

Oct. 9, 1951

K. F. FERGUSON

2,570,784

ADJUSTABLE ELECTRIC PLUG

Filed July 23, 1948

2 Sheets-Sheet 1

Fig. 1.

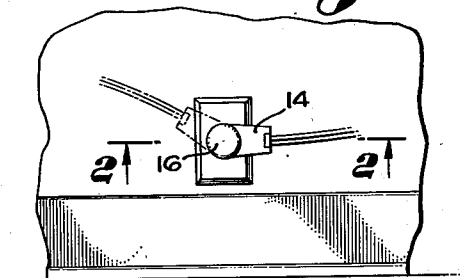


Fig. 2.

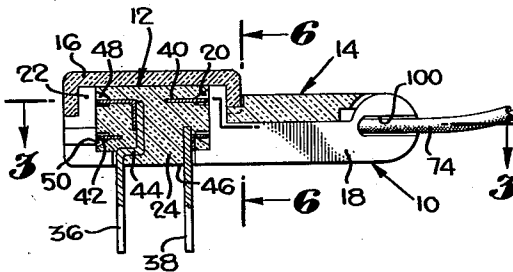


Fig. 3.

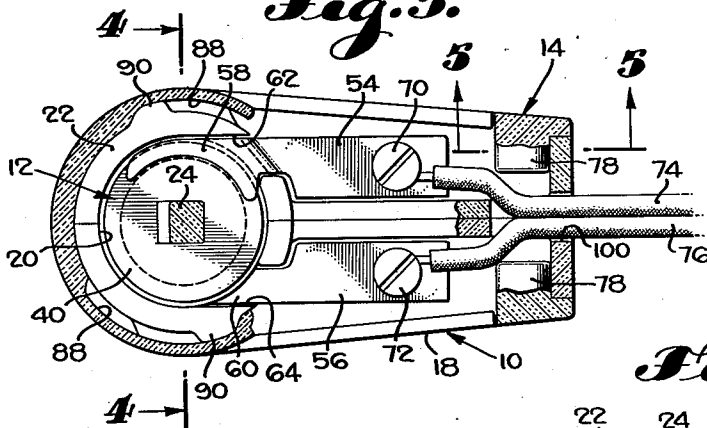


Fig. 5.

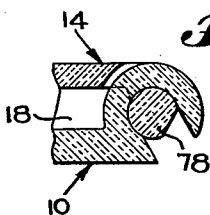


Fig. 4.

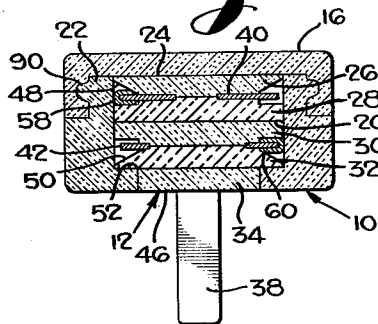
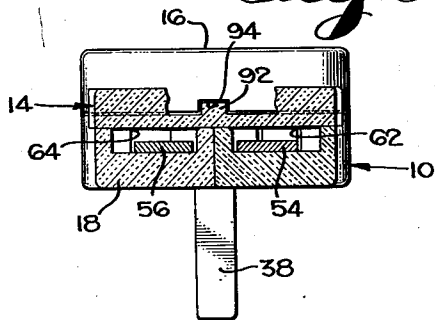


Fig. 6.



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2 Sheets-Sheet 2

Fig. 7.

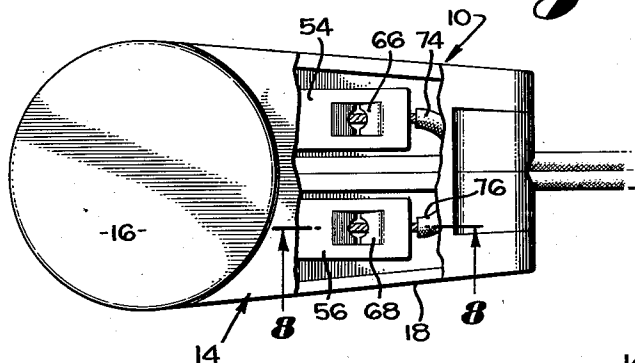


Fig. 8.

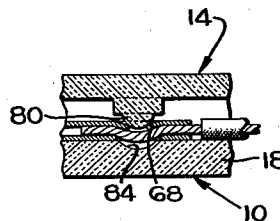


Fig. 9.

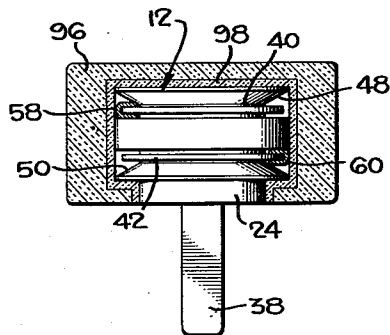
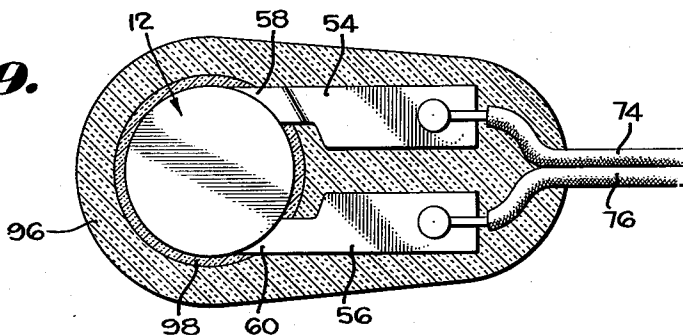


Fig. 10.

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UNITED STATES PATENT OFFICE

2,570,784

ADJUSTABLE ELECTRIC PLUG

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2 Claims. (Cl. 173—324)

1

My invention relates to improvements in electrical plugs, and more specifically to an adjustable male plug.

The primary object of my invention is to provide a male plug which can be plugged into an ordinary 110 volt outlet, or a larger outlet when constructed proportionally larger, and then can be rotated in a plane substantially perpendicular to the plug prongs to the position which is most satisfactory, thus greatly reducing wear and tear on the plug end of the wires or cord used.

Another object of my invention is to provide an adjustable plug of the character described which firmly clamps the ends of the connecting wires without the use of metal clamps, screws, or nuts and bolts.

Another object of my invention is to provide an adjustable plug of the character described which does not use metal clamps, screws, or nuts and bolts to fasten the body portions together.

A further object of my invention is to provide a device of the character described which is relatively flat and sturdy, being more attractive and involving a fewer number of parts than the usual device of this character.

Other objects and advantages of this invention will be apparent from the following description and claims, the novelty consisting in the features of construction, combination of parts, the unique relations of the members and the relative proportioning, disposition and operation thereof, all as more completely outlined herein and particularly pointed out in the appended claims.

In the accompanying drawings, forming a part of the present specification,

Figure 1 is a plan view showing my assembled male plug in operative position in a wall socket.

Figure 2 is a section along the line 2—2 in Figure 1.

Figure 3 is a section along the line 3—3 in Figure 2 showing the conventional means for locking the wire ends in the plug.

Figure 4 is a section along the line 4—4 in Figure 3 showing the distributing discs and the pickup members.

Figure 5 is a section along the line 5—5 in Figure 3 showing the hinge joining the top member to the cap member.

Figure 6 is a section along the line 6—6 in Figure 2 showing the means for locking the cap member into position on the body member in completing the assemblage of my plug.

Figure 7 is a plan view partly in section showing my novel means for locking the wire ends in the pickup members of the plug.

2

Figure 8 is a section along the line 8—8 in Figure 7 showing my novel means for locking the wire ends in the plug.

Figure 9 is a longitudinal section view showing an alternative embodiment of my plug which contains no replaceable parts.

Figure 10 is a transverse sectional view of the alternative embodiment shown in Figure 9 to show how the rotor is incased in the body member.

Referring to the drawings, the preferred embodiment of my invention comprises four main parts composed of plastic or other suitable insulating material, a body member 10, a rotor 12, a top member 14 and a cap or locking member 16. The body member 10 is provided with a shank section 18 and a recess 20, which recess substantially conforms to the shape of the walls of the said rotor 12. The upper part of the recess 20 forms the inner wall of cylindrical section 22 of the body member 10.

The rotor 12 comprises plastic portion 24, copper or brass prongs 36 and 38, and copper or brass distributing discs 40 and 42. The plastic portion 24 may comprise five separate discs 26, 28, 30, 32 and 34 of substantially equal thickness which are glued or otherwise fastened together, or may be molded in one piece. If the plastic portion is composed of five separate discs, the said distributing discs 40 and 42 may be disposed between two pairs of these plastic discs, the distributing disc 40 being disposed between the discs 26 and 28, and the distributing disc 42 being disposed between the discs 30 and 32. By composing the rotor 12 of such discs the section 44 of the prong 36, which section is perpendicular to the axis of rotation of the rotor 12, can be disposed between the discs 32 and 34, both prongs being readily disposed on the plastic portion 24. If the plastic portion 24 is molded, the prongs 36 and 38 and the distributing discs 40 and 42 are held in their proper relative positions and are secured in the plastic portion 24 during the molding process. The prongs 36 and 38 are disposed in the bottom end 46 of the plastic portion 24, being parallel with the axis of rotation of the rotor and the standard distance of substantially one-half inch apart.

The distributing discs 40 and 42 are longitudinally disposed along the axis of rotation of the rotor, being displaced from each other a distance of about one-quarter of an inch. The circumference of the said distributing discs 40 and 42 are substantially the same as the greatest circumference of the plastic portion 24, there being

3

grooves 48 and 50 in the plastic portion 24 whereby about one-eighth of an inch of both faces of each of the distributing discs is radially exposed around the peripheries.

The rotor 12 lies in the recess 20 so that the surface of the bottom end 46 of the rotor 12 contacts the shoulder 52 of the body member 10, the rotor 12 being free to rotate in the recess 20.

Pickup members 54 and 56 are disposed in the body portion 10 so that the ends 58 and 60 thereof contact the distributing discs 40 and 42 respectively, as shown in Figures 3, 4 and 10. The pickup members 54 and 56 are made of sheet brass or copper folded double. The double folds of the contact ends or brushes 58 and 60 of the pickup members 54 and 56 permit the contact ends or brushes 58 and 60 to contact both faces of each of the respective distributing discs 40 and 42 around the peripheries of the distributing discs 40 and 42, providing an excellent electrical contact which is undeviated as the rotor moves. Slots 62 and 64 in the wall of the cylindrical section 22 of the body portion 10 enable the respective pickup members 54 and 56 to extend from the rotor 12 into the shank section 18 of the body member 10.

Locking terminals 66 and 68 are associated with the respective pickup members 54 and 56, the locking terminals 66 and 68 being holes and slits punched into the pickup members in the preferred embodiment of my invention as illustrated in Figure 7. These locking terminals 66 and 68 may alternatively be conventional screws 70 and 72, about which the respective wires 74 and 76 are wrapped as illustrated in Figure 3.

The top member 14 is pivotally attached to the body member 10 by means of hinge 78. Two raised sections 80 are provided in the top member 14 in the preferred embodiment of my invention. These raised sections 80 register with the locking terminals 66 and 68 when the top member 14 is in the closed position. The raised sections 80 press the wires 74 and 76 and the locking terminals 66 and 68 down into the recesses 84 in the body member 10, the said wires being above the said locking terminals, whereby the wires are firmly secured to the plug without the usual necessity of wrapping the wires around a screw and screwing up the screw which is very inconvenient and usually requires the ends of the wires to be soldered in order to provide a good firm connection.

The cap or locking member 16 is hollow and is provided with grooves 88 in its inner cylindrical wall. Large threads 90 are provided in the outer wall of the cylindrical section 22 of the body member 10, whereby the cap member 16 can be screwed on to the cylindrical section 22, holding the rotor 12 in movable position in the recess 20 of the body member 10 and the top member 14 in its closed relation to the body member 10. The axis of rotation of the cap member 16 generally conforms to the axis of rotation of the rotor 12. The top member 14 is provided with a raised section 92 and the cap member is provided with a slot 94, and this raised section 92 and slot 94 lock the cap member 16 tightly into position on the body member 10 by registry with each other when the cap member 16 is tightly screwed on to the body member 10. The large size of the threads 90 and the grooves 88, coupled with a certain amount of flexibility in the material used in the body member 10 and the cap member 16 enable the cap member to fit tightly on the body member after the raised section 92 has fallen into the slot

4

94. We shall hereafter refer to this combination of the body member 10, the top member 14 and the cap member 16, all in fixed relation to each other, as the casing.

The previously mentioned alternative construction which makes use of screws 70 and 72 instead of locking terminals 66 and 68 does not include any recesses 84 or raised sections 80. Otherwise this alternative construction is identical to the preferred embodiment.

The second alternative construction shown in Figures 9 and 10 is the same as the preferred embodiment except that the wires are riveted to the pickup members, and the body member, the top member and the cap member are all included in a single molded member 96. A jacket 98 is placed around the rotor to allow free rotary movement of the latter. There are no replaceable parts in this embodiment, and it is generally used when the plug is sold already attached to the wires, this embodiment being of course more sturdy than those having replaceable parts.

In general the preferred embodiment of my device is operated in the following way: The cap member 16 is unscrewed from the body member 10 and, after it has been removed, the hinged top member 14 is folded upward out of the way.

Then the wires 74 and 76 are fed together through the passage 100 in the hinge 78 and are spread apart, the end of each of the wires being placed on top of its respective locking terminal. Then the hinged top member 14 is lowered whereby each of the raised sections 80 engages the top of the respective wire end thereunder, each of the said raised sections mashing a wire end together with its respective locking terminal down into its corresponding recess 84, whereby the wires are securely locked to the plug. The hinged top member 14 is then held down in place in its gripping relation to the body member 10 by means of the cap member 16, which is screwed onto the body member 10 and secured in place by registry of the raised section 92 and the slot 94. It should be pointed out that although the passage 100 is substantially perpendicular to the axis of rotation of the rotor 12 in the preferred embodiment of my invention, the passage can be so disposed as to make any other suitable angle with the axis of rotation of the rotor.

The completely assembled plug with the wires attached thereto can then be plugged into an ordinary 110 volt socket and used. In use, the prongs 36 and 38, and hence the rotor 12 remain in stationary relation to the socket into which the said prongs are inserted and all of the rest of the unit can be rotated 360 degrees around the rotor, thus greatly reducing wear and tear on the plug end of the wires or cord used.

It is to be understood that the form of my invention herein shown and described is my preferred embodiment and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the appended claims.

I claim:

1. An adjustable electrical plug comprising a body member having a hollow cylindrical portion and a shank portion extending radially outwardly from said cylindrical portion, said shank portion having a pair of cavities extending longitudinally thereof and communicating with the hollow interior of said cylindrical portion, a rotor rotatable in said cylindrical portion, a pair of longitudinally spaced annular grooves in the

5

periphery of said rotor, a pair of distributing discs fixed in said rotor with the periphery of one disc being exposed in each of said grooves, a pick up member positioned in each of said cavities and extending into brushing engagement with one of said discs, said pick up members being of U-shape in cross section and straddling the exposed peripheries of their respective discs, means for connecting an electrical conductor to the outer end of each of said pick up members, and a pair of prongs projecting from said rotor parallel to the axis thereof with one prong being connected to each of said discs.

2. An adjustable electrical plug comprising a body member having a hollow cylindrical portion and a shank portion extending radially outwardly from said cylindrical portion, a rotor rotatable in said cylindrical portion, said cylindrical portion having an annular shoulder in one end thereof limiting axial movement of said rotor in one direction, a pair of distributing discs fixed in said rotor, a pair of pick up members positioned longitudinally of said shank portion and extending into brushing engagement with said discs, a top member hinged to said shank portion at the outer end thereof and covering

6

said pick up members, a cap member removably secured on the end of said cylindrical portion opposite said shoulder for retaining said rotor in said cylindrical portion, the periphery of said cap member engaging the inner end of said top member to retain the same in position to cover said pick up members, and a pair of prongs projecting from the end of said rotor adjacent said shoulder and parallel to the axis of the rotor with one prong being connected to each of said discs.

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