

[54] ISOLATED ELECTRICAL OUTLET
ASSEMBLY

830,720 3/1960 Great Britain..... 200/51.09
83,234 7/1951 Netherlands..... 200/51.09

[76] Inventor: William B. McGill, 9612-B
Roosevelt Dr., Ellsworth A.F.B., S.
Dak. 57706

Primary Examiner—David Smith, Jr.
Attorney—Harvey B. Jacobson

[22] Filed: Apr. 7, 1972

[21] Appl. No.: 241,999

[52] U.S. Cl. 200/51.09
[51] Int. Cl. H01r 33/30
[58] Field of Search 200/51.09

[56] References Cited

UNITED STATES PATENTS

3,280,278 10/1966 Ganzert 200/31.09

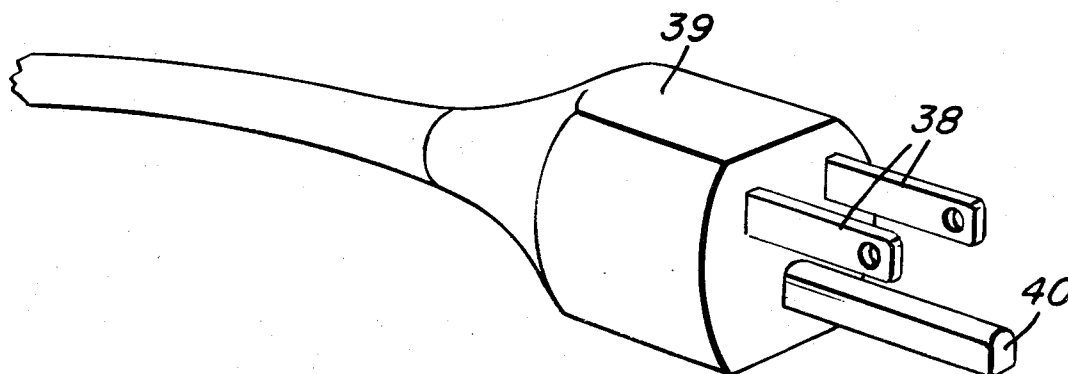
FOREIGN PATENTS OR APPLICATIONS

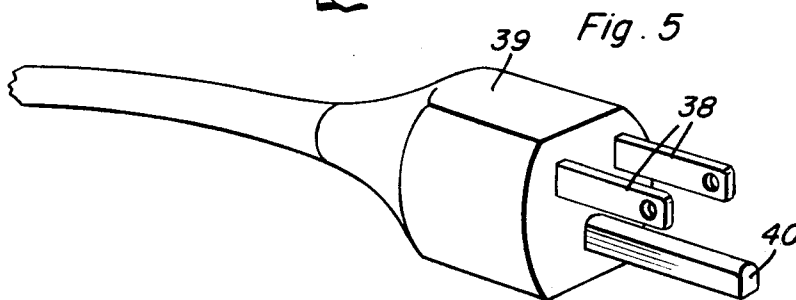
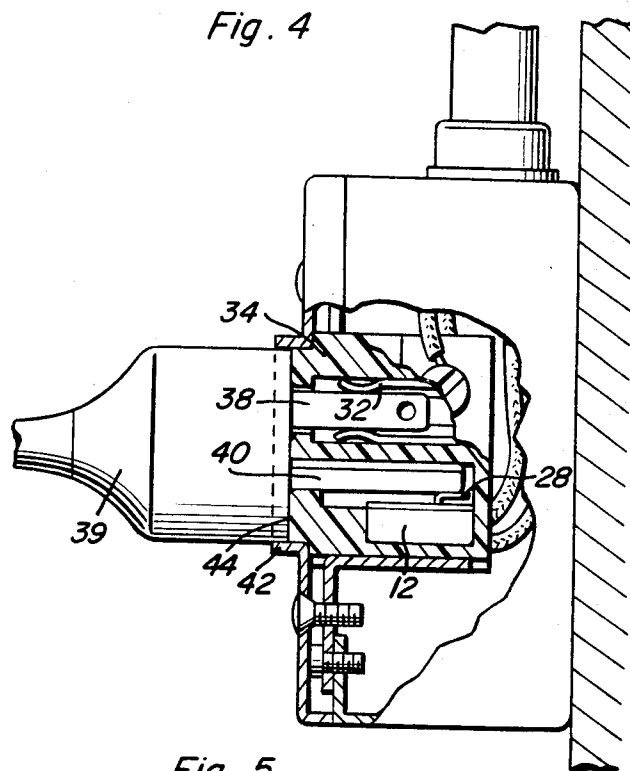
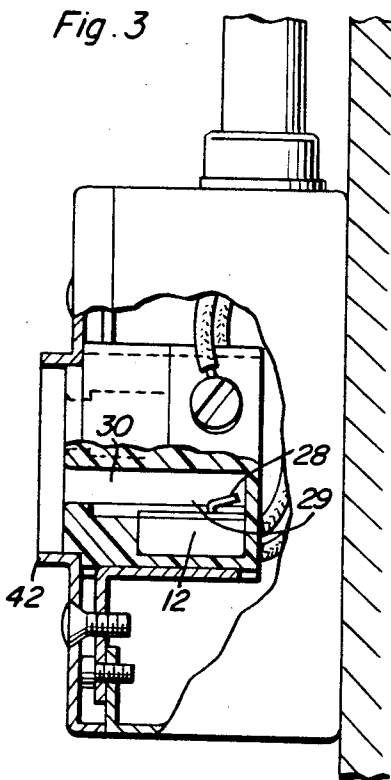
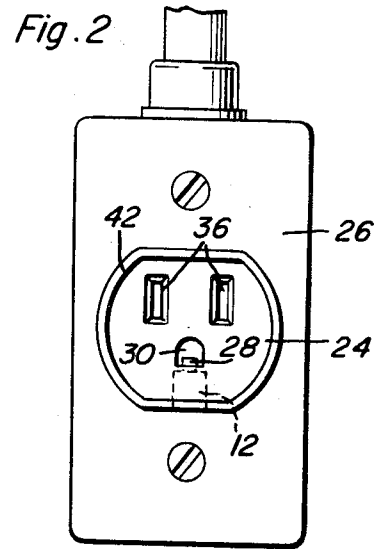
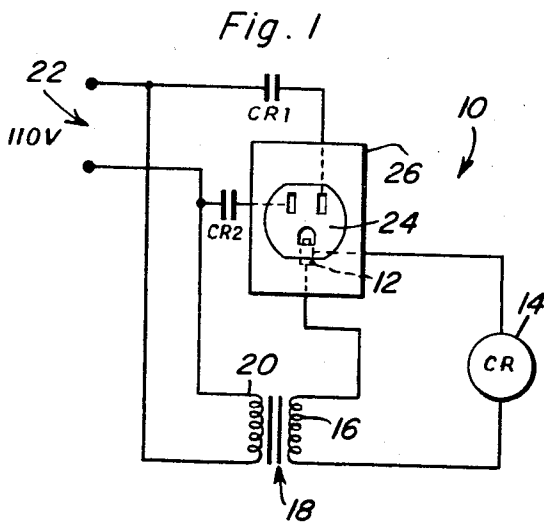
1,119,671 4/1956 France 200/51.09

[57] ABSTRACT

An electrical outlet and safety control circuit for preventing accidental shock comprising a socket with a pair of outlet terminals isolated from a primary voltage source by normally opened relay contacts, and a switch actuatable by an elongated pin on the associated electrical plug upon insertion thereof into the socket, the switch being serially connected to the relay for closure thereof and simultaneous energization of the electrical terminals upon complete insertion of the plug.

3 Claims, 5 Drawing Figures





ISOLATED ELECTRICAL OUTLET ASSEMBLY

The present invention is generally related to electrical outlets and, more particularly, to an improved electrical outlet assembly including safety means for preventing accidental shock to a user.

In the past, various electrical plug assemblies have been provided, several of which included safety means for preventing accidental shock to a user or a child who may accidentally poke his fingers into the outlet socket. However, such conventional devices have either required specially constructed plugs or were unduly complex in nature so as to render them impractical for household use or installation.

Therefore, it is an object of the present invention to provide an improved electrical outlet assembly which prevents accidental shock, is relatively inexpensive to manufacture and install, and which may be operated with the use of standard commercially available electrical plugs.

Another object of the present invention is to provide a unique electrical outlet assembly which includes a compact socket with a switch mounted therein which is effective in a control circuit to isolate the socket's electrical terminals until insertion of the plug has been completed, thereby greatly reducing the possibilities of accidental shock.

It is a further object of the present invention to provide a versatile electrical outlet assembly which includes a control relay actuatable by closure of a safety switch and effective to isolate the socket terminals until the associated electrical plug has been fully inserted into the socket to close the safety switch.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a schematic diagram of the electrical circuitry associated with the outlet assembly of the present invention.

FIG. 2 is a front elevation of the outlet of the present invention mounted in a typical junction box.

FIG. 3 is a side elevation of the outlet and junction box illustrated in FIG. 2, with sections removed.

FIG. 4 is a side elevation of the electrical outlet and junction box illustrated in FIG. 3 but with a plug fully inserted therein.

FIG. 5 is a perspective view of the electrical plug associated with the present invention.

Referring now, more particularly, to FIG. 1 of the drawings, the circuitry associated with the present invention is generally indicated by the numeral 10 and includes a conventional switch mechanism 12 including normally opened contacts, not illustrated, serially connected to a control relay 14 and a secondary winding 16 associated with a control transformer 18. The control transformer is provided with a primary winding 20 which is connected to a primary source of voltage, such as 110 VAC indicated at 22. An outlet socket 24 is provided in a conventional mounting 26 and includes a pair of electrical outlet terminals connected to the voltage source through normally opened contacts CR1 and CR2, respectively, of the control relay 14.

With reference to FIGS. 2-4, it will be observed that switch mechanism 12 is provided with an actuator 26 in the form of a pivotally mounted lever arm, a portion

of which extends through an opening 29 into an elongated passageway 30 associated with the outlet socket. The switch mechanism is such that the actuator's pivotal axis is located below and transverse of passageway 30, depression of the actuator being effective to close the normally opened contacts of the switch mechanism to effect energization of control relay 14. This operation, in turn, causes closure of the control relay contacts CR1 and CR2, thereby connecting conductive outlet terminals 32 of the outlet socket to the primary voltage source. Preferably, the outlet socket is comprised of an insulated housing 34 which substantially surrounds outlet terminals 32 and is provided with a pair of spaced openings or slots 36 adjacent the terminals to receive conductive electrical prongs 38 associated with a plug 39, as illustrated in FIG. 4.

As explained above, the electrical outlet terminals 32 remain isolated from the primary voltage source until closure of switch mechanism 12 has been effected by depression of the associated lever arm 28. This operation is achieved by way of an elongated actuation prong 40 associated with plug 39. The actuation prong is of a configuration similar to the cross section of passageway 30 such that it is easily inserted therein upon insertion of the electrical prongs 38 into slots 36 for contact with terminals 32. Switch actuator 28 is located remotely from the opening of passageway 30, such that it is not engaged by the actuation prong until the plug is fully inserted into position, as illustrated in FIG. 4. Thus, the electrical terminals 32 remain isolated from the primary voltage source until the plug has effected closure of the switch mechanism 12. This prevents accidental shock by contact of one's fingers with the electrical terminals of the socket member or the electrical prongs associated with the plug member. The possibilities of shock are further reduced by providing a flange or lip 42 which extends around the electrical outlet and overlaps a peripheral edge portion 44 of the plug member.

Referring to FIG. 5, the construction of the plug member associated with the present invention may be seen in more detail. Preferably, this construction is similar to that of conventional electrical plugs with ground prongs. However, the actuation prong 40 associated with plug member 39 is not connected to a ground wire or circuit as normally done. If desired, actuation prong 40 may be made of non-conductive materials, such that it may be readily distinguishable from a conductive ground terminal, or conventional grounded plug constructions may be utilized so long as the ground prong is insulated from the electrical wiring. As such, standard commercially available plugs may be utilized with the electrical outlet assembly of the present invention. This permits convenient installation and use of the outlet assembly of the present invention in place of conventional household outlets to increase safety by providing isolation of the outlet terminals. Of course, it is not intended that the present invention be limited to the exact configuration or mounting of the outlet socket and associated switch mechanism illustrated in the drawings, minor changes in such falling within the scope of the present invention.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and de-

scribed, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. An electrical socket assembly comprising an insulated housing with first and second prong-receiving slots therein, a pair of electrical terminals disposed in said first and second prong-receiving slots, a third prong-receiving slot in said housing and aligned with a passageway coextensive therewith and adapted to receive an actuation prong on an electrical plug, said passageway being of elongated configuration with said third slot at one end thereof, a switch mounted to said housing adjacent said passageway and including an actuator extending into said passageway remote from said third slot and being movable between opened and closed positions, said elongated passageway including an opening, said switch actuator comprising an elongated lever arm pivotally mounted with respect to said switch for movement about an axis transversely disposed of said elongated passageway, and an electrical

plug including a pair of conductive prongs extending through said first and second slots and in engagement with said pair of electrical terminals and an actuation prong extending into said passageway and in operative wiping engagement with said switch lever arm to maintain it substantially parallel to said passageway when in said closed position.

2. The structure set forth in claim 1 wherein said prongs are substantially parallel to each other, said third prong being of greater length than said first and second prongs.

3. The combination set forth in claim 1 wherein said plug and said housing include oppositely disposed surface areas around said prongs and openings, and a raised lip integral with said housing and closely surrounding said surface areas, said electrical terminals being energized upon full insertion of said plug, such that said surface areas are immediately adjacent each other and shielded by said lip whereby personal contact with said electrical prongs is prevented.

* * * * *

25

30

35

40

45

50

55

60

65