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SAFETY PLUG-IN ELECTRICAL RECEPTACLE

Filed March 29, 1945

2 Sheets-Sheet 1

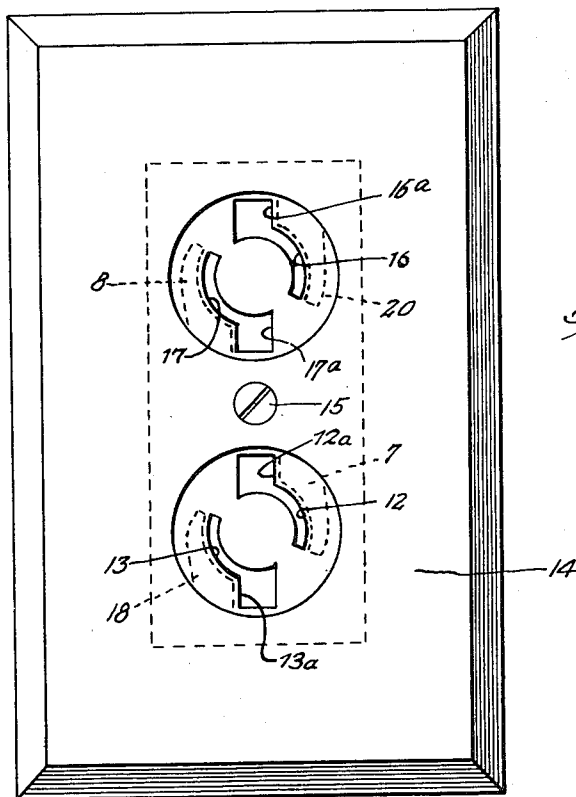


Fig. 1.

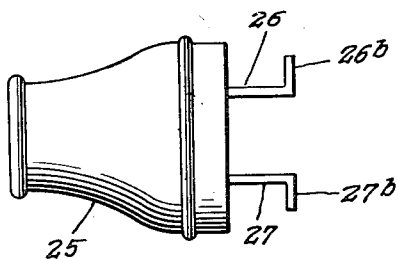


Fig. 5.

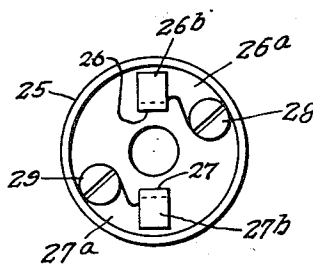


Fig. 6.

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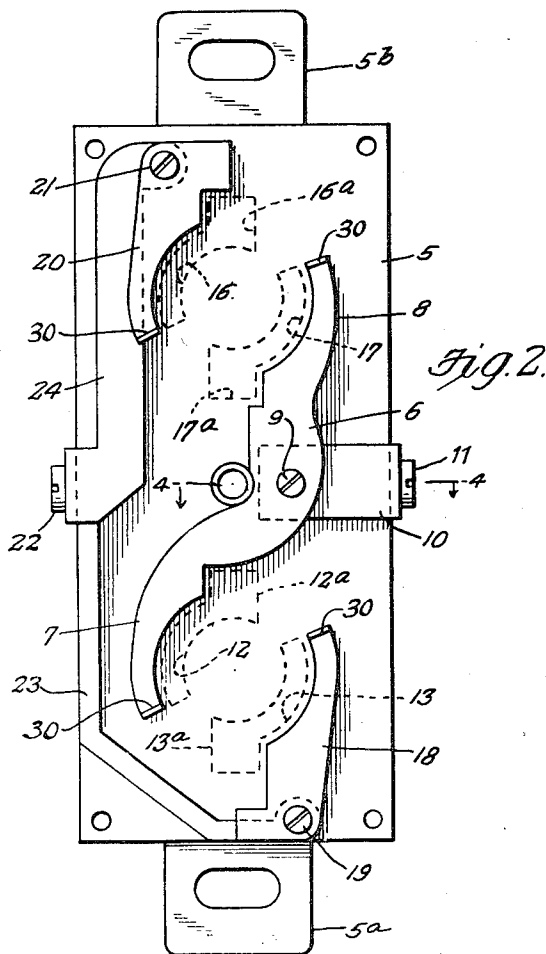
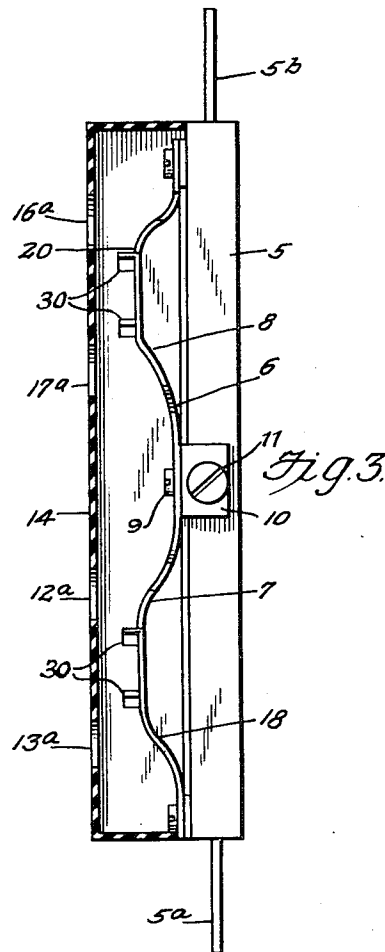
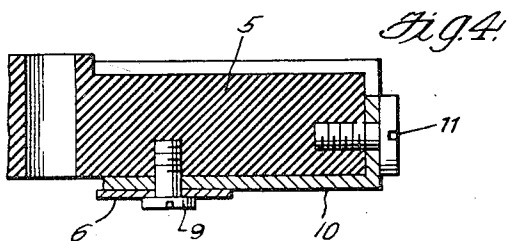
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SAFETY PLUG-IN ELECTRICAL RECEPTACLE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SAFETY PLUG-IN ELECTRICAL RECEPTACLE

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1 Claim. (Cl. 173—330)

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This invention relates to an improved electrical receptacle, and one of its objects is to provide an electrical receptacle and a plug-in connector, with means for locking the plug-in connector in circuit connecting position against disengagement by a direct pull upon the cord of the connector, or the plug-in connector itself, but which will permit of easy manual separation by a slight turning movement of the plug-in connector.

Another object of the invention is to provide a safety electrical receptacle with contact spring elements, and with plug-in prong receiving slots, so arranged that the connecting circuit wires cannot be shorted by a child or other person inserting metal wires or pins through the slots.

With the above and other objects in view the invention consists in certain new and useful constructions, combinations, and arrangements of parts, clearly described in the following specification, and fully illustrated in the accompanying drawings, in which:

Fig. 1 is a front elevation of the improved safety receptacle, with the socket plate in position.

Fig. 2 is an enlarged front elevation of the receptacle, showing the front plate removed, the socket or prong receiving openings being indicated in dotted lines.

Fig. 3 is a view of Figure 2, partly in section.

Fig. 4 is a transverse sectional view, taken on line 4—4 of Fig. 2, looking in the direction of the arrows.

Fig. 5 is a detail side view of a plug-in connector.

Fig. 6 is a detail end view thereof.

Referring to the accompanying drawings, which illustrate the practical construction of my invention, 5 designates a base block of refractory material or of other insulating material, on which is mounted the intermediate contact spring element 6, which is provided with outwardly disposed yielding spring arms 7 and 8, which extend on opposite sides of the connecting screw 9, by which the contact spring element 6 is electrically connected to the conductor bar 10, which carries a circuit wire connecting screw 11 thereon.

The spring arm 7 is curved around the axis of the connector prong receiving openings 12 and 13, formed in the frontal plate 14, which is attached to the insulating block 5 by means of the central holding screw 15. A boss of insulating material separates the spring contact element 6 from the holding screw 15. The opening 12 is arcuate along its entire inner edge and is arcuate for the major portion of its outer edge and is then enlarged at 12a to provide a key

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receiving offset opening. The opening 13 is similarly constructed, being provided on one end with a key receiving offset opening 13a. These key receiving offset openings are located in opposition to each other.

The spring arm 8 is similarly curved about the center of the arcuate slots 16 and 17, formed in the front plate 14, and these slots are of similar construction to the slots 12 and 13. The slot 16 is formed with a key receiving offset opening 16a and the slot 17 is formed with a key receiving offset opening 17a, which is located in opposition to the opening 16a.

The curved spring arm 7 is disposed in concentric relation to the prong receiving slots 12 and 13, and the curved spring arm 8 is disposed in concentric relation to the prong receiving slots 16 and 17, and the slots are located inwardly of the circular planes of the spring arms.

A single spring contact arm 18 is attached to the base block 5 in concentric relation to the slot 13, and adjacent to it, but located outwardly of this slot, by means of the connector screw 19. A single spring contact arm 20 is attached to the base block 5, adjacent and concentric to the slot 17, and outwardly thereof, by means of the connector screw 21. The contact arm 18 is connected to the binding or circuit connecting screw 22 by means of the conductor spring piece 23, and the contact arm 20 is connected to this binding screw by means of the conductor strip 24.

The intermediate spring contact element 6 is the positive element and the contact spring arms 18 and 20 are the negative elements.

The plug-in connector consisting of a body 25, which may be conical as shown, and which is provided with conductor prongs 26 and 27. The prong 26 is attached to the body of the plug by means of the base wing 26a and the holding or binding screw 28, and the prong 27 is attached to the body of the plug by means of its wing 27a and the holding or binding screw 29. The prong 26 is formed with a lateral key 26b on its outer end, and the prong 27 is formed with a lateral key 27b on its outer end, which project in opposite directions from each other, so as to provide a normal gap between the prongs.

The base 5 is provided with the usual attaching wings 5a and 5b, on opposite ends thereof, whereby the base may be secured to a wall recess structure, or other support.

When the unit has been completely assembled and properly wired to the house circuit wires, the plug-in connector is forced through any pair of prong receiving slots or openings of the front

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plate, or case, so that the keys of the two prongs will be in registration with the key offset openings of the slots, and then the plug is turned so that the keys of the prongs will ride or move against the plate and be out of registration with the offset key openings of these slots. When this takes place the prongs will bear against the spring contact arms, thereby bridging these contacts, and closing the circuit through the electrical unit with which the wires of the plug-in connector are connected in circuit, provided of course that any external switch is closed.

Contact between the prongs of the plug-in connector and the spring contact arms adjacent the slots through which these prongs are inserted, is established by the mechanical contact of the prong keys with the spring arms, the spring arms being located outside of the circular arc described by the prong receiving slots, but in the path of the keys of the prongs when they are inserted in the slots and turned. Each spring arm is formed with a terminal stop 30, to limit the turning movement of the connector prongs thereon. The front plate 14 is made of plastic or other insulating material.

When the plug-in connector has been properly connected with the spring arms of the receptacle, the prong keys will resist a direct pull upon the plug or its connecting wires or cord, and release will require a manual unlocking turning movement of the plug on the receptacle. This prevents the accidental pulling out of the connecting plug, and compels the user to go to the receptacle and properly disengage or uncouple the plug.

Should any one insert a hair pin or a wire through one or both slots the spring arms adjacent the slots will not be engaged, and the circuit will not be shorted.

Having described my invention it is understood that various changes in the proportions, construction and combination of parts, may be resorted to, within the scope of the claim of this application.

Having described my invention I claim as new:

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An electrical conductor coupling comprising an elongated rectangular base of non-conducting material, a contact spring fixed midway between opposite ends of the base, opposite ends of the spring curving away from the base and terminating in arcuate contacts which extend toward adjacent ends of the base adjacent opposite sides thereof, said arcuate contacts lying in spaced relation to the base, a conductor strip lying along one side of the base, spring contact members at opposite ends of the conductor strip, an arcuate contact on each spring contact member, said last-named arcuate contacts being spaced from the base for cooperating with the contacts carried by the spring to provide a pair of spaced arcuate contacts adjacent each end of the base, a cover for said base, said cover having a pair of arcuate slots lying concentric with and inside the inner edges of each pair of arcuate contacts, a plug connector carrying spaced contacts adapted to enter a pair of arcuate slots in the cover, laterally extending ears on the contacts of the plug connector adapted upon rotation of the plug to engage the arcuate contacts, stops at the free ends of the arcuate contacts to engage the ears and arrest rotation of the plug when the ears are in full contact with the arcuate contacts and the cover having a notch opening into each arcuate slot to accommodate the ear on a plug contact.

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