Oct. 28, 1958 H. R. WENGEN ET AL 2,858,522

CONNECTOR STRUCTURE

Filed April 25, 1955

Fig. 1

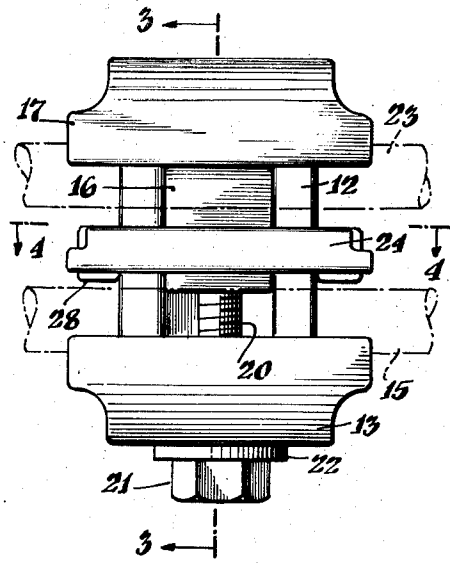


Fig. 2

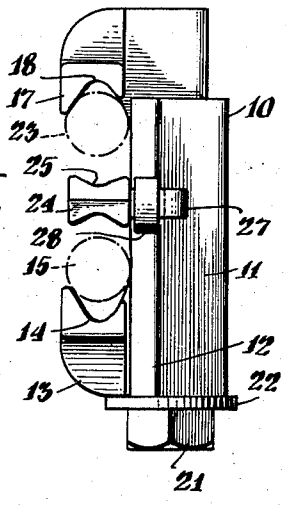


Fig. 3

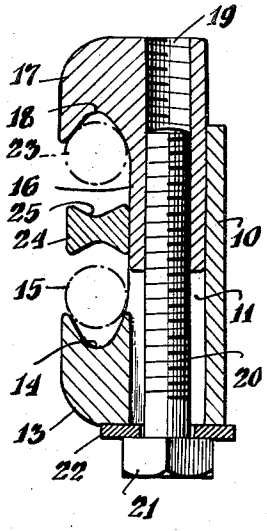


Fig. 4

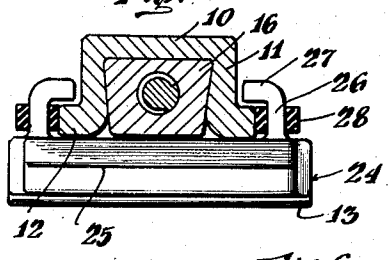


Fig. 5

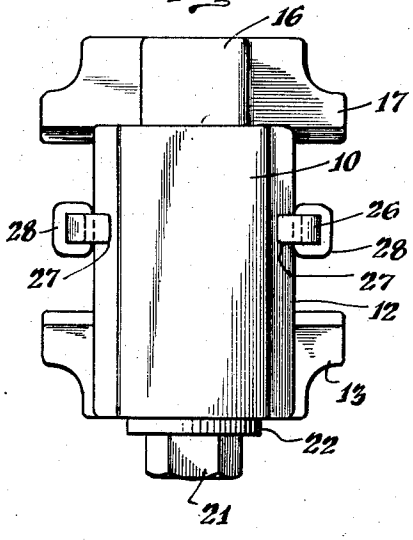
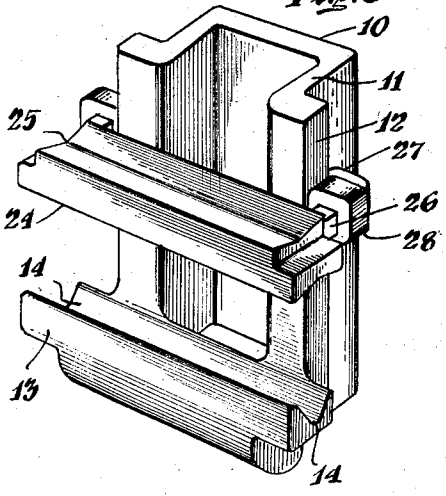


Fig. 6



INVENTORS

Henry R. Wengen

BY Robert L. Walker, Jr.

Kane, Dalsimer and Kane

ATTORNEYS

United States Patent Office

2,858,522

Patented Oct. 28, 1958

2,858,522

CONNECTOR STRUCTURE

Henry R. Wengen, Poughkeepsie, N. Y., and Robert L. Walker, Jr., Richmond, Va., assignors to Fargo Mfg. Company, Inc., Poughkeepsie, N. Y., a corporation of New York

Application April 25, 1955, Serial No. 503,475

1 Claim. (Cl. 339—264)

This invention relates to a structurally and functionally improved connector and especially a unit of this type wherein conducting cables or wires are clamped or secured against movements with respect to each other.

It is a primary object of the invention to furnish a connector assembly which may be used by the installer with both hands free to operate the wrench or "stick," by means of which the parts of the clamp are tightened or released. Therefore, installation and removal may be achieved with the expenditure of minimum effort and time.

A further object is that of providing a unit of this type which will preferably include a spacer bar, that bar being mounted in a manner such that it may be freely shifted at the will of the operator to assume any desired predetermined position and will remain in that position against all possibility of accidental displacement until a deliberate operation or manipulation of the connector is undertaken.

Still another object is that of designing a structure of this type which will be relatively inexpensive and capable of assembly in large quantities to furnish a desirable unit, functioning with freedom from all difficulties.

With these and other objects in mind, reference is had to the attached sheet of drawings, illustrating one practical embodiment of the invention, in which:

Fig. 1 is a plan view of the connector;

Fig. 2 is a side view thereof;

Fig. 3 is a sectional view, taken along the line 3—3 in the direction of the arrows as indicated in Fig. 1;

Fig. 4 is a transverse sectional view taken along the line 4—4 in the direction of the arrows as also indicated in Fig. 1;

Fig. 5 is a bottom plan view of the assembly; and

Fig. 6 is a front perspective view of the same, with one of the jaw elements and the operating bolt removed therefrom.

In these views, the numeral **10** indicates the base or body of the connector, which is preferably provided with upstanding arm portions **11**, providing with that body or base, a configuration which, in cross-section, is U-shaped. Flanges **12** may extend outwardly adjacent the free edges of arms **11**. The latter define between them a preferably "keystoned" space, in that their inner faces are inclined in opposite and outward directions toward base **10**. Preferably integral with this body portion of the assembly is a clamping jaw **13**, which is formed in its inner face with a notch or groove **14** of an area such that it may receive a wire or cable **15**.

A slide member **16** rides within the space defined between arms **11** and is conveniently wedge-shaped, as especially shown in Fig. 4, so that it may not be withdrawn from association with base **10** by merely moving in a direction outwardly of the latter. This body **16** has preferably formed integrally with it a jaw **17**, which may be grooved as at **18** in a manner corresponding to the grooving at **14** of jaw **13**.

With a view to causing relative movements of jaws **13** and **17** with respect to each other, the body **16** affixed to

the latter is preferably formed with a screw-threaded bore **19** extending axially of its length. Engaging these threads are the threads of a bolt shank **20**. The head **21** of that bolt lies beyond jaw **13** and body **10**; extending between the arms **11**. Conveniently, a washer **22** is interposed between head **21** and the end of the assembly **10—13**. In this manner, thrust may be exerted by the bolt thread as the shank **20** of that bolt is turned with respect to the remaining parts of the assembly, in that the opening of washer **22** will not be sufficiently large to permit of the passage of head **21** which bears against its face.

With the exception of the bolt and the washer, aluminum alloy castings may be used to furnish jaws **13** and **17** as well as body portions **10**, **11** and **16**. The length of the parts will, of course, be such that in addition to conductor or cable **15**, a further wire or cable **23** may be accommodated adjacent jaw **17**; the distance between the jaws (when the device is expanded) also permitting of the accommodation therebetween of a spacer bar.

According to the present teachings, this spacer bar will preferably be formed of substantially pure aluminum. Therefore, when contact and clamping pressures are applied, the bar will engage and extend partially around the strands of the cable or wire. This will seal out corhosive media and furnish a high conductive path between the adjacent leads because current will tend to flow directly through the intervening spacer from one conductor to another rather than traversing the relatively high resistance path which would otherwise be involved.

The spacer will preferably take the form of a bar **24** extending parallel to the jaws **13** and **17** and conveniently having its side faces grooved as at **25** to complement the grooves **14** and **18**. The length of this bar will be such that it extends beyond the outer edges of flanges **12**. At those points, it will be provided with arms **26** spaced a distance greater than the distance between the flange edges and which arms are inturned as at **27** to provide parts underlying those flanges or rails. Accordingly, with the bar in position, it may not be accidentally separated from body **10**, either by direct lateral movement or past jaw **13** or **17** and will be free to shift towards either of these jaws.

In connectors of this type as heretofore constructed, considerable difficulty has been experienced incident to the spacer bar shifting either toward one or the other jaw, so as to define at this zone inadequate space to receive conductor **15** or **23**. Such shifting has occurred as a consequence of jars or the action of gravity. Therefore, it has usually been necessary for the operator to manually adjust the spacer bar to the desired position where it would intervene a pair of conductors or cables, with the latter disposed in proper positions with respect to the individual jaws. Aside from the danger involved incident to voltages which may be impressed on the connector, an operator has been under the difficulty of maintaining the spacer bar in the desired position, with one hand, while endeavoring to manipulate the bolt head **21** and retain the other parts by a suitable tool operated by the other hand, or else directly engaging the parts of the connector with the other hand. By the present teachings, this difficulty is overcome.

Specifically, a detent or retaining structure is furnished, which prevents a pre-shifting of bar **24** axially of the assembly, although that shifting may be accomplished by the employment of a reasonable force. Such force may be exerted with the operator merely observing a pair of conductors **15—23** and with the connector in his hands. Assuming that the spacer bar is to occupy a position substantially midway between the jaws **13—17**, then that position will be established by manually moving bar **24** laterally along flanges **12**. Thereupon, the operator, either by direct manual contact or by employing a suit-

able tool, may apply the connector so that it receives one conductor or cable adjacent its jaw **13** and the other cable adjacent its jaw **17**, with the spacer bar in an intermediate position separating the cables. Now, by tightening the connector, the cables or leads are moved towards each other and into contact with bar **24**. Thus they are desirably clamped against movement with respect to each other and a proper electrical path may be established between them.

While the detent or retaining structure might take one of numerous different forms, it is preferred to employ grommets in association with the arms **26**. These grommets have been indicated at **28**, as encircling arms **26** and lying in the planes of flanges **12**. The grommets or collars are conveniently formed of a plastic, such as "neoprene." Their width is such that they would normally fill in excess of the space between the inner surfaces of arms **26** and the adjacent flange surfaces. Therefore, when occupying this position, they will be under slight compression and frictionally bear against the edges of flanges **12**. Consequently, a friction-detent structure is furnished at this point, which will restrain a shifting of the spacer bar, excepting only when it is deliberately and manually manipulated to move axially of the assembly. These grommets are outside of the current paths between the conductors and will, of course, in no way interfere with the smooth and easy operation of the clamp parts.

Thus, it will be understood that when the apparatus is to be assembled, body **10—11** will have applied to it, as in Fig. 6, the spacer bar **24**. That bar may be adjusted to any desired position. Thereupon, the grommets **28** will retain it in that position. The bolt and washer may now be applied to the bore defined by the U-shaped body, with washer **22** bearing against the end of the same, as shown, for example, in Fig. 5. The shank **20** of the bolt is introduced into the bore **19** of body **16**. Now by turning

head **21**, jaw **17** is drawn toward jaw **13** so that, for example, spaces of substantially equal area exist between these jaws and the adjacent side surfaces of the spacer. Assuming that a linesman finds this spacing to be proper, he will have no difficulty in applying the connector to conducting lines and thereupon tightening the parts of its assembly so that the two jaws firmly grip the two or more conductors which are present and intimately engage the surfaces of these conductors with the material of the spacer **24**. When it is desired to release the parts, a reverse operation will occur.

Thus, among others, the several objects of the invention as specifically aforenoted are achieved. Obviously, numerous changes in construction and rearrangements of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

We claim:

A connector including, in combination, a channel-shaped body, flanges extending outwardly from the edges of the same, a spacer slidably riding over said flanges, arms extending from said spacer adjacent the edges of said flanges and underlying the latter, and grommets of friction material associated with said arms and bearing against the edges of said flanges to retard movement of the spacer with respect to said body.

References Cited in the file of this patent

UNITED STATES PATENTS

2,349,802	McKnight	May 30, 1944
2,354,382	Kent	July 25, 1944
2,456,808	Becker	Dec. 21, 1948
2,457,506	Sorensen	Dec. 28, 1948
2,469,542	Becker	May 10, 1949
2,643,371	Sleeger	June 23, 1953