

Jan. 13, 1959

S. STUART

2,869,097

ELECTRICAL LAMP SOCKET

Filed July 3, 1957

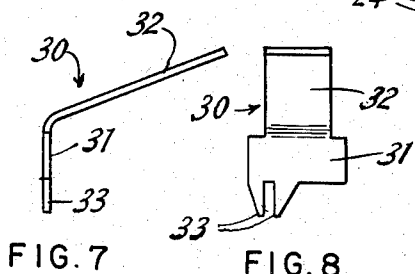
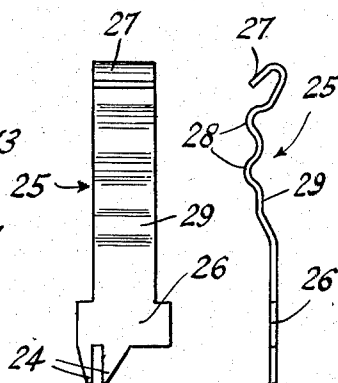
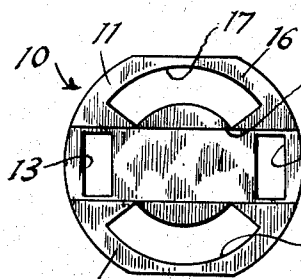
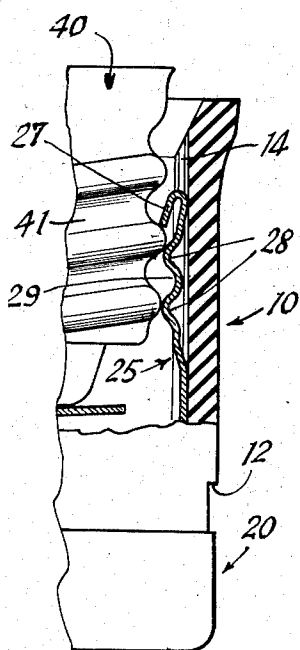
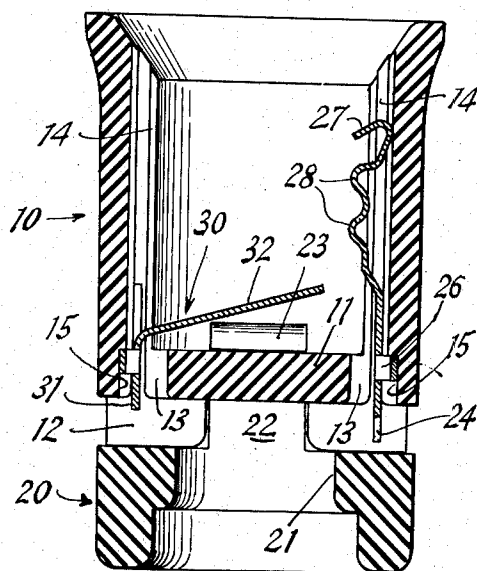
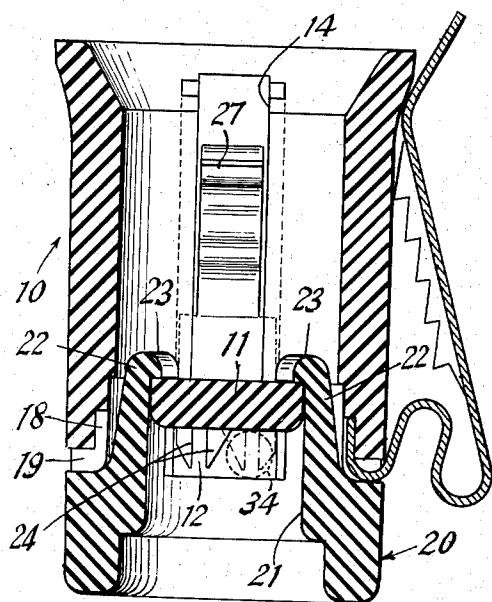


FIG. 3

INVENTOR.

SIMON STUART

BY *Irving Seidman*
ATTORNEY

1

2,869,097

ELECTRICAL LAMP SOCKET

Simon Stuart, Bronx, N. Y.

Application July 3, 1957, Serial No. 669,896

4 Claims. (Cl. 339—69)

This invention relates to lamp sockets and, more particularly, to a novel lamp socket adapted for quick relatively permanent attachment to a lamp cord and to quick insertion of a lamp bulb therein.

In assembling lamp sets, such as used in Christmas tree ornamentation for example, it is necessary to electrically connect each of a plurality of lamp sockets to a lamp cord and then to screw a bulb into each socket. The electrical connection of each socket to the supply cord has hitherto involved soldering of leads to terminals or securing of the conductors to screw type pressure terminals. The time and labor required for such operations, as well as the time and labor required to screw a lamp bulb into each socket, has made the cost of such lamp sets unduly high.

For example, the usual lamp socket for such lamp sets comprises a socket of dielectric material in which is secured a cylindrical threaded member of conductive metal forming the side contact for the base of the lamp bulb. This side contact is usually secured in place by a metal rivet or screw to which one conductor of the cord is electrically connected. The socket also includes a center or base contact, of the spring type, which is also screwed or riveted in place and electrically connected to the other conductor of the cord. Thus, even the assembly of such a socket requires substantial time and labor.

In accordance with the present invention, a novel lamp socket is provided in which no soldered, riveted, or threaded connections are needed, and into which a lamp bulb can be easily inserted by merely pressing it into the socket without any "screwing in" operation, although the lamp bulb, when inserted into the lamp socket, can be removed only by a "screwing out" operation.

More specifically, the socket comprises a cylindrical body formed of a suitable dielectric material such as a synthetic resin. A rigid thermosetting plastic material is preferred. This body has a base or partition located somewhat inwardly of one end and formed with a pair of diametrically opposite substantially rectangular openings which may align with grooves along the inner surface of the cylindrical wall. The base further has a pair of diametrically opposite arcuate slots or openings each intermediate the rectangular openings. A supply cord slot extends diametrically of the outer surface of the base between the rectangular openings, this slot opening outwardly of the body at each end.

The rectangular slots receive the socket terminals which are relatively elongated strips of electrically conductive metal insertible through the rectangular slots into the socket. Each terminal has a cross member adjacent its lower end limiting its movement into the socket, and the lower end of each terminal is formed with conductor piercing and electrical contact making barbs. When the two terminals are in place, the barbed ends of the respective terminals are staggered laterally of the supply cord slot so that each terminal makes electric contact with a different conductor of the supply cord.

One of the terminals constitutes the side terminal or

2

contact for the lamp base, and is formed with an inwardly reentrant hook on its free or outer end and with transverse undulations inwardly of the hooked end. When the side terminal is in place, its undulating portion is bowed away from the socket wall. The other, or base terminal, has an outer end bent to extend radially of the socket when this terminal is in position.

To assemble the socket, the respective terminals are inserted through the base of the body and a supply cord is laid in the diametric slot in the base with its conductors pressed onto the respective barbed ends of the terminals. A cap of flexible material is then snapped into interlocking relation with the body to force the conductors firmly onto the barbs.

This cap is formed of dielectric material, preferably a fire retardant thermoplastic and thus flexible material. The cap comprises a circular end wall from which projects a pair of diametrically opposite arcuate cross-section extensions engageable through the arcuate slots of the base by virtue of their flexibility. Each extension has a rib on the inner surface of its free end, and the relative proportion of parts is such that, when these ribs snap into engagement with the inner surface of the base due to the flexibility of the cap, the cap wall engages the bottom of the socket body and firmly presses the conductors onto the barbs. The flexibility of the cap allows permanent assembly of the socket without the use of rivets, screws, or other fasteners.

When the socket is of the type used in Christmas tree lamp sets, a tree branch engaging clip may have a hooked end inserted in an opening in the socket body and locked in place by the cap.

For an understanding of the invention principles, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing. In the drawing:

Figs. 1 and 2 are axial sectional views of the socket taken at right angles to each other;

Fig. 3 is a partial axial sectional view of the socket with a lamp therein;

Fig. 4 is a bottom plan view of the socket body;

Figs. 5 and 6 are, respectively, front and side elevation views of the bulb retaining contact element; and

Figs. 7 and 8 are, respectively, front and side elevation views of the bottom contact element.

Referring to the drawing, the lamp socket forming the subject matter of the invention comprises a socket body 10, a socket cap 20, a bulb-retaining and conductor piercing side contact 25 and a bottom conductor piercing contact 30. Body 10 and cap 20 are molded from a suitable dielectric material, the body 10 being formed of a rigid thermosetting plastic material and the cap 20 being a fire retardant thermoplastic material such as cellulose acetate for example. Contacts 25 and 30 are stampings of electrically conductive metal such as brass, copper, or aluminum.

Body 10 is a generally cylindrical member having a substantially closed inner end 11 and an open outer end. End 11 has a conductor receiving slot or groove 12 extending thereacross and communicating adjacent each end with substantially rectangular opening 13 aligned with diametrically opposite grooves 14 extending longitudinally of the inner surface the side wall of member 10. The inner end of each groove 14 is recessed or notched as at 15.

The segmental ribs 16 formed by groove 12 have arcuate openings 17 therein for a purpose to be described, and these openings have recesses or notches 18 adjacent radial openings 19.

Cap 20 is generally annular and formed with a circumferential rib 21 at its inner end. The cap has diametrically opposite arcuate extensions 22 on its inner end

each having an intumed lip 23 at its free end. These extensions fit through openings 17 when the socket is assembled.

Side contact 25 is an elongated strip having a cross-head 26 at one end, a hook 27 at the other end, and undulations 28 in a bowed intermediate section 29 adjacent hook 27. Conductor piercing prongs 24 project from the side of head 26 adjacent one end.

End contact 30 is also an elongated strip having a cross head 31 and a stem 32 extending at an angle thereto. Conductor piercing prongs 33 project from the edge of head 31 adjacent one end.

In assembling the socket, contact 25 is inserted through one opening 13 to extend along the associated groove 14 with bowed section 29 projecting from the groove. Head 26 limits inward movement of contact 25. Contact 30 is inserted in the other opening 13 so that stem 32 extends across the center of the socket. When the contacts are thus inserted, prongs 24 lie on one side of the centerline of groove 12 and contacts 33 lie on the other side of such centerline.

A two-conductor cord, or two single insulated stranded wires, are then laid in groove 12 with one wire pressed onto prongs 24 and the other pressed onto prongs 33, to pierce the insulation and make electrical connection between each wire and one of the contacts 25 or 30. If desired, a clip 35, such as used on Christmas tree lights, may have a hooked end inserted through an opening 19 with the hook seating in a notch 18.

Cap 20 is then assembled to body 10 by inserting extensions 22 through openings 17 until lips 23 snap over the inner surface of end wall 11. This closes groove 12 and forces the wires 34 firmly onto the prongs 24 and 33.

A lamp bulb 40 is easily and quickly assembled with the socket by merely pushing its threaded base 41 into the socket until the center base contact engages and depresses stem 32 of contact 30. Bowed portion 29 of contact 25 "gives" to allow base 41 to slip past. However, to remove bulb 40, it must be unscrewed from the socket as hook end 27 prevents pulling the bulb out. This hook is cantled in such a direction that upward stress on the hook causes bowed section 29 to grip the lamp base even more firmly.

Bulb 40 may also be screwed into the socket as well as pushed in axially. The resiliency of bowed portion 29 of contact 25 permits the threads of base 41 to slip over undulations 28 if it is attempted to screw bulb 40 into the socket beyond the point at which the center contact of base 41 engages contact 30. Thus, if it is attempted to tighten bulb 40 by grasping the bulb and turning it further into the socket, there is no possibility of twisting the bulb off its base, due to the very small resistance to turning movement of the bulb as the base threads slip over undulations 28.

The flexibility of the material of cap 20 allows fingers 22 with ribs 23 to deflect as the fingers are inserted through openings 17 and then snap back to engage ribs 23 over the inner surface of wall 11 to lock the parts together permanently. Thereby, no bolts, screws, rivets or other fasteners are needed to secure the socket parts together.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the invention principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A lamp socket comprising, in combination, a substantially cylindrical socket body having a base formed with a pair of substantially diametrically opposite apertures communicating with grooves extending along the inner surface of said socket, and formed with a groove extending diametrically of its undersurface and communicating with said apertures; a first contact in the form of a relatively elongated metal strip having an enlarged head formed with insulation piercing barbs, said first contact extending upwardly through one of said apertures with its head in said base groove and limiting upward movement of said first contact; said first contact extending diametrically of said base and spaced from the upper surface thereof to engage the center contact of a threaded lamp base; a second contact adapted to engage the side contact of the threaded lamp base and including a relatively narrow second strip of conductive metal extending through the other aperture and longitudinally of one of the grooves in the inner surface of the cylindrical wall of said socket body; said second strip having transverse undulations intermediate its ends engageable with the threads of the lamp base and the undulated portion of said second strip being bowed inwardly from said wall, and having an enlarged head in said base groove limiting upward movement of said second contact and formed with conductor piercing barbs; whereby a lamp bulb may be mounted in said socket by non-rotational movement axially into said socket to flatten said second strip toward said wall; said second strip having a radially and axially inwardly directed hook on its outer end engageable with the threads of the lamp base to prevent removal of the lamp bulb from said socket except by an unscrewing rotation of the lamp bulb; the barbs on the two heads being offset laterally of said groove to engage different conductors of a two-conductor cable in said base groove; said base having a pair of diametrically opposite arcuate openings intermediate said apertures; and a socket cap having a circular wall and a pair of diametrically opposite arcuate cross-section fingers extending longitudinally from said wall for insertion through said arcuate openings; the free ends of said fingers having ribs on the inner surfaces thereof engageable with the upper surface of the socket base; the distance of said ribs from said cap wall being such that, when said ribs are engaged over the upper surface of said socket base, said cap wall will firmly press the conductors of such cord in said groove onto said barbs.

2. A lamp socket as claimed in claim 1 in which said socket body has a side opening therein; and a socket mounting clip having an end engaged in said side opening and retained in position by said cap.

3. A lamp socket as claimed in claim 1 in which said cap is formed of thermoplastic material.

4. A lamp socket as claimed in claim 1 in which said socket base is formed of a thermosetting material and said cap is formed of a thermoplastic material.

References Cited in the file of this patent

UNITED STATES PATENTS

2,475,243	Irrgang	July 5, 1949
2,651,072	Gilbert	Oct. 21, 1952
2,800,635	Christenbery	July 23, 1957

FOREIGN PATENTS

462,798	Italy	Apr. 3, 1951
---------	-------	--------------