





FIG. 4

FIG. 3

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## SAFETY ELECTRICAL OUTLET

This invention relates to a safety electrical outlet comprising a plug receptacle at which no electrical potential is available unless at least two plug prongs are simultaneously inserted into said receptacle. In other words, the receptacle (socket) is normally "dead" or inactive electrically and can only be made "live" by the insertion of two prongs simultaneously in the respective socket holes.

An added feature of the inventive outlet resides in the fact that, when adapted for a three-pronged plug wherein one prong is for ground, it may be designed whereby only the ground prong and the negative or dead side prong of the plug serve to activate the receptacle. This would mean that, for example, a child probing within the receptacle holes with pins or nails would have to simultaneously press a nail into each of the three prong holes before it could experience a shock from electrical potential at the "hot" or positive plug hole.

The aforementioned operative feature is realized by connecting the hot or live wire of the electrical power circuit directly to a switch means rather than, as conventionally, to a terminal on the plug receptacle itself, and further, by providing an aforementioned switch means which is actuatable only by the simultaneous action thereupon of two prong members. When these two conditions are satisfied, the switch will be closed and will thereby establish electrical connection between the circuit hot or live line and a corresponding contact means on the receptacle which is associated with one of the prong holes.

An object of the invention is to provide a safety feature in an electrical prong-type receptacle means whereby it would be practically impossible for a person, such as a child, to be able to receive an electrical shock at the outlet by the insertion of metal pronglike members into the receptacle holes.

A further object of the invention is the realization of such a feature through a device which is simple and economical to construct and reliable and effective in operation.

A further object of the invention is the realization of a device as aforementioned and which does not require the discarding of or the making of any changes in standard plugs which are to be used with an outlet according to this invention.

A further object of the invention is the realization of a device as aforementioned and which may incorporate therein standard plug receptacles.

Other objects are those which are inherent in the device as disclosed herein, a preferred embodiment of which will now be described in detail with reference to the accompanying drawing, wherein:

FIG. 1 is an isometric view of a standard wall outlet plate for a standard three-prong plug-type receptacle;

FIG. 2 is a side elevation view of an outlet according to this invention;

FIG. 3 is an elevation view of an outlet according to this invention taken along a plane indicated by line 3—3 of FIG. 2; and

FIG. 4 is a side elevation analogous to FIG. 2 but showing a lady's hairpin inserted into one of the receptacle holes.

According to the preferred embodiment, the invention incorporates a standard receptacle 2 into whose holes are insertable the three prongs 3 of a standard three-prong plug 1, of which the middle prong 3g is the ground prong; while of the other two, one is the "hot" side prong and one is the return side prong 3r of the electrical circuit.

Normally, the power source "hot" wire 5 is connected to a terminal such as 6 located on the receptacle 2 itself, and this terminal is normally connected to a contact strap exposed at the inner end of one of the receptacle holes so that, even when no plug is inserted into the receptacle 2, it would be possible to insert a metallic member, such as a lady's hairpin H (FIG. 4), into that hole and make contact with said strap. This is what often is done by young children who, in consequence thereof, receive a harmful electric shock. According to this invention on the other hand, the hot wire 5 is connected to a ter-

minal 6 which is part of a switch means 7, such as a microswitch, which is connected in series in the circuit between the hot line 5 and the receptacle 2. In order, therefore, for electrical potential from hot wire 5 to be available at one of the holes of the receptacle, it is necessary for switch 7 to be closed.

In this regard, it is seen that switch 7 includes a snap-action elongate member 8 rigidly connected to the switch body at the end thereof and having a contact 9 at the free end thereof. Said member 8 is shown as being in the form of a flat blade spring having a hole intermediate its ends and through which freely extends a rigid pin 10 mounted on the switch body.

A flat elongate control member 11 is connected at one end thereof to a rigid part of the outlet frame 12 and extends in cantilever fashion therefrom generally parallel to the elongate member 8 in that said member 11 may flex elastically or otherwise pivot to the left and right (as referred to in FIGS. 2 and 4) about its point of connection to frame 12. As is also seen in FIGS. 2 and 4, the members 8 and 11 are spaced apart from each other, but a pin member 13 rigidly attached to member 11 extends towards and contacts member 8 at a point intermediate its ends. In fact, as is shown in FIG. 4, the snap-action spring member 8 is normally slightly bowed convexly towards the pin member 13. If control member 11 is moved towards snap action member 8, said pin 13 will press against said member 8 and cause it to snap to the position illustrated in FIG. 2; that is, the convexity of member 8 will reverse direction, and the contact 9 at the free end of member 8 will snap to the left and into contact with the metal strap 14 which in turn is part of the receptacle 2 and is contractable by a prong inserted into the "hot" one of the receptacle holes.

The means for displacing the control member 11 towards the snap action member 8 will now be described.

At the free end 15 of member 11, there is pivotally mounted a plate 16 along a central axis thereof. Further, the receptacle body 2', which is of insulating material, includes two bores 17 within which are slidably mounted respective plungers 18 which in turn are axially aligned with the ground prong hole and the return side prong hole of receptacle 2 so that the respective prongs 3r and 3g will bear against and press said plungers against plate 16 when a plug is inserted into the receptacle. This condition is illustrated in FIG. 2 wherein it is also seen that the pivot axis of plate 16 is located medially between the axes of reciprocation of said plungers 18. It is evident, therefore, that when both plungers 18 are pushed simultaneously and to the same extent against plate 16, said plate will not pivot about its axis at 15 but will, instead, force control member 11 to the right whereby pin 13 will press against snap action spring 8 with the ultimate result that contact 9 snaps from its FIG. 4 to its FIG. 2 position.

FIG. 4, on the other hand, illustrates the action of plate 16 when only one of the plungers 18 is pushed to the right, as when an item such as a hairpin H is inserted into either the ground prong hole or into the return side prong hole of receptacle 2. In this instance the plate 16 will simply pivot about 15 in either direction, as shown in FIG. 4, depending upon which of the two plungers is pushed, but the control member 11 will not be affected and will remain in its inactive position of FIG. 4, and no electrical potential would be available at the hot prong hole.

It should be noted in this regard, that even if a child or other person were to simultaneously push a hairpin into each of the two prong holes which coincide with the plungers 18, this would only result in the aforescribed snapping action of the switch member 8; however, in order to get an electric shock, the child would also have to insert a third pin into the hot prong hole while continuing to hold the first two pins in their respective holes.

In summary, therefore:

a. the insertion of only one pin into any one of the three receptacle holes cannot ever result in the obtention of electrical potential at the outlet receptacle;

b. the insertion of two pins simultaneously into the receptacle holes, one pin in the hot prong hole and one pin in any other hole, cannot ever result in the obtention of electrical potential at the outlet receptacle;

c. the insertion of two pins simultaneously into the receptacle holes, one pin in the ground prong hole and the other pin into the return side prong hole, activates the receptacle hot prong hole; however, no danger exists from touching these two pins alone; and

d. in order to experience a dangerous condition, it is necessary to simultaneously insert a pin into each of the three prong holes, and this is, as a practical matter, extremely difficult to accomplish unless a standard electrical plug such as plug 1 is employed.

The essentials of the invention are as heretofore set forth, and various noncritical details of an obvious nature may have been omitted from the description. For example, control plate 11 may be secured to the outlet frame by screw means 19 or other suitable means which permit a proper flexing of said member 11 toward and away from member 8. In this regard, member 11 may itself be a flat resilient member which is normally self-biased to its position as shown in FIG. 4, or it may be so biased by other spring elements in a known manner.

Likewise, the actual structure and action of member 8 may be modified or substituted by an arrangement which produces an equivalent result. For example, the snapping action of member 8 may be employed to internally actuate a microswitch which would internally complete the circuit from terminal 6 to strap 14, rather than in the manner illustrated wherein contact 9 is carried directly on member 8.

Alternatively, the snap action spring member 8 could be replaced by a reciprocable plunger or pushbutton type contact member which would normally be biased to the disconnect position by a simple compression spring and would be directly acted upon by the pin member 13 to move to the contact-making position when member 11 is displaced by a plug.

Pin member 13 is disclosed as being adjustable lengthwise so as to provide the proper snapping action of spring member 8.

Of course, member 16 could also be positioned so as to be acted upon directly by the plug prongs without the interposition of the plungers 18; however, the illustrated arrangement provides various advantages as to adaptability of the invention to existing outlets.

The plungers 18 preferably include enlarged head portions 18' which fit within corresponding enlarged portions of bores 17 so as to prevent the plungers from being pushed too far in the direction of the plate 16. Also, additional spring means (not shown) may be provided for biasing the plungers 18 towards the left. According to the presently illustrated embodiment, the plungers 18 return leftwards after removal of plug 1 from the receptacle, by virtue of the normal return spring action of member 11. Also, as is obvious, member 8 snaps back to its FIG. 4 condition by virtue of its inherent spring action.

A suitable cutout portion 19 is provided in plate 11 to permit freedom of pivoting for plate 16 about axis 15.

Various details which are set forth herein in describing a preferred embodiment of realization of the invention are illustrative and not limitative of the disclosed inventive concept, it being clear that such details may be varied by one skilled in the art without departing from said inventive concept.

What is claimed is:

1. An electrical outlet, comprising:
  - a plug receptacle having a plurality of holes for receiving the prongs of a multipronged plug;
  - an electrical terminal means for connection to the live side of an electrical power circuit;
  - a contact means associated with said holes for contacting the aforementioned plug prongs when the latter are inserted into said hole;
  - a switch means interposed between said terminal means and the said contact means which is associated with one of

said holes, said switch means being actuable to establish or interrupt electrical communication between said terminal means and the said contact means; and

control means for actuating said switch means, said control means being arranged to be responsible to the simultaneous insertion of a plug prong into at least two of said receptacle holes and to be irresponsive to the insertion of any pronglike member into only one of said holes at any one time;

wherein said control means comprises a first member which is displaceable to actuate said switch means, a second member freely pivotally mounted on said first member about an axis which is transverse to the direction of said receptacle holes and is located medially between two of said holes, said second member being pivotable in opposite rotative senses relative to said first member pursuant to a force being imposed thereagainst along the direction of either one of said two holes, respectively, and said second member being arranged to be acted upon simultaneously by a force acting along the direction of each of said two holes whereby said second member is prevented from pivoting by the opposite rotational effect of said forces and, consequently, said second member acts upon said first member to displace same; and further wherein said first member is an elongate member supported at one end thereof from a rigid part of the outlet and extending in cantilever fashion from said one end to a free end, said second member being pivotally mounted at said free end.

2. The outlet of claim 1, said receptacle having three said holes for a standard three-pronged plug which includes a ground prong, said two holes being the ground prong hole and the circuit return side prong hole.

3. The outlet of claim 1, said receptacle including a bore aligned with each of said two prong holes, a plunger slidable in each of said bores, one end of each plunger being abuttingly engageable against the end of a plug prong and the opposite end of each plunger being abuttingly engageable against said second member on opposite sides of the pivotal axis thereof.

4. An electrical outlet, comprising:

- a plug receptacle having a plurality of holes for receiving the prongs of a multipronged plug;
- an electrical terminal means for connection to the live side of an electrical power circuit;
- a contact means associated with said holes for contacting the aforementioned plug prongs when the latter are inserted into said hole;

a switch means interposed between said terminal means and the said contact means which is associated with one of said holes, said switch means being actuable to establish or interrupt electrical communication between said terminal means and the said contact means; and

control means for actuating said switch means, said control means being arranged to be responsible to the simultaneous insertion of a plug prong into at least two of said receptacle holes and to be irresponsive to the insertion of any pronglike member into only one of said holes at any one time;

wherein said control means comprises a first member which is displaceable to actuate said switch means, a second member freely pivotally mounted on said first member about an axis which is transverse to the direction of said receptacle holes and is located medially between two of said holes, said second member being pivotable in opposite rotative senses relative to said first member pursuant to a force being imposed thereagainst along the direction of either one of said two holes, respectively, and said second member being arranged to be acted upon simultaneously by a force acting along the direction of each of said two holes whereby said second member is prevented from pivoting by the opposite rotational effect of said forces and, consequently, said second member acts upon said first member to displace same;

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said switch means comprising a snap action flat spring member having a contact member thereon which pursuant to the snapping action of said spring member is shiftable between first and second positions, respectively, establishing and interrupting electrical communication between said terminal means and said receptacle contact means, said spring member being normally in said second position and being shiftable to said first position in response to displacement of said first member; and said first member and said spring member extending generally parallel to one another and being spaced apart

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from each other, a fixed pin member extending from said first member towards said spring member, said spring member normally being bowed convexly towards said pin member, and said pin member pressing against the convex portion of said spring member and causing the latter to snap and reverse the direction of its convexity pursuant to the aforementioned displacement of said first member.

5. The outlet of claim 4, the length of said pin member extending between said first member and said spring member being adjustable.

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