

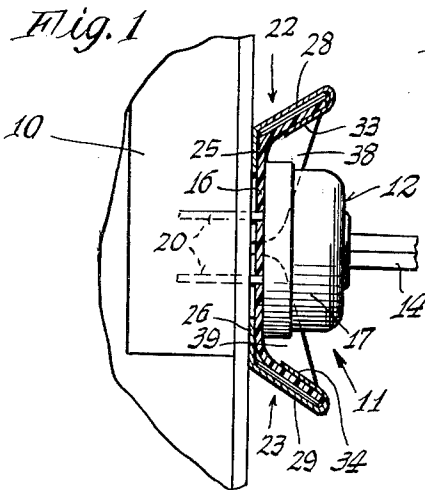
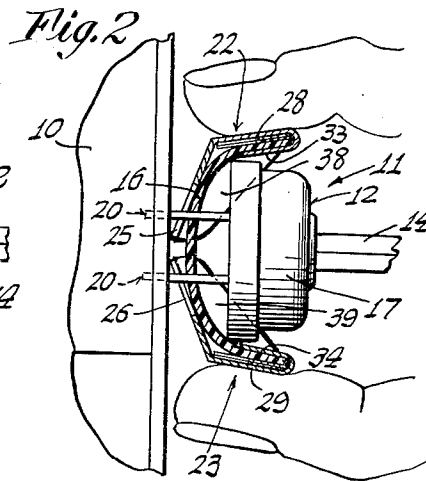
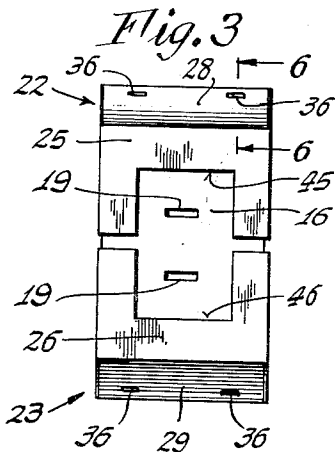
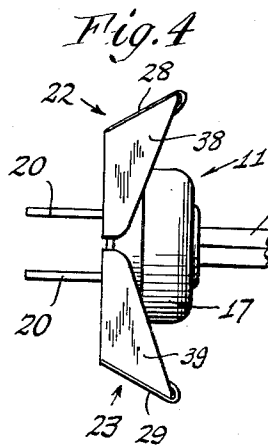
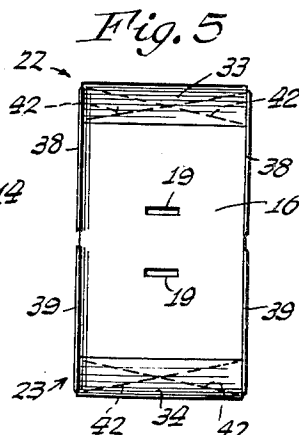
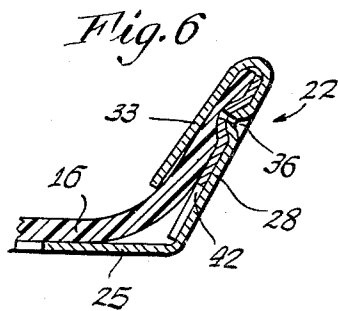
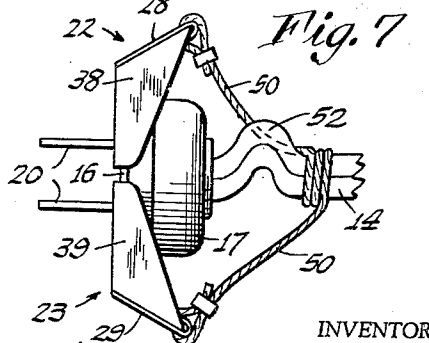
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G. W. OAKES

3,008,115

ELECTRICAL PLUG AND EJECTING DEVICE THEREFOR

Filed June 24, 1959



INVENTOR
George W. Oakes

BY
Munn, Liddy, Daniels & March
ATTORNEYS

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3,008,115 ELECTRICAL PLUG AND EJECTING DEVICE THEREFOR

George W. Oakes, Crystal City, Mo.
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This invention relates to electrical plugs of the type which are insertable in receptacles, and more particularly to means adapted for use in conjunction with such plugs, for effecting an ejection or removal of the same from the receptacles.

An object of the invention is to provide a novel and improved electrical plug and ejection means or device therefor, which does not involve or require any special construction of the plug or any modification or alteration of a usual or conventional plug construction.

Another object of the invention is to provide a novel ejector means in the form of an attachment for existing plugs, which attachment is universal in its application, whereby it will fit all different types of electrical plugs.

A further object of the present invention is to provide an improved electrical plug ejector means as above set forth, which is safe in its operation at all times, thereby to preclude the possibility of short circuits being caused by its use.

Still another object of the invention is to provide an improved electrical plug ejector means as characterized, which is simple and easy to use whereby a person may easily become familiar with its operation and will readily remember the mode of operation involved.

Yet another object of the invention is to provide a novel electrical plug ejector means which is extremely reliable and foolproof in its operation, and which is not likely to easily get out of order.

A still further object of the invention is to provide an improved electrical plug ejector means in accordance with the foregoing, which is constituted of relatively few parts, the said parts or components being easily fabricated and assembled.

An additional object of the invention is to provide an improved ejector attachment for existing plugs, which may be easily and quickly applied or attached to the plug without the use of tools and without special instruction other than, for example, a simple outline-type diagram.

A further object of the invention is to provide an improved ejector means for electrical plugs and the like as above characterized, which is economical to fabricate and produce.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification similar characters of reference have been used to designate like components throughout the several views, in which:

FIGURE 1 is a side elevational view of an electrical receptacle and plug carried thereby, the plug being provided with the improved ejecting means of the invention, said ejecting means being shown in vertical section.

FIG. 2 is a view like FIG. 1 but showing the ejecting means as being put in operation, whereby the plug is partially ejected from the receptacle.

FIG. 3 is a front elevational view of the ejecting means per se.

FIG. 4 is a side elevational view of the electrical plug and ejecting means attached to it.

FIG. 5 is a rear elevational view of the ejecting means shown in FIG. 3.

FIG. 6 is a fragmentary sectional view, enlarged, taken on the line 6-6 of FIG. 3.

FIG. 7 is a side elevational view like FIG. 4 but illustrating a modification of the invention wherein the ejecting means is actuated in response to a pull on the electric cord attached to the plug.

Referring first to FIGS. 1 through 6, there is illustrated

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a conventional type of receptacle 10, to which there is secured a usual type of two-prong electrical plug 11 having extending from its rear wall 12 a two-wire conductor or cord 14.

In accordance with the present invention a novel and improved ejecting attachment is provided for use in conjunction with the electrical plug 11 whereby the latter may be easily and quickly ejected or removed from the receptacle 10 without straining the connections between the electric cord 14 and the plug terminals or prongs, and without adversely affecting the construction of the plug or securement of the cord 14 thereto. The ejecting attachment as illustrated in the figures comprises but three separate parts or components, two of the said components being duplicates of each other. Thus, actually but two different components are involved in the construction of the ejecting means, one of said components being duplicated or used in multiple numbers.

Considering FIGS. 1, 3 and 4, the plug ejecting attachment or means comprises a thin sheet of resilient material 16 which is adapted to extend across the face of the plug body 17, said sheet having a pair of spaced openings or slots 19 through which the prongs 20 of the plug 11 may extend. The ejecting attachment further comprises a pair of rigid, angular lever members 22 and 23 which are engaged with and extend along the sheet 16, each of said levers or lever members having one arm normally disposed flat with respect to the face of the plug body. Thus, considering FIG. 3, the lever member 22 has an arm 25 which is so disposed, and the lever member 23 has a similar arm 26 disposed in a like manner.

The lever members 22 and 23 have other, manually operable and engageable arms 28 and 29 respectively, which extend along the sides of the plug body 11 in spaced relation thereto. The said other arms 28 and 29 are seen to be oppositely disposed about the plug body, whereby they may be readily pressed toward each other by the fingers of a hand, thereby to fulcrum the lever members about peripheral portions of the plug body and to swing the first-mentioned arms of the lever members away from the face of the plug body for ejecting the plug from the receptacle. The manually engageable arms 28 and 29 preferably make an obtuse angle with the receptacle-engaging arms 25 and 26, as clearly shown in FIGS. 1, 2 and 4.

The resilient sheet of material 16 serves the purpose of mounting and securing the mounting members 22 and 23 to the electrical plug 11, and further prevents the said lever members from coming into contact with the prongs 20 of the plug while at the same time permitting a fulcruming or swinging movement of the lever members in the manner indicated in FIG. 2.

Preferably the lever members 22 and 23 are secured to the resilient sheet 16 by being fastened to the ends of the said sheet as in the manner illustrated in FIGS. 1, 2 and 6. In these figures, the arms 28 and 29 of the lever members, are shown as having inwardly folded end portions 33 and 34 respectively whereby the extremities of the sheet 16 may be crimped or clamped and securely held. Preferably, as shown in FIGS. 3 and 6, indentations 36 may be made in the arms 28 and 29 to effect a more secure retention of the end portions of the resilient sheet 16.

For the purpose of reinforcing the lever members 22 and 23, the said members may be provided with side flanges 38 and 39 respectively, said flanges being secured to the receptacle-engaging arms 25 and 26 and also to the manually engageable arms 28 and 29.

In accordance with the invention each of the lever members may be constituted from a single piece or stamping of sheet metal, which is blanked out by a suitable tool. The flanges 38 of the lever member 22 may, for example, be integral with the receptacle engaging arm 25 of the

member, and may have folded portions 42 (FIG. 5) which are bent at right angles to the flanges 38 and which lie flat against the inner surface of the arm 28 of the lever member. The folded end portion 33 of the lever member may thus engage and clamp the upper end portion of the resilient strip 16, and the said end portion will be engaged with the folded parts 42 of the flanges, said folded parts in turn being engaged with the inner surface of the arm 28 of the lever member. The indented portions 36, FIGS. 3 and 6, of the manually engageable arms may thus deform and lock the folded parts 42 of the flanges 38.

By such construction a rigid lever structure is provided, while at the same time the structure is simple and economical to fabricate. The side flanges 38 and 39 of the lever members will engage the side edges of the resilient sheet 16, as clearly seen in FIG. 5, thereby to further securely position the lever members and prevent the latter from coming in contact with the prongs 20 of the plug. As shown in FIG. 3, the arms 25 and 26 have rectangular cutouts or notches 45 and 46, to provide adequate clearance with respect to the plug prongs 20.

The resilient and flexible sheet 16 may be conveniently fabricated of rubber or a rubber-like material, or else of a flexible and resilient plastic substance, and preferably the lever members 22 and 23 are fabricated of sheet metal, although it should be understood that the lever members may be formed of molded plastic having sufficient strength and/or reinforcement to enable the members to withstand the normal working stresses encountered in the operation of the device.

Preferably the openings or slots 19 are slightly smaller than the cross sectional areas of the prongs 20 of the plug, so that the resilient sheet 16 is securely held when it is placed over the prongs as in FIGS. 1, 2 and 4.

Considering the operation of the device, starting with the parts in the positions of FIG. 1, the fingers are applied to the finger engageable arms 28 and 29 of the lever members and the said arms are squeezed together or toward each other, as illustrated in FIG. 2. This will cause the lever members to fulcrum about peripheral portions of the plug body 17, and will cant the receptacle-engaging arms 25 and 26 in the manner indicated, whereby the plug will be forced outward or away from the receptacle.

A modification of the invention is illustrated in FIG. 7, wherein the arms 28 and 29 are provided with openings to accommodate a string 50 which is wrapped around the electric cord 14 several times, and which may be secured to the cord in any suitable manner. Preferably, a loop or slack portion 52 is provided in the cord 14 between the plug body 17 and the remainder of the electric cord 14 as shown. With this construction, when the electric cord 14 is pulled, the pull will be imparted to the string 50, and this action will cause the lever members 22 and 23 to be canted or to fulcrum about the plug body in the manner shown in FIG. 2, thereby ejecting the plug from the receptacle.

From the foregoing it will be seen that I have provided a novel and improved, greatly simplified ejector means and attachment for use with existing electrical plugs, by which the latter may be easily and quickly removed from the receptacle without damage to the cord or connections between the cord and the plug prongs. The ejecting means consists of relatively few parts, is easy to operate, safe and reliable in its use, and may be economically fabricated.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A combination electric plug and ejecting device therefor, comprising a plug body having a pair of spaced contact prongs extending from it for reception in a co-operable receptacle; and an ejecting means comprising a thin

sheet of resilient material extending across the face and beyond the edge of the plug body at opposite sides thereof and having a pair of spaced openings through which the said prongs extend, and including a pair of rigid angular lever members engaged with and extending along the said sheet of resilient material, each of said lever members having one arm normally disposed flat with respect to the face of the plug body and having another arm extending along a side of the plug body in spaced relation thereto, the said other arms being oppositely disposed about the plug body whereby they may be readily pressed toward each other by the fingers, thereby to fulcrum the lever members about peripheral portions of the plug body and swing the first-mentioned arms of the lever members away from the face of the plug body for ejecting the plug from the receptacle, the resilient sheet returning the lever members to their original positions when the finger pressure is relieved.

2. The invention as defined in claim 1 in which there is an electric cord extending from the back of the plug body, and in which there are pull elements secured to the ends of the said other arms of the lever members and attached to the said cord whereby a pull on the cord will be transmitted to the pull elements to effect canting of the levers and consequent ejection of the plug.

3. The invention as defined in claim 2 in which there is slack in the electrical cord between the plug body and the point of attachment of the pull elements to enable the latter to have a greater travel.

4. An ejector device for attachment to an electric plug of the type having a plug body and a pair of spaced contact prongs extending from the face of the plug body, comprising a thin sheet of resilient material adapted to extend across the face and beyond the edge of the plug body at opposite sides thereof and having a pair of spaced openings through which the prongs may extend; a pair of rigid angular lever members engaged with and extending along the said sheet of resilient material, each of said lever members having one arm adapted to be normally disposed flat with respect to the face of the plug body and having another arm arranged to extend along a side of the plug body in spaced relation thereto whereby the said other arms may be oppositely disposed about the plug body and may be pressed toward each other by the fingers to fulcrum the lever members about peripheral portions of the plug body so as to swing the first-mentioned arms of the lever members away from the face of the plug body for ejecting the plug from the receptacle, the resilient sheet returning the lever members to their original positions when the finger pressure is relieved.

5. The invention as defined in claim 4, in which the resilient sheet has a pair of opposite, straight parallel sides, and in which the lever members have side flanges engaged with the straight sides of the sheet, to guide and position the members.

6. The invention as defined in claim 5, in which the lever members are each formed as an integral unit comprising four flat sides two of which constitute spaced-apart side flanges and the other two are disposed between the side flanges and constitute the lever arm.

7. The invention as defined in claim 6, in which the lever members are constituted each of a blank of flat sheet metal folded into the said integral unit.

8. The invention as defined in claim 7, in which the said other arms of the lever members are folded back at their ends and crimped against the ends of the resilient sheet.

9. The invention as defined in claim 4, in which the first-mentioned arms of the lever members are cut out at their center portions to provide clearance for the plug prongs.

10. The invention as defined in claim 9, in which the cut-outs of the lever members are rectangular.

11. The invention as defined in claim 4, in which the

resilient sheet is rectangular, and in which the lever members are secured to opposite ends of the sheet.

12. The invention as defined in claim 4 in which there are pull elements secured to the ends of the said other arms of the lever members and arranged to be attached to the cord of the plug whereby a pull on the cord will be transmitted to the pull elements to effect canting of the lever members and consequent ejection of the plug.

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