Feb. 28, 1950 F. G. BELLEK 2,498,642

ELECTRICAL RECEPTACLE

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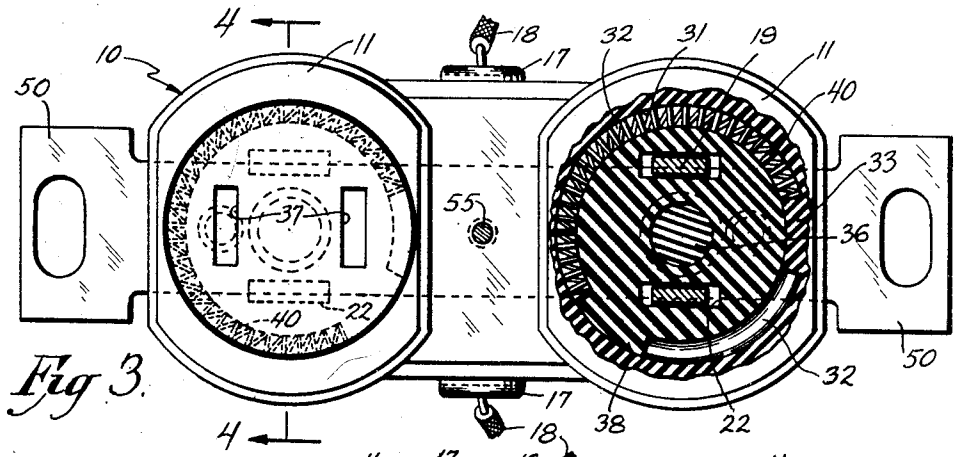



Fig 3.

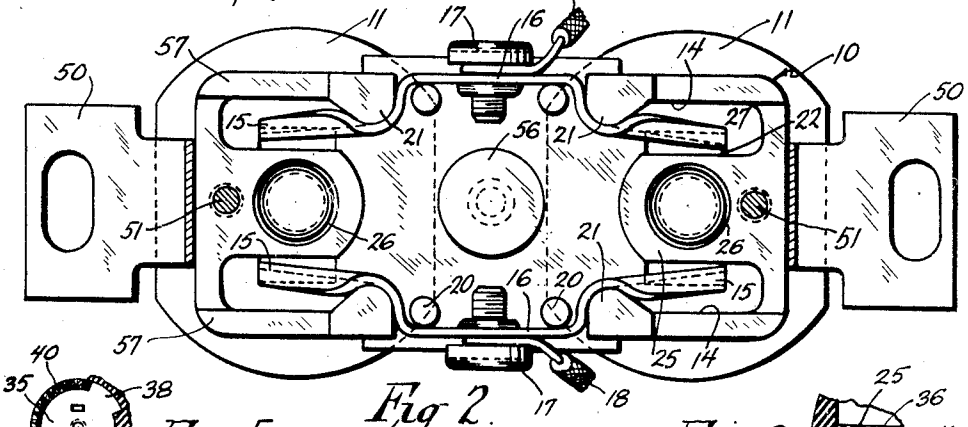



Fig 2.

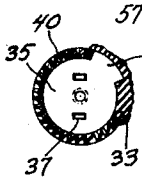



Fig 5

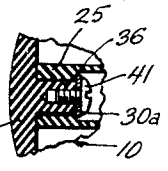
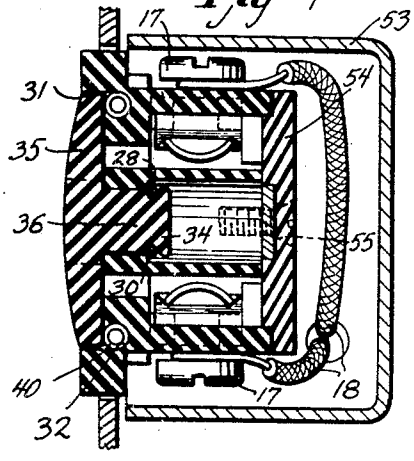
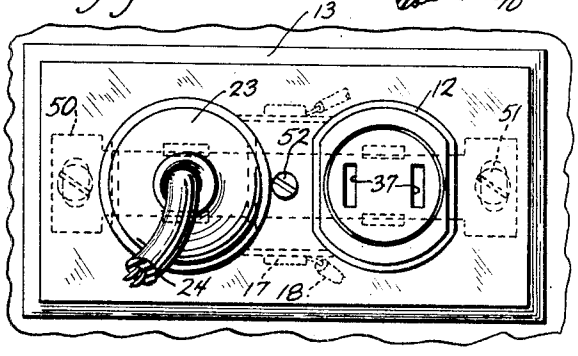



Fig 6.

Fig 1.

Fig 4




Frank G. Bellek INVENTOR.

BY Watson D. Haubaugh

Atty.

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# UNITED STATES PATENT OFFICE

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## ELECTRICAL RECEPTACLE

Frank G. Bellek, Chicago, Ill., assignor, by direct and mesne assignments, to Bell Electric Company, Chicago, Ill., a corporation of Illinois

Application February 6, 1946, Serial No. 645,883

6 Claims. (Cl. 173—330)

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The present invention relates to electrical receptacles or sockets and certain improvements therein by which a meddling by children is prevented which would be dangerous to them, and an appliance plug when in place is more firmly held against accidental removal without it being positively locked against strains which would normally break a cord.

No outlet socket has been successfully placed upon the market which has a guard that prevents children from sticking pins or wires into the outlet openings. Several patents have been granted to others in which guards were disclosed but their construction has been such that they can be easily manipulated by small children with parts so constructed and arranged as to be comparatively fragile under use.

Furthermore, the constructions shown in earlier patents can only be used as guarded receptacles throughout their lifetime, even after children have grown up. They cannot be changed from a guarded receptacle to an unguarded receptacle, nor can they be changed from an unguarded receptacle to a guarded receptacle in event the danger of children playing with the receptacle occurs again in later years.

One of the objects of the present invention is to provide a single or duplex electrical outlet receptacle whose construction can be changed from a guarded to an unguarded receptacle, or vice versa, depending upon the likelihood of children being shocked by playing with the receptacle during the early years of their life.

A further object of the invention is to provide a construction in which a leverage effect upon the relative moving parts is most favorable to preventing meddling by children and to frictionally binding the electrical contact prongs of a plug inserted into the receptacle to hold it against inadvertent removal, yet releases under such strains as would cause the cord to break if the plug was positively locked in the socket.

A further object of the invention is to provide a device of the class described which is strong and sturdy but simple and inexpensive to construct, assemble and repair.

These being among the objects of the invention, other and further objects will appear from the drawing, the description relating thereto and the appended claims.

In the drawing:

Fig. 1 is a plan view of a duplex receptacle as it appears when mounted in place ready for use, with one of the receptacles shown in its guarding position as when not in use, and the other receptacle shown with an extension cord plug received in it;

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Fig. 2 is a plan view of the duplex receptacle from the rear thereof as it appears when connected to the house current;

Fig. 3 is a plan view of the device shown in Fig. 1 with the cover plate removed and with one of the receptacles shown partly in section;

Fig. 4 is a section taken upon the line 4—4 of Fig. 3;

Fig. 5 is a view of the receptacle embodying the invention when the parts are arranged to provide an unguarded or continuously open condition similar to the present day unguarded receptacles; and

Fig. 6 is a section similar to Fig. 4 illustrating another embodiment of the invention in which the receptacle can be readily converted from a guarded to an unguarded receptacle, or vice versa.

The receptacle embodying the invention is one whose construction is such that it can be assembled by the manufacturer either as an unguarded or as a guarded receptacle without any alterations of the parts. The receptacle can be assembled with the mating openings of the base and a rotary guard disposed normally in alignment with each other without need for the guard to be rotated when a plug is to be inserted in place, or, the prong openings through the rotary guard can be normally disposed at right angles to the openings in the base so that the guard must be rotated a quarter turn before the openings are aligned to receive the prongs of an extension cord plug.

With such an arrangement a manufacturer need inventory only identical parts which can be used either as a guarded receptacle or an unguarded receptacle, depending upon the manner in which they are assembled. Not only this, but if the receptacle produced the construction shown in Fig. 6, the receptacle can be furnished as standard equipment to electricians and they can adjust the receptacle to be a guarded or unguarded one before or after initial installation to meet with the desires of the occupants of the house.

In providing a receptacle embodying the invention, a base 10 made of a molded Bakelite or other insulating material is provided having two integral front bosses 11 whose peripheral contours mate with the openings 12 in a conventional face plate 13. Immediately behind each of the bosses two pairs of channels 14 are provided to receive spring ends 15 of electrical connector strips 16 tapped in the middle to receive binding post

screws 17 for holding in place leads 18 of the house wiring.

The connector strips are preferably of the form illustrated in Fig. 2 and are held in place by pins 20 to rest against rounded shoulders 21 over which the spring ends 15 flex to and from a position partially obstructing openings 22 in the front bosses 11 which are spaced and of a size necessary to receive the prongs 19 of a plug 23. The spring ends 15 normally obstruct the openings until the prongs are inserted, and the prongs 19 by forcing the spring ends 15 outwardly establish a good electrical contact therewith to complete the circuit from the receptacle through an appliance that is attached to the plug by extension cord 24.

Between the ends of each spring contact 15 is provided a boss 25 having an opening 26 disposed in the center of the boss directly between the prong openings 22. The surfaces 27 of the boss 25 adjacent to the spring ends 15 serve as slideways for the plugs to support the prongs against the tension exerted by the spring ends 15, and the opening 26, as shown in Fig. 4, is provided with a shoulder 28 facing rearwardly. A washer 30 or 30*a* (Fig. 6) engages the shoulder to hold the guard in place as will now be described.

Concentric with the opening 26, the boss 11 is provided with a circular recess 31 having a deeper groove 32 extending for an arcuate distance of approximately 315° around the periphery thereof and ending in a boss 33 which occupies an arc of approximately 45°. A rotary guard 35 is provided whose outer surface blends in with the outer surface of the boss 11 when received within the recess 31. The guard is preferably made of a heat moldable, insulated material having an integral shaft 36 at its rear, of a length sufficient to journal in the opening 26 and receive the washer. The guard is held in place by the washer 30 when the inner end of the shaft 36 is received through the opening of the washer and swaged under heat and pressure to rivet the washer in place.

The guard 35 has openings 37 therein which in one position of rotation will mate with the openings 22 in the base while in another position they will be disposed at right angles thereto. These relative positions between the guard and the base are determined by a stop 38 molded integrally with the guard 35 to be received in the groove 32 where it moves to and fro in the groove and cooperates with the boss 33. The stop 38 occupies approximately 35° of an arc and when disposed upon one side of the boss 33 the openings 22 and 37 coincide whereas when disposed upon the other side of the boss 33 the openings 22 and 37 are disposed at right angles with respect to each other.

A small diameter compression spring 40 is mounted in the groove 32 to urge the stop 38 and boss 33 into engagement with each other, and depending upon the relative position in which the stop 38 and the boss 33 are disposed when assembled, this spring will urge the guard to a position in which the openings coincide or to a position in which the openings are disposed at right angles to each other. The spring as thus provided is shielded completely from all electric current bearing parts so that the spring cannot cause a short circuit in event it breaks.

In the embodiment illustrated in Fig. 2 the location of the spring 40 and the relative position of the stop 38 and the boss 33 with respect to each other is such that the openings are normally disposed at right angles with respect to each other until the prongs 19 of the plug are inserted in the openings 37 and the guard is moved by rotary movement in clockwise direction by a manipulation of a plug until the openings 37 and 22 coincide, at which time the prongs of the plug may be received through the openings 22 and forced into engagement with the spring ends 15 to make full electrical contact therewith.



As shown in Fig. 5, the spring 40 and the relative position of the stop 38 and the boss 33 is such that the position to which the guard is urged by the spring is one in which the openings 37 and 22 coincide.

From the description thus far it will be seen that a construction and arrangement of parts are provided which can be supplied by the manufacturer from the same parts as an unguarded (normally open receptacle), or as a guarded receptacle (normally closed receptacle). This not only reduces the cost of inventory but also the cost of production of the parts since they are identical for guarded or unguarded receptacles. Furthermore, the cost of assembling the parts is no different for an unguarded receptacle than the cost of assembling a guarded receptacle. For this reason the price for a guarded or unguarded receptacle can be standardized, there being certain instances where an unguarded receptacle can be used without any danger of children reaching it, whereas guarded receptacles can be used wherever there is a danger of children reaching it.

Although the simplicity with which the dial guard is held in place by the swaged over end 34 of the shaft 36 provides a very economical construction, the preferred embodiment by which the guard 35 is held in place is illustrated in Fig. 6 where the shaft 36 is internally threaded to receive a screw 41 and a "shake-proof" washer 30*a* having internal locking wings and known as the internal type. The lock exerted by the washer 30*a* is one between the head of the screw 41 and the end of the shaft 36 with the length of the shaft sufficient for the dial to have freedom for rotary movement under the influence of the spring 40.

Thus, with the arrangement shown in Fig. 6, the receptacle can be converted in the field from a guarded or unguarded receptacle, or vice versa, depending upon the desires of the user. In fact most of the receptacles can be assembled as unguarded receptacles for commercial installations or as guarded receptacles for household installations and changed at a particular outlet by the electricians installing the receptacles.

It will be also seen from the drawing and the foregoing description that the leverage effort of the compression spring 40 is the maximum of the system since it lies at the periphery of the guard. Not only this, but when the guard is moved from its guarded position to the position where the openings 37 and 22 coincide, the compression spring 40 is almost solid to provide a secondary stop action which prevents the dial from being turned past the position in which the openings 22 and 37 coincide.

It is preferred in constructing the base 10 to save all the material that is necessary without sacrifice to ruggedness. Consequently, applicant has illustrated a construction in which pins 20 and shoulders 21 are employed to mount the connector strips 16. In view of the fact, however, that economy and ruggedness determine whether or not additional stock will be used at a particular point in forming the body, applicant does not

intend to limit himself to the particular form of the receptacle body as shown. Furthermore ribbed reinforcement can be employed wherever desired without departing from the spirit of the invention. Moreover, the several standard means such as outlet box wings 50 and screws 51 therefor and cover plates 13 and screw 52 therefor can be used for mounting the body and associated elements in an outlet box 53 without departing from the spirit of the invention. In this connection a back cover 54 is employed and held in place by a screw 55. The cover holds the connector strips 16 in place against the thrust of the prongs 19 on the spring ends 15, the back cap being so formed as to give the connector strips 16 direct support against this force. An internally threaded boss 56 molded integrally with the body 10 receives the screw 55 for this purpose. This back cover 54 is held in place in mating relationship with ears 57 molded on the body 10 at the four corners thereof.

Consequently, having thus described several embodiments of the invention and the reasons for the preferred forms thereof, it will be readily apparent to those skilled in the art of manufacturing and using electrical outlet receptacles that various and further changes can be made without departing from the spirit and substance of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. An electrical receptacle comprising a body of insulating material having a circular recess in the front thereof and prong receiving openings in the bottom of said recess, a guard journalled on said body and having a front portion filling said recess, said recess having a peripheral groove therein extending over approximately 315°, and said guard having a stop receivable in said recess extending over a length of approximately 45° and spring means disposed in said groove urging said stop to one limit of its movement in said recess.

2. An electrical receptacle comprising a body member of insulating material having prong receiving openings therethrough, a guard member journalled on said body and covering said openings, one of said members having an arcuate groove therein extending over approximately 315° and the other member having a stop receivable in said groove extending over a length of approximately 45°, and spring means disposed in said groove for urging said stop to one limit of its movement in said groove.

3. An electrical receptacle comprising a body member of insulating material having prong receiving openings therethrough, a guard member journalled on said body and covering said openings, one of said members having an arcuate groove therein extending over approximately 315° and said guard having a stop receivable in said groove extending over a length of approximately 45°, and spring means disposed in said groove for urging said stop to one limit of its movement in said groove, said spring means going solid when said stops are moved a predetermined distance away from each other.



4. An electrical receptacle comprising a body of insulating material having a circular recess in the front thereof and prong receiving openings in the bottom of said recess, a guard journalled on said body and having a front portion filling said recess, said recess having a peripheral groove therein, and said guard having a stop receivable in said recess, the arcuate length of the groove being approximately equal to 270° plus the arcuate length of the stop, and spring means disposed in said groove urging said stop to one limit of its movement in said recess.

5. An electrical receptacle comprising a body member of insulating material having prong receiving openings therethrough, a guard member journalled on said body and covering said openings, one of said members having an arcuate groove therein and the other member having a stop receivable in said groove, the arcuate lengths of said groove and said stop being such that the length of the groove diminished by the length of the stop is 270°, and spring means disposed in said groove for urging said stop to one limit of its movement in said groove.

6. An electrical receptacle comprising a body member of insulating material having prong receiving openings therethrough, a guard member journalled on said body and covering said openings, one of said members having an arcuate groove therein and said guard having a stop receivable in said groove, the arcuate lengths of said groove and stop being such that the length of the groove diminished by the length of the stop is 270°, and spring means disposed in said groove, said spring means going solid when said stops are moved a predetermined distance away from each other.

FRANK G. BELLEK.


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