

April 22, 1941.

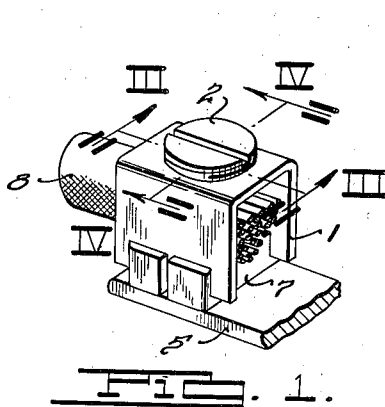
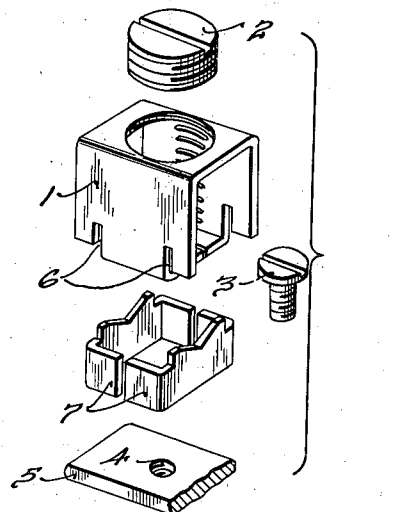
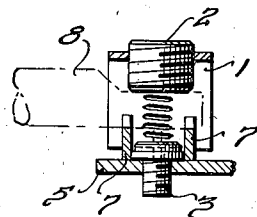
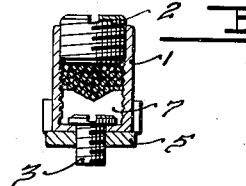
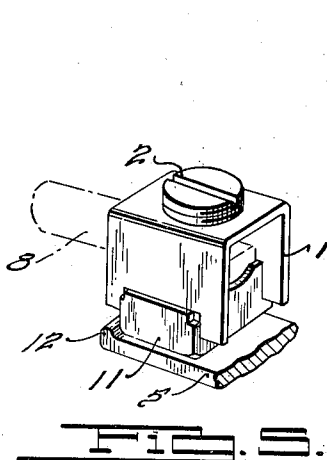
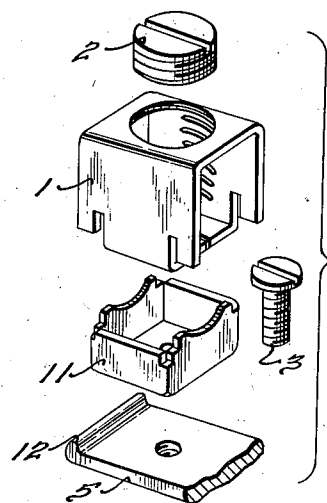
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2,239,100

ELECTRICAL CONNECTOR

Filed Nov. 8, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

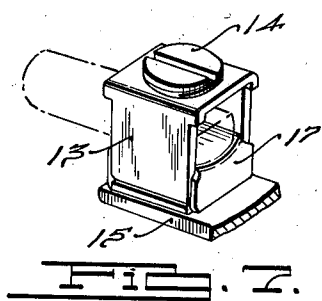
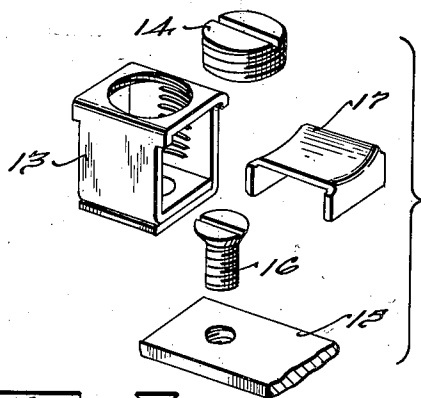
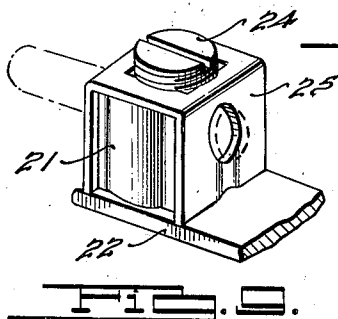


FIG. 8.

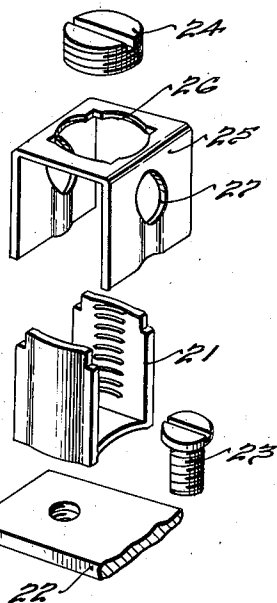
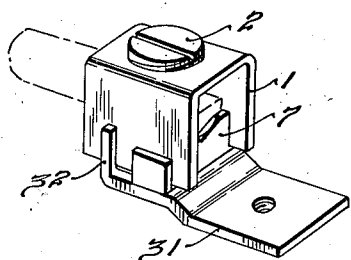


FIG. 10.

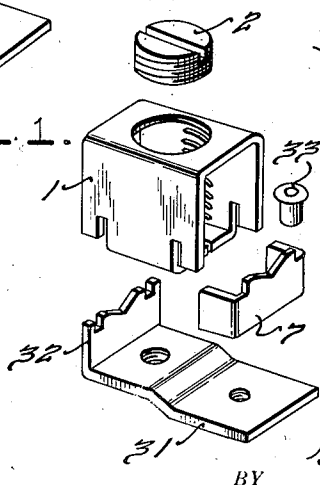


FIG. 11.

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2,239,100

ELECTRICAL CONNECTOR

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Application November 8, 1937, Serial No. 173,317

11 Claims. (Cl. 173-259)

This invention relates to means for connecting or attaching electrical conductors of the type known as "solderless connectors" and has for its object the provision of a connector having a clamping portion secured to a conducting strap at one point and having relatively movable current carrying portions against which the cable is clamped and which are pressed against the strap thus providing for a good electrical connection irrespective of the tightness of the attachment of the clamping portion to the strap.

Other objects and features of this invention will be readily apparent to those skilled in the art from the following specification and appended drawings illustrating certain preferred embodiments of the invention in which:

Figure 1 is a perspective view of a connector according to the present invention.

Figure 2 is an exploded perspective view of the connector of Figure 1.

Figure 3 is a sectional view on the line III—III of Figure 1.

Figure 4 is a sectional view on the line IV—IV of Figure 1.

Figures 5 and 6 are respectively a perspective and an exploded perspective view of a modified form of connector.

Figures 7 and 8 are respectively a perspective and an exploded perspective view of a further modified connector.

Figures 9 and 10 are respectively a perspective and an exploded perspective view of another form of connector.

Figures 11 and 12 are respectively a perspective and an exploded perspective view of a still further form of connector.

The preferred form of connector of Figures 1 to 4 inclusive embodies a clamping portion 1 of rectangular cross section having its top surface provided with a threaded opening and its interior side surfaces also threaded to receive a clamping screw 2. A stud 3 passing through an opening in the bottom surface of the clamping member 1 is threaded into an opening 4 in conducting strap 5 to attach the clamping member 1 thereto. The bottom surface of the member 1 is cut away at its opposite ends as shown more particularly in Figures 2 and 3 and its opposite side walls are provided with slots 6. Members 7 of relatively good conducting material are relatively loosely disposed within the slots 6. The members 7 are provided as shown with end flanges embracing the exterior side walls of the clamping member 1 and preventing any spreading apart of these portions under the clamping action.

The operation of this type of connector will be readily apparent. The bared end of a cable 8 is inserted into the connector beneath the screw 2 which is tightened to clamp the cable electrically and mechanically therein. This clamping force is exerted on the cable between the screw 2 and the members 7. As the members 7 are loose with respect to the clamping member 1 they will be forced into intimate conducting relation with the conducting strap 5. Hence it is apparent that the clamping member 1 need not carry any current but that the current path may flow from the cable 8 through the members 7 directly to the strap 5. This provides for good electrical conductivity and also, as the cable is securely clamped against the top notched surfaces of the members 7, will result in a connection of considerable mechanical strength.

One important advantage of this construction lies in the fact that whenever the screw 2 is tightened the connection will have a high electrical conductivity regardless of the tightness of the connection of the clamping member 1 to the strap 5 by the stud 3. If the clamping member 1 were the current carrying part it would always be necessary for the connection thereof to the strap 5 to be secure in order to have a high conductivity at this point. In the connector herein shown and described the stud 3 may be quite loose and high electrical conductivity still result so long as the screw 2 is tightened down since the members 7 will always be pressed tightly against the strap 5.

In the connector shown in Figures 5 and 6 the clamping member 1, clamping screw 2 and stud 3 remain the same but the members 7 are replaced by a single cup-shaped member 11 loosely disposed beneath the bottom surface of the clamping member 1 and having a clearance hole in which the stud 3 is received. The conducting strap 5 is here provided with an end flange 12 to prevent rotation of the connector thereon. The operation of this connector is exactly the same as that previously described, the member 11 now carrying out the function of the members 7 in the preferred form of connector.

The connector of Figures 7 and 8 has a clamping member 13 having the top threaded opening and side wall threads as previously described and a clamping screw 14. The bottom surfaces of the clamping member 13 are overlapped as shown and are connected to a conducting strap 15 by means of a stud 16. In this construction an inverted U-shaped saddle member 17 is disposed within the clamping member 13 and serves as a

surface against which the cable is clamped and which in turn is pressed against the strap 15.

The connector of Figures 9 and 10 embodies a U-shaped member 21 having its bottom surface connected to a conducting strap 22 by a stud 23 and having its opposite interior surfaces threaded for the reception of a clamping screw 24 as shown. An inverted U-shaped conducting member 25 is provided having a top opening 26 receiving the ends of the legs of the member 21 in slidable relation and preventing spreading thereof. The conducting member 25 is also provided with aligned openings 27 in its opposite side walls through which the cable is extended. In this type of connector the member 25 being movable with respect to the member 21 has the cable clamped against the edges of opening 27 as the screw 24 is tightened and is in turn pressed tightly against the strap 22 to form the electrical connection of high conductivity in a manner similar to that previously described.

The conductor shown in Figures 11 and 12 is quite similar to the preferred form but is more particularly adapted for use where a connector of the lug type is desired. Here the short connecting strap or lug 31 has its end portion bent up as at 32 to take the place of one of the members 7 shown in the connector of Figures 1 to 4 inclusive. The parts 1 and 2 are identical with those of the preferred form as is the single part 7. An alternative method of connection of the clamping member 1 is here illustrated as a rivet 33 which serves as a substitute for the stud 3 in the preferred form. In the type of connector shown in Figures 11 and 12 the cable will be clamped against the member 7 and the end flange 32 as the screw 2 is tightened and the member 7 will be pressed against the strap or lug 31 in the manner previously described.

It is seen that in all the types of connectors herein illustrated there is provided a clamping member which is connected to a conducting strap and which need not be a current carrying part and in which a clamping screw is threaded and that there is provided an element or elements against which the cable or conductor is clamped and which are loosely mounted so as to be pressed by the clamping action against the conducting strap so that as long as a clamping pressure is exerted upon the cable or conductor within the connector good electrical conductivity will result regardless of the connection of the screw carrying member to the conducting strap.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims.

What is claimed is:

1. In an electrical connection of the solderless type, a conducting strap, a member mounted on the front face of said strap by means accessible for frontwise attachment and removal of said member, said means being obscured by the insertion of a conductor to be clamped, a clamping screw threaded in the said member, an auxiliary member removable with respect to said first mentioned member and providing a seat against which a cable or conductor is adapted to be clamped, said second mentioned member being adapted to be pressed against the conductor strap in good conducting relation by the action of the

clamping screw in clamping a conductor or cable in the connector.

2. In an electrical connector of the solderless type, a conducting strap, a member mounted on a face of said strap by a stud accessible for manipulation from the front of said face, access to said stud being prevented by a conductor to be clamped in the connector when in clamped position, a clamping screw threaded in said member, spaced elements on said connector at opposite sides of the axis of said clamping screw movable relative to said member and providing seats for a cable or conductor to be clamped in the connector, said elements being limited in their movement relative to the member under the clamping action of the screw by their positive contact with the face of the strap.

3. In an electrical connector of the solderless type, a member adapted to be mounted on a face of a conducting strap by means accessible and manipulable from in front of said face, a clamping screw threaded in said member, access to said means being prevented by a conductor to be clamped in the connector when in clamped position, an element movable with respect to said member and providing a seat against which a cable or conductor is adapted to be clamped by said screw, said element being adapted to be pressed against the strap in the same direction as the clamping movement of the screw to establish high electric conductivity thereto irrespective of the member mounting.

4. An electrical connection of the solderless type, comprising a conducting strap, a generally rectangular shaped clamping member mounted on said strap, disposed entirely in front of said strap and connected to its front face by means accessible from the front, said means being obscured by a conductor to be clamped in the connector, a clamping screw threaded in said clamping member, and a conducting member disposed between said conducting strap and said clamping screw and movable with respect to the clamping member, said conducting member forming a seat against which the clamping screw forces the conductor to be clamped, said conducting member being adapted to be pressed against the strap in conducting relation when the conductor is clamped thereagainst by the clamping screw.

5. An electrical connection of the solderless type comprising a conducting strap, a relatively non-current carrying element adapted to be mounted on the front face of said strap and disposed entirely in front of the plane of the main body of the strap, a clamping screw threaded in said element, and a current carrying element disposed between said clamping screw and said conducting strap and movable with respect to said element, said current carrying element forming a seat against which a conductor to be clamped is adapted to be forced by said clamping screw, said current carrying element being forced against the conducting strap in good conducting relation by the action of said clamping screw in securing the conductor within the connector whereby a high conductivity connection results irrespective of the nature of the connection of the relatively non-current carrying element to the conducting strap.

6. An electrical connector of the solderless type comprising a rectangular shaped clamping member having its bottom surface mounted on the front face of a conducting strap and having its top surface and interior side walls threaded to

receive a clamping screw, opposite slots in the lower portion of said clamping member, a pair of conducting elements spaced on opposite sides of the axis of the clamping screw and loosely disposed in said slots and having portions bearing against said conducting strap, said clamping screw being adapted to clamp a conductor against said elements and said elements against said strap.

7. An electrical connector of the solderless type comprising a rectangular shaped clamping member having its bottom surface adapted to be connected to a conducting strap and having its top surface and interior side walls threaded to receive a clamping screw, opposite slots in the lower portion of said clamping member, a pair of spaced conducting elements loosely disposed in said slots and having portions adapted to bear against said conducting strap, said clamping screw being adapted to clamp a conductor against said elements and said elements against said strap, said elements being provided with and flanges engaging the opposite side walls of said clamping member to prevent spreading thereof.

8. An electrical connector of the solderless type comprising a rectangular shaped clamping member having its bottom surface connected to a conducting strap and having its top surface and interior side walls threaded to receive a clamping screw, opposite slots in the lower portion of said clamping member, a pair of spaced conducting elements loosely disposed in said slots and having portions bearing against said conducting strap, said clamping screw being adapted to clamp a conductor against said elements and said elements against said strap, said elements having notched top surfaces receiving said cable or conductor in clamping relation and flat surfaces engageable with the strap.

9. An electrical connector of the solderless type comprising a clamping member of generally rectangular form adapted to be connected to a conducting strap, a cup-shaped member having its bottom surface disposed between said clamping

member and said strap and movable relative to said clamping member, a clamping screw threaded in said member and adapted to clamp a conductor against the edges of said cup-shaped member, said cup-shaped member being pressed against said conducting strap by said clamping action.

10. An electrical connector of the solderless type comprising a clamping member of generally rectangular form adapted to be connected to a conducting strap, a cup-shaped member having its bottom surface disposed between said clamping member and said strap and movable relative to said clamping member, a clamping screw threaded in said member and adapted to clamp a conductor against the edges of said cup-shaped member, said cup-shaped member being pressed against said conducting strap by said clamping action, said clamping member being provided with cut away portions and slots receiving the opposite side walls of the cup-shaped member carrying the surfaces against which the cable is clamped, the end walls of said cup-shaped member engaging the side walls of the clamping member to prevent spreading thereof.

11. An electrical connector of the solderless type comprising a U-shaped element adapted to be connected to a supporting strap and having its interior side walls threaded to receive a clamping screw, an inverted U-shaped member mounted over said first mentioned member, said members being relatively movable and said last mentioned member engaging the ends of the legs of said first mentioned member to prevent spreading thereof, a clamping screw threaded in said first mentioned member, and aligned apertures in the legs of said second mentioned member through which a conductor to be attached is adapted to extend and against the edges of which it is adapted to be clamped by the action of said clamping screw, said clamping action pressing said last mentioned member tightly against the conducting strap.

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