Nov. 4, 1941. L. CORNWELL 2,261,615

ELECTRICAL CONNECTOR

Filed May 20, 1939

FIG. 1

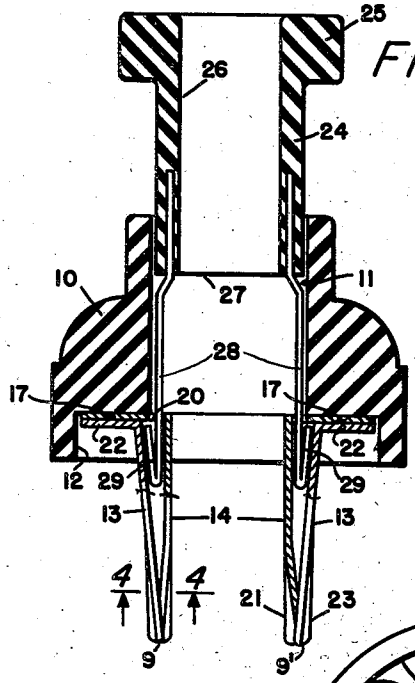


FIG. 2

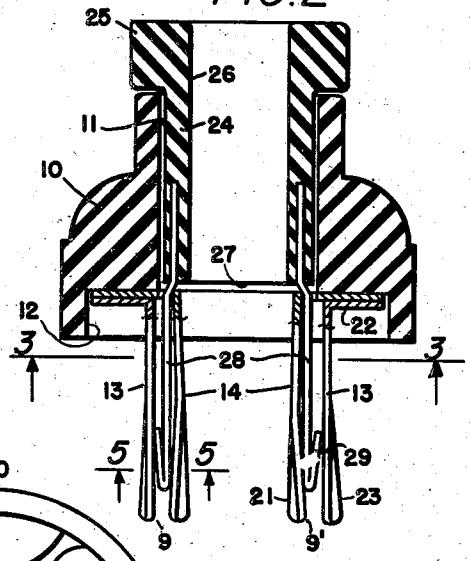


FIG. 3

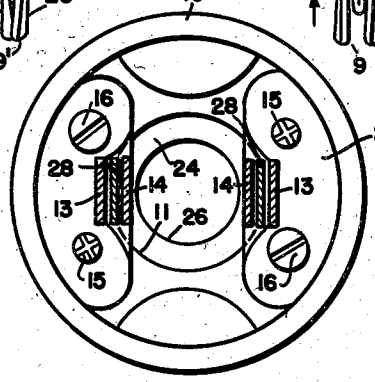


FIG. 7

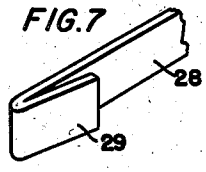
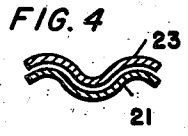


FIG. 4



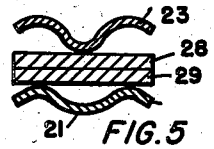
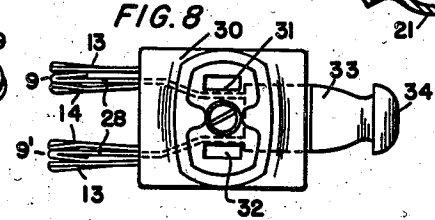


FIG. 5

FIG. 8



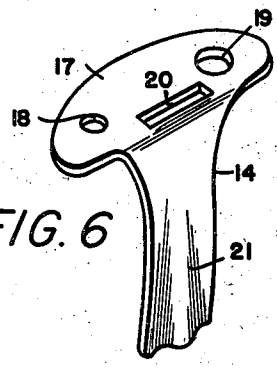


FIG. 6

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ELECTRICAL CONNECTOR

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Application May 20, 1939, Serial No. 274,752

5 Claims. (Cl. 173—361)

My present invention relates to improvements in electrical connectors for use in connection with electrical cord plugs in their attachment in suitable outlet sockets.

An important object of the invention has been the provision of an electric connector which can be positively secured in an electrical outlet so that the connector cannot be accidentally removed therefrom.

Another object of the invention has been to provide an electric connector embodying an improved construction and simple operation so that the minimum number of parts are used, to the end that the electrical connector can be simply manufactured and easily assembled and, by having a minimum number of operating parts, be insured of long life and be practical in use.

A still further object is the provision of means for positively securing a multiple outlet plug in the conventional outlet.

Other objects and advantages of the invention will be apparent during the course of the following description, where the construction and operation of the device and arrangement of parts is more fully set forth and described in the subjoined claims.

In the accompanying drawing forming a part of this specification, and in which like numerals indicate like parts throughout the same:

Figure 1 is a longitudinal sectional view through the plug of my invention showing it in the extended position,

Figure 2 is a similar view illustrating the connector in its locking position,

Figure 3 is a planned view with portions in sections taken on line 3—3 of Figure 2,

Figure 4 is a sectional view through the spring fingers of my connector taken on line 4—4 of Figure 1,

Figure 5 is a similar sectional view taken on line 5—5 of Figure 2,

Figure 6 is a view in perspective of one of the spring fingers of my connector,

Figure 7 is a perspective view of a portion of the spreader prong used in connection with my device, and

Figure 8 illustrates a modified form of the invention as used in connection with a multiple outlet plug.

In the drawing, wherein for the purpose of illustration of my invention is shown a preferred embodiment and a modified form thereof, the numeral 10 designates a plug body which may be formed of any suitable insulating material. A central passage 11 passes longitudinally through the body 10 and widens out on the lower face to form the depression 12. Contactor members 9 and 9' each comprise a pair of spring fingers 13 and 14 secured in the depression 12 by means of rivets 15—15, and they are provided with terminal screws 16—16.

The spring finger 14 has a mounting flange 17 extending at right angles from the upper end of the finger, and this flange is secured in the depression 12 of the head 10, as shown in the drawing, by means of the rivet 15 and the terminal screw 16. For the purpose of receiving the rivet and the screw the flange is provided with a rivet hole 18 and a screw hole 19. I also form a slot 20 in the flange 17 adjacent the angle formed by the juncture of the finger 14 and the flange 17.

The lower end of the finger 14 is provided with graduated corrugations as 21 which are formed by distorting the metal into a compound ogee curve, as may be seen in Figures 4 and 5. These corrugations extend upward in the finger 14, gradually tapering in to the flat body of the finger.

The spring finger 13 is also provided with a flange 22 and has means for receiving and being secured by the rivet 15 and the screw 16. The lower end of the finger 13 has graduated corrugations 23 complementary to those in the finger 14.

When the spring fingers 13 and 14 are distorted from their normally compressed position, as shown in Figures 1 and 4, to the expanded position shown in Figures 2 and 5, it will be apparent that the fingers form a dovetail-shaped element as 9' which firmly and positively grips the contact elements interior of the plug-receiving socket of a conventional outlet.

Within the passage 11 I insert a sliding tube 24 which has a knob 25 upon its upper outer periphery, and a central passage 26 for the reception of the electric cord to which the plug is to be attached. Extending from the lower face 27 of the tube 24 are a pair of resilient spreader prongs 28—28. The lower ends of the prongs have a portion 29 which is a part of the prong bent back upon itself and permitted to stand out at a slight angle from the main body of the prong.

In the modified form shown in Figure 8, the plug body 30 is provided with a multiple number of plug receiving sockets 31 and 32 and has the usual spring fingers 13 and 14. Interior contact plates (not shown) communicate between the inner ends of the spring fingers 13 and 14 and the openings 31 and 32 so that when an electrical connector is inserted into the sockets 31 and 32, a secure contact will be made.

Within the body 30 I provide a sliding member 33 having a handle 34, and upon the lower end of the member 33 is a pair of spreaders 28 as previously described.

In assembling the plug, the sliding tube with its depending prongs 28 is inserted into the pas-

sage 11, the lower ends of the prongs being passed through slots 20 in the flanges of the spring fingers 14, as may best be seen in Figure 1. Due to the resiliency of the element 29, and the fact that the slot 20 is substantially twice the thickness of the prong 28, or equal to the thickness of the elements 28 and 29, when element 29 is compressed against element 28, the ends of the prongs may be passed through the slot 20, and the natural resiliency will cause element 29 to expand after insertion in the slot, as shown in the drawing, between the prongs 13 and 14. By pressing the tube 24 downward into the passage 11, its travel being limited by the knob 25, the spring fingers 13 and 14 are caused to be spread apart or flexed, as shown in Figure 2, so that they more securely grip the inside faces and contact elements of the conventional outlet plug slots. The corrugations 21 and 23 materially assist in gripping the interior of the plug slots and assure a positive grip which cannot be displaced through the ordinary manipulations of the cord, as when used in connection with a power tool or extension lamp.

To electrically connect a conductor cord to the prongs of my electrical connector, one end is passed through the opening 26 of the tube 24 and through the opening between the prongs 14, and the terminal ends of the cord, which have previously been bared, will be passed around the screws 16—16 and securely tightened under the heads of the screws to effect a connection in the usual manner.

When it is desired to use the plug the spring fingers are inserted into the electrical outlet with the prongs 28 withdrawn as in Figure 1, and when the contactors are properly seated, pressure upon the handle knob 25 forces the spreaders 28 between the fingers 13 and 14 to flex them and securely grip the outlet sockets.

To remove the plug one merely grasps the knob 25, withdraws the tube 24 upwardly in the passage 11 to permit the spring fingers 13 and 14 to contract against each other as shown in Figure 4, and the connector is then free to be removed. The rearward travel of the tube is limited by the extending ends of elements 29 abutting against the under side of the flanges 17.

In the modified form of Figure 8 no cord is utilized, the object of the device being merely to provide a multiplicity of plug receiving outlets, such as a "two-way" or multiple outlet plug. In the usual manner, the spring fingers 13 and 14 are inserted into the sockets of the outlet and the member 33 pressed downwardly toward the body 30 of the plug so that the spreaders 28—28 will spread the spring fingers and cause them to securely grip the interior face of the outlet sockets. The construction of the body 30 is substantially the same as the body 10.

My invention is not to be limited by the drawing to electrical connectors employing a pair of contactor members, as 9 and 9', as it is possible by the use of the principles of my invention to provide a connector having three or more contactor members.

It is to be understood that the form of the invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size, material and general arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

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

1. An electrical connector comprising a plug body having a central longitudinal opening, contactor members on said body each comprising a pair of resilient fingers, a tube telescopically slidable in said opening, prongs on the tube interposed between the pairs of resilient fingers to flex said fingers upon inward movement of the slidable tube, each of said prongs having a shoulder portion on its outer end cooperable to flex the resilient fingers on inward movement of the slidable end and to limit outward movement of the slidable tube, and an electrical conductor cord inserted through said tube and said central body opening and having its terminals fixed to said contactor members.

2. An electrical connector comprising a plug body having a central longitudinal opening, contactor members on said body each comprising a pair of resilient fingers having complementary corrugations on their outer ends, a tube telescopically slidable in said opening, prongs on the tube interposed between the pairs of resilient fingers and cooperable with the corrugations to flex said fingers upon inward movement of the slidable tube, each of said prongs having a shoulder portion on its outer end cooperable to flex the resilient fingers on inward movement of the slidable end and to limit outward movement of the slidable tube, and an electrical conductor cord inserted through said tube and said central body opening and having its terminals fixed to said contactor members.

3. An electrical connector comprising a plug body having a central longitudinal opening, contactor members on said body each comprising a pair of resilient fingers having attaching flanges, one flange of each pair being provided with a slot adjacent the juncture with the finger, a tube telescopically slidable in said opening, prongs on the tube passing through said slot and interposed between the pairs of resilient fingers, said prongs having flared end portions to flex the resilient fingers upon inward movement of the slidable tube and cooperable with the slotted flange to limit outward movement of the slidable tube, and an electrical conductor cord inserted through said tube and said central body opening and having its terminals fixed to said contactor members.

4. In an electrical connection of the type in which a member having flexure prongs slides in a plug body to flex resilient fingers carried by the plug body to thereby grip the inner contacts of an outlet receptacle; stop and flexure means comprising an abutment adjacent each aperture in the body through which passes a flexure prong, and a member on each said prong operable to flex the resilient fingers associated therewith upon inward movement of the prongs and cooperable with the adjacent abutment to limit outward movement of the prongs.

5. In an electrical connector of the type in which a member having flexure prongs slides in a plug body to flex resilient fingers carried by the plug body to thereby grip the inner contacts of an outlet receptacle; abutment means adjacent the base of the resilient fingers, and a barb on said prongs disposed to flex said resilient fingers upon inward movement and cooperable with said abutment means to limit outward movement.

LEROY CORNWELL.