Jan. 25, 1944. E. R. KULKA 2,340,062

WEATHERPROOF SOCKET FOR ELECTRIC LIGHT BULBS

Filed June 21, 1941

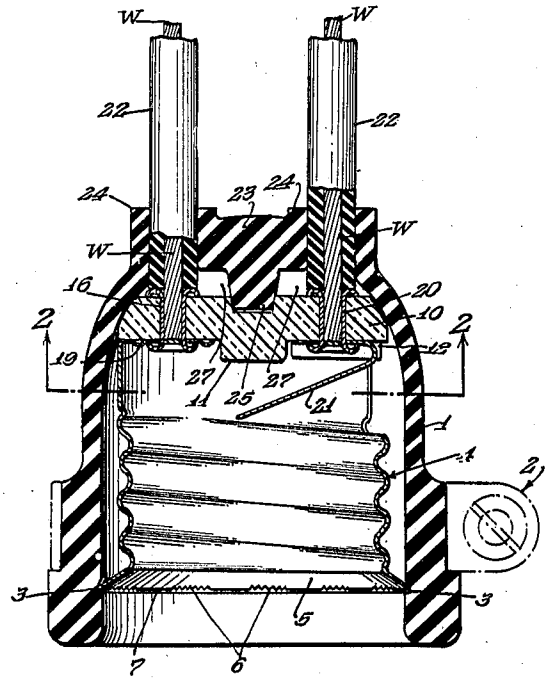


FIG. 1.

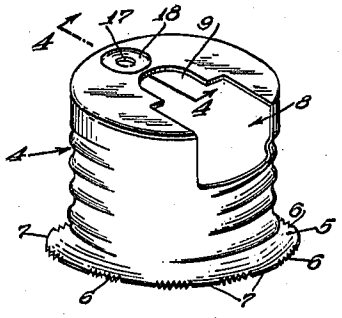


FIG. 3.

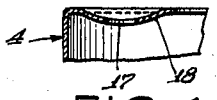


FIG. 4.

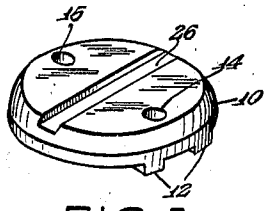


FIG. 5.

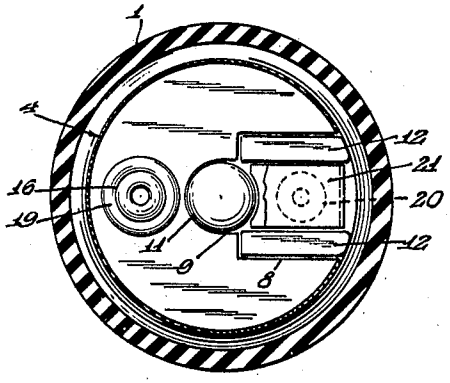


FIG. 2.

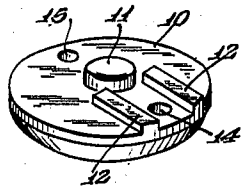


FIG. 6.

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WEATHERPROOF SOCKET FOR ELECTRIC LIGHT BULBS

Eugene R. Kulka, Mount Vernon, N. Y.

Application June 21, 1941, Serial No. 399,097

3 Claims. (Cl. 173—358)

My invention relates to a new and improved weatherproof socket for electric light bulbs.

One of the objects of my invention is to provide a socket which will eliminate the necessity of connecting the metal shell of the socket to the outer casing of the socket by means of cement.

Another object of the invention is to provide a socket which can be easily and cheaply manufactured and assembled.

Another object of the invention is to provide improved means for rigidly connecting the metal shell of the socket to the outer insulating casing of the socket, so as to prevent the metal shell from turning or otherwise moving relative to said casing.

Another object of the invention is to provide improved means for preventing the central contact of the device from being bent inwardly too far.

Other objects of the invention will be stated in the annexed description and drawing which illustrate a preferred embodiment thereof, it being understood that the above general statement of the objects of my invention is intended generally to explain the same but without limitation.

Fig. 1 is a vertical central section through the axis of the improved device.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of the inner metal shell of the device.

Fig. 4 is a sectional view on the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of the porcelain head to which the inner end of the metal shell is connected.

Fig. 6 is a perspective view of the device shown in Fig. 5, in reversed position.

For convenience, the device will be described with reference to its vertical position which is shown in Fig. 1, although the device can be held in any position.

In making sockets of the known commercial weatherproof type, it is customary to locate an ordinary insulating washer of disk shape at the upper end of the metal screw shell. Water-proof cement is then applied to the upper surface of said insulating washer, and this cement fills up the space between the washer and the top of the insulating casing. The lower ends of the respective connecting wires are then connected respectively to the metal screw shell and to the central contact thereof. The upper ends of said connecting wires are then pulled through the holes at the upper end of the insulating shell or casing, and the casing is thus connected to said shell by means of said cement, in order to provide water-proof connecting and sealing means. In actual practice, this connection has been very inefficient and very often the cement leaked out when it was heated by the lamp.

The improved device comprises an outer shell or casing 1 which is made of any suitable insulating material, such as Bakelite or the like. The shell 1 may be provided with a clamp 2 of any conventional type, by means of which a shade can be supported. The inner wall of the insulating shell 1 is provided with an undercut or groove 3. This groove 3 extends continuously and circumferentially around the inner wall of the insulating shell 1. The metal screw shell 4 is corrugated in the usual manner, in order to provide an internal thread, so that the base of the bulb can be screwed into the metal screw shell 4 in the usual manner. At its lower end, the shell 4 is provided with an outwardly flaring flange 5, of frusto-conical shape. The rim of this flange 5 is provided with serrated zones 6, which are separated by intermediate unserrated zones 7. The shell 5 is made of the usual metal or alloy, and its flange 5 is resilient. The top wall and the upstanding wall of the shell 5 are provided with a common cut-out 8. The cut-out 8 is provided with a half-round extension 9, in the top wall of the metal shell 4. A rigid head 10, which is made of porcelain or other suitable insulating material, is provided with a central boss 11, which fits snugly against the wall of the cut-out 9. As shown in Fig. 2, a part of the upstanding periphery of the boss 11 projects below the top part of the cut-out 9, when the parts are assembled.

The bottom surface of the insulating head 10 is provided with spaced ribs 12, between which a bore 14 is located. The insulating head 10 is also provided with another vertical bore 15. The top wall of the metal shell 4 is connected to the insulating head 10, by means of a metal eyelet 16 which is passed through the bore 15 and through an aligned bore 17 which is provided in the top wall of the metal shell 4. As shown in Fig. 4, the hole 17 is provided in a dished portion 18 of the top wall of the shell 4. After the cylindrical eyelet 16 has thus been passed through the holes 15 and 17, the ends of said eyelet 16 are enlarged and said enlarged ends are forced towards each other, in order to provide a rivet-like clamping connection between the metal shell 4 and the insulating head 10. This clamping

pressure straightens the dished portion 18, either wholly or partially, but no objectionable convex protuberance is formed in the top wall of the shell 4. As shown in Fig. 1, after the clamping pressure of the member 16 has been applied, the top wall of the shell 4 is provided with an annular recess 19.

The metal eyelet 20 is used for connecting the base of the central metal contact 21 of the device, to the insulating head 10. This metal contact is a resilient blade, of angular shape. It has a base which abuts the bottom face of the rigid insulating head 10. This metal eyelet 20 is passed through the hole 14 and through an aligned hole of the base of the resilient blade contact 21. The ends of the metal eyelet 20 are then enlarged and forced towards each other, in order to provide a rivet-like clamping connection. Of course the central contact 21 of the device does not contact with the metal shell 4, because the cut-out 8 provides ample clearance between the central contact 21 and the metal shell 4. The base of the central contact 21 fits snugly between the ribs 12. Therefore the base of the central contact 21 is held against turning relative to the insulating head 10, even though a single eyelet 20 is used for connecting the elements 21 and 10.

After the metal shell 4 has thus been assembled with the insulating head 10, before said shell 4 is assembled with the outer shell 1, the bared ends of the wires W are rigidly connected to the inner walls of the eyelets 16 and 20 by solder or the like. The wires W are provided with the usual exterior insulation 22.

The top of the insulating shell 1 is provided with an integral head 23, and said head 23 is provided with holes through which the insulated wires can be pulled upwardly. The head 23 is provided with bosses 24, which extend around the holes through which the insulated wires are pulled. The head 23 is provided with a depending rib 25, which fits accurately in the diametral groove 26 of the head 10, when the parts are assembled. The rib 25 is downwardly tapered and the groove 26 has a corresponding tapered shape, so that the rib 25 fits very snugly in the groove 26, when the parts are assembled.

Therefore, when the insulated wires are pulled upwardly through the holes in the head 23, the rib 25 is caused to engage the groove 26, thus holding the head 10 from turning relative to the shell 1, and eliminating the necessity of using cement.

Likewise the rib 25 prevents the flow of water between the chambers or spaces 27. Therefore, if any water leaks through one of the holes of the head 23, in which an insulated wire is located, said water cannot short circuit the wires within the casing 1.

When the assembled metal shell and its head 10 are thus pulled into position, the resilient flange 5 yields slightly until the rim of said flange snaps resiliently into the groove 3. The diameter of the rim of the flange 5 is slightly greater than the diameter of the inner wall of the insulating shell 1, below the groove 3. Likewise, the diameter of the rim of the flange 5 exceeds the diameter of the inner wall of the groove or undercut 3, so that the resilience of the flange 5 forces the serrations 6 into the insulating material of the casing 1. This provides a very reliable connection between the metal shell and its casing 1, so that the metal shell cannot turn or otherwise move relative to the casing 1. There is preferably a slight clearance between the bottom of the rib 25 and the bottom of the groove 26, when the parts are assembled. Likewise, when the parts are assembled, there may be a slight clearance between the depending walls of the rib 25 and the depending walls of the groove 26. However, the parts are made with sufficient accuracy so that the depending walls of the groove 25 preferably fit very tightly against the depending walls of the groove 26 when the parts are assembled.

The diametral rib 25 extends wholly across the bottom face of head 23. In this embodiment, only parts of the heads 23 and 10 interfit to provide a water-tight barrier between the wires, but the invention is not limited to this, and in general, the invention covers numerous sub-combinations of the complete combination illustrated herein, as said sub-combinations can be used independently of the complete combination.

The rib 25 and groove 26 illustrate one means for maintaining water-tight contact between the heads 10 and 23, while providing spaced chambers 27 between said heads, but the invention is not limited to this construction, or to the use of a single rib. The use of cement is unnecessary, but the invention includes the construction claimed herein, even if cement is used as auxiliary insulating connecting means, and to fill one or both of the chambers 27 with an insulating filling. However, it is preferred to eliminate the use of cement. For convenience, shell 1 may be designated as the first shell and shell 4 may be designated as the second shell, head 23 may be designated as the first head, and head 10 may be designated as the second head, eyelet 16 may be designated as the first eyelet and eyelet 20 may be designated as the second eyelet.

The parts are dimensioned so that the resilient flange 5, due to its deformation when the parts are assembled, upwardly forces the head 10, so as to hold the walls of groove 26 forced under pressure against the upstanding inclined walls of rib 25.

This fit may be water-tight and gas-tight.

When the base of the bulb is screwed into the metal shell 4, the depending inclined arm of the resilient blade contact is forced upwardly, into contact with the bottom face of boss 11. This boss 11 acts as a stop, so that the resilient junction between the base of element 21 and its depending inclined arm cannot be stressed beyond the elastic limit. This prevents the angular blade 21 from being permanently deformed. The bottom face of boss 11 is located below the curved junction between the base of member 21 and its inclined arm.

I prefer to provide the head 23 with a single rib 25, but the invention is not limited to a single rib.

I have described a preferred embodiment of my invention, but it is clear that numerous changes and omissions can be made without departing from its spirit.

I claim:

1. A lamp-socket comprising an outer shell made of insulating material, said outer shell having a rigid head, said head having spaced bores, a metal shell located in said outer shell, said second shell having a rigid head made of insulating material, spaced wires respectively located in the bores of the head of the outer shell, a metal contact member connected to said head of the metal shell and held spaced from said metal shell, said wires being respectively electrically connected to said metal shell and to said contact

member, said heads having portions thereof abutting each other in water-tight contact between the points at which said wires are connected to said metal shell and said contact member, said portions wholly separating said wires inwardly of said outer shell.

2. A weather-proof socket comprising an outer shell made of rigid insulating material, an inner metal shell located in said outer shell, said outer shell having a rigid head which has an inwardly extending rigid rib, said inner metal shell having a rigid head of insulating material which has a groove with which said rib interfits in water-tight contact, said rib and said groove extending wholly across their respective heads, wires located on the respective opposite sides of said rib, one of said wires being connected electrically to said metal shell, a contact connected to the head of the metal shell and spaced from said metal shell, the other wire being connected to said contact, said interfitting groove and rib providing water-tight separating means between the respective points at which said wires are respectively connected to said shell and to said contact.

3. A weather-proof socket comprising a first and outer shell made of insulating material and having a first head which has spaced bores and an internal rib which is located between said bores and which extends wholly across the inner face of the first head, a second and inner shell made of metal and having a longitudinal wall which is shaped to receive the head of a bulb, said second shell having an end-wall at the inner end of said longitudinal wall, the end-wall of said second shell and its longitudinal wall having a cut-out whose outer end is spaced inwardly from the outer end of said longitudinal wall, said second shell having a second rigid head made of insulating material, the inner wall of the second head having a groove which extends wholly across said inner wall, said internal rib interfitting with the walls of said groove from end-to-end to provide a water-tight barrier to the passage of water from one side of said rib to the other side thereof, said groove being located between said first bore and said second bore, a contact blade connected to said second head, said contact blade being located in said cut-out and being spaced from the second shell and extending into the interior of the second shell, wires respectively located in the first bore and in the second bore and respectively electrically connected to said inner shell and to said contact blade at opposite sides of said barrier.

EUGENE R. KULKA.