

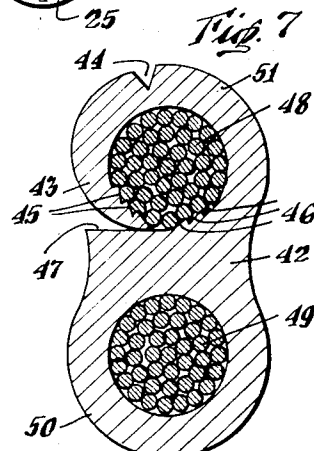
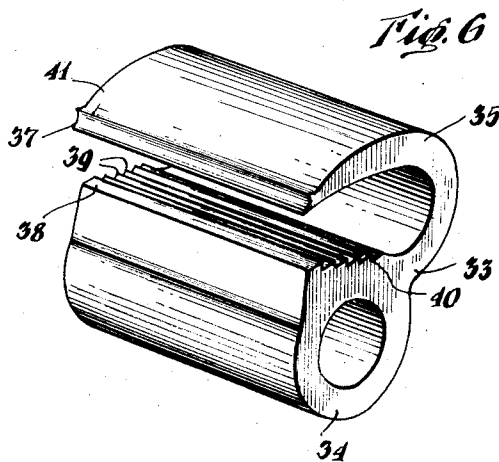
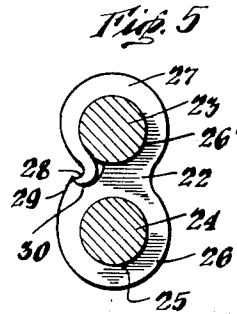
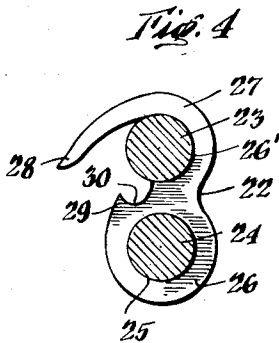
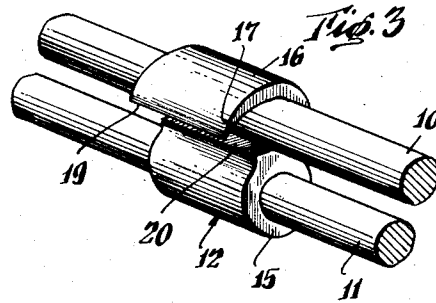
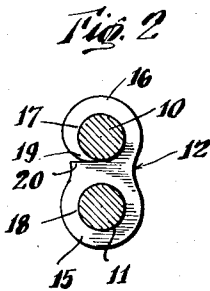
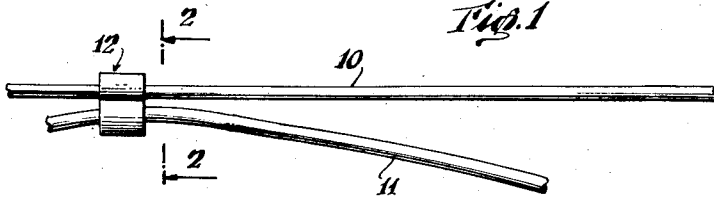
April 28, 1959

S. P. BECKER ET AL

2,884,478

STRAND CONNECTOR

Filed April 20, 1955



INVENTORS  
*Stephen F. Becker*  
BY *Henry R. Wengen*  
*Kane, Dalimer and Kane*  
ATTORNEYS

1

2,884,478

## STRAND CONNECTOR

Stephen P. Becker and Henry R. Wengen, Poughkeepsie, N.Y., assignors to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y., a corporation of New York

Application April 20, 1955, Serial No. 502,664

3 Claims. (Cl. 174—94)

This invention relates to a structurally and functionally improved connector of the compression type, which will be of especial value when employed in connection with a "tap-off."

It is a primary object of the invention to furnish a simple and compact unit which may readily be employed by the usual linesman and operated by a more or less conventional tool, so that it will be properly applied to a cable or electrical line.

So applied, it will remain against all probability of displacement and retain a pair of lines for indefinite periods in a predetermined relationship.

Still another object is that of furnishing a connector which may readily be manufactured by substantially automatic machines and quantity production methods, so that a unit is produced which may be sold at a relatively nominal figure.

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

Fig. 1 is a fragmentary side elevation of a pair of lines involving a "tap-off" with respect to which the present connector is of primary utility;

Fig. 2 is a transverse sectional view taken along the line 2—2 in the direction of the arrows as indicated in Fig. 1;

Fig. 3 is a perspective view of the connector and fragments of the lines associated therewith prior to the final application of the connector to these lines;

Fig. 4 is a view similar to Fig. 2, but showing an alternative form of structure;

Fig. 5 is a view similar to Fig. 4, but showing the parts of the connector as illustrated in the latter shifted to a final position;

Fig. 6 is a perspective view of a still further form of connector; and

Fig. 7 is a transverse sectional view in enlarged scale, showing an additional form of unit applied to a pair of lines.

Primarily referring to Fig. 1, there has been shown a fragment of lines associated in the form of a "tap-off." Thus, the numeral 10 indicates a line which may be a main supply source and 11 a line which constitutes the tap-off. These lines are coupled by means of a connector generally indicated by the reference numeral 12. The detailed structure of that connector has been shown in Figs. 2 and 3.

In those views, the numerals 15 and 16 indicate sleeve portions which are preferably integral with each other and are both formed of metal having ductile qualities such that at least certain parts of the connector may be bent or constricted in a manner hereinafter brought out. These sleeve portions define bores 17 and 18, each of which receives one of the lines or conductors. As illustrated, sleeve 16 is slotted to provide an extended or tail portion 19 which, in the initial position of the parts as in Fig. 3, may extend outwardly and spaced from the

2

adjacent surface 20 of the connector. Assuming sleeve 15 to be unslotted (as shown), then conductor 11 may be disposed within the bore 18 of that sleeve and secured against movement with respect thereto prior to the linesman establishing the tap. Otherwise, this sleeve may, at the site of the work, be compressed around conductor or line 11 so that its bore is constricted and movement between the line and the connector is accordingly prevented.

Regardless of this factor, however, the linesman will simply shift the connector with the line 11 secured to the same, so that line 10 is received within the bore 17 of sleeve 16. To this end, the extended portion or tail 19 is spaced from surface 20 to an extent greater than the diameter of line 10. As is apparent, the reception of line 10 occurs by simply moving the connector in a lateral direction with respect to that line.

The parts will now be in the position shown in Fig. 3. In order to provide a permanent coupling, a suitable tool is employed. That tool may embody numerous different forms of construction and will conveniently embrace a pair of jaws or work-engaging portions such that the sleeve received therein may be constricted or compressed. Also, a hammer or similar member could be employed to tap against the exterior surface of sleeve 16 adjacent the leading edge of projecting portion 19. In any event, that edge will be introduced into the space existing between the camming or operating surface 20 and line 10. Thereupon, by exerting further constrictive action, sleeve 16 will be wrapped around line 10 with the tailpiece 19, in effect, wedged between these surfaces. It will be appreciated that no difficulty will be encountered in this direction, because face 20 will act to guide the tailpiece as the latter is pressed inwardly. Therefore, a wedge-type fit will be established.

Should it be desired to provide a more positive locking action on the part of the upper sleeve, then a connector of the type shown in Figs. 4 and 5 could be employed. That connector has been generally indicated by the numeral 22. Lines 23 and 24 have also been shown, which are received within bores 25 and 26' defined by sleeves 26 and 27.

In common with the form first described, sleeve 26 is tubular, while sleeve 27 is slotted. The slot of the latter is defined by a projecting edge portion 28 of preferably tapered configuration and engageable with the lip 29 defining the forward end of a groove 30 formed at the juncture of the two sleeves.

Again, assuming that sleeve 26 has heretofore been applied to line 24 so that the latter will not shift within bore 25, then line 23 is introduced by lateral relative movement of the parts into bore 26'. Under these circumstances, and as shown in Fig. 4, the leading edge of the tail or projecting part 28 is spaced from the adjacent surfaces so that the line 23 may occupy this position. When the parts are once disposed as in Fig. 4, then by a constricting or impact tool, the leading edge of the projecting part 28 is introduced into groove 30 and further constriction of bore 26' is resorted to. Under these circumstances, the edge of portion 28 will abut lip 29 and bend upon itself in an inward direction, as shown in Fig. 5, to furnish a detent structure. This will provide a positive lock preventing any subsequent accidental opening of sleeve 27 and, therefore, maintaining line 23 against any movement with respect to the connector.

In the connector shown in Fig. 6, sleeves 34 and 35 are involved in the body 33. Again, the sleeve 34 is unslotted, while sleeve 35 is interrupted to provide a tail or leading edge portion 37. A surface 38 is included which corresponds to surface 20 and guides this leading edge inwardly when the latter is once bent or the sleeve 35 is distorted, so that constriction will result due to

edge portion 37 riding in camming relationship with respect to surface 38. The bore of sleeve 35 may, on its face surface, include preferably two or more teeth or ribs 39 having base portions 40. These will serve as ratchet elements in cooperation with a pawl or tooth 41 formed on the exterior of sleeve 35 adjacent the edge portion 37 of the latter.

Again assuming that a conductor has been permanently associated with the bore of sleeve 34, it will further be assumed that a second conductor or line has been disposed within the bore of sleeve 35. The latter is now bent so that its leading edge 37 extends inwardly in a manner similar to the previously-described forms. At this moment, by constricting sleeve 35, its leading edge 37 will move in guided relationship over surface 38 and over the teeth 39. Therefore, this tail portion will assure pawl 41 overriding these teeth as it is tucked into the space between the base of the sleeve and the conducting line. Therefore, in common with the previously-described forms, a proper detent structure will be furnished, such that the connector will remain permanently in proper position with respect to the lines to which it is applied.

Finally, in the form of the connector illustrated in Fig. 7, a body 42 is involved which includes sleeve portions 50 and 51. The latter may be slotted, while the former is preferably circular. So constructed, a tail or leading portion 43 will be included in sleeve 51 and corresponding to the parts 19, 28 and 37 as heretofore described. Pawl or gripping teeth 45 and 46 may be formed in the bore of sleeve 51 at points adjacent the base of the latter when the sleeve is completed. Also, a line of weakening, in the form of a groove or crease 44, may be included in sleeve 51.

Therefore, with lines 48 and 49 in position, the operator will constrict sleeve 51. A zone of flexure will be provided by the groove or crease line 44, such that the leading edge of the tail 43 will readily shift over supporting surface 47 and be guided by the latter to form a bore, the surfaces of which constrict intimately in engagement with lead 48. As the camming action between tail 43 and surface 47 occurs, the gripping teeth or pawls 45 and 46 will ride over the strands of the conductor 48. They will bite into the same, so that a release of sleeve 43 will be precluded. Thus, in common with the previous forms of structure, a satisfactory detent is included in the connector.

In this connection, it will be noted that in all forms of the invention illustrated, the body of the connector includes a structure whereby a line, such as for example 11, may be secured thereto. The body also includes a recess to receive a second line. A tail portion forms a part of the body and is flexible so that its leading edge may be tucked into or introduced into the recess to wrap around the second line to a greater or lesser extent. So disposed, it will intimately engage that line and force the latter into bearing engagement with the surface of the recess. The tail piece is retained in the form shown in Figs. 2 and 3, incident to the guiding and wedging structure provided. In the form of Figs. 4 and 5, the groove 30 in effect forms a part of the recess. The leading edge of tail piece 28 is introduced into the groove and by deformation of the parts is caused to flex upon itself and thus retain the second line in position. In Fig. 6, a structure similar to Figs. 2 and 3 is present. In addition, a retaining pawl is furnished to be received within a suitable recess 40. In Fig. 7, the pawl teeth provides the desired retaining structure.

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

#### We claim:

1. A connector comprising: a first sleeve section adapted to support a line, a second flexible open sleeve section adapted to retain a second line, said second section having an outer surface, a tail portion and an inner surface, part of said inner surface being defined by a plurality of serrated teeth separated by grooves into which said tail fits when in closed position, said first and second sections being integrally connected, said second section being adapted to receive the second line when in open position and to retain said line when in closed position, said tail portion being retained within one of said grooves and between said teeth in accordance with the diameter of said retained second line.

2. A connector for coupling a pair of electrical lines to each other, said connector including a body, a line, means forming a part of said body to secure such line thereto, said body including a recess, a second line disposed therein, a tail portion forming a part of said body and having a leading edge initially overlying said recess in spaced relationship to an edge defining the latter to an extent such that said second line is introducible into such recess, said tail portion being formed of ductile metal whereby it is flexible to introduce its leading edge into said recess and wrap around said second line with its inner face intimately engaging said second line and forcing the latter into bearing engagement with the surfaces of said recess, means forming a part of said body and tail piece whereby to retain the latter against displacement with respect to the surfaces defining said recess and second line, a pawl extending from the outer surface of said tail piece and a retaining tooth cooperable with said pawl, said tooth forming a part of said body and being disposed adjacent said recess.

3. A connector for coupling a pair of electrical lines to each other, said connector including a body, a line, means forming a part of said body to secure such line thereto, said body including a recess, a second line disposed therein, a tail portion forming a part of said body and having a leading edge initially overlying said recess in spaced relationship to an edge defining the latter to an extent such that said second line is introducible into such recess, said tail portion being formed of ductile metal whereby it is flexible to introduce its leading edge into said recess and wrap around said second line with its inner face intimately engaging said second line and forcing the latter into bearing engagement with the surfaces of said recess, means forming a part of said body and tail piece whereby to retain the latter against displacement with respect to the surfaces defining said recess and second line, a pawl extending from the outer surface of said tail piece and a series of teeth forming a part of said body adjacent said recess to provide a ratchet portion, the individual elements of said portion being engageable with said pawl to retain the latter.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |                |               |
|-----------|----------------|---------------|
| 1,397,040 | Dillon         | Nov. 15, 1921 |
| 1,449,727 | Bowman         | Mar. 27, 1923 |
| 2,707,775 | Hoffman et al. | May 3, 1955   |
| 2,789,279 | Gebel          | Apr. 16, 1957 |

##### OTHER REFERENCES

Publication I—Kearney Squeezon, published by James R. Kearney Corp., St. Louis, Mo. Printed June 1951. Copy in Div. 69, 174-94.1.