

July 15, 1941.

F. PENNELL

2,249,492

LINE CONNECTOR

Filed July 10, 1940

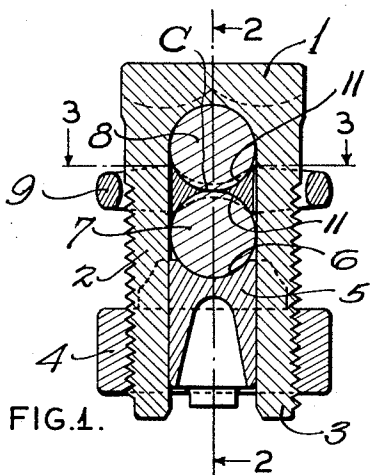


FIG. 1.

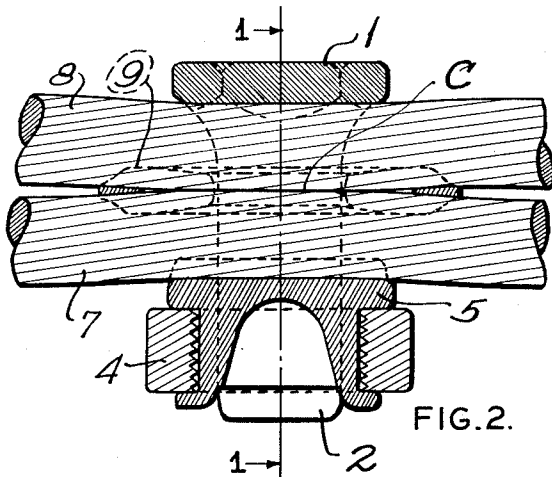


FIG. 2.

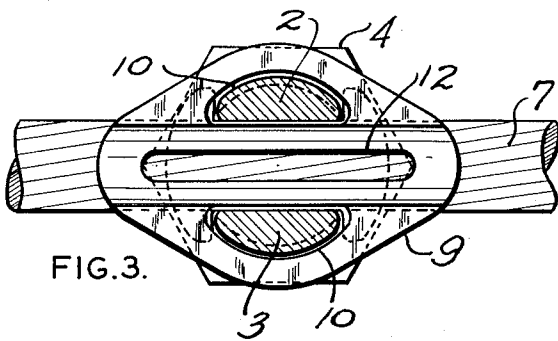


FIG.3.

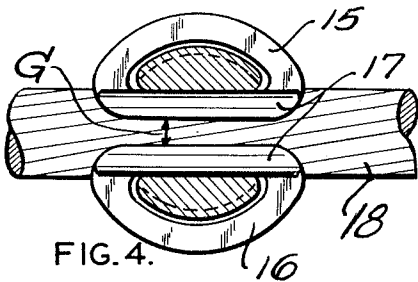


FIG. 4.

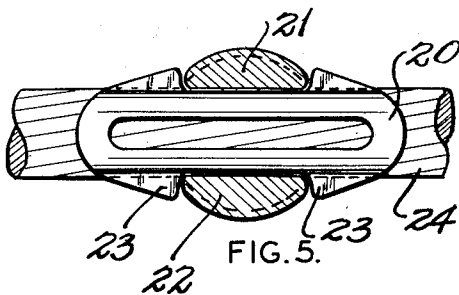


FIG. 5.

INVENTOR.

FORD PENNELL

BY

Rodney Bedell
ATTORNEY.

ATTORNEY.

UNITED STATES PATENT OFFICE

2,249,492

LINE CONNECTOR

Ford Pennell, Webster Groves, Mo.

Application July 10, 1940, Serial No. 344,631

8 Claims. (Cl. 287—78)

The invention relates to connectors of the split bolt or similar type used with wires, cables or other electrical lines or conductors to clamp the conductors together.

The main object of the invention is to improve the conduction of current from one conductor to the other, and this object is attained by definitely positioning the conductors in the connector so that they have contact with each other as well as with portions of the connector bolt.

This general objective and other detail objects of the invention, as will appear below, are attained by the structure illustrated in the accompanying drawing, in which—

Figure 1 is a longitudinal section through a connector bolt embodying the invention and showing in transverse section two connected conductors. Figure 1 is taken on the section line 1—1 of Figure 2.

Figure 2 is a section taken at right angles to the plane of the section of Figure 1 and is taken on the line 2—2 of Figure 1.

Figure 3 is a horizontal section taken on the line 3—3 of Figure 1.

Figures 4 and 5 correspond to Figure 3 but illustrate respectively different forms of the invention.

The bolt shown in Figures 1, 2 and 3 includes a head 1, a split shank having legs 2 and 3, a nut 4 threaded upon the shank, a washer 5 rotatably assembled with nut 4 and having an elongated concaved inner face 6 disposed to receive a portion of a conductor 7 passing through the bolt. Another conductor 8 passes through the bolt beneath conductor 7 and a washer 9 is provided between conductors 7 and 8.

Washer 9 is elongated lengthwise of the conductors and is substantially oval in contour and is substantially flat and has apertures 10 spaced apart transversely of its shorter axis to receive the legs 2 and 3, respectively, of the split shank. The above described elements are well-known in the art and in themselves do not constitute the present invention.

Between apertures 10 the opposing faces of washer 9 are concaved as indicated at 11 to provide a large bearing area and to more definitely position the conductors seated therein. The concavities 11 are so deep throughout a portion of their length that they intersect to provide an opening 12 of substantial width which permits conductors 7 and 8 to approach and contact with each other as indicated at C.

Hence, when nut 4 is tightened, there is pro-

vided, in addition to contact between each conductor and the bolt elements, a substantial contact between the conductors themselves. This arrangement produces a more satisfactory transmission of current between the conductors since there is but a single pair of surfaces for the current to traverse from one conductor to the other, whereas, with the usual construction, the current must pass from one conductor to one or more intermediate bolt elements and then to the other conductor. The transmission of current between the conductors is further facilitated because the conductors are usually made of material having a higher degree of conductivity than the connector bolt parts, which frequently are of cast metal and therefore have a lower degree of conductivity than the conductors themselves and also usually have rougher surfaces.

The advantageous features referred to above may be attained in various ways, and Figures 4 and 5 illustrate other forms of the invention.

In Figure 4 the washer structure consists of two separate elements 15 and 16, each corresponding generally to one-half of the washer 9 and apertured to receive one of the shank legs and each having a straight inner portion 17 opposing the corresponding portion of the other element and the adjacent surfaces of the conductors 18 and concaved or tapered to form a gap G between the elements to provide for contact between the conductors.

In Figure 5 the washer 20 consists of a single element corresponding to the middle portion of washer 9, but the washer does not encircle the shank legs 21 and 22. Ears 23 on the end portions of the washer prevent its disassembly from the bolt shank. The opposite faces of the washer are concaved to seat the conductors 24 and to provide contact between the conductors as in washer 9.

In each form of the invention the washer structure will keep the conductors straight and in line with each other and will afford a support for the rounded portions of the conductors and prevent them from distorting under pressure of the nut and washer 5, as soft metal conductors are likely to do when subjected to pressure over a period of time and, in addition to performing all of these functions, as done previously by bolts of this general type, the conductors are thrust into contact with each other and the effective transmission of current between them is increased.

The details of the construction may be changed without departing from the spirit of the invention and the exclusive use of those modifications

which come within the scope of the claims is contemplated.

What is claimed is:

1. In a device of the class described, a bolt including a head and a split shank, a nut threaded on said shank, and washer structure between said head and nut constructed and arranged to lie between conductors passing through the bolt and having elements to position the conductors relative to each other and apertured to provide for their contact with each other.
2. In a device of the class described, a bolt including a head and a split shank, a nut threaded on said shank, and a washer structure having parts for engaging the spaced legs of said shank, said structure being arranged to lie between conductors to which the device is applied to position the conductors relative to each other, there being an opening between said parts arranged to provide for the projection therethrough of the conductors when the nut is screwed down on the shank whereby the conductors may contact directly with each other.
3. In a device of the class described, a bolt including a head and a split shank, a nut threaded on said shank, and washer structure for insertion between conductors to which the bolt is applied, there being a gap in said washer structure adjacent the axis of the bolt and at least one conductor-engaging face of said washer structure being inclined towards said gap to provide for direct contact between conductors at opposite sides of the washer structure.
4. In a device of the class described, a bolt including a head and a split shank, a nut threaded on said shank, and washer structure having oppositely facing concave sides arranged to seat and to align respective conductors passing through the bolt, the concaved faces intersecting to form an opening through the washer structure through which the conductors may contact with each other.
5. In a device of the class described, a bolt in-

cluding a head and a split shank, a nut threaded on said shank, and a washer substantially flat and of substantially oval contour with its ends projecting laterally from said shank, the top and bottom faces of said portion being concaved towards each other, and said portion having an elongated opening extending beyond the sides of the shank and providing for the projection through the opening of portions of conductors seated against said washer so that the conductors may contact with each other when said nut is screwed down on said shank.

6. In a device of the class described, a bolt including a head and a split shank, a nut threaded on said shank, and a washer structure between said head and nut comprising separate elements surrounding respective legs of said shank and having tapered opposing faces spaced apart and arranged to engage portions of conductors passing through the bolt and to hold them against movement and in contact with each other when said nut is screwed down on said shank.

7. In a conductor wire connecting device, structure having opposing members, means for applying pressure in opposite directions to adjacent wires between said members, and a washer for insertion between said wires, said washer being apertured to accommodate offsetting of said wires through the washer into contact with each other under the thrust of said pressure means.

8. In a conductor wire connecting device, structure having opposing members, means for applying pressure through said members in opposite directions to adjacent wires between said members, and a washer for insertion between said wires and having elements for engaging said structure and said wires to position the latter against shifting movement in the device, said washer being apertured to accommodate offsetting of said wires through the washer into contact with each other under the thrust of said pressure means.

FORD PENNELL.