Oct. 17, 1961 L. J. BERG 3,005,176

RETAINER CLAMPS FOR ELECTRIC PLUG AND SOCKET CONNECTORS

Filed Jan. 27, 1960

Fig. 2

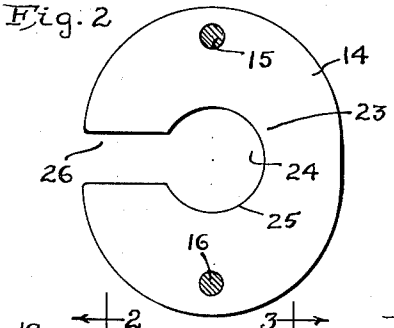


Fig. 7

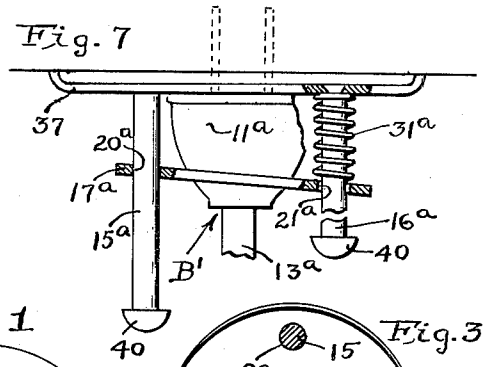


Fig. 1

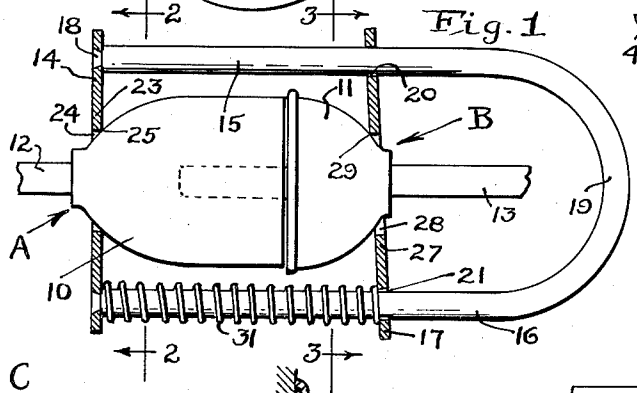


Fig. 3

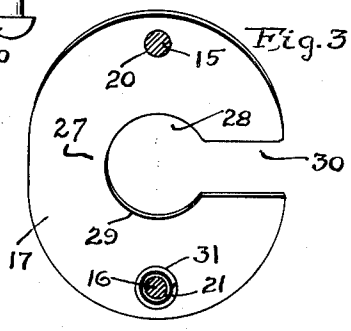


Fig. 6

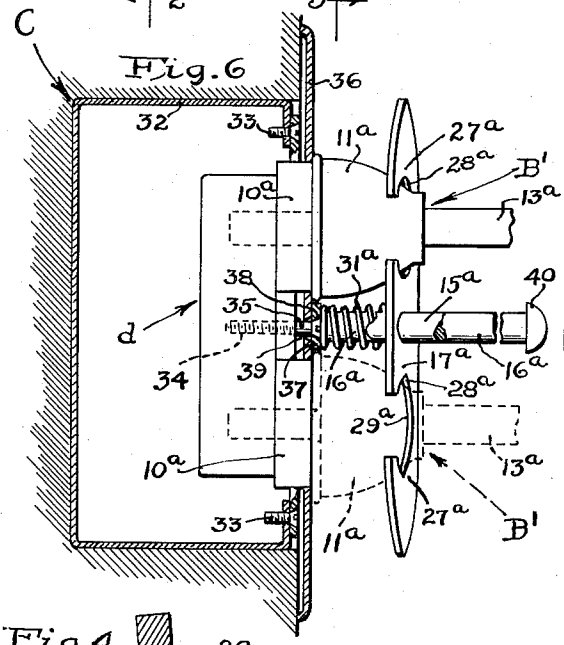


Fig. 5

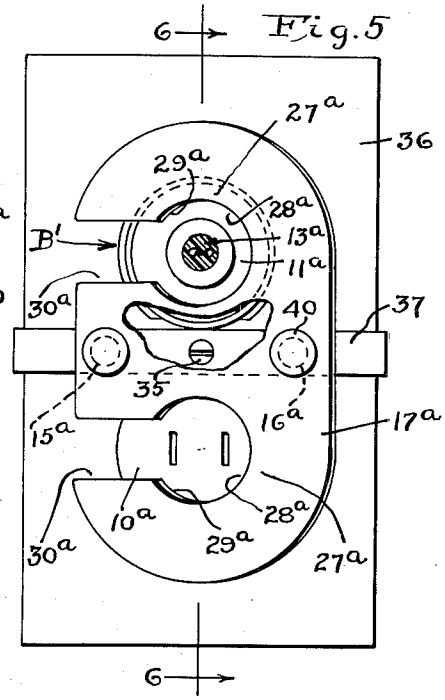
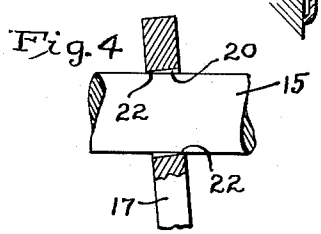


Fig. 4



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RETAINER CLAMPS FOR ELECTRIC PLUG AND SOCKET CONNECTORS

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My invention relates to improvements in retainer clamps for releasably holding electric plug and socket connectors together in assembled relation.

It is known that the plug connectors of electric cords are apt to be accidentally separated from the sockets of other electric cords interconnected therewith or from other electric outlets into which they have been plugged. This is not only annoying but is sometimes fraught with danger.

An object of the invention is to provide improved retainer clamps of the present nature which are simple, durable and inexpensive in construction, a further object being to provide such clamps which, while being adapted to be quickly and easily applied to and removed from an assembly of electric plug and socket connectors, will securely hold together the assembled connectors when applied thereto.

These and other objects will become apparent from the following description and the accompanying drawings in which:

FIG. 1 is a side elevational view, partly in section, illustrating an embodiment of the invention in one form thereof, the same being shown with electric plug and socket connectors held together thereby in assembled relationship,

FIG. 2 is a sectional view taken as on the line 2—2 of FIG. 1, the electric socket being omitted,

FIG. 3 is a sectional view taken as on the line 3—3 of FIG. 1, the electric plug being omitted,

FIG. 4 is a magnified view of a portion of FIG. 1,

FIG. 5 is an elevational view illustrating an embodiment of the invention in a second form thereof,

FIG. 6 is a sectional view taken as on the line 6—6 of FIG. 5, and

FIG. 7 is a plan view of the construction shown in FIGS. 5 and 6.

Referring to the accompanying drawings, it will be seen that said first form of the invention, shown in FIGS. 1, 2 and 3, constitutes a retainer clamp for holding together the socket 10 of an electric extension cord A and the mating plug 11 of a contiguous extension cord B, 12 being the electric cable leading to the socket 10 of the electric cord A, and 13 being the electric cable leading to the plug 11 of the electric cord B. Said first form of the invention includes an anchor plate 14, first and second parallel rails 15, 16 extending forwardly from said anchor plate 14, and a follower plate 17 slidably mounted on said rails 15, 16. These rails 15, 16 are riveted at their corresponding ends to the anchor plate 14, as at 18, or are otherwise suitably secured endwise to said plate 14. The rails 15, 16, as shown, are the legs of a U-shaped rod, such construction being advantageous in that the bend 19 of said U-shaped rod will strengthen the rails 15, 16 by tying them together remotely from the anchor plate 14 and will fend the clamp away from obstructions in the event that it be dragged along the ground together with the electric cords to which it is applied.

The follower plate 17 has a first bore 20 therein in which the first rail 15 is slidably received and has a second bore 21 therein in which the second rail 16 is similarly received. The diameter of the second bore 21 is substantially greater than the diameter of said second rail 16 resulting in a comparatively loose fit between the plate 17 and said second rail 16 which enables the follower plate 17 to tilt out of right angular relationship with the rails 15, 16 and thus take a biased position relative thereto. The diameter of the first bore 20 in the follower plate 17 is but slightly greater than the diameter of the first rail 15 to the end that the diametrically opposite portions 22 (FIG. 4) of the wall of the bore 20 at the ends of said bore will engage and grip said rail 15 upon the biasing of the follower member 17. The anchor plate 14 has a central abutment portion 23 in which an opening 24 is formed, said opening providing a seat 25 against which the socket 10 of the electric cord A may be placed, as shown in FIG. 1. Said anchor plate 14 has therein a bifurcation 26 which communicates with the opening 24 in said plate 14 and provides a passageway for the sidewise insertion of the cable 12 into said opening 24. Like the anchor plate 14, the follower plate 17 has a central abutment portion 27 in which an opening 28 is formed to provide a seat 29 against which the plug 11 of the extension cord B may be placed, as shown in FIG. 1. This follower plate 17 also has a bifurcation 30 therein which provides a passageway for the sidewise insertion of the cable 13 of said extension cord B into said opening 28.

In the application of the clamp (FIG. 1) to the assembled socket 10 and plug 11 of the extension cords A, B, the cables 12, 13 connected with socket and plug are passed sidewise through their respective bifurcations 26, 30 into their respective openings 24, 28 in the anchor plate 14 and follower plate 17. Said follower plate 17 is then slid along the rails 15, 16 toward the anchor plate 14 to clamp the plug and socket assembly between the two plates 14, 17, the seat 29 of the follower plate 17 being thereby brought against the plug 11 and the socket 10 being thereby brought against the seat 25 of the anchor plate 14. In thus sliding the follower plate 17 along the rails 15, 16, said plate 17 is caused to be biased into position gripping the rail 15 by exerting pressure against said plate 17 at the locality of the rail 15. Plugs and sockets, such as those indicated at 11 and 10, are commonly made of resilient material and will yield somewhat under the clamping pressure applied to a plug and socket assembly between the anchor plate 14 and follower plate 17. Resiliently reacting against the follower plate 17, the assembly will cause the follower plate 17 releasably to remain gripped upon the rail 15, thereby holding the assembled socket 10 and plug 11 together securely against any tendency of their separation unpremeditately. Aside from any resiliency obtaining in the assembly of a socket and plug, as at 10, 11, which serves to keep the biased follower plate 17 at grips with the rail 15, I have found that the employment of a helical expansion spring, as at 31, encircling the rail 16 and interposed between the anchor plate 14 and follower plate 17 will serve the same purpose in supplementary fashion or by itself alone. While the socket 10 in said first form of the invention (FIG. 1) is shown as seated against the anchor plate 14 and the plug 11 is shown as seated against the follower plate 17, it will be readily understood that the positions of said socket and plug relative to the plates 14, 17 may be reversed so that the plug 11 will seat against the anchor plate 14 and the socket 10 will seat against the follower plate 17.

To release a plug and socket assembly from the form of the invention shown in FIG. 1, pressure will be brought against the follower plate 17 at the locality of the rail 16 in direction toward the anchor plate 14. This will advance the retrograded side of the biased follower plate 17 and relieve its grip upon the rail 15, whereupon said follower plate 17 may be backed away from the plug and socket assembly, thereby freeing both plug 11 and socket 10 from its respective plate 14 or 17.

While the second form of the invention, shown in

FIGS. 5, 6 and 7, is basically the same as the form shown in FIGS. 1 to 4, inclusive, it provides for the simultaneous clamping of the plugs of two extension cords to the twin sockets of a dual outlet, as at C, or the clamping of the plug of a single extension cord to either of the sockets of such an outlet. In illustrating said second form of the invention, I have shown a conventional duplex receptacle or outlet C, the same including a wall box 32, a socket unit *d* attached to the box 32 by screws 33 and having twin sockets 10ª, said socket unit *d* having a screw hole 34 therein between said sockets 10ª. As will be recognized, this screw hole 34 in the socket unit *d* receives the conventional fastening screw 35 which clamps the usual wall plate 36 in place. In said second form of the invention, an anchor bar 37 traverses said wall plate 36 between the twin sockets 10ª of the socket unit *d*, said bar 37 having a screw hole 38 therein intermediately thereof for the reception of the conventional fastening screw 35 which extends through an opening 39 in the wall plate 36 and into the screw hole 34 in the socket unit *d*. Further included in the second form of the invention are a first rail 15ª and a second rail 16ª. These rails 15ª, 16ª are separate parallel rails riveted or otherwise suitably secured at their inner ends to the anchor bar 37, said rails 15ª, 16ª being provided at their outer ends with heads 40. The follower plate 17ª in the second form of the invention, as in the first form, has a first bore 20ª and a second bore 21ª therein, the second bore 21ª slidably receiving the second rail 16ª in a relatively loose fit to admit of the biasing of the follower plate 17ª relative to the rails 15ª, 16ª, and the first bore 20ª slidably receiving the first rail 15ª in a relatively snug fit to provide for the gripping of the first rail 15ª by the follower plate 17ª upon the biasing thereof. Instead of having a single abutment portion, the follower plate 17ª of the second form of the invention has two abutment portions 27ª in each of which is formed an opening 28ª providing a seat 29ª, one opening 28ª being axially aligned with one of the twin sockets 10ª and the other opening 28ª being similarly aligned with the other of the said twin sockets 10ª. Said follower plate 17ª has two bifurcations 30ª formed therein, one for each of the openings 28ª, each bifurcation communicating with its respective opening 28ª for the sidewise passage therethrough of the cable 13ª of an extension cord B¹ coupled to the outlet C. The helical expansion spring 31ª encircling the second rail 16ª of the second form of the invention, and bearing at one end against the anchor bar 37 and at its other end against the follower plate 17ª, corresponds with the spring 31 of the first form of the invention, serving the same purpose in the presence of a plug 11ª in either of the twin sockets 10ª of the socket unit *d*.

It is believed that those skilled in the art to which the invention pertains will be able to obtain a clear understanding of the invention from the foregoing description considered in connection with the accompanying drawings.

While certain particular embodiments of my invention have been disclosed herein, it will be understood that changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A retainer clamp for electric plugs and sockets comprising an anchor member having means engageable with a socket for depriving such member of forward movement relative to the socket, a first rail and a second rail secured at their corresponding ends to and extending forwardly in parallelism from said anchor member, a follower member mounted on said rails and having an abutment portion for engagement with the rear of a plug

plugged into the socket, said follower member being formed with a first bore therein in which said first rail is slidably received and with a second bore therein in which the second rail is slidably received, the diameter of said second bore being considerably greater than the diameter of the second rail enabling the follower member to be biased relative to the rails fore and aft thereof, the diameter of the first bore being but slightly greater than the diameter of said first rail and such that the diametrically opposite portions of the wall of the bore at the opposite ends thereof will engage and grip said first rail upon the biasing of said follower member, said follower member being adapted to be moved along the rails toward the socket into biased disposition abutting the plug thereby to hold the plug against withdrawal from the socket.

2. A retainer clamp, as defined in claim 1, wherein spring means is interposed between the anchor member and follower member, said means yieldingly holding the latter in biased disposition gripping said first rail.

3. A retainer clamp, as defined in claim 1, wherein an expansion spring interposed between the anchor member and follower member, encircles the second rail, and bears at its forward end aginst the follower member, said spring yieldingly holding the follower member in biased disposition gripping said first rail.

4. A retainer for releasably clamping the plugs of electric extension cords in socketed relation with the twin sockets of a dual electric outlet, said retainer comprising an anchor member, means securing the anchor member to said outlet, a first rail and a second rail secured at the corresponding ends thereof to said anchor member, said rails extending forwardly in parallelism from the sockets and axially located in a plane between the axes of said sockets, a follower member movably mounted on said rails, said member having a first bore therein slidably receiving said first rail and having therein a second bore slidably receiving said second rail, said member having at either side of said rails a portion for abutment with the rear of the plug plugged into the corresponding socket of the outlet, the diameter of said second bore being considerably greater than the diameter of the second rail enabling the follower member to be biased relative to the rails fore and aft thereof, the diameter of the first bore being but slightly greater than the diameter of the first rail and such that the diametrically opposite portions of the wall of the bore at the opposite ends thereof will engage and grip said first rail upon the biasing of the follower member, said follower member being adapted to be moved along said rails toward the outlet into biased disposition abutting the plug in each of the twin sockets, thereby to retain the same against withdrawal from the outlet.

5. A retainer, as defined in claim 4, wherein an expansion spring encircles the second rail between the anchor member and follower member, bearing at its forward end against the latter and yieldingly keping it in biased disposition gripping said first rail.

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