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ELECTRICAL CLAMP

Filed April 10, 1968

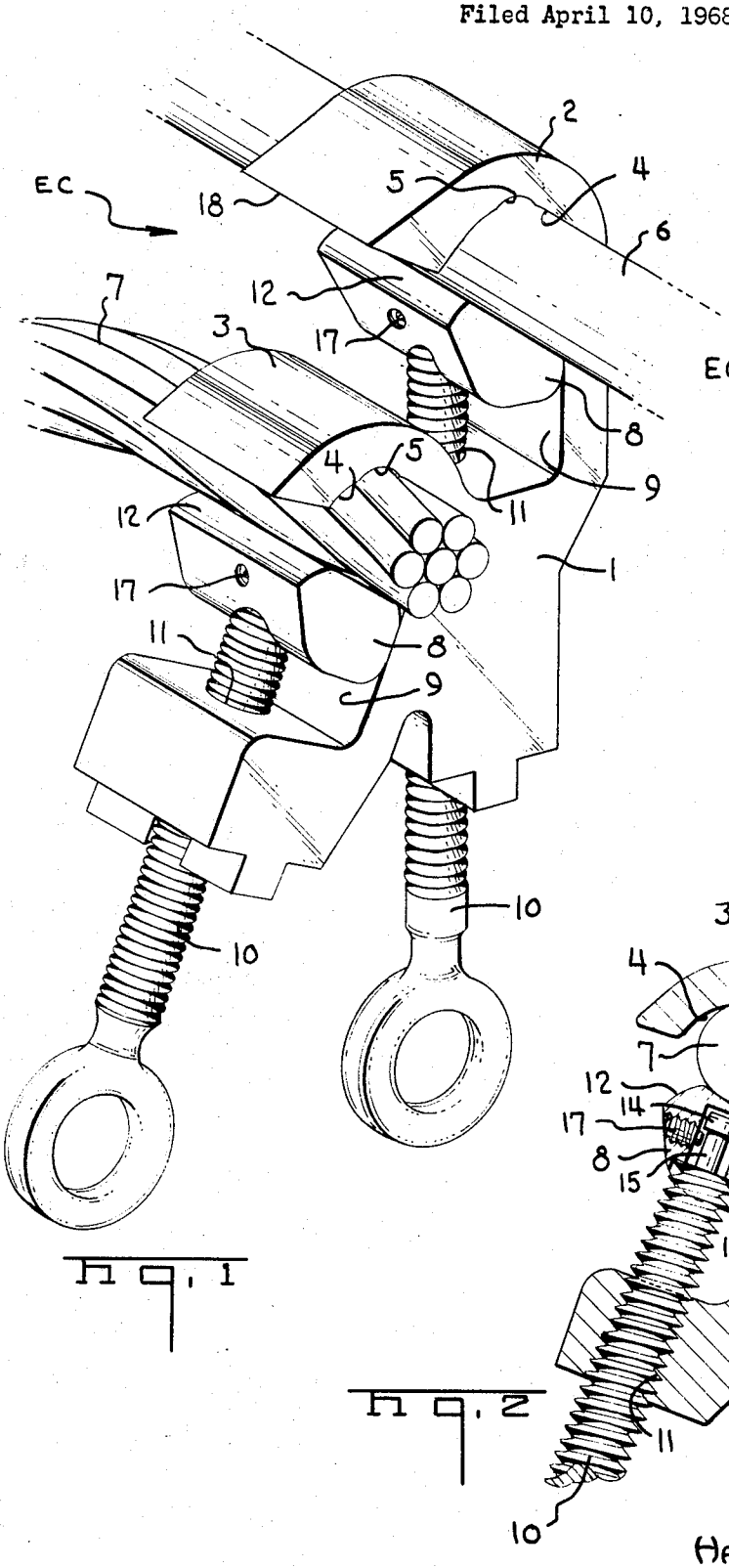


Fig. 1

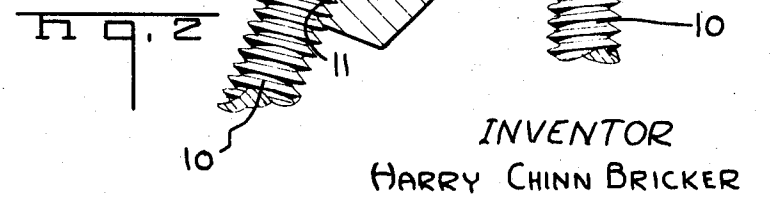


Fig. 2

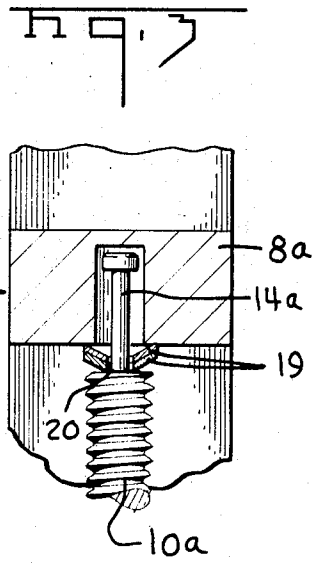


Fig. 3

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ELECTRICAL CLAMP

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ABSTRACT OF THE DISCLOSURE

An electrical clamp having spaced conductor-receiving areas for receiving therein respective electrical conductors and conductor-engaging means driven by driving means along the conductor-receiving areas in the same direction to engage and secure the conductors in the conductor-receiving areas.

This invention relates to electrical clamps and more particularly to electrical clamps for securing a pair of electrical conductors together.

U.S. Pat. 2,958,067 discloses a wire clamp having a shoulder which is common to conductor-receiving areas on each side thereof so that movable conductor-engaging means move toward the common shoulder in opposite directions to secure conductors thereagainst. The common shoulder brings the conductors too close together when the conductors are to be connected together via a hot stick application. The conductor-engaging or nesting areas deform the conductors because of their configuration. The clamp is expensive to fabricate. The nesting areas have a small contact area which affects the conductivity as well as the stability when being used for hot stick applications. The clamp is complicated in structure therefore rendering maintenance and repair difficult. This clamp is also heavy.

An object of the invention is to provide an electrical clamp which overcomes the disadvantages of the existing clamp enumerated hereinabove.

Another object of the invention is the provision of an electrical clamp which spaces the conductors to be connected together thereby a proper amount to facilitate hot stick application.

A further object of the invention is to provide an electrical clamp that has sizeable conductor-engaging areas affording good conductivity, minimum of deformation to the conductors and increased stabilization on the conductors.

An additional object of the invention is the provision of an electrical clamp which is simple in construction to provide different widths and light in weight.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there are shown and described illustrative embodiments of the invention; it is to be understood, however, that these embodiments are not intended to be exhaustive nor limiting of the invention but are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawing:

FIG. 1 is a perspective view of the electrical clamp;

FIG. 2 is a cross-sectional view of FIG. 1; and

FIG. 3 is a fragmentary sectional view of an embodiment of the invention.

Electrical clamp EC, which is illustrated in FIGS. 1 and 2, includes a body member 1 provided with stationary

sections 2 and 3 which are spaced from each other, stationary section 2 being spaced forwardly and below stationary section 3.

Stationary sections 3 and 4 are provided with arcuate surfaces 4 which are provided with depressions 5. Arcuate surfaces 4 receive thereagainst electrical conductors 6 and 7.

Conductor-engaging members or indentors 8 move along surfaces 9 of stationary sections 2 and 3 via eye bolts 10 which serve as driving means for the conductor-engaging members. Surfaces 9 act as guide means to guide conductor-engaging members toward and away from arcuate surfaces 4 under the influence of bolts 10 which are threadably mounted in threaded holes 11.

Conductor-engaging members 8 are provided with radiused surfaces 12 which mate with corresponding areas of arcuate surfaces 4 and depressions 13 for engagement with electrical conductors 6 and 7 when driven thereagainst via bolts 10 to secure the conductors against arcuate surfaces 4. Arcuate surfaces 4 and depressions 13 of conductor-engaging members 8 define nesting areas for receiving conductors 6 and 7 and these nesting areas provide increased surface contact on the conductors thereby providing good conductivity as well as minimized deformation to the conductors during the clamping operation.

The ends of eye bolts 10, which are in engagement with conductor-engaging members 8, are provided with extensions 14 which are provided with annular grooves 15. Extensions 14 and the ends of the threaded sections of bolts 10 fit into stepped openings 16 in conductor-engaging members 8 and set screws 17 threadably disposed in conductor-engaging members 8 mate with annular grooves 15 to maintain conductor-engaging members 8 in engagement with eye bolts 10 so that the conductor-engaging members 8 can be moved along surfaces 9 by bolts 10 without coming loose therefrom and without being turned thereby. Stationary section 2 is provided with an enlarged section at the free end thereof which has a surface 18 and this surface in combination with the top surface of stationary section 3 provides an effective guide means to effectively guide conductor 6 into the nesting area of stationary section 2. Thus, surface 18 and the top surface of stationary section 3 define an entrance leading into the nesting area of stationary section 2. This is essential because electrical conductor 6 is in the energized state and electrical clamp EC has to be rapidly applied to conductor 6 in order to obviate or minimize any arcing that may take place.

In use, conductor 7 is secured in the nesting area of stationary section 3. The conductor-engaging member 8 of stationary section 2 is moved to the end of its travel opposite arcuate surface 4. The eye bolt 10 of stationary section 2 is inserted into an insulating clamping stick (not shown), and the clamp EC, together with conductor 7, is raised up to conductor 6 which represents an energized existing line. The electrical clamp is then rapidly moved into engagement with conductor 6 through the entrance of stationary section 2 via surface 18 and the top surface of stationary section 3 and the clamping stick is rotated thereby driving conductor-engaging member 8 via eye bolt 10 into tight engagement with conductor 6 to secure same against arcuate surface 4. Depressions 5 serve to permit extrusion of conductors 6 and 7 therein to abet the securing of the conductors in the nesting areas.

Body member 1 and conductor-engaging members 8 are extruded from a suitable material such as, for example, aluminum and the body member and conductor-engaging members are cut from the extruded material in accordance with the desired width so that body member 1 provides a one-piece body member of increased surface

contact area providing excellent conductivity. The electrical clamp is light in weight and provides stability when used on hot sticks due to the width of the clamp. The spacing between the nesting areas is such to properly space the conductors from one another during hot stick application so that a conventional connector assembly preferably of the wedge type variety can be applied in a small amount of time with a minimum of effort. The electrical clamp can be used as a temporary connection device thereby rendering it reuseable or it can be used as a semi-permanent connection device whereby the connection can remain for an extended period of time. The nesting areas are spaced apart a distance greater than the distance between surface **18** and the top surface of stationary section **3**. The axes of the eye bolts intersect at a point exterior of the clamp.

In the event that the electrical clamp is to be used as a semi-permanent clamp, electrical connector EC*a*, as illustrated in FIG. 3, is an alternative embodiment of the invention. In this embodiment, extension **14***a* have Belleville washers **19** disposed thereon and the Belleville washers are disposed between conductor-engaging members **8***a* and shoulders **20** of eye bolts **10***a* so that when the conductor-engaging members are tightly driven into engagement with the electrical conductors, the Belleville washers are placed under tension thereby providing spring tension on eye bolts **10***a* which prevents these bolts from backing out as a result of vibration of the line conductor.

It will, therefore, be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiments of the invention, which are shown and described herein, are intended as merely illustrative and not as restrictive of the invention.

The invention is claimed in accordance with the following:

1. An electrical clamp for connecting electrical conductors together comprising a body member having a first stationary member and a second stationary member extending outwardly from said body member and spaced from each other, said stationary members having a width the same as that of said body member, conductor-receiving surfaces provided on said stationary members for receiving respective ones of the electrical conductors thereagainst and having axes substantially parallel with respect to each other, planes passing through and including said axes intersecting each other outside the confines of said body member, conductor-engaging means movable toward and away from respective ones of said stationary members and having a width substantially the same as that of said body member, and driving means connected between said body member and said conductor-engaging means for individually driving said conductor-engaging means toward and away from respective ones of said stationary members.

2. An electrical clamp according to claim **1** wherein means is provided to prevent said conductor-engaging members from backing away from said conductors after said conductor-engaging members have been driven tightly against said conductors by said driving means.

3. An electrical clamp according to claim **1** wherein guide surfaces are provided by said body member in alignment with said stationary members to guide said conductor-engaging means in their movement toward and away from said stationary members.

4. An electrical clamp according to claim **1** wherein a free end of said first stationary member is positioned overlying said second stationary member thereby providing an entrance to said conductor-receiving surface of said first stationary member.

5. An electrical clamp comprising a body member, a first conductor-receiving area and a second conductor-receiving area provided on said body member, said conductor-receiving areas being in alignment and spaced from each other the distance therebetween defining an entrance to one of said conductor-receiving areas, said conductor-receiving areas having a width the same as that of said body member, each conductor-receiving area including a flat surface merging into an arcuate surface and a movable conductor-engaging member having a width substantially the same as that of said body member, the axes of said arcuate surfaces being parallel, and driving means connected between said body member and said movable conductor-engaging members for individually driving said movable conductor-engaging members along said flat surfaces toward and away from said arcuate surfaces.

6. An electrical clamp comprising a body member, stationary members provided on said body member and having arcuate conductor-receiving surfaces, said stationary members having a width the same as that of said body member, said stationary members extending outwardly from said body member and spaced from each other, one of said stationary members being spaced forwardly and below the other of said stationary members, said stationary members having flat surfaces merging with said arcuate conductor-receiving surfaces, conductor-engaging members disposed in alignment with said conductor-receiving surfaces, and driving means connected between said conductor-engaging members and said body member for individually driving said conductor-engaging members along said flat surfaces toward and away from said conductor-receiving surfaces.

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