# United States Patent

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**a part interest**


[54] **BIASING ELECTRICAL COUPLING HOLDER**
**10 Claims, 6 Drawing Figs.**


[52] **U.S. Cl.** ..... **339/75 P,** 24/123 A, 287/90 D
[51] **Int. Cl.** ..... **H01r 13/54**
[50] **Field of Search** ..... 24/123 A; 285/317, 320; 287/90 D; 339/75 R, 75 P, 75 M, 91 R



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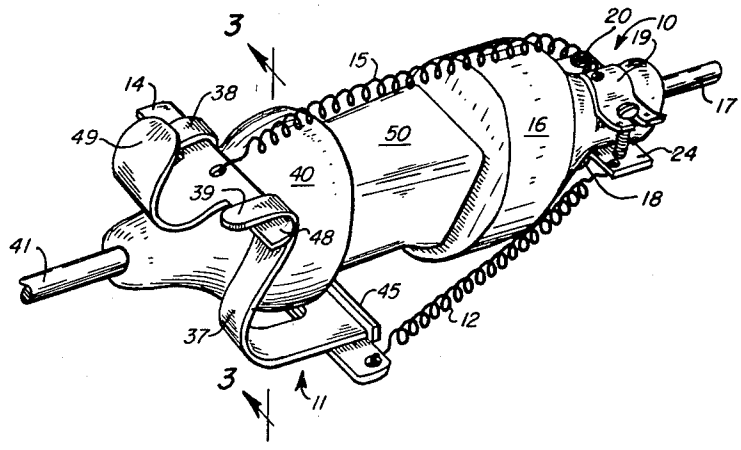


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**ABSTRACT:** The holder retains in-line slidably disengageable electric plug members coupled together for continuous electrical connection between the cables extending from the plug members at each end of the coupling.

The holder includes a clamp member or means which is mounted upon the base portion of a first plug member at one end of the coupling. The holder also includes a bifurcated means comprising an adjustable yoke and two arms extending from the yoke in substantially parallel aligned spaced relationship. The terminal ends of these arms are turned laterally to form a bifurcated lock-receiving hook recess. This bifurcated means is fitted over the base portion of the second plug member at the other end of the coupling in such a manner that one arm of the bifurcated means extends on each side of the cable connection to that second plug member. Also, the terminal ends of the arms of the bifurcated member are so positioned that they project in a direction away from the coupling. A biasing resilient connection (such as a coil spring) extends between the clamp means at the base portion of the first plug member and the bifurcated means at the base portion of the second plug member. Lock bar means is removably nested in the bifurcated lock-receiving hook recess formed by the outwardly turned terminal ends of the arms of the bifurcated means. A further or second biasing resilient connection extends between the lock bar and the clamp. The resilient connections between the bifurcated means and the clamp means, and between the lock bar means and the clamp means, serve to place a constant compressive force upon the coupling; and this constant compressive force biases the first and second plug members of the coupling toward each other.

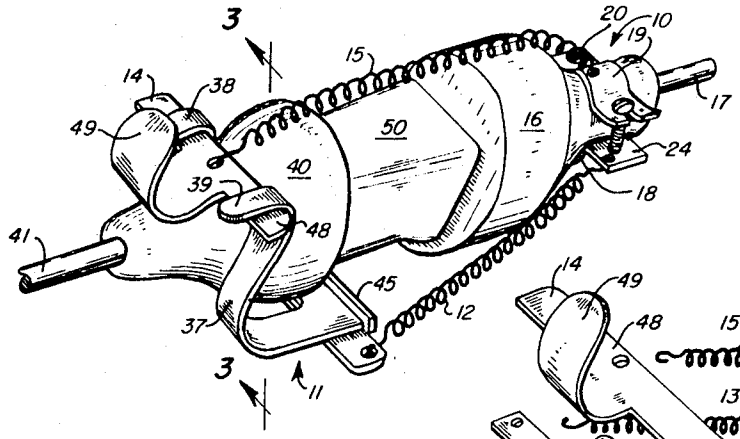



FIG. 1

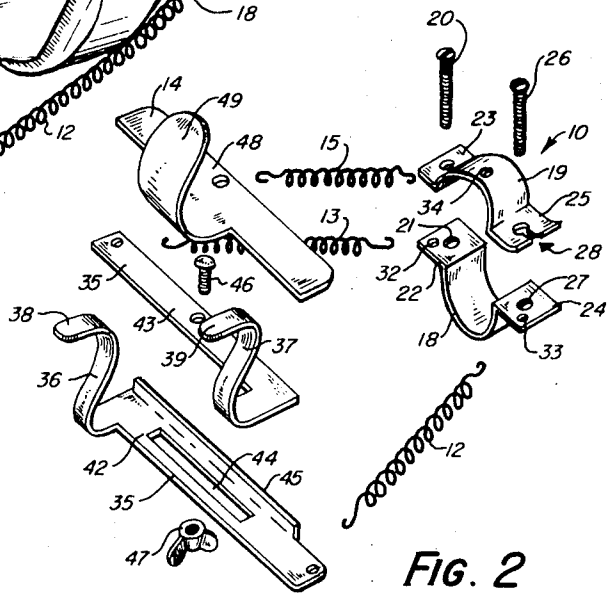



FIG. 2

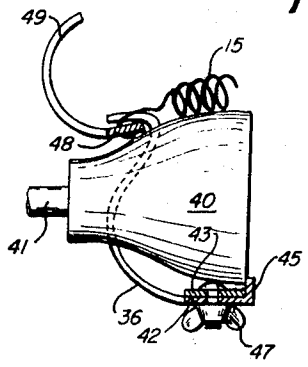



FIG. 3

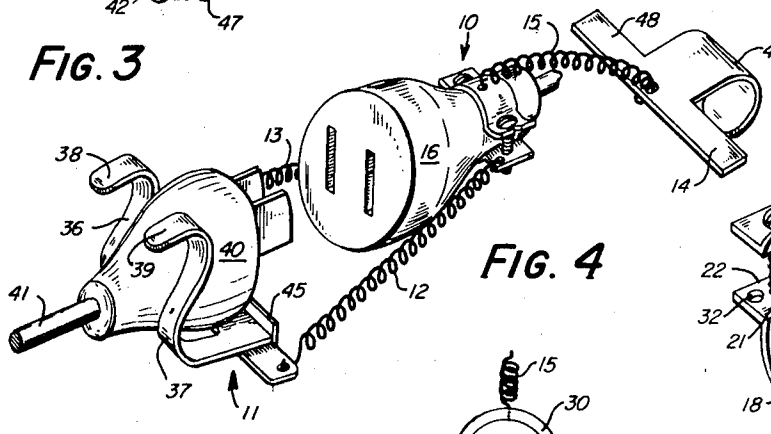



FIG. 4

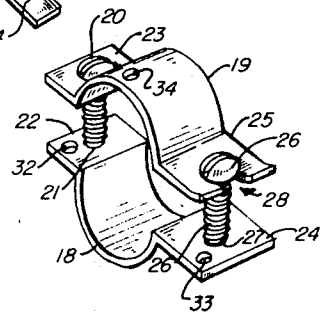



FIG. 5

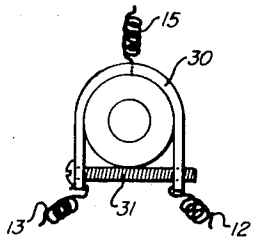



FIG. 6

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# BIASING ELECTRICAL COUPLING HOLDER

This invention relates to a new holder especially useful for retaining in-line slideably disengageable electric plug members coupled together.

A variety of clamps and other devices have been proposed for holding the electric plug members for an extension cord against inadvertent separation. However, the nature of the devices heretofore proposed has been such that they are limited in application. For example, if they have been designed for household use, the size and functional features have been such that they have been unsuitable for industrial use. In some cases, the design and functional features have been such that a part of the clamp or device becomes more or less a permanent part of one of the coupling plugs because the part is either integral with the plug or removed from it only with great difficulty. In still other cases, earlier-known clamps or holders have been relatively unsatisfactory in terms of performing the function of maintaining plug members operably coupled together, but yieldingly so, as the extension cord is pulled or dragged over a floor around legs of objects or pulled into the air over rungs of a ladder as one ascends the ladder. The forces to which an extension cord coupling is subjected in various environments tend to disengage or twist the relative relationship of the plug members forming the coupling; and these forces should not always be unyieldingly resisted. In other words, it is preferable to have the coupling yield or even separate slightly than to end up tearing an electrical cable out of its attachment to a plug of the coupling.

A long-desired combination of features and functional advantages is exhibited by the special holder of this invention.

This new holder is extraordinarily versatile. It is easily removed from one coupling and placed upon another. In a preferred embodiment, the adjustability features built into the holder are such that it may be quickly placed upon a coupling formed of small electrical plugs as commonly employed in a household, and thereafter, as and when the need arises, quickly removed therefrom and adjusted for emplacement as a holder for large couplings, even those of industrial type.

A significant feature of the holder is that it maintains a constant but yielding compressive force upon a coupling; and this compressive force biases the plug members of the coupling toward each other. This feature is especially significant as a safeguard against damaging or tearing the connection between an electrical plug and the electrical cable extending therefrom. It is especially significant as a property combined with the aforenoted versatility feature for the holder.

A further feature of this new holder is that it has all of its parts connected together even when it is not performing a holding function. It is conveniently attached as a unit upon one plug member of an electrical cord as a semipermanent but easily removable part of it. Thus the holder hereof is not apt to become lost or misplaced when changing electrical hookups for power saws, sanders and the like.

Still further, the holder hereof is readily capable of holding together a complex coupling including a converter from a three-wire (with ground) to two-wire (without ground) between electrical plugs.

Still other benefits and advantages of the new holder of this invention will become apparent as this description proceeds. The invention will be described by reference to a drawing, made a part hereof, wherein:

FIG. 1 is a perspective view of a complex electrical coupling fitted with the holder of this invention;

FIG. 2 is an exploded perspective view of the holder apart from a coupling;

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 1;

FIG. 4 is a perspective view of the holder of this invention partially fitted on plug members to be coupled together;

FIG. 5 is an enlarged perspective view of a clamp means in accordance with the invention;

FIG. 6 is an end view of an alternate embodiment for a clamp means according to the invention.



Referring to the drawing, the holder of this invention broadly comprises clamp means **10** bifurcated means **11**, a first resilient means (suitably consisting of coil spring members **12** and **13**) extending as a connection between the bifurcated means **11** and clamp means **10**, a lock bar means **14**, and a second resilient means **15** extending as a connection between the lock bar means **14** and clamp means **10**.

The clamp means **10** is adapted for removable mounting upon the base portion of a first plug member **16** at one end of the electric coupling. Normally, the mounting of clamp **10** will be at a throat part of plug **16**, near or adjacent to the port of the plug **16** from which an electrical cable **17** extends. Thus, clamp **10** desirably performs not only the function of serving as means by which the holder hereof is semipermanently (but removably) fixed as a unit upon one plug of a coupling, but also serves as an added grip member to hold cable **17** in the port of plug **16**.

Suitably, clamp means **10** consists of two opposing bands or brackets **18** and **19** of metal or plastic, with a curved recess portion (for receiving plug **16**) intermediate the ends thereof, and an adjustable fastening member, such as a threaded bolt **20**, for clamping or holding the two strips of the clamp means in a firm nonslideable grip upon the throat portion of the first plug member **16**. The nut for the bolt fastener **20** of the clamp means is unnecessary when, as is preferred, cooperative threads are placed within the hole **21** of the opposite clamp part **18** for threadedly receiving fastener **20**. Thus, fastening means **20** and **21** extends between or serves as the fastener for one pair of opposing mated ends **22** and **23** of brackets **18** and **19**. The other pair of opposing mated ends **24** and **25** of brackets **18** and **19** comprise a first end member **24** and a second end member **25**. First end member **24** is equipped with adjustable means (such as a threaded bolt **26** in threaded hole **27**) which slideably interlocks with means (such as slot **28**) extending inwardly from the end of the second member **25**. The very end of slotted end member **25** suitably is curved upwardly or away from the opposing mated end **24**, which assists in maintaining end member **25** under the head of bolt **26** as the clamp **10** is mounted on a plug. Bolt **26** is adjustable to change the length of it projecting upwardly from first end member **24**; and this adjustment is suitably made with the holder of the invention held in ones hands before fixing it to female plug **16**. Then the slotted end **25** of bracket **19** is slipped under the head of bolt **26** during mounting of clamp **10** on plug **16**, after which fastening means **20** and **21** is tightened to pull brackets **18** and **19** toward each other in clamping relationship. The slot feature for end **25** facilitates not only rapid emplacement of clamp **10** in semipermanent position, but also rapid removal of it should the holder be needed for a different coupling.

An alternate embodiment for the clamp means is illustrated in FIG. **6** and consists essentially of a U-shaped band **30** of flexible metal or plastic with a threaded fastener **31** between the legs of the U.

Clamp **10** is equipped with holes **32**, **33** and **34**, or other suitable means for attachment of resilient means **12**, **13** and **15**, preferably in triangular relationship.

The bifurcated means **11** of the new holder comprises a yoke part **35** and two arms **36** and **37** extending from the yoke in substantially parallel aligned spaced relationship. The terminal ends **38** and **39** of these arms provide a lock-receiving recess. They are turned laterally in substantially parallel alignment to form a bifurcated (that is, "split") lock-receiving hook recess. A key feature of this bifurcated means **11** is that it is adapted to be fitted over the base portion of he second plug member **40** at the other end of the total coupling; and one of the arms **36** and **37** of the bifurcated means extends on each side of the cable port for cable **41** to the second plug member **40**. Furthermore, the terminal ends **38** and **39** of the arms **36** and **37** of the bifurcated means **11** project in a direction away from the coupling structure itself. Preferably, the arms **36** and **37** which project from the yoke **35** are curved first in one direction and then the other as illustrated in the drawing; and the curvature intermediate the ends of the arms is adapted to

facilitate nesting of bifurcated means 11 on the base of plug 40. The outward curvature of the arms 36 and 37 at their terminal ends (as the bifurcated means is placed on plug 40) forms the bifurcated lock-receiving hook recess for receiving the lock means or bar 14.

An important preferred feature of the bifurcated means 11 is the adjustability of the spacing or distance between the arms 36 and 37 so as to permit the holder of the invention to be used for the smallest of electrical plugs as well as the very large practical types as encountered in some industrial operations. This adjustability is built into the yoke portion of the bifurcated means. The yoke is formed of two sections or parts 42 and 43 slideably adjustable with respect to one another. One arm 36 or 37 extends from each such part 42 and 43 of the yoke 35. One plate or part 36 of the yoke 35 is equipped with a central elongated slot 44 and an edge curved bead or bent flange 45 (perpendicular to plate part 42), both of which cooperatively guide the slide of part 42 with respect to the other plate part 43 of the yoke 35. The part 43 of the yoke is equipped with means 46 projecting from it into the slot of the first yoke part 42; and this means 46 (which suitably is a bolt or threaded member) serves with slot 44 and flange 45 to guide the slide between parts 42 and 43 in a predetermined linear path. Wing nut 47 serves with the threads of bolt or guide shaft means 46 as a device whereby the two parts 42 and 43 of the yoke may be fixed against sliding motion after they have been adjusted to a desired spacing distance for arms 36 and 37.

As a practical matter, bolt 46 may be fixed as a threaded shaft projecting from plate part 43 of the yoke. The wing nut on this projecting threaded shaft 46 is used to tighten the two plate parts of the yoke together in any desired position as need for the size of any particular coupling structure.

Resilient means extend as a connection between the bifurcated means 11 and the clamp means 10. Suitably, a coil spring may serve as this resilient means. In the drawing, however, two such coil springs extend between the bifurcated means 11 and clamp means 10. One coil spring 12 extends between one end 24 of one bracket 18 of the clamp means 10 to one plate part 42 of the yoke. A further coil spring 13 extends between the opposite end 22 of the one bracket 18 to the other yoke part 43. It will be understood that resilient materials of resilient plastic or of rubbery character may be substituted for the coil spring resilient means illustrated. Further, a single resilient member or a plurality may be employed between the bifurcated means 11 and clamp 10.

Lock means 14 suitably comprises a bar 48 and a handle member 49 for finger gripping. Lock bar 48 is removably nested in the bifurcated lock-receiving hook recess formed by the laterally turned ends 38 and 39 of the arms 36 and 37 of the bifurcated means 11.

Resilient means 15 extends between the lock bar 48 and clamp means 10. Of course, the resilient means 15 may comprise more than one member; but such is unnecessary.

Preferably, the triangular relationship of spaced resilient elements 12, 13 and 15 is maintained. The spacing of these resilient elements in an approximately triangular relationship about the complete electrical coupling provides a good balance of forces (a perfect balance is unnecessary), and is effective to hold the members forming the coupling under a substantially constant compressive force which biases the members of the coupling together.

The entire holder may be fabricated in organic plastic or metal (such as steel) or a combination of materials.

The type holder illustrated is extremely versatile. It may be used for couplings of various sizes. It may be used for the simple male-female plug coupling as well as for rather complex coupling structures. It is illustrated in FIG. 1 as holding together a male electrical plug 40 (suitably of three leads with one a ground), a converter 50 from a three-lead to a two-lead, and a two-lead female electrical plug (without ground), all in-line and slideably disengageable. The bumping or jarring of such a complex coupling may tend to twist or throw one or two elements of it out of alignment; but the substantially constant compressive force of the holder of this invention pulls the elements back into alignment for the continuous electrical connection between the cables 17 and 41 extending from the plug members at each end of the coupling. Furthermore, the yielding or resilient biasing action of the holder assists in safeguarding against jerking a cable connection out of its respective plug. This feature is made possible by the absence of a rigid brace member or element extending between the easily removable clamping or holding parts on end plug members of a coupling. Nevertheless, the holder is effective to hold plug members coupled together as several feet of cord, below the coupling, are pulled up a ladder and supported substantially solely by the holder of this invention.

A variety of modifications for the holder are possible while still retaining the essential benefits of the invention and additionally gaining other benefits. If desired, the attachment of resilient means 12, 13 and 15 to the clamp 10 or to the bifurcated means 11 or lock means 14 may be adjustable so as to permit alteration of the length of the resilient members and thereby change the degree of compressive action by the resilient means upon a coupling. Specifically, the attachment may be by means of a series of spaced hooks on the resilient members for latching to the clamp. In this manner, the tensioning force or action of the resilient means may be adjusted (as desired for different coupling structures) to be below the breaking force required for pulling or separating the cable connections to plugs in the coupling. Another illustrative modification is that of hinging the clamp of the holder; that is, a hinge may replace the cooperative parts 26 and 28 of the two-band clamp as specifically illustrated in FIG. 5. The arms of the bifurcated means may be contoured in a variety of ways, or may be of varying cross-sectional size at different positions along their length. Guide members or means to cause the adjustable parts of the bifurcated means to move in a controlled predetermined path may be such as to provide an arcuate path of adjustment, but one altering the spacial relationship between the arms extending from the yoke of the bifurcated member. These illustrative modifications should be accomplished, when desired, without detracting from the basic functional advantages and basic structural features and relationships aforedescribed.

That which is claimed is:

1. A holder for retaining in-line slideably disengageable electric plug members coupled together for continuous electrical connection between cables extending from cable ports in the plug members at each end of said coupling, comprising:

i. clamp means adapted for removable mounting upon the base portion of a first plug member at one end of said coupling,

ii. bifurcated means comprising a yoke and two arms extending from said yoke in substantially parallel aligned spaced relationship, the terminal ends of said arms providing lock-receiving means, said bifurcated means being adapted to be fitted over the base portion of a second plug member at the other end of said coupling with one arm of said bifurcated means on each side of a port for a cable from said second plug member,

iii. first resilient means extending as a biasing connection between said bifurcated means and said clamp means,

iv. lock means adapted to be removably nested in said lock-receiving means of said bifurcated means, and

v. second resilient means extending as a biasing connection between said lock means and said clamp means, said first and second resilient means being such as to place a constant compression force upon said coupling biasing said first and second plug members toward each other.

2. The holder of claim 1 wherein said clamp means comprises an adjustable fastening member for causing said clamp means to firmly grip said first plug member in a nonslideable manner.

3. The holder of claim 1 wherein said clamp means comprises a pair of opposing brackets adapted to be placed on op-

posite lateral sides of the base portion of said first plug member, and adjustable fastening means for pulling said brackets toward each other in clamping relationship.

4. The holder of claim 3 wherein said fastening means extends between one pair of opposing mated ends of said brackets, and wherein the other pair of opposing mated ends of said brackets comprises a first and second end member, said first member being equipped with means slideably interlocking with means on said second member.

5. The holder of claim 1 wherein the terminal ends of said arms providing the lock-reciving means are turned laterally in substantially parallel alignment to form a bifurcated lock-receiving hook recess, and wherein said lock means comprises a lock bar adapted to be received in said recess as said bifurcated means is fitted on a plug with said turned terminal ends projecting in a direction away from said coupling.

6. The holder of claim 1 wherein said bifurcated means comprises adjustable means for altering the spacial distance between the two arms extending from the yoke thereof.

7. The holder of claim 1 wherein said yoke of said bifurcated means comprises two parts slideably adjustable with respect to each other plus means to fix said yoke parts against sliding motion, and wherein one of the arms of said bifurcated means is fixed to one of said yoke parts and the other of the arms of said bifurcated means is fixed to the other of said yoke parts.

8. The holder of claim 7 additionally comprising means for guiding the sliding motion of said yoke parts in a predetermined path.

9. The holder of claim 1 wherein said first resilient means comprises a pair of coil springs spaced from each other.

10. The holder of claim 1 wherein said lock means comprises a bar and a handle member extending outwardly from said bar intermediate the ends thereof.