Feb. 14, 1956 D. F. PASSARELLI 2,735,079

ELECTRICAL WALL SOCKET

Filed Nov. 23, 1951 2 Sheets-Sheet 1

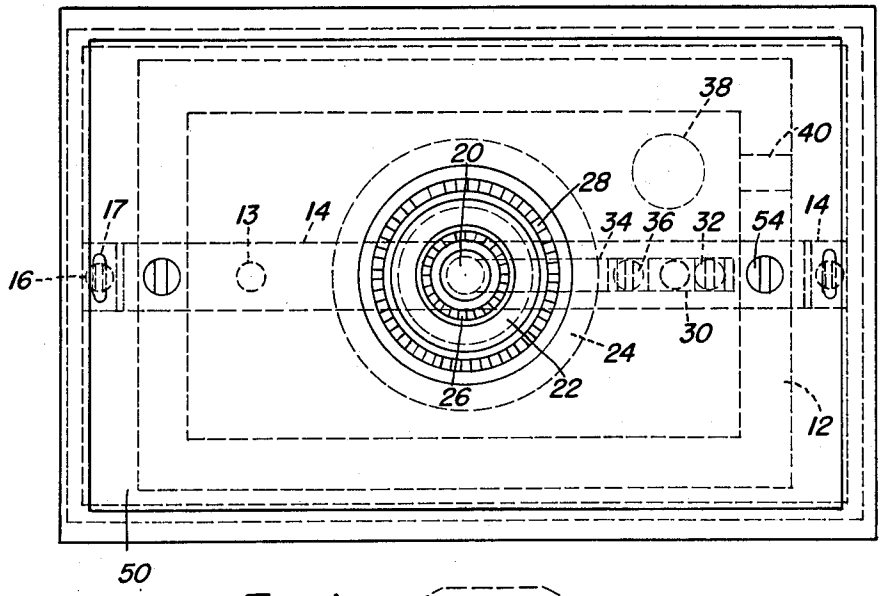


FIG. 1.

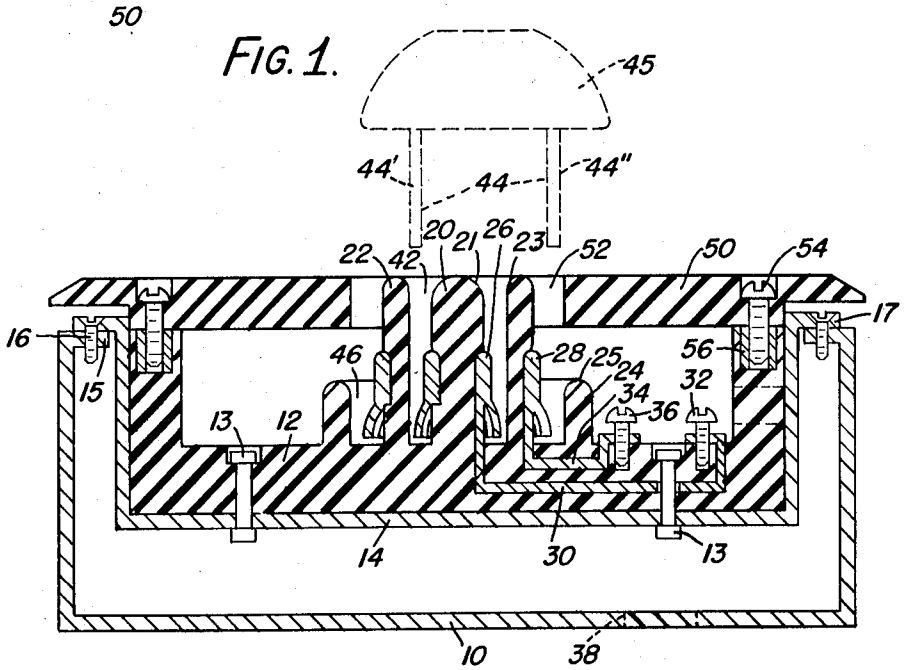


FIG. 2.

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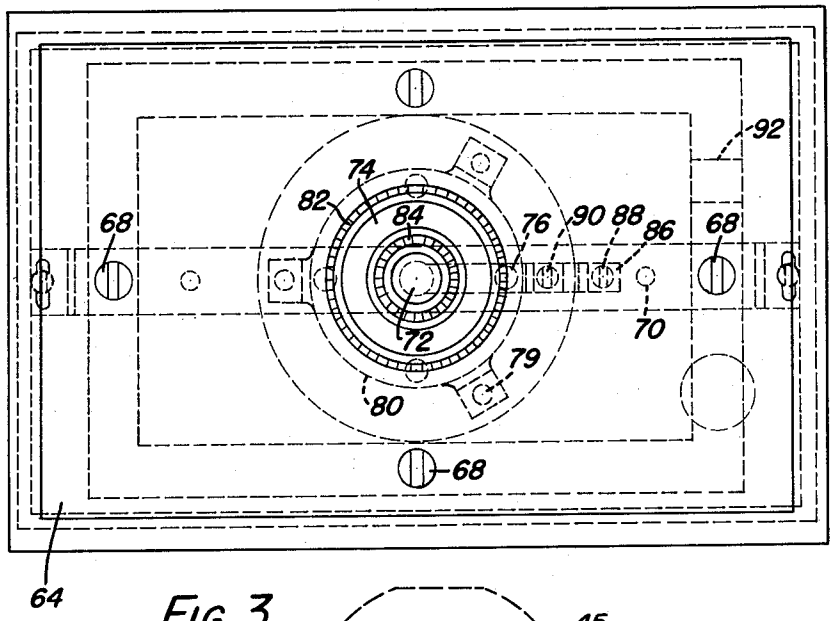


FIG. 3.

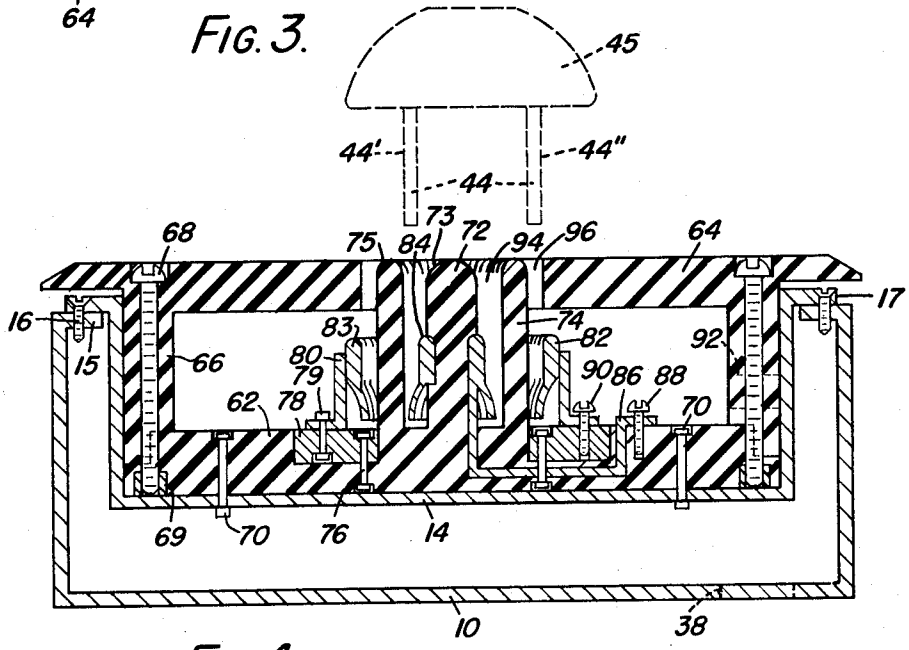


FIG. 4.

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ELECTRICAL WALL SOCKET

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4 Claims. (Cl. 339—164)

The present invention relates to electrical connections and more particularly to an electrical wall socket constructed to cooperate with and receive a conventional two-pronged electrical plug to transmit current to the electrical appliance to which the plug is connected.

The conventional electrical wall socket has two recesses in it to receive the two prongs of conventional electrical plugs. Because the recesses of the conventional socket are made to dimensions to fit closely the prongs of the plug it is difficult to insert the plug in the socket especially in the dark. Moreover, because the recesses of the conventional wall socket are made to fit closely the prongs of the plug, the plug has to be positioned in a specific direction in order to insert it into the socket.

One object of the present invention is to provide an electrical socket into which it is possible to insert a conventional two-pronged electrical plug without having to find the recesses for the prongs and even though the recesses for the prongs be not visible.

Another object of the invention is to provide an electical socket into which the prongs of a conventional electical plug can readily be inserted without requiring that they extend in a specific direction.

Another object of the invention is to provide an electrical wall socket in which the plug must be completely inserted in order to make electrical contact, and which, therefore, will be safer than conventional electrical wall plugs.

A further object of the invention is to provide an improved electrical wall socket into which it is impossible for anyone, for instance, a child, to insert its finger and get an electrical shock.

A further object of the invention is to provide an electrical wall socket so constructed that the prongs of the plug will be guided into correct contacting position with the socket even though a person cannot see the socket when the plug is inserted.

Still another object of the invention is to provide an electrical wall socket which will hold a conventional electrical plug with better electrical contact than conventional electrical wall sockets hold such plugs.

Other objects of the invention will be apparent hereinafter from the specification and from the recital of the appended claims.

In the drawings:

Fig. 1 is a front elevation of an electrical wall socket constructed according to one embodiment of this invention;

Fig. 2 is a longitudinal section through this socket and the outlet box which houses the same illustrating diagrammatically, also, how a conventional electrical plug may be inserted into this socket;

Fig. 3 is a front elevation similar to Fig. 1, of a modified form of the invention; and

Fig. 4 is a section, corresponding to Fig. 2, of this modified form of electrical wall socket, and illustrating, also, how a conventional electrical plug may be inserted therein.

Referring now to the drawings by numerals of reference, and first to the embodiment of the invention shown in Figs. 1 and 2, 10 denotes a conventional, rectangular wall outlet box or receptacle adapted to receive the socket proper. The socket proper comprises a rectangular body member 12 which is secured by screws or rivets 13 to a metallic supporting strap 14. Strap 14 is generally U-shaped, and is supported from the in-turned peripheral flange 15 formed at the front of the outlet box 10. Strap 14 is secured to this inturned flange by screws 16 that pass through elongated slots 17 in the outer ends of the strap 14 and that thread into flange 15.

The base or body 12 of the socket is made of an insulating material and is preferably molded from a plastic insulating material. Integral with the base or body portion 12 and projecting forwardly therefrom is a centrally disposed protrusion 20 which is circular in cross section and which is rounded on its outer ends as denoted at 21. Integral with the base or body portion 12, also, is an annular protrusion or sleeve 22. This is concentric with the protrusion 20 and spaced therefrom. It projects from the base portion of the socket approximately the same height as the protrusion 20; and it, too, is rounded at its projecting end as denoted at 23.

Integral, also, with the base portion 12 is a second annular protrusion or sleeve 24. This is spaced from and surrounds the sleeve or protrusion 22. It is concentric with the sleeve 22 and protrusion 20, but it is of considerably smaller height than either protrusion 20 or protrusion 22.

Secured in the periphery of the protrusion 20 close to the base of that protrusion is a metallic ring or skirt 26, made for instance of copper. Secured in the periphery of the protrusion 22 is another metallic ring or skirt 28 which may also be made of copper. The two rings 26 and 28 are concentric with one another and with the protrusions 20, 22 and 24. Both the skirt 26 and the skirt 28 are flared outwardly at their inner ends and slit radially with a large number of slits to provide flexible contact fingers. These have a spring action and insure proper electrical contact of the socket with the prongs of a conventional electrical plug.

Secured to or integral with the ring 26 is a metal strap 30 which is bent radially outwardly, then forwardly, and then inwardly and to which is secured one terminal screw 32 of the socket. Secured to or integral with the ring 28 is a metallic strap 34 which extends inwardly, then radially outwardly, then forwardly, and then radially outwardly again, and into which the other terminal screw of the socket is threaded. These two straps 30 and 34 may be made of copper or other suitable conducting material.

The electrical wires for conducting the current to the socket can be passed through the hole 38 in the back of the outlet box 10 and in through the hole 40 formed in the side of the base member 12. These wires are connected by terminal screws 32 and 36 to straps 30 and 34, respectively. The space 42 around the protrusion 20 between the protrusion 20 and the inside wall of the annular protrusion or sleeve 22 is dimensioned to receive one prong 44 of a conventional electrical plug 45. Likewise, the annular space 46 between ring 28 and the annular protrusion or sleeve 24 is designed to receive one prong 44 of a conventional electrical plug 45. The plug 45 may be inserted at any angle around the axis of the protrusions 20, 22 and 24; and either prong of the plug can be inserted into the space 42 while the other prong of the plug is being inserted in the space 46. In the position shown in Fig. 2, the prong 44′ will enter the space 42 making contact with the slit skirt portion of the ring 26, while the prong 44″ will enter the space 46 making contact with the slit skirt portion of the ring 28. The prong 44′ might, also, be inserted in the space 46 and the prong 44″ into

the space 42. The two prongs of the plug can be inserted into the two spaces 42 and 46 at any angle around the axis of the projections 20, 22 and 24.

It will be clear, therefore, that even in the dark, one can readily insert a conventional electrical wall plug into an electrical wall socket made according to the present invention. Due to the ring shape of the spaces 42 and 46 the prongs 44' and 44'' assume chordal positions when inserted in spaces 42 and 46. Thus the prongs are held in close contact with the electrical conducting rings 26 and 28. The spring-like quality of the slitted skirts of these rings insures also good electrical contact. Regardless of the angle of position of the plug about the axis of the recesses 42 and 46, the prongs will make contact and close an electrical circuit in any of the positions in which the plug is inserted and regardless of which of the two circular recesses either prong may enter. The rounded outer ends 21, 23 and 25 of the protrusions 20, 22 and 24, respectively, readily ease the prongs into the recesses of the socket.

The socket is adapted to be covered by a rectangular cover or escutcheon 50 which has a circular central opening 52 therein through which the prongs of the plug may be inserted into the socket. The opening 52 is preferably made just enough larger in diameter than the outside diameter of the sleeve or protrusion 22 for the prong 44' or 44'' to enter. When the prongs are fully inserted in the socket, then, the rings 25, 22, 26 and 28 will hold the inner ends of the prongs securely while the bounding walls of the opening 52 in conjunction with center post 20 will hold the upper portions of the prongs securely. Consequently, the prongs will be held fast in position against being unintentionally pulled out of the socket.

The cover or escutcheon 50 is bolted to the rectangular base 12 by bolts 54 which thread into bushings 56 molded in the base. It will be noted that the cover or escutcheon extends over the flanges 17 of the strap member 14 and the flanges 15 at the outlet box 10. Upon removal of the cover 50, however, the two screws 16, which secure the socket strap 14 to the outlet box, are accessible so that the socket can then readily be removed from the outlet box.

A somewhat different construction is illustrated in Figs. 3 and 4. Here parts that are identical with those shown in Figs. 1 and 2 are identified by the same reference numerals.

In this embodiment of the invention the socket comprises a rectangular base 62 which is rabbetted along its edges and to which there is secured a rectangular cover or escutcheon 64 which is formed with a skirt portion 66 that is rabbetted to fit the base 62. Both cover and base are made of a plastic insulating material. The cover or escutcheon is secured to the base by bolts 68 and nuts 69. The base itself is riveted to the strap 14 by rivets 70.

Protruding forwardly from the base, as in the first described embodiment of the invention is a centrally disposed protrusion 72. The nose or outer end of the protrusion 72 is rounded off as denoted at 73 as in the first described embodiment of the invention.

Surrounding the protrusion 72 and spaced therefrom, and concentric therewith, is an annular protrusion or sleeve 74 which is rounded off at its front end as denoted at 75. Riveted to the base 62 by rivets 76 is a ring of insulating material 78; and riveted to this ring by rivet 79 is a metallic annulus or sleeve 80. This sleeve is spaced from the annular protrusion 74 and has soldered or otherwise fastened to its inside face a metal conducting ring 82, made, for instance, of copper. The lower end of this ring is inwardly flared and slitted to provide flexible copper contact for the prongs of an electrical plug which is inserted into the socket. The front end of the copper ring 82 is rounded off as denoted at 83. Mounted on the periphery of the protrusion 72 is another metallic conducting ring 84, made, for instance, of copper. This ring has a skirt portion which is slitted also to provide flexible conducting fingers.

Integral with the ring 84 or secured thereto is a copper conducting strap 86 which is bolted into the plastic of the base and into the outer end of which there is threaded the terminal screw 88. The other terminal screw 90 of the socket threads into one of the tabs 79 of the ring 80. The electric wires, which supply current, are led through the hole 38 in the box 10 and through the hole 92 in the socket to be fastened, respectively, to the terminals 88 and 90.

The prongs 44 of a conventional electric plug may be inserted, one into the annular space 94 between the protrusion 72 and the annular protrusion or sleeve 74, and the other into the annular space between the protrusion 75 and the copper ring 82. Either prong 44' or 44'' of the plug can go into either of these annular spaces so that, as in the first described embodiment of the invention, it is possible to insert the plug into the socket in the dark in any angular position about the axis of the socket. The plate of escutcheon 64 has a central opening 96 in it through which the plug may be inserted into the socket. As in the first described embodiment of the invention, the opening 96 is preferably made to a diameter just enough larger than sleeve or protrusion 74 for insertion of the prongs 44' or 44'' so that the prongs will be held fast in the socket both at top and at bottom.

For safety purposes the metal contacts in the socket are placed, as before, close to the bottom of the well so that the plug must almost be inserted completely to make contact. Thus, it is impossible for a person to insert fingers into contact with the conducting rings of the socket because of the narrow annular spaces provided about these rings.

The spring action of the contact rings provide, as stated, for proper electrical contact and also tend to keep the plug securely held in the socket. One need not see the socket when inserting the plug. This is because of the simple construction of the socket which permits the plug to be guided and inserted only in the correct position. It is not possible to insert the plug and not make electrical contact.

While the invention has been illustrated in connection with wall sockets having only one socket element, it is obvious that as in conventional wall sockets, wall sockets may be made according to the present invention with two or more socket elements. Furthermore, while the invention has been described in connection with a wall socket, it is obvious that the socket member of any electrical connection, as, for instance, of an extension cord, may be made according to the present invention.

Moreover, while two different embodiments of the invention have been illustrated, it will be understood that the invention is capable of further modification, and this application is intended to cover any variations, uses or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth and as fall within the scope of the invention or the limits of the appended claims.

Having thus described my invention, what I claim is:

1. A female electrical socket member having a central post, and a pair of sleeves surrounding said post and spaced from said post and from one another but concentric with one another and with said post to provide two concentric annular spaces, each adapted to receive one of the two prongs of a conventional male electrical plug, the distance between the inner annular space and the outer annular space, measured in a straight line diametrically across said post, being substantially equal to the distance between the prongs of said plug, whereby when said

prongs are inserted into said annular spaces, said plug straddles both said post and the inner of said two sleeves, said post and one sleeve at least being made of insulating material, and a pair of electrical conducting rings, concentric with said post, one of said rings being mounted in the periphery of said post and defining with said post the inside of the inner of said two spaces and the other of said rings being mounted in one of said sleeves, so that the prongs of the plug will make electrical contact with said rings regardless of which prong is inserted into which annular space and regardless of what angle about the central post the prongs are inserted into said annular space.

2. A female electrical socket member having a central post, and a pair of sleeves surrounding said post and spaced from said post and from one another but concentric with one another and with said post to provide two concentric annular spaces, each adapted to receive one of the two prongs of a conventional male electrical plug, the distance between the inner annular space and the outer annular space, measured in a straight line diametrically across said post, being substantially equal to the distance between the prongs of said plug, whereby when said prongs are inserted into said annular spaces, said plug straddles both said post and the inner of said two sleeves, said post and both of said sleeves being made of insulating material, and a pair of electrical conducting rings mounted in the periphery of said post and in the periphery of the radially innermost of said pair of sleeves, respectively, to provide contacts for said prongs, said rings being mounted adjacent to the bottom of said post and of said innermost sleeve, respectively, and said rings defining, respectively, the inner sides of the annular spaces into which they extend.

3. A female electrical socket member having a central post, and a pair of sleeves surrounding said post and spaced from said post and from one another but concentric with one another and with said post to provide two concentric annular spaces, each adapted to receive one of the two prongs of a conventional electrical plug, the distance between the inner annular space and the outer annular space, measured in a straight line diametrically across said post, being substantially equal to the distance between the prongs of said plug, whereby when said prongs are inserted into said annular spaces, said plug straddles both said post and the inner of said two sleeves, said post and the radially innermost of said pair of sleeves being made of insulating material, and a pair of electrical conducting rings mounted in the periphery of said post and on the interior of the radially outermost of said pair of

sleeves, respectively, to provide contacts for said prongs, said rings defining, respectively, the inside and the outside of the two annular spaces into which they extend, so that the prongs of the plug will make electrical contact with said rings regardless of which prong is inserted into which annular space and regardless of what angle about the central post the prongs are inserted into said annular space.

4. A female electrical socket member comprising a base portion, a post integral with and disposed centrally of said base portion and projecting forwardly therefrom, a sleeve integral with said base portion and spaced from and surrounding said post and projecting forwardly from said base portion approximately the same distance as said post, a second sleeve mounted on said base portion and spaced from and surrounding said first sleeve and projecting forwardly from said base portion a lesser distance than said first sleeve, said post and sleeves being rounded at their forward ends, the two spaces between said sleeves and between the first sleeve and the post, respectively, constituting annular spaces into which the two prongs of a conventional electrical plug may be inserted with one prong inserted into one space and the other prong into the other space and with the plug straddling the post and the first sleeve, said post and one of said sleeves at least and said base portion being made of insulating material, a pair of electrical conducting rings mounted in the periphery of said post and on one of said sleeves, respectively, to provide contacts for said prongs, the ring on said post defining the inside of the inner of said two annular spaces, a strap to which said base portion is secured and by which said socket member may be supported from an electrical outlet box, said strap having holes adjacent its outer ends adapted to receive fastening means for securing it to the outlet box, and an escutcheon plate secured to said base portion and having a centrally-disposed hole therethrough through which said prongs may be inserted into said annular spaces, the rounded forward ends of said post and sleeves serving to guide the prongs into said annular spaces to contact said conducting rings regardless of which prong is inserted into which annular space and regardless of what angle about the central post the prongs are inserted through said hole in said escutcheon plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,818,352	Randles	Oct. 9, 1929
2,093,358	Holler	Feb. 25, 1935
2,225,461	Reynolds	Dec. 17, 1940