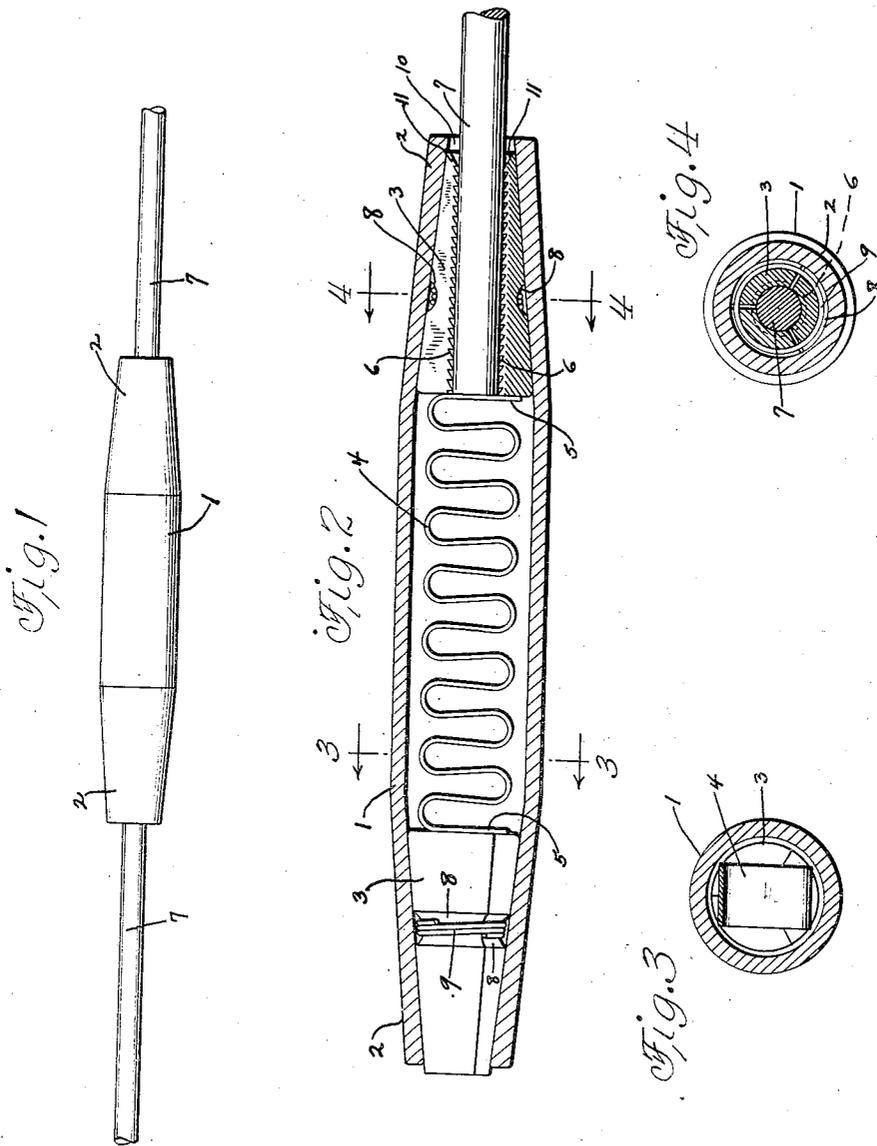


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STRAIGHT LINE CONNECTOR
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STRAIGHT LINE CONNECTER

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4 Claims. (Cl. 24—126)

This invention relates to improvements in straight line connectors.

It is an object of this invention to provide a connector for electrically connecting the ends of a pair of conductors.

A further object is to provide, in a connector comprising a tubular body having open and tapered ends and a set of tapered gripping jaws at each end of the tube engageable with the tapered ends thereof, a spring within the tube having its ends disposed in diametrical relationship to the tube and serving as abutments with which the jaws and the ends of conductors will engage when the conductors are inserted into the connector, thereby defining a limit of relative movement between the conductors and the jaws and subsequently forcing the jaws into engagement with the tapered ends of the tube.

More specifically, it is an object of this invention to provide for the connector, a reversely curved or double-curved, flat spring having its ends terminating in planes extending radially of the connector body, thereby providing abutments for the clamping jaws and the ends of electrical conductors when inserted into the connector.

It is also an object of this invention to provide a straight line connector which is cheap to manufacture, efficient in operation, and easily installed.

In the drawing:

Fig. 1 is a view in side elevation of a connector embodying this invention with a pair of conductors connected thereto.

Fig. 2 is an enlarged view of the device shown in Fig. 1, with the tube sectioned in a longitudinal plane, disclosing the inner mechanism.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Like parts are identified by the same reference characters throughout the several views.

The device illustrated in the drawing comprises a metal tube 1 having its ends open and tapered at 2, a set of jaws 3 at each end of the tube, and a corrugated ribbon-like or reversely curved flat spring member 4 having its ends 5 disposed diametrically or transversely across the tube and engaging the inner ends of the jaws 3. The spring member 4 is expansible longitudinally of the tube 1 and urges the jaws 3 into contact with the adjacent tapered ends 2 of the tube.

The jaws 3 are arranged in sets of three, each of which is arcuately curved and tapered to conform to the inner wall of the adjacent tapered section 2 of the tube 1 and is provided with

arcuately curved gripping teeth 6 for engagement with the bared ends of electrical conductors 7. Registering grooves 8 are provided on the outer peripheral faces of the jaws, thus comprising an annular groove within which a radially contractible coil spring 9 is disposed for the purpose of holding the jaws in proper registry with each other and for holding them in gripping contact with the electrical conductors.

The foregoing description and the drawing disclosed what may be termed a straight line connector comprising a minimum number of elements which co-operate efficiently to hold the gripping jaws 3 in a given clamping arrangement relative to the conductors 7 and which effectively maintain the jaws 3 in engagement with the conductors. For instance, when the conductors 7 are inserted between the jaws, the ends 5 of the spring will prevent the ends of the conductors from moving inwardly of the tube 1 relative to or beyond the plane in which the corresponding ends of the jaws are disposed. This is very desirable, for otherwise the ends of the conductors might, without great exercise of care, be inserted too far into the tube by the manipulator.

When the connector is placed in operation, the electrical conductors will be inserted into the tubular openings at 10, as clearly illustrated in Fig. 2. As the conductors are pushed into the tube, the jaws 3 will be caused to move away from the tapered ends of the tube and also will be forced radially apart by reason of the contact of the ends of the conductors upon the flared portions 11 on the outer ends of the jaws. Continued movement of the conductors 7 longitudinally of the jaws will cause them to contact the ends 5 of the spring 4.

It will be observed from Fig. 2, that further movement of the conductors 7 into the tube after they contact the ends 5 of the spring, will not cause any relative movement between the jaws and the conductors. Upon release of the conductors, the spring will force them and the jaws 3 toward the ends of the tube until the jaws contact the tapered portions thereof.

If the conductors 7 and the tube 1 are then pulled in opposite directions, the jaws 3 will be forced into more intimate contact with the conductors 7 and prevent removal thereof from the tube. As the pulling force is increased, the jaws will automatically more firmly grip the conductors 7 and resist withdrawal of the conductors from the tube. Consequently, nothing less than a force sufficient to break the conductors, will separate them from the connector.

When it is desired to remove the conductor from the connector, specific reference being made to Fig. 2, it is only necessary to push the conductor into the connector to disengage the jaws from the tapered ends of the tube and then to insert a proper tool (not shown) to prevent the jaws from moving toward the tapered ends of the tube when the conductor 7 is being pulled outwardly from the tube.

From the foregoing description, it will be observed that the spring 4 serves not only as an element tending to hold the jaws 3 in contact with the tapered ends 2 of the tube, but also as means for preventing the conductors from being moved beyond the inner ends of the jaws and into the tube to a point where they might interfere with each other when connecting the conductors together.

The connector herein disclosed comprises a minimum number of parts which function to produce a plurality of results not heretofore attainable by a like number of parts. In other words, the elements of the connector have been arranged in a novel combination which produces a plurality of results in a new way.

It is also obvious, from the foregoing disclosure, that the connector is one which may be cheaply manufactured, is efficient in operation, and is readily placed in operation.

I claim:

1. A connector comprising a tubular body member having open tapered ends, two sets of jaws within said member and each engaging an adjacent tapered end, in combination with a spring in said member and between said sets urging said jaws into engagement with said tapered ends, each end of said spring being disposed diametrically across the axis of said member, whereby conductors introduced to said connector will engage the ends of said spring.

2. In a straight line connector, the combination with a tubular member having open tapered ends and a set of gripping jaws within said member conforming to and adjacent each of said ends,

said sets being adapted to receive conductors between the jaws of each set, of a corrugated ribbon-like spring within said tube and held under compression by said jaws, the ribbon-like ends of said spring being disposed transversely across said member and across the path of movement of conductors introduced to said jaws.

3. A connector comprising a tubular body portion having open and tapered ends, a set of jaws within and at each end of said portion, each set being movable longitudinally of said portion and engageable with an adjacent tapered end, each jaw being movable radially of said portion and provided with a gripping surface cooperatively related to a corresponding gripping surface, whereby a conductor may be inserted between the jaws of each set and clampingly engaged thereby, in combination with a flat reversely curved expansible spring disposed between said sets and within said portion and engaged with said sets, thereby to urge said jaws into contact with said tapered ends, the ends of said spring being extended transversely across said portion and across the line of movement of conductors introduced to said portion, whereby to serve as abutments against which the conductors will contact.

4. A connector comprising a tubular body member having open tapered ends, a set of clamping jaws at each end, each conforming to the taper of the adjacent end, said jaws being provided with cooperating gripping surfaces between which a conductor may be inserted, said jaws being movable radially and longitudinally relative to said member, in combination with a reversely curved spring within said member engaged with and held under compression by said jaws, thereby to urge said jaws toward said tapered ends, the ends of said spring being disposed diametrically across said tube to serve as an abutment against which the conductors will contact when inserted into said connector.

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