means 6 and the second contact means 10 are insulated from each other by the insulating sleeve or collar 7 and its flange 8.

The structure thus far described constitutes a removable plug base member adapted for insertion into a socket and is arranged to receive a removable miniature lamp structure which projects from the nipple portion 6 coaxially therewith.

The removable lamp structure per se comprises, in the form shown, an externally threaded metal base 11 which may be partially threaded as shown in Figs. 2 and 3, or completely threaded as shown in Fig. 1. At the inner end of said metal base, as shown in Fig. 3, there is provided an insulating hollow insert 12 within which is a hollow metal insert 13.

Into the externally threaded metal base is inserted and securely seated a miniature lamp bulb 14 provided with a filament 15 having terminal leads 16 and 17. The inner end of said lamp bulb is held securely within said base 11 by insulating plastic material or cement 18 which is made to extend up into the metal insert 13. The outer end of said lamp bulb 14 projects outwardly of the metal base 11 and of the nipple portion 6 of the plug base member 4 and coaxially therewith when the base 11 is screwed into the internally threaded metal sleeve or collar 9.

The terminal lead 16 of the filament 15 is electrically connected, as by soldering or tinning, to the metal base 11 as shown at 18, and the terminal lead 17 is electrically connected in the same manner to the metal insert 13 as indicated at 19 where an excess of solder or tin may be provided to form a contact which engages the inner surface of the metal plug base member 4 as shown in Fig. 3.

Thus it will be seen that when the lamp structure is inserted into the plug base member 4 by screwing the externally threaded metal lamp base 11 into the internally threaded metal collar or sleeve 9, the filament 15 is connected to the threaded contact means 6 through terminal lead 17, contact 19 and the body of the metal plug base member 4, and is connected to the second contact means 10 through terminal lead 16, connection 18, lamp base 11 and internally threaded sleeve or collar 9.

The lamp structure and plug base member are separable and the lamp may be easily removed and replaced, in the event it burns out, by merely unscrewing it and removing it and screwing in a new lamp, thus saving the plug base member.

In Fig. 1 there is shown another embodiment of the novel miniature separable lamp and plug base structure of the invention, which is substantially the same as that shown in Fig. 3 except that in Fig. 1 the externally threaded metal sleeve

or collar 9 is provided with a portion 20 which extends outwardly beyond the flange 10 to form a cylindrical additional contact surface which is adapted to engage an internal cylindrical contact surface of a socket as will appear later.

There is shown in Fig. 2 a third embodiment of the novel miniature separable lamp and plug base structure of the invention, which is also similar to that shown in Fig. 3 but in Fig. 2 the lamp base 11 is extended further over the lamp bulb 14 so as to project outwardly of the nipple portion of the plug base member 4 as shown at 21, and this projecting portion 21 is unthreaded so as to also provide a cylindrical additional contact surface.

There is now provided a lamp socket structure for receiving any one of the novel separable lamp and plug base structures hereinbefore described. The socket structure is illustrated in Fig. 1 and is shown as forming part of an indicating instrument, the indicating means of which are to be illuminated in the manner disclosed and described in the hereinbefore-mentioned co-pending application of Gregory V. Rylsky, Serial No. 29,323.

As illustrated in Fig. 1, the socket structure comprises a molded extension 22 formed integrally with the instrument casing 23 of which only the necessary portion is shown. The molded extension 22, however, may be part of an adapter or frame which is arranged to be secured to a previously constructed and completed instrument, as illustrated and described in another co-pending application of said Gregory V. Rylsky, Serial No. 141,525.

Within the molded extension 22, which is of insulating material, there is provided an internally threaded metallic sleeve member 24 which is adapted to receive and engage the externally threaded nipple portion 6 of the plug base member 4 when the latter is inserted into the socket. Arranged concentrically with the molded extension 22 and the internally threaded sleeve member 24 there is a boss 25 which is molded integrally with the instrument casing 23 and is also of insulating material.

On a ledge formed internally of the boss 25 is seated an annular flange 26 of a cylindrical conducting metal sleeve 27 whereby, upon insertion of the plug base member 4 and the lamp carried thereby into the socket, the flange 10 of the conducting sleeve 9 of the plug base structures shown in all three embodiments, contacts and engages the flange 26 of the conducting sleeve 27, thereby insuring positive electrical contact between contact means 10 and 26.

With the embodiments illustrated in Figs. 1 and 2, an additional contact is provided between the plug base member or lamp and the socket by virtue of the fact that either the surface 20 of Fig. 1 or the surface 21 of Fig. 2 engages the inner surface of the conductive sleeve 27 of the socket.

Thus the socket is arranged to receive any one of the lamp and plug base structures shown in Figs. 1, 2 and 3.

Means are now provided for connecting the internally threaded conducting sleeve member 24 and flanged conducting sleeve member 27 to a source of electrical energy such as a battery (not shown). In the illustrated embodiment, said connecting means comprise leads 28 and 29, the lead 29 being directly soldered to the sleeve member 24 as shown at 30, and the lead 28 being connected to the flanged sleeve 27 by a conducting

rod 31 to which the lead 28 is soldered as indicated at 32.

When the separable lamp and plug base structure is inserted into the socket, the lamp takes the position 14a shown in dotted lines in Fig. 1 so as to extend between the ends of a glass ring 33, only one end 34 of said ring being shown, in the manner disclosed in the aforesaid application of Gregory V. Rylsky, Serial No. 29,323. The glass ring 33 conducts the light from the lamp in a circular path adjacent the dial 35 and then emits the light onto said dial which is located behind the instrument cover glass 36, the latter being held in place by a snap ring 37.

There is thus provided a novel miniature separable lamp and plug base structure which is extremely simple, economical, readily removable from a co-operating socket, particularly adapted for use with a lamp socket formed in an instrument casing for illuminating the indicating means of the instrument, and a structure in which the lamp per se can be easily removed from the plug base member and replaced by a new lamp without having to discard the plug base member, thereby saving in the cost of this particular part.

Although three embodiments of the invention have been illustrated and described, various other changes and modifications in construction, form and relative arrangement of parts, which will now appear to those skilled in the art, may be made without departing from the scope of the invention. Reference is, therefore, to be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A miniature separable lamp and plug base structure for indicating instruments, said structure comprising a plug base member having a finger-operable gripper portion and a metallic hollow nipple portion threaded externally to provide a threaded conductive sleeve within said insulating sleeve or collar within said nipple portion and having a flange peripherally engaging the projecting end of said nipple portion, an internally threaded conductive sleeve within said insulating sleeve and having a flange engaging the flange of the insulating sleeve or collar and providing a second electrical contact means, and a removable lamp comprising a bulb having a filament therein, an externally threaded metal base permanently securing said bulb therein and adapted to be removably screwed into the internally threaded conductive sleeve with the bulb projecting outwardly from the nipple portion of the plug base member coaxially therewith, and a metal contact on the inner end of said lamp base but insulated therefrom and providing contact with the said first contact means of the plug base member, the filament of the lamp having one end connected to said end contact and its other end connected to said lamp base whereby, when said lamp base is screwed into the internally threaded conductive sleeve, one end of said filament may be connected into an energizing circuit through said end contact on the lamp base and through the metallic screw threads of the plug base member and the other end of the filament through the metal lamp base and through the internally threaded conductive sleeve upon insertion of the plug base member into a cooperating lamp-receiving socket provided with contact means for engagement with the externally threaded nipple portion of the plug base member and the flange of the internally threaded conductive sleeve.

2. A miniature separable lamp and plug base structure according to claim 1 but wherein the internally threaded metallic sleeve in the plug base member has a portion extending beyond the flange of said sleeve to provide a cylindrical additional contact surface.
3. A miniature separable lamp and plug base structure according to claim 1 but wherein the metal lamp base is extended over the lamp bulb so as to project outwardly beyond the nipple portion of the plug base member, thereby to provide a cylindrical additional contact surface.
- GREGORY V. RYLSKY.
STEPHEN CERSTVIK.

CERTIFICATE OF CORRECTION.

Patent No. 2,130,367.

September 20, 1938.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 41, claim 1, strike out the words "threaded conductive sleeve within said" and insert instead the syllable and words vide a first electrical contact means, an; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of December, A. D. 1938

Henry Van Arsdale

(Seal)

Acting Commissioner of Patents.

2. A miniature separable lamp and plug base structure according to claim 1 but wherein the internally threaded metallic sleeve in the plug base member has a portion extending beyond the flange of said sleeve to provide a cylindrical additional contact surface.
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