

Jan. 18, 1944.

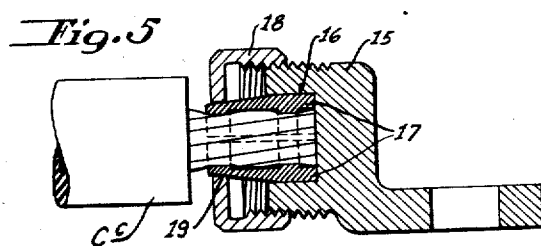
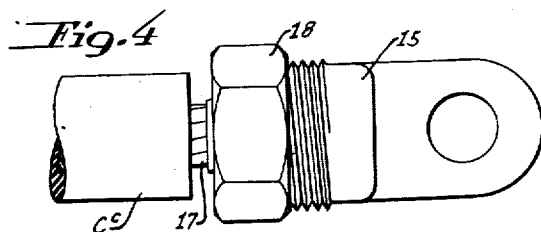
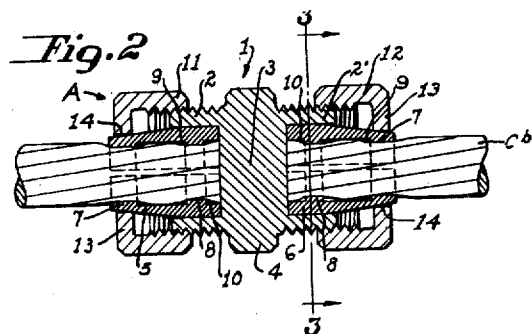
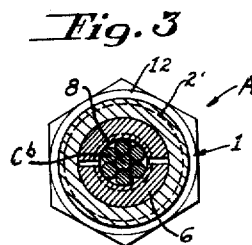
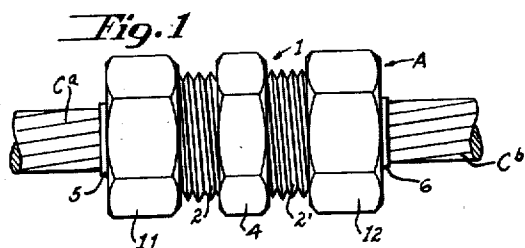
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2,339,488

CONNECTOR

Filed Dec. 7, 1942

2 Sheets-Sheet 1



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CONNECTOR

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2 Sheets-Sheet 2

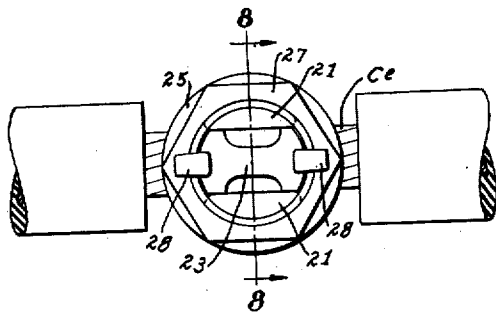


Fig. 6

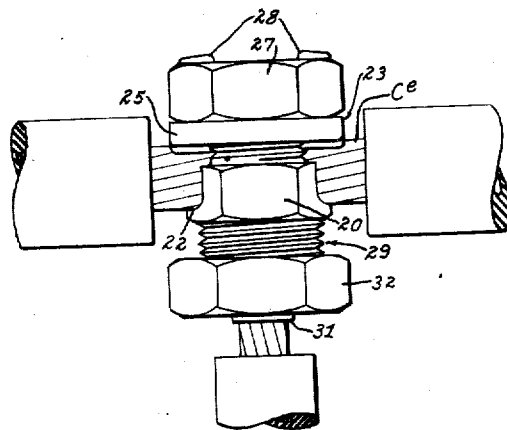


Fig. 7

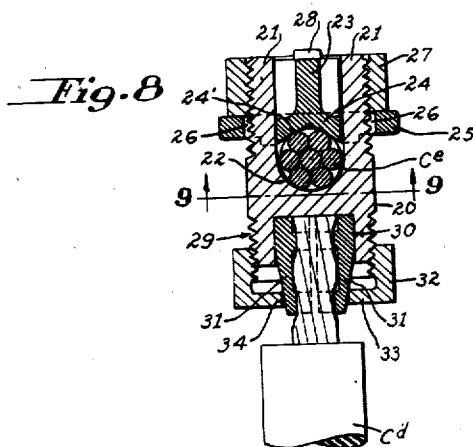


Fig. 8

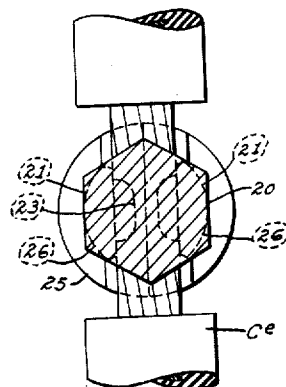


Fig. 9

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2,339,488

CONNECTOR

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Application December 7, 1942, Serial No. 468,055

6 Claims. (Cl. 287—75)

This invention relates generally to connectors and more specifically to connectors of the type adapted for use in mechanically and electrically connecting stranded cables, the predominant object of the invention being to provide an improved connector of this type which is of extremely simple construction and arrangement and which is capable of performing its intended function in a highly efficient manner.

Fig. 1 is a side elevation of the improved connector shown in association with a pair of cables.

Fig. 2 is a longitudinal section through the connector assembly shown in Fig. 1.

Fig. 3 is a cross-section taken on line 3—3 of Fig. 2.

Fig. 4 is a plan view of a modified form of the invention.

Fig. 5 is a longitudinal section through the connector assembly illustrated by Fig. 4.

Fig. 6 is a plan view of still another modified form of the invention.

Fig. 7 is a side elevation of the assembly illustrated in Fig. 6.

Fig. 8 is a vertical section taken on line 8—8 of Fig. 6.

Fig. 9 is a horizontal section taken on line 9—9 of Fig. 8.

In the drawings, wherein are shown for the purposes of illustration, merely, several embodiments of the invention, A designates generally the improved connector illustrated in Figs. 1, 2, and 3. The connector A includes a body member 1 comprising an elongated structure having opposed, cylindrical portions 2 and 2' which are externally screwthreaded and the inner openings of which are divided by a solid, integral wall 3 (Fig. 2) that is located at the approximate longitudinal center of the body member. The body member 1 includes also an outwardly projected integral extension 4 of polygonal formation which is located at the approximate longitudinal center of the body member and serves to receive a wrench, or other suitable tool, when a pair of cables are being connected with the aid of the connector. It is to be noted that the inner faces of the walls of the opposed, cylindrical portions 2 and 2' are straight, in that they are parallel with the axis of the body member, and also that the opposite side faces of the solid wall 3 provide abutments which serve as closures for the openings within the opposed, cylindrical portions 2 and 2' at the inner ends thereof, said openings being open at the outer ends of the respective opposed, cylindrical portions 2 and 2'.

Included as parts of the completely assembled

connector A are pairs of wedge elements 5 and 6, each comprising two elongated elements of semicircular cross-sectional shape, as is shown to good advantage in Figs. 2 and 3. The walls of the elements of each pair of wedge elements are of tapering thicknesses throughout the greater part of the length thereof; that is to say, the walls of said elements taper from points of their greatest thickness located inwardly of certain and corresponding ends of the elements to substantially reduce thickness at the opposite ends thereof. Because of the tapering thicknesses of the walls of pairs of elements 5 and 6 each pair thereof, when assembled, provides a longitudinally split tapered tube, the mated sections of which are spaced apart slightly.

At the inner face of the wall of each element of the pairs of wedge elements 5 and 6 a pair of inwardly extended ribs 7 and 8 are formed thereon. These ribs 7 and 8 are formed integrally with the wedge element with which they are associated, the rib 7 of each wedge element being located at the end of the element where the wall thereof is of reduced thickness, and the rib 8 being located inwardly of the end of the element at which the wall thereof is of greater thickness. The ribs 7 and 8 of each wedge element are of semicircular formation, and the ribs of a pair of associated wedge elements are correspondingly located so that the ribs of each of a pair of associated wedge elements are annular continuations of the ribs of the other of the associated pair of wedge elements. Between the ribs 7 and 8 of each of the wedge elements said element is provided with a semicircular cavity 9 and, also, between the rib 8 of each wedge element and the adjacent end of the element a semicircular cavity 10 is provided (Fig. 2).

Forming parts of the connector A illustrated in Figs. 1, 2, and 3, is a pair of nuts 11 and 12 which are adapted to be screwed inwardly on the exteriorly screwthreaded cylindrical portions 2 and 2', respectively. Each of the nuts 11 and 12 is provided with an end wall 13 through which an opening 14 is formed, the wall of said opening 14 being adapted to engage the tapered outer surfaces of a pair of wedge elements 5 and 6 in a manner and for a purpose to be hereinafter set forth.

In connecting a pair of cables with the aid of the improved connector A illustrated in Figs. 1, 2, and 3, the nuts 11 and 12 are passed inwardly of the pair of cables to be connected, the cables being extended through the openings 14 of the nuts and such cables being designated in the

drawings by the reference characters Ca and Cb. A mated pair of the wedge elements 5 or 6 is then applied to the end portion of each cable so that the associated pair of wedge elements embrace the end portion of the cable to provide same with a tapered and longitudinally split tubular structure. The operator squeezes or presses the pair of wedge elements of each cable end toward each other by hand sufficiently to permit the mated wedge elements, with the cable end portion therebetween, to be introduced into the opening of the appropriate cylindrical portion 2 or 2' of the body member 1 of the connector. The nuts 11 and 12 are then moved into engagement with the externally screwthreaded cylindrical portions 2 and 2' and are screwed inwardly thereon. As the nuts 11 and 12 are screwed inwardly on the externally screwthreaded cylindrical portions 2 and 2', the walls of the openings 14 of said nuts engage the tapered surfaces of the paired wedge elements 5 and 6 and cam said paired wedge elements toward each other so as to compress the end portions of the cables therebetween. As a result of the application of compressive force to the pairs of wedge elements by the walls of the openings 14 of the nuts 11 and 12 concentration of uniform, high pressure line contact is obtained between the ribs 7 and 8 of the wedge elements and the cables with the result that said cables are very securely gripped between the pairs of wedge elements. Also, because of the presence of the cavities 9 and 10 between the ribs 7 and 8 and at ends of the wedge elements, the application of compressive force to the cables at the locations of the ribs will cause portions of the cables to spread outwardly into said cavities, as shown in Fig. 2, with the result that a mechanical locking action is obtained between the wedge elements and the cables which effectively aids the inward pressure at the ribs 7 and 8 in resisting stresses which might tend to pull the cables longitudinally from between the wedge elements.

It is important to note that the cavities 10, which are located between the ribs 8 and the adjacent ends of the wedge elements, serve to facilitate convenient assembly of the wedge elements 5 and 6 with the cable ends. This result follows from the fact that the extreme end portions of the cables are usually slightly spread, or mushroomed, due to the cutting of the cables, and these spread or mushroomed end portions may be disposed in the cavities 10 without any necessity that they be compressed or reformed as would be the case if the cavities 10 were not provided.

In Figs. 4 and 5 the invention is illustrated as providing means for connecting an insulated cable Cc to a terminal lug 15. In accordance with this form of the invention the terminal lug 15 is provided with an opening 16 which receives a pair of wedge elements 17, of the construction previously described herein, with an end portion of the cable disposed therebetween, said cable end portion having the insulation stripped therefrom. The terminal lug 15 is provided with an externally screwthreaded portion which receives a nut 18 made in accordance with the nuts 11 and 12 of Figs. 1 and 2, the wall of the opening 16 of said nut engaging the tapered surfaces of the wedge elements 17 when said nut is screwed inwardly on the screwthreaded portion of the terminal lug to compress the wedge elements onto the cable end and thereby securely connect the cable to the terminal lug in the manner previously explained herein.

In Figs. 6, 7, 8, and 9, the present invention is

cooperatively associated with a connector of the well known split-bolt type to provide a unitary connector structure adapted to make a T-type connection between conductors. The structure of Figs. 6, 7, 8 and 9, includes a body member 20 which is bifurcated in its upper portion to provide a pair of spaced, upstanding legs 21 which are shaped in cross-section as shown in Fig. 6 and are provided with screwthreads on their outer curved faces. The space between the spaced legs 21 is shaped at its lower end to provide a conductor seat 22, and associated with the body member 20 is a follower 23 which includes a portion 24 which is movable vertically within the space between the legs 21 and is provided with a conductor seat 24'. The follower 23 includes a horizontally disposed portion 25 which is provided with openings 26 through which the legs 21 extend, and screwthreadedly mounted on the screwthreaded legs 21 and arranged in contact with the washer portion 25 is a nut 27. The follower 23 is provided at its upper end with lugs 28 which overhang the nut 27, said nut being rotatable between the washer portion 25 and the lugs 28 and with respect to the spaced legs 21 and the portion 24 of the follower 23 disposed between said spaced legs.

The lower portion of the body member 20 of the connector structure shown in Figs. 6, 7, 8, and 9, is externally screwthreaded, as shown at 29 in the Figs. 7 and 8, and said lower portion of said body member has an open-bottom opening 30 formed therein. The opening 30 receives a pair of wedge elements 31, of the type illustrated in Figs. 2 and 3 and previously described in detail herein, which wedge elements are arranged in embracing relation with respect to an end portion of an insulated cable Cd, said end portion of said cable having the insulation stripped therefrom. The connector structure shown in Figs. 6, 7, 8, and 9, includes also a nut 32 which is similar in construction to the nuts 11 and 12 which form parts of the connector illustrated in Figs. 1, 2, and 3, said nut being screwthreadedly mounted on the screwthreaded portion 29 of the body member 20 and having a wall 33 through which an opening 34 is formed, the wall of which opening engages the tapered surfaces of the wedge elements 31 to force said wedge elements toward each other to grip therebetween the end portion of the conductor Cd when said nut is screwed upwardly on the screwthreaded portion 29 of the body member 20 as has been previously explained herein.

The connector structure illustrated in Figs. 6, 7, 8, and 9, may be applied to an overhead, or other conductor, Ce by removing the nut and follower assembly and passing the body member 20 into assembled relation with respect to the conductor, in which relation the spaced legs will straddle the conductor and said conductor will engage the conductor seat 22. The nut and follower assembly is then re-applied to the body member, the nut 27 being screwed downwardly on the spaced legs 21 until the conductor seat 24' of the follower engages the conductor and clamps said conductor between the conductor seat 22 of the body member and the conductor seat 24' of the follower.

I claim:

1. A connector comprising a body member having an externally screwthreaded portion in which a smooth-walled opening is formed, said opening being of substantially constant diameter throughout its length and being provided at its inner end with a wall providing an abutment, a plural-

ity of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions, said wedge elements being adapted to be arranged in assembled embracing relation with respect to an end portion of a conductor and the end portion of the conductor and the wedge elements assembled with respect thereto being adapted to be introduced into said opening of said body member with the inner ends of the wedge elements in contact engagement with said inner wall of said opening, and a nut screwthreadedly mounted on the externally screwthreaded end portion of said body member, said nut being provided with a wall portion having an opening formed therethrough through which said wedge elements extend, and the wall of said opening being adapted to engage the tapered surface portions of said wedge elements when the nut is screwed inwardly with respect to the screwthreaded end portion of said body member in a manner to force said wedge elements into tight gripping contact with the conductor end portion located therebetween, longitudinal movement of said wedge elements relative to said opening of said body member being prevented during inward movement of said nut because of their contact with the inner wall of said opening.

2. A connector comprising a body member having an externally screwthreaded portion in which a smooth-walled opening is formed, said opening being of substantially constant diameter throughout its length and being provided at its inner end with a wall providing an abutment, a plurality of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions, raised portions formed on the inner faces of said wedge elements, said wedge elements being adapted to be arranged in assembled embracing relation with respect to an end portion of a conductor and the end portion of the conductor and the wedge elements assembled with respect thereto being adapted to be introduced into said opening of said body member with the inner ends of the wedge elements in contact engagement with said inner wall of said opening, and a nut screwthreadedly mounted on the externally screwthreaded end portion of said body member, said nut being provided with a wall portion having an opening formed therethrough through which said wedge elements extend, and the wall of said opening being adapted to engage the tapered surface portions of said wedge elements when the nut is screwed inwardly with respect to the screwthreaded end portion of said body member in a manner to force the raised portions of said wedge elements into tight gripping contact with the conductor end portion located therebetween, longitudinal movement of said wedge elements relative to said opening of said body member being prevented during inward movement of said nut because of their contact with the inner wall of said opening.

3. A connector comprising a body member having an externally screwthreaded portion in which a smooth-walled opening is formed, said opening being of substantially constant diameter throughout its length and being provided at its inner end with a wall providing an abutment, a plurality of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions, pairs of ribs formed on the inner faces of said wedge elements in such manner that cavities are provided at said inner faces of said wedge elements adjacent to said ribs, said wedge elements being adapted to be arranged in assembled embracing

relation with respect to an end portion of a conductor and the end portion of the conductor and the wedge elements assembled with respect thereto being adapted to be introduced into said opening of said body member with the inner ends of the wedge elements in contact engagement with said inner wall of said opening, and a nut screwthreadedly mounted on the externally screwthreaded end portion of said body member, said nut being provided with a wall portion having an opening formed therethrough through which said wedge elements extend, and the wall of said opening being adapted to engage the tapered surface portions of said wedge elements when the nut is screwed inwardly with respect to the screwthreaded end portion of said body member in a manner to force the pairs of ribs of said wedge elements into tight gripping contact with the conductor end portion located therebetween and spread parts of said conductor end portion into said cavities, longitudinal movement of said wedge elements relative to said opening of said body member being prevented during inward movement of said nut because of their contact with the inner wall of said opening.

4. A connector comprising a body member having an externally screwthreaded portion in which a smooth-walled opening is formed, said opening being of substantially constant diameter throughout its length and being provided at its inner end with a wall providing an abutment, a plurality of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions, a pair of ribs formed on the inner face of each of said wedge elements in such manner that a cavity is provided at said inner face between said pair of ribs and a similar cavity is provided at said inner face between one of the ribs and an adjacent end of the wedge element, said wedge elements being adapted to be arranged in assembled embracing relation with respect to an end portion of a conductor and the end portion of the conductor and the wedge elements assembled with respect thereto being adapted to be introduced into said opening of said body member with the inner ends of the wedge elements in contact engagement with said inner wall of said opening, and a nut screwthreadedly mounted on the externally screwthreaded end portion of said body member, said nut being provided with a wall portion having an opening formed therethrough through which said wedge elements extend, and the wall of said opening being adapted to engage the tapered surface portions of said wedge elements when the nut is screwed inwardly with respect to the screwthreaded end portion of said body member in a manner to force the ribs of said wedge elements into tight gripping contact with the conductor end portion located therebetween and spread parts of said conductor end portion into said cavities, longitudinal movement of said wedge elements relative to said opening of said body member being prevented during inward movement of said nut because of their contact with the inner wall of said opening.

5. A connector comprising a body member having a pair of opposed externally screwthreaded end portions in which openings having smooth walls are formed, said openings respectively being of substantially constant diameters throughout their lengths and being separated by a wall therebetween at the inner ends of said openings, pairs of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions, a pair of said wedge elements being adapted to be

arranged in assembled embracing relation with respect to an end portion of each of a pair of conductors and said end portions of said conductors and the pairs of wedge elements assembled therewith being adapted to be introduced respectively into the openings of the opposed externally screwthreaded end portions of said body member with the inner ends of said pairs of wedge elements in contact engagement with the opposite faces of the wall between said openings, and nuts screwthreadedly mounted on the opposed externally screwthreaded end portions of said body member, said nuts being provided with wall portions having openings formed therethrough through which said wedge elements extend, and the walls of said openings being adapted to engage the tapered surface portions of said wedge elements when the nuts are screwed inwardly with respect to the screwthreaded end portions of said body member in a manner to force said wedge elements into tight gripping contact with the conductor end portions located between said pairs of wedge elements, longitudinal movement of said wedge elements relative to the openings of said body member in which they are arranged being prevented by the contact of said wedge elements with opposite faces of the wall located between said openings.

6. A connector comprising a body member having a pair of opposed externally screwthreaded end portions in which openings having smooth walls are formed, said openings respectively being of substantially constant diameters throughout their lengths and being separated by a wall therebetween at the inner ends of said openings, pairs of wedge elements of arcuate cross-sectional shape and provided with tapered surface portions,

a pair of said wedge elements being adapted to be arranged in assembled embracing relation with respect to an end portion of each of a pair of conductors and said end portions of said conductors and the pairs of wedge elements assembled therewith being adapted to be introduced respectively into the openings of the opposed externally screwthreaded end portions of said body member with the inner ends of said pairs of wedge elements in contact engagement with the opposite faces of the wall between said openings, nuts screwthreadedly mounted on the opposed externally screwthreaded end portions of said body member, said nuts being provided with wall portions having openings formed therethrough through which said elements extend, and the walls of said openings being adapted to engage the tapered surface portions of said wedge elements when the nuts are screwed inwardly with respect to the screwthreaded end portions of said body member in a manner to force said wedge elements into tight gripping contact with the conductor end portions located between said pairs of wedge elements, and pairs of ribs formed on the inner faces of said wedge elements, said ribs providing cavities at the inner faces of said wedge elements into which parts of the end portions of the conductors are spread so as to increase the gripping effect between the wedge elements and the conductors, longitudinal movement of said wedge elements relative to the openings of said body member in which they are arranged being prevented by the contact of said wedge elements with opposite faces of the wall located between said openings.

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