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EXTENSION CORD LOCK AND KEEPER

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FIG. 1.

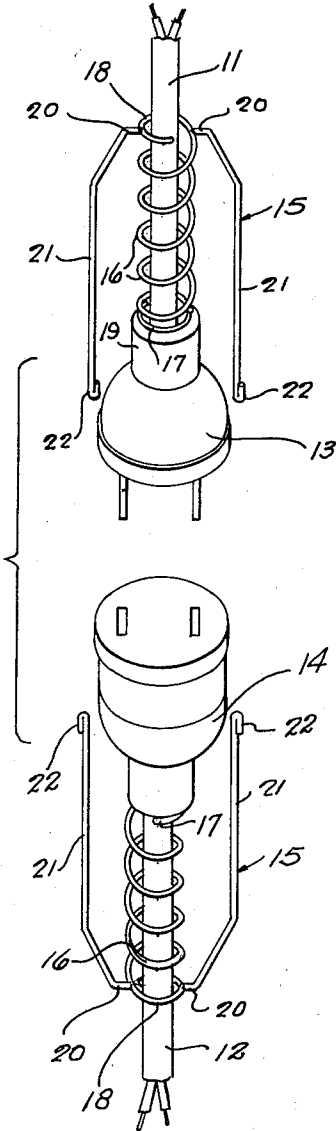


FIG. 2.

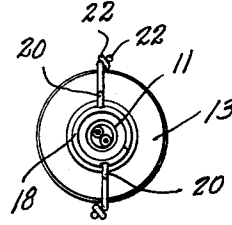
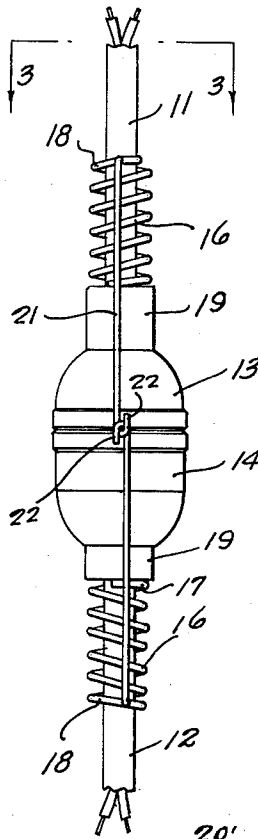


FIG. 3.

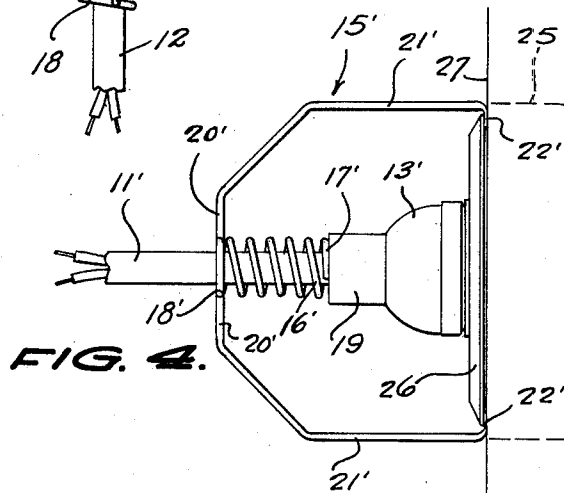


FIG. 4.

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**EXTENSION CORD LOCK AND KEEPER**

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2 Claims. (Cl. 339—75)

This invention relates to retention devices for electrical connectors, and more particularly to retention devices of the resilient type which may be engaged on cords associated with electrical connectors without the necessity of removing electrical connectors.

A main object of the invention is to provide a novel and improved retention device for an electrical cord terminal connector, the device being simple in construction, being engageable on the cord without the necessity of removing the adjacent terminal connector, and acting to maintain the terminal connector in its connecting position until the retention device is manually moved to an inoperative position.

A further object of the invention is to provide an improved retention device of the spring type for an electrical cord terminal connector, said device being inexpensive to fabricate, being durable in construction, being compact in size, being arranged so that it cannot be easily lost when it is once mounted on an electrical cord, and being engageable on the electrical cord and being removable therefrom without the use of any tools.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a perspective view showing fragmentary portions of a pair of line cords provided with mating electrical connectors, the cords being provided with cooperating retention devices constructed in accordance with the present invention for holding the electrical connectors in mating connection positions.

FIGURE 2 is an elevational view showing the line cord portions and electrical connectors of FIGURE 1 in mating connected positions with the retention devices interengaged for retaining the connectors in said mating connecting positions.

FIGURE 3 is a horizontal cross sectional view taken substantially on the line 3—3 of FIGURE 2.

FIGURE 4 is a side elevational view of a portion of a line cord provided with a male plug which is engaged in a conventional supply receptacle, the line cord being provided with an improved retention device constructed in accordance with the present invention and being formed so that it is lockingly engageable with the cover plate associated with the supply receptacle.

Referring to the drawings, and more particularly to FIGURES 1, 2 and 3, 11 and 12 respectively designate the end portions of line cords provided with the male and female plugs 13 and 14, respectively, said plugs being adapted to be mated together in the manner illustrated in FIGURE 2 so as to connect the conductors of the line cord 11 to the conductors of the line cord 12. Designated respectively at 15, 15 are retention devices which are engaged respectively on the line cords 11 and 12 and which are arranged to interengage in the manner illustrated in FIGURE 2 to hold the male and female plugs 13 and 14 in mating connecting positions. Each of the retention devices 15 comprises a helically wound spring 16 having open end turns 17 and 18, the end turn 17 being adapted to engage against the end collar portion 19 of the associated connector 13 or 14, the opposite end turn 18 being located remote from the collar portion. As will be readily apparent, since the end turns are open, it is relatively easy to thread the helical spring 16 onto the line cord 11 or 12, and it is not necessary to remove the associated connector 13 or 14 from the line cord while thus threading the helical spring 16 onto the cord.

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Rigidly secured to the end turn 18 are outwardly projecting wire retention arms 20, 20, the retention arms 20, 20 projecting diametrically oppositely from the end turn 18, as is clearly shown in FIGURES 1 and 3, said retention arms having outer elongated portions 21, 21 extending substantially parallel to the spring 16 and being substantially longer than the normal length of the spring, as shown in FIGURE 1. The retention arms 21, 21 are formed at their ends with respective hook-like retention elements 22, 22, said elements being oppositely directed and being disposed in planes at a relatively large angle to each other so that the hook elements 22 of a pair of cooperating retention members 15, 15 may be easily lockingly interengaged with each other in the manner illustrated in FIGURE 2.

As shown in FIGURE 2, when the connectors 13 and 14 are mated together with the prongs of the male connector 13 received in the apertures of the female connector 14, the hook elements 22 may be interengaged, placing the springs 16 under tension and causing the springs to exert inward force on the respective connector collar elements 19, 19, holding the connector elements 13 and 14 in mating connected positions. To disengage the connectors, it is necessary to exert inward force on the end turns 18, 18 of the respective helical springs 16, 16, sufficient to disengage the hook elements 22 from each other, after which the retention devices 15 are rotated sufficiently to allow the hook elements to clear each other when the springs 16 are released. With the hook elements 22 disengaged and the springs 16 released, the connectors 13 and 14 are free to be disengaged from each other.

Although the arms 21 are of substantial length, as above mentioned, said arms are sufficiently short so that substantial tension may be developed in the springs 16, 16 when the hook elements 22 are lockingly engaged with each other in the manner shown in FIGURE 2, whereby to provide a substantial inward biasing force on the mating connectors 13 and 14 to retain them connected together as long as is required.

Referring now to FIGURE 4, 15' designates a modified form of retention device adapted to be employed to hold a male plug 13' associated with a line cord 11' in connecting relationship with a conventional supply receptacle 25 of the type provided with a cover plate 26. The retention device 15' thus comprises the helical spring 16', similar to the spring 16 described in the previously disclosed form of the invention, the spring having open end turns 17' and 18', enabling same to be threaded onto the line cord 11' without the necessity of removing the plug 13'. Rigidly secured to diametrically opposite points of the end turn 18' are the retention arms 20', 20', each of said arms being formed with elongated portions 21', 21' extending parallel to the spring 16'. The portions 21' are formed at their ends with inwardly directed, substantially aligned hook elements 22' which are relatively flat and which are reduced somewhat in thickness so that they are engageable between the end portions of the cover plate 26 and the wall surface 27, as illustrated in FIGURE 4, so as to develop tension in the spring 16', producing an inward force on the collar element 19 associated with the plug 13' to urge the plug against the cooperating socket portion of the receptacle 25. The arms 20' are made of wire material and are sufficiently resilient so that the elongated portions 21' thereof may be easily spread apart sufficiently to disengage the hook-like elements 22', 22' from the end portions of the cover plate 26 when it is desired to release the plug 13' so that it may be removed from the receptacle 25. The normal configuration of the retention arms 20', including their portions 21' and 22', is such that the hook-like elements 22', 22' are biased towards each other by the re-

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resiliency of the members 20' when the hook-like elements 22' are engaged between the end portions of the cover plate 26 and the adjacent wall surface 27 in the manner illustrated in FIGURE 4, so that the resiliency of the retention arms 20' acts to retain the elements 22' in holding positions with respect to the cover plate 26. To lock the plug 13' against removal from the socket 25, it is therefore merely necessary to flex the arm portions 21' outwardly sufficiently to allow the hook-like elements 22', 22' to be engaged around the opposite end edges of the cover plate 26 and to be inserted between the opposite end portions of the cover plate and the wall surface 27. The plug 13' is released for removal from the socket 25 by spreading the arm portions 21' outwardly sufficiently to retract the hook-like elements 22' and disengage them from the opposite end portions of the cover plate 26.

The retention devices may be furnished in a set of three, comprising two retention devices 15, 15 and one retention device 15', the set enabling a cord to be connected to an outlet receptacle 25 and to be locked with respect thereto, and further enabling the cord to be connected to an appliance cord and to be locked thereto by the arrangement of retention devices 15, 15 illustrated in FIGURES 1 to 3.

While certain specific embodiments of an improved retention device for an electrical cord terminal connector have been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In combination, a pair of mating electric plugs having respective line cords connected axially thereto, and cooperating retention members on the line cords, each retention member comprising a helically wound spring surrounding the associated line cord and having an inner end adapted to bear on its associated plug, a plurality of retention arms secured to spaced portions of the outer

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end of the spring and extending substantially parallel to the spring in the direction of the opposing mating plug, and respective hook-shaped loops on the ends of the retention arms opening toward said outer end, the hook-shaped loops of the retention arms of the retention member associated with one of the line cords being transversely receivable in the hook-shaped loops of the retention arms of the retention member associated with the other line cord, the combined axial lengths of the retention arms being less than the combined normal lengths of the springs and mating plugs, whereby the springs are placed under tension when the hook-shaped loops of the opposing retention arms are linked together.

2. In combination, a pair of mating electric plugs having respective line cords connected axially thereto, and cooperating retention members on the line cords, each retention member comprising a helically wound spring surrounding the associated line cord and having an inner end adapted to bear on its associated plug, a pair of retention arms secured to diametrically opposed portions of the outer end of the spring and extending substantially parallel to the spring in the direction of the opposing mating plug, and respective hook-shaped loops on the ends of the retention arms opening toward said outer end, the hook-shaped loops of the retention arms of the retention member associated with one of the line cords being transversely receivable in the hook-shaped loops of the retention arms of the retention member associated with the other line cord, the combined axial lengths of the retention arms being less than the combined normal lengths of the springs and mating plugs, whereby the springs are placed under tension when the hook-shaped loops of the opposing retention arms are linked together.

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