

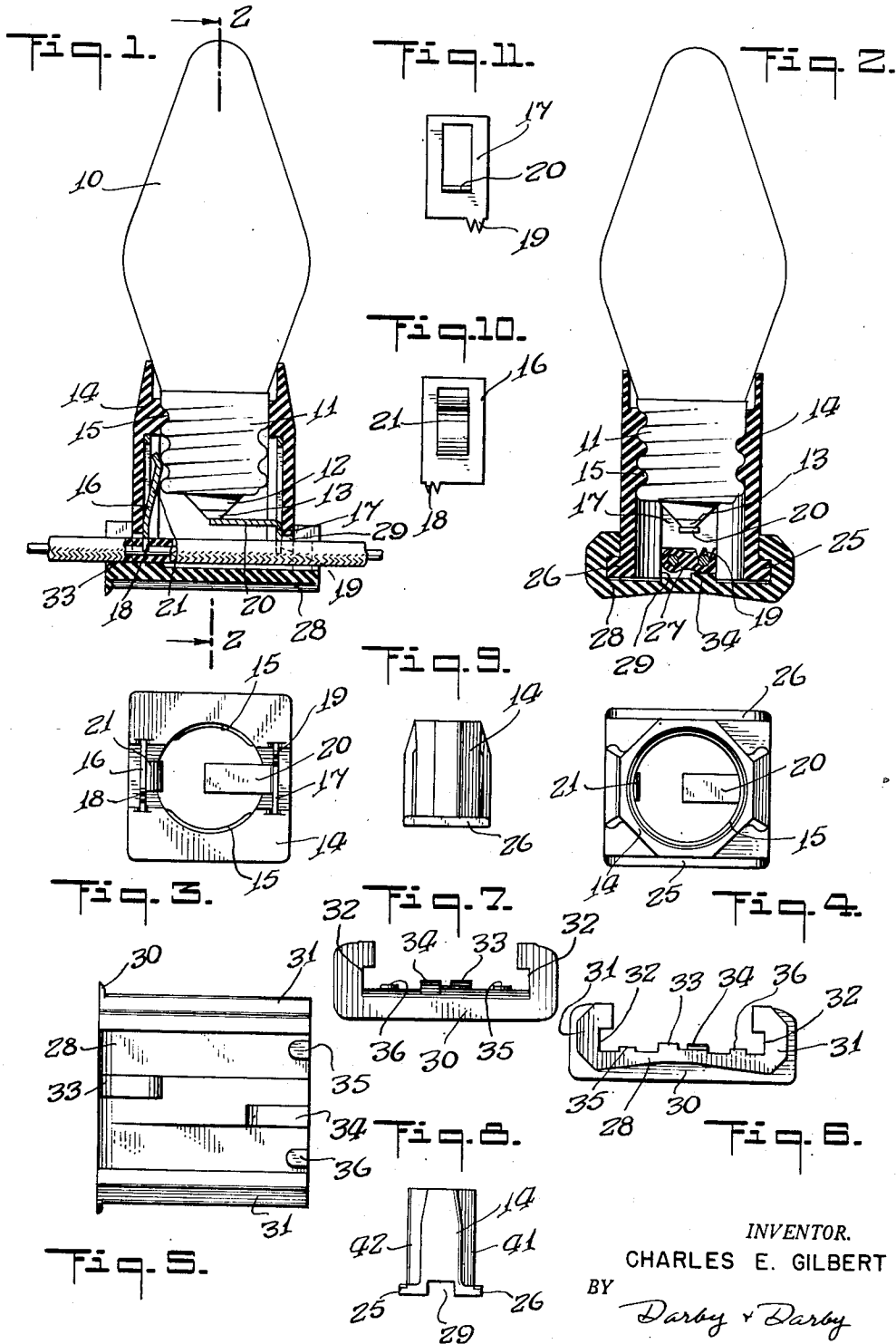
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ELECTRIC LAMP SOCKET WITH PIN TAP CONNECTING MEANS

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ELECTRIC LAMP SOCKET WITH PIN TAP
CONNECTING MEANS

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1

2

This invention relates to an electric socket structure and, in particular, to an electric socket especially adapted for parallel connection singly or in large number to a single paired wire conductor at any desired position thereon.

For ornamental purposes and, to some extent, for utilitarian purposes, it is often desirable to have lights arranged in long strings, the most popular use being in connection with the ornamental Christmas tree lights. The superiority of the parallel connected lights is so well established that their general acceptance is common. However, conventional socket arrangements are inflexible in requiring that the wires be cut and stripped before being brought into a socket, and screw connections must thereupon be made to connect the wires to the socket. On the other hand, 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 lights or number of lights along a string.

Accordingly it is a fundamental object of the instant invention to provide a socket structure which may be assembled on a conductor directly without stripping insulation so that the socket may be placed at any point on the conductor and removed when its use is to be discontinued.

It is a second object of the invention to provide a simple two-piece socket structure having provision for the passage of electric cord therethrough and for making electric contact with the cord directly without the employment of tools for stripping insulation or connecting wire to the socket.

It is a third object of the invention to provide a simple two-piece socket structure for use with conventional electric cord which will permit mounting of a plurality of the sockets at any intervals desired on an electric cord to provide for any desired arrangement of lamps thereon.

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

The invention accordingly is embodied in a socket structure formed of essentially two pieces, the one carrying the electrical contacts and the other mating piece providing for forcing electric cord into contact therewith, the two elements being formed for sliding engagement with each other to complete a unitary two-piece structure having the features of construction, combinations of elements, and arrangement of parts herein-after to be described in greater detail.

In the drawings illustrating a preferred embodiment of the invention:

Figure 1 constitutes a longitudinal section through the socket in the plane of the electric cord conductor passing therethrough, showing a bulb in place in the socket making contact with the electrical socket contacts therein and further showing the electric connection of those contacts to the cord;

Figure 2 is a longitudinal section through the socket taken at right angles to the view shown in Figure 1;

Figure 3 is a bottom view of the body portion which receives the light bulb;

Figure 4 is a top plan view of the body portion shown in Figure 3;

Figure 5 is a plan view of the cap or cover element cooperating with the body portion shown in Figures 3 and 4;

Figure 6 is an end view of the cover element shown in Figure 5;

Figure 7 is an opposite end view of the cover elements;

Figure 8 is a side elevation of the body portion;

Figure 9 is a second side elevation of the body portion taken at right angles to the view shown in Figure 7;

Figure 10 is a plan view of one of the electrical contacts formed for assembly with the socket body portion; and

Figure 11 is a similar side elevation of the other electrical contact formed for assembly with the socket body portion.

Referring back to Figure 1 showing a section through an assembled unit mounting an electric light bulb, 10 represents a bulb of substantially conventional form having the usual metal screw base 11, in which the threaded portion serves as one contact, and the insulating cap 12 having a conductive tip 13 forming a second contact to complete the circuit through the bulb filament. The socket body 14 which receives the bulb is preferably a molded insulation piece, having an interior generally right circular bore with two partial threaded portions 15 (Figs. 2 and 3) matching the screw threads on the bulb itself. Set within the socket body are conductive contact members 16 and 17 which are held in place on opposite sides of the inside of the socket body by a pressed fit in respective grooves between the threaded portion 15, contact 16 being formed with an offset central portion 21 to meet and make electrical contact with the threaded base of the bulb and contact 17 being formed with a central portion 20 thereof bent inwardly, substantially to the

3

center of the cylindrical socket to make contact with the conductive tip of the bulb. The two conductive elements 16 and 17 have sharpened tips 18 and 19, shown in more detail in Figures 9 and 10, which extend downward into channel 29 to form electrical contact with the wires of a cord passing through the socket structure, as will be shown in greater detail.

In Figures 1 and 9, contact 17 is shown to be essentially a rectangular electrically conductive piece in which a central tongue 20 is cut out. To make contact with the tip 13 of the bulb base, the tongue 20 is bent outward perpendicular to the piece to the center of the cylindrical body opening, as shown in Figure 1. The bottom of the piece has a pair of sharp prongs 19 formed thereon and aligned to be offset to one side of the center of the base.

In Figure 10, contact 16 is shown as essentially a rectangular electrically conductive piece in which a central tongue 21 is cut out. To make contact with the bulb base 11, the tongue 21 is bent forward toward the center sufficiently to meet the threads of the bulb base. Like element 19, the bottom of contact 17 has a pair of sharp prongs 18 formed thereon and aligned to be offset on the opposite side of center from prongs 19.

Socket body 14 is formed, preferably by molding, to have two symmetrically placed longitudinal grooves recessed therein and having sections such that contacts 16 and 17 may be slipped thereinto from the bottom, as shown in Figure 3, to be retained in the grooves by a pressed or frictional fit.

Referring to Figure 2, which is essentially a section taken at right angles to that shown in Figure 1, the several parts of the socket may be readily identified. Socket body 14 is of fundamentally cylindrical form and terminates at the lower end of the cylinder in outwardly extending longitudinal projections 25 and 26 so that the outline of the socket body resembles a T. Extending parallel to the longitudinal projections 25, 26 is a cord-receiving channel 29 formed centrally in the lower part of the body 14, as shown most clearly in Figure 8. It will be understood that the prongs 18 and 19 of contact elements 16 and 17 extend into channel 29, as shown in Figures 1 and 2, with the prongs 18 near one side of the channel 29 and the prongs 19 near the other side. Matching cap 28, which completes the unit, has an internal outline matching the external T configuration of the socket body to form a sliding fit with the body of the socket to cover channel 29. As will be described, this cap or cover 28 presses against the cord 27 in channel 29 to force the cord against the prongs 18 and 19, so that these prongs pierce the cord insulation and make electrical contact with the respective wires of the cord.

In Figure 7 the side elevation of socket 14 indicates it may have portions thereof offset or tapered for ornamental purposes but will generally have two opposite planar faces 41 and 42 paralleling the projections 25 and 26 so as to provide for receiving the sliding cap 28. Figure 8 shows the socket element in the direction at right angles to that of Figure 7.

The structure of the cap 28 to form the sliding fit on the base of the socket body to compress the cord against the sharp projecting prongs of the socket is essentially a channel-like section, as shown in Figure 6, matching the cross piece of the T-shaped section 25, 26 of the base of the socket body. The cap 28 is also formed with an

4

outwardly extending flange 30 on one side to identify the slightly widened end thereof which permits easy entry on the T-shaped base of the socket. The upwardly and inwardly extending sides 31 of the cap define a channel in which the T-shaped section of the socket body base fits.

In Figure 6, which is a view taken from the narrower end of the base plate, the flange 30 at the back thereof is identified and the extremes of the opening 32 for receiving the projections 25, 26 of the socket body base are shown in dotted lines. The opening quickly tapers to a close fit for the body base. The several projections appearing on the inner face of the channel have their purposes as follows: the two central projections 33 and 34 are, respectively, on either side of the axis of channel 29 in alignment with the sharp prongs 18 and 19 forming the parts of the electrical contact members, so that when the device is assembled, these projections will compress the cord in groove 29 against the prongs, thereby establishing electrical contact with the encased wire. For this purpose, these projections 33, 34 are wedge-shaped in longitudinal section, and merge into the main portion of cap 28. The two projections 35 and 36 are oriented at the narrower end of the base plate and serve simply as stops for engaging the base of the socket body and stopping it when it is substantially centrally located over the base plate.

From the above description of the structure of the parts, the function and the manner of assembly of the socket should be readily understood. Briefly, in the assembly of the socket and establishment of electrical contact with wires encased in insulating material, such as conventional rubber covered lamp cord, the wire or lamp cord is laid in the groove 29 of the socket (conventional two-wire rubber covered lamp cord would be used for the assembly of ornamental Christmas tree lights), and cap or cover 28 is fitted over the end of the body base and slid into place until it engages stops 35 and 36. In being forced into position, projections 33 and 34 on the plate serve to compress the wire against the prongs 18 and 19 of wire 27 sufficiently to cause the prongs to pierce the soft insulating covering of the wire and establish electrical contact with the encased wires substantially as shown in Figures 1 and 2. In this manner one or any number of sockets may be assembled on a wire, up to the current carrying capacity of the wire.

It will be understood that any suitable type of cord may be used, although parallel conductor cords are preferred. If desired, separate single wires may be used. In any case, the wedge projections 33, 34 of the cap 28 are proportioned to force the wires of the cord into contact with the prongs 18, 19, whereby the wires are electrically connected to the contact elements 16, 17 and thence to the terminals of the light bulb.

It will be understood that the socket described above may be used in any position, and may have the light bulb extending downwardly or at any desired angle.

Thus there has been described an extremely simple bulb socket, made of a minimum number of easily fabricated parts and adapted for assembly by the user without any tools whatever, which permits mounting of one or more light bulb sockets on a cord at any desired locations therealong.

Though the invention has been described in connection with only a single embodiment thereof, the fundamental principle should be apparent

and variations thereof without departing from the spirit or scope of the invention may readily be made.

What I claim is:

1. A socket for electric light bulbs having a threaded base terminal and a further central tip terminal, comprising a hollow unitary body of insulating material having a substantially cylindrical bore, a pair of grooved recesses formed in the inner surface of said bore diametrically opposite one another and extending partially therealong from one end thereof to form respective shoulders, said bore having threads formed therein adapted to receive the threaded base of a light bulb, a pair of flat electrical contact elements integrally formed of sheet metal having portions respectively slidably seated in said recesses in abutment with said shoulders and having projections integrally formed therewith and adapted to make electrical contact with the respective terminals of said light bulb when inserted in said threads, said hollow body having a channel formed transversely at said one end of said bore and extending in alignment with and communicating with said recesses, each of said contact elements being provided with an integral pointed end formed at one end of said first named portions and extending into said channel for piercing the insulation of a respective one of the insulated wires of an electrical conductor cord when lying in said channel to make electrical contact with said wires, said body having a pair of ridges extending along the outer walls thereof parallel to and in part coplanar with said channel, and means in the form of a cover having linearly extending reentrant edges slidably engaging said ridges for covering said channel, said cover having an inner surface substantially parallel to the base of said channel and a pair of projections at locations respectively opposite said pointed contact ends for holding such an electrical conductor cord in contact with said contact element ends.

2. A socket for electric light bulbs comprising a hollow unitary insulating body having a transverse channel at one end thereof and a pair of grooved recesses extending from said channel longitudinally of said body and terminating in respective shoulders, said body having a substantially cylindrical longitudinal bore between said recesses and being formed with threads on the inner surface of said bore for engaging the threaded base of a light bulb, a pair of electrical contact elements extending in said recesses with one end abutting a respective one of said shoulders and each having a pointed end thereof within said channel for piercing the insulation of an insulated wire, each of said contact elements being formed of sheet material and also having means formed integrally therewith for making electrical contact with a respective terminal of a light bulb when engaging said threads, said body having a pair of flanges extending along the outer walls thereof parallel to said channel, and means including an integral cover having longitudinally extending re-entrant portions slidably engaging said flanges for covering said channel and having an inner surface substantially parallel to the base of said channel and a pair of projections on said inner surface at locations re-

spectively opposite said pointed contact ends for applying pressure to an electrical conductor cord when placed in said channel to press the respective wires of said cord into contact with the pointed ends of said electrical contact elements to make electrical contact between each of the wires of said cord and a respective contact element.

3. A socket as in claim 2 wherein said cover has a pair of further projections extending from the inner surface adjacent one end adapted to engage said body to define a position for said cover at which said first projections are opposite said contact pointed ends.

4. A socket for electric light bulbs having a threaded base shell forming one terminal thereof and a further tip terminal, comprising an integral molded hollow insulating body having a substantially cylindrical bore, a pair of grooved longitudinal recesses formed in diametrically opposite portions of said bore and extending partially therealong to terminate at one end in respective shoulders, a channel extending across one end of said body transversely thereof and joining the other ends of said recesses, a pair of unitary stamped sheet-metal contact elements mounted respectively in said recesses in abutment with respective shoulders, one of said elements having a bent-out integral projection extending into said cylindrical bore and adapted to make electrical contact with the threaded shell terminal of a light bulb when inserted into said bore, the other of said contact elements having a bent-out integral projection extending inwardly of said bore substantially to the center thereof for making electrical contact with the tip terminal of such a light bulb, each of said contact elements further having a sharp pointed end extending into said channel adjacent respective opposite sides thereof, said body further having a pair of flanges extending transversely thereof adjacent to and parallel to the edges of said channel, and a sliding cover adapted to cover said channel and having reentrant lips engaging said flanges for retaining said cover in engagement with said body, said cover having an inner surface substantially parallel to the base of said channel and protuberances on its inner surface in register with said channel whereby when a conductor cord is laid in said channel and said cover is slid over said body and cord, said protuberances are adapted to force said conductor into a contact with said contact element pointed ends whereby said ends pierce the insulation of said conductor cord and make electrical contact between the respective wires of said cord and the respective light bulb terminal-engaging portions of said contact elements.

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