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3,036,285

WIRING DEVICE

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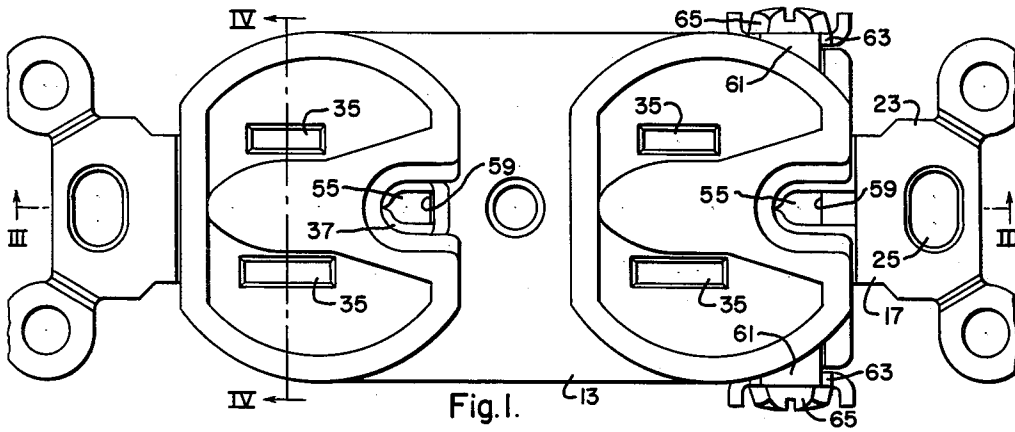


Fig. 1.

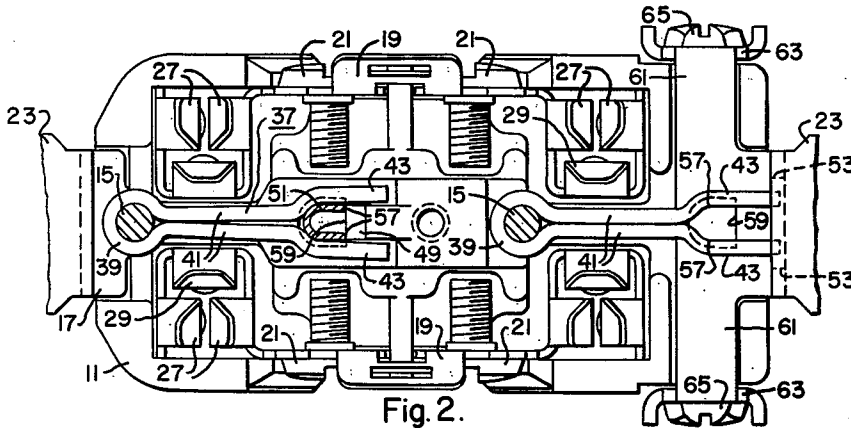


Fig. 2.

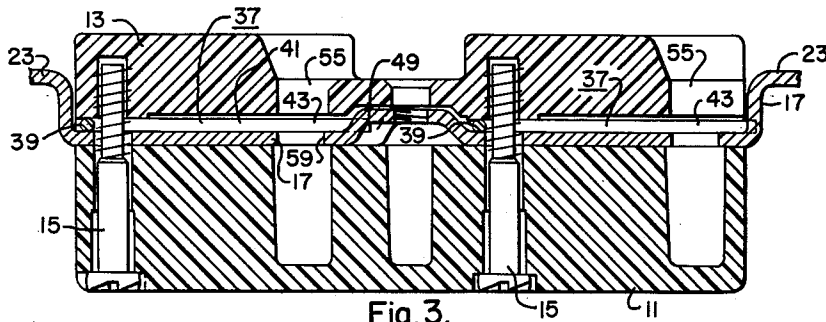


Fig. 3.

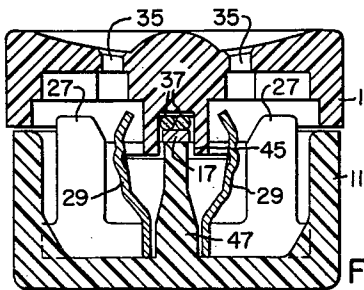


Fig. 4.

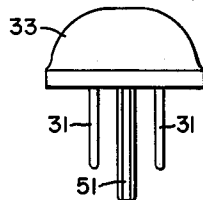


Fig. 5.

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3,036,285

WIRING DEVICE

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4 Claims. (Cl. 339-14)

This invention relates to electric wiring devices and more particularly to improved grounding contacts for such wiring devices.

One object of the invention is to provide a receptacle having an improved grounding contact adapted to cooperate with a male plug having a grounding prong for grounding appliances and the like.

Another object of the invention is to provide an improved plug and wall receptacle therefor which when receiving the plug makes a ground contact in advance of any electrical connection and which breaks the ground contact after the electrical connections have been broken.

Another object of the invention is to provide a plug and plug receptacle which is of simple and durable construction and is inexpensive to manufacture.

The invention both as to structure and operation, together with additional objects and advantages thereof, will be best understood from the following detailed description thereof, when read in conjunction with the accompanying drawings.

In said drawings:

FIGURE 1 is a top plan view of a receptacle embodying the principles of the invention;

FIG. 2 is a plan view of the receptacle with the cover removed;

FIG. 3 is a longitudinal sectional view taken on line III—III of FIG. 1 and looking in the direction indicated by the arrows;

FIG. 4 is a transverse sectional view taken on line IV—IV of FIG. 1 and looking in the direction of the arrows; and

FIG. 5 is an elevational view showing the plug for use with the receptacle.

Referring to the drawing, the receptacle comprises a base 11 and a cover 13 both of molded insulating material secured together by screws 15 which pass through openings in the base 11 and threadably engage in openings in the cover 13. A mounting yoke 17 is clamped between the base 11 and cover 13, and two oppositely disposed terminal plates 19 are mounted in the casing at opposite sides, each having two terminal screws 21 for connecting wires to the plate which are accessible at the exterior through side openings in the casing. The mounting yoke 17 is formed from sheet steel and is provided with the usual mounting tab 23 at each end having an opening 25 therein for attaching the receptacle to an outlet box (not shown).

Each terminal plate 19 has integrally formed contact fingers 27 and 29 for engaging contact prongs 31 on a plug 33 (FIG. 5) which are inserted through slots 35 (FIGS. 1 and 4) in the cover 13.

A grounding contact 37 is disposed adjacent each set of contact fingers 27 and 29. The grounding contacts 37 are made from round wire of resilient high conductivity material, such as bronze, in the general shape of a harpin. At one end the grounding contact 37 is formed into a ring 39 and the two legs 41 at the other end are spaced apart to form contact portions or fingers 43. The yoke 17 has an opening directly beneath the contact fingers 43 for receiving the grounding contact 51 of the plug 33. The ring portions 39 of the grounding contacts surround the screws 15 and are electrically connected to the yoke 17, as by welding. Between the ring 39 and

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the contact portion 43 the legs 41 of the grounding contact are in close proximity to each other, and adjacent the contact fingers 27—29 lie in a channel 45 (FIG. 4) molded in the cover 13 so as to insulate the grounding contact from the electrical contacts 27—29. A rib 47 molded in the base 11 opposite the channel 45 insulates the contact fingers 27 and 29 on opposite sides of the base from each other.

The contact fingers 43 of the grounding contact 37 adjacent the left end (FIG. 2) of the device straddle a central raised portion 49 of the yoke to maintain the contact fingers 43 the proper distance apart to properly receive a grounding prong 51 on the plug 33 (FIG. 5). The contact fingers 43 on the right-hand end of the yoke 17 may be disposed in holes in the upwardly directed end portion of the yoke 17 for the same purpose.

The plug 35 is inserted into the receptacle by first inserting the grounding prong 51 in an opening 55 (FIGS. 1 and 3) in the cover 13 and then inserting the male prongs 31 into the slots 35. As the plug 35 is inserted, the grounding prong 51 engages and makes contact with the grounding contact 37 before the polarized prongs 31 engage the contact fingers 27—29. The grounding prong 51 is generally U-shaped and when inserted into the receptacle made a four-point grounding contact, two points of contact being made with the grounding contact fingers 43 as indicated at 57, and two points of contact are made at 59 with the yoke 17. This is due to the spring wedging action of the two spring contact fingers 43 on the grounding prong 51 at the points 57 which presses the grounding prong 51 against the edge 59 of the yoke 17. This assures good grounding contact.

The yoke 17, to which the grounding contacts 37 are secured, is provided at one end with integral portions 61 (FIGS. 1 and 2) extending laterally of the receptacle and having downwardly formed terminals 63 provided with terminal screws 65 to which grounding wires (not shown) may be connected to ground the device.

When the plug 35 is removed from the receptacle, the polarized male prongs 31 first break contact with the contact fingers 27—29. Thereafter, the grounding prong 51 breaks the grounding contact thereby maintaining the appliance grounded until after it is deenergized.

The invention provides an improved grounding contact arrangement for a plug-in electrical outlet receptacle that is simple and inexpensive to manufacture which provides a superior four-point contact. The device is easy to make and handle thus reducing the cost of manufacture and assembly.

While the invention has been disclosed in accordance with the provisions of the patent statutes, it is to be understood that various changes and modifications may be made in the structural details thereof without departing from the spirit of the invention.

I claim as my invention:

1. In an electrical wiring device constructed to receive a grounding prong and having a conductive mounting member that can be connected to ground potential, a grounding contact being secured to said mounting member and having resilient arms extending along the mounting member, the extremities of said arms having at least a portion thereof being angular to said extending direction and in the plane of said arms and being spaced from but biased toward each other and being positioned above an opening in said mounting member and in the entry path of said grounding prong, said arm extremities clamping against said grounding prong when the latter is inserted therebetween and said angular arm portion effecting an imposition of forces in said extending direction against said grounding prong to urge said grounding prong against a mounting member portion adjacent said mount-

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ing member opening whereby said prong is grounded to said mounting member at multiple points of contact.

2. In an electrical wiring device constructed to receive a grounding prong and having a conductive mounting member that can be connected to ground potential, a grounding contact being formed from resilient wire and being secured to said mounting member and having arms extending along the mounting member, the extremities of said arms having at least a portion thereof being angular to the extending direction and in the plane of said arms and being spaced from but biased toward each other and being positioned above an opening in said mounting member and in the entry path of said grounding prong, said arm extremities clamping against said grounding prong when the latter is inserted therebetween and said angular arm portion effecting an imposition of forces in said extending direction against said grounding prong to urge said grounding prong against a mounting member portion adjacent said mounting member opening whereby said prong is grounded to said mounting member at multiple points of contact.

3. A wiring device for receiving a male connector having current carrying blades and a grounding prong, said wiring device comprising an insulating base having a channel for receiving said grounding prong, contact means engaging said base for energizing said current carrying blades of said connector, an elongated conductive member engaging said insulating base to be electrically free of said contact means and being disposed outwardly of a reference volume in said base channel, said reference volume being defined by said grounding prong when the latter is fully inserted in said base channel, a resilient grounding contact member being secured to said conductive member and having spring arms extending along said conductive member into said base channel, said spring arms being spaced relative to each other in said base channel and extending substantially laterally of said base channel, said spring arms being biased toward each other so that when said grounding prong is inserted in said base channel said grounding prong can be engaged by said spring arms to form an electrically conductive path therewith, means forming a part of said spring arms for urging said grounding prong in the extending direction of said spring arms against a portion of said conductive member adjacent said reference volume in said base channel, and means for electrically grounding said conductive member.

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4. A wiring device for receiving a male connector having current carrying blades and a grounding prong, said wiring device comprising an insulating base having a channel for receiving said grounding prong, contact means engaging said base for energizing said current carrying blades of said connector, an elongated conductive member engaging said insulating base to be electrically free of said contact means and being disposed outwardly of a reference volume in said base channel, said reference volume being defined by said grounding prong when the latter is fully inserted in said base channel, a resilient grounding contact member being secured to said conductive member and having spring arms extending along said conductive member into said base channel, said spring arms being spaced relative to each other in said base channel and extending substantially laterally of said base channel, said spring arms being biased toward each other so that when said grounding prong is inserted in said base channel said grounding prong can be engaged by said spring arms to form an electrically conductive path therewith, means forming a part of said spring arms for urging said grounding prong in the extending direction of said spring arms against a portion of said conductive member adjacent said reference volume in said base channel, said conductive member portion extending into a reference plane through said spring arms and being laterally and resiliently engaged with said spring arms prior to insertion of said grounding prong, and means for electrically grounding said conductive member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,179,728	Knapp	Apr. 18, 1916
1,648,797	Cohen et al.	Nov. 8, 1927
2,249,977	Penfold	July 22, 1941
2,535,578	Johanson	Dec. 26, 1950
2,675,527	Hartranft	Apr. 13, 1954
2,686,297	Hütt	Aug. 10, 1954
2,697,210	Del Camp	Dec. 14, 1954
2,838,265	Jackson	June 10, 1958

FOREIGN PATENTS

629,143	Great Britain	May 27, 1953
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