

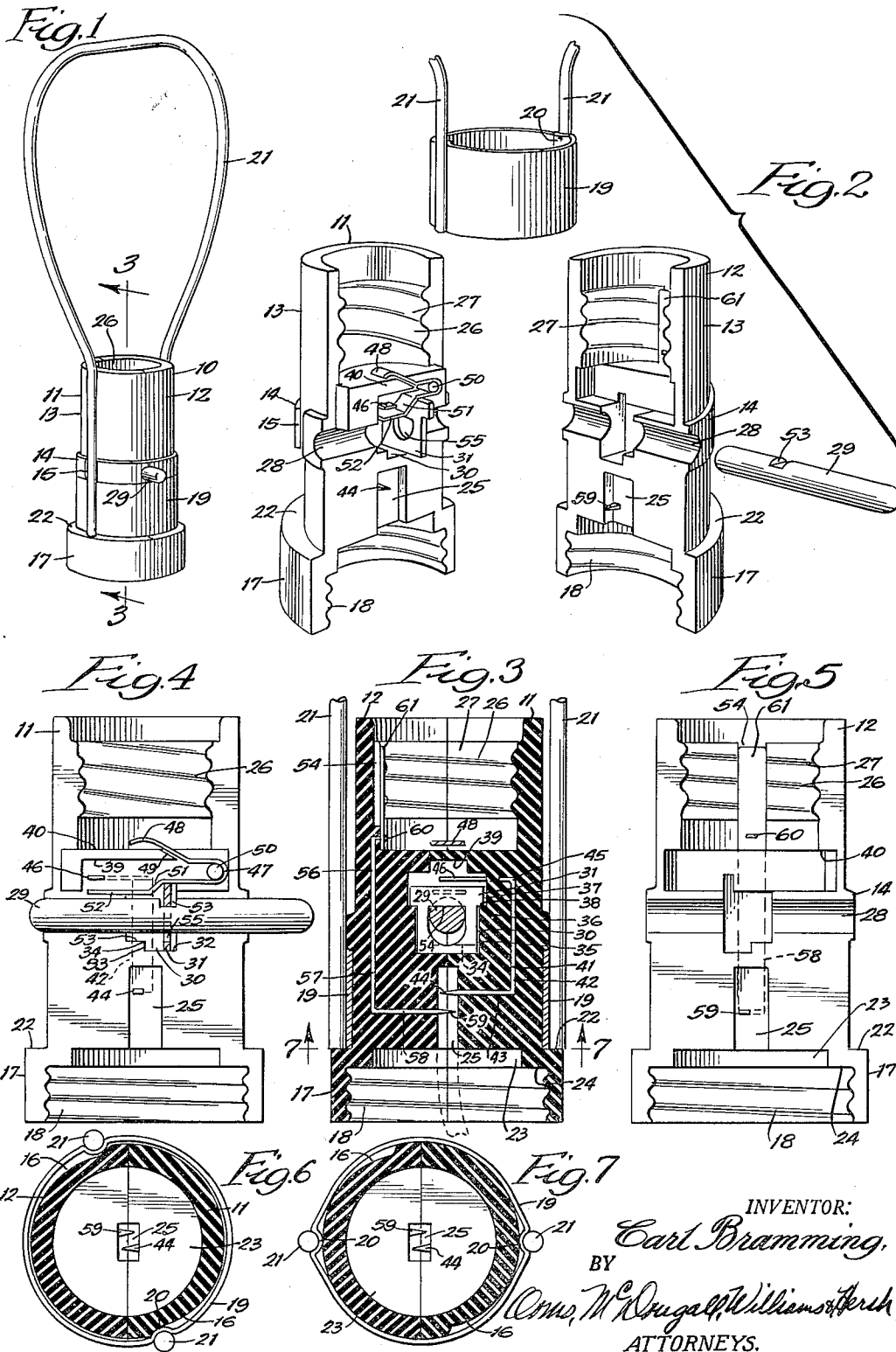
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ELECTRICAL SOCKET AND SWITCH

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ELECTRICAL SOCKET AND SWITCH

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4 Claims. (Cl. 200—51.16)

This invention relates to electrical sockets in which electric light bulbs are mounted, and more particularly to sockets adapted to be mounted on table lamps or the like in which a harp is supported by the socket to in turn support a lamp shade.

Known electrical sockets are generally composed of a large number of separate parts which must be hand assembled in order to make them operative. These parts include an outside casing, an insulating member, an inside threaded portion adapted to receive an electric light bulb, a supporting base, and the usual terminal clips and binding screws. This large variety of parts is expensive to manufacture and to assemble.

It is therefore an object of this invention to provide an electrical socket comprising a pair of body portions molded of an insulating plastic material, the electrical connector means being molded in the walls of the body portion, and the contact means being easily assembled therewith.

A further object is to provide an electrical socket in which the conductor wire is attached to the conductor means by sharp prongs rather than by terminal clips and binding screws.

A further object is to provide an electrical socket having a portion of the body member thereof formed as a cam surface to be engaged by a clamping ring which will hold the parts of the socket in operative position and at the same time support a harp upon which a lamp shade may be mounted.

A further object is to provide an electrical socket having a push rod type actuator which operates in conjunction with an improved operating plate and switch spring.

A still further object is to provide an electrical socket in which a contact strip is provided to establish electrical contact with the threaded base of the electric light bulb.

Further objects and advantages of my invention will be apparent from a consideration of the following specification together with the accompanying drawings, in which:

Fig. 1 is a view in perspective of the assembled socket with the harp in place,

Fig. 2 is an exploded view of the socket of Fig. 1, though on a larger scale, showing the various parts previous to final assembly,

Fig. 3 is a view in section on the line 3—3 of Fig. 1,

Fig. 4 is a view in elevation of one of the molded body sections,

Fig. 5 is a view in elevation of the other of the molded body sections,

Fig. 6 is a view in section at the plane of the line 7—7 of Fig. 3, with the clamping ring resting in its initial position on the lower shoulder, and

Fig. 7 is a view similar to Fig. 6 but showing the clamping ring rotated with reference to the body of the socket.

As shown in the drawings the socket 10 is made up of a body portion 11 and a body portion 12, which to-

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gether form a structure having a cylindrical upper barrel 13, a retaining flange 14 in which are formed the passages 15, a lower cam-shaped surface 16, and the base section 17, internally threaded at 18 to be received over the upper threaded end of a lamp base, not shown.

The clamping ring 19 is formed with a pair of cam followers 20, on the opposite side of which are mounted the two ends of the harp 21. It will be appreciated that the cylindrical portion 13 of the socket 10 may be inserted in the ring 19, the cam followers 20 being aligned with the channels 15 in the retaining flange 14. With the parts in this position the ring 19 can be moved downwardly into position over the cam surface 16, the ring 19 engaging the shoulder 22 at the top of the base 17. Since the surface 16 is shaped to provide a cam surface, as shown particularly in Figs. 6 and 7, clockwise rotation of the ring 19 relative to the socket 10 will provide a clamping and locking effect on the portions 11 and 12. The flange 14 will prevent longitudinal movement of the ring 19 with respect to the socket 10.

The portion 11 is formed with the lower bore having threads 18, a central bore 23 providing a shoulder 24, and a central conductor-wire receiving channel 25. The upper end of the portion 11 defines half of the light bulb receiving socket 26 with its molded threads 27. The central part of the portion 11 defines half of the cylindrical channel 28 adapted to receive the operating pin 29 and the chamber 30 in which is mounted the operating plate 31. The chamber 30 has a floor 32 and a step 33 providing a shoulder 34 which functions as a stop for the lower portion of the operating plate 31. In the portion 11 the chamber 30 has a side wall 35 which extends above the center of the operating pin 29, a step 36, over which the shoulder 38 of the plate 31 extends, and an upper side wall 37. The chamber 30 has an upper surface 39 formed by the horizontal wall 40 which projects from the portion 11 into a suitable cavity in the portion 12.

A current carrying member 41 is molded into the portion 11, and comprises a vertical shaft 42, a lower horizontal shaft 43 presenting a sharpened prong 44 into the channel 25, the prong 44 being laterally offset so that it can engage only one of the two wires of a conductor introduced into the channel 25. The current carrying member 41 at the top of the shaft 42 is bent toward the center of the socket as at 45 whence it extends arcuately and projects from the wall of the chamber 30 below the surface 39 to provide a contact member 46.

The switch spring 47 has a contact portion 48 formed by rolling the end of the resilient stock from which the switch spring 47 is made. The switch spring 47 projects from the socket cavity 26 through the slot 49 in the wall 40 and into the cavity 30, where it extends around the pin 50 and back toward the center of the socket. At approximately the center of the socket the switch spring 47 is bent to form a cam section 51, and the free or contact end 52, which is adapted to make electrical connection with the contact member 46 of the conductor member 41. The resilient character of the switch spring 47 urges the free end 52 downwardly into its non-contacting position.

The operating pin 29 is formed with a central cut-out 53 having a horizontal plane surface adapted to mate with the horizontal surface 54 in the operating plate 31. The plate 31 defines an aperture 55 of sufficient size to receive the pin 29. In assembling the socket 10, the pin 29 is passed through the aperture 55 until the plate 31 drops into the cut-out 53. In this condition the plate 31 is supported on the pin 29 in such a manner as to have clearance on all sides of the cavity 30. When the pin 29 is moved in a direction to close the electrical circuit, it moves the plate 31 against the cam surface 51, thereby lifting the free end 52 of the switch spring 47 into engage-

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ment with the contact arm 46. Normal operation of the pin 29 will move it into its extreme electrical circuit making position, which will cause the lower part of the plate 31 to contact the shoulder 34 thereby forcing the upper part of the plate 31 well past the shoulder formed between the cam surface 51 and the free end 52, thereby securely locking the operating mechanism in the closed circuit position.

When the operating pin 29 is moved to the circuit-opening position, the plate 31 will remain in its canted position until the lower end of the plate 31 engages the end of the chamber 30. Further movement then of the pin 29 will give accelerated movement to the upper portion of the plate 31 thereby releasing the connection between the members 52 and 46 with a snap.

The body portion 12 is formed similarly to the body portion 11 as to the lower bore having the threads 18, the central bore 23, the shoulder 24 and the channel 25. The light bulb receiving socket 26 is formed similarly to that in the portion 11, excepting for the vertical channel 54 formed in the threads 27, for a purpose as will appear later. The portion 12 defines complementary cavities to those defined by the portion 11 to form the chamber 30, and in addition has a cavity 55 adapted to receive the projecting wall 49, the pin 50 and the switch spring 47, which are carried on the portion 11. The portion 12 also defines one-half of the cylindrical channel 28 in which the operating pin 29 is positioned.

The current carrying means 56 is molded in the portion 12 and comprises a vertical shaft 57 carrying at its lower end a horizontal member 58 terminating in a sharp projecting prong 59 which projects into the channel 25. The prong 59 is radially offset from the prong 44 so that it will contact only one of the two wires of a conductor received in the channel 25, and is axially offset so that it will contact that wire at a point above or below that at which the other wire is contacted by the prong 44. The shaft 57 terminates in a tongue 60, projecting into the socket 26, which in turn supports the contact strip 61 positioned in the channel 54 in such a manner as to lie against the threaded base of an electric light bulb inserted into the socket 26.

The complete socket may be assembled by placing a suitable lamp cord type electrical conductor in the channel 25 of the portion 11, moving the portion 12 into mating engagement therewith, and pressing the two tightly together. This will cause the prongs 44 and 59 to be inserted through the insulation on the electrical conductor and to make electrical contact. The ring 19 is then assembled over the top of the socket by aligning the cam followers 20 with the passages 15 in the retaining flange 14 and moving the ring 19 down until it engages the shoulder 22. Clockwise rotation of the ring 19 relative to the socket 10 will, by reason of the cam surface formation of the portion 16, tightly clamp the two portions 11 and 12 together. The operating pin 29 may then be inserted into the channel 28, through the aperture 55 in the plate 31 until the edge 54 drops into engagement with the lower edge of the cut-out 53. With the parts in this position the socket will provide operative electrical connections between an outside source of power and a bulb which is positioned in the socket 26.

If it should be desired to disassemble the socket 10, it is first necessary to rotate the pin 29 approximately 180 degrees on its longitudinal axis, thereby lifting the plate 31 so that it is out of operative engagement with the cut-out 53, at which time the pin 29 may be removed from the aperture 55 and the channel 28. Counterclockwise rotation of the ring 19 relative to the cam surface 16 will permit aligning the cam followers 20 with the passages 15 and the lifting of the ring 19 off the socket 10. The portion 11 may then be separated from the portion 12.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In an electrical lamp socket device for receiving an

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electric light bulb, the combination comprising an electrically insulating body including first and second complementary generally hemicylindrical half shells disengageably mating generally along a longitudinal diametrical plane, said half shells defining an axial socket in said body at one end thereof for receiving an electric light bulb, means in said body for establishing electrical connections between a lamp cord and the light bulb, each of said half shells having a portion intermediate its ends and formed with an external generally spiral cam surface with low and high points thereon, a continuous generally cylindrical locking ring disengageably received over said intermediate portions and having a pair of diametrically opposite inwardly directed cam follower projections engaging said cam surfaces, said ring being rotatable around said half shells to move said projections between said low and high points on said cam surfaces and thereby clamp said half shells together by camming action, said half shells defining an outwardly extending shoulder on one end of said body for retaining said ring on said intermediate portions against movement in one direction, said half shells defining an enlarged annular retaining portion on the other end of said body for disengageably retaining said ring against movement in the opposite direction, said enlarged retaining portion being of a diameter less than the internal diameter of said ring but greater than the distance between said cam follower projections, said enlarged retaining portion having a pair of diametrically opposite longitudinally extending grooves therein to provide passage for said cam follower projections over said retaining portion, said grooves being longitudinally aligned with said low points, on said cam surfaces so that said cam follower projections will be misaligned with said grooves when said ring is rotated to move said cam follower convolutions between said low and high points on said cam.

2. In an electrical lamp socket device for receiving an electric light bulb, the combination comprising an electrically insulating body including first and second complementary generally hemicylindrical half shells disengageably mating generally along a longitudinal diametrical plane, said half shells defining an axial socket in said body at the upper end thereof for receiving an electric light bulb, contact means mounted in said body and extending into said socket for establishing electrical contact with the lamp bulb, switching means in said body for selectively establishing an electrical circuit with said contact means, said half shells defining a generally diametrical switch pin channel extending through said body, each of said half shells having a portion intermediate its ends and formed with an external generally spiral cam surface with low and high points thereon, a continuous generally cylindrical locking ring disengageably received over said intermediate portions and having a pair of diametrically opposite inwardly directed cam follower projections engaging said cam surfaces, a lamp shade harp having lower end portions fixed to said ring, said ring being rotatable around said half shells to move said projections between said low and high points on said cam surfaces and thereby clamp said half shells together by camming action, said half shells defining an outwardly extending shoulder on the lower end of said body for retaining said ring on said intermediate portions against downward movement, said switch pin channel being disposed above but adjacent said cam surfaces, a switch pin slidably movable in said switch pin channel and operatively connected to said switching means, said switch pin extending outwardly from said switch pin channel and thereby retaining said ring on said body against upward removal, and means in said switching means for disengageably retaining said switch pin against removal from said switch pin channel.

3. In an electrical lamp socket device for receiving an electric light bulb, the combination comprising an electrically insulating body including first and second com-

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plementary generally hemicylindrical half shells disengageably mating generally along a longitudinal diametrical plane, said half shells defining an axial socket in said body at the upper end thereof for receiving an electric light bulb, contact means mounted in said body and extending into said socket for establishing electrical contact with the lamp bulb, switching means in said body for selectively establishing an electrical circuit with said contact means, said half shells defining a generally diametrical switch pin channel extending through said body, each of said half shells having a portion intermediate its ends and formed with an external generally spiral cam surface with low and high points thereon, a continuous generally cylindrical locking ring disengageably received over said intermediate portions and having a pair of diametrically opposite inwardly directed cam follower projections engaging said cam surfaces, a lamp shade harp fixed to said ring, said ring being rotatable around said half shells to move said projections between said low and high points on said cam surfaces and thereby clamp said half shells together by camming action, said half shells defining an outwardly extending shoulder on the lower end of said body for retaining said ring on said intermediate portions against downward movement, said half shells defining an enlarged annular retaining portion on said body above said cam surfaces for disengageably retaining said ring against upward movement, said enlarged retaining portion being of a diameter less than the internal diameter of said ring but greater than the distance between said cam follower projections, said enlarged retaining portion having a pair of diametrically opposite longitudinally extending grooves therein to provide passage for said cam follower projections over said retaining portion, said grooves being longitudinally aligned with said lower points on said cam surfaces so that said cam follower projections will be misaligned with said grooves and thereby locked below said retaining portion when said ring is rotated to move said cam follower projections between said low and high points on said cam, said switch pin channel being disposed above but adjacent said cam surfaces, a switch pin slidably movable in said switch pin channel and operatively connected to said switching means, said switch pin extending outwardly from said switch pin channel and thereby retaining said ring on said body against upward removal, and means in said switching means for disengageably retaining said switch pin against removal from said switch pin channel.

4. In an electrical lamp socket device for receiving an electric light bulb, the combination comprising an electrically insulating body including first and second complementary generally hemicylindrical half shells disengageably mating generally along a longitudinal diametrical plane, said half shells defining an axial socket in said body at the upper end thereof for receiving an electric light bulb, said half shells having opposed complementary recesses defining a generally longitudinal channel at the lower end of said body for receiving the end of a two-conductor lamp cord, first and second sharply pointed electrically conductive prongs mounted in said half shells and projecting into said channel for piercing the lamp cord and contacting the conductors thereof, said prongs being offset axially and laterally from each other and being directed generally perpendicular to the mating plane of said half shells so that said prongs will pierce the lamp cord when

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said half shells are brought together with the lamp cord therebetween and in said channel, a pair of contact elements mounted in said body and extending into said socket for establishing electrical contact with the lamp bulb, conductor means in said body connecting one of said prongs to one of said contact elements, switching means in said body for selectively establishing an electrical connection between the other prong and the other contact element, said half shells defining a generally diametrical switch pin channel extending through said body, each of said half shells having a portion intermediate its ends and formed with an external generally spiral cam surface with low and high points thereon, a continuous generally cylindrical locking ring disengageably received over said intermediate portions and having a pair of diametrically opposite inwardly projecting longitudinally extending cam follower convolutions engaging said cam surfaces, a lamp shade harp having lower end portions fixed to the outside of said convolutions, said ring being rotatable around said half shells to move said convolutions between said low and high points on said cam surfaces and thereby clamp said half shells together by camming action, said half shells defining an outwardly extending shoulder on the lower end of said body for retaining said ring on said intermediate portions against downward movement, said half shells defining an enlarged annular retaining portion on said body above said intermediate portions for disengageably retaining said ring against upward movement, said enlarged retaining portion being of a diameter less than the internal diameter of said ring but greater than the distance between said cam follower convolutions, said enlarged retaining portion having a pair of diametrically opposite longitudinally extending grooves therein to provide passage for said cam follower convolutions over said retaining portion, said grooves being longitudinally aligned with said low points on said cam surfaces so that said cam follower convolutions will be misaligned with said grooves and thereby locked below said retaining portion when said ring is rotated to move said cam follower convolutions between said low and high points on said cam, said switch pin channel being disposed above but adjacent said intermediate portions, a switch pin slidably movable in said switch pin channel and operatively connected to said switching means, said switch pin extending outwardly from said switch pin channel and thereby retaining said ring on said body against upward removal, and means in said switching means for disengageably retaining said switch pin against removal from said switch pin channel.

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