

Oct. 2, 1962

E. A. ERIKSSON
ELECTRICAL CONNECTOR

3,056,941

Filed May 18, 1960

3 Sheets-Sheet 1

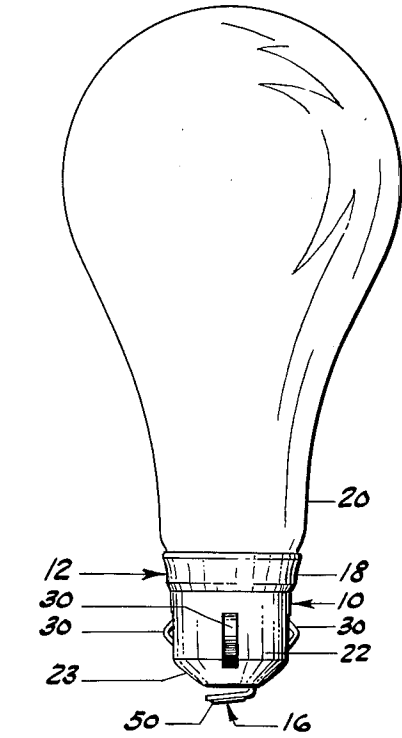


FIG. 1

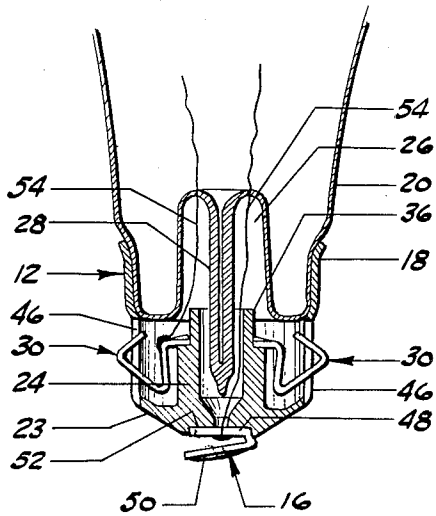


FIG. 2

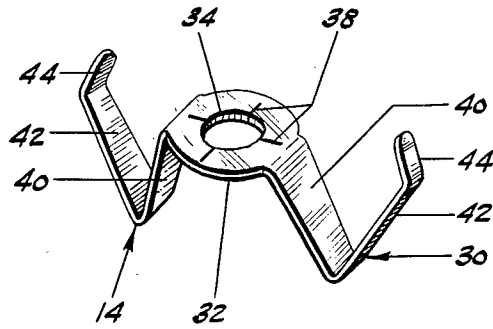


FIG. 4

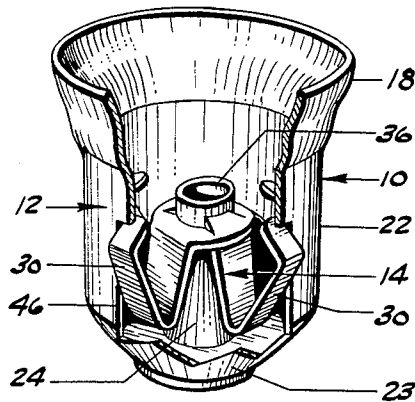


FIG. 3

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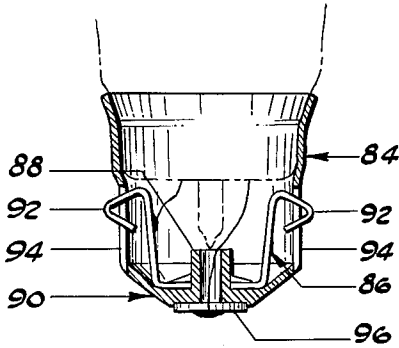


FIG. 9

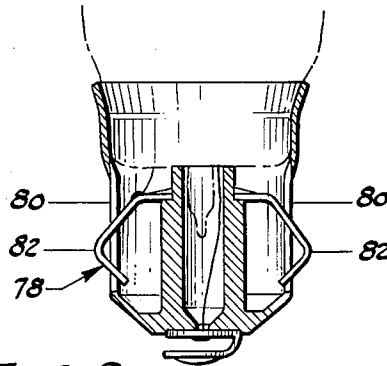


FIG. 8

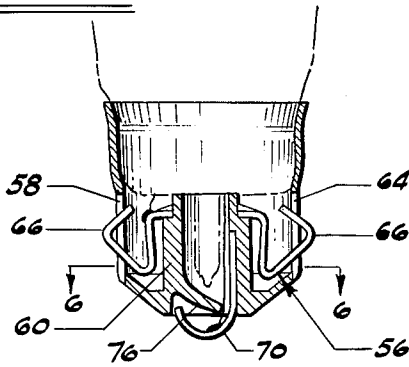


FIG. 5

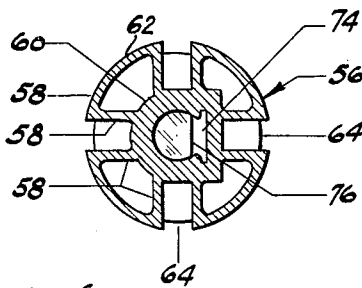


FIG. 6

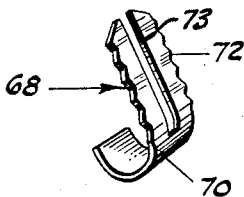


FIG. 7

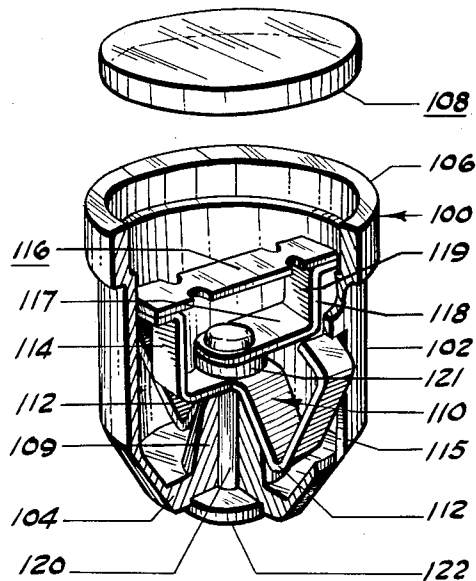


FIG. 10

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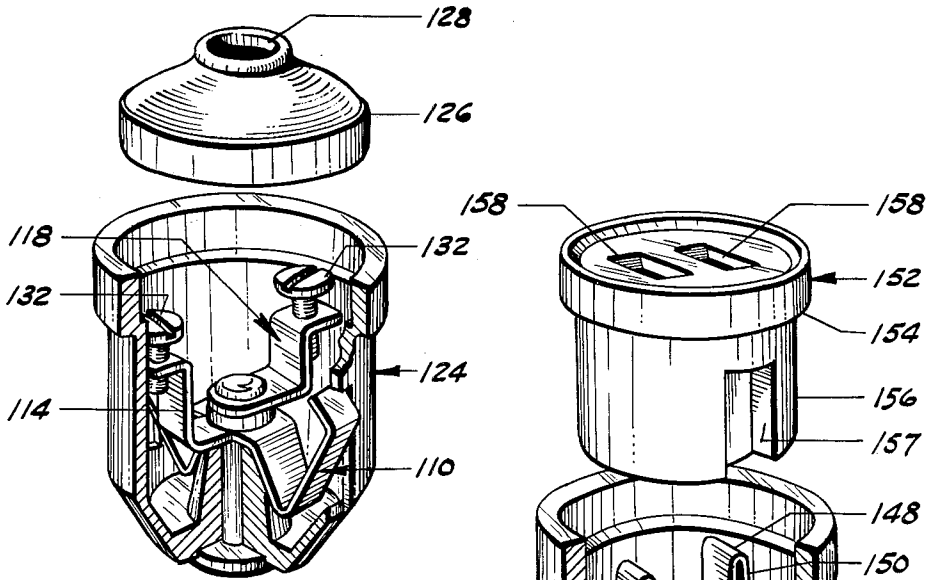


FIG. 11

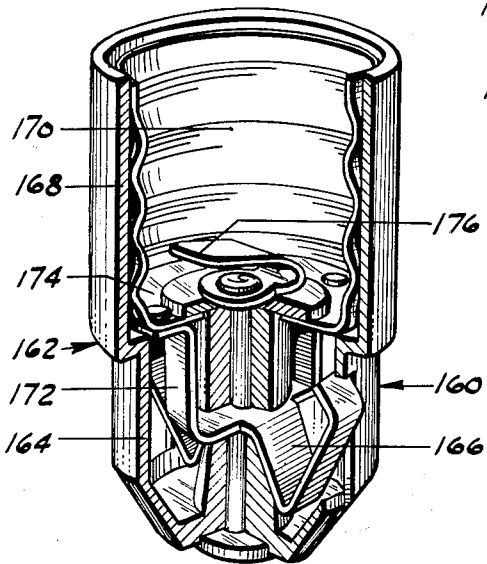


FIG. 13

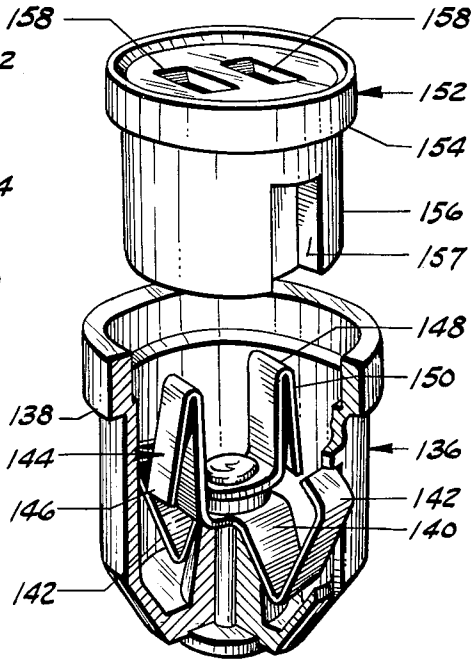


FIG. 12

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3,056,941

ELECTRICAL CONNECTOR

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Filed May 18, 1960, Ser. No. 29,929
22 Claims. (Cl. 339—72)

This invention relates to electrical connectors and more particularly to connectors designed for incorporation as components of lamps, plugs, plug fuses and the like.

An object of the invention is to provide a novel and improved electrical connector of the type described capable of being introduced into and withdrawn from standard threaded electrical sockets simply, easily and without rotation and providing a secure engagement between said connector and the socket, effectively resisting withdrawal therefrom.

Another object of the invention is to provide an electrical connector of the type described comprising a minimum number of inexpensive and easily assembled components.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the apparatus possessing the construction, combination of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings wherein:

FIGURE 1 is an elevational view of an electric lamp embodying the connector of the invention as the lamp base;

FIG. 2 is a fragmentary, sectional view of the lamp of FIG. 1, the section being taken in a plane through the center of the lamp;

FIG. 3 is a perspective view with parts broken away of the lamp base of FIGS. 1 and 2;

FIG. 4 is a perspective view of a component of the lamp base;

FIG. 5 is a view similar to FIG. 2, showing another embodiment of the lamp base;

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 5;

FIG. 7 is a perspective view of a component of the lamp base of FIGS. 5 and 6;

FIGS. 8 and 9 are views similar to FIG. 2, showing other forms of lamp bases embodying the invention;

FIG. 10 is a perspective view of a plug fuse embodying the invention, shown partially exploded and with parts broken away; and

FIGS. 11, 12 and 13 are views, similar to FIG. 10, illustrating the invention as, respectively, a plug, a receptacle for a male plug, and an adaptor for a threaded connector.

The electrical connector of the invention is generally in the form of a plug adapted to be introduced directly and without rotation into a standard threaded electric lamp socket. The connector may comprise a plug coupled with an electrical conductor, a plug providing a convenience outlet into which a conventional male plug may be introduced, an adaptor for threaded connectors, a plug fuse or the base of a conventional incandescent electric lamp.

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The connector is characterized by a construction which is neither complex nor expensive and is easy to assemble; and, even though the connector is merely snapped into the socket without rotation, it effectively retains itself in the socket and resists accidental or unintentional dislodgement such as might result from vibration. In addition to the more readily apparent advantages, such as convenience, safety, and the like, the connector of the invention particularly when incorporated in a lamp or plug fuse, possesses the additional advantages of a construction which resists corrosion and allows withdrawal from a socket in circumstances under which corrosion would prevent withdrawal of a conventional, threaded connector.

Reference is now made to FIGS. 1 through 3 of the drawings wherein an electrical connector embodying the invention is shown comprising the base of a conventional incandescent lamp. The connector or lamp base 10 comprises only three basic elements, these being a shell 12, a spider 14, and a base contact 16. The shell is adhered to the glass lamp envelope and functions to mount and/or enclose the spider and base contact. The spider functions to engage the threads of the socket for retaining the connector within the socket, and both the spider and base contact provide the two electrical connections for the lamp.

Shell 12 is generally cup-shaped and axially symmetrical, having an open end with a flared edge portion 18 shaped to snugly fit the base portion of a glass lamp envelope 20 which, in the form shown, tapers toward its base. The shell includes a base portion 22 which is generally cylindrical and is designed to fit within the threads of a conventional threaded lamp socket. The base end of shell 12 includes an end wall 23 on which is mounted a central support tube 24 extending from the closed base end of the shell toward the open end thereof. Since shell 12 is adapted to mount the electrical contacts for the lamp socket, the shell is formed of a dielectric material, organic plastics being particularly suited for this purpose. The design of the shell is such as to readily permit its manufacture by molding techniques from organic plastics characterized by high dielectric strength and good resistance to heat. Examples of materials suitable for this purpose include organic thermosetting plastics such as the phenolics, specifically phenol formaldehyde and phenol furfural; amino compounds such as melamine and urea; the allylics; fluoro carbons such as tetrafluoroethylene, trifluorochloroethylene and chlorotrifluoroethylene polymers; and alkyd molding materials. The use of organic plastics offers a further advantage in that it makes possible the color coding of lamp bases to indicate lamp size.

Conventional lamp envelopes, such as are shown in the drawings, usually include a recess 26 in the end of the envelope base and a draw-off tube 28 projecting from the recess beyond the end of the envelope. Flared edge portion 18 of shell 12 is secured to the base of the glass lamp envelope so that the end of support tube 24 extends to a point closely adjacent the end of the lamp envelope, and draw-off tube 28 projects into support tube 24. The shell is secured to the glass envelope by a material which will adhere to organic plastics and to glass, epoxy resin adhesives being suited for this purpose. Examples of particular epoxy resins are available from: Ciba Co., Inc., under the trade name "Araldite"; Shell Chemical Corp. under the trade name "Epon"; and Emerson and Cummings Co. under the trade name "Eccobond Paste 88."

Spider 14, as previously noted, performs the dual functions of engaging the socket threads for retaining the connector in the socket and providing one of the two electrical contacts of the connector and, for this reason, is formed of a resilient sheet metal. The spider, in the form shown, comprises four legs 30 and a base 32 formed with a hole 34, at which the spider is mounted on the end portion of support tube 24, the latter being provided with an end section 36 of reduced diameter which fits into hole 34. The spider may be fabricated from a single blank of sheet metal, or it may be fabricated, as shown, from two strips of sheet metal, each strip providing two legs 30 and a base 32 having a hole 34 therein. The spider is retained on end section 36 against the shoulder provided by the larger section of the support tube by forming hole 34 with a diameter which is slightly less than the diameter of end section 36. The base of spider 14 is provided with slits 38 extending radially outward from hole 34. The slits allow the base to deform sufficiently to permit end section 36 to be forced into hole 34. The edges of the hole are preferably quite sharp so that they have a tendency to cut into the support tube, and this, together with the slight deformation of the spider base, effectively prevents movement of the spider on end section 36.

Legs 30 of the spider are shaped similarly, each leg comprising a first section 40 extending along tube 24 toward end wall 23 where the leg is bent at an acute angle to provide an intermediate section 42 extending outwardly and toward the open end of shell 12. The end section 44 of each leg is relatively short and is bent so as to extend inwardly toward the end of the support tube and the open end of the shell. The wall of cylindrical base portion 22 of shell 12 is provided with four axial slots 46 adapted to receive the legs of the spider and located preferably evenly spaced (90° from one another) around the circumference of base portion 22. The portion of each leg of the spider comprising the bend at which the intermediate and end sections 42 and 44 are joined projects outwardly through a slot 46 for engaging the threads of a lamp socket into which connector 10 is introduced. The legs, as noted, are preferably resilient and are biased outwardly so as to function as spring detents for retaining the connector in the socket. Since the spider legs are deformable, assembly of the shell and spider is quite simple, requiring only that the spider be pressed into the shell until the base is engaged around the end section of support tube 24 and the legs project through the slots 46. The slots in the shell may be formed to extend substantially the full length of cylindrical portion 22 and thus facilitate both molding of the shell and introduction of the spider into the shell.

An alternative method of retaining spider 14 in place may be employed when the material comprising the shell is a thermoplastic. In this embodiment, end section 36 is introduced into hole 34 in the spider, whereupon the end section is heated to soften it sufficiently to allow it to be compressed to form a bead or head on the end of the support tube which is compressed against the spider to retain the latter in place.

Base contact 16 of the connector is preferably in the form of a metallic spring having two sections, the first providing means at which the contact is mounted on the shell and the second comprising a cantilever spring projecting beyond the end of the shell to provide an electrical contact element. In the form shown in FIG. 2, base contact 16 is generally U-shaped, having two arms designated base arm 48 and contact arm 50. Base arm 48 is shaped to fit within a centrally located recess 52 formed in the outer surface of end wall 23 and includes a small hole aligned with the conduit formed by support tube 24 for receiving a wire lead projecting from the lamp envelope. The shapes of recess 52 and base arm 48 are such as to facilitate retention of the base arm in the recess which

may be shaped, for example, so as to require deformation of the base arm as the latter is forced into the recess.

The electric lamp includes a pair of wire leads in the form of pigtails 54 extending from lamp envelope 20 at the base of draw-off tube 28 in recess 26. Pigtails 54 are led from recess 26 along opposite sides of the draw-off tube and are connected to the spider and base contact preferably by soldering. The pigtail connected to spider 14 can be soldered to the first section 40 of a leg 30 after the spider has been mounted within the shell. The other pigtail is led through tube 24 and is threaded through the hole in base arm 48 of the base contact. This other pigtail may be drawn taut before being soldered to the outer surface of the base arm, and in this manner may assist in retaining the base contact on the shell.

Alternative embodiments embodying the invention and taking the form of a lamp base are illustrated in FIGS. 5 through 9 of the drawings. In the form shown in FIGS. 5 through 7, the shell 56 is provided with internal ribs 58 extending between support tube 60 and the cylindrical wall portion 62 of the shell. Ribs 58 are provided in pairs which extend to wall portion 62 adjacent the edges of slots 64 therein, through which legs 66 of the spider project, and function to retain the spider in proper position while adding strength and rigidity to the shell structure. Base contact 68, in this embodiment, is generally J-shaped (see FIG. 7), having a curved contact end portion 70 and a shank 72 which is provided with a longitudinal slot 73 intermediate its edges, the latter being roughened or serrated to facilitate gripping of the shank portion of the base contact in a channel 74 provided in support tube 60. The base contact is mounted on the shell by pressing shank portion 72 into channel 74. The channel 74 and shank portion 72 are so dimensioned, i.e., the channel is narrower, that the shank portion is deformed by compressing the sides of the slot 73 together so that there is an outward bias on the portions of the shank portion on opposite sides of the slot, tending to force the serrated edges of the shank portion to cut into the material of the shell so that they are firmly gripped thereby. One of the pigtails is soldered to the base contact, either before or after insertion of the contact into the shell. If the soldering operation is to be performed following assembly of the base contact and shell, the pigtail may be passed through a small hole provided in end portion 70. A recess 76 is also provided in the end wall of the shell to allow for deformation of the base contact when the lamp base is inserted into a lamp socket.

Other forms of lamp bases are illustrated in FIGS. 8 and 9 of the drawings. The primary difference in the connector of FIG. 8 resides in the construction of the spider, designated 78, which comprises legs each having only two sections. The first section 80 of each leg extends downward from the shell through a slot therein and each leg is bent so that the second or end section 82 projects back into the shell. Otherwise, the construction of the connector is essentially the same as shown and described.

The lamp base construction of FIG. 9 offers the advantage of being somewhat shorter than that of FIG. 8. The shell, designated 84, is substantially the same as those described previously except that it is somewhat shorter, and the primary difference again resides in the spider 86 which is mounted at the base of support tube 60 against end wall 90 of the shell. Spider 86 includes legs 92 which extend outwardly and away from end wall 90 through slots 94 in shell 84. The end portions of legs 92 are overturned so as to extend back into the shell toward end wall 90. Spider 86 is retained in the position shown against end wall 90 in the manner described heretofore, that is, by providing radial slits adjacent a hole in the base portion of the spider. The construction of slots 94 may be such as to engage the end portions of legs 92, preventing movement of the spider away from end wall 90 toward the lamp envelope.

The base contact in this embodiment is in the form of a disk 96 secured in a suitable recess in end wall 90 by forcing the disk into the recess so that it is deformed and is firmly engaged therein, or by a suitable adhesive, and by passing one of the pigtailed through a hole in the disk, drawing the pigtail taut and soldering it in place.

As previously noted, the connector of the invention finds considerable utility as a plug fuse adapted to be snapped, rather than screwed, into a threaded socket or fuse holder. A plug fuse, designated 100, is illustrated in FIG. 10 and is adapted to be used in place of the standard Edison-base plug fuse. Fuse 100 comprises a generally symmetrical, cup-shaped shell having a cylindrical body 102 tapering to an end wall 104 at its base and having a cylindrical, flanged or enlarged portion 106 at its other (open) end providing a recessed seat for a cover 108. An axial support tube 109 is provided in the shell extending from end wall 104 toward the open end of the shell which, like the lamp base shell, is adapted to be formed by molding from organic plastic materials, the materials previously suggested being suitable for this purpose. Cover 108 is preferably transparent and may be formed of a plastic material, or it may comprise glass, and is retained in the seat provided by enlarged portion 106 by friction and/or by cementing the cover in place.

Fuse 100 includes a spider 110 having three legs, including two retaining legs 112 located opposite one another and shaped substantially the same as legs 30 of spider 14 described above, and a generally L-shaped support leg 114 extending outwardly and toward the open end of the fuse holder for mounting the end of a fusible link 116. Spider 110 includes a hole in the body portion thereof intermediate the legs and is mounted on the smaller-diameter end portion of support tube 109 which projects through the hole in the base of the spider. The shell body 102 is provided with a pair of axial slots 115 through which legs 112 project for engagement with a threaded fuse holder.

Means are provided for mounting the other end of fusible link 116 and, in the form shown, comprises an L-shaped bracket 118 mounted on the end of support tube 109. Bracket 118 includes an arm 117 extending outwardly from the support tube toward the shell body in the opposite direction from leg 114 and having a hole adjacent its end for receiving an elongated rivet 120 which extends through the support tube for retaining bracket 118 on the support tube. A washer 121 formed of a dielectric material is provided between spider 110 and bracket 118 for electrically insulating the two elements from one another. Bracket 118 includes a second arm 119 which extends toward the open end of the shell and mounts an end of fusible link 116, the latter preferably being soldered at its end to leg 114 and bracket 118 at the ends thereof which, in the form shown, are bent outwardly for this purpose. The base contact of the fuse comprises a head 122 on the external end of rivet 120 seated in a recess formed in end wall 104.

Assembly of fuse 100 is quite simple, requiring only that the spider be introduced into the shell so that legs 112 project through slots 115 and the end portion of support tube 109 projects through the hole in the spider. Washer 121 is then placed around the end portion of the support tube and rivet 120 is inserted from the base through the support tube to project beyond the end thereof. Bracket 118 is placed over the projecting end of the rivet which is then headed over to hold the bracket in place. Fusible link 116 is soldered to leg 114 and arm 119 of bracket 118, and cover 108 is secured in place, closing the open end of the fuse shell.

FIGS. 11 and 12 of the drawings illustrate the connector of the invention, respectively, as a plug 124 for an electric appliance or extension cord and as a receptacle 136 for a standard two-conductor male plug. The construction of the plug and the receptacle offers the advantage of being, for the most part, basically the same

as that of fuse 100, particularly insofar as the shell, spider, mounting bracket and their manner of assembly are concerned.

The construction of plug 124 differs in that cap 126 thereof may be designed to be removable. For this purpose, the cap and seat provided by the shell may be threaded, or the seat may be slightly under-cut and the cap flared slightly. The plug also includes a hole 128 through which the electrical conductor or cord extends.

Means are provided for connecting the two wires of a conductor to the legs of the spider and the base contact and, in the form shown, comprise a support leg 114 of spider 110 and an L-shaped bracket 118 having a support arm 119, both the bracket and the leg of the spider having the same construction as the fuse. Attachment of the wires may be made by soldering or may be facilitated by the provision of terminal bolts 130 threaded into the end portions of leg 114 and arm 119 of the bracket.

Receptacle 136 comprises a shell 138 and a spider 140 having legs 142 and modified by the provision of a contact leg 144 extending toward the open end of the shell and being bent sharply upon itself so as to provide a contact spring section 146 extending toward the closed end of the shell and slightly outwardly. An L-shaped bracket 148 mounted in the shell in the same manner as bracket 118 of the fuse provides a contact arm 150 also bent upon itself to form a spring section. Receptacle 136 includes a cap 152 having a flange 154 which is seated in the open end of the shell and a skirt 156 which extends into the shell around the spider and bracket. The periphery of skirt 156 is provided with recesses 157 aligned with legs 142 of the spider and is shaped to accommodate the legs for allowing their inward deformation. The outer end of cap 152 is formed with a pair of openings or slots 158 aligned with contact leg 144 and arm 150 and adapted to receive the contacts of a male plug for guiding the plug contacts into engagement with the spring fuse of the contact leg and arm.

The connector of the invention is illustrated in FIG. 13 as an adaptor 160 which may be screwed onto a conventional, threaded lamp base, a threaded plug, or the like to allow the threaded unit to be pushed into and removed from a threaded socket without rotation. Adaptor 160 comprises a shell 162 having a cylindrical base section 164 which is substantially the same as the corresponding portion of the shell of the first plug or receptacle described and is shaped to fit within a conventional, threaded lamp socket. A basically similar spider 166 is mounted, as described, within the base section of shell 162. The shell includes an enlarged open section 168 in which is mounted a cup-shaped metallic shell 170 threaded to receive a conventional, threaded lamp base.

Spider 166 includes two arms 172 extending toward the open end of the shell and attached to an end wall 174 provided on the inner end of threaded shell 170 and having a centrally located opening. As a means for making an electrical connection with the center contact of a lamp base, the adaptor is provided with a generally U-shaped contact spring 176 mounted on the inner end of rivet 120 and spaced from the spider by a dielectric spacing washer 178 and a dielectric dividing washer 180. Spacing washer 178 serves to position contact spring 176 within threaded shell 170, while dividing washer 180 fits within shell 170 against end wall 174 for separating the upper portion of the adaptor which holds the threaded lamp base from the base portion of the adaptor shell containing the elements of the connector of the invention. This construction may be modified to facilitate assembly, for example, by forming washers 178 and 180 as a single element rather than as two separate elements.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description as shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. An electrical connector for use in an internally threaded electric lamp socket, said connector comprising, in combination, a body formed of a dielectric material, said body including a generally cup-shaped shell for insertion within said lamp socket and an integral support member centrally located within said shell, a first resilient, electrically conductive element mounted within said shell on said support member, said element having a plurality of legs each extending outwardly from said shell through circumferentially spaced openings in said shell providing an electrical contact spring for engaging the threads in said lamp socket to retain said connector therein, a second electrically conductive element mounted on the exterior of the base of said shell for making electrical contact with the center contact of said lamp socket, and an electrical conductor coupled with said second element and extending into said shell.

2. The electrical connector of claim 1 wherein said support member is in the form of a tube extending from said base of said shell and having a bore extending throughout its length and through said base of said shell, and said electrical conductor extends through said bore.

3. The electrical connector of claim 2 wherein said second conductive element and said electrical conductor comprise portions of a unitary member.

4. The electrical connector of claim 1 wherein said first conductive element is in the form of a spider having a body section mounted on said support member and at least a pair of said legs projecting in opposite directions.

5. The electrical connector of claim 4 wherein said body section of said spider is provided with a rounded opening and slits extending radially from said opening for allowing deformation of portions of said body section at the edge of said opening, and at least a portion of said support member is generally cylindrical and includes a portion having a diameter at least equal to the diameter of said opening in said body section, said portion of said member being engaged in the last-mentioned opening.

6. The electrical connector of claim 4 wherein said legs of said spider extend toward said base of said shell, and said spider includes at least a third leg extending away from said base of said shell for supporting a component of said connector.

7. The electrical connector of claim 1 wherein said first conductive element is mounted on the end portion of said support member farthest from said base of said shell, and each of said legs includes a first section extending within said shell toward said base, a second section extending away from said base and projecting from said shell, and a third section extending away from said base and projecting into said shell, the portions of said second and third sections projecting from said shell providing said contact springs.

8. The electrical connector of claim 1 wherein said first conductive element is mounted on said support member adjacent said base of said shell, and each of said legs includes a section extending away from said base and a bent section projecting outwardly from said shell through one of said openings and then inwardly into said shell through said one opening for providing one of said contact springs.

9. The electrical connector of claim 1 wherein said second element is generally U-shaped, having a first arm at which said second element is mounted on said shell and coupled with said electrical conductor, and a second arm comprising a spring for making contact with the center contact of said lamp socket.

10. An electrical connector for use in an internally threaded electric lamp socket, said connector comprising, in combination, a body formed of a dielectric material, said body including a generally cup-shaped shell having a cylindrical section for insertion within said lamp socket and an integral support member centrally located within said cylindrical section of said shell and extending

from the base thereof, a first resilient, electrically conductive element mounted within said shell on said support member, said element having a plurality of legs extending outwardly from said shell through circumferentially spaced openings in said cylindrical section of said shell, each of said legs having a bent end portion projecting outwardly from said shell and then inwardly into said shell through one of said openings, said bent end portion of each of said legs providing an electrical contact spring for engaging the threads in said lamp socket for retaining said connector therein, a second electrically conductive element mounted centrally on the exterior of said base of said shell for making electrical contact with the center contact of said lamp socket, and an electrical conductor coupled with said second element and extending into said shell through an opening provided in said base of said shell.

11. An electrical connector for use in an internally threaded electric lamp socket, said connector comprising, in combination, a generally cup-shaped shell formed of a dielectric material and including a base section for insertion within said socket and an enlarged open end section for receiving a closure element, a closure element engaged within said open end section of said shell, a support member comprising an integral portion of said shell centrally located within said base section of said shell and extending toward the open end section thereof, said support member having a bore extending throughout its length to the exterior of said shell at the base thereof, a first resilient, electrically conductive element in the form of a spider having a body section mounted on said support member, at least a pair of legs extending in opposite directions from said shell through circumferentially spaced openings in said base section of said shell for providing electrical contact springs for engaging the threads in said socket to retain said connector therein, and a support leg extending within said shell away from said base, a second electrically conductive element projecting outwardly from said base of said shell at the outer end of said base for making electrical contact with the center contact of said socket, an electrically conductive bracket mounted within said shell on said support member, insulated from said first conductive element and including a portion extending away from said base, and an electrically conductive connecting member located within said bore and electrically coupled with said second element and said bracket.

12. The electrical connector of claim 11 wherein said closure element comprises a cap engaged in closing relation within said open end section of said shell, and a fusible link is provided coupled between said support leg and said bracket.

13. The electrical connector of claim 11 wherein said closure element comprises a cap having a hole formed therein and engaged in closing relation in said open end section of said shell, and a pair of electrically conductive leads are provided coupled with said support leg and said bracket and projecting through said hole in said cap.

14. The electrical connector of claim 11 wherein said closure element is engaged in closing relation within said open end section of said shell and is provided with a pair of openings for guiding the contacts of a male plug into engagement with said support leg and said bracket.

15. The electrical connector of claim 11 wherein said closure element comprises a metallic, cup-shaped shell threaded to receive an electric lamp and engaged within said open end section of the first-mentioned shell, the base of said threaded shell being provided with an opening, said support leg is electrically coupled to said threaded shell, and said bracket extends into said threaded shell through said hole in said base thereof for engaging the center contact of an electric lamp engaged in said threaded shell.

16. An electrical connector for use in an internally threaded electric lamp socket, said connector comprising,

in combination, a generally cup-shaped shell formed of a dielectric material having a generally cylindrical base section for insertion within said lamp socket and an open end section for receiving a closure element, a closure element engaged within said open end section of said shell, a support member comprising an integral portion of said shell, axially disposed within said cylindrical base section of said shell and having an axial bore extending throughout its length to the exterior of said shell at the closed end thereof, a first resilient, electrically conductive element in the form of a spider including a body section having a hole formed therein, said support member being engaged in said hole in said body section, a plurality of legs extending outwardly from said shell through circumferentially spaced openings in said cylindrical base section of said shell for providing contact springs for engaging the threads in said socket to retain said connector therein, and a support leg extending within said shell toward said closure element, a second electrically conductive element projecting outwardly from the exterior of said closed end of said shell at the outer end of said bore for making electrical contact with the center contact of said lamp socket, an electrically conductive L-shaped bracket having a base at which said bracket is mounted within said shell on said support member, means for insulating said bracket from said first conductive element, said bracket including an arm portion extending away from said closed end toward said closure element, and an electrically conductive connecting member extending through said bore and electrically coupled with said second element and said bracket.

17. In an incandescent lamp including a glass lamp envelope and a pair of electrically conductive leads extending from said envelope, the combination therewith of a base for securing said lamp within an internally threaded lamp holder and making the requisite electrical contacts with said lamp holder, said base comprising a generally cup-shaped shell having a closed base section for insertion within said lamp socket and an open end section secured around a portion of said lamp envelope, said shell being formed of a dielectric material and including a support member comprising an integral portion of said shell centrally located within said base section and extending therein toward said lamp envelope, a first resilient, electrically conductive element mounted within said shell on said support member and electrically coupled with one of said leads, said first element having a plurality of legs each extending outwardly from said shell through circumferentially spaced openings in said base section of said shell for providing an electrical contact spring for engaging the threads in said lamp holder to retain said lamp base therein, a second electrically conductive element extending outwardly from the exterior of the end of said base section and electrically coupled with the other of said leads for making electrical contact with the center contact of said lamp holder.

18. In an incandescent electric lamp including a glass lamp envelope and a pair of electrically conductive leads extending from said envelope, the combination therewith of a base for securing said lamp within an internally threaded lamp socket and making the requisite electrical contacts with said sockets, said base comprising a generally cup-shaped shell formed of a dielectric material and having a generally cylindrical section for insertion within said lamp socket and an open end section secured around a portion of said lamp envelope, a support member comprising an integral portion of said shell centrally located within said cylindrical section and extending from the closed end thereof toward said lamp envelope, said support member comprising a tube having a bore extending throughout its length and through said closed end of said shell, a first resilient, electrically conductive element mounted within said shell on said support member, said element having a plurality of legs extending from said shell through circumferen-

tially spaced openings in said cylindrical section of said shell, each of said legs having a bent end portion projecting outwardly from said shell and then inwardly into said shell through one of said openings, said bent end portion of each of said legs providing an electrical contact spring for engaging the threads in said lamp socket for retaining said lamp base therein, said first element being electrically coupled with one of said leads, a second electrically conductive element extending outwardly from the exterior of said closed end of said shell for making electrical contact with the center contact of said lamp socket, the other of said leads extending through said bore and being electrically coupled with said second element.

19. A fuse for use in an internally threaded Edison-base fuse holder, said fuse comprising, in combination, a generally cup-shaped shell formed of a dielectric material having a base section for insertion within said fuse holder and an enlarged open end section providing a seat for a closure element, a closure element engaged in closing relation within said seat provided by said open end section of said shell, a support member comprising an integral portion of said shell centrally located within said base section of said shell and having a bore extending throughout its length to the exterior of said shell at the closed end thereof, a first resilient, electrically conductive element in the form of a spider having a body section at which said element is mounted on said support member, a pair of legs extending in opposite directions outwardly from said shell through circumferentially spaced openings in said base section of said shell for providing electrical contact springs for engaging the threads in said fuse holder to retain said fuse therein and an arm extending toward said closure element, a second electrically conductive element extending outwardly from the exterior of said closed end of said shell at the outer end of said bore for making electrical contact with the center contact of said fuse holder, an electrically conductive bracket mounted within said shell on said support member and insulated from said first conductive element, said bracket including a portion extending away from said closed end, an electrically conductive connecting member extending through said bore and electrically coupled with said second element and said bracket, and a fusible link connected between said arm and said portion of said bracket.

20. The fuse of claim 19 wherein said body of said spider is provided with a hole, said support member projects through and is engaged in said hole, said bracket is L-shaped having a base at which said bracket is mounted on said support member, and an arm extending away from said closed end of said shell, said base of said bracket being provided with a hole aligned with said bore in said support member, said connecting member being engaged in said hole in said base of said bracket for securing said bracket to the end of said support member.

21. The fuse of claim 20 wherein said connecting member comprises an elongated pin, and said second conductive element comprises an integral portion of said pin.

22. An electrical connector for use in an internally threaded electric lamp socket, said connector comprising, in combination, a generally cup-shaped shell for insertion within said lamp socket and formed of a dielectric material, a support member formed of said material and comprising an integral portion of said shell centrally located within said shell, at least a portion of said support member being generally cylindrical, a first resilient electrically conductive element in the form of a spider having a body section and at least a pair of legs projecting in opposite directions, said body section of said spider being provided with a rounded opening and slits extending radially from said opening for allowing deformation of portions of said body section at the

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edge of said opening, a portion of said support member having a diameter at least equal to the diameter of said opening in said body section and being engaged in the last-mentioned opening, said spider being mounted within said shell with said legs extending outwardly from said shell through circumferentially spaced openings in said shell to provide electrical contact springs for engaging the threads in said lamp socket and retaining said connector therein, a second electrically conductive element mounted on the exterior of the base of said shell for making contact with the center contact of said lamp socket, and an electrical conductor coupled with said second element and extending into said shell.

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