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PULL CHAIN SOCKET

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Fig. 1.

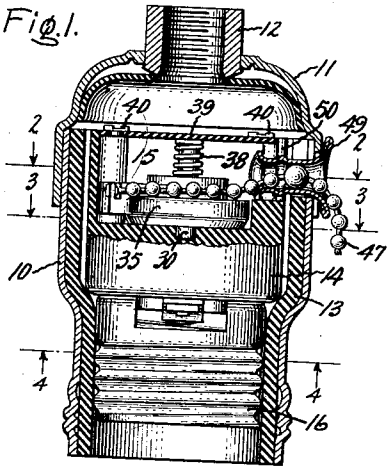


Fig. 2.

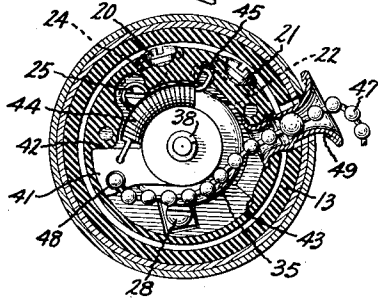


Fig. 3.

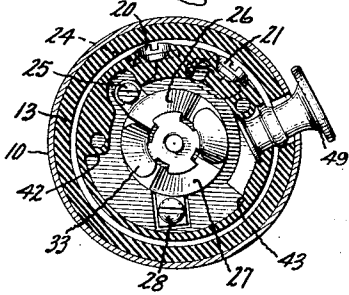


Fig. 4.

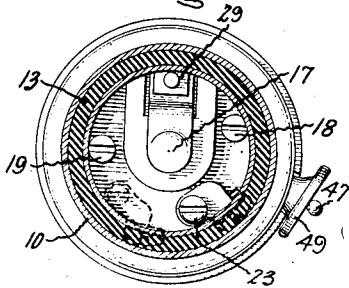


Fig. 6.

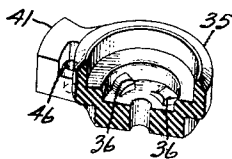
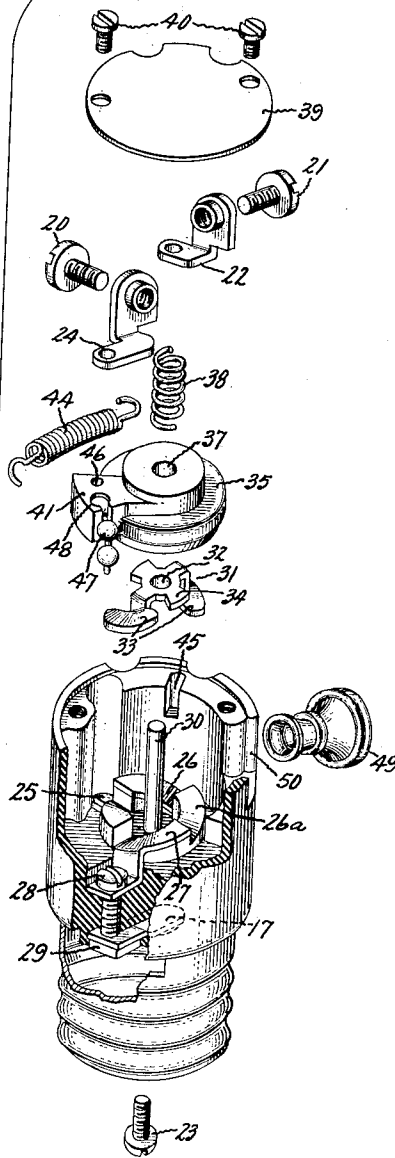


Fig. 5.



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UNITED STATES PATENT OFFICE

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PULL CHAIN SOCKET

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5 Claims. (Cl. 200—65)

The present invention relates to pull chain sockets for incandescent lamps of the type including a receptacle or socket for connection to a socket of an incandescent lamp and a housing with a switch operated by a pull chain to open and close an electric circuit for such lamp.

The object of my invention is to provide an improved construction of pull chain sockets or receptacles which have few parts of simple and sturdy construction that can be manufactured at low cost.

For a consideration of what I believe to be novel and my invention, attention is directed to the following description and the claims appended thereto in connection with the accompanying drawing.

In the drawing Fig. 1 illustrates a sectional view of a pull chain socket or receptacle embodying my invention; Figs. 2, 3 and 4 are sections along lines 2—2, 3—3 and 4—4 respectively of Fig. 1; Fig. 5 is a perspective, exploded view of the essential parts of the socket of Fig. 1; and Fig. 6 is another perspective view of a part of the socket.

The socket comprises an outer sheet metal shell 10 with a detachable cap 11 having a hub 12 through which an electrical cord may be passed for connection to terminals of the sockets. The housing has an insulating lining 13. A cylindrical base 14 made of insulating material is disposed in an upper portion of the housing and forms a chamber 15 for a switch mechanism. Two contacts for connection to an incandescent lamp are supported by the insulating base 14. One of these contacts 16 is in the form of a screw shell contact and the other is in the form of a central spring contact 17. The screw shell contact 16 is secured to the bottom of the base by two screws 18 and 19 engaging a flanged portion of the shell. Two wire binding screws 20 and 21 for attachment to a wiring system are secured to the insulating base 14. The binding screw 21 is electrically connected by means of a terminal 22 and a screw 23 (Fig. 4) to the screw shell 16. The other binding screw 20 is connected to one end of a terminal 24, the other end of which is connected by means of a screw 25 to a fixed or stationary contact 26. The contact 26 is attached to one of four circumferentially spaced, inclined cam surfaces 26a formed on the bottom of the switch chamber 15. Another such stationary contact 27 engages an inclined cam surface diametrically opposite that to which the contact 26 is attached. The stationary contact 27 is secured to the base 14 by means of a bolt 28 projecting through a bore in the bottom of the insulating base and fastened to the central spring contact 17 by means of a nut 29. A post or stud 30 is secured to the base centrally within the chamber 15. The stationary contacts 26 and 27

are cooperatively associated with a movable, metallic switch member 31 which has a central opening 32 for engaging the post 30 to be centered thereby and feet 33 for engaging the stationary contacts 26, 27.

The switch mechanism includes means for effecting step-by-step rotation of the movable switch member 31 to effect successive opening and closing of a circuit through the contacts 26, 27. To this end the movable switch member is provided with ratchet teeth 34 cooperatively associated with an insulating arc snuffing cup or disk 35. This cup is viewed from the top in Fig. 5 and from the bottom in Fig. 6. It has a cup-shaped body of an inner diameter slightly larger than that of the diameter of the rotatable switch member 31. The ratchet teeth 34 of the switch member are cooperatively associated with circumferentially spaced cams 36 formed in the snuffing cup 35. The latter has a central bore 37 to permit centering of the cup on the post 30. With this arrangement rotation of the snuffing cup 35 in counterclockwise direction when viewed in Fig. 5 causes counterclockwise rotation of the movable switch member 31 by engagement between the cam surfaces 36 of the snuffing cup with the ratchet teeth 34. In order to assure such engagement the snuffing cup 35 is biased downward into engagement with the rotatable switch member 31 by a spring 38 on the post 30 bearing at its lower end against the top of the snuffing cup 35 and at its upper end against an insulating end plate 39 secured to the housing by screws 40. The snuffing cup 35 has an arm 41 projecting radially outward from the disk 35 and adapted to engage stops 42 and 43 formed in the chamber 15 by ribs on the cylindrical wall of the base 14. The snuffing cup 35 is biased into engagement with the stop or rib 42 by means of a retrieving coiled spring 44 having one end connected to a recess 45 in the base 14 and another end connected to an opening 46 in the arm 41. The snuffing cup may be moved away from this end position and turned about the post 30 until the arm 41 engages the other stop 43 by means of a ball type pull chain 47 which has one ball located in an opening 48 of the arm 41. The chain passes through a bell mouth guide 49 held in aligned openings 50 of the base 14, the receptacle 10 and the lining 13. This chain guide 49 also acts to prevent rotary movement of the base within the outer shell 10.

During assembly the lamp contacts 16, 17, the wiring binding screws 20, 21 with the terminals 22, 24 and the stationary contacts 26, 27 are attached to the base. Thereupon the movable switch member 31 and the arc snuffing cup 35 are mounted on the post or stud 30 which latter is preferably molded into the base. Thereafter the retrieving spring 44 which previously has been

connected at one end to the arm 41 of the snuffing cup and at its other end to the opening 45 of the base 14. The bell mouth guide 49 is then inserted into the chain and the last ball of the chain is placed into the opening 48 of the arm 41 and the bell mouth cap assembled on the base. Finally the compression spring 38 is inserted on the upper end of the stud 30 and biased downward by attachment of the cover plate 39 to the base. The base with the switch mechanism and contacts thereon may then be assembled with the outer shell and insulating lining.

Assuming that the switch is in "off" position, a pull on the chain 47 causes counterclockwise turning movement of the snuffing cup 35 when viewed in Fig. 2 until the arm 41 engages the stop 43. During such turning movement the ratchet connection between the snuffing cup 35 and the movable switch member 31 causes rotation of the latter by approximately 90 angular degrees whereby the feet 33 of the movable switch member are moved from the insulating inclined cam surfaces into engagement with the contacts 26, 27, thus closing the switch and establishing a circuit for a lamp connected to the lamp contacts. During the turning movement the snuffing cup 35 is moved axially upward on the stud 30 against the compression of the spring 38 until at the end of such movement the feet 33 drop downward into engagement with the contacts 26, 27, permitting quick downward movement of the snuffing cup 35 by action of the spring 38. As the pull chain 47 is released the snuffing cup 35 is forced back into its normal position in which the arm 41 engages the stop 42. The return movement of the cup 35 does not effect movement of the movable switch member 31 because the cams 36 form a positive driving connection with the movable switch member only upon counterclockwise movement of the snuffing cup 35. Upon closing of the contacts 26, 27 by the movable switch member 31 the switch may be opened by another pull on the chain 47. During opening of the switch the snuffing cup 35 is again reciprocated on the stud 30. The movable switch member 31 is substantially enclosed by the cup 35 so that upon opening of the switch and simultaneous downward movement of the snuffing cup 35 by action of the spring 38 the arc that may be formed between the stationary and movable contacts is effectively extinguished. The provision of separate springs 44, 38, one for retrieving the snuffing cup 35 and the other for biasing the snuffing cup axially on the stud 30, has the advantage of eliminating the necessity of adjusting the springs subsequent to the assembly of the switch. The springs may be chosen initially so that no subsequent adjustment thereof is necessary.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. Pull chain socket comprising an insulating base forming a switch chamber with a centrally disposed stud therein and a plurality of circumferentially spaced inclined cam surfaces around the stud, a pair of stationary contacts secured to diametrically opposite cam surfaces, a rotatable switch member on the stud having a pair of diametrically opposite feet for engaging in one position said contacts and in another position a pair of insulating cam surfaces, and means for actuating the rotatable switch member including a snuffing cup rotatably mounted on the stud and having cam surfaces forming a ratchet

connection with the rotatable switch member, the cup forming a chamber to enclose the movable contacts to reduce the formation of arcs during operation.

2. Pull chain socket comprising an insulating base forming a switch chamber with a centrally disposed stud therein and a plurality of circumferentially spaced inclined cam surfaces around the stud, a pair of stationary contacts secured to diametrically opposite cam surfaces, a rotatable switch member on the stud having a pair of diametrically opposite feet for engaging in one position said contacts and in another position a pair of insulating cam surfaces, and means for actuating the rotatable switch member and for substantially enclosing the cooperating contacts including a snuffing cup rotatably mounted on the stud and having cam surfaces forming a ratchet connection with the rotatable switch member, means limiting rotary movement of the snuffing cup, a spring normally biasing the cup into a fixed angular position and another spring for biasing the cup axially towards the rotatable switch member.

3. Pull chain socket comprising a base forming a switch chamber with a central stud and circumferentially spaced inclined insulating cam surfaces around the stud, stationary contact means secured to alternate cam surfaces, a rotatable switch member mounted on the stud for electrically connecting the stationary contacts, and means for rotating the rotatable switch member comprising a snuffing cup rotatably mounted on the stud and having cams forming a ratchet connection with the rotatable switch member, said cup forming a chamber enclosing substantially the rotatable switch member and portions of the stationary contact means to effect quick extinguishing of arcs between the rotatable switch member and the stationary contacts upon opening of the switch.

4. An electric switch for pull chain sockets comprising a base having a central stud, a plurality of circumferentially spaced cam surfaces around the stud, stationary contact means mounted on alternate cam surfaces, a rotatable switch member mounted on the stud for electrically connecting the stationary contacts, means for rotating the rotatable switch member comprising ratchet teeth formed on the rotatable switch member, and a snuffing cup rotatably mounted on the stud forming a chamber substantially enclosing the rotatable switch member and portions of the stationary contact means, said cup having cams forming a ratchet connection with the ratchet teeth.

5. An electric switch for pull chain sockets comprising a base having a central stud, a plurality of circumferentially spaced cam surfaces around the stud, stationary contact means mounted on alternate cam surfaces, a rotatable switch member mounted on the stud having feet for electrically connecting the stationary contacts, means for rotating the rotatable switch member comprising ratchet teeth formed on the rotatable switch member, a snuffing cup rotatably mounted on the stud substantially forming a chamber for enclosing the rotatable switch member and having cams forming a ratchet connection with the ratchet teeth, stops on the base limiting angular movement of the snuffing cup, and separate springs for biasing the snuffing cup towards one of the stops and towards the rotatable switch member respectively.

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