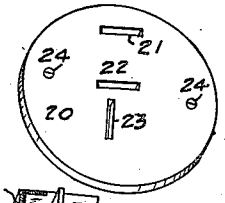
March 25, 1947. M. M. GUERNSEY 2,417,928

ELECTRIC PLUG

Filed Aug. 28, 1945

Fig. 4.



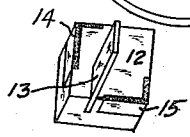
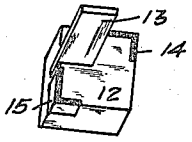


Fig. 2.

Fig. 3



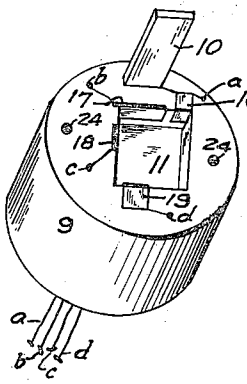


Fig. 1.

Fig. 5.

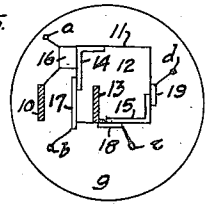


Fig. 7

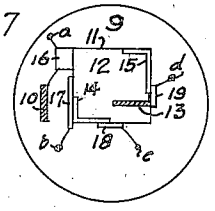


Fig. 6.

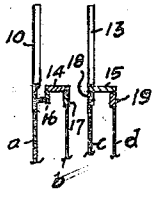
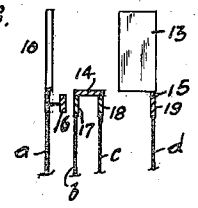


Fig. 8.



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ELECTRIC PLUG

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Application August 28, 1945, Serial No. 613,044

4 Claims. (Cl. 173—361)

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This invention relates to electric plugs, and especially to those adapted to connect a small electric motor to either a 220-volt or a 110-volt circuit, and has for its main object to provide a plug which may be changed for use with one circuit or the other without disconnecting or changing its connections with the motor or changing the motor wiring arrangement.

I attain this and other objects by the devices and arrangements illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of the plug body, the removable parts having been removed therefrom; Fig. 2 is a perspective view of the insert, showing it in the relative position for connecting with the 220-volt circuit; Fig. 3 is a similar view thereof, showing it in the relative position for connecting with the 110-volt circuit; Fig. 4 is a plan of the cover of the plug; Figs. 5 and 6 are diagrammatic plan and elevation views of the plug, with the cover removed, showing the insert in the position for connecting with the 110-volt circuit; and Figs. 7 and 8 are similar views showing the insert in a position for connection with the 220-volt circuit.

Similar numerals of reference refer to similar parts throughout the several views.

Small electric motors are commonly equipped with a terminal box having four terminals therein, connected to suitable parts of the electric circuits therein. These terminal boxes are provided with means for connecting together one or two pairs of such terminals, depending on whether the motor is to be connected to a 220-volt or a 110-volt circuit respectively. The standard outlets for said two circuits differ in that for the 220-volt circuit the slots for the receipt of the plug connecting fingers lie at right-angles to each other while for the 110-volt circuit the slots lie parallel to each other. Therefore, at the present time, when it is desired to change the motor from one circuit to another of a different voltage, it is necessary to rearrange the connections in the terminal box at the motor and also to replace the plug by which it is to be connected to the new circuit with another plug adapted to engage the outlet of the said new circuit.

I have provided a means of eliminating both said steps by connecting each of the four wires in the motor terminal box by separate wires (preferably by a four-wire cord) directly to my improved plug, which is provided with means whereby one such plug finger may be changed from one to the other position relatively to the

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other plug finger, and in so doing the proper pairs of wires are connected together in the improved plug, so that it is only necessary to remove the cover that holds the parts of the plug together to change both the position of the one finger in relation to the other and to effect the necessary changes to the motor wiring, and this is accomplished without the necessity of disconnecting any wiring terminals either at the motor or at the plug.

Referring, now, to the drawings, the main plug body 9 is made of insulating material and is provided with a single fixed vertical contact finger 10 extending out therefrom. This finger 10 is flat in cross-section and is adapted to fit in one of the contact slots in the outlet in the usual manner. The outer face of the body 9 is provided with a square recess or cavity 11 adapted to receive the following described insert 12, said insert being adapted to occupy either one of two positions in said cavity 11.

The insert 12 comprises a square body of insulating material having, at a suitable point therein, the complementary contact finger 13 extending therefrom. This finger 13 is positioned so that it will extend from the plug 9 with its major axis in positions either parallel with or at right-angles to the major axis of the said contact finger 10, depending on the position of the insert 12 in the cavity 11. Two opposite corners of this insert 12 are provided with angular metallic contact plates 14 and 15. As seen in Figs. 2 and 3 the contact plate 15 is electrically connected to the said vertical contact finger 13.

Referring to Fig. 1 it will be observed that the vertical walls of the cavity 11 are provided with four contact plates 16, 17, 18 and 19. Designating the four wires of the cord from the motor as *a*, *b*, *c* and *d* and referring to the diagram in Figs. 5 and 6, the wire *a* is permanently electrically connected to the contact plate 16; the wire *b* to plate 17; the wire *c* to plate 18; and the wire *d* to plate 19. Also the wire *a* is electrically connected through the plate 16 to the fixed contact finger 10.

When the insert 12 is placed, as shown in Fig. 5, for 110-volt circuit, it will be seen that the corner contact plate 14 of the insert touches and thus connects together the two contact plates 16 and 17 in the cavity, and that the contact plate 15, which is connected to the contact finger 13, touches the contact plates 18 and 19 in the cavity, thus it will be observed that the two wires *a* and *b* are connected together by the

contact plate 14 and the two wires *c* and *d* are connected together by the contact plate 15, and that the major cross-sectional axes of the two contact fingers 10 and 13 are parallel with each other.

By removing the insert 12 from the cavity 11 and then turning it through a right-angle and reinserting it into the cavity 11, it will be seen by Figs. 7 and 8 that the corner contact plate 14 of the insert now touches the contact plates 17 and 18, thus the wires *b* and *c* from the motor are connected together, while the wire *a* connects directly with the contact finger 10 and the wire *d* connects through the contact plates 19 and 15 with the contact finger 13, and the major cross-sectional axes of the contact fingers 10 and 13 lie at right-angles to each other.

Thus it will be seen that for the 110-volt circuit, the wires *a* and *b* are combined and act as one while the wires *c* and *d* are similarly combined; while for the 220-volt circuit the wires *b* and *c* are combined. These several wires leading to the proper terminals in the terminal box of the motor enable it to run on either circuit.

Referring now to Fig. 4, the cover 20 is made of insulating material and is provided with two parallel slots 21 and 22 adapted to receive the contact fingers 10 and 13 above described, respectively, when in the positions shown in Fig. 5, and a third slot 23 which is adapted to receive the contact finger 13 when it is in the position shown in Fig. 7. The cover 20 is removably attached to the plug 9 by any suitable means, such as by screws passing through the holes 24 therein to hold the insert and the contact fingers 10 and 13 in their proper positions. Thus, all that is necessary to do in changing the voltage of the circuit to which the motor is to be plugged, is to first remove the cover 20, then change the position of the insert 12, and then replace the cover 20.

Thus I have provided a plug which is permanently attached to the four wires *a*, *b*, *c* and *d*, which are extensions of the motor wiring to the terminal box, and which is provided with a fixed contact finger 10 and a movable contact finger 13; which may be easily shifted from one position to the other; and which is held in such position by the cover 20 until it is again desired to shift it back to its first position.

It is, of course, understood that changes may be made in the construction of my improved plug without departing from the spirit of my invention as outlined in the appended claims.

Having described my invention, what I claim and desire to secure by Letters Patent, is:

1. In an electric plug having a number of circuit wires connected thereto and leading therefrom and adapted to be connected to either of

two circuits of different voltages, comprising a fixed contact finger mounted on the plug and in constant connection with one of said circuit wires; a movable body mounted on the plug; a second contact finger mounted on said movable body; fixed plates mounted on said plug adjacent to said body and connected to said circuit wires; and plates mounted on said body and adapted to contact the plates mounted on the plug one said plate being connected to said second contact finger, whereby when said second contact finger is in one position said plates on said body contact certain plates on the plug and when said second contact finger is in its other position said plates on said body contact other plates on the plug.

2. In an electric plug, having a number of circuit wires attached thereto and leading therefrom, the combination of an insulating body; a fixed contact finger extending therefrom and electrically connected to one said circuit wire; a cavity in the end of said plug; an equal number of contact plates mounted in the sides of said cavity and each electrically connected to its corresponding circuit wire; an insert of insulating material adapted to fit in said cavity; a complementary contact finger mounted on said insert and extending therefrom and adapted to cooperate with said fixed contact finger for insertion in an electric outlet; and two contact plates mounted on the sides of said insert and adapted to contact said contact plates in said cavity, one of said two contact plates being connected to said second contact finger.

3. An electric plug as set forth in claim 2, wherein said cavity is square and wherein said insert may be placed therein in either of two positions, whereby the relative positions of said two contact fingers may be changed, and whereby the contacts between the plates on the insert and in the cavity are changed.

4. An electric plug as set forth in claim 2, together with a cover removably secured to the end of the plug and adapted to hold said insert in said cavity.

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