

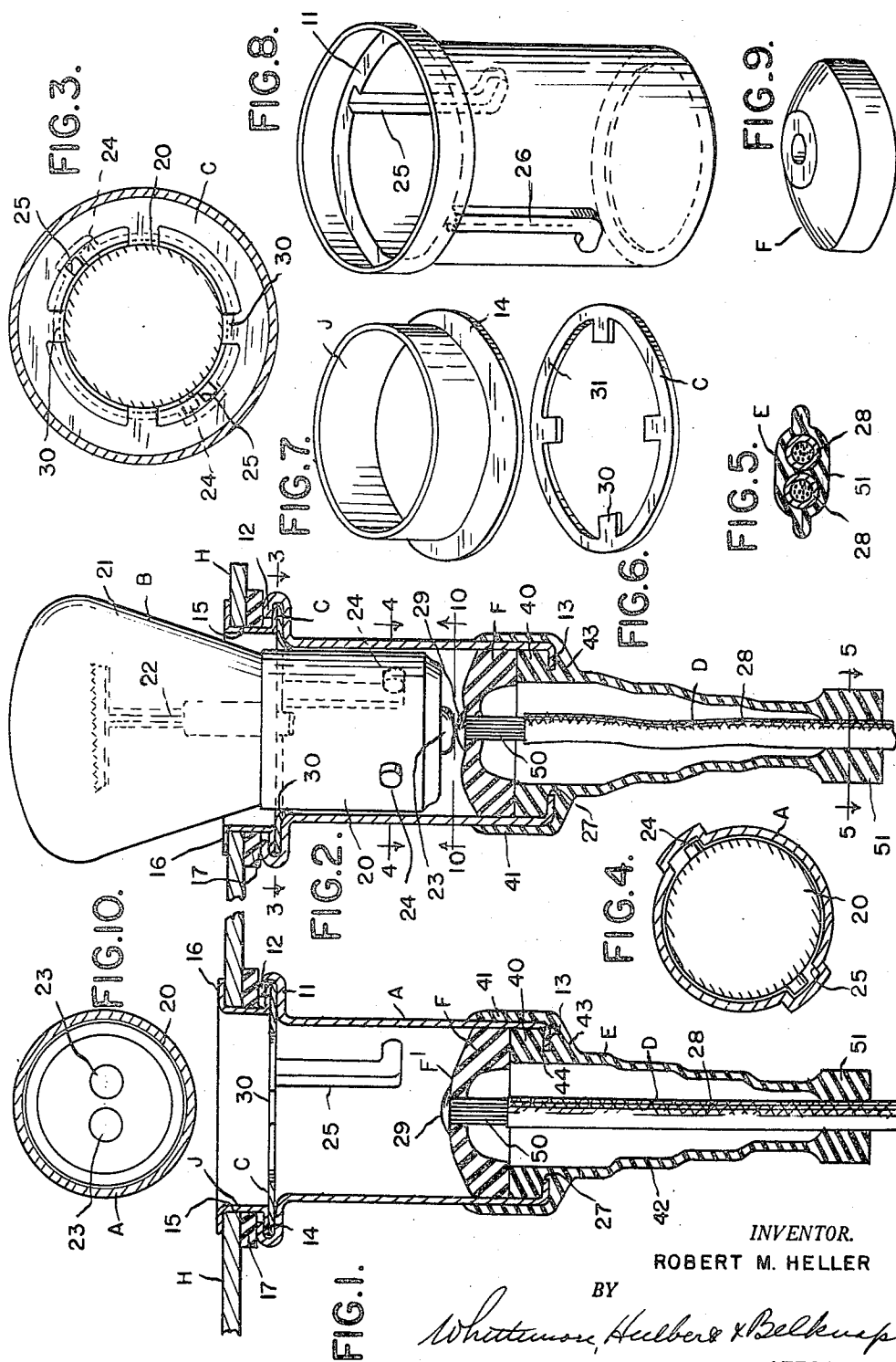
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ELECTRICAL RECEPTACLE

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ELECTRICAL RECEPTACLE

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The present invention relates generally to electrical receptacles, and refers more particularly to electric bulb sockets.

One of the essential objects of the invention is to improve generally the construction of electric bulb sockets by eliminating parts heretofore believed necessary, and by providing such sockets with new elements that increase the efficiency of the sockets while in use.

More specifically it is an object of the present invention to provide a socket wherein the usual core, the sleeve therefor, the electric contact elements carried by said core, and the coil springs surrounding said contact elements have all been eliminated and have been replaced by fewer and more efficient new elements.

In the present instance one of the new elements is a one-piece resilient washer or grommet, preferably comprising a heat resistant resilient material such as nylon or fibrous material impregnated with a phenolic resin, and employed at the mouth of the socket to hold in proper assembled relation therewith the base of an inserted electric bulb, and to prevent destruction of the bulb by absorbing any shocks and vibration to which such bulb may be subjected while in use.

Another of the new elements is a one-piece soft, resilient, heat resistant compressible plastic member of insulating material preferably comprising a molded arched neoprene support for the electric terminals of the electrical conductors and operable as a spring under compression when the bulb is inserted into the shell to hold the electric terminals of the electrical conductors in proper electrical contact with the electric terminals of the bulb.

Another object is to provide the shell of the bulb socket with a resilient extensible boot having one end thereof secured to and forming an endwise extension of the shell and having its other end crimped upon and fused or heat sealed with the insulating coverings of the electrical conductors.

Another object is to provide a boot of the type mentioned comprising a mandrel dipped or a molded hollow enclosure for the electrical conductors and capable of stretching somewhat when the electric terminals of the conductors are depressed by the electric terminals of the bulb when the latter is inserted into assembled relation with the shell, and of thereafter contracting or returning to unstretched condition when the bulb is removed from the shell.

Another object is to provide a boot operable to provide freedom of movement of the electrical conductors relative to the shell while permitting the electric terminals of said electrical conductors to be held by the arched support aforesaid in proper electrical contact with the terminals of the bulb should the electrical conductors be bent at a sharp angle relative to the shell when the bulb socket is originally installed in a vehicle instrument panel or other support.

Another object is to provide a boot that has a larger cross section than the over-all cross section of the elec-

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trical conductors to enable such conductors to be easily and quickly threaded through the boot from either end thereof when being initially assembled with the boot.

Another object is to provide a boot that is preferably formed from a vinyl material such as a polyvinyl chloride compound or polyethylene that is compatible with the insulating coverings of the electrical conductors, so that such material may be effectively pinched or crimped upon and fused or heat sealed with such insulating coverings, as aforesaid.

Another object is to provide a bulb socket that is simple in construction, economical to manufacture and efficient in use.

Other objects, advantages and novel details of construction of this invention will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings wherein:

Figure 1 is a longitudinal sectional view through a bulb socket embodying my invention and through a vehicle instrument panel to which it is connected.

Figure 2 is a view similar to Figure 1, but showing the arrangement of parts when an electric bulb is inserted into the socket.

Figure 3 is a cross sectional view taken substantially on the line 3—3 of Figure 2.

Figure 4 is a cross sectional view taken substantially on the line 4—4 of Figure 2.

Figure 5 is a cross sectional view taken substantially on the line 5—5 of Figure 2.

Figure 6 is a perspective view of the washer or grommet.

Figure 7 is a perspective view of the attaching tube of the bulb socket, and showing its configuration before being attached to the instrument panel.

Figure 8 is a perspective view of the shell of the bulb socket, and showing its configuration before the tube just mentioned is attached thereto.

Figure 9 is a perspective view of the arched support;

Figure 10 is a cross sectional view taken substantially on the line 10—10 of Figure 2.

In the drawing, A is the shell, B is the electric bulb, C is the resilient washer or grommet, D are the electrical conductors, E is the resilient extensible boot, and F is the arched support for the terminals of the electrical conductors D.

As shown, the shell A is formed of sheet metal and is tubular in configuration. Preferably this shell A is provided at one end thereof with an annular outwardly projecting flange 11 having an open return bent marginal flange 12, and is provided at its other end with an annular inwardly projecting flange 13.

For attaching the shell A to a suitable support such as a metal instrument panel H of a motor vehicle, I have provided a short tube J, preferably of larger diameter than the shell A and having at one end thereof an annular laterally projecting flange 14 extending between and clamped by the flanges 11 and 12 respectively. The tube J extends through an opening 15 in the metal instrument panel H and has its free end upset to provide an outwardly projecting flange 16 overlying the adjacent surface of said panel. Any suitable means such as a ring 17 of insulating and sound deadening material may be employed to surround the tube J between the return bent flange and the instrument panel H to provide an effective seal between such parts.

The electric bulb B is a standard type having a base portion 20, a glass bulb portion 21, an electric filament portion 22, and one or more electric terminals 23 connected by wiring (not shown) extending through the base portion 20 to the electric filament portion 22.

As shown, the base portion 20 of the bulb is provided at diametrically opposite sides thereof with lugs or pro-

jections 24 that are detachably engageable with suitable J-shaped or bayonet slots 25 provided by similarly shaped outwardly offset or projecting portions 26 of the shell at diametrically opposite sides thereof to releasably lock the bulb B to the shell A.

The resilient washer or grommet C is a flat relatively thin annulus and has an outer edge portion that extends between and is clamped by the flanges 11 and 14 respectively of the shell A and tube J. Preferably this annular washer C has an inner edge encircling and spaced from the base portion 20 of the electric bulb, and is provided at circumferentially spaced points of its inner edge portion with inwardly projecting radially extending bendable lugs 30 that are engageable freely with the base portion 20 of the electric bulb B to hold said base portion 20 centered relative to and out of contact with the side walls of the shell A. Thus this washer C will effectively protect the bulb B and filament portion 22 from destruction or premature failure by absorbing any shocks and vibrations to which such bulb may be subjected while in use.

When assembled with the shell A, the lugs 30 of the washer C are located upon opposite sides of the J slots 25, and the inner edge portions 31 of the washer between said lugs are in rear of the outer surfaces of the J slots, so that the lugs 24 of the electric bulb B may be inserted into and removed from said J slots 25 without interference by the washer C.

Preferably the washer C is formed of heat resistant material such as nylon but may be formed of fibrous material impregnated with a phenolic resin.

One or more electrical conductors D extend from a suitable source (not shown) through the opening 27 provided by the annular flange 13 into the lower end of the shell A. Such electrical conductors D have suitable insulating coverings 28 and are provided at their free ends within the shell A with electric terminals 29 for engagement with the electric terminals 23 of the bulb B.

The boot E cooperates with the shell A to form an enclosure for the electrical conductors D and has a relatively thick annular anchorage portion 40 within the shell A and abutting or seated upon the inner surface of the annular flange 13, an outer tubular portion 41 encircling and bearing against the outer surface of the shell A, an axially extending tapered extensible sleeve portion 42 projecting endwise from the shell, an annular flange portion 43 connected to said tubular portion 41 and to said sleeve portion 42 and bearing against the flange 13 of said shell, and an annular portion 44 extending through said opening 27 across the inner edge of the flange 13 and connected to said sleeve portion 42, anchorage portion 40 and flange portion 43. Thus one end of the boot E is open and is effectively secured to the shell A. The other end of the boot E is crimped upon and fused or heat sealed with the coverings 28 of the electrical conductors D and thus is closed.

Such boot E may be either a mandrel dipped or a molded member, and preferably is formed from a vinyl material such as polyvinyl chloride compound or polyethylene that is compatible with the insulating coverings 28 of the electrical conductors D, so that such material may be effectively pinched or crimped upon and fused or heat sealed with such insulated coverings.

The arched support F for the terminals 29 of the electrical conductors D has substantially cylindrical side walls that conform in shape to and fit snugly like a plug within the shell such support and is seated against and serves as a closure for the annular anchorage portion 40 of the boot E. Preferably this arched support F is sleeved tightly upon exposed metallic portions 50 of the electrical conductors D between the insulating coverings 28 and the terminals 29 and forms a supporting seat for the latter. Such support F is a molded one-piece, soft, resilient, heat resistant and compressible plastic member of insulating material, such as neoprene, and has a crown portion F' operable as a spring under compression when the bulb B is in-

serted into the shell A to hold the electric terminals 29 of the electrical conductors D in proper electrical contact with the electric terminals 23 of the bulb.

Before being crimped upon and fused or heat sealed with the insulating coverings 28 of the electrical conductors D, the end 51 of the sleeve portion 42 of the boot has a larger cross section than the over-all cross section of the electrical conductors D to enable such conductors to be easily and quickly threaded through the boot E from either end thereof when being initially assembled with the boot. Also, before the end 51 of the sleeve portion 42 of the boot is crimped upon and heat sealed with the insulated coverings 28 of the electrical conductors, the said conductors are straightened within the sleeve portion 42 so that the length of said conductors within the sleeve portion 42 and shell A is substantially the same as the distance between the crown of the uncompressed arched member F and the end 51 of the sleeve portion 42 of the boot. The end 51 of the sleeve portion 42 of the boot is then crimped upon and fused or heat sealed with the insulated coverings 28 of the conductors D.

After the end 51 of the sleeve portion 42 of the boot E has been crimped upon and fused or heat sealed with the insulated coverings of the electrical conductors, the shell A may then be secured to the instrument panel H of a motor vehicle by inserting the free end of the tube through the opening 15 in the instrument panel and then upsetting said free end over the adjacent surface of said panel, as shown in Figure 1.

The extensible sleeve portion 42 of the boot is also operable to provide freedom of movement of the electrical conductors D relative to the shell A while permitting the electric terminals 29 of said electrical conductors D to be held by the arched support F in position for proper electrical contact with the terminals 23 of the bulb B should the electrical conductors D be bent at a sharp angle relative to the shell A when the bulb socket is originally installed in the vehicle instrument panel H.

In use, when the bulb B is inserted into the shell A the electric terminals 23 of the bulb will engage and depress the electric terminals 29 of the electrical conductors D. Consequently the crown portion of the arched support F will be depressed and will be operable as a spring under compression to hold the electric terminals 29 of the electrical conductors D in proper electrical contact with the electric terminals 23 of the bulb. When the crown portion of the arched support is depressed, the sleeve portion 42 of the boot will be extended somewhat by that portion of the electrical conductors between the arched support F and the fused end 51 of the boot, and said portion of the electrical conductors D will thereafter buckle slightly when the sleeve portion 42 of the boot has reached its stretching limit, as shown in Figure 2. Also, the lugs 30 of the washer C will effectively hold the base portion 20 of the bulb in proper assembled relation with the shell A and will prevent destruction of the bulb by absorbing any shocks and vibrations to which such bulb may be subjected while in use.

When the bulb B is thereafter removed from the shell A for any purpose, the electrical terminals 29 of the electrical conductors D will be free of and relieved from the pressure previously exerted by the electrical terminals 23 of the bulb B. Hence the crown portion of the depressed support F will return to its original arched configuration, the sleeve portion 42 of the boot E will return to its original unstretched configuration and the electrical conductors D will become straight again, as shown in Figure 1. In this connection it will be noted that the spring action of the crown portion of the arched support F will assist the return of both the conductors D and of the sleeve portion 42 to their original configurations,

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What I claim as my invention is:

1. An electric bulb socket assembly comprising an elongated tubular shell open at one end to receive the cylindrical base portion of an electric bulb and adapted to be closed at the other end by means of a member supporting an electric terminal for engagement with an electric terminal on an electric bulb inserted within said shell, an outwardly extending annular flange on said shell at said one end thereof, said annular flange having an open returned bent portion projecting outwardly from said shell to provide an inwardly opening annular groove at said one end of said shell, a tube axially positioned with respect to and located adjacent said one end of said shell, said tube including a radially outwardly extending annular flange at the inner end thereof adjacent said shell, the outer periphery of the tube flange extending into said groove whereby said tube and shell are secured together, an annular insulating and sound deadening member sleeved upon said tube and engaging the open returned bent portion of the shell flange, said tube further including a second annular radially outwardly extending flange at the other end thereof operable to clamp the periphery of an opening in a fixed support against said insulating and sound deadening member whereby said tube is resiliently secured to said support, a flat annular member of heat resistant material positioned within said shell, the outer periphery of said flat annular member being firmly held in said groove in contact with the flange at said one end of said tube whereby said tube and shell are rigidly secured together, and resilient fingers extending radially inwardly of said shell from the inner periphery of said flat annular member and operable when a bulb is inserted in said shell to yieldingly engage the cylindrical base portion of said

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bulb at circumferentially spaced points thereof to hold the bulb base in a centered position relative to and out of contact with the inner surface of said shell for absorbing shocks and vibrations to which the bulb would otherwise be subjected if held in contact with said shell.

2. The electric bulb socket assembly as claimed in claim 1 wherein J-shaped slots are provided in said one end of said shell for receiving lugs on the base of an electric bulb inserted within said shell whereby the electric bulb may be retained in said shell, and wherein said open returned bent portion of said shell flange, said tube and said annular member have an inner periphery larger in diameter than the inner diameter of said shell and the depth of said slots combined, and wherein said resilient fingers of said flat annular member are positioned at circumferentially spaced points of said tube between said J-shaped slots, whereby an electric bulb may be inserted into or withdrawn from said shell without said tube, shell flange, or flat annular member interfering with the movement thereof.

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