June 27, 1939. R. N. ROWE 2,164,022

ELECTRIC CONNECTOR

Filed Dec. 10, 1937

Fig. 1.

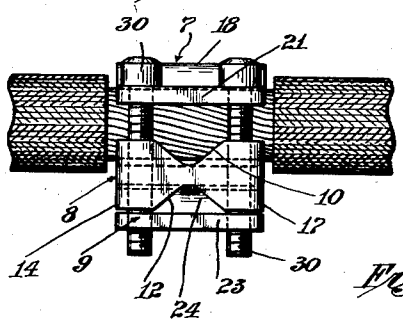


Fig. 2.

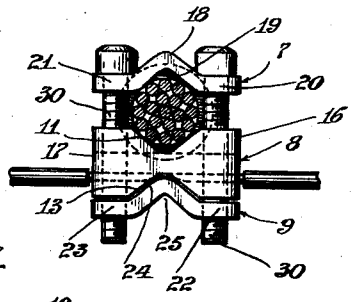


Fig. 3.

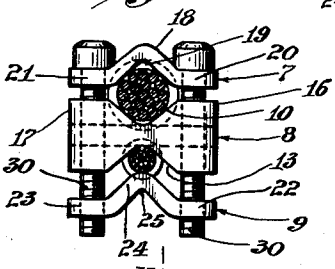


Fig. 4.

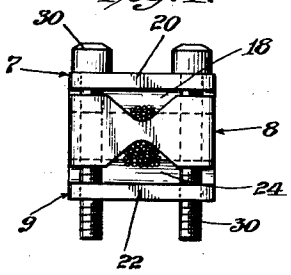


Fig. 6.

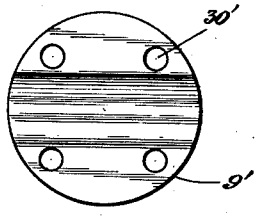
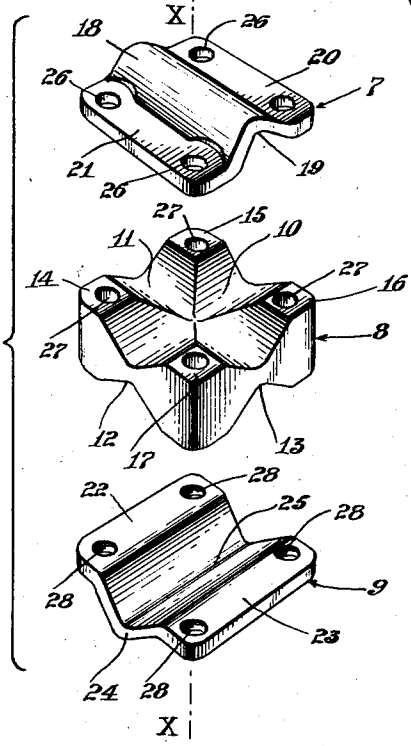


Fig. 5.



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ELECTRIC CONNECTOR

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Application December 10, 1937, Serial No. 179,044

4 Claims. (Cl. 24—243)

My invention relates to devices for connecting electric wires or conductors and especially for connecting wires of different sizes.

The main object is to provide a simple but rugged device which can be conveniently used for connecting wires of the same size or varying considerably in size and by which wires can be readily connected either in parallel relation, or at right angles to each other or crossing each other; in other words, a simple device to be used in as many different ways as possible.

To accomplish these ends I provide a clamping device formed of three pieces, i. e. a central block and two end caps drawn toward each other by four screws or bolts arranged symmetrically around a central axis. The central block has intersecting grooves in each of its upper and lower faces for receiving the wires to be connected. Each end cap has a positioning groove in one face and they are interchangeable and may be arranged in different positions at ninety degrees to each other about the vertical axis of the device. Each cap has a flat or substantially flat gripping face on each side of its groove and preferably has a rib or projection on the face opposite its groove adapted when inverted to cooperate with a groove in the central block to grip or clamp a wire in the groove between the two members.

Fig. 1 is a front elevation of one form of the device connecting a small wire to a comparatively large wire at right angles to each other.

Fig. 2 is a side view of the same taken at right angles to the plane of the view of Fig. 1.

Fig. 3 is a similar view to that of Fig. 2 but showing other sizes of wire in parallel relationship.

Fig. 4 is a side view showing another arrangement of the clamping members.

Fig. 5 is a dropped perspective view of the three clamping members.

Fig. 6 is a plan view of a cylindrical clamping member.

The three members 7, 8 and 9 are preferably square in plan view and are made of suitable metal strong enough to sustain safely the stresses expected to be applied.

The central member is provided in each of its upper and lower faces with intersecting grooves 10 and 11 in one face and 12 and 13 in the opposite face. These grooves are preferably substantially V-shaped in cross section so that their inclined walls will tend to laterally centralize and compress the wires located in them when the end caps are drawn toward the central block. The corner seats 14, 15, 16 and 17 are symmetrically arranged around the vertical axis X.

The upper cap 7 has a rib 18 which is shaped to approximately fit one of the grooves in the block 8 and also has a groove 19 which is preferably similar to one of the grooves in the central block. The flanges 20 and 21 serve to provide clamping faces for wires at right angles to the groove 19.

The lower cap or plate 9 is substantially identical with the upper plate or cap 7. It has the flat flanges 22 and 23, the rib 24 and the groove 25. These side flanges are adapted to cooperate with the clamping faces of the grooves in the central block to hold wires inserted between them.

The cap members are invertible so that the ribs 18 and 24, the grooves 19 and 25 or the flat flanges 20, 21 and 22, 23 may cooperate with the grooves in the central block to provide relatively large or small passages to receive the desired size of wires and to allow the wires to project from the connector in the desired direction.

In each corner of each piece is a hole or passage such as 26, 27 and 28 for a screw or bolt such as 30. These holes are equi-distantly spaced so that the three members of a complete connector may be assembled with each member in any one of four different positions and either or both of the cap members 7 and 9 may be assembled either side up or down to conform to the size of the wires to be connected. The holes in the upper plate or cap in the central block are threadless so that the screws may pass freely through them and thus permit a suitable range of clamping action. The holes 28 may be screw threaded to serve as nuts for the screws so that when the screws are tightened the three members of the device will be drawn toward each other and securely clamp whatever wires are interposed between them.

The top and bottom plates may be made of comparatively thin metal but the central block is made thick enough to insure sufficient clearance for the insulation on the larger sizes of wires. In a slightly modified form the cap plate 9' may be provided with non-threaded clearance holes 30' for the bolts if desired in which case the top and bottom plates would be identical and in which case suitable nuts (not shown) would be threaded onto the bolts to clamp the parts of the connector together.

In Figs. 1 and 2 it will be seen that a large diameter cable is held between the two parts 7 and 8 and lying in the grooves 11 and 19.

A small wire is held between the parts 8 and 9. In this case the wire is located in the groove

12 and clamped by the rib 24 of the bottom plate 9 which extends into the groove 13.

By assembling the three parts 7, 8 and 9 in various ways a large number of combinations may be made so as to connect almost any sizes or arrangement of wires.

Preferably the cap members 7 and 9 may be stamped out of sheet metal which will provide for a maximum of strength and a minimum of cost as well as to assure exact duplication of parts.

While it is preferable to make the parts of this connector of substantially square configuration, it is obvious that they may be of other shapes—even in a perfectly round or cylindrical form as shown in Fig. 6 provided the bolt holes, grooves and ribs maintain the same relative spacings and position with respect to each other.

As an example of the range and utility of this construction, it may be stated that a single small size connector will properly clamp two 4/0 wires or two No. 12 stranded wires or one 4/0 wire and one No. 12 stranded wire and the two wires clamped together by the connector may extend either in parallel relation or at right angles to each other.

This is a continuation in part of application Serial Number 12,553 filed March 23, 1935, now Patent No. 2,111,939 of March 22, 1938.

I claim:

1. An electrical connector including two end pieces of substantially uniform thickness throughout and a central piece, the end pieces each having a flat wire clamping wall and an invertible ribbed portion to form a wire clamping wall in either normal or inverted position, the two wire-clamping walls mutually bisecting at right angles on the respective faces of each end piece, the central piece having two identical wire-receiving walls mutually bisecting at right angles on each of the faces of said central piece adjacent the respective end pieces, means for aligning the three pieces with the wire clamping walls on the end pieces aligning with the walls on the central piece and for selectively positioning said pieces so that the wire clamping walls of the two end pieces may lie in either the same direction or at right angles to each other, and means for drawing said end pieces toward each other and toward the central piece, whereby wires of various sizes may be clamped by said walls in either parallel or crossed relation.

2. An electrical connector including two end pieces and a central piece, the end pieces being invertible and each piece having two wire-receiving walls mutually bisecting at right angles on the respective faces of each end piece, one of said walls on each end piece having a groove therein, the other wall being flat-surfaced excepting where the groove intersects it, the central piece having two wire-receiving walls mutually bisecting at right angles on each of the faces of said central piece adjacent the end pieces, each of these walls having a groove therein, means for aligning the walls on the end pieces with the walls on the central piece and for selectively and invertibly positioning said end pieces so that the grooved walls in the end pieces may lie in either the same direction or at right angles to each other, and means for drawing said end pieces toward each other and toward the central piece whereby wires of various sizes may be clamped by said walls in either parallel or crossed relation, said means for aligning and positioning and said means for drawing including a plurality of screw bolts, said central piece being free to position itself between said end pieces.

3. A wire connector including a central block and two invertible end plates, each part being substantially square and having a screw passage in each corner, the central block having two clamping faces with intersecting grooves in each clamping face and each end plate having a central rib on one face with side flanges and a central groove in the opposite face with side flanges along the sides of the groove, the rib being adapted to fit into a groove of the central block and clamp screws passing freely through one end plate and the central block and having threaded engagement in the other end plate.

4. A wire connector consisting of a solid central block and two identical end plates formed of sheet metal, all of the parts having four bolt passages symmetrically arranged about a central axis, the central block having diametral grooves intersecting in the axis of the block on both faces and the end plates being formed of sheet metal with a diametral groove in one face and a corresponding rib on its opposite face, said end plates being invertible and rotatable with respect to the central block and four clamping bolts passing through the respective passages in the end plates and central block for drawing the three members toward each other.

RAYMOND N. ROWE.