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STRAIN RELIEF FOR ELECTRIC CORD CONNECTORS

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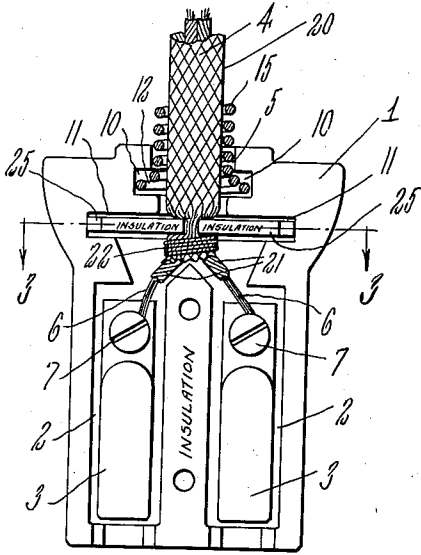


Fig. 1.

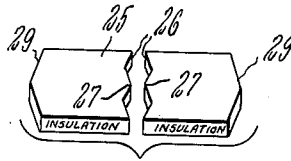


Fig. 2.

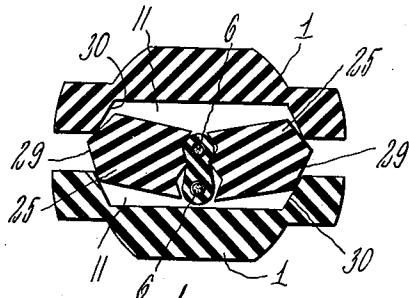


Fig. 3.

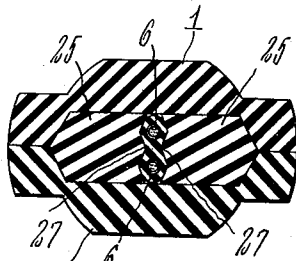


Fig. 4.

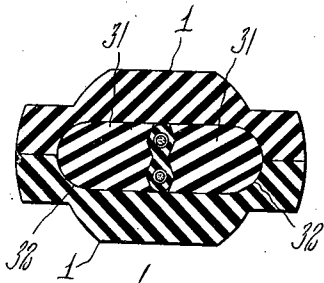


Fig. 5.

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UNITED STATES PATENT OFFICE

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STRAIN RELIEF FOR ELECTRIC CORD CONNECTORS

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4 Claims. (Cl. 173-322)

This invention relates to electric cords and to their connections and has for an object to relieve the attachment of the wires of the cord to other parts from tension and torsional stresses exerted on the cord itself, thus avoiding damage to or destruction of such attachments with the resultant possibility of loosening or breaking contact or of producing short circuits.

In accordance with this invention the desired results are accomplished by the provision of cord-clamping means carried by the member to which the cord is secured and by the assembly of which on the cord the desired gripping effect is secured.

For a more complete understanding of this invention, reference may be had to the accompanying drawing in which—

Figure 1 is a plan view of one-half of a socket plug connector showing the strain relief parts in position therein.

Figure 2 is a perspective view of the cord-gripping elements.

Figure 3 is a transverse section through the two parts of a socket plug and the gripping elements as the parts are being assembled, the section being taken on line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3, but showing the plug parts brought together and the gripping elements in gripping positions.

Figure 5 is a view similar to Figure 4, but showing a modification.

Referring to the drawing, particularly Figures 1, 3 and 4, at 1 is shown two parts of an electric socket plug which parts in use are closed together and there held. Each of these parts, as shown in Figure 1, is provided with a pair of spaced recesses 2 for receiving contacts, herein shown as sockets 3 of any usual or suitable type, between which may be pressed prongs (not shown) of any desired electrical apparatus to which the electric cord 4 is to be connected. Communicating with each of the recesses 2 is a groove 5 within which the cord 4 may be placed, the conducting wires 6 of which are extended into the recesses 2 and secured as by the screws 7 to the sockets 3. The groove 5 of each part is also provided with pairs of opposed recesses 10 and 11. The recesses 10 together form an annular slot to receive the inner headed end 12 of a spiral cord guide 15 such as is commonly employed to prevent unduly sharp bending of the cord adjacent to the socket plug. The cord 4 carries a plurality of conducting wires enclosed within an insulating sheath 20, this sheath being cut away at the end of the cord to expose the wires 6 and

their individual coverings 21. In order to avoid raveling out of the insulating sheath 20 at its end, this end may be bound around as by a thread or wire 22. This binding is situated inwardly of the recesses 11. The recesses 11 of each plug member together form a channel extending laterally of the cord, the two channels of the two members being in opposed relation when the members are assembled.

As shown best in Figures 3 and 4, these recesses 11 of the two parts of the socket plug form an elongated chamber for the reception of cord-gripping elements 25. Each element 25 may be formed of insulating material of a thickness to ride easily within the recesses 11, and of a length slightly less than half that of the chambers. The two have confronting edges 26 shown as serrated and presenting a central prong 27. The outer ends of these elements 25 are formed tapered, presenting end faces 29 forming an obtuse angle with each other at the center of width of each element, the elements thus being tapered outwardly toward their centers of width. The end walls 30 of the recesses 11 are shown as matingly tapered.

The cord being in position within one of the parts of the plug member and with its guard 15 in position and with its wires 6 secured to the sockets 3, the elements 25 are inserted as shown in Figure 3. The other part of the plug member is then placed in position as shown in Figure 3 and is forced toward the first part, thus forcing the members 25 inwardly toward each other as toggle arms and causing the prongs 27 to press into the cord between the wires 6 until the two parts are tight together as shown in Figure 4. In addition to the toggle effect of the members 25 the engagements of their outer ends with the ends of the recesses cause a wedging action, also forcing the adjacent ends of the elements 25 into gripping engagement with the cord. In this position the gripping elements are firmly engaged and pressed into the cord, thus holding it firmly and preventing the transmission past them of any tensional or torsional stresses exerted on the cord. It will be noted from an inspection of Figure 3 that the parts of the plug member initially engage the end portions of the members 25, thus acting through a long lever arm to force the prongs 27 into the cord, the total distance through which the plug parts are moved after initial engagement with the members 25 being much longer than the extent of motion of the prongs. The prongs 27 are thus moved toward each other under considerable mechanical ad-

vantage so that they grip the cord tightly through relatively only small pressure between the plug parts such as can be readily exerted between the fingers by the person assembling the parts. The serrated ends of the members 25 on each side of the prongs 27 form sockets of substantially hexagonal contour through which the conductors 6 pass.

In place of forming the outer ends of the gripping elements with the straight edges 29, these outer ends of the elements may be formed rounded as illustrated at 31 in Figure 5, the ends of the recesses in the two parts of the plug member being similarly rounded as at 32. The engagement of these rounded ends of the gripping elements with the rounded end walls of the recesses produce similar inwardly wedging action of the gripping elements against the cord as has been previously described with reference to Figures 3 and 4.

From the foregoing description of certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. In combination, a two-part member, each part having a portion of an electric cord receiving opening, a cord extending through said opening, each of said members having an elongated recess arranged transverse to said cord receiving opening and in communication therewith, the recesses of said member parts registering with each other when said parts are closed together about said cord, and cord gripping elements each of a length slightly less than one half the length of said recesses arranged in alignment within said recesses and positioned with their adjacent ends in engagement with said cord positioned between them, the remote ends of said elements engaging the end walls of said recesses, whereby said elements act as toggle arms to pinch the cord between their opposed ends when said elements are pressed into said recesses in assembling said member parts together.

2. In combination, a two-part member, each part having a portion of an electric cord receiving opening, a cord provided with a pair of conductors extending through said opening, each of said members having an elongated recess arranged transverse to said cord receiving opening and in communication therewith, the recesses of said member parts registering with each other

when said parts are closed together about said cord, and cord gripping elements each of a length slightly less than one half the length of said recesses arranged in alignment within said recesses and positioned with their adjacent ends in engagement with said cord positioned between them, the remote ends of said elements engaging the end walls of said recesses, whereby said elements act as toggle arms to pinch the cord between their opposed ends when said elements are pressed into said recesses in assembling said member parts together, said adjacent ends each having a central prong positioned to indent the cord between the conductors thereof.

3. In combination, a two-part member, each part having a portion of an electric cord receiving opening, a cord extending through said opening, each of said members having an elongated recess arranged transverse to said cord receiving opening and in communication therewith, the recesses of said member parts registering with each other when said parts are closed together about said cord, and cord gripping elements each of a length slightly less than one half the length of said recesses arranged in alignment within said recesses and positioned with their adjacent ends in engagement with said cord positioned between them, the outer end walls of said recesses and the remote ends of said elements being inclined to the lengths of said recesses in direction to wedge said elements against said cord, while said elements act as toggle arms to further pinch said cord between them when said member parts and elements are being assembled with said cord.

4. In combination, a two-part member, each part having a portion of an electric cord receiving opening and a channel extending laterally of said opening and in communication therewith, a cord extending through said opening, the channels of said parts registering with each other when said parts are closed together about said cord, gripping elements each somewhat less than half the length of said channels and of a thickness to ride easily therein and having recesses in their mutually opposed ends to receive said cord lying in said opening, the remote ends of said elements being adapted to engage the end walls of said channels, whereby said elements act as toggle arms when said elements are pressed into said channels in assembling said member parts, and means for securing said member parts in assembled relation.

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