

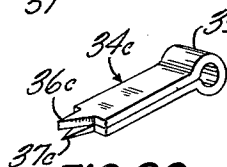
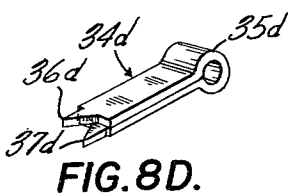
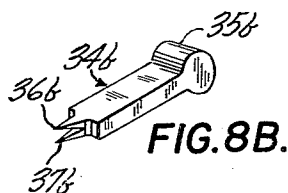
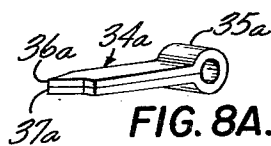
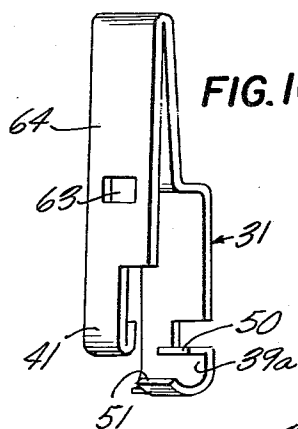
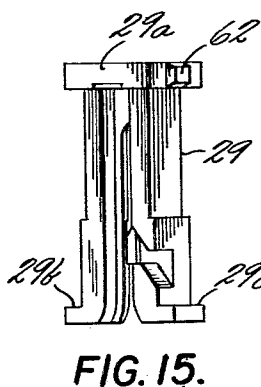
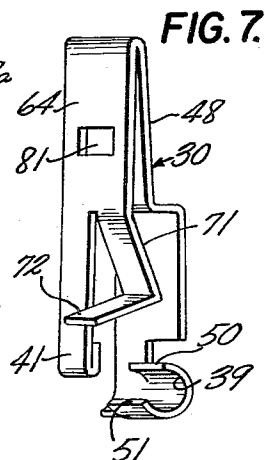
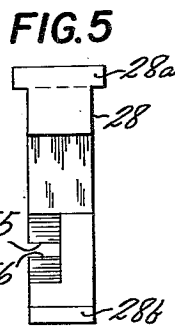
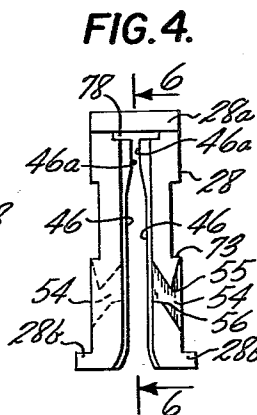
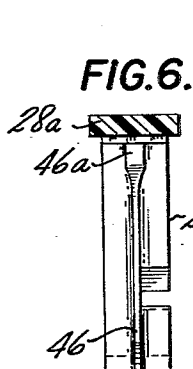
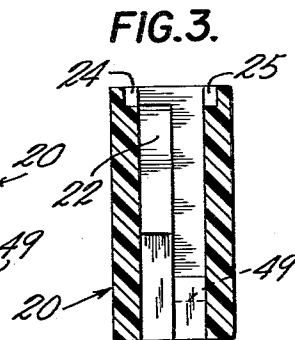
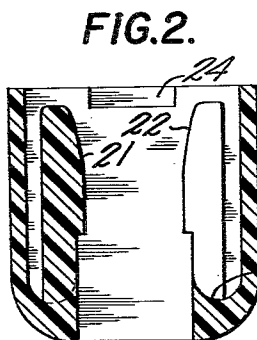
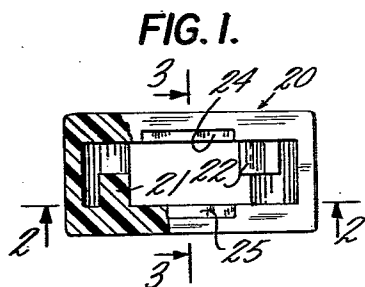
Oct. 22, 1957

H. L. KERR
ELECTRIC PLUG

2,810,894

Filed Aug. 2, 1954

2 Sheets-Sheet 1



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ELECTRIC PLUG

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2 Sheets-Sheet 2

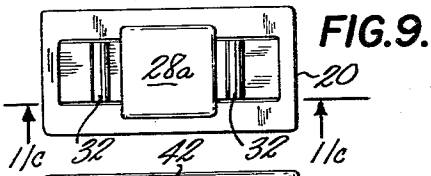


FIG. 9.

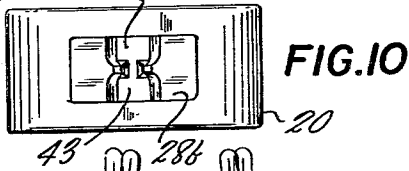


FIG. 10



FIG. 12.

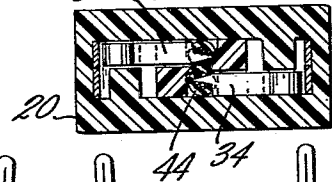


FIG. 13.

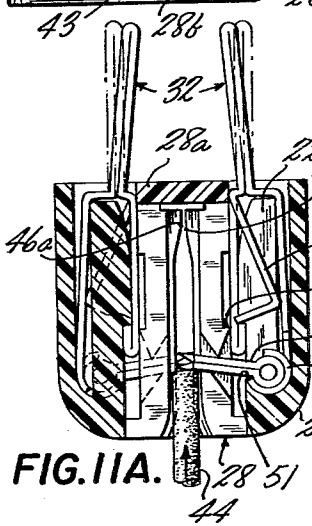


FIG. 11A.

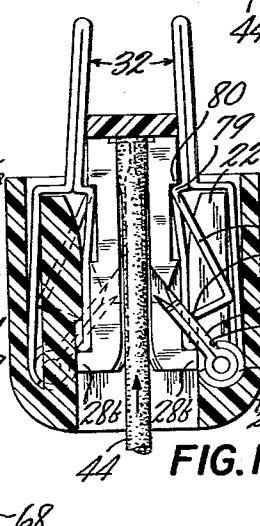


FIG. 11B.

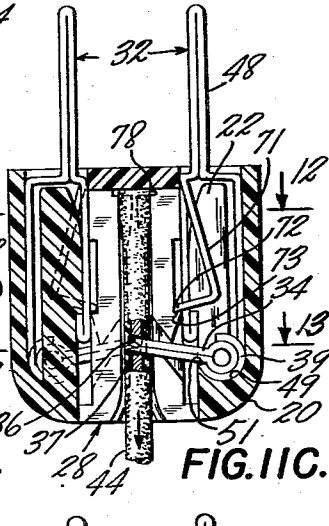


FIG. 11C.

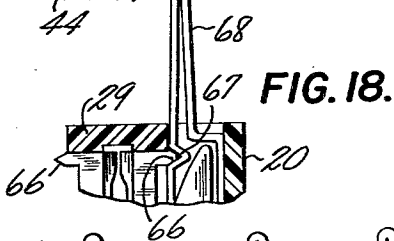


FIG. 18.

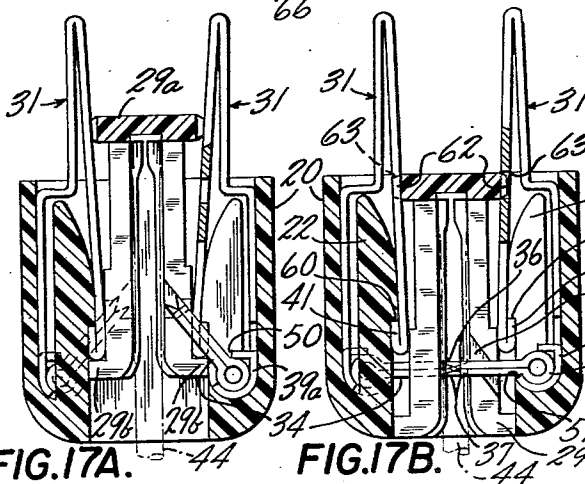


FIG. 17A.

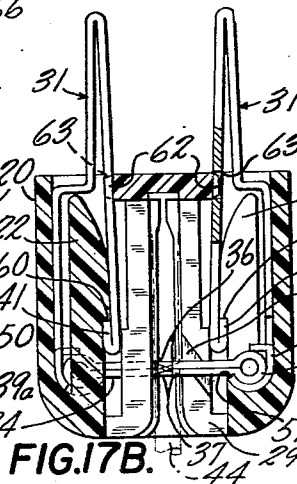


FIG. 17B.

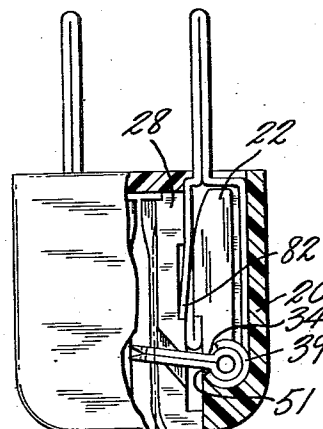


FIG. 14.

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2,810,894

ELECTRIC PLUG

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Application August 2, 1954, Serial No. 447,129

4 Claims. (Cl. 339—99)

The present invention relates to electrical connectors, and, more particularly, to novel and improved electrical connecting plugs of the insulation-piercing type which can readily be attached to the end of an electrical cord.

Many different varieties of insulation-piercing electrical plugs have been devised whereby an electrical connecting plug may be attached to the end of common types of electric lamp cord by the inexperienced householder without the use of tools or the need of stripping the insulation off the ends of the wire. However, the electrical connecting plugs of the above type which are currently on the market or otherwise well-known have been found to have many disadvantages, among which are unreliability in establishing electrical contact, complex connecting procedures, and difficult and expensive manufacturing techniques. Plugs of this type usually are composed of a large number of parts of complex configuration and require rivets and bolts in their assembly. Accordingly, they are difficult to manufacture and expensive to assemble.

It is an object of the invention, therefore, to provide novel and improved electrical connecting plugs which can be easily and cheaply manufactured, readily assembled, and easily connected to an electrical cord in a minimum number of steps.

It is a further object of the invention to provide a novel and improved electrical connecting plug which can be reliably connected to an electrical conducting cord to establish a good electrical contact in a simple and direct manner.

These and other objects may be achieved, in accordance with the invention, by an electrical connecting plug which may comprise a minimum of six separate elements, only four of which are different. These elements may include a plug body, a pair of connecting prongs adapted to be received in an electrical wall outlet or receptacle, a pair of contactors for establishing contact between the connecting prongs and the individual conductors of a parallel wire, rubber or plastic covered, electrical cord (for example, the conventional #18 electrical household lamp cord), and a plunger adapted to receive the electrical cord and control the establishment of electrical contact between the conductors of the cord and the contactors.

The configuration of the above component parts of the electrical connecting plugs of the invention is such that the electrical connecting plug may be connected to the lamp cord merely by pushing the lamp cord into the plunger and then pulling on the cord.

For a more complete understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying figures of the drawing, in which:

Fig. 1 is a partially broken away top view of the body of an electrical plug, in accordance with the invention;

Figs. 2 and 3 are sectional views of the electrical plug body of Fig. 1 taken along the lines 2—2 and 3—3, respectively, and looking in the direction of the arrows;

Figs. 4 and 5 are side elevations of one embodiment of

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an electrical plug plunger, in accordance with the invention;

Fig. 6 is a sectional view of the plunger of Fig. 4 taken along the line 6—6 and looking in the direction of the arrows;

Fig. 7 is an isometric view of one embodiment of a connecting prong, in accordance with the invention;

Figs. 8A, 8B, 8C, and 8D are each isometric views of various embodiments of a contactor for the electrical connecting plug of the invention;

Figs. 9 and 10 are top and bottom views, respectively, of an assembled electrical connecting plug, in accordance with the invention;

Figs. 11A, 11B, and 11C are sectional views of one embodiment of the electrical connecting plug taken along the line 11C—11C in Fig. 9 and looking in the direction of the arrows, and showing the cooperative relation of the elements of the plug during different steps of the process by which the plug may be attached to a lamp cord;

Figs. 12 and 13 are sectional views taken along the lines 12—12 and 13—13, respectively, in Fig. 11C and looking in the direction of the arrows;

Fig. 14 is a partially broken away side elevation of an assembled electrical connecting plug, in accordance with a different embodiment of the invention;

Fig. 15 is an isometric view of an alternate embodiment of the plunger shown in Figs. 4, 5, and 6;

Fig. 16 is an isometric view of an alternate embodiment of the connecting prong;

Figs. 17A and 17B are views in vertical section of another assembled embodiment of the electrical connecting plug of the invention showing the structural relationship of the elements in two different positions of the plunger; and

Fig. 18 is a partial sectional view of an electrical connecting plug showing a further embodiment of the invention.

Referring now to Figs. 1, 2, and 3, the body 20 of the electrical connecting plug may have a shell-like configuration and may be composed of any suitable electrically non-conducting material such as a conventional plastic or Bakelite, for example. The outer dimensions of the body 20 are preferably small and, for example, in a preferred embodiment of the invention, the body 20 is one inch long, $\frac{3}{32}$ inch wide, and $\frac{15}{32}$ inch thick.

The body 20 may include two raised portions 21 and 22 which are respectively disposed on opposite inner walls thereof as best seen in Figs. 1 and 2. The body 20 may also include two recessed portions 24 and 25. The purpose of the raised portions 21 and 22 and the recessed portions 24 and 25 will become apparent in the later description of the cooperative relationship of the assembled elements of the electrical connecting plug.

The body 20 may be unitary in structure and can be easily and cheaply manufactured in simple molds. Thus the need for rivets, bolts, or nuts to assemble the body 20 of the electrical connecting plug is eliminated.

The plunger 28 as shown in Figs. 4, 5, and 6, or the alternate embodiment 29 of the plunger as shown in Fig. 15 may similarly be composed of any suitable type of electrically non-conducting material such as Bakelite and conventional plastics of a resilient nature. The plungers 28 or 29 may also be readily manufactured by using simple molds or other suitable manufacturing techniques.

The connecting prong 30 of Fig. 7 may be composed of any suitable electrically conductive material, and, preferably, is formed by conventional stamping and bending techniques from sheets of material such as electrical contact brass. The conducting prong 30 is of such a configuration that it is readily adaptable to production in a conventional automatic stamping machine. Similarly

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the connecting prong 31 of Fig. 16 is also composed of suitable electrically conductive material and can be readily stamped and bent into its desired configuration by an automatic stamping machine.

The contactors 34a, 34b, 34c and 34d of Figs. 8A, 8B, 8C, and 8D, respectively, are also composed of suitable electrically conductive material, preferably conventional electrical contact brass. Each of the ends 35a, 35b, 35c and 35d, respectively, of the contactors may be formed with a cylindrical configuration adapted to be snugly and rotatably received by either of the contactor holding means 39 or 39a of Figs. 7 and 16, respectively.

The contactors may either be solid as in Fig. 8B or formed from a folded strip of electrically conductive material as shown in the other figures of the drawing.

The points of the contactors are formed on the ends of the contactors opposite to the cylindrical ends 35a, 35b, 35c and 35d. These points may take any desired configuration or combination of configurations. For example, in Fig. 8A, the points 36a and 37a of the contactor 34a are chisel shaped and are disposed contiguously to each other at one side of the contactor end. As for the solid contactor 34b of Fig. 8B, the points 36b and 37b are centrally disposed at the end of the contactor and have a pyramidal configuration. While the apices of the points 36b and 37b are spaced apart from each other so as to provide two separate contactor points, a single pyramidal contactor point may be formed.

In Fig. 8C, the contactor 34c has a chisel shaped contactor point 36c and a pyramidal contactor point 37c, each of which are centrally disposed in the end of the contactor. In Fig. 8D, two chisel shaped contactor points 36d and 37d are shown. However, these contactor points are not contiguously placed as in Fig. 8A but are oppositely disposed at different sides of the end of the contactor 34d.

Having now generally described various exemplary component parts or elements of the electrical connecting plugs of the invention, let us consider the operation and cooperative relationship of these parts in an assembled plug.

As seen first from Figs. 11A, 11B, and 11C the plunger 28 is adapted to slide within the central portion of the body 20 of the plug. The upper end 28a of the plunger 28 has a greater width than the shank of the plunger 28 (Fig. 5). This enlarged end 28a has a configuration designed to fit into the recessed portions 24 and 25 in the body 20 (as shown in Fig. 3). Thus the downward movement of the plunger 28 within the body 20 to the position shown in Fig. 11A is limited by the enlarged end 28a. From Figs. 4 and 5, it will be seen that the plunger 28 also has shoulders 28b on the end of the plunger 28 opposite to the enlarged end 28a, but extending in a direction transverse to the overhang of the enlarged end 28a. As seen in Fig. 11B, the shoulders 28b of the plunger 28 serve as stops for the upward movement of the plunger 28, when they are brought in contact with the folded end of a locking arm 41 of the connecting prong 32.

As seen in Figs. 4 and 10, the shank of the plunger 28 is divided into two legs forming two adjacent channels 42 and 43, respectively. The channels 42 and 43 are adapted to receive the two parallel conductors of an electrical cord 44. As shown more specifically in Fig. 10, each leg of the plunger 28 may have a centrally located ridge 45 running the length thereof and disposed oppositely to each other. These ridges 45 serve to partially separate the channels 42 and 43 in the plunger 28 and to guide the two parallel wires of the insulation covered electrical cord 44 along fixed predetermined paths (see Figs. 12 and 13).

In Fig. 10, the bottom openings to the two channels 42 and 43 diverge slowly inwardly so as to initially guide the conductors into the channels. Then as the cord 44 is pushed further into the channels 42 and 43, it comes

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in contact with a progressively widening portion 46a of each of the ridges 46. The widening portions 46a in each of the ridges 46 also increase in height, as shown in Figs. 4 and 6. The widening portions 46a tend to force the parallel wires of the cord 44 apart and progressively decrease the size of the channels 42 and 43, thereby snugly gripping the cord 44 (see Fig. 11B). Therefore, when the cord 44 is pulled downwardly as shown in Fig. 11C, the plunger 28 is carried with it.

Let us now consider the function of the connecting prongs in greater detail. The top folded end may take any conventional form. For example, either the form of the connecting prong 32 of Fig. 11C, wherein the two sides of the folded strip are contiguous, or the form of the connecting prong 30 of Fig. 7, wherein they are lightly sprung apart. In either case, or if in any other conventional form, the upper ends of the connecting prongs are adapted to be forced into a conventional electric outlet or receptacle to establish contact therewith.

One leg 48 of the connecting prong 30 may have a right angled S curve therein. At the end of the leg 48 is the contactor holding means 39. The configuration of this lower portion of the leg 48 of the connecting prong 30 including the contactor holding means 39, is such as to be snugly received within a pocket 49 in the body 20 as shown in Fig. 11C. As is best seen in Figs. 7 and 16, the cylindrical contactor holding means 39 and 39a only extend for substantially one half the width of the electrically conductive strip from which the connecting prong is formed. The pockets 49 in the body 20 need only be of a corresponding size.

The cylindrical contactor holding means, for example, contactor holding means 39 is designed so that its edges 50 and 51 are spaced apart by a distance substantially less than the diameter of the cylindrical ends of the contactors 34. Thus the contactors 34 cannot be pulled radially from the contactor holding means, but must be slid longitudinally thereinto. The edges 50 and 51 may also serve as stops or limits for the rotative movement of the contactors 34 within the contactor holding means 39 or 39a. This limiting effect is shown in Figs. 11A, 11C and 17B, wherein the edge 51 serves to limit the downward movement of the contactor 34 to the horizontal position at which it engages one of the conductors in the cord 44. In Figs. 11B and 17A, the limiting action of the edges 50 upon the upward movement of the contactor 34 to its most fully retracted position may be observed.

As seen in Fig. 4, each leg of the plunger 28 has a contactor guide channel 54 formed therein which may include two pivot points 55 and 56 spaced apart by a distance substantially equivalent to the thickness of the shank of the contactor 34 which passes therebetween. Thus as shown in Figs. 11A, 11B and 11C, or in Figs. 17A and 17B relative movement between the plungers 28 or 29 and the body 20 of the connecting plug causes the contactors 34 to be withdrawn from or inserted into their associated channels 42 and 43. The walls of the guide channel 54 may be of such a configuration as to limit the relative movement of the contactor 34 and the plunger 28 rotationally about the pivot points 55 and 56. If desired, the limiting effect of the wall configuration of the contactor guide channel 54 may be designed to cooperate with and assist the limiting effect of the edges 50 and 51 bounding the contactor holding means 39.

Various types of operation can be achieved by different configurations of the connecting prongs. For example, when using the connecting prong 31 of Fig. 16 in the connecting plug assembly of Figs. 17A and 17B, a simple push-pull operation is sufficient to operatively connect the lamp cord 44 to the connecting plug.

As seen in Fig. 17B when the plunger 29 is in its full down position, the contactors 34 are horizontal and are inserted to their fullest extent into the channels 42 and

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43, respectively. When in this position, any further downward movement of the plunger 29 is prohibited by the limiting action of the edges 51 of the contactor holding means 39a and the configuration of the contactor guide channel 54. The connecting prongs 31 are retained within the body 20 by means of the locking action of the locking arm 41 on a shoulder 60 of the raised portion 22 of the body 20.

While further downward movement of the plunger 28 within the body 20 is restricted, as explained above, it may also be necessary to hold the plunger 28 in this downward position. This may be accomplished by means of one or more detents 62 extending from an enlarged end 29a of the plunger 29 (see Fig. 15). The detents 62 are adapted to come into locking engagement with slots 63 which may be positioned, as shown in Fig. 16, in the leg 64 of the connecting prong 31. The sides of the detents 62 may be appropriately beveled so as to permit them to slide into and out of engagement with the slots 63 upon relative movement between the plunger 29 and the body 20.

In order to assemble the connecting plugs shown in Figs. 17A and 17B, the plunger 29, the two connecting prongs 31, and the two contactors 34 are assembled as shown in Fig. 17A outside of the body 20. They are then held in this assembled position and slid into the body 20. The folded end of the locking arm 41 of each of the connecting prongs 31 is at least twice as thick as the strip of electrically conductive material from which the connecting prong is made. Therefore, either the sides of the raised portion 22 of the body 20 or the legs of the plunger 29 must be sufficiently resilient in nature to permit the locking arms 41 of each of the connecting prongs 31 to slide down the curved sides of the raised portions 22 to their assembled positions, at which point the locking arms snap into locking engagement with the shoulders 60 of the raised portions 22, as shown in Fig. 17B.

Let us now discuss the method for attaching the cord 44 to the assembled electric connecting plug of Fig. 17B. The electrical cord 44 is grasped near an unstripped end. The end is pushed into the channels 42 and 43 in the bottom of the plunger 29. As the parallel insulated conductors of the cord 44 pass along the channels 42 and 43, the end of the cord 44 engages the contactors 34 pushing them upwardly. The upward pressure upon the plunger 29 when the cord 44 is pushed into the channels 42 and 43 is sufficient to cause the detent 62 to slip out of locking engagement with the slots 63 in the connecting prongs 31.

This upward movement of the contactors 34 causes a relative movement between the plunger 29 and the body 20 toward the position shown in Fig. 17A, wherein the contactors 34 are fully withdrawn from the channels 42 and 43. The upward movement of the plunger 29 is stopped by the engagement of the shoulders 29b of the plunger 29 with the ends of the locking arms 41 of the connecting prongs 31.

The cord 44 is pushed fully into the channels 42 and 43 until the ends thereof abut the enlarged end 29a of the plunger 29. When this occurs, the cord 44 is then pulled downwardly away from the plug. The upper ends of the channels 42 and 43 are restricted by the enlarged ridge sections 46a. As shown in Fig. 12, this restriction is sufficient to wedge the cord 44 into the plunger 29. Since the cord 44 is thus wedged into the plunger 29, when the cord 44 is pulled downwardly, the plunger 29 follows. As the downward movement of the plunger 29 is started, the contactors 34 rotate in their respective contactor holding means 39a and the contactor points 36 and 37 start to bite into the insulation covering the conductors of the cord 44.

With continued downward movement of the plunger 29, the contactors 34 bite more deeply into the insulation and finally into the stranded metallic conductors of

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the cord 44, as shown in Fig. 13. Thus the harder the cord 44 is pulled downwardly away from the connecting plug, the more deeply the contactor points 36 and 37 bite into the insulation and the stranded conductors of the cord 44 to form a good reliable contact.

This downward movement continues until limited by the enlarged end 29a of the plunger 29 and the action of the edges 51 of the contactor holding means 39a and the walls of the contactor guide channels 54. When the plunger has reached this lower limit, the detents 62 will have again locked into the slots 63, thereby maintaining the connecting plug in positive electrical connection with the cord 44. Since the channels 42 and 43 serve to guide the parallel conductors of the cord 44 in definite and restricted channels, a positive electrical contact is automatically established between the contactors 34 and the stranded metallic conductors within the cord 44.

In order to remove the cord 44 from the electrical connecting plug of Figs. 17A and 17B, the cord 44 is grasped with the fingers at a point near to the connecting plug and pushed upwardly. When the plunger has arrived at its extreme upward position, as shown in Fig. 17A, the enlarged end 29a of the plunger 29 is maintained in that position and the cord 44 is simply pulled from it. This is readily accomplished since the contactors 34 have been automatically withdrawn from the cord 44 by the guiding action that is exerted upon the contactors 34 during relative movement of the plunger 29 and the body 20.

Instead of the holding action achieved by the detents 62 and the slots 63 of the connecting plug of Figs. 17A and 17B, the holding action can be accomplished as shown in Fig. 18, by a pair of detents 66 which are adapted to come into engagement with an indentation 67 formed in a connecting prong 68.

In the embodiment of the invention shown in Figs. 11A, 11B and 11C, a slightly different operating technique is utilized. The connecting prongs may either take the form of the connecting prong 30 in Fig. 7 or the connecting prong 32 of Figs. 11A, 11B and 11C. In either case the contactor holding means 39 snugly hold the contactors 34 in the same manner as discussed with regard to Figs. 17A and 17B. Similarly, the electric connecting plug of Figs. 11A, 11B and 11C is assembled in the same manner as that described relative to Figs. 17A and 17B.

With either type of connecting prong, a biasing and locking arm 71 may be utilized. The biasing and locking arm 71 preferably may have the configuration shown in Fig. 7 with its upper and lower sections substantially angularly displaced. This angular displacement is preferably that of a right angle. The biasing and locking arm 71 may also be additionally angularly displaced from the main portion of the leg 64 of the connecting prong by a lesser angle. The end 72 of the biasing and locking arm extends beyond the plane of the locking arm 41 in such a manner as to engage a locking shoulder 73 formed in the shank of the plunger 28 when the plunger 28 is at its full down position (see Fig. 11C). The locking action of the biasing and locking arm 71 and the shoulder 73 of the plunger 28 positively prevents any unwanted upward movement of the plunger 28 within the body 20.

Let us now consider the method by which the cord 44 may be attached to the electrical connecting plug of Figs. 11A, 11B and 11C. The cord 44 is pushed through the channels 42 and 43, in the manner previously described, until its end contacts the two contactors 34. While in the embodiment of Figs. 17A and 17B, a continuous pressure upon the cord 44 would cause the plunger 29 to move upwardly relative to the body 20, the locking action of the biasing and locking arm 71 effectively prevents such an action.

In order to release this locking action, the two connecting prongs 32 are grasped by the fingers and moved inwardly in the manner shown in Fig. 11A. This inward pressing of the connecting prongs 32 causes the biasing and locking arms 71 to disengage from the shoulders 73

of the plunger 28, permitting the plunger 28 to move upwardly relative to the body 20 into the position shown in Fig. 11B. The electric cord 44 is pushed upwardly through the channels 42 and 43 until it is wedged therein by the restrictive action of the enlarged ridges 46a.

A further function for the biasing and locking arm 71 now becomes apparent. As shown in Fig. 11B, the end 72 of the biasing and locking arm 71 engages the shank of the contactor 34 in such a manner as to bias it toward its associated channel 42 or 43. Thus, when the cord 44 is pulled downwardly, the contactors 34 are sufficiently biased toward their associated channels 42 and 43 to cause them to pierce the insulation surrounding the parallel conductors of the cord 44 at the earliest opportunity. Of course, this biasing effect of the biasing and locking arm 71 would have no effect in the situation where the contactor 34 snugly fits between the pivot points 55 and 56 of the contactor guide channel 54 without any play. However, such would not normally be the case. Therefore, the inclusion of the biasing and locking arm 71 permits a greater tolerance in the manufacture of the plunger 28.

As shown in Fig. 4, the configuration of the contactor guide channel 54 may be such that the wall from the pivot point 55 to the shoulder 73 is cut back to permit the end 72 of the biasing and locking arm 71 to bear against the contactor 34 for the greatest portion of its movement.

As previously described with relation to Figs. 17A and 17B, when the cord 44 has been pulled sufficiently downward so that the downward movement of the plunger 28 is limited by the edges 51 of the contactor holding means 39 and the configuration of the contactor guide channels 54, the contactor points 36 and 37 of the contactor 34 have bitten through both the insulation and the electrical conductors in such a way as to reliably establish a sound electrical connection. Also as shown in Fig. 11C when the plunger 28 has moved to its extreme downward position, it is locked in that position by the biasing and locking arms 71.

It is of interest to note that in each of the above embodiments of the invention, the possibility of shorting between the two parallel electrical conductors is substantially eliminated, since the insulation surrounding them tends to be pushed upwardly into a recess 78 formed between the legs of the plunger 28 and its enlarged end 28a.

It may sometimes be desirable to provide a means whereby the plunger 28 may be locked in its upward position. This can be accomplished in a number of different ways. For example, as shown in Fig. 11B, shoulders 79 may be provided on the connecting prongs 32 to engage a locking shoulder 80 in the shank of the plunger 28. As seen in Fig. 11C, when the plunger 28 is in its downward position, the shoulders 79 of the connecting prongs 32 are sufficiently displaced to the side to permit the passage of the plunger 28.

On the other hand, when the plunger is in its upward position and the connecting prongs are pressed inwardly, a locking engagement between the shoulders 79 of the connecting prongs 32 and the shoulders 80 of the plunger 28 is effected. This locking action of the shoulders 79 and 80 is helpful in removing the cord 44 from the connecting plug, since it is then unnecessary to manually hold the plunger 28 in its upward position when the cord 44 is removed therefrom. When the manual inward pressure on the connecting prongs 32 is released, the locking arm 41 straightens out and the shoulders 79 and 80 disengage.

Instead of utilizing the locking action of the shoulders 79 and 80 as shown in Fig. 11B, a similar locking action may be achieved by using the plunger 29 of Fig. 15 instead of the plunger 28 in cooperation with the connecting prong 30 of Fig. 7. Such a combination would work in the same manner as the embodiment disclosed in Figs. 11A, 11B and 11C with the exception that when the plunger 29 was in its upward position, the detent 62

would be placed in locking engagement with a slot 81 similar to the slot 63 in the connecting prong 31 of Fig. 16.

Another type of locking arm 82 is disclosed in the embodiment of Fig. 14. The locking arm 82 performs its locking function in the same manner as the biasing and locking arm 71. However, it may have a configuration such as shown in Fig. 14 and is bent outwardly from the main plane of the connecting prong 83.

Thus there has been provided, in accordance with the invention, novel and improved types of electrical connecting plugs which can be easily operated by inexperienced individuals, manufactured and assembled cheaply, and which possess a degree of reliability as to the electrical contact established with an electric lamp cord which is not otherwise available in the prior art.

While the above disclosed embodiments show a number of novel and extremely useful types of electrical connecting plugs, it will be understood by those skilled in the art that these embodiments are meant to be merely exemplary and that they are susceptible of modification and variation without departing from the spirit and scope of the invention. For example, it will be evident that different types of locking arrangements and different configurations of the individual elements of the connecting plug may be combined in numerous combinations other than those specifically disclosed herein.

More particularly, both the locking slots 63 and 81 could be used on the same connecting prong to provide locking in both extreme positions. Further, the legs of the plungers could be slanted inwardly so that they would be forced apart by the insertion of the cord 44, thereby providing a substitute or supplemental gripping method for performing the function of the raised ridge portions 46a. Therefore, the invention is not deemed to be limited except as defined in the appended claims.

I claim:

1. An electrical connector adapted to be connected to an insulated electrical conducting means having a pair of parallel electrical conductors for enabling said conducting means to be connected to an electrical receptacle, comprising a pair of electrically conductive connecting means adapted to engage the electrical receptacle, an electrically non-conductive hollow body holding said pair of connecting means, a pair of insulation-piercing contact means each respectively pivoted at a point on a respective one of said connecting means, a plunger slidable in said hollow body, a cord passage in said plunger longitudinal to its direction of movement for receiving said conducting means, and recesses in said plunger permitting said contact means to pierce individual conductors of said conducting means, said contact means extending sufficiently through said recesses so that movement of said plunger will cause said contact means to rotate towards a position perpendicular to the cord passage, and said cord passage being adapted to properly position the respective conductors of said conducting means.

2. An electrical connector adapted to be connected to an insulated electrical conducting means having a pair of parallel electrical conductors for enabling said conducting means to be connected to an electrical receptacle, comprising a pair of electrically conductive connecting means adapted to engage the electrical receptacle, an electrically non-conductive hollow body holding said pair of connecting means, a pair of insulation-piercing contact means each respectively pivoted at a point on a respective one of said connecting means, a plunger slidable in said hollow body, a cord passage in said plunger longitudinal to its direction of movement for receiving said conducting means, recesses in said plunger permitting said contact means to pierce individual conductors of said conducting means, said contact means extending sufficiently through said recesses so that movement of said plunger will cause said contact means to rotate towards a position perpendicular to the cord passage, and dividing

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means in said cord passage for positively aligning each of said electrical conductors of said pair with respective ones of said recesses.

3. An electrical connector adapted to be connected to an insulated electrical conducting means having a pair of parallel electrical conductors for enabling said conducting means to be connected to an electrical receptacle, comprising a pair of electrically conductive connecting means adapted to engage the electrical receptacle, an electrically non-conductive hollow body holding said pair of connecting means, a pair of insulation-piercing contact means each respectively pivoted at a point on a respective one of said connecting means, a plunger slidable in said hollow body, a cord passage in said plunger longitudinal to its direction of movement for receiving said conducting means, means for limiting the movement of said plunger within said hollow body, and recesses in said plunger permitting said contact means to pierce individual conductors of said conducting means, said contact means extending sufficiently through said recesses so that movement of said plunger will cause said contact means to rotate towards a position perpendicular to the cord passage, and said cord passage being adapted to properly position the respective conductors of said conducting means.

4. An electrical connector adapted to be connected to an insulated electrical conducting means having a pair of parallel electrical conductors for enabling said conducting means to be connected to an electrical receptacle, comprising a pair of electrically conductive connecting means adapted to engage the electrical receptacle, an electrically

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non-conductive hollow body holding said pair of connecting means, a pair of insulation-piercing contact means each respectively pivoted at a point on a respective one of said connecting means, a plunger slidable in said hollow body, a cord passage in said plunger longitudinal to its direction of movement for receiving said conducting means, recesses in said plunger permitting said contact means to pierce individual conductors of said conducting means, said contact means extending sufficiently through said recesses so that movement of said plunger will cause said contact means to rotate towards a position perpendicular to the cord passage, means for biasing the rotative movement of said contact means, and said cord passage being adapted to properly position the respective conductors of said conducting means.

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