

- [54] **ELECTRICAL SAFETY GROUNDING DEVICE MEANS** 3,268,847 8/1966 Klumpp, Jr. 339/14 R
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3,754,202 8/1973 Nelson..... 339/14 P

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[22] Filed: **Dec. 28, 1973**

Primary Examiner—Roy Lake
Assistant Examiner—DeWalden W. Jones

[21] Appl. No.: **429,104**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 204,826, Dec. 6, 1971, which is a continuation-in-part of Ser. No. 16,477, March 4, 1970, Pat. No. 3,626,354.

[57] **ABSTRACT**

Electrical safety grounding devices of the type for single phase two and three wire systems. It features improved electrical grounding capability for plugs, connectors, receptacles and adapters having improved fuse protection and signal response indicating means protecting life and equipment in the daily use of electricity.

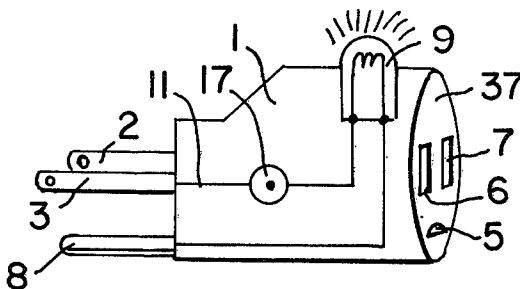
- [52] **U.S. Cl.**..... 339/14 P; 339/113 L
- [51] **Int. Cl.²**..... **H01R 3/06**
- [58] **Field of Search**..... 339/14 R, 14 P, 18 B, 18 P, 339/113 R, 113 L

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14 Claims, 23 Drawing Figures



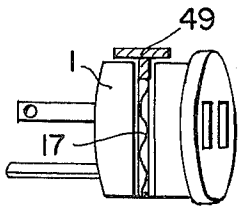


Fig. 1A

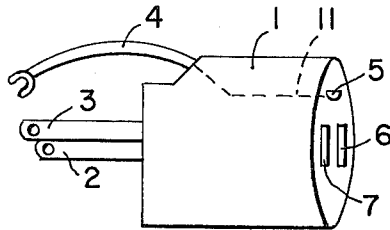


Fig. 1

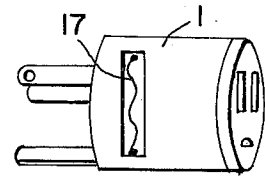


Fig. 1B

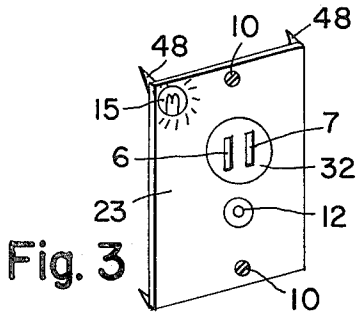


Fig. 3

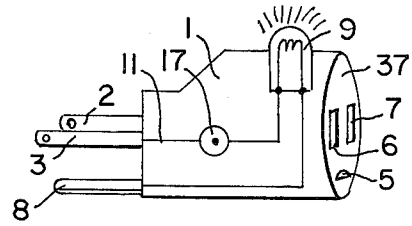


Fig. 2

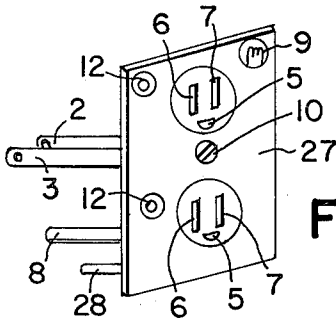


Fig. 5

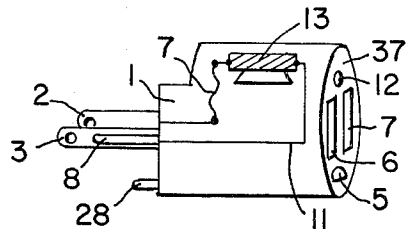


Fig. 4

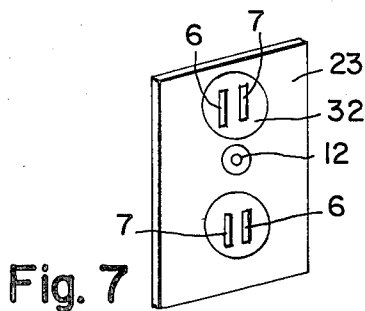


Fig. 7

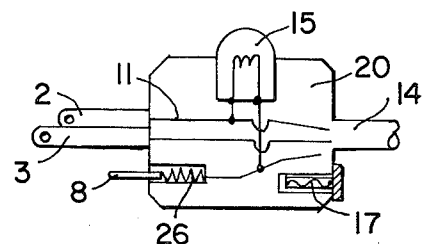


Fig. 6

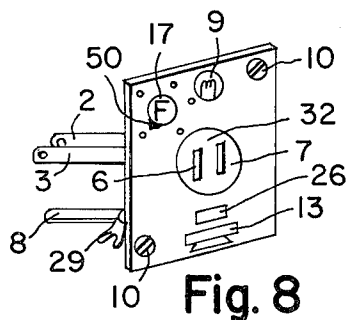


Fig. 8

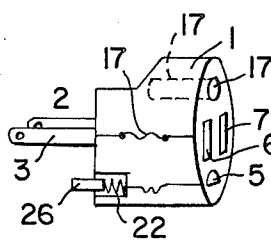


Fig. 9

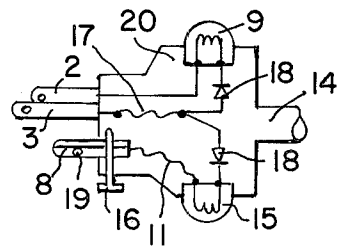


Fig. 10

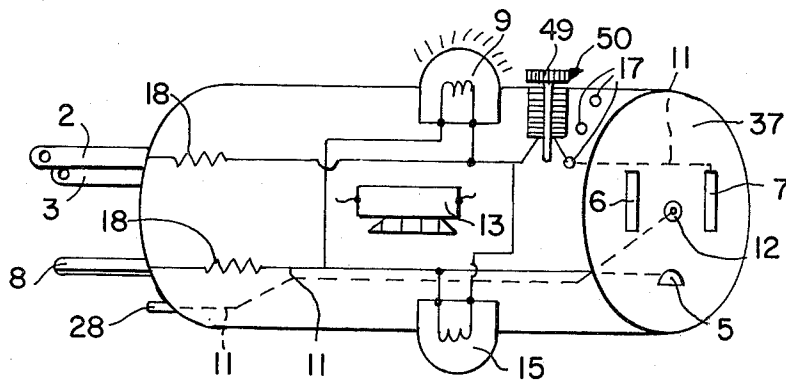


Fig. 11

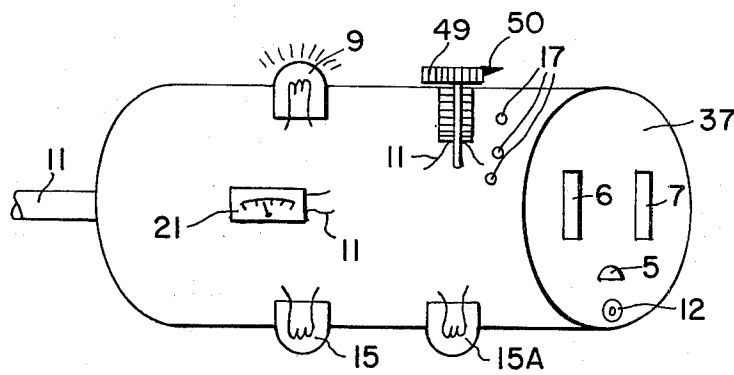


Fig. 12

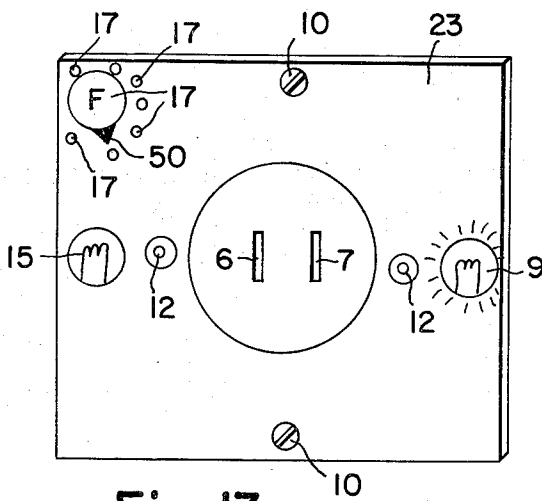


Fig. 13

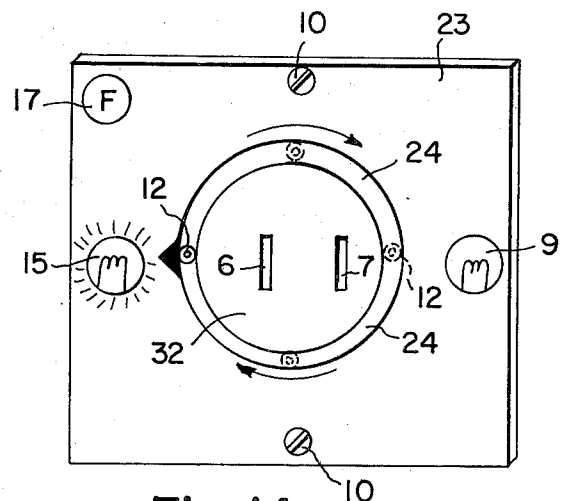


Fig. 14

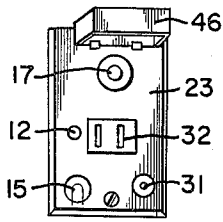


FIG. 15

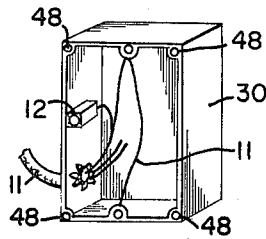


FIG. 16

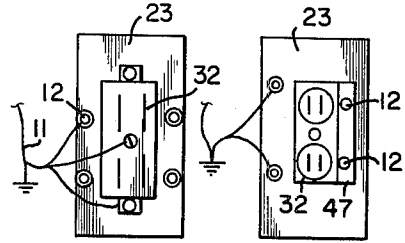


FIG. 17 FIG. 18

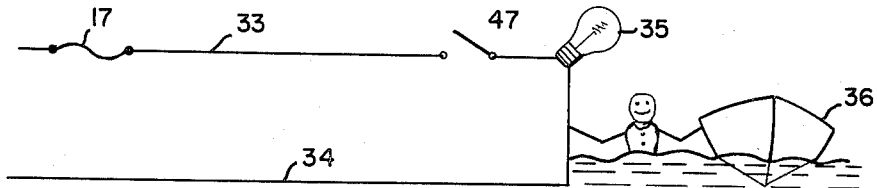


FIG. 19

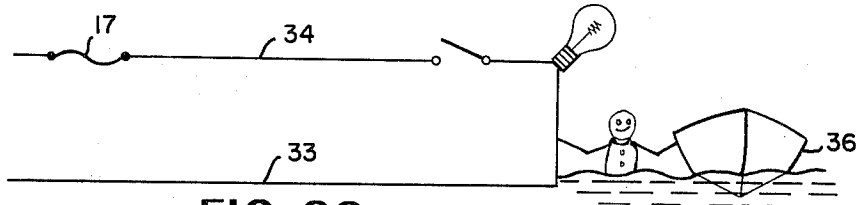


FIG. 20

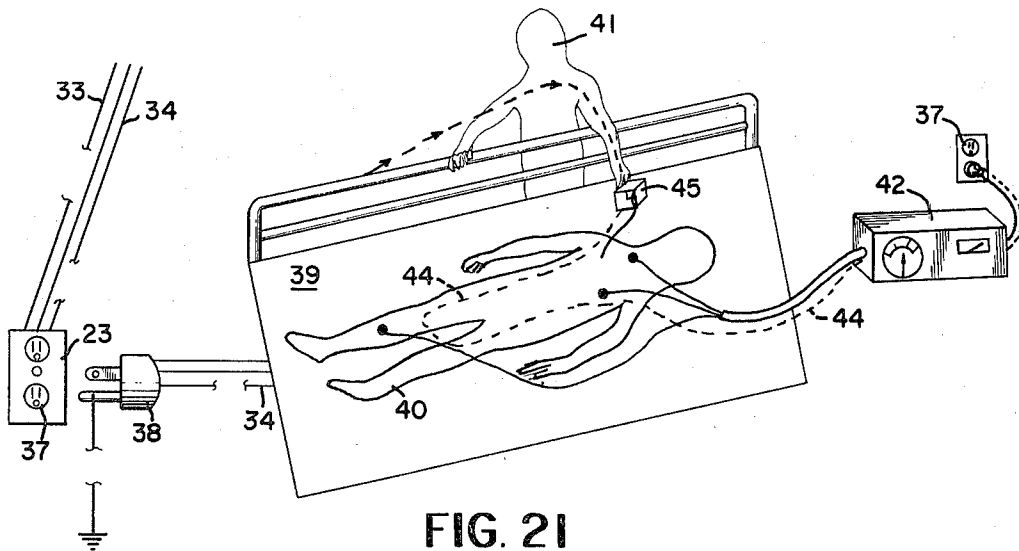


FIG. 21

ELECTRICAL SAFETY GROUNDING DEVICE MEANS

This application is a continuation in part to my prior application Ser. No. 204,826 filed Dec. 6, 1971, which was a continuation in part of Ser. No. 16477 filed Mar. 4, 1970 now U.S. Pat. No. 3,626,354. Ser. No. 16,477 shows Polarity Reversing Adapter Means and Ser. No. 204,826 shows Polarity Testing Adapter Means.

The present application is an improvement to both of the earlier applications referred to by having improved the method and application of using grounding devices through new grounding techniques. It is also suggested to replace present use of grounding adapters having an attachable grounding wire outlawed in Canada as dangerous under existing Canadian Standard Electrical Code. The unknown quality of a grounding attachment is important to the expectant life of equipment and to the safety of individuals which if improved by manufacturers of electrical appliances and wiring devices would significantly reduce fires and accidents caused by the absence of grounding protection. In examining a grounding adapter with an attached wire one would wonder whether the connection of such a wire would give the kind and quality of ground contact required for safety by being attached to a holding screw in a locking plate, in a common receptacle that has been subjected to paint and dirt and possibly a broken grounding wire connection. Therefore, starting at the point of electrical supply, the receptacle in the wall or a connector it is imperative that the grounding conductor should be of top quality with signal and fuse protection to safeguard users of receptacles, plugs, connectors, adapters, testers as shown in this application.

More particularly, the present invention provides new grounding conductor means for two and three wire electrical systems, providing new grounding conductors on ordinary receptacle outlets by placing a grounding connection between the plug and the plate where the plate has been grounded directly to the junction box and a grounding wire. Also, in placing new grounding outlet attachments to receptacles, around their periphery we can provide new grounding means through new cover plates. The ordinary attachment screw for plates to receptacles has been changed to include a special grounding screw insuring efficient grounding protection. In another illustration this screw has been changed to allow a connector in its place that would permit the insertion of a grounding conductor on a plug into the connector that is connected to the ground on the plate or to the receptacle behind it. This connector could still be the means to tighten the plate to the receptacle by using another arrangement of attachment. The placement of special ground connectors with positive contact to junction boxes and grounds, provides new sources of grounding means absolutely necessary for safety.

New grounding plugs are shown for attachment to appliances and devices that use two and three-wire electrical power. An illustration in FIG. 1-A and 1-B shows fuse-plugs that have a replaceable fuse built into the plug and the other model being a throwaway. Heat and other short circuit damage bring forth a question of whether the plug is safe to re-use due to stress and internal damage, that at another occasion causes greater problems. In the other illustrations, new grounding attachments allows a two-wire plug to have a grounding contact, that makes contact with a receptacle, connec-

tor or a plate, providing a grounding contact instead of a loose wire in the adapter form. These contacts are shown in magnetic or common type and having movable and lockable features. It provides another separate ground wire in a three-wire plug assuring safety. The second ground provides a fourth-wire to three wire plugs, needed for hospital and special use shown in the drawings and explained further in these specifications. The plugs have special fuse protection that should be selected according to manufacturers requirements, and future codes, that will demand new practices of plug safety use and construction for fault, stress and balance and longer life expectancy of plugs and the appliances they serve. A plug on a electric shaver, on a drill, on a electric iron or heater have varying current requirements and certainly different amperage protection needs. This is accomplished by having a switch type of fuse selection that a user can select the amount of amperage needed for the specific use appliance he is about to plug into a receptacle. A short circuit may not be great enough to blow a main line fuse of the usual 15 or more amperes causing damage to equipment and to the safety of the user. Also, the build-up to 15 or more amperes damages the current supply by overheating and breaking down the wire resistance lowering the equipment life, damaging the plug and appliance wiring or starting fires. Also, during the period of the short circuit the user is in great danger if he is grounded as in a boat, mobile-home, back-yard or factory, and touches an ungrounded appliance. The fact that a plug is usually inserted manually by a human being into a receptacle while the equipment is in the on position places an immediate demand for power and the user cannot escape the resulting damage from heat or fire caused by short-circuiting which suggests a need for new appliance electrical codes and new protective devices that may include throwaway type fuse-plugs shown in this invention, or ampere rated replaceable fuses in plugs. These ampere rated fuses will be placed in plugs, connectors and other such devices and as an example can be described to operate with different amperage values placed upon the outside of said plugs and devices for selective use by the user. Another simple alternative would be to mark the devices having amperage selection with different exact uses such as electric shaver; small 2 slice toaster; 6 slice toaster; oven; electric iron; electric fan and any other desired corresponding appliance where the fuse and amperage are accordingly set to the manufacturers specifications for each appliance to be used. Using a lesser amperage will merely disconnect the line and using higher than needed amperage results in the conditions that people have today wherein they ARE using more amperage protection than necessary causing an unsafe fire-hazard condition, safeguarded by this invention.

Further improvement is shown by grounding indicating lights and alarm means in receptacles, plugs, adapters and connectors that have visual and audio advantages. Fuse advantages are also adaptable to these electrical devices that are used to connect appliances and equipment to electrical supply sources and a low amperage disconnect would be desirable. The use of grounding signal indicating means will immediately pick-up any broken ground in a receptacle, connector or adapter signifying that the user should not attempt to use the electricity from that source. Further advantage is shown by an alarm built into equipment that will notify of a broken ground when plugged in or while

equipment is operating. The sound of this alarm will be heard easily away from the equipment while indicating lights are used to advantage when viewing the condition of an electrical circuit. Replaceable fuses for protection and ground signal indicating means provides a measure of safety to millions that use electricity every day of their lives. Further safety is hereby provided by circuit indicating light means that also show whether the wiring circuit has or hasnt electric power, that also indicate to the user whether to disregard the use of a receptacle and call someone to repair it. Further discussion in this specification shows the proper and improper use of a two-wire plug, where in one position it is correctly placed and in another position it by-passes the switch in the equipment.

The ground fault eliminating devices shown include a magnetic contact in plugs adapters, connectors and receptacles placed to mate them providing maximum contact value. One of the illustrations is shown to have a spring loaded grounding blade spaced to enter a grounding connection on a plate or receptacle connectors and adapters supplying a new grounding condutor means. In one application, a grounding blade would protrude under enough pressure to contact special plate locking screws on existing equipment, where screw mates with the grounding blade on two-wire receptacles or three wire.

Another embodiment of the grounding improvement shows another form of ground contact by having a movable member attached to a grounding blade, such as in a plug, that when inserted the movable grounding blade locks upon the plate locking screw, affording grounding conductor protection.

Another feature shown is an adapter, connector or plug that has a grounding blade capable of being placed in more than one position. This would allow the movement of the ground blade back into the body and then being locked in one or more positions so as to actuate or eliminate the grouding blade. Instances that require a two or three wire vary a electric drill used at a considerable distance from a power source must use a three-wire grounding-type extension cord for safety. The same drill at a lesser distance may not require this procedure although a grounding wire is always protective, insuring a path for fault or stray currents. Where the adapter has the advantage of being a two or three prong convertible device such would be used to advantage. The use of the retractable third grounding blade is suggested for use with the ordinary ground prong and the special grounding device shown in this application.

Another embodiment shows an adapter having a receptacle on one side showing a regular three-wire plug and a three-wire receptacle on the other side, having fuse protection for the hot wire, two indicating lights for signalling ground fault or an improper circuit problem, an alarm to signal a broken ground. This adapter also shows the second grounding blade that would be received by the special ground connector on the receptacle, offering a second grounding conductor connection. In addition to this the adapter lights are shown very simply wired wherein both lights become signal responsive when the ground is broken. Being signal responsive it can therefore signal by lights or an alarm indicating that the ground is impaired which would be a valuable feature for industry, homeowners, boat-owners and mobile homes or anywhere that a third wire, the grounding wire, is necessary to insure safety by providing a low resistive path to ground for any fault

currents, a safe escape route for such currents. In one second, only 30/1000 of an ampere of fault current can kill a person who is grounded. Current that small is not enough to immediately cause fuses or circuit breakers to cut off power, which in itself verifies the need for grounding to combat rising safety accidents and fires caused by not having this protection.

Another embodiment is shown in the fuse protection wherein a fuse selector can be positioned on a plug, receptacle, adapter, connector so that a desired amount of fuse protection is given according to the selection and requirement of a specific need to operate equipment. This is accomplished by havning more than one fuse arranged in a fuse carrier having different amperage ratings, where the selector cover is turned to make contact with the particular fuse needed by pointing the cover to a marker on the fuse housing. FIGS. 8, 11, 12 & 13 show this embodiment and FIGS. 8 & 13 further explain this advantage in fuse selection and protection which would allow an adapter to serve the needs of the particular appliance according to its need for proper size fuse protection. The fuses can be easily made to change in cases of short circuit, they will also be placed for easy accesibility turned by a switch and having a rotating cylinder holding such fuses having different amperage ratings which can be selectively used as shown in this invention. The illustrations or geometrical form of the fuse and amperage can be in any shape that would accomplish said amperage uses.

Column 1 & 2 of The Wall Street Journal on Monday Nov. 5, 1973 showed an alarming amount of appliances involving "350,000 products" ranging from television sets to tea kettles having hazards reported "by the manufacturers under the new law" to the new Consumer Products Safety Commission in Washington. Another report of alleged shock hazards in potentially "four million electric frying pans" made by another company was also stated. Another statement in the same editorial concerns TV sets and their safety defects. It does indicate that new grounding methods may help consumer safety considerably, particularly where no ground protection was provided previously, or where the extra grounding protection provided would be valuable, providing "at least" one grounding conductor to equipment. Placing a ground on TV sets or a polarity correction device would improve the safety factor considerably and the addition of a fuse protected adapter having visual and signal response advantages would increase safety even more. Add the new grounding conductors of this invention and we really have a safe application of electricity for consumers. Referring to Electricity in Hospitals reported in the IEEE Spectrum 1971 showed many illustrations of grounding wire failures that placed the patients in immediate danger. Page 46 FIG. 9 shows a grounding wire failure in isolation transformer system and further states that "Isolation techniques permit a reduction of the inherent hazards of electrically powered equipment to a degree." Isolation transformers can help to protect the patient if devices that ground the implanted electrode are used. The patient is not protected, however, if a grounding connection fails. Therefore, routine inspection and testing of the quality of these connections is an essential requirement to ensure the safety of the patient and medical personnel. Another reference by an authority of electricity in hospitals on page 47 concerns the "open ground problem." "Despite its value in managing the fault-current problem, one very important class of fail-

ures is not eliminated by the isolation-transformer system; if a ground wire in a power cord breaks, it will be detected by the isolation monitor; and if the patient is in the situation in FIG. 9, he can be in immediate danger. Therefore, it is necessary to consider the dual possibility of an internal line-to-ground failure in a device and a break in a ground wire. The insidious situation here is that the ground-wire break would not be detected by the staff since the equipment would probably continue to function."

From the foregoing information on hospitals and consumer reports on hazards we can conclude the necessity for equipment grounding systems, signal responsive means and plugs, adapters, connectors, receptacles having low fuse protection and improved grounding means for greater safety, such as shown in this application. It is considered completely unobvious to presently place extra grounding facilities on present equipment or to place various symmetrical connections on receptacles or to witness such small equipment having ground fault indicating signal means. A statement in the ASSE Journal November 1973 "It is a well known fact that a large percentage of the common electrical hazards in health care facilities were directly traceable to the plug-receptacle combination." In another statement "we should accept the fact that the plug-receptacle specifications of the past are not longer sufficient. Tighter specifications for manufacturing, and, what is just as important, OSHA safety standard enforcement during the use-life of the plug-receptacle are needed to assure that a reliable power link and grounding do exist." Canada has wisely outlawed the special grounding adapter shown in the drawings as FIG. 1 which has a ground wire extending from the body of the adapter for connection to a grounded receptacle.

Another single important factor in electrical safety, concerning two-wire appliances very commonly used everywhere is potentially dangerous. When using an ordinary two-wire receptacle without grounding advantages you have a selection of two ways to plug in an appliance. In the first position you are placing the circuit of the appliance being used so that the switch on the hot side in the appliance mates with the hot wire of the receptacle which is permanently wired. In the second entry position, which is accomplished by turning the two-wire plug 180° you have reversed the wiring in the plug to receptacle relationship and have therefore bypassed the hot side switch built into the appliance. In this instance, the appliance is potentially a hazard under certain conditions where stray and fault current exists and a grounded person touches the appliance. In cases where insulation breakdown occurs and a person is grounded such as on a boat, in a backyard, standing on wet ground or concrete in a factory and in many other instances a person can receive severe shock resulting from improper grounding and having the wiring to an appliance in the wrong insertion of two entry positions. Therefore, in a correct polarity configuration we can assume that the proper use of plugs and receptacles would be desirable wherein the hot side used is the normal hot side and the lights, appliances and other equipment is safely in use and the ground side is dead when the switch is off. In an incorrect polarity situation occurring when the plug is placed into the receptacle the wrong way the ground side becomes the hot side even when the switch is off or the fuse is blown which easily causes severe or fatal shock to an unsuspecting

grounded person accidentally touching the hot appliance.

An illustration of the foregoing is shown in the drawings, clearly and precisely indicating the correct and incorrect positions of entry and the effect thereof in safety terms, in simplified form, that anyone would understand. To ensure proper use of electricity in homes the present invention provides a new type of adapter grounding for plugs and connectors that have the necessary low ampere fuse protection, at the plug, to disconnect the short circuit without interfering with the main circuit. In another embodiment it has a ground signal indicator showing the condition of the ground. In another embodiment it has a signal response showing the circuit condition, informing the user that in a two-wire situation the hot and ground current carrying wires are properly working. The combination of all these advantages plus grounding protection provided makes a sensible proposition.

Accordingly, a principal object of the invention is to provide new and improved ground fault electrical safety devices.

Another object of the invention is to provide new and improved grounding adapters, connectors, plugs and receptacles having at least one grounding connection providing safety to consumers and industry.

Another object of the invention is to provide new and improved signal response devices both visual and audio to control the absence of grounding means or properly wired circuits.

Another object of the invention is to provide new and improved retractable grounding blades for both the ordinary grounding blade and the special grounding blades shown in this specification.

Another object of the invention is to provide new and improved magnetic ground contact connections on both the plug and receptacles permitting same to make positive safe contact.

Another object of the invention is to provide new and improved receptacles having an adapter form permitting the receptacle-adapter to function with a signal means, built in fuse and one or more ground contacts, having any of the described grounding connectors for grounding advantages when connecting a plug or appliance.

Another object of the invention is to provide new and improved light duty fused circuits that in case of ground faults will eliminate the need to blow main fuses when said fuses are placed in the plugs, connectors, adapters and receptacles.

Another object of the invention is to provide a visual ground safety gauge attendant to ground fault safety changes.

Another object of the invention is to provide new and improved grounded receptacles having special ground connectors placed so that a special prong or attachment will make contact providing a second grounding means on a 3 wire receptacle and a first grounding means on a 2 wire receptacle.

Another object of the invention is to provide new and improved safety grounding device means having a plurality of grounding attachments connected in common.

Another object of the invention is to provide new and improved receptacles having a ground position selector disc with an arrow that in mobile situations as an adapter-receptacle or an adapter will select the right position for entry by aligning the selector disc with the indicat-

ing light, signalling the position of ground safety, while opening the one entry to the correct ground position.

FIG. 1 is a side view of a grounding adapter of the former art having a flexible ground wire attachment.

FIG. 1-A is a side plan view of one embodiment of this invention in adapter form.

FIG. 1-B is a side view of an embodiment of this invention in adapter form.

FIG. 2 is a side plan view of an embodiment in adapter form.

FIG. 3 is a front plan view of an embodiment in receptacle form.

FIG. 4 is a side plan view showing another embodiment in adapter form.

FIG. 5 is a front plan perspective view of an embodiment in this invention having a standard three-prong combination adapter-receptacle with a second ground conductor.

FIG. 6 is a side plan view showing another embodiment of the invention in connector form.

FIG. 7 is a front plan view of a receptacle showing an embodiment of the invention.

FIG. 8 is a front plan perspective view of a combination adapter-receptacle showing an embodiment of the invention.

FIG. 9 is a side plan view of an adapter showing an embodiment of the invention.

FIG. 10 is a side plan perspective view of a connector, showing embodiments of the invention in a side view.

FIG. 11 is a side perspective view of an adapter in which electrical safety fault grounding protection means is constructed in accordance with this invention, with two grounds.

FIG. 12 is a side perspective view of a connector in which electrical safety fault grounding protection embodiment is shown in this invention.

FIG. 13 is a front plan view of a receptacle showing an embodiment of the invention.

FIG. 14 is a front plan view of another receptacle showing an embodiment of the invention.

FIG. 15 is a front plan view of a receptacle showing an embodiment of this invention.

FIG. 16 is a front plan view of a junction box showing an embodiment of the invention.

FIG. 17 is a front view of a receptacle showing an embodiment of the invention.

FIG. 18 is a front view of a receptacle showing an embodiment of the invention.

FIG. 19 shows a diagrammatic view of using electricity correctly.

FIG. 20 shows a diagrammatic view of using electricity incorrectly.

FIG. 21 shows an exploded view of a typical dangerous hospital situation involving an electrically equipped bed and apparatus, an attendant and a patient, and an accident situation preventable by having proper grounding conductors shown on the various grounding devices of this invention.

Referring to FIG. 1 it shows an adapter presently used for grounding in the old art having a body 1 a first current carrying blade 2 and a second current carrying blade connected to a ground wire 3 with a flexible grounding conductor wire 4 connected to the corresponding grounding conductor socket 5 shown in the female socket side having two recesses 6 & 7 for connection of another device having current carrying blades 2 & 3.

FIG. 1-A shows a fuse-plug in adapter form 1 having a replaceable fuse 17 showing a fuse locking screw 49, illustrated to show one placement of the fuse means.

FIG. 1-B shows another fuse-plug adapter 1 having a permanent fuse 17 within the body 1 for throwaway use after short circuited, or have a circuit breaker for reset.

FIG. 2 shows an embodiment of the present invention in adapter form, having an adapter body 1, first and second current carrying blades 2 & 3, also showing a receptacle side 37 having a grounding conductor recess 5 and two recesses 6 & 7 for connection to two current carrying blades and a new grounding blade 8 of this invention, placed outside of the standard receptacle, for connection to a plate or special receptacle further shown and explained in the drawings and specifications.

FIG. 3 shows an embodiment of the invention in receptacle form having a two-wire receptacle 32 with two recesses 6 & 7 connected to current carrying wires in the electrical supply, not shown. The new grounding conductor 12 is shown placed in this illustration under the two-wire receptacle 32 in the ground plate 27 providing a new method of grounding conductor attachment on two-wire devices so commonly in use. FIG. 3 also shows a grounding indicator test light and switch 31 which can operate with separate light and switch not shown, that would indicate the condition of the grounding conductor 12 when such is about to be used for insertion of a plug into this device. The grounding plate 27 is shown having contacts 48 for grounding the plate 27 to another grounding conductor, the junction box shown in FIG. 16 although said plate 27 merely indicates one method of using this new ground. The placement of contacts 48 may also be placed anywhere on the plate 27 as may be required.

FIG. 4 shows another adapter having current carrying prongs 2 & 3, a three-wire receptacle 37 having recesses 5, 6 & 7, wherein the grounding recess 5 is connected internally to new grounding blades 8 & 28 placed upon the side and bottom of the current carrying blade 3, for entry into a newly created position on a grounded receptacle cover plate 27, or on a newly designed four-wire receptacle further shown in this application. FIG. 4 shows one form of fuse protection 17 placed for illustration in the body of the adapter 1, which can be of a replaceable or throwaway type set according to the fuse range prescribed by codes or the manufacturers recommended usage on various appliances that require varying amount of fuse protection with each use. Further, the fuse can be removable and replaceable, it should be placed to prevent short-circuit build-up and subsequent blowing of high amperage fuses in a main supply. A alarm 13 is shown in this adapter signalling when the ground is broken having audio advantages that can be heard in reasonable distance when a grounding conductor is disconnected.

FIG. 5 shows a three-wire receptacle-adapter having two grounding connectors 12 placed in the plate 27 that is connected to the ground in the receptacle or to the ground of the junction box shown in FIG. 16. It shows a ground indicating light 9 and a special grounding blade 28 that supplements the grounding of blade 8 separately. If blade contact 8 were broken then blade 28 would make the ground on the plate 27 or to the junction box referred to in FIG. 16. The ground recesses 12 are connected internally to ground 28 that is responsive to signal 9 indicating light or an alarm 13 shown in FIG. 4, 8 & 11.

FIG. 6 shows a connector body 20 having a ground indicating light 15 connected to wiring 11 having one form of fuse 17 showing external wiring cable 14 for connection to an appliance. Two current carrying blades 2 & 3 are shown and a new ground blade 8 of this invention is shown having a light pressure contact spring keeping pressure against prong 8 for contact purpose. The placement of the ground blade 8 is below the receptacle and would make contact with a special cover plate connector 12 on a receptacle, connector or adapter. Where a two-wire is needed, the ground blade 8 would recede within the connector body 20 and not interfere with the two-wire operation.

FIG. 7 shows another receptacle having this ground connection 12 on the plate 23 and further shows how the invention keeps the polarity correct by the reversal of a two wire plug where the center ground connector 12 is equidistant from each of the receptacles shown 32 and the 180° movement requires that the plug be turned to accommodate grounding while mating the circuit wiring properly. Note that the positions of recesses 6 & 7 are opposite on the bottom receptacle 32. On all two wire equipment one side is hot and the switch on and off is placed on the hot side which can be bypassed by turning the plug the wrong way. The ground 23 in FIG. 7 locks the cover plate 23 to a wall while serving as a ground means 48, 12.

FIG. 8 shows a combination receptacle-adapter having a fuse protector 17 shows a two wire receptacle 32 with recesses 6 & 7, a indicating light 9 showing the condition of the regular wiring circuit by connecting the light 9 to both of the current carrying blade connections in the receptacle. It also shows a fuse selector 50 illustrated with four positions of use, having a fuse selector body 50 on this adapter. FIG. 8 also shows an alarm 13, locking screws 10 for attachment to other devices where required permanently, and it shows a new ground contact in magnetic form 26 also shown on FIG. 6 which will provide maximum grounding contact. Another feature is shown in ground contact 29 that is attached to a regular ground blade 8 which is designed to attach to a special grounding screw on a cover plate when the adapter is fully inserted. This ground contact 29 provides secondary grounding preventing the loss of grounding conductor use.

FIG. 9 shows an adapter body 1 having a magnetic ground contact 26 that is spring loaded 22 or placed stationary. Also shows two fuse 17 positions.

FIG. 10 shows a connector body 20 having indicator lights 9 & 15 that relate to indicating a broken ground 15 and circuit condition 9. Another new feature of this present invention is shown on the grounding blade 8 having one or more position locking slots 19 that is locked in position within the connector or an adapter, not interfering with its use on a two-wire insertion. The combination of fuse protection 17, indicating lights 9 & 15 and locking features 16 & 19 show many new grounding advantages.

FIG. 11 shows an adapter having a three-wire plug side having another ground attachment to the body 12 & 28 affording double grounding safety for two and three-wire devices. Further, the signal indicating lights 9 & 15 are signal responsive when the ground is broken causing both lights to go on at one time and start the alarm 13. A fuse 17 and four recesses are shown 5, 6, 7, and 12 the female side. This adapter shows all ground faults and provides an extra grounding conductor for application into the new receptacle advantages

that specifically relates to grounding conductors 12 and 28 showing improvement on two and three-wire devices.

FIG. 12 shows a adapter connector having the same components of FIG. 11 except for the voltage indicator 21 giving visual aid in detecting broken grounds. Showing double grounding conductor lights 15 & 15-A, connected to grounding conductors 5 & 12.

FIG. 13 shows a receptacle 32 with indicating lights 9 & 15 having a fuse 17 and two ground conductors 12 in the receptacle plate 23, with current carrying blades 6 & 7 and lock screws 10 for attachment. The preferred form of test switch is the combination of light and switch arrangement where you depress the unit making contact to light the indicator, separate switches can be installed. The fuse 17 is shown having a fuse selector body 50 showing seven positions for fuses that can be selected. The fuse holder below it is not shown but explained simply that it would have contained fuses below in a fixed position, of throwaway or replaceable type, that are connected on one end to the hot wire, and the other end to a wire in the selector body 50 making proper contact. The receptacle is for polarity reversal, having two entries and two grounding indicating lights one of which would indicate the correct polarity entry. where polarity is not involved the double grounding connectors 12 would provide multiple ground provisions that would be particularly useful in hospitals and other sensitive installations where ground dangers can cost a life.

FIG. 14 shows a receptacle 32 having a two position disc 24 that as shown can turn to open grounding connections 12 in any number of positions horizontally or vertically. By turning the disc to one of two ground lights 15 it will automatically position the plug entry into the socket 32 correctly for polarity. For other than polarity use as shown it has a light to indicate correct wiring 9 and ground connection 15 and not requiring a selector disc 24 which can also be used to keep the grounding connectors 12 closed and free from entry of dirt.

FIG. 15 shows a receptacle plate 23, a fuse 17, two wire receptacle 32, light 15, switch 31, ground connector 12, and ground indicating light 15 connected by internal wiring to the plate 23 contact 12 and the other wire to the hot side, which is fuse protected 17 in accordance with manufacturer specifications. The fuse cover is shown 46.

FIG. 16 shows a junction box 30 ground wiring 11 and new ground contact 12 shown illustrated in one of many possible positions on a junction box 30. The placement of a cover plate 23 will correctly allow grounding by this new means using the ground connections 48 of cover plates to junction boxes wired directly to the grounding conductors, in plugs, receptacles, adapters connected to appliances.

FIG. 17 shows a double two-wire receptacle 32 having a regularly designed receptacle 32 providing a ground alongside each of the recesses. This permits new grounding contacts on one and two receptacle units using two-wire devices and even on three wire receptacles using three wire devices. This extra grounding facility 47 having grounding connectors 12 provides new receptacles for grounding use. The plate 23 is shown having the invention 12 at the other side of plate 23.

FIG. 18 shows another two wire double receptacle 32 having a special grounding feature where the recepta-

cle 32 has additional grounding feature 47 accomodating one or more grounding connectors 12. The manufacturing of such larger receptacles offer many ground advantages needed for safety.

FIG. 19 is a diagrammatic view of a correct wiring situation where a fuse 17 is placed in the hot wire 33, switch 47 and appliance 35. Also shown is a boat 36 and no shock conditions.

FIG. 20 is a diagrammatic view of an incorrect wiring condition where severe or fatal shock occurs, showing that a plug can be inserted into the wrong side bypassing the switch in the hot side 33. You will note that the hot side 33 is open to the appliance 35 and the switch 47 was bypassed. Therefore, by placing grounds on plugs and receptacles such must be able to incorporate signal means and reversal means and proper ground contact afforded by this invention. On a two wire system the two wire plug should be used properly because the grounded conductor is a current carrying conductor connected to the side of the source which is intentionally maintained at ground potential. The grounding conductor differs in being a normally non-current carrying conductor provided to connect the exposed metallic enclosures of electrical equipment to ground for the purpose of minimizing shock hazard to personnel. A ground applies to the potential of the earths surface and is established by a conducting connection (intentional or accidental) with the earth, including any conductive part of the wetted surface with a hull, appliances and machinery.

FIG. 21 is illustrative view of how a broken ground can be fatal to a patient in a hospital where the maintenance of grounding conductors are imperative to safety practices. The anatomy of an accident; The faulty ground connection on an electric bed 39 allows a voltage to exist on the bedframe 39 due to capacative coupling between the bed frame and the primary wiring in the bed 39. Here, the attendant 41 unwittingly supplies the completion of the current path 44 (from the source, through the pacemakers wire 45, to the patient 40, to ground 34.) When he touches the bed 39 thereby permitting the leakage current 44 to flow through his body 41 and that of the patient 40. The EKG Monitor is shown as 42 connected to an AC line 37. Broken ground wire 34 and broken hot wire 33 are shown to illustrate the need to maintain both of these protective sources accomplished by many of the present inventions grounding safety device means, where a second grounding condutor is imperative.

The old art of using adapters that attach to painted surfaces by means of a a separate wire has been outlawed in Canada, there never was any assurance that the grounding conductor was effective. The use of two wire appliances in boats is sometimes dangerous and the same applies to backyards, television sets and industry or hospitals where anything less than a perfect ground is undesirable. The devices of this invention basically deal with the ground fault conditions and therefore indicate the presence of grounding conductors by visual and audio means in addition to having polarity advantages and new kind of grounds for receptacle plates, receptacles, adapters, connectors in all two and three wired devices making electricity safer to use. Another significant factor is the increase in use of electricity in boats and mobile homes plus the medical and musical professions which presents new safety problems to hospital personnel patients and performers, who suffer injury or death by the use of electrical

equipment having no grounding conductors. The development of grounding conductor means to new cover plate connections, to plugs and adapters and receptacles together with proper fuse protection and signal response means will save costly equipment burnout and extend the life expectancy of appliances, save circuit fuse burnouts, eliminate many fire hazards resulting from improper use of electricity having grounding safety faults easily corrected by this invention. How long can we expect a wire to last when the wire and a plug are both forced into a receptacle under pressure and then pulled out sometimes by the wire. The small plugs in use today hardly allow a hand-grip and previous short circuits in the wire, receptacle or plug attached to a appliance has certainly caused some damage to these elements that are again used without question to their capability to perform. On a two-wire or three-wire receptacle or plug means how could anyone determine the safety factor by an inspection without having the benefit of the safety means shown in this patent. If we built adapters to take the strain and control the use of plugs into receptacles with proper fuse means and ground indicating means it would eliminate part of the present day dilemma we are in.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims and the foregoing specification as indicating the scope of the invention.

I claim:

1. An electrical safety grounding device means of the type for two and three wire electrical systems having a receptacle comprising a conductive cover plate for said receptacle, means to ground said plate, and a plug adapted to plug into said receptacle, a ground contact on said plug adapted to contact said grounded plate, and fuse protection in said plug connected to a current carrying wire, and ground indicating means connected to said wire and said ground on said plug, wherein the receptacle is an adapter having a receptacle on one end having a grounding contact and a connector body on the other end connected to wiring.

2. Apparatus as in claim 1 wherein means to ground said plate comprises grounding the connection of said conductive plate to a grounded junction box connected to a grounding conductor providing grounding from said plate to a plug and receptacle.

3. Apparatus as in claim 1 wherein said fuse protection means comprises fuse protection in plugs, receptacles and adapters having replaceable and throwaway fuses that fit into said plugs receptacles and adapters.

4. Apparatus as in claim 1 wherein electrical safety grounding means comprises having ground and circuit indicating means with visual and audio advantages giving warning of broken grounding conductors and improper circuit wiring.

5. Apparatus as in claim 1 wherein said receptacle means comprises a rotatable pointer disc mounted over one end of said receptacle so that when rotated it opens at least one grounding conductor connection in said receptacle.

6. An electrical safety grounding device means of the type for two and three wire electrical systems having a receptacle comprising a conductive cover plate for said receptacle, means to ground said plate, and a plug adapted to plug into said receptacle, a ground contact on said Plug, plate and receptacle having magnetic

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contacts for grounding conductors

7. Apparatus as in claim 1 wherein said ground contact comprises a first and second grounding contact connected together so that first and second grounding contacts have a connected ground.

8. Apparatus as in claim 5 wherein said adapter has a rotatable disc and pointer on said two and three wire receptacle ends that have at least two grounding recesses so that said disc and pointer are selectively responsive to indicating at least one grounding conductor recess by connection to signal responsive means.

9. Apparatus as in claim 1 wherein said adapter comprises signal responsive audio alarm on said two and three wire electrical systems that indicate circuits and grounding conditions in said adapters.

10. Apparatus as in claim 1 wherein said adapters have an on-off switch turning said two and three wire electrical systems on and off on said adapters.

11. Apparatus as in claim 10 wherein said adapters have a test switch connected to said two and three wire electrical systems indicating the electrical safety conditions of said adapters.

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12. An electrical safety grounding device means of the type for two and three wire electrical systems wherein adapters, receptacles, connectors, plugs and testers have a selective amperage fuse protection switch connected to at least one wire of said two and three wire electrical systems responsive to disconnecting said wire when said fuse protection short circuits protecting current carrying line wiring by selective positioning of differently rated amperage fuse located within said electrical safety grounding means which is selected according to the specific amperage needs of the appliance or equipment to be used.

13. Apparatus as in claim 1 wherein said electrical safety grounding device means has an on-off switch turning said two and three wire electrical systems on and off on said adapters, receptacles, connectors plugs and testers.

14. Apparatus as in claim 13 wherein said electrical safety grounding device means has a test switch connected to said two and three wire electrical systems indicating the electrical safety condition of said adapters, receptacles, connectors, plugs and testers.

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