Oct. 1, 1963 T. W. SMITH 3,105,730

BULB SOCKET ADAPTER

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FIG. 1

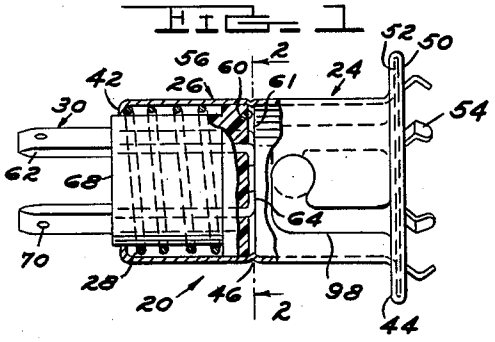


FIG. 3

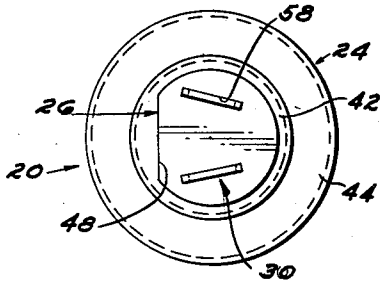


FIG. 2

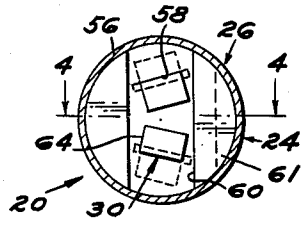


FIG. 4

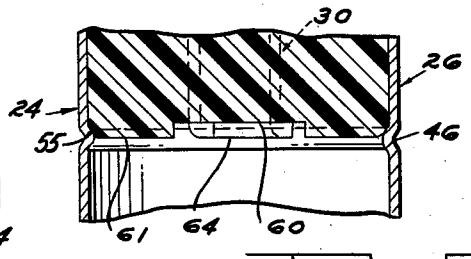


FIG. 5

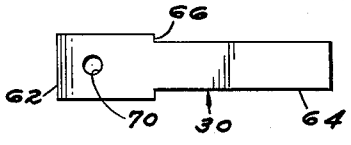


FIG. 8

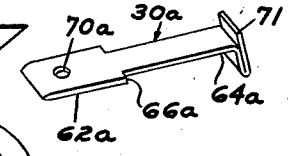


FIG. 6

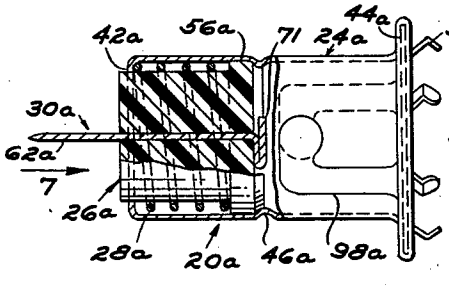
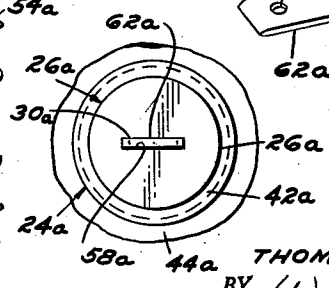


FIG. 7



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FIG. 9

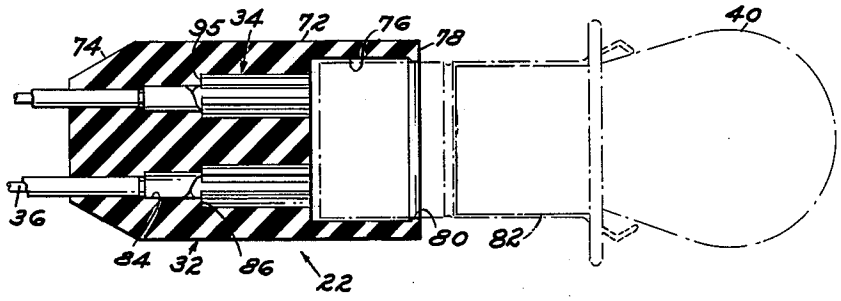


FIG. 10

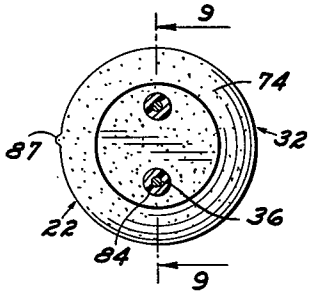


FIG. 11

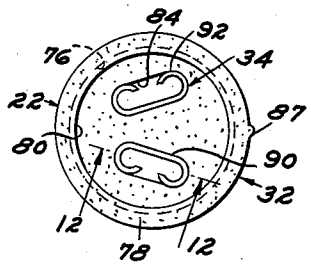


FIG. 12

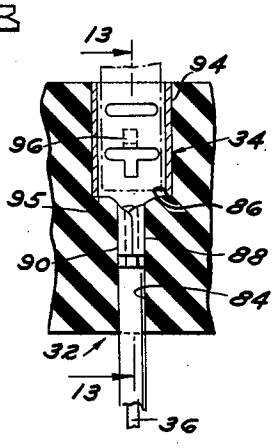


FIG. 13

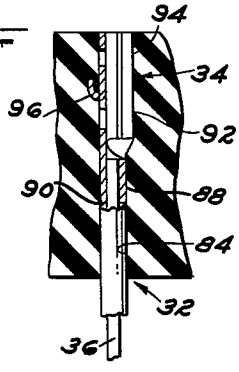
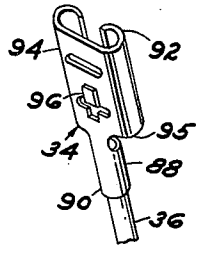


FIG. 14



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BULB SOCKET ADAPTER

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Filed Jan. 4, 1960, Ser. No. 331
4 Claims. (Cl. 339—170)

The present invention relates generally to an electrical socket structure and refers more particularly to an improved electric bulb socket and electrical connector adapted to connect the terminals of an electric bulb to electrical conductors.

One of the objects of the invention is to provide improved means for connecting a terminal of an electric bulb to an electrical conductor.

Another object is to provide an improved electric bulb socket and an electrical connector operable in conjunction with each other to connect the terminals of an electric bulb inserted in the bulb socket to electrical conductors held by the electrical connector.

Another object is to provide an improved coupling between the terminals of an electric bulb and electrical conductors comprising a bulb socket including a socket tube and a core inserted within said socket tube and also including contact members extending longitudinally through the core and resilient means acting between the core and socket tube to bias one end of the contact members into engagement with the terminals of an electric bulb inserted in said socket tube, said improved coupling further comprising an electrical connector including a body member having clips extending longitudinally therethrough to which said electrical conductors are attached, said clips being adapted to make electrical contact with said contact members.

Another object is to provide an improved electric bulb socket comprising a socket tube, a core inserted within said socket tube, a contact member extending longitudinally through said core, and resilient means acting between said socket tube and core to bias one end of the contact member into engagement with an electric bulb inserted in said socket tube.

Another object is to provide an electric bulb socket as set forth above wherein said socket tube is provided with a radially inwardly extending flange at one end and said core is provided with a radially outwardly extending flange and the resilient means comprises a spring surrounding said core and acting between the flanges.

Another object is to provide an electric bulb socket as set forth above wherein an annular groove is provided centrally of said socket tube to limit movement of said core wtihin said socket tube in one direction.

Another object is to provide an electric bulb socket as set forth above wherein said core has a transverse recess across the inner end thereof and the contact member has abutments thereon positioned to prevent movement thereof in one direction through said core and wherein one end of the contact member is bent over within the recess in the core to prevent movement of the contact member in the other direction through said core.

Another object is to provide an electrical connector for connecting an electric bulb socket to electrical conductors comprising a body member of insulating material and clips extending through said body member attached at one end to electrical conductors and adapted to receive the contact members of an electric bulb socket at the other end.

Another object is to provide an electrical connector as set forth above wherein said body member has a recess in the end thereof adjacent the end of the clips adapted to receive the contact members of the electric bulb socket

which forms a boot of insulating material adapted to receive the end of the electric bulb socket.

Another object is to provide an improved electrical socket structure including an electric bulb socket and electrical connector which 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 an elevational view of a bulb socket according to the invention having the socket tube partially broken away.

FIGURE 2 is a cross-sectional view of the bulb socket shown in FIGURE 1 taken on the line 2—2 in FIGURE 1.

FIGURE 3 is an elevational view of the left end of the bulb socket of FIGURE 1.

FIGURE 4 is an enlarged partial longitudinal section of the bulb socket shown in FIGURE 1 taken on the line 4—4 in FIGURE 2.

FIGURE 5 is a view of the male contact member of the bulb socket shown in FIGURE 1.

FIGURE 6 is an elevational view of a modified bulb socket according to the invention wherein a single male contact member with a T-shaped bulb contact end is provided.

FIGURE 7 is an elevational view of the left end of the bulb socket shown in FIGURE 6.

FIGURE 8 is a perspective view of the contact member having a T-shaped bulb contact end illustrated in FIGURE 6.

FIGURE 9 is a longitudinal sectional view of the electrical connector of the invention which is adapted to receive the bulb socket of FIGURE 1 which section view is taken on the line 9—9 in FIGURE 10.

FIGURE 10 is an elevational view of the left end of the electrical connector illustrated in FIGURE 9.

FIGURE 11 is an elevational view of the right end of the electrical connector illustrated in FIGURE 9.

FIGURE 12 is a partial longitudinal section of the electrical connector illustrated in FIGURE 9 taken on the line 12—12 in FIGURE 11.

FIGURE 13 is a partial longitudinal section of the electrical connector illustrated in FIGURE 9 taken on the line 13—13 in FIGURE 12.

FIGURE 14 is a perspective of one clip of the electrical connector illustrated in FIGURE 9.

With particular reference to the drawings an embodiment of the socket structure of the invention will now be described.

The socket structure of the invention comprises an improved bulb socket generally indicated 20, and shown best in FIGURE 1, together with an electrical connector generally indicated 22, and shown best in FIGURE 9. Bulb socket 20 comprises socket tube 24, core 26, spring 28, and contact members 30. The electrical connector 22 comprises body member 32 and clips 34.

In use the bulb socket 20 assembled as shown in FIGURE 1 is positioned in the electrical connector 22, as illustrated in FIGURE 9. The electrical connector is secured to the electrical conductors 36 and an electric bulb 40 is inserted in the bulb socket 20. Thus the bulb 40 may be energized by electrical current flowing through conductors 36.

More specifically the socket tube 24 of the bulb socket 20 of the invention, as shown best in FIGURE 1, is a cylindrical metal member having at one end thereof a radially inwardly projecting annular flange 42. Socket tube 24 is provided with an outwardly projecting flange 44 at the other end thereof and a groove 46 around its outer circumference positioned intermediate the ends thereof.

Flange 42, as shown in FIGURE 1, serves as an abutment for one end of spring 28. Flange 42 is also provided with a flat portion 48 illustrated best in FIGURE 3, which is operable to prevent rotation of core 26 in assembly with the socket tube 24.

Flange 44, as shown in FIGURE 1, is open returned and may be used to mount the socket tube on a convenient surface as will be understood by those in the art. In addition flange 44 supports an annular ring 50 in the annular groove 52 formed by the open returned edge thereof. Annular ring 50 has resilient fingers 54 extending therefrom which are shaped as shown in FIGURE 1 to which convenient decorative or cover means for bulb 40 may be attached.

As shown groove 46 engages the beveled end 55 of core 26 as core 26 is urged toward groove 46 by spring 28. Groove 46 is operable to prevent movement of core 26 to the right within socket tube 24 as illustrated in FIGURE 1.

Core 26, as illustrated best in FIGURE 1, is a substantially cylindrical member which may be constructed of plastic material having suitable insulating properties. Core 26 is provided with an outwardly extending flange 56 at one end thereof which provides an abutment against which the other end of spring 28 is positioned. A flat surface extending longitudinally of core 26 is provided and is operable in conjunction with the flat portion of flange 48 of socket tube 24 to prevent rotation of core 26 with respect to socket tube 24 as previously indicated.

Additionally core 26 is provided with a pair of slots 58 extending therethrough longitudinally thereof, as shown best in FIGURE 3. Slots 58 are provided to receive contact members 30. The slots 58 are inclined slightly toward each other in conjunction with a similar positioning of clips 34 of electrical connector 22 as shown best in FIGURE 11 so that the contact members 30 positioned in slots 58 may be connected with the clips 34 of electrical connector 22 with only one angular orientation.

The core 26 is further provided with a laterally extending recess 60, as best shown in FIGURE 2, extending across the flanged end thereof. The recess 60 enables contact members 30 inserted in slots 58 to be bent into contact with the bottom surface of the recess 60 on assembly of the contact members 30 with the core 26, whereupon the exposed surface of the contact members 30 is positioned substantially level with the end surface 61 of the core 26.

Spring 28 as shown is a helically wound compression spring and is positioned between flange 42 of the tube socket and flange 56 of the core 26 in an assembled bulb socket 20 and is operable to urge the core member 26 and therefore the contact members 30 secured thereto toward a bulb 40 inserted in socket tube 24 to maintain the contact members 30 in electrical contact with the terminal portions of the bulb 40.

Contact members 30, as best shown in FIGURES 1 and 5, comprise substantially flat elongated members, the clip contacting end 62 of which is slightly wider than the bulb contacting end 64 thereof to provide abutments 66 which rest against the end surface 68 of the core 26 with the contact members in assembly with the core 26. Ends 62 of the contact members 30 are provided with an opening 70 therethrough to which electrical conductors may be attached if desired and are beveled as shown in FIGURE 1 to provide easy insertion thereof in clips 34 of electrical connector 22.

As indicated the bulb contact end 64 of the contact member 30, as shown in FIGURE 2, is bent over within the transverse recess 60 of core 26 to fixedly secure the contact members 30 to the core 26 and provide a contact surface against which the terminal portions of bulb 40 are pressed by spring 28. The ends 64 may be bent either inwardly or outwardly as shown in FIGURE 2 to provide for different spacing of the terminals of bulbs 40.

A modified bulb socket 20*a* according to the invention

is illustrated in FIGURES 6, 7 and 8. The bulb socket 20*a* is the same as bulb socket 20 in all respects, except that instead of two contact members 30 extending through core 26 a single contact member 30*a* is provided centrally of core 26*a*. Also contact member 30*a* instead of merely being bent over at end 64 thereof is first bent over and is then returned along the bent-over portion thereof to form the T-shaped head 71 illustrated best in FIGURE 8. In the modified bulb socket 20*a* the socket tube 24*a* acts as one terminal of a coaxial connector. Thus in use an electric circuit is completed through the socket tube 24*a* of the bulb socket 20*a*, contact member 30*a* and a light bulb (not shown) inserted in bulb socket 20*a* in the known manner.

With reference to FIGURE 9 the body member of the electrical connector 22 of the socket structure of the invention is generally cylindrical and may be constructed of plastic or other suitable insulating material. Body member 32 as shown has a generally cylindrical outer surface 72 which is tapered inwardly at end 74. A recess 76 forming a boot adapted to receive the end of socket tube 24 is provided in end 78 of body member 32. A bead or flange 80 extends radially inwardly around the outer edge of recess 76, as shown best in FIGURE 9, for the purpose of gripping the end 82 of socket tube 24.

The body member 32 of electrical connector 22 is further provided with a pair of longitudinally extending openings 84 therethrough which are adapted to closely receive clips 34. Openings 84 are provided with offsets 86 against which clips 34 are positioned. Also, a locating bead 87 is provided on the exterior of body member 32 extending longitudinally thereof and illustrated in FIGURES 10 and 11 to aid in angularly locating the electrical connector 22.

Clips 34, as best illustrated in FIGURES 12–14, are formed as shown of electrically conductive material such as soft brass. Clips 34 are provided with wing portions 88 at end 90 thereof which are adapted to wrap around and tightly grip an electrical conductor 36 to make an electrical connection therewith. Clips 34 are further provided with open returned edge portions 92 at end 94 thereof which form abutments 95 adapted to fit against the offsets 86 in the body member 32 of the electrical connector 22. The open returned portions 92 of clips 34 are adapted to receive the clip contact ends 62 of contact members 30 of bulb socket 20.

Clips 34 are also provided with a struck-out and open returned portion 96 located substantially centrally of end 94 thereof adapted to secure clips 34 within body member 32 to prevent removal thereof through recess 76 after initial assembly.

In assembly electrical conductors 36 are secured to clips 34 by means of wing portions 88 of the clips inserted in openings 94 of adapter 22 which are formed to orient the clips 34 at an angle with respect to each other which is the same as the angle at which the contact members 30 are mounted in core 26 as previously indicated to permit inserting of contact members 30 into clips 34 with the bulb socket 20 and electrical connector 22 in only one relative angular position.

In use a bulb socket, such as 20, assembled as shown in FIGURE 1, may be secured in a desired mounted position by means of flange 52 and a bulb 40 inserted therein by means of engaging the lugs (not shown) on the side of the terminal end 82 of the bulb in bayonet slots 98 formed in socket tube 24 whereby the terminals of the bulb 40 are caused to contact the bulb contact end of the contact members 30 to make an electrical connection therewith. The clip members 34 positioned in body member 32 of electrical connector 22 are secured to electrical conductors 36 as illustrated in FIGURE 9, and the electrical connector 22 is then inserted over the extending clip contact ends 62 of contact members 30 of the bulb socket 20 with the clip contact ends engaging

the open returned portions 92 of the ends 94 of clips 34 in electrical contact whereby an electrical circuit from conductors 36 through bulb 40 is completed.

Thus it is seen that applicant has provided a socket structure which is simple in construction, easy to manufacture and efficient in use, which may be conveniently mounted and in which bulb socket 20 in conjunction with electrical connector 22 provides efficient easily disconnectable means for connecting electrical conductors to electrical terminals of an electrical bulb.

What I claim as by invention is:

1. An electric bulb socket comprising a cylindrical socket tube adapted to receive an electric bulb in one end thereof and including an annular radially inwardly extending flange at the other end thereof, a cylindrical core of insulating material in said other end of said socket tube, one end of said core extending through said other end of said socket tube, the other end of said core including an annular radially outwardly extending flange therearound and a recess thereacross, a contact member of conductive material extending through said core and insulated from said socket tube thereby, said contact member being positioned to engage an electric terminal of an electric light bulb received in said one end of said socket tube, said contact member also having abutments located centrally thereof adapted to engage said one end of said core, the other end of said contact member extending at right angles to the axis of said core along the bottom surface of said recess whereby said contact member and core are locked in assembly, and resilient means acting between said inwardly extending flange on said socket tube and said outwardly extending flange on said core to bias the core toward said one end of said socket tube to maintain said contact member in electrical engagement with an electrical terminal of an electrical bulb received in said socket tube.

2. An electric bulb socket comprising a cylindrical socket tube adapted to receive an electric bulb in one end thereof and including an annular radially inwardly extending flange at the other end thereof, a cylindrical core of insulating material in said other end of said socket tube, one end of said core extending through said other end of said socket tube, the other end of said core including an annular radially outwardly extending flange therearound and a recess thereacross, a contact member of conductive material extending through said core and insulated from said socket tube thereby, said contact member being positioned to engage an electric terminal of an electric light bulb received in said one end of said socket tube, said contact member also having abutments located centrally thereof adapted to engage said one end of said core, the other end of said contact member extending at right angles to the axis of said core along the bottom surface of said recess and returned to form a T-shaped head within said recess whereby said contact member and core are locked in assembly, and resilient means acting between said inwardly extending flange on said socket tube and said outwardly extending flange on said core to bias the core toward said one end of said socket tube to maintain said contact member in electrical engagement with an electrical terminal of an electrical bulb received in said socket tube.

3. An electric bulb socket comprising a cylindrical socket tube adapted to receive an electric bulb in one end thereof and including an annular radially inwardly extending flange at the other end thereof, a cylindrical core of insulating material in the other end of said socket tube,

one end of said core extending through said other end of said socket tube, the other end of said core including an annular radially outwardly extending flange therearound and a recess thereacross, a pair of substantially flat elongated contact members of conductive material having their transverse axes inclined to each other extending through said core and insulated from said socket tube thereby, said contact members being positioned to engage electric terminals of an electric light bulb received in said one end of said socket tube, said contact members also having abutments located centrally thereof adapted to engage said one end of said core, the other end of said contact members extending at right angles to the axes of said core along the bottom surface of said recess whereby said contact members and core are locked in assembly and resilient means acting between said inwardly extending flange on said socket tube and said outwardly extending flange on said core to bias the core toward said one end of said socket tube to maintain said contact members in electrical engagement with electric terminals of an electric bulb received in said socket tube.

4. An electric bulb socket comprising a cylindrical socket tube adapted to receive an electric bulb in one end thereof, a cylindrical core of insulating material in the other end of said socket tube, one end of said core extending through said other end of said socket tube, the other end of said core including a recess thereacross, a pair of substantially flat elongated contact members of conductive material having their transverse axis inclined to each other extending through said core and insulated from said socket tube thereby, said contact members being positioned to engage electric terminals of an electric light bulb received in said one end of said socket tube, said contact members also having abutments located centrally thereof adapted to engage said one end of said core, the other end of said contact members extending at right angles to the axes of said core along the bottom surface of said recess whereby said contact members and core are locked in assembly and resilient means acting between said socket tube and said core to bias the core toward said one end of said socket tube to maintain said contact members in electrical engagement with electric terminals of an electric bulb received in said socket tube.

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