Feb. 6, 1962 J. W. ANDERSON 3,020,512

TAKE-APART SOCKET FOR ELECTRIC LAMPS

Filed May 27, 1958

Fig. 5

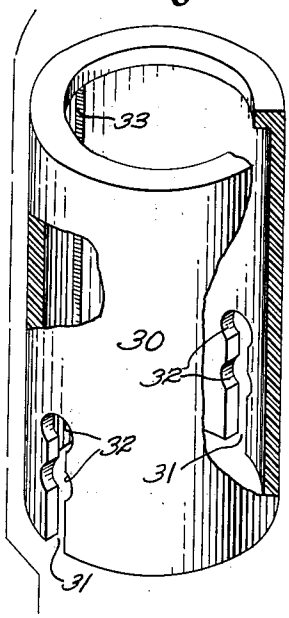


Fig. 1

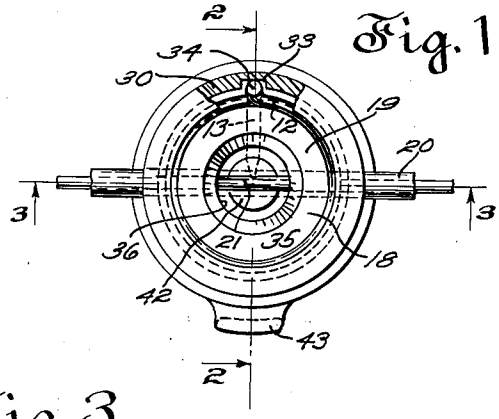
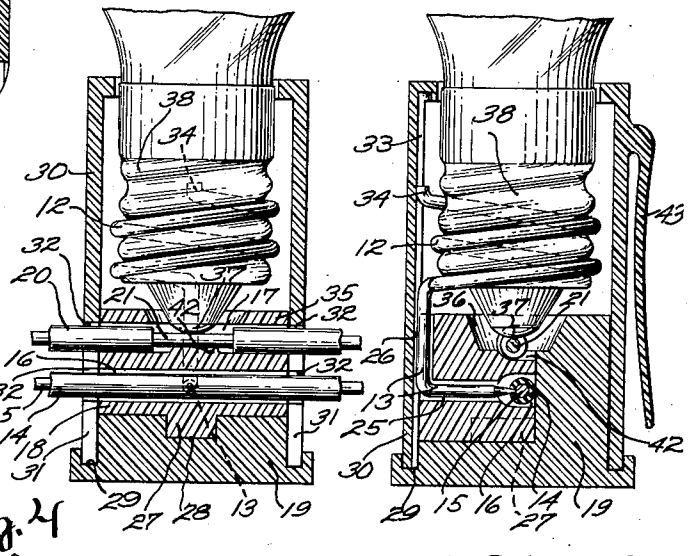


Fig. 3



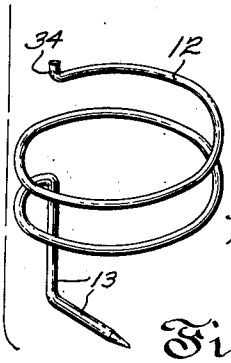


Fig. 4

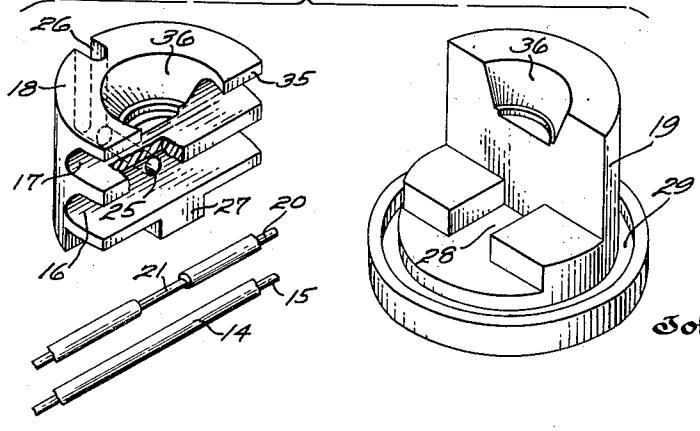


Fig. 2

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TAKE-APART SOCKET FOR ELECTRIC LAMPS

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This invention relates to an improved socket for across-the-line installation of electric lamps of the screw-base, center-terminal type and is particularly applicable to lamp sockets of the smaller sizes, such as the candelabra size screw-base in common use for Christmas tree lights.

An object of the invention is to depart from conventional features of construction which lead to early deterioration of small lamp sockets resulting in part from the falling out of wax filings and adhesives depended on to shield or retain electrically alive parts of the socket.

Another object is to avoid the complication and expense of incorporating metallic inserts in molded bodies of insulative plastic materials which inserts tend to become loosened or displaced in service.

Another object is to rely on nothing less substantial than secure mechanical interfitting of a few and sturdy parts composing the assembled socket.

Another object is to provide a lamp socket composed of unusually few and simple parts which can be separated and reassembled by hand without the use of tools for the purpose of detaching the socket from line conductors of opposite polarity or attaching it to line conductors at any desired point therealong for supplying current to lamps in parallel relation wherein if one lamp burns out it does not cause extinguishment of any other lamp.

Another object is to reduce the overall size of the lamp socket in comparison with the dimensions of lamp bases it is adapted to receive.

Still another object is to do away with the expense and liability to corrosion of a screw-shell receptacle for the lamp base commonly incorporated in lamp socket construction.

These and other objects of the invention will appear in fuller particularity from the following description of a successful embodiment of the improvements in which description reference is had to the appended drawings wherein:

FIG. 1 is a plan view of the open or lamp receptive, end of one successful form of the improved socket drawn on a much enlarged scale and showing a portion cut away to expose details of the construction of the casing shell.

FIG. 2 is a view taken mostly in section on the plane 2—2 in FIG. 1, looking in the direction of the arrows, showing a screw shell lamp base inserted into the socket.

FIG. 3 is a similar view taken mostly in section on the plane 3—3 in FIG. 1, looking in the direction of the arrows.

FIG. 4 is a perspective view of two separated sections of the mounting body of the socket with the line conductors removed therefrom.

FIG. 5 is an exploded view of the casing shell and lamp receptive wire coil shown in perspective separate from the parts of FIG. 4.

When the presently improved lamp socket construction is employed to receive screw-base lamps of the smaller sizes, such as that termed candelabra size whose screw-base measures roughly 7/16" in outside diameter, the overall diameter of my improved socket when adapted to receive such candelabra base need not exceed 9/16" and the overall length need not exceed 1", evidencing the considerably greater compactness made possible by those features of construction which will now be described.

There need be only four parts all told in the improved construction, three of which may be made of molded

insulative material and the fourth of which parts is a simple helical coil 12 of preferably resilient metallic wire, one end 13 of the wire coil 12 is angularly bent to extend first downward and then inward of the helix and is pointed to a piercing sharpness at its extremity for penetrating the insulation 14 of a line conductor 15 as best shown in FIG. 2. Coil 12 thereby becomes electrically alive with conductor 15.

Passageways 16 and 17 are formed in a smaller section 18 of the mounting body of the socket whose larger section 19 mates with the smaller section in a manner evident from FIG. 2. The upper passageway 17 admits a second line conductor 20 which is bared at 21 for purposes hereinafter to be explained.

Body section 18 contains an aperture 25 extending laterally from the passageway 16 to the exterior of section 18 and also contains an upright groove 26 which meets the outer end of aperature 25 so that there may be nested in the said groove and extended through said aperture the angled bottom end 13 of wire coil 12 as best shown in FIG. 2.

When body sections 18 and 19 are placed together a key 27 on the former snugly fits a keyway 28 in the latter and this accurately aligns the two body sections so that they combine to form a flanged cylinder in whose flange there is sunk the circumferential groove 29 receptive to the bottom end of a cylindrical casing shell 30 as clearly shown in 2 and 3. The interior of shell 30 is of a size to slidingly fit the upright portion of the combined body sections 18, 19 and thereby holds them locked firmly together with dependable security as the bottom edge of shell 30 nests in and is withdrawably retained in groove 29.

To enable shell 30 to slide axially into and out of its nested position in groove 29 while line conductors 15 and 20 are in place, the cylindrical wall of the shell contains diametrically opposite notches 31 sufficiently wide to enable the bottom end of the shell to slide axially past the line conductors. If the wall of shell 30 is made of nylon or a plastic of equivalent resilient properties sufficiently thin to permit a little distortion of the open end of the shell such as will permit widening or spreading of the notches 31, it is preferred to make these notches a little more narrow than the overall girth of the line conductors so that as the end of the shell is being seated in circumferential groove 29 the line conductors can come into occupancy of spot enlargements 32 of the notches appropriately located therein and thereby releasably retain the shell 30 when the latter is sleeved over the body 18—19.

The wall of shell 30 further contains an axially extending groove 33 sunk from its internal surface and in which the top end 34 of the wire coil 12 is slidable lengthwise of the groove. Coil end 34 so engages groove 33 that the wire coil is restricted against turning relatively to casing shell 30 in any direction that can twist the coil while leaving the convolutions of the coil free to spread or contract axially. This permits the wire coil to assume perfect conformity with the rolled threads in lamp base 38. The top end of shell 30 has a lip projecting inward across the line of axial movement of the top end 34 of coil 12 which reliably prevents escape of said top end of the coil from the shell groove 33. The radial clearance between coil 12 and the inner surface of the shell wall may be more or less than that herein shown. It must not permit coil end 34 to leave groove 31.

In FIG. 2 it is shown that the top shelf 35 of body section 18 overlying line conductor 21 is cut away to form an aperture at 36 to admit the center terminal 37 of a screw-type lamp base 38 into direct contact with a bared spot 21 on conductor 20 when the threaded lamp base 38 is screwed into the wire coil 12. A slightly

raised boss 42 on the top surface of shelf 35 serves as a firm rest for the bared spot 21 in conductor 20 and opposes the pressure of the center terminal 37 of the lamp base thereagainst.

When used for Christmas tree lighting the casing shell 30 of resilient plastic material will have incorporated in its molded shape the flexible mounting clip 43 adapted to be sprung somewhat away from the outer surface of the casing shell and clingingly hooked over a branch or twig of the tree for attaching the socket in a fixed location on the tree.

The functioning and operation of the disclosed lamp socket will have become mainly apparent from the foregoing description. Starting with the parts separated as in FIGS. 4 and 5, the body sections 18 and 19 may be placed together with the line conductors 15 and 20 occupying the passageways 17 and 16, respectively, key 27 then occupying the keyway 28. Next the wire coil 12 will be installed in its relation to the parts as shown in FIG. 2, the pointed wire end 13 piercing insulation 14 and reaching into conductive contact with conductor 15. Coil 12 will be held firmly anchored in this position by hooding casing shell 30 loosely over coil 12 and showing it telescopically over the mounting body 18, 19 until the edge of the shell bottoms within the circumferential groove 29, line conductors 15, 20 then occupying the enlargements 32 in the notches 31 in the shell. Engagement of the narrower portions in the lengths of the notches will yieldably resist forces tending to pull shell 30 away from the mounting body 18, 19. The slidable engagement of coil end 34 with the shell groove 33 permits the convolutions of the coil to conform themselves to the rounded threads carried by the screw base 38 of the lamp while preventing twisting of the coil as a whole as the lamp base is screwed into it. Forcible screwing of the lamp base further into the coil than shown in FIGS. 2 and 3 will pull upward on the coil as a whole and tend to increase the pressure of conductive contact of the coil with the screw base of the lamp.

Many departures from the exact shape, number and arrangement of parts suggested in the herein disclosed example of a successful embodiment of the principles of the invention are possible and are intended for inclusion in the invention as defined in the appended claims.

I claim:

1. A socket for an electric lamp having a screw threaded base and center terminal adapted for across-the-line connection to line conductors of opposite polarity comprising, an insulative body adapted for alignment with the axis of the lamp base and of shape to form parallel first and second conduit passageways extending in separated relationship completely through said body in crosswise relation to said axis and opening laterally to the exterior of said body at each of the four ends of said conduits for admitting to said passageways first and second line conductors respectively, an open coil of conductive wire exterior to said body anchored at one end thereto and outstanding axially therefrom helically wound to conform at least approximately to screw threads on the lamp base whereby to receive and hold said base in screw threaded engagement with said coil, a first aperture opening from said first passageway to the exterior of said body, said aperture slidably containing an extension of the end convolution of said coil, said extension reaching and making contact with one of said conductors in said first passageway, and a second aperture opening from said second passageway to the exterior of said body centrally of said end convolution of said coil of sufficient size to permit the center terminal of the lamp base to reach into conductive contact with the other of said conductors in said second passageway.

2. A socket for an electric lamp as defined in claim 1, in which the said insulative body is divided into sections separable in a direction to open and expose the said conduit passageways without opening or exposing the said first aperture, whereby the socket may be removed from the said line conductors without removal of the said coil from said body.

3. A receptacle for electric lamps having a conductive screw base and center terminal comprising, a tubular casing shell open at both ends having diametrically opposite notches in the tubular wall thereof at one end of the shell including an enlargement of each of said notches separated from said end of the shell by a relatively constricted width of the notch, parallel spans of current supplying conductors sufficiently thicker individually than said constricted width of each notch to require forceful insertion of at least one of said conductors past said constricted width of the notches and into said notch enlargements, a mounting body of insulative material separably engaged with and closing one open end portion of said casing shell and housing at least two parallel passageways occupied respectively by said conductors and extending through said body in crosswise relation to the tubular axis of said shell, at least one of said passageways having its opposite ends in register with said notch enlargements whereby to enable said body to encompass and be supported by said conductors with the latter protruding from both sides of said shell, said body further having an opening extending from said one of said passageways through its surface facing the interior of said shell for admitting the central terminal of the lamp base into conductive contact with the conductor in said passageway, and a helical coil of resilient conductive wire having convolutions of size and pitch approximately to fit and receive the screw base of the lamp, one end portion of the wire of said coil extending slidably through the insulative material of said body into the other of said passageways whereby to contact with the other of said conductors therein.

4. A socket for electric lamps as defined in claim 3, in which the said mounting body is divided into sections separable in a direction laterally of the said passageways in a manner when separated to unhouse the said line conductors and release them from said body.

5. A socket for electric lamps as defined in claim 4, in which the said casing shell encompasses and fits the said body sections in a manner to hold them together.

6. A socket for electric lamps as defined in claim 3, in which the said mounting body contains an aperture extending laterally from the said one of the said passageways to the exterior of said body, and the said conductor contacting end portion of the said wire passes withdrawably through said aperture.

7. A socket for electric lamps as defined in claim 6, in which the tubular wall of the said casing shell contains an axially extending groove sunk from its internal surface and dead-ended at the end of said shell remote from the said mounting body, and the end of the said wire remote from its said conductor contacting end portion is anchored slidably in said groove in a manner to be retained in said groove by the dead end thereof and to be retained from turning relatively to said shell in a direction to twist the said coil.

8. A socket for electric lamps as defined in claim 7, in which the said casing shell has a lip at its end remote from the said mounting body projecting inward and forming the dead end of the said groove.

9. A socket for electric lamps as defined in claim 3, in which the said casing shell contains notches extending axially thereinto from the said end of said shell that engages the said mounting body, said notches being of sufficient width to enable said end of said shell to slide past both of said line conductors into engagement with said mounting body, and said mounting body contains a circumferential groove that faces said meeting end of said shell and in which said shell end is nested.

(References on following page)

5

References Cited in the file of this patent

UNITED STATES PATENTS

693,087	Uytenbogaart	Feb. 11, 1902
1,013,681	Osland et al.	Jan. 2, 1912
1,036,010	Russell	Aug. 20, 1912
1,464,602	Garcillan	Aug. 14, 1923
1,785,239	Alden	Dec. 16, 1930
1,914,959	Osterman	June 20, 1933
1,980,187	Crawford	Nov. 13, 1934
2,605,317	Tiscione	July 29, 1952
2,620,376	Benander	Dec. 2, 1952
2,670,870	Fleischer	Mar. 2, 1954
2,888,509	Ekvall et al.	May 26, 1959

6

FOREIGN PATENTS

137,562	Australia	June 8, 1950