

[72] Inventors **Arthur Keith Cook;**
Edward Fulton, both of Santa Ana, Calif.
[21] Appl. No. **779,998**
[22] Filed **Nov. 29, 1968**
[45] Patented **Sept. 14, 1971**
[73] Assignee **Oak Electro/Netics Corp.**

3,276,014 9/1966 Rueger 240/8.16 X
3,286,255 11/1966 Sanchez 240/8.16 X
3,476,928 11/1969 Greasley 240/8.16 X

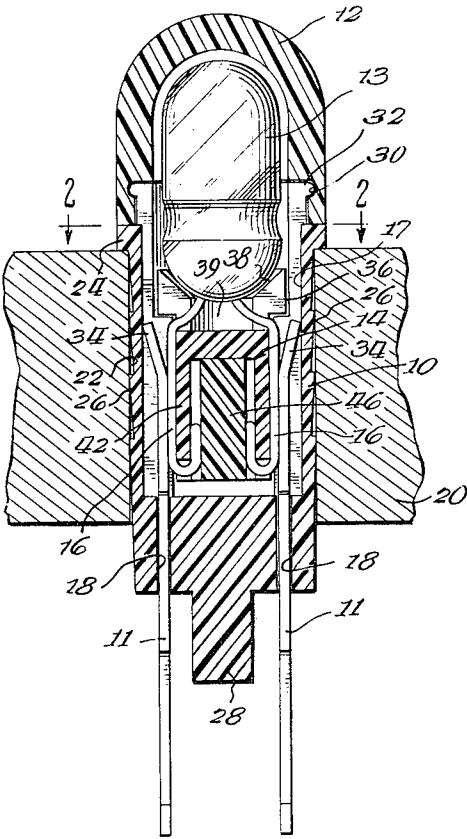
Primary Examiner—Samuel S. Matthews
Assistant Examiner—Monroe H. Hayes
Attorneys—Howard T. Markey, Alfred H. Plyer, Jr., James G.
Staples and Daniel C. McEachran

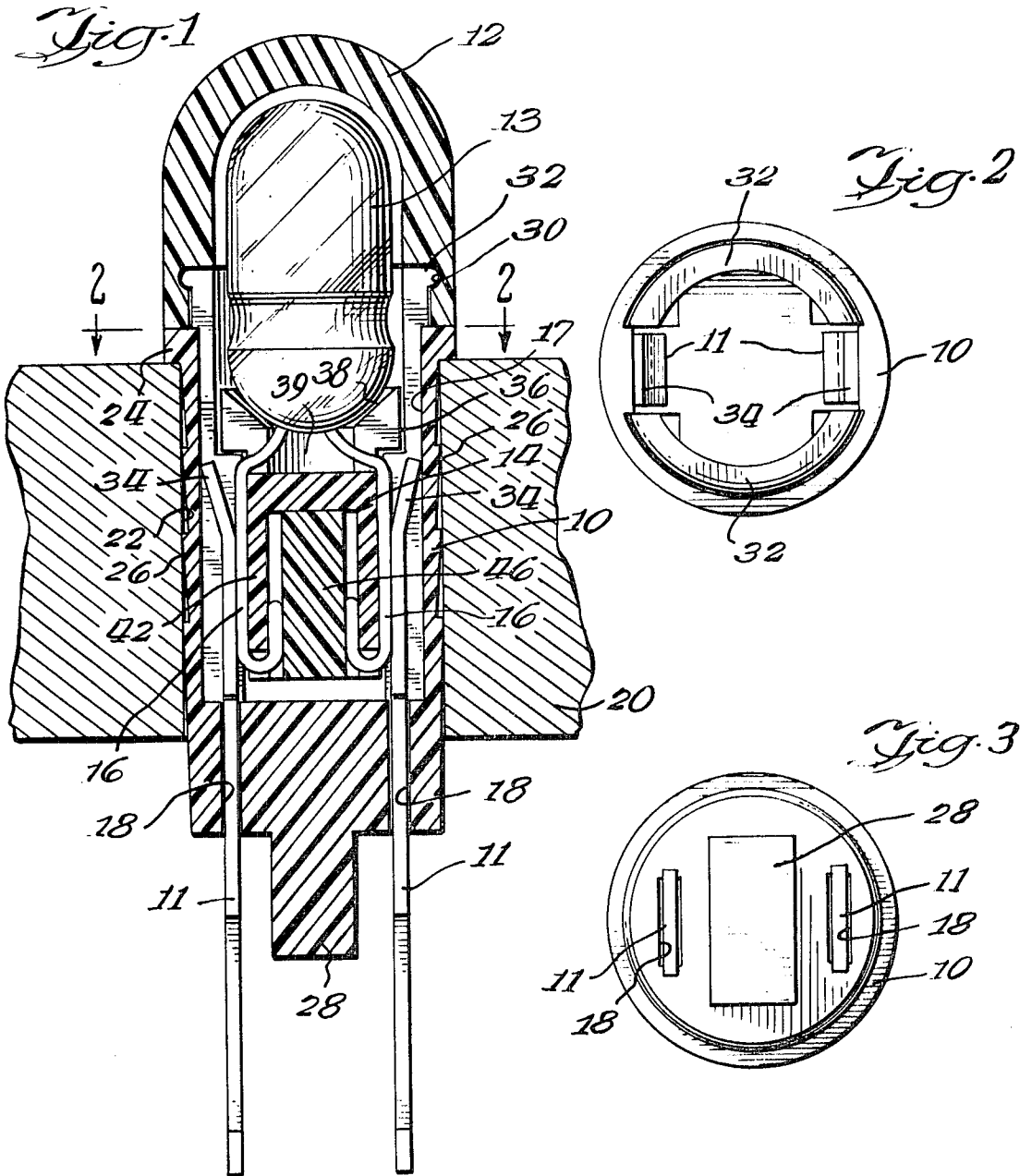
[54] **MINIATURE LAMP ASSEMBLY**
4 Claims, 9 Drawing Figs.

[52] U.S. Cl. **240/8.16**
[51] Int. Cl. **B60g 3/04**
[50] Field of Search **240/8.16**

[56] **References Cited**
UNITED STATES PATENTS
1,905,843 4/1933 Foulke 240/8.16 X
3,120,986 2/1964 Pusch 240/8.16 UX
3,229,083 1/1966 George 240/8.16

ABSTRACT: A miniature lamp assembly which includes a replaceable wire lead miniature bulb and a housing having a receptacle for receiving the bulb. A pair of terminal contact members are mounted on the housing with portions thereof exposed within the receptacle. A two-piece bulb base is provided for assembly with the bulb to position and hold the wire leads so that the bulb and bulb base can easily be inserted into the receptacle formed by the housing with the wire leads in engagement with the exposed portions of the terminal contact members.





INVENTORS
 Arthur Keith Cook
 Edward Gulton
 BY Hoffman, Wagner, Allen, Steelman & Holm
 ATTORNEYS

Fig. 8

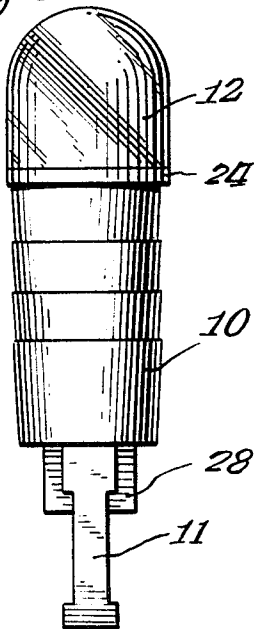


Fig. 9

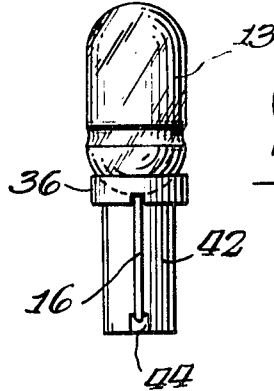


Fig. 5

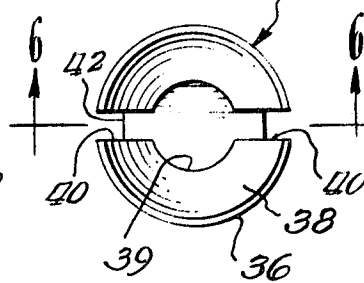


Fig. 6

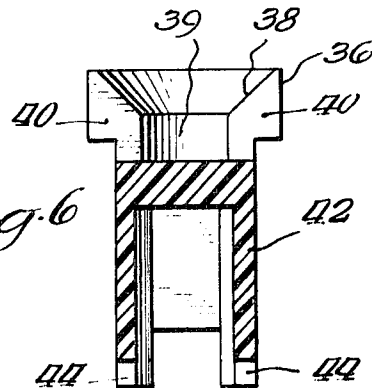


Fig. 4

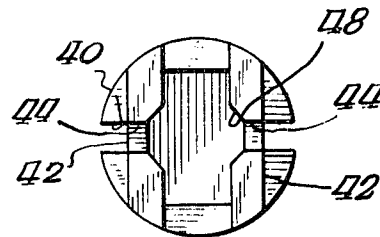
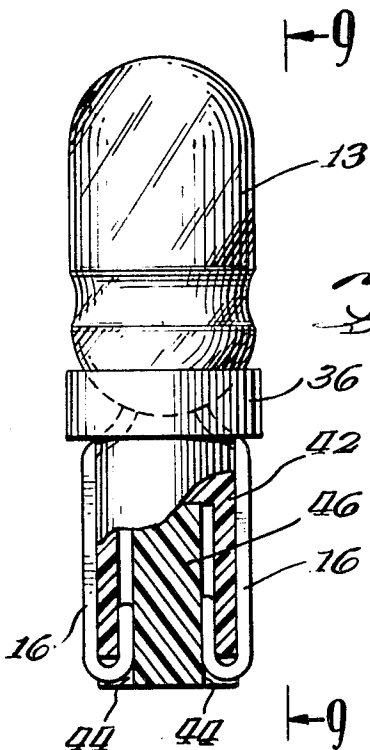


Fig. 7

MINIATURE LAMP ASSEMBLY

BACKGROUND OF THE INVENTION

Extremely small electrical bulbs of the type shown in the patent to George, Jr. U.S. Pat. No. 3,229,083 are now widely used for connection into electrical circuits. As stated therein, such bulbs have been available with two different means for connecting the bulb into an electrical circuit. Bulbs with wire leads have been soldered or welded directly into the circuit. This mode of use proved to be quite satisfactory for initial installation but it presented many difficulties when the bulb needed replacing. Bulbs also have been available with metal bases for insertion into mating sockets. This latter type of bulb is much easier to install and replace, but the base and socket often are larger than the bulb, defeating the purpose of achieving a small overall installation. The lamp structure of the George patent is of a third type in which a wire lead miniature bulb is slidably inserted and removed from a lamp socket with the wire leads slidably received in a pair of tubular conductors. This third type of assembly provided for replacement of the bulbs, met the necessary small overall dimensions, but complicated the situation by requiring careful manipulation of the bulb so that the very small wire leads enter the tubular conductors and provide a suitable contact therewith.

The wire lead miniature bulbs of the character described are oftentimes less than an eighth of an inch in diameter and one-quarter of an inch in length, and having wire leads in the order of 0.007 to 0.0011-inch diameter. Wire leads of this size are extremely difficult to manipulate into position for initial assembly into the receptacles or for replacement. It would be desirable to provide a bulb base which would position the wire leads and hold the leads in place for proper insertion into the receptacle formed by the housing, in engagement with terminal contact members within the receptacle.

SUMMARY OF THE INVENTION

The principal object of this invention is to provide a new and improved miniature lamp assembly particularly adapted for use with very small bulbs and one which permits easy replacement of the bulbs.

Another object of the invention is to provide a lamp assembly of the character described for use with a wire lead miniature bulb and bulb base, with sliding insertion and removal of the bulb and bulb base from a receptacle formed by a lamp housing.

A further object of the invention is to provide a lamp assembly for a replacement wire lead miniature bulb and including a lamp housing having a receptacle for receiving the bulb, a pair of terminal contact members mounted on the housing for sliding engagement with the leads of the bulb, and a two-piece bulb base positioning and holding the wire leads in place for engaging the terminal contact members as the bulb and bulb base are positioned within the receptacle of the housing.

The two-piece bulb base set forth in the preceding paragraph includes a body member having a head portion with a frustoconical seat on which the base of the bulb is seated. The head has a central recess and diametrically disposed slots through which the wire leads extend from the base of the bulb to the exterior of the body member of the lamp base. The body member also has a generally tubular shank portion extending below the head portion thereof whereby the wire leads can be wrapped around the bottom of the shank portion with the free ends of the leads extending upwardly into the interior of the shank portion. The second piece of the bulb base comprises an insulator plug member which is wedged into the interior of the shank portion of the bulb base to separate the free ends of the wire leads, insulate the leads from each other, and hold the leads in position so that the assembled bulb and bulb base can be inserted slidably into the receptacle formed by the housing with the leads in proper engagement with the terminal contact members.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal central sectional view of the miniature lamp assembly of this invention;

FIG. 2 is a view taken generally along the line 2—2 of FIG. 1, with the bulb and bulb base removed;

FIG. 3 is a bottom plan view of the lamp assembly;

FIG. 4 is an elevational view, partly in section, of an assembled bulb and bulb base, removed from the lamp housing;

FIG. 5 is a top plan view of a bulb base;

FIG. 6 is a central sectional view of the bulb base taken generally along the line 6—6 of FIG. 5;

FIG. 7 is a bottom plan view of the bulb base;

FIG. 8 is a side elevational view, on a reduced scale, of the miniature lamp assembly of this invention; and

FIG. 9 is an elevational view, on a reduced scale, taken generally in the direction of line 9—9 in FIG. 4.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings in greater detail, the invention is shown herein as embodied in a miniature lamp assembly which includes a mounting tube or lamp housing 10, terminal contact members 11, a lens cap 12, a wire lead miniature bulb 13 positioned within the housing 10, and a bulb base, generally designated 14.

The bulb 13 may be a conventional incandescent bulb with flexible wire leads 16 normally intended for soldering directly into an electrical circuit. However, as will be set forth in greater detail hereinafter, the bulb base 14 is of novel construction so as to position the wire leads and hold the leads in place against the upper ends of the terminal contact members 11.

The housing 10 is in the form of a socket providing a receptacle 17 and may be molded of glass or filled nylon and includes openings 18 at the closed end thereof for receiving the terminal contact members 11. The housing is mounted on a suitable support such as a panel 20 by pushing the housing into a mating opening 22 from the front side of the panel. The housing is preferably provided with a collar or flange 24 and a plurality of tapering surfaces 26, with the tapers converging toward the closed end of the housing forming ribs which lock the housing into the opening 22 of the panel 20. The opening in the panel is preferably of a size to provide an interference fit at the maximum diameter of the ribs formed by the tapered surfaces 26. The housing is preferably cylindrical for insertion into round openings, but, of course, square, octagonal and other cross-sectional shapes may be utilized for the housing, as desired. A boss 28 extends away from the closed end of the housing 10 between the terminal contact members 11 and is provided to reduce the danger of short circuiting.

The lens cap 12 is generally hemispherical and may be molded of polycarbonate, may be transparent or translucent, and may be clear or have any desired color. Means are provided for affixing the cap on the housing so that the cap can be mounted and removed as desired. Preferably, an annular groove 30 on the interior of the cap engages a pair of annular ribs 32 (as best seen in FIG. 2) on the upper end of the housing, permitting the cap to be pushed into place onto the housing and to be removed by hand pulling. Various other forms of caps may be utilized with the housing, such as, for instance, one with flat faces.

The terminal contact members 11 are preferably flat and elongated with the upper ends 34 thereof bent outwardly to facilitate camming the bulb base 14 and wire leads 16 therebetween, as will be described below.

The bulb base itself is illustrated best in FIGS. 5 through 7 and is shown assembled with the bulb 13 and wire leads 16 in FIGS. 1, 4 and 9. The bulb base comprises two pieces and includes a body member which has a head portion 36 provided with a frustoconical seat 38 on which is seated the base of the bulb 13. The head portion 36 has a central recess 39 and a pair of diametrically disposed slots 40 extending outwardly from

the central recess and through which the wire leads 16 extend from the base of the bulb 13. This structure permits the wire leads to be disposed on the exterior of the bulb base 14 in position for engagement with the upper ends of the terminal contact members 11. The body member of the bulb base 14 has a generally tubular shank portion 42 extending below the head portion 36 providing an interior recess opening opposite said head portion 36. The shank portion has a pair of diametrically disposed slots 44 at the lower end thereof in angular alignment with the slots 40 in the head portion 36. As seen best in FIGS. 1 and 4, the wire leads 16 (extending from the base of the bulb 13, through slots 40, and positioned on the exterior of the shank portion 42) are bent around the lower end of the shank portion through the slots 44 so that the ends of the leads extend into the interior of the shank portion 42. The second piece of the bulb base comprises an insulator plug member 46 (FIGS. 1 and 4) which is wedged into the shank portion 42 from the bottom thereof to urge the free ends of the wire leads 16 into a pair of longitudinal grooves 48 (FIG. 7) in angular alignment with the slots 44 at the bottom of the shank portion 42. It thus can be seen that this novel two-piece bulb base 14, comprising the body member (FIGS. 5-7) and the insulator plug member 46, spaces the wire leads 16 from each other, positions the wire leads for engagement with the pair of terminal contact members 11, holds the wire leads in such position to facilitate assembling the lamp assembly, and insulates the free ends of the wire leads from each other.

The lamp assembly of this invention is particularly adapted for use with very small bulbs and provides a complete installation for a replaceable bulb that is extremely small and one which requires a minimum of volume in addition to that occupied by the bulb itself. With the structure disclosed by this invention, it can be seen that the bulb can be mounted on the bulb base 14 with the wire leads 16 extending from the base of the bulb properly positioned and held in place for easy insertion into the receptacle 17 in engagement with the terminal contact members 11, either prior to or after the housing 10 is mounted in the panel 20. There is no need for tedious manipulation of the extremely fine size wire leads 16 in order to position the bulb within the housing 10. The entire lamp assembly may be assembled as a unit as shown in FIG. 8 and then mounted in the panel 20 or the various components of the assembly may be mounted individually into the panel as follows. First, the housing 10 is press fit into the opening 22 in the panel 20. The terminal contact members 11 may be positioned into the openings 18 at the closed end of the housing 10 from the inside thereof, either before or after the housing is mounted on the panel 20. The bulb and bulb base assembly, as shown in FIGS. 4 and 9, may be assembled as described above and maintained in stock as complete assemblies. The bulb and

bulb base assembly is simply pushed into the open end of the housing 10 with the wire leads 16 angularly disposed for engagement with the upper ends 34 of the terminal contact members 11. The lens cap 12 is then snapped over the ribs 32 on the upper end of the housing to completely encase and protect the bulb.

The foregoing detailed description has been given for clearness of understanding only and no unnecessary limitations should be understood therefrom as some modifications will be obvious to those skilled in the art.

We claim:

1. A miniature illuminating lamp assembly including an illuminating bulb having elongated flexible wire leads extending outwardly from the bulb, a housing having a receptacle for receiving the lead end of the bulb, and terminal contact members mounted on the housing for engagement with the wire leads of the bulb, the improvement comprising a two-piece bulb base including a body member having a head portion on which said bulb is seated and a generally tubular shank portion extending below the head portion around the bottom of which wire leads are wrapped with the free ends of the leads extending upwardly into the interior of the shank portion, and a plug member wedged into the interior of the shank portion for separating the free ends of the wire leads and holding the wire leads in position for engagement with said terminal contact members.

2. The lamp assembly of claim 1 wherein the head portion of said body member has a central recess and diametrically disposed slots through which the wire leads extend from the base of the bulb to the exterior of the shank portion of the body member.

3. The lamp assembly of claim 1 wherein said plug member is an insulator.

4. A miniature illuminating lamp assembly including an illuminating bulb having elongated flexible wire leads extending outwardly from the bulb, a housing having a receptacle for receiving the lead end of the bulb, and terminal contact members mounted on the housing for engagement with the wire leads of the bulb, the improvement comprising a two piece bulb base including a body member having a central recess in which the bulb is seated, diametrically opposed slots in said body member opening into said recess through which the wire leads extend from the base of the bulb to the exterior of the body member, a recess in the interior of said body member, the wire leads being wrapped around said body member with the free ends thereof positioned within said last-named recess, and a plug member being positioned in said last-named recess to separate the free wire ends and hold them in spaced relationship while holding the wire leads in position on the exterior of said body member.

55

60

65

70

75