

May 16, 1961

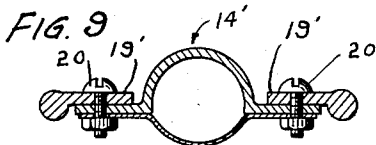
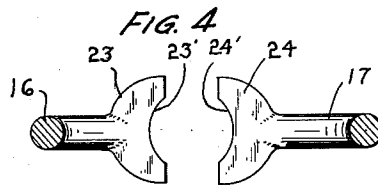
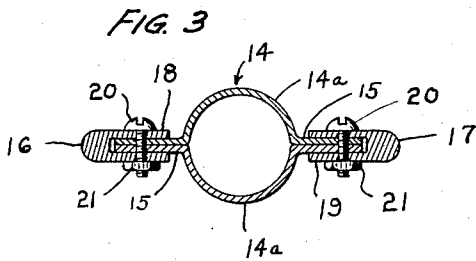
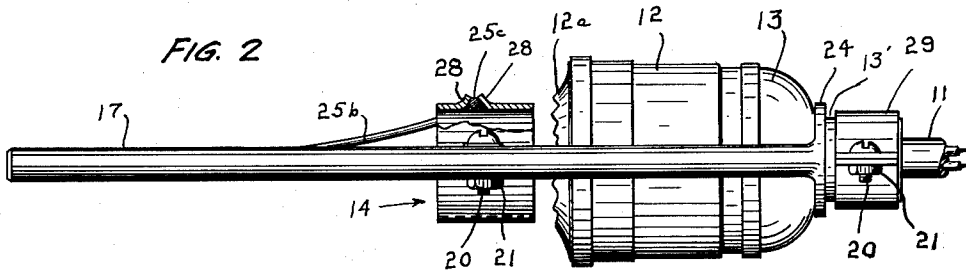
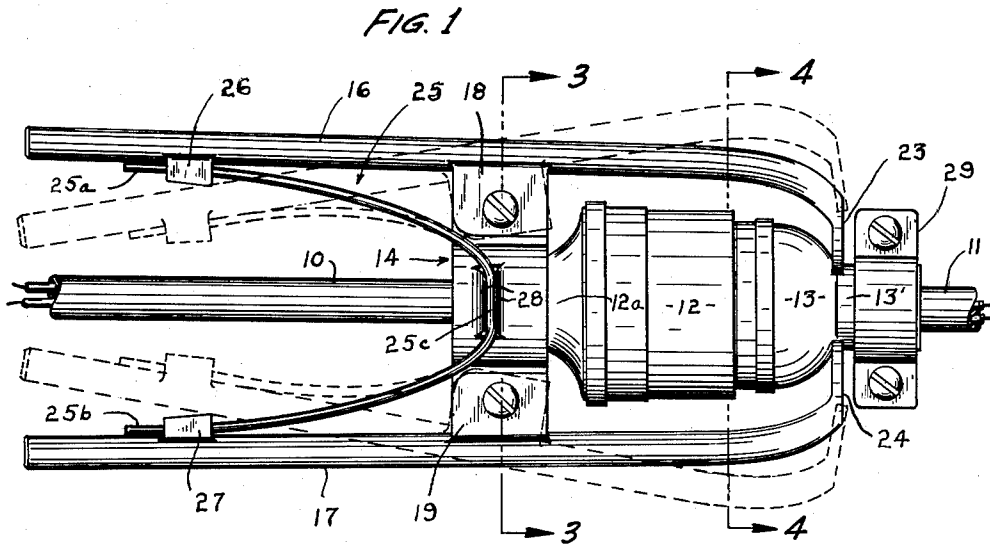
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CLAMPING DEVICE FOR ELECTRICAL EXTENSION CORD COUPLINGS

Filed June 25, 1959

2 Sheets-Sheet 1



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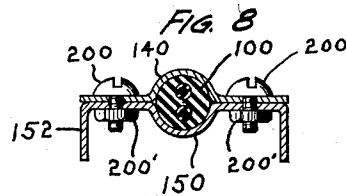
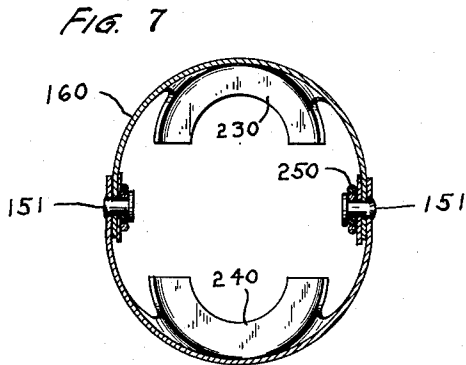
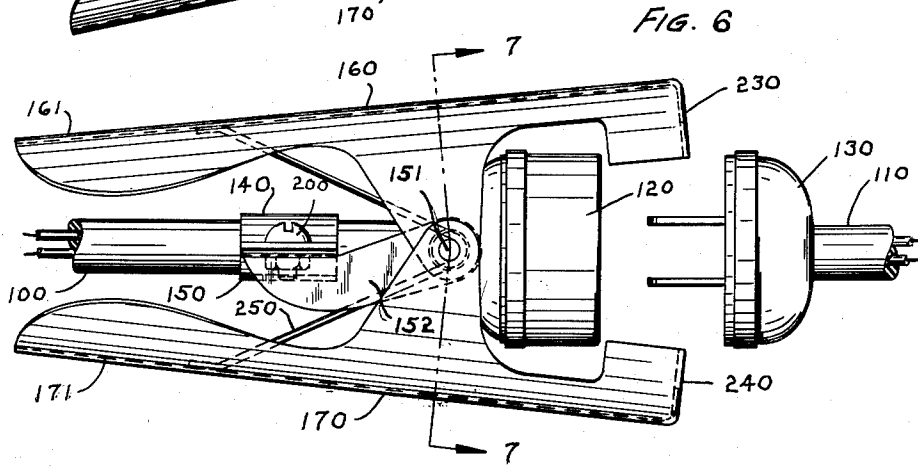
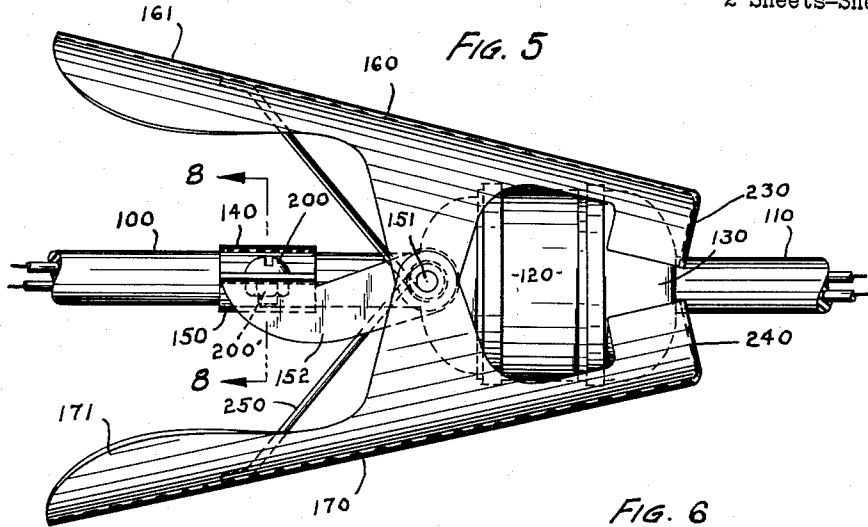
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CLAMPING DEVICE FOR ELECTRICAL EXTENSION CORD COUPLINGS

Filed June 25, 1959

2 Sheets-Sheet 2



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2,984,815

**CLAMPING DEVICE FOR ELECTRICAL EXTENSION CORD COUPLINGS**

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5 Claims. (Cl. 339—75)

This invention relates to a clamping device for electrical extension cord couplings. In particular, the invention has to do with a clamping device for association with the usual male and female plug type couplings, which are commonly used for interconnecting electrical extension cords in series.

It is a primary object of the invention to construct such a device in a manner which will greatly facilitate its application to and use with extension cords and which especially facilitate the coupling together and clamping of said couplings where their cords are under tension, as, for instance, where the interconnected coupling portions of the cords are to be suspended in mid-air.

Generically, the invention comprises the concept of forming the device to consist of two interrelated clamps, one of which is a usual conventional split type clamp adapted to be fixedly secured to the terminal end portion of one of the extension cords, together with a pair of clamping levers, both medially fulcrumed on the split type clamp for swinging movement in a common plane. At their forward ends, these levers carry clamp jaws directed inwardly toward each other in opposed relation and spaced from the split clamp whereby the interconnected couplings may be received between the split clamp and the clamp jaws, and the clamp jaws may thereafter be brought together in abutting relation with one of the plugs forming the coupling, to thereafter prevent disconnection of the coupling. The rearward ends of the respective levers constitute operating handles and are normally urged resiliently apart by suitable spring means to effect movement of the jaw members into closing relation toward each other.

In use, after the split clamp is fixedly secured to one of the cords adjacent its plug type coupling element, it may be supported simply by manually grasping and urging together the handle portions of the clamp levers to spread apart the jaws. This may be done with one hand while the other hand engages and supports another cord adjacent its plug element to assemble the said plugs or plug elements in operative coupled relation through the open jaws of the clamp levers. Subsequent release of the handle portions of such levers will permit the jaws to close by resilient spring action and thus move toward each other into abutting relation rearwardly of the coupling to prevent subsequent inadvertent disengagement of the connected plugs.

The generic inventive concept as above expressed is herein shown as employed in the two specific exemplifications, each of which incorporates certain additional specific features and advantages contributing to the utility of the device.

In the preferred embodiment of the invention, the two halves of the split clamp are drawn together by threaded pivot members, which in addition to their clamp actuating function, also are utilized as pivots to provide fulcrums for the respective levers. A further advantageous feature of this preferred embodiment consists in providing each of the said clamp levers with a clevis, the opposed

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legs of which receive between them the opposite ends of the respective halves of the split clamp to retain these in loosely clamped relation about the cord or the base of the plug of the respective cord, while the said threaded pivot members are passed through registering openings in each said clevis and its associated clamp halves. Thus, by this feature the assembly of the device in operative relation to its associated cord is greatly facilitated, as will be readily apparent.

In accordance with a further feature of the preferred embodiment, the spring which normally urges the handles of the clamp levers toward each other is pivotally mounted on the split clamp for swinging movement transversely to the plane of the levers, to and from a position between and in operating engagement with their handles. Thus, by swinging the spring to inoperative position, assembly of the levers and split clamp is facilitated.

In the second, or modified, embodiment of the invention, the opposed halves of the split clamp are adapted for application directly to their associated extension cord rearwardly of the electrical plug at its end and thus the split clamp acts directly on the cord to resist its accidental withdrawal from the plug. Moreover, in this embodiment, the split clamp carries forwardly projecting arms projecting toward the plug, at the free ends of which are medially fulcrumed the respective clamp levers. By this arrangement, the fulcrum points for the levers are made to approach more closely the mid-point of the coupling, whereby the jaw-carrying arms are relatively shortened and the actuating handles are correspondingly lengthened, as compared to the preferred embodiment. Thus, hand pressure exerted on the levers for opening the jaws may be transmitted with a somewhat increased mechanical advantage as compared to the preferred embodiment. Moreover, in the said modified form of the invention, the pivots or fulcrums for the clamp levers are economically employed to serve the manifold functions of providing fulcrums for the said clamp levers, interconnecting said levers to the split clamp, and in addition, providing an anchorage for the spring which functions to close the jaws of the clamp levers.

Specific embodiments of the invention are illustrated in the accompanying drawings in which:

Figure 1 represents a plan view of the preferred clamping device of the invention as applied to a conventional plug connection between the two electrical extension cords, which are shown fragmentarily. In broken lines, this view illustrates the position assumed by the parts of the clamp levers and associated structure when their jaws are spread apart for assembly or disassembly;

Figure 2 is a side elevation of the structure shown in Figure 1 connected at right angles to the plane of Figure 1;

Figure 3 is a detailed cross-section of the line 3—3 of Figure 1;

Figure 4 is a view partly in elevation and partly in section on the line 4—4 through the jaw-bearing portions of the levers showing these portions and the jaws;

Figure 5 is a view similar to Figure 1, showing a modified form of the invention;

Figure 6 is a view similar to Figure 5, but with the clamp levers positioned to open their jaws for passage of the male plug element of one of the extension cords into or from coupling engagement with the female plug element of the other cord;

Figure 7 is a cross-section on the line 7—7 of Figure 6; and

Figure 8 is a detail section on the line 8—8 of Figure 5.

Figure 9 is a view similar to Figure 3, showing a slight modification.

Referring now in detail to the accompanying drawings, and first considering the preferred embodiment of

the invention shown in Figures 1 to 4, inclusive, Figures 1 and 2 include fragmentary showings of the extension cords 10 and 11, each of which terminates in a conventional plug-in type electrical plug or coupling element 12 and 13, respectively. In the arrangement shown, the coupling element 12 constitutes the female plug and 13 is the usual male type of plug. The plug 12 includes the sleeve-like shank portion 12a, about which are fixedly clamped the opposed halves of a usual split clamp, these halves being designated 14—14, respectively. It will be seen that these are of similar but symmetrically arranged construction, each embodying a generally semi-circular clamping portion 14a and relatively diametrically opposed and projecting flat plates, each designated 15.

Medially fulcrumed on the split clamp structure 14 for relative swinging movement in a common plane are the similar but symmetrically disposed rigid clamp levers 16 and 17, respectively. At its mid-portion the lever 16 is provided with a preferably integrally formed clevis 18 between the legs of which are received the side plates 15 at one side of the split clamp 14. Similarly, the lever 17 is provided with integral clevis 19, between the legs of which are received the side plates 15 at the opposite side of the split clamp 14. It will be readily apparent that these clevises, in addition to forming part of the pivotal connection or fulcrum structure for each lever, function additionally as temporary holding or positioning means for maintaining the clamp halves 14 operatively positioned about the sleeve 12a of the plug 12, while threaded pivot elements exemplified by the bolts 20—20, respectively, are disposed through the registering openings in each clevis and its associated plates 15 to establish the desired pivotal connection or fulcrum. The position of the bolts 20 is maintained by means of nuts 21 threaded on the respective bolts and tightened to deflect the clevis legs slightly toward each other. This brings the clamp plates 15 toward each other to insure tightening of the clamp structure 14 in fixed relation about the plug sleeve 12a.

The clamp levers in the present embodiment are conveniently formed of metal rods having the clevis legs cast, forged, or otherwise formed integrally therewith.

The portions of the rods or levers projecting away from the coupling 12—13 on one side of the fulcrums 20 constitute handles for grasping and squeezing toward each other for the purpose of spreading apart the cooperating jaws 23 and 24 at the opposite or forward ends of the levers, respectively. These jaws 23 and 24 are of similar structure, being directed generally inwardly in opposed relation toward each other and preferably having recessed or arcuate operative edges 23' and 24', respectively, as shown in Figure 4, for operative engagement with the sleeve-like shank 13' of the male plug 13. Such engagement preferably is at the point where the said shank 13' merges with the enlarged bell-like portion of the plug 13, whereby abutting endwise engagement between such bell-like portion and the jaws will retain the plug 13 against withdrawal from the plug 12.

For the purpose of resiliently urging the jaws 23 and 24 toward their closed operative position, there is provided a resilient U spring 25, the opposite legs of which are received in inwardly projecting slotted cradles 26 and 27, respectively, on the handles. The spring normally resiliently urges the said handles apart and resiliently maintains them in the operative position shown in Figure 1. The base, or mid-portion, of the spring 25 is preferably pivotally connected to the clamp 14, as by being rotatably held between tongues or flanges 28, which are struck out from the sheet metal forming one of the split halves 14a of the clamp. Thus the spring may be swung transversely to the common plane of the levers to bring its legs to and from operative positions in the cradles 26, 27, respectively.

In the use of such a device, it will be readily apparent that the opposed split clamp members may be brought together and manually held in position about the sleeve-like shank 12a of their associated plug 12, while the clevises 18 and 19 of the clamp levers are brought together in operative relation on opposite sides of the clamp plates 15—15 to temporarily hold these together during application of the bolts 20 and their associated nuts 21. During this period, the spring 25 may be swung about medial pivot portion 25c to have its legs in an out-of-the-way position. However, as soon as the bolts and nuts 20 and 21 are applied in the manner above mentioned, the opposite legs or free end portions 25a and 25b of the spring may be grasped and compressed toward each other while they are swung inwardly into position between the cradles or pairs of bosses 26 and 27 of their respective levers, whereby they may be released and permitted to expand into operative engagement with each of the levers between the said pairs of bosses.

Thereafter, by grasping and squeezing together the handle portions of the levers, their jaws 23 and 24 may be spread apart as desired to permit coupling or uncoupling of the plugs 12 and 13 and the spring 25 will normally act through the handles to maintain the jaws 23 and 24 resiliently closed in operative engagement with the plug 13 to prevent its unintentional disengagement with the plug 12. It will be readily apparent that the clamping device and its associated cord 10 may be readily supported and manipulated in one hand while the other cord 11 and its associated plug may be supported in the other hand and coupled to the first cord in obvious manner. In the modification shown in Figure 9, each of the clevises 19 of Fig. 3 is replaced by a simple lug 19' for reception of pivot pin 20 to provide the required fulcrum for its lever.

In the modified form of the invention shown in Figs. 5 to 8, inclusive, the split clamp halves 140 and 150 are secured directly in fixed relation about the cord 100 by the threaded clamp screws and nuts 200 and 200', respectively, as shown in Figure 8. Although the fulcrums or pivots 151 for the clamp levers 160 and 170 are supported from the split clamp structure 140, 150, they are displaced therefrom toward the plug coupling to shorten the distance between the said fulcrum axis 151 and the jaws 230 and 240 at the forward end of the levers, all to the end that the correspondingly lengthened handle portions of the levers may function to transmit a jaw opening action at a greater mechanical advantage than occurs in the preferred embodiment. It will be seen that the pivots 151 in this modification consist of rivets which are spaced apart on a common axis on opposite sides of the plug 120 at the end of extension cord 100. In this instance the fulcrums or pivots 151 are carried at the free ends of arms 152 which project from and are integral with one of the split clamp members 150. The resilient spreading of the handles 161 and 162 is accomplished by springs 250, one of which is coiled around each pivot 151 and has diverging free ends disposed between and abutting outwardly against the handles 161 and 171. It will thus be seen that the split clamp is supported by its arms 152 for angular movement relative to levers 160 and 170, about the common axis of the pivots 151. Such angular movement of the arms 152 permits advantageous positioning of the split clamp 140, 150 adjacent one of the handles 171 to facilitate access to the clamp screws 200 with a screw driver, during application of the split clamp about the cord 100.

The subsequent use of this embodiment will be readily apparent from the preceding description.

Having thus described our invention, we claim:

1. A holder for electrical plug type extension cord couplings comprising a split clamp including clamp

halves and relatively laterally spaced bolts disposed through opposite sides of said clamp halves for drawing them together, a pair of rigid clamp levers respectively medially fulcrumed on said bolts for relative swinging movement in a common plane, each said lever being formed with a clevis for reception of the opposite sides of said assembled clamp halves to maintain said clamp halves in operative relation about an object encompassed therein during application of said bolts through registering openings in each said clevis and its associated sides of said clamp halves, said levers terminating at their forward ends respectively in relatively opposed inwardly directed jaws for operative engagement with one of the plugs of an electrical coupling, said levers respectively including relatively opposed handles on the rearward side of said bolts, in combination with a U spring pivotally mounted on said split clamp at its mid-portion for angular movement about an axis generally parallel to said common plane and transverse to said levers into and from an operative position between and in resiliently outwardly thrusting engagement with said respective lever handles.

2. A holder for electrical plug type extension cord couplings comprising a split clamp including clamp halves and relatively laterally spaced bolts disposed through opposite sides of said clamp halves for drawing them together, a pair of rigid clamp levers respectively medially fulcrumed on said bolts for relative swinging movement in a common plane, said levers terminating at their forward ends respectively in relatively opposed inwardly directed jaws for operative engagement with one of the plugs of an electrical coupling, said levers respectively including relatively opposed handles on the rearward side of said bolts, in combination with a U spring pivotally mounted on said split clamp at its mid-portion for angular movement about an axis generally parallel to said common plane and transverse to said levers, said spring including legs normally diverging from said mid-section for movement of their free ends about said axis into and from an operative position between and in resiliently outwardly thrusting engagement with said respective lever handles, said handles having relatively opposed inwardly directed cradles for removable reception and retention of said free ends.

3. A holder for electrical plug type extension cord couplings comprising a split clamp including clamp halves and relatively laterally spaced bolts disposed through opposite sides of said clamp halves for drawing them together, a pair of rigid clamp levers respectively medially fulcrumed on said bolts for relative swinging movement in a common plane, said levers terminating at their forward ends respectively in relatively opposed inwardly directed jaws for operative engagement with one of the plugs of an electrical coupling, said levers respec-

tively including relatively opposed handles on the rearward side of said bolts, in combination with a U spring pivotally mounted on said split clamp at its mid-portion for angular movement about an axis generally parallel to said common plane and transverse to said levers, said spring including legs normally diverging from said mid-section for movement of their free ends about said axis into and from an operative position between and in resiliently outwardly thrusting engagement with said respective lever handles.

4. A holder for electrical plug type extension cord couplings comprising a split clamp including clamp halves and relatively laterally spaced bolts disposed through opposite sides of said clamp halves for drawing them together, a pair of rigid clamp levers respectively medially fulcrumed on said bolts for relative swinging movement in a common plane, said levers terminating at their forward ends respectively in relatively opposed inwardly directed jaws for operative engagement with one of the plugs of an electrical coupling, said levers respectively including relatively opposed handles on the rearward side of said bolts, in combination with a spring pivotally mounted on said split clamp at its mid-portion for angular movement about an axis generally parallel to said common plane and transverse to said levers, for movement about said axis into and from an operative position between and in resiliently outwardly thrusting engagement with said respective lever handles.

5. A holder for electrical plug type extension cord couplings comprising, a split clamp including clamp halves and relatively laterally spaced bolts disposed through opposite sides of said clamp halves for drawing them together, a pair of rigid clamp levers respectively medially fulcrumed on said bolts for relative swinging movement in a common plane, each said lever being formed with a clevis for reception of the opposite sides of said assembled clamp halves to maintain said clamp halves in operative relation about an object encompassed therein during application of said bolts through registering openings in each said clevis and its associated sides of said clamp halves, said levers terminating at their forward ends respectively in relatively opposed inwardly directed jaws for operative engagement with one of the plugs of an electrical coupling, said levers respectively including relatively opposed handles on the rearward side of said bolts.

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