Dec. 3, 1968 R. BISZKO 3,414,870

ELECTRICAL PLUG

Filed Aug. 2, 1966

Fig. 1.

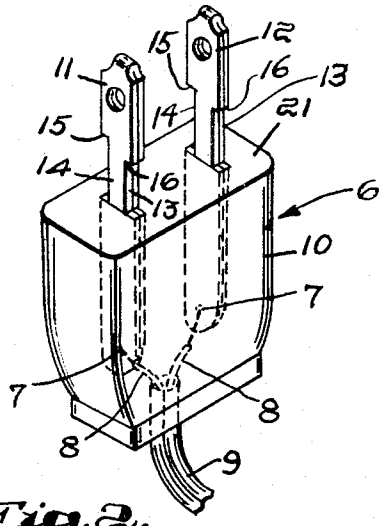


Fig. 2.

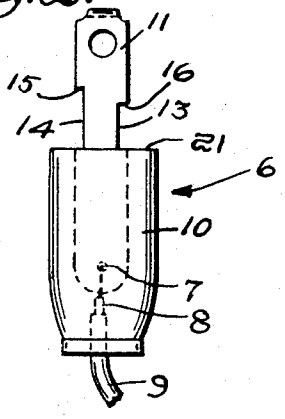
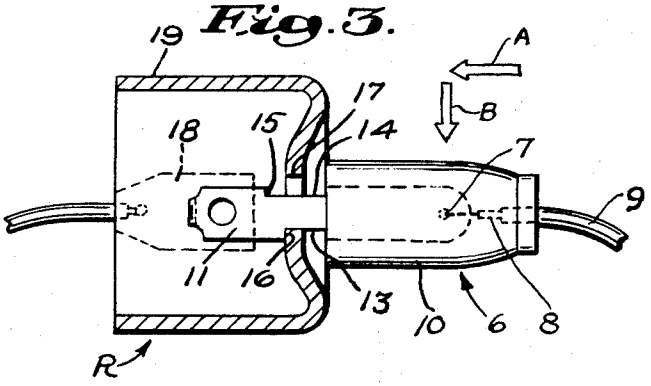


Fig. 3.



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ELECTRICAL PLUG

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Continuation-in-part of application Ser. No. 494,135, Oct. 8, 1965. This application Aug. 2, 1966, Ser. No. 569,721

5 Claims. (Cl. 339—195)

This invention, which is a continuation-in-part of Ser. No. 494,135, filed Oct. 8, 1965, now abandoned, relates to an improved electrical plug connection of the type commonly used with appliances such as toasters, irons, vacuum cleaners, etc., and more particularly to an electrical plug that can be locked into a receptacle to avoid accidental disconnection.

Ordinarily, electrical plugs are designed with conductive prongs which are arranged to frictionally engage resilient contacts in a receptacle. Such plugs are held in place solely by the frictional engagement between the prongs and the receptacle contacts. However, this frictional engagement is usually not sufficiently effective to prevent the plug from becoming accidently disconnected when a pull is exerted on the insulated wire leading from the plug to the appliance being used.

A number of attempts have been made to resolve this problem, but to date none have proved satisfactory. For example, some prior art plugs have been provided with notches on the prongs, the notches being designed to mechanically engage the receptacle walls. However, in order to place such notches in operative engagement with the receptacle, it has heretofore been necessary to provide the plug with a resilient body which can be squeezed together to facilitate insertion of the prongs into the receptacle. Thereafter, the plug walls are allowed to "spring back," thus allowing the prongs to locate themselves in locked engagement with the receptacle wall. Plugs of this type are relatively expensive to manufacture and in many cases, are not readily adaptable for use with conventional receptacles. Moreover, in order to disconnect plugs of this type, it is necessary to first squeeze the resilient plug walls together to disengage the prongs from their locked positions. This particular feature can prove dangerous, particularly when an operative emergency is encountered requiring quick disconnection.

It is therefore an object of the present invention to provide an improved electrical plug construction wherein means associated with the conductive prongs are provided for quickly and efficiently placing the plug in locked engagement with a conventional receptacle.

Another object of the present invention is to provide an electrical plug which may easily be removed from the receptacle in the case of an emergency.

A further object of the present invention is to provide a plug construction which is simple and inexpensive to manufacture and which can be employed with any conventional receptacle.

These and other objects of the present invention will become more apparent as the description proceeds with the aid of the accompanying drawings in which:

FIG. 1 is a perspective view of an electric plug embodying the concepts of the present invention;

FIG. 2 is a side elevational view of the plug shown in FIG. 1; and

FIG. 3 is a view partially in section showing the plug inserted and locked in a conventional receptacle.

Referring initially to FIGS. 1 and 2 wherein are best shown general features of the invention, an electrical plug **6** is shown comprised basically of a plug body **10** having two substantially parallel electrically conductive prongs **11** and **12** extending outwardly therefrom. The prongs, which may be attached by any known manner

to the plug body, are each connected at one end as at **7** to the leads **8** of an insulated cord **9**. The foregoing is descriptive of conventional plug constructions and is not considered as part of the present invention.

One edge of each of the prongs **11** and **12** is provided with a locking notch **13** which extends from the face **21** of the plug body **10** to a shoulder **16**. The opposite edge of each prong may be similarly provided with a second locking notch **14** which terminates in a shoulder **15**.

The purpose served by the locking notches **14** and **15** will now be described in detail by further reference to FIG. 3 which includes a sectional view of a conventional receptacle assembly R. The receptacle includes a wall **19** enclosing resilient contacts **18** (only one of which is shown), the latter being connected in a conventional manner to a power source. As shown in FIG. 3, the plug **6** is in locked operative engagement with receptacle R. This engagement is achieved by the following procedure: first, the prongs **11** and **12** of plug **6** are inserted axially into spaced slots **17** located in the front face of receptacle wall **19**. The direction of initial insertion is indicated diagrammatically by the arrow A, it being understood that the width of the unnotched prong portions is slightly less than the width of slots **17**. When fully inserted, the prongs are in frictional engagement with the contacts **18**. Once fully inserted, plug **6** is then pressed downwardly in a transverse direction indicated diagrammatically by the arrow B. This transverse movement causes the bottom edge of each wall slot **17** to enter into the locking notches **13** and thus become mechanically engaged against the shoulders **16**. Such mechanical engagement effectively prevents the plug from accidentally being withdrawn from the receptacle in a direction opposite to that of arrow A without first being transversely raised to disengage the notches **13** from the front face of the receptacle wall.

In some instances, the distance between the contacts **18** and the front face of receptacle wall **19** may be much less than that shown in FIG. 3. Under these circumstances, the plug **6** may simply be rotated 180° prior to insertion in order to permit placement of the lower notches **14** in locked engagement, thus avoiding the danger of damaging the receptacle contacts **18** by over-insertion of the prongs **11** and **12**. The manner of locking the plug into place when using notches **14** is, however, identical to that previously described in connection with notches **13**.

The above-described construction provides several significant advantages over prior art plug constructions. To begin with, the locked engagement afforded by the notched prongs **11** and **12** effectively prevents accidental disconnection of the plug from the receptacle during normal operation. This locking engagement is made possible without resorting to expensive specially constructed plug bodies, and thus avoids undue expenditures. An important advantage also lies in the fact that by grasping the cord **9** and simply moving it rapidly up and down, the prongs **11** and **12** will be displaced in a transverse direction, thus causing the locking notches **13** (or **14** if such be the case) to become disengaged. Once this has been accomplished, the plug may simply be withdrawn from the receptacle by pulling on cord **9**. This feature avoids the necessity of grasping the plug itself and in some instances when an operative emergency is encountered, may be of considerable importance.

Finally, it is important to note that a plug constructed in accordance with the foregoing description may be employed with all types of conventional receptacles, as opposed to some prior art constructions which require both the plug and receptacle to be specially constructed.

It is my intention to cover all changes and modifications of the embodiment herein described which do not depart from the spirit and scope of the invention.

I claim:

1. An electrical plug construction comprising in combination: a plug body; at least two electrically conductive prongs extending outwardly in a substantially parallel relationship from said plug body, said prongs being adapted for axial insertion through suitably spaced slots in the wall of a conventional electrical receptacle, and locking means on said prongs for cooperating with said wall to prevent removal in a reverse axial direction of said prongs from said receptacle, said locking means being operatively engaged with said wall by transverse displacement of said plug relative to said receptacle.

2. The apparatus as set forth in claim 1 wherein said locking means is comprised of a locking notch on one edge of each said prongs, said notches terminating in shoulders adapted to engage the wall of said receptacle upon transverse displacement of said plug.

3. The apparatus as set forth in claim 2 further characterized by an additional notch on the opposite edge of each said prongs.

4. The apparatus as set forth in claim 3 wherein the notches on each said prongs are of different lengths.

5. The apparatus as set forth in claim 4 further characterized by said plug body being fabricated of a dielectric rigid substance.

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