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J. C. RICHARDSON

2,097,470

ELECTRICAL CONNECTER

Filed Nov. 27, 1935

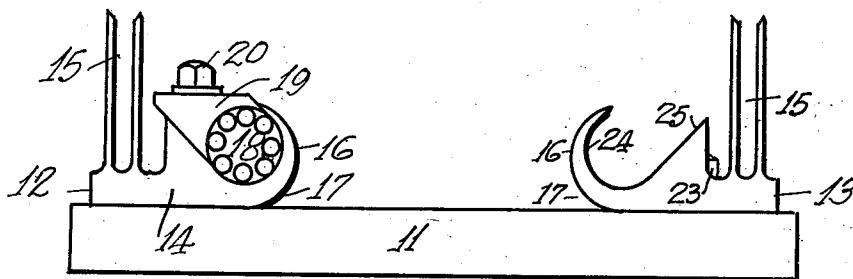


Fig. 1

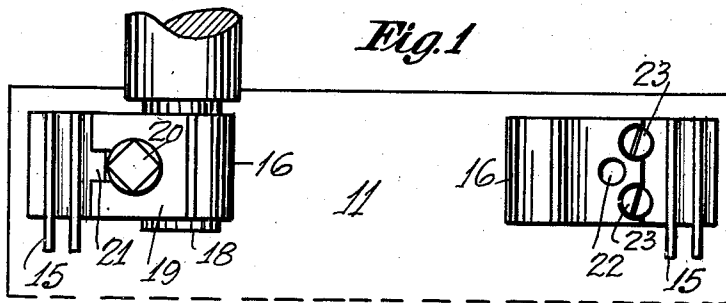


Fig. 2

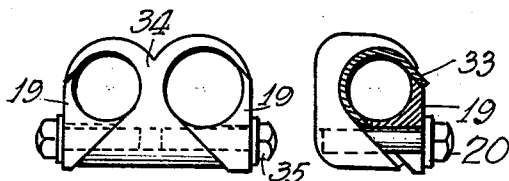


Fig. 5

Fig. 4

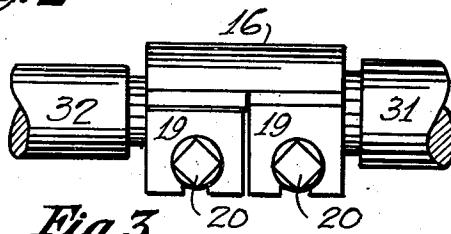


Fig. 3

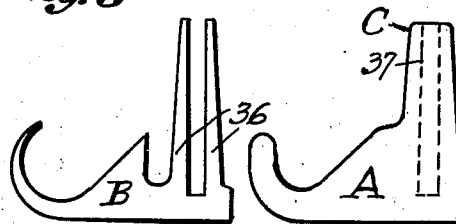


Fig. 9

Fig. 8

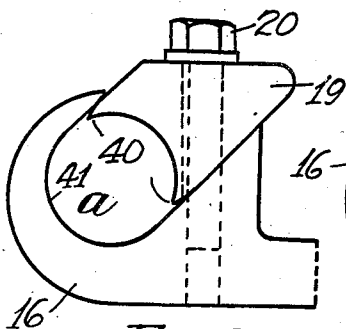


Fig. 6

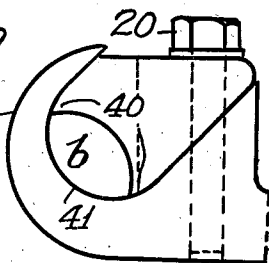


Fig. 7

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ELECTRICAL CONNECTER

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8 Claims. (Cl. 173-259)

This invention relates to solderless connectors for electric conductors and has for an object to provide a connector to clamp a conductor intermediate its ends or at its ends, to provide a conductor clamp that grips the conductor uniformly throughout its length, to provide a clamp for a conductor having an engaging member operating on an inclined plane, to provide a clamp with means of varying its size, to provide a plurality of clamps for conductors formed integrally as a unit construction, to provide a clamp that can be formed in different lengths from bar stock and to provide a clamp with clips for a switch terminal that may be drawn or extruded to shape. Other objects of the invention will appear from the following specification and the accompanying drawing, illustrating one form of the invention, and in which;

Fig. 1 is an elevation of a switch panel with a pair of lugs having connectors formed according to this invention;

Fig. 2 is a plan view of the construction in Fig. 1;

Fig. 3 is a form of the invention for connecting the abutting ends of a pair of conductors;

Fig. 4 is an end view of the left end of Fig. 3, with the conductor omitted;

Fig. 5 is a modified form of a clamp for a pair of cables placed side by side, constructed according to this invention;

Fig. 6 is an end view of the terminal with the clamp expanded;

Fig. 7 is another end view of the terminal with the clamp contracted;

Fig. 8 is a rolled form of bar stock that may be used in making these terminals;

Fig. 9 shows the stock in Fig. 6, after drawing and finishing.

This invention comprises a clamp form of terminal for an electric conductor to which the conductor is secured by a clamping action without any preparation or forming other than removing the insulation from the conductor. The construction includes a jaw with a semicircular inner end developed into a pair of parallel sides tangent to the circular inner end, and a sliding wedge or block arranged to slide between these parallel sides and having its inner face formed in a semicircle complementary to the semicircle of the jaw. The conductor is inserted in the jaw and the wedging member is then placed between the parallel sides and forced into engagement with the conductor by a screw on an inclined plane construction. Power conductors, such as are used on electric distribution systems are usually

made of stranded cables and under the wedging action of the clamp these cables can be forced from a cylindrical to an oval shape. The wedging member is arranged to close the clamp so that its aperture may be reduced to an oval construction and thus the terminal may be applied to conductors of different sizes. The size of the cylindrical aperture of the clamp may also be varied by inserting a liner in the clamp.

The jaw and the wedging member of the invention are made from bar stock that is longitudinally uniform so that they can be manufactured in lengths either by rolling or by extruding the metal, the lengths are then cut into sections to form the individual terminals as desired, the construction thus lends itself to production at low cost.

In the drawing, 11 is the base panel of an electric switch, 12 is a terminal at one side of the panel and 13 is a terminal at the opposite side. These terminals are formed out of solid stock 14 having the upstanding clip 15 for the fuse or switch blade and the jaw 16 in which the wedging member 19 is forced to close the jaw by the screw 20 to clamp the stranded conductor 18. The jaw is preferably curved on the outer surface as indicated at 17 to increase the distance between the metal parts which are mounted on the insulated panel 11.

The wedge 19, Fig. 2, is provided with a slot at 21 for the stem of the screw 20 to enable the wedge to slide on the inclined surface 25 for clamping purposes. This surface is inclined relative to the base and the screw 20 is perpendicular to the base. The terminals may be secured to the panel by the counter bored screws 23 and the bolt 20 is screwed into the screw hole 22 in the jaw. It will be observed that as the screw 20 is tightened the wedge 19 is forced inwardly towards the semi-cylindrical surface 24 of the jaw and is guided forward by the parallel sides of the jaw. From Figs. 6 and 7, it will be observed that the inner face of the wedge is semi-cylindrical and is formed to the same radius as the semi-cylindrical jaw so that when in the position indicated in Fig. 6 the clamp incloses a cylinder as indicated by *a*. In order that the clamping member may advance into the jaw to reduce the clamping space, the parallel sides of the member 19 where they join the semi-cylindrical face are rounded as indicated at 40 to the same radius as the jaw, thus enabling the clamp to close up to the position indicated by *b*, Fig. 7, thereby adapting the clamp to conductors of different sizes.

The term, "semi-cylindrical" does not imply that a true cylinder shaped jaw is necessary. The jaw is merely rounded to avoid sharp corners and to conform to the shape that the stranded conductor may assume as it is clamped in the jaw.

In Fig. 3, the application of the invention for connecting a pair of cables in the same straight line is shown, cable 31 connecting to the right hand terminal and cable 32 connecting to the left hand terminal. The construction in Fig. 5 shows a clamp adapted for a pair of cables that may be placed side by side. In this construction the body 34 is provided with a pair of opposed jaws for the conductors in which the wedges 19 are forced into engagement by the screw 35, this may be a bolt passing through the base and engaging both wedges or each wedge may have a separate screw for holding it in place. In Fig. 4, a liner 33 is provided in the jaw and is formed to a contour of the jaw, within this liner the wedge member 19 is applied by the screw 20 to clamp the conductor. This provides a means of reducing the size of the jaw without changing the cylindrical form of the clamp.

The terminals forming the jaw may be cast or may be built up from separate pieces, but the preferred method of construction is indicated in Figs. 8 and 9. The terminals are usually made of hard copper or copper alloy and may be rolled in bar stock in the form indicated at A with the upstanding portion C to form the jaws of the clip 36, Fig. 9. This bar stock is then extruded in the form indicated in B, Fig. 9, which is ready to be cut into lengths and drilled for the attaching screws. The slot 37 may be formed in the extruding process, or partially formed, and finished by machining.

The invention admits of a variety of applications in addition to those shown. It is also apparent that some of the constructions can be combined in one device, as for instance the application of liner 33, Fig. 4 to the form of the device shown in Figs. 6 and 7.

Having thus described my invention, I claim:

1. A clamp for an electrical conductor comprising a base with a jaw having a semi-cylindrical end with parallel sides formed on an inclined plane relative to said base, a clamping member for clamping the conductor in the jaw, arranged to slide on said inclined plane between the parallel sides and having its inner end formed semi-cylindrical complementary to the jaw, and means for forcing said member into said jaw.

2. A clamp for an electrical conductor comprising a body with a base having a jaw with a semi-cylindrical end and with parallel formed on an inclined plane relative to said base, a clamping member for clamping the conductor in the jaw arranged to slide between said parallel sides, having its inner end formed semi-cylindrical and having a slot in its outer end, and a screw passing through the slot into said body for forcing the clamping member into engagement with the conductor.

3. A clamp for an electrical conductor comprising a body with a base having a jaw with a semi-cylindrical end and with parallel sides

formed on an inclined plane relative to said base, a clamping member for clamping the conductor in the jaw arranged to slide between said parallel sides having its inner end formed semi-cylindrical, and having a slot in its outer end and a screw off-centered from the plane of the conductor passing through the slot into said body for forcing the clamping member into engagement with the conductor.

4. A clamp for the abutting ends of a pair of electrical conductors comprising a body having a base formed in a longitudinal semi-cylindrical jaw to receive the abutting ends of the conductors, said jaw having a pair of parallel sides formed on an inclined plane relative to the base, a clamping member for each conductor arranged to slide between said sides on the inclined plane and having its inner end formed semi-cylindrical to engage the conductor and a screw for each clamping member engaging the member and the body for independently clamping the end of each conductor to said body.

5. A clamp for a pair of electrical conductors comprising a body having a base formed in a pair of semi-cylindrical jaws each with parallel sides formed on an inclined plane relative to the base to receive the conductors, a clamping member for each jaw arranged to slide between said sides on the inclined plane and having its inner end formed semi-cylindrical to engage the conductors and means engaging said body and each of said clamping members to force said members into engagement with the conductors.

6. A clamp for an electrical conductor comprising a member having a base and a semi-cylindrical jaw with a pair of parallel sides for receiving the conductor, said jaw having its sides inclined relative to the base to form an inclined plane, a wedging member for the jaw sliding between said sides on said inclined plane and having an outer face parallel with the base and a screw engaging said outer face and said base to force the wedge into the jaw.

7. A clamp for an electrical conductor comprising a clamping jaw formed substantially in a semicircle with parallel sides tangent to the circle, a wedge having parallel sides sliding in said jaw and having its inner face formed in a semicircle complementary to the jaw, the parallel sides being rounded where they meet the semicircular face to the radius of the jaw to permit the wedge to contract the aperture of the jaw and means for forcing the wedge into the jaw.

8. A clamp for an electrical conductor for mounting on a base, comprising a clamping jaw formed in a semicircle with parallel sides tangent to the semicircle and with the exterior of the jaw formed in a curve having approximately the same centre as the semi-circle, one of said sides mounted on the base, a wedge sliding with a close fit between said parallel sides and having its inner end formed as a complement to the semicircle and a screw engaging the mounted side opposite and out of line with the conductor for forcing said wedge into engagement with the conductor in the jaw.

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