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[56]

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[54] **ELECTRICAL SOCKET**
5 Claims, 6 Drawing Figs.

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339/199 R, 339/218 L
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199, 218

ABSTRACT: An electric lamp socket molded around part of a power cord and having contacts with pointed tips piercing the insulation of the power cord to effect electrical communication therewith. Each contact is provided with a crosspiece constituting a key formation anchoring the contact within the socket material and rendering the contact immovable relative thereto.

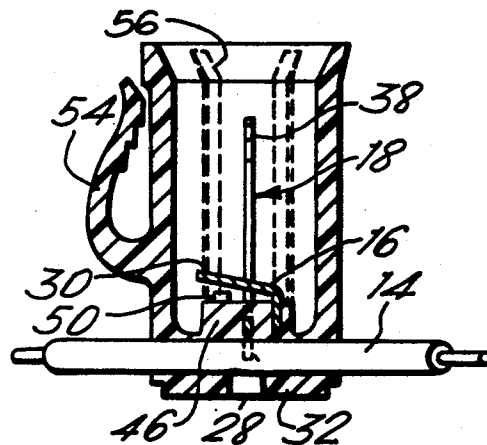


Fig. 1.

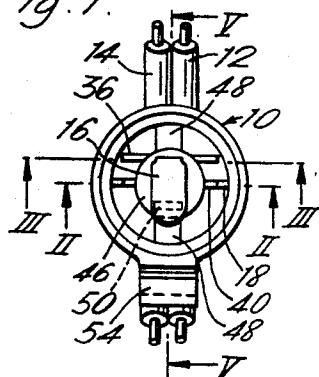


Fig. 2.

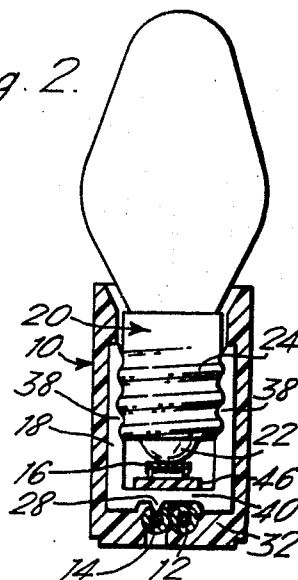


Fig. 4.

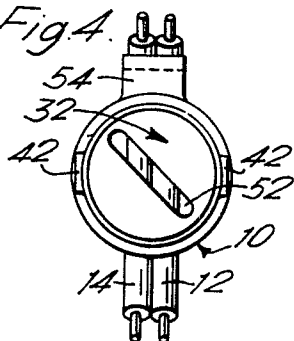


Fig. 3.

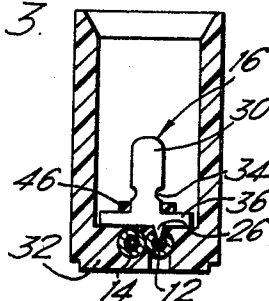


Fig. 5.

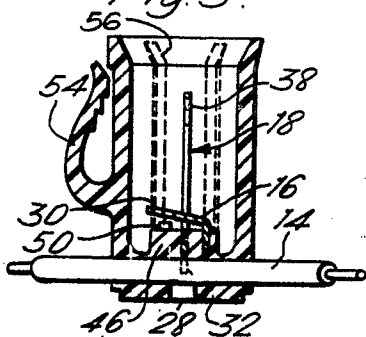
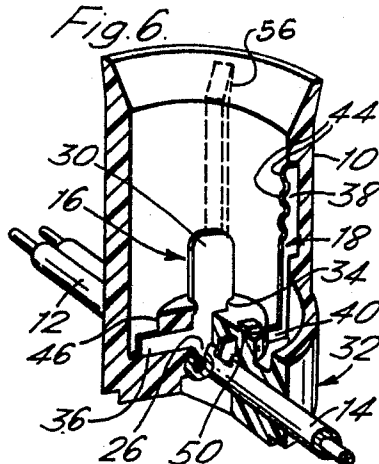


Fig. 6.



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ELECTRICAL SOCKET

This invention relates to an electrical socket molded upon a pair of electrical conductors for supplying electrical energy to the socket. The invention particularly relates to such a socket adapted to receive an electric light bulb and also to a plurality of such sockets mounted in electrical parallelism upon a said pair of electrical conductors as, for example, in a set of Christmas tree lights.

It is known from the prior art to provide electrical sockets molded from an electrically insulating material on and around a pair of electrical conductors. It is also known to provide electrical contact elements in molded sockets wherein a contact element makes electrical connection with an electrical conductor upon which the socket is mounted by means of a piercing element on the contact element, said piercing element penetrating the electrically insulating covering normally provided upon the said conductors to contact the electrically conductive wire within the conductor. However, such contact and piercing elements have been inserted into the molded socket after the socket has been molded on the conductors and there has, therefore, been the possibility that the contacts may loosen within the socket or even become electrically disconnected from their respective conductors.

It is an object of the present invention to provide an improved electrical socket and conductor assembly which will overcome certain disadvantages which may result in prior art sockets.

It is a further object to provide such an assembly wherein the socket is molded on and around a pair of electrical conductors, a respective one of which is in electrical connection with a contact element.

It is a yet further object to provide such an assembly wherein a pair of electrical contact elements are carried within the socket in electrical connection with a respective conductor and are positively retained within said socket against displacement relative thereto.

It is a still further object to provide such an assembly wherein each said contact element is provided with piercing means for penetrating the insulating covering of a respective conductor and wherein piercing of such covering is carried out during the molding of the socket onto the conductors to effect electrical connection as aforesaid.

It is a still further object to provide such an assembly wherein one of the contact elements includes a limb extending longitudinally of the socket, the limb providing screw means for receiving a screwcapped electric element, such as an electric light bulb, within the socket.

It is a still further object to provide such an assembly wherein said one contact element is in the form of two such limbs interconnected by an integral bridge element, both of the contact elements are formed of strip metal material, are firmly embedded within the socket during the molding thereof and are also positively prevented from being displaced from their embedded position within the socket.

In accordance with the invention, there is provided an electric lighting assembly comprising the combination of an electrical socket and a pair of mutually insulated conductors embedded over part of their lengths in insulating material from which the socket is molded; the socket including two contacts each immovably embedded, in part, in the socket in electrical connection with an associated one of said conductors. Each said contact preferably includes a sharp piercing element thereon for penetrating the insulating covering of an associated conductor to establish the said electrical connection therewith.

The socket is conveniently adapted to receive a screw-type cooperating electrical element such as, for example, a center pole screwcapped light bulb and accordingly one of the said electrical contacts of the socket is engageable by a said center pole and the other of said contacts is engageable by the screwcap of a said electrical element.

Preferably, said one contact which is engageable by said center pole comprises an elongated metal strip projecting at its one end out of said insulating material of the socket for contact with said pole and having said piercing element provided thereon at its other end. Preferably also, the other contact which is engageable by said screwcap comprises two limbs and an integral connecting bridge constituting a key formation, said limbs being partially embedded within said socket at locations disposed diametrically opposite to one another and providing screw means engageable by said screwcap, and said bridge being embedded within and surrounded by said insulating material of the socket and having said piercing element provided thereon.

Other objects of the invention, more or less broad than the foregoing, will become apparent from the following description of the parts, principles and elements of the invention given herein solely by way of example and with reference to the accompanying drawings wherein:

FIG. 1 is a top plan view of the instant electrical socket and conductors;

FIG. 2 is a cross-sectional view taken on the line II-II of FIG. 1 additionally showing an electric lamp bulb inserted within the socket;

FIG. 3 is a cross-sectional view taken on the line III-III of FIG. 1 with the center contact of the socket distorted upwardly from its normal position in order to show its configuration more clearly;

FIG. 4 is an underneath plan view of the instant socket and conductors;

FIG. 5 is a cross-sectional view taken on the line V-V of FIG. 1, and

FIG. 6 is a part cutaway perspective view of the instant socket and conductors with the center contact of the socket distorted upwardly as in FIG. 3.

The instant electrical socket is essentially comprised of an insulating casing 10 molded on and around a pair of mutually insulated electrical conductors 12 and 14 and including electrical contact elements 16 and 18 electrically connected respectively to said conductors. The socket is preferably molded of a suitable plastics material such as, for example, polypropylene and is molded in situ around the aforesaid pair of conductors 12 and 14 and contact elements 16 and 18 in such manner that, in the finally molded article, the electrical contacts are in electrical connection with the respective conductors and are also exposed for contact by a cooperating electrical component such as, for example, the base 20 of an electric light bulb (see FIG. 2).

Referring to the drawings, the contact elements 16 and 18 provide electrical contact respectively for the center pole 22 and screwcap 24 of the base 20 of an electrical component such as a light bulb; each contact 16 and 18 being provided with a respective piercing element 26 and 28 for penetrating the insulating covering of a respective conductor 12 or 14 for making electrical connection therewith.

The center contact 16, which is engageable by the center pole 22 of a screwcapped electrical element as aforesaid, is preferably in the form of an electrically conductive flexible brass strip having a flat stem or tongue portion 30 bent out of the plane of the strip and projecting into the hollow interior of the casing 10 from the insulating base 32 which forms a closed end thereof. That part of the strip which is embedded within said base 32 is necked adjacent the tongue as shown at 34 to facilitate bending as aforesaid and further includes an enlarged portion 36 at least partially embedded in the insulating base 32. Said enlarged portion 36 constitutes a key formation for the contact 16 and is in the form of a head or transverse crosspiece having said piercing element 26 extending therefrom on the opposite side thereof from the tongue 30. Thus, as will be particularly clearly seen from FIGS. 3 and 6 of the drawings, the crosspiece 36 effectively forms an anchor, resisting movement of the embedded portion of the center contact 16 relative to the base 32 of the socket casing. It will be appreciated that the crosspiece 36 is, in part at least, wholly

embedded within the base 32 of the casing and is completely surrounded by the insulating material thereof both between the crosspiece 36 and the hollow interior of the casing 10 and also between the crosspiece 36 and the electrical conductors 12 and 14 which extend through the base 32.

The other contact 18 is preferably in the form of a pair of elongated brass limbs 38, 38 connected at their respective ends by an integral head 40 constituting a key formation for the contact 18. As shown herein, said head 40 is in the form of a bridge which is itself embedded within and surrounded by the insulating material of the base 32 of the casing although it should be appreciated that one such limb 38 may be equally effective in providing an electrical contact as explained below. Each limb 38 is partially embedded within the sidewall of the casing 10 at positions located diametrically opposite to one another in such manner that each limb 38 projects over substantially the whole of its length on and extends longitudinally of the inside of the socket. The outer periphery of the casing 10 adjacent each limb 38 is locally thickened as by rib 42 to provide an adequate thickness of insulating material around the limb 38.

The inner edges of the limbs 38, 38 are preferably serrated (see FIGS. 2 and 6) to provide a series of teeth 44 engageable by a screwcap 24 as aforesaid whereby a screwcapped electrical element such as a light bulb may be retained within the socket with its center pole 22 engaged with the tongue 30 of the center contact 16 of the socket. As a modification, not illustrated herein, the or each limb 38 may be plane and part, at least, of the interior of the casing 10 may be screw threaded for receiving the screwcap 24 of a light bulb therein.

The integral bridge 40 is embedded within the base 32 of the casing at a position spaced from the center contact 16 so as to be separated therefrom by an appropriate thickness of the insulating material which constitutes the base. The bridge 40 is also formed with said piercing element 28 extending therefrom on the opposite side to the two limbs 38, 38 aforesaid. Thus, the bridge 40 effectively forms an anchor, resisting movement of the contact element 18 relative to the molded casing 10. As will be particularly clearly seen from FIGS. 2 and 6 of the drawings, the bridge 40 is, at least in part, wholly embedded within the base 32 of the casing and is surrounded by the insulating material thereof both on that side thereof adjacent the hollow interior of the casing 10 and also between the bridge 40 and the conductors 12 and 14 which extend through the base 32.

The two piercing elements 26 and 28 are offset relative to one another so as to be respectively engageable with an associated one of the electrical conductors 12 and 14 embedded within the base 32 of the casing. Each piercing element 26 and 28 is in the form of a sharp point integral with its respective contact element so as to penetrate the insulating covering of a respective conductor 12 or 14 and make electrical connection with the conductive core thereof. Such piercing of the electrical conductors 12 and 14 by the respective piercing elements 26 and 28 of the contacts 16 and 18 to effect electrical connection therewith is carried out prior to or during the process of molding the socket on and around the conductors in any suitable manner which it is not deemed necessary to enlarge upon herein.

Referring to the drawings, it will be observed that the pair of electrical conductors 12 and 14 which are embedded in the base 32 of the casing are located closely adjacent to one another in side-by-side relation and both lie in a plane parallel to the base of the casing. The conductors 12 and 14 extend substantially diametrically through the base 32 with respect to the casing while the crosspiece 36 on the center contact 16 and the bridge 40 on the other contact 18 are disposed substantially perpendicular to the conductors and are themselves in spaced-apart relation with their piercing elements 26 and 28 electrically connected to a respective one of the conductors 12 and 14.

It will also be noted that whereas the exterior surface of the base 32 of the casing 10 is relatively plane, the interior sur-

face, i.e. that surface within the interior of the hollow casing, comprises an upstanding central circular boss 46 spaced from the sidewalls by two spacing ribs 48 also formed of the same electrically insulating material as the remainder of the casing (see FIG. 1). The center contact 16 aforesaid extends upwardly through said boss 46 adjacent one side thereof and is bent as aforesaid to overlie the true center of the socket while at that side of the boss 46 diametrically opposed to the center contact 16, there is provided a small molded support bridge or platform 50. It will be appreciated that the center contact 16, being formed of brass, is relatively resilient to accommodate easy electrical connection with the center pole 22 of a screwcapped electrical element as aforesaid, and that the tongue 30 of the contact 16 is prevented from being depressed too far towards the base 32 of the casing by means of the aforesaid molded support 50 engaging the undersurface of the tongue 30 if it should tend to become over depressed as aforesaid.

As stated above, the exterior surface of the base 32 of the casing 10 is relatively plane, but referring to FIG. 4 of the drawings, it will be noted that said exterior surface is relieved over a part of its area by the provision of a diametrically extending slot 52. Such slot is provided during the molding operation which produces the socket by a punch member which presses the conductors 12 and 14 onto the respective piercing elements 26 and 28 to effect electrical connection therewith and as such at the said slot 52 forms no part of the present invention which is not concerned with the molding process.

It will also be observed from FIGS. 1, 4, and 5 of the drawings that the socket is provided with an integral molded curved clip 54 extending from the exterior sidewall of the casing in a plane parallel to the line of the conductors 12 and 14 whereby the socket may be clipped onto any appropriate supports such as, for example, one of the branches of a Christmas tree. Alternatively, the clip 54 may be utilized to engage a loop of the conductors 12 and 14 which is passed around an appropriate support; the provision of such clip 54 in the plane aforesaid facilitating such looping and also enhancing the appearance of the socket and conductors assembly.

In a further modification, the interior of the casing 10 is provided with a plurality of longitudinally extending integral ribs 56 (as shown in dotted outline in FIGS. 5 and 6) for strengthening the casing 10. Also, such ribs 56 serve to stabilize and further support the screwcap 24 of a light bulb installed within the casing.

We claim:

1. An electric lighting assembly comprising, in combination: a pair of elongated electrical conductors each including an electrically conductive core encased in an electrically insulating sheath;

a socket formed of molded electrically insulating material accommodating installation of an electric light bulb therein, the interior of said socket being provided with a plurality of reinforcing ribs extending longitudinally thereof, said ribs assisting in supporting said electric light bulb;

said conductors being embedded, over a portion of their length, in the material of the socket;

electrical contacts within said socket electrically engageable by the respective poles of an electric light bulb

installed in the socket; a key formation on each said contact embedded within the material of the socket anchoring said contact in immovable relation thereto, and

means on each said contact establishing electrical connection with the said conductive core of an associated electrical conductor, said socket being molded around said portions of said conductors and said key formations anchoring said contacts and maintaining said electrical connection with the conductive cores as aforesaid

2. An electric lighting assembly comprising, in combination: a molded socket of electrically insulating material accommodating installation of an electric light bulb therein;

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a pair of elongated electrical conductors each including an electrically conductive core encased in a continuous electrically insulating sheath, the respective core and sheath of both said conductors being embedded in and wholly surrounded by the material of the socket over a portion of the length of said conductors;

electrical contacts of flat platelike form electrically engageable by the respective poles of an electric light bulb installed in the socket;

each of said electrical contacts including a flat base portion at least part of which is anchored wholly within said socket material above said conductors, said base portions being in spaced relation and extending substantially across the interior of said socket for rigid anchoring relation with said socket material;

each of said base portions being formed on the bottom thereof with a piercing element coplanar with said base portion penetrating the insulating sheath and establishing electrical connection with a respective conductive core embedded in said socket material.

3. The electric lighting assembly of claim 2 wherein one of said electrical contacts is adapted to be electrically engaged by the center pole of a screwcap electric light bulb installed in

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the socket, said one contact comprising a flexible stem extending out of the material of the socket for engagement by said center pole, and an integral head extending transversely of said stem constituting said base portion of said electrical contact.

4. The electric lighting assembly of claim 2 wherein one of said electrical contacts is adapted to be engaged by the screwcap of an electric light bulb installed in said socket, said electrical contact including at least one limb extending out of the material of the socket adjacent the sidewall thereof for engagement by said screwcap, and an integral head extending transversely of said limb constituting said base portion of said one contact.

5. The electric lighting assembly of claim 2 wherein one of said electrical contacts is adapted to be engaged by the screwcap of an electric light bulb installed in said socket, said one electrical contact including a pair of limbs extending out of the material of the socket adjacent the sidewall thereof and disposed in diametrically opposed relation thereon for engagement by said screwcap, and said limbs being interconnected by an integral bridge constituting said base portion of said one contact.

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