Feb. 22, 1955 A. M. DAVID 2,702,894

WALL PLUG AND OUTLET RECEPTACLE

Filed Aug. 7, 1952

FIG. 1

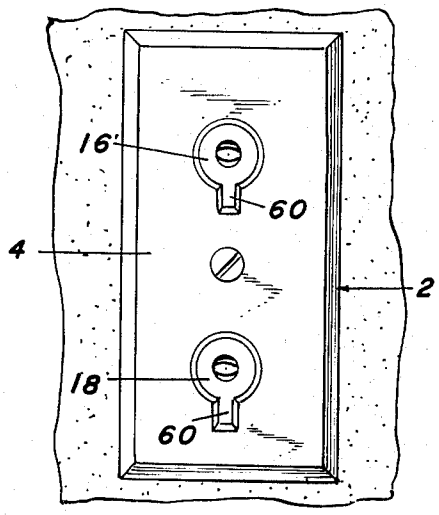


FIG. 2

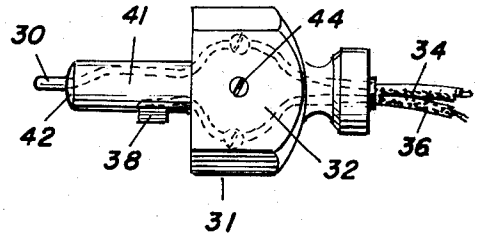


FIG. 3

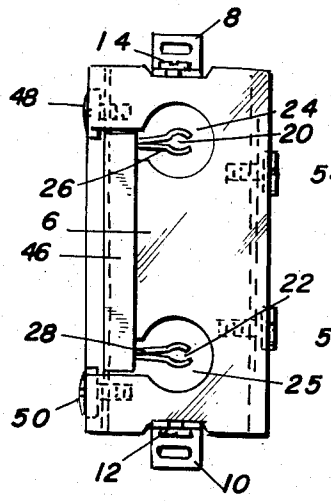


FIG. 4

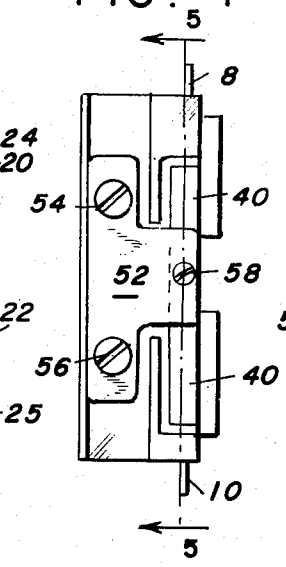
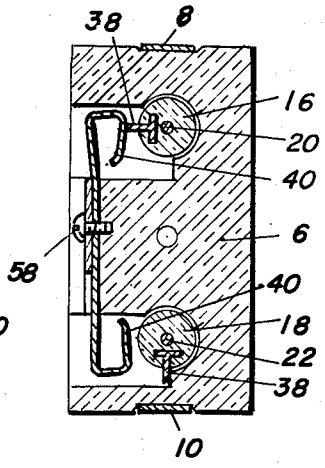


FIG. 5



INVENTOR

ANDREW M. DAVID,

BY James M. Drysdale

ATTORNEY

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WALL PLUG AND OUTLET RECEPTACLE

Andrew Mitchell David, Washington, D. C.

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3 Claims. (Cl. 339—155)

My invention relates to electrical connectors and more particularly to a plug and receptacle adapted to readily permit connection of portable electrical appliances to an electric supply circuit. This invention is an improvement of my former patent for Electrical Connector No. 2,236,167 dated March 25, 1941. The improvements over the prior patent more particularly relate to locking, polarity and safety features not disclosed in the patent.

To provide for the ready connection of portable electrical appliances to supply circuits in homes or other buildings, it is the usual practice to provide the appliances with a flexible electric cable to one end of which is secured a connector plug having metal terminals thereon adapted to be inserted into terminal openings in a receptacle which in turn is permanently and stationarily located in the building and is permanently connected to the supply circuit or wiring within the building.

It is an object of this invention to provide a receptacle having means adapted to cooperate with the elongated cylindrical portion of the male member.

Another object of my invention is to provide a novel form of outlet box with a single pronged polarity plug therefor, which is adapted to be readily inserted into the outlet box by the sense of touch, so as not to require illumination of the outlet box in order to insert the plug

Another object of the invention is to provide a novel form of single-pronged plug which is adapted to be inserted in a receptacle in only one position and which provides for spring pressed engagement of the plug contact with the contacts of the receptacle.

A further object of the invention is to provide a novel construction in an outlet box and wall plug which is simple in form, rugged and durable in construction and which may be manufactured commercially at a low cost of production.

Another object of the invention is to provide a plug and receptacle so constructed that the elongated cylindrical portion of the plug has a bevelled or frusto conical portion which when contacting with the front surface of the receptacle constitutes a guide for the plug, automatically aligning the axis of the plug with the center of the receptacle.

A further object of the invention is to provide means for locking the plug to the receptacle in closed circuit position.

Another object of the invention is to provide a novel form of single-pronged plug and receptacle which is polarized so that the current shall always pass in the same direction through the implement energized by the current.

Other objects and advantages of my invention will be apparent from a study of the following specifications, read in connection with the accompanying drawings wherein—

Fig. 1 is a perspective view of the receptacle construction, in accordance with my invention, applied to the usual type of wall receptacle installation.

Fig. 2 is a perspective view of a connector plug constructed in accordance with my invention and adapted for use with the receptacle shown in Fig. 1.

Fig. 3 is a perspective view of the bottom side of the receptacle or the side opposite to that shown in Fig. 1.

Fig. 4 is a side elevation of the receptacle body shown in Fig. 1.

Fig. 5 is a sectional view along the line 5—5 of Fig. 4 showing the internal construction of the receptacle body.

Referring more in detail to the drawing, the numeral 2 designates the outlet box or receptacle of the preferred

form of my invention, the receptacle having a face plate 4 and a body portion 6 which may be integral with the face plate or separable therefrom. The outlet receptacle may be fastened in place in a wall by the usual fastening means such as slotted bracket members 8 and 10 and screws 12 and 14 for fastening the same to the body portion 6 which may be of any suitable insulating material such as plastic or the like.

The face plate and body portion are provided with slotted cylindrical openings 16 and 18 which extend through the face plate and through a portion of the body portion as illustrated in Fig. 5, the lower portion of the cylindrical openings communicating with smaller openings 20 and 22 which communicate with shallow recessed cylindrical openings 24 and 25 at the bottom of the plug as shown in Fig. 3.

Within these shallow recessed openings and surrounding the smaller openings 20 and 22 are resilient spring members 26 and 28 which contact the end terminal 30 of the connector plug 32 when the connector plug is forced into seating position in the cylindrical opening 16.

The connector plug 32 shown in perspective in Fig. 2 is also constructed of plastic or similar insulating material and is provided with an end terminal or contact member 30 which is the extension of one of the wires 34 of the supply circuit. The other wire 36, of the supply circuit terminates in a laterally extending rectangular terminal contact member 38 having a cam surface. On side of and traversing the cylindrical openings 16 and 18 is a longitudinal slot 60 extending parallel to the axis of said openings and adapted to receive the terminal contact member 38. When the cylindrical portion 41 of the connector plug is inserted in one of the cylindrical openings in the correct position the plug being guided by the contact member 38 may be pushed to its lowest position so that the end terminal 30 contacts one of the resilient spring members 26 or 28. The plug is then turned to the right 90 degrees, the contact member 38 then traversing an arcuate groove in the body portion so that the cam surface of the contact member 38 makes contact with one of contacts 40 of the receptacle and the plug is locked to the receptacle in closed circuit position and can not be removed without first turning the plug 90 degrees to the left to properly disengage the plug. Thus the plug shown in Fig. 2 may be defined as a single-pronged plug or a plug having a body portion 31 and single cylindrical stem 41 on which contacts are mounted, as distinguished from the two pronged contacts of the usual double-pronged plug. The said single-pronged plug is further distinguished from the double pronged plug in that the single cylindrical stem terminates in a bevelled or frusto conical portion 42 which when contacting with the front surface of the receptacle constiutes a guide for the plug, automatically aligning the axis of the plug with the center of the receptacle.

The above described single pronged polarity plug is further distinguished from the double pronged plug in that the single stem is of a cylindrical form such that it may be inserted into a stem-receiving opening 16 of the receptacle in only one position of the stem, thus serving as a key by which engagement of the contact 30 of the plug with one of the contacts or resilient spring members 26 or 28 of the receptacle, and engagement of the contact 38 of the plug with one of the contacts 40 of the receptacle may be obtained in only the oriented position of the stem with respect to the opening in the receptacle. Thus it is obvious that the said single pronged plug when inserted into the receptacle has a fixed polarity with direct current, and a fixed grounded phase when used with alternating current.

The connector plug 32 may be constructed, in a well known manner, of complimentary halves held together by means of the screw 44.

The contacts or resilient spring members 26 and 28 are connected to a metallic bar 46 which is firmly secured to the side of the receptacle by means of screws 48 and 50. In like manner the contacts 40 are secured to a metallic bar 52 which is firmly secured to the opposite side of the receptacle by means of screws 54, 56 and as clearly shown in Fig. 4.

Each of the metallic bars 46 and 52 is secured in a recessed portion of a side face of the receptacle thus providing a safety feature against accidental shock due to careless handling of the receptacle. When properly installed the ground or negative wire would contact the rear and the positive wire would contact the side making it impossible for any person to become injured by inserting a metallic object or finger against either of said contacts.

With the construction described above a receptacle is provided with means for positively locking the plug thereto the single pronged plug and receptacle are polarized so that the current shall always pass in the same direction through the implement energized by the current and the safety feature insures against accidental shock. None of these improved features are shown in applicant's prior patent above referred to.

It will be apparent that various changes may be made in the device as will be obvious to those skilled in the art. While I have shown and described the preferred embodiment of my invention, I do not desire to be limited to any of the details of construction shown or described herein, except as defined in the appended claims.

I claim:

1. An outlet receptacle and single-pronged plug for connection to a two wire supply circuit therefor which comprises a body portion of insulating material in said outlet receptacle, a single-pronged plug having a single cylindrical stem having at its end a terminal which is the extension of one of the wires of the supply circuit, a laterally-extending contact member mounted in the stem and comprising the extension of the other wire of the supply circuit, a transverse cylindrical opening extending through a portion of the body portion and communicating with a laterally extending slot having sides adapted to engage the laterally extending contact member, the cylindrical opening then communicating with a smaller opening which communicates with a shallow recessed cylindrical opening, a resilient spring contact member surrounding the smaller opening and mounted within the shallow recessed cylindrical opening and adapted to contact the end terminal of the plug, a second spring contact member mounted adjacent the transverse cylindrical opening and adapted to contact the laterally extending contact member only when the plug is inserted in the socket and rotated said laterally extending contact member providing means for positively locking the plug to the receptacle in the oriented position of the plug.

2. The combination of an outlet receptacle having a body portion and a single pronged plug therefor, a transverse cylindrical opening in the body portion, a longitudinal slot traversing said opening and extending parallel to the axis of said opening a single pronged plug having a single stem adapted to fit into said cylindrical opening, a forwardly extending contact member passing through the end of said stem, a laterally extending contact member mounted in the stem and providing means for positively locking the plug to the receptacle when said plug is inserted into said transverse cylindrical opening and oriented 90° to the right, resilient spring members secured to the opposite side of the receptacle and making contact with said forwardly extending contact member, a metallic bar connected to said resilient spring members and secured to the side of the receptacle, contact members secured to the opposite side of the receptacle and making contact with said laterally extending contact member in the oriented position of the plug, a metallic bar connected to said contact members on the opposite side of the receptacle, each of said metallic bars being secured in a recessed portion of a side face of the receptacle thus providing a safety feature.

3. The combination of an outlet receptacle having a body portion and a cylindrical plug therefor having an end terminal, a transverse cylindrical opening in the body portion of the outlet receptacle, a longitudinal slot on one side of and traversing the cylindrical opening and extending parallel to the axis of said opening, the cylindrical plug adapted to fit into said cylindrical opening, a contact member having a spring plate extension mounted in said body portion adjacent said slot, a laterally extending contact member mounted on said cylindrical plug and making contact with said spring plate extension when said plug is inserted into said transverse cylindrical opening and oriented 90° to the right to effect contact of said spring plate extension and the laterally extending contact member, said laterally extending member and said transverse cylindrical opening communicating with a smaller opening which communicates with a shallow recessed cylindrical opening at the bottom of the plug, a second contact member comprising resilient spring members surrounding the smaller opening and mounted within the shallow recessed cylindrical opening and contacting the end terminal of the connector plug.

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