Oct. 2, 1962 H. L. HULL 3,056,943

LAMP SOCKET

Filed May 21, 1959

FIG. 1

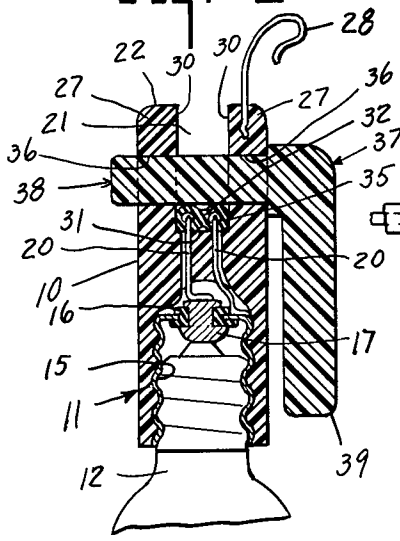


FIG. 2

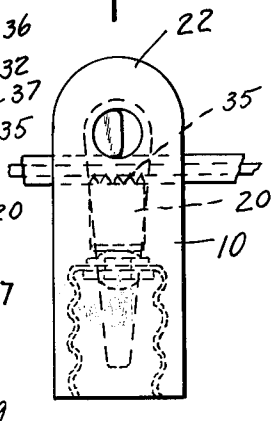


FIG. 3

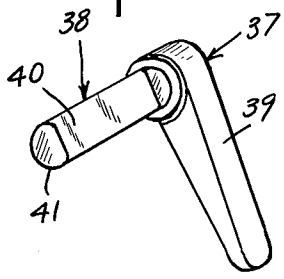


FIG. 4

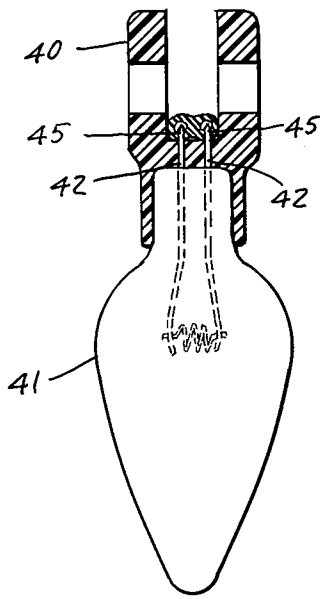


FIG. 5

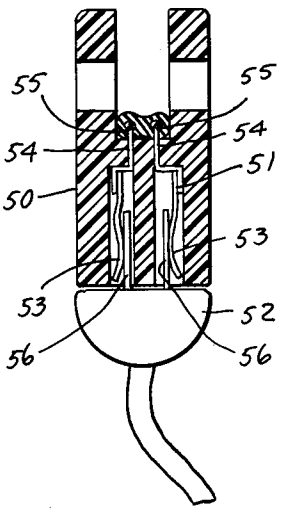
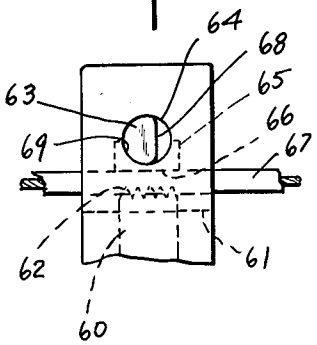


FIG. 6



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3,056,943

LAMP SOCKET

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The present invention relates to an electric socket structure and to an electric lamp structure and finds its primary utility in an electric socket especially adapted for single or plural parallel connection to a single paired wire conductor at any desired position thereon.

It is often desirable to have lights arranged in long strings, as for example, the small electric lights used for Christmas trees. In most situations calling for the use of strings of lights, especially where ornamentation is desired, it will usually be desirable to have arrangements whereby the stringing may be made flexible with respect to the intervals between the lights or with respect to the number of lights along the string.

It is therefore an important object of the present invention to provide a socket or lamp structure which may be assembled on an electric cord directly without stripping insulation from the cord so that a socket or lamp may be placed at any point on the cord and removed when use of the socket or lamp is to be discontinued.

A further object of the present invention is to provide a socket or lamp structure having structure adapted for the passage of an electric cord therethrough for making electrical contact with the cord directly without the employment of tools for stripping insulation or connecting wire to the socket or lamp structure.

Another object of the invention is to provide an electric lamp or socket structure which will permit mounting of a plurality of such structures at any desired interval on an electric cord.

The present invention has incorporated therein means for piercing the insulation surrounding the conductor of an electric cord to provide an electric connection between the conductor and the socket structure of the present invention. Certain conventional devices of this character operate in such a manner that the electric cord may be relatively greatly damaged by the device either because the cord is completely pierced or because the degree of piercing cannot be accurately controlled.

It is therefore a further object of the present invention to provide a lamp or socket structure which may be mounted upon an electric cord with relatively little damage to the cord.

Still a further object of the present invention is to provide a lamp or socket structure having means incorporated therein for accurately controlling the amount of piercing of the electric cord upon which the lamp or socket structure is to be mounted.

Still another object of the present invention is to provide a lamp or socket structure which may easily be mounted upon an electric cord and which does not require the exertion of excessive force during such mounting.

Still a further object of the present invention is to provide a lamp or socket structure which may be mounted upon an electric cord with little wearing or abrading of the cord.

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

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

FIG. 1 is a longitudinal sectional view of a socket structure embodying the present invention.

FIG. 2 is a fragmentary side elevation of the structure illustrated in FIG. 1.

FIG. 3 is a perspective view of a cam forming a portion of the structure illustrated in FIGS. 1 and 2.

FIG. 4 is a longitudinal sectional view of a lamp structure forming an alternative embodiment of the invention, the lamp structure being shown with the cam thereof removed.

FIG. 5 is a longitudinal sectional view of a socket structure forming an alternative embodiment of the invention, the structure being shown with the cam thereof removed and with a conventional electric plug received within the socket.

FIG. 6 is a fragmentary side view similar to FIG. 2 of a further alternative embodiment of the invention.

Referring now to the drawings and more especially to FIGS. 1 and 2, I have illustrated my invention as comprising an elongated cylindrical body **10** composed of insulating material and having a conventional threaded lamp socket **11** received in one end thereof. In FIG. 1 an electric lamp **12** such as, for example, a Christmas tree lamp is shown threadedly received within the socket **11**. The socket **11** is conventional and comprises a generally cylindrical threaded member **15**, an insulating collar **16** received within the end of the threaded member **15** and an electrically conductive terminal **17** mounted within the collar **16**.

A pair of contact plates **20** are embedded within the body **10** in such a manner as to project out of the body **10** into a groove or slot **21** in the end **22** of the body **10**. One of the contact plates **20** extends to and is electrically connected to the terminal **17**. The other contact plate **20** extends to and is electrically connected to the cylindrical member **15**.

The slot **21** is formed by a pair of ears **27** which extend axially of the body **10** and have mutually facing surfaces **30** which form the side walls of the slot **21** and lead to a base wall **31** of the slot **21**. The side walls **30** and the base wall **31** of the slot have flat surfaces whereby a section of twin conductor electrical cord **32** may be received within the slot **21** so as to lie in abutting relationship with the base wall **31** of the slot as illustrated in FIG. 1.

The contact plates **20** are parallel to one another and are parallel to the side walls **30** of the slot **21** and each have a plurality of teeth **35** on their projecting edges so that when the electrical cord **32** is in abutting relationship with the base wall **31** the teeth **35** pierce the insulation surrounding the conductors of the electrical cord and project into those conductors so as to provide an electrical connection between the conductors and the electrical socket **11**. It should be noted that the fact that the plates **20** are parallel to the length of the electrical cord makes possible a connection between the conductors and the plates which extends a substantial length along the conductors.

The ears **27** are provided with a pair of aligned bores **36—36** within which may be received a manually operable cam indicated generally by the numeral **37**. The cam **37** comprises a handle and a shaft **38** having camming surfaces **40** and **41**. As can best be seen in FIG. 3, the shaft **38** has a generally cylindrical shape which is shaved off on one side thereof to form the flat camming surface **40**. One of the ears **27** may be provided with a hook member **28** thereby to provide means for hanging a Christmas tree string of lights on a Christmas tree.

When it is desired to connect the electrical socket of FIGS. 1–3 to the electrical cord **32** at some point along the length thereof, the cord is placed within the slot **21** adjacent to the base wall **31** thereof and engaging the teeth **35** of the contact plates **20**. The cam **37** is then inserted into the bores **36** with the flat camming surface **40** facing the cord **32** and the base wall **31** of the slot.

The cam 37 is then rotated within the bores 36 by means of the handle 39 causing the camming surface 41 to engage the electrical cord 32 and to force the cord toward the base wall 31 of the slot. By such an operation the teeth 35 are caused to pierce the insulation of the cord and contact at multiple points the twin wire conductors of the cord thereby electrically connecting the cord conductors to the socket 11. It should be noted that the distance of movement of the cord is always the same. In other words, the surface 41 is always moved to the same position with relation to the base wall 31 of the slot. Thus the degree of piercing of the electrical cord is always accurately controlled and may be determined by the particular dimensions to which the device is manufactured. Also the piercing of the cord does not require a great amount of force to be exerted because of the moment arm provided by the cam handle 39.

Referring now to FIG. 4 an alternative embodiment of the invention has been illustrated and comprises a body 40 of insulating material which has mounted in one end thereof an electric lamp 41. The terminals 42—42 of the lamp 41 pass through the body 40 and are provided with a plurality of teeth 45 identical to the teeth 35 of the above described embodiment. In all other respects the embodiment of FIG. 4 is identical to the above described embodiment of FIGS. 1–3 and is operated in the same manner.

FIG. 5 illustrates still another embodiment of the present invention which embodiment comprises a body 50 of insulating material having in one end thereof a conventional female electrical socket 51 of the type designed for reception of a male plug 52. The socket 51 includes a pair of spring terminals 53 which are electrically connected to conductors 54—54 each of which has a plurality of teeth 55 similar to the above described teeth 35 projecting from one end thereof. When the plug 52 is inserted within the socket 51 the spring terminals 53 yieldably engage the prongs 56 to provide electrical contact between the terminals and the prongs. In all other respects the embodiment of FIG. 5 is similar to the above described embodiment of FIGS. 1–3.

Referring now to FIG. 6, an alternative embodiment is depicted which may include the socket of either the embodiment of FIGS. 1–3 or the embodiment of FIG. 5 or, alternatively, may include the lamp of the embodiment of FIG. 4. A pair of contact plates 60—60 project through a base wall 61, identical to the base wall 31 of the first described embodiment, and have a plurality of teeth 62 on the outwardly projecting ends thereof. A cam 63 identical to the cam 37 is mounted within bores 64—64 identical to the bores 36 of the embodiment of FIGS. 1–3 but spaced somewhat farther from the base wall 61 than are bores 36 from base wall 31. When it is desired to connect the device of FIG. 6 to an electrical cord a shim 65 is placed with its flat surface 66 in contact with the electrical cord 67. The cam 63 is inserted within the bores 64 in such a manner that a flat camming surface 68 faces a part cylindrical surface 69 of the shim 65. The cam 63 is then rotated causing the shim 65 and electrical cord 67 to be forced toward the teeth 62 and causing the teeth 62 to pierce the cord and to electrically contact the wire conductors of the cord. In all other respects the

embodiment of FIG. 6 is identical to the above described embodiment of FIGS. 1–3. From the above description it will be obvious that the shim 65 does not rub against or abrade the cord 67 because it moves in a direction directly toward the cord.

While the invention has been disclosed and described in some detail in the drawings and foregoing description, they are to be considered as illustrative and not restrictive in character, as modifications within the broad scope of the invention may readily suggest themselves to persons skilled in this art, reference being had to the appended claims.

The invention claimed is:

1. An electrical connector device comprising in combination: an insulated elongated body member having a bifurcation at one end thereof and means affording connection of an electrical load device at the other end thereof, said means including a pair of conductors carried by said body member and having at least one sharpened edge at one end extending into the base of said bifurcation; means defining a pair of aligned bores one extending through each of the bifurcated portions of said body member; and a cam member comprising a cylindrical shaft having at least one flattened side extending axially thereof to one end thereof to permit insertion into said aligned bores with the flattened side overlying and closely adjacent to a twin conductor cable placed in said bifurcation overlying and in contact with said sharpened edges and a lever arm fixed with respect to said shaft and extending radially from the other end thereof, said cam member being rotatable in said bores for camming the twin conductor cable against said sharpened edges of said conductors to thereby effect a positive electrical connection between said pair of conductors and the twin conductor cable.

2. A device as defined by claim 1 in which said insulating body member comprises the base of an electrical lamp and the said pair of conductors at the ends opposite said sharpened edges extend into the lamp envelope for supplying electrical energy thereto.

3. A device as defined by claim 1 in which said insulating body member includes at its end opposite the bifurcated end, a bore extending axially of said body member and an electric lamp socket mounted in said bore, the electrical terminals of said socket being connected to said pair of conductor members.

4. A device as defined by claim 1 in which said body member comprises at its end opposite said bifurcated end a female electrical plug and said pair of conductors are connected to the conductive prongs of said plug.

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