

Nov. 25, 1947.

C. S. PENFOLD

2,431,583

ELECTRICAL CONNECTION MEANS

Filed Jan. 12, 1942

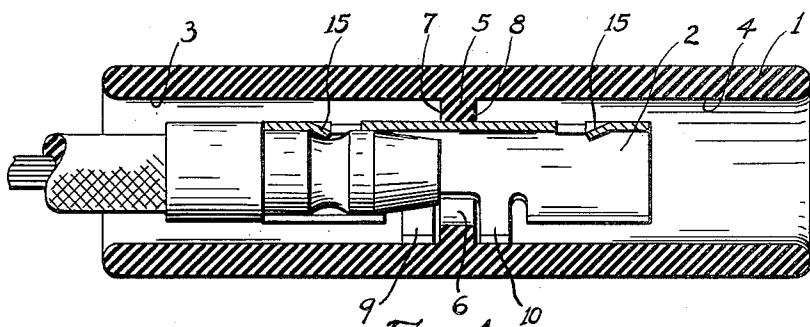


FIG. 1.

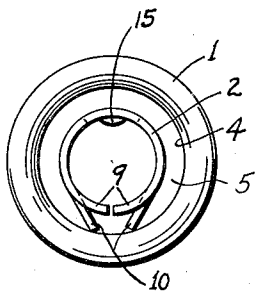


FIG. 2.

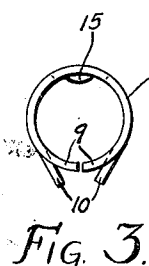


FIG. 3.

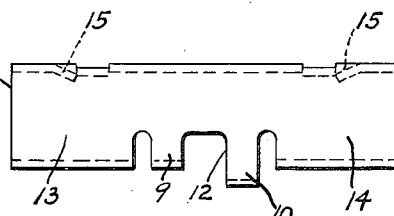


FIG. 4.

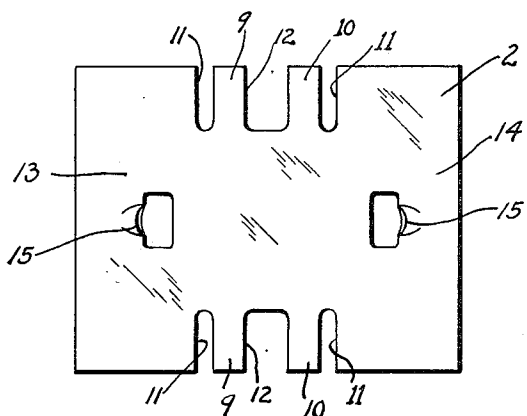


FIG. 5.

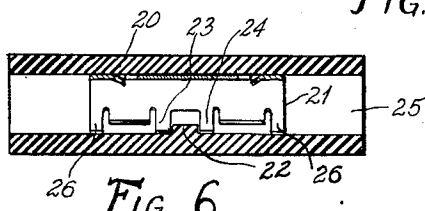


FIG. 6.

INVENTOR.

Charles S. Penfold

UNITED STATES PATENT OFFICE

2,431,583

ELECTRICAL CONNECTION MEANS

Charles S. Penfold, Bronson, Mich., assignor to
H. A. Douglas Mfg. Co., Bronson, Mich., a corporation of Michigan

Application January 12, 1942, Serial No. 426,527

4 Claims. (Cl. 173-328)

1

This invention relates generally to electrical connection means and more particularly has to do with what is known in the trade as a line connector for providing a detachable electrical connection between two or more lines or circuits.

More specifically, the invention is directed to a connector consisting of two generally tubular members, one of which is in the form of a sleeve of insulating material and the other is in the form of a metallic insert or electrical connection means disposed within the sleeve.

One particular object of the invention is to provide improved means for locking the insert within the sleeve.

Another object of the invention is to provide a connector which may be easily and quickly assembled and manufactured economically on a commercial scale.

Other objects and advantages of the invention will be apparent after reading the description hereinafter set forth in conjunction with the drawing annexed hereto.

In the drawing:

Figure 1 is a longitudinal sectional view of the first embodiment of the connector;

Figure 2 is an end view of the connector shown in Figure 1;

Figure 3 is an end view of the insert forming a part of the invention;

Figure 4 is a side view of the insert shown in Figure 3;

Figure 5 is a surface development of the insert used in conjunction with the connector illustrated in Figure 1; and

Figure 6 is a second embodiment of the invention.

Referring to the first embodiment of the invention illustrated in Figures 1 through 5 of the drawing, numeral 1 represents a tubular sleeve of insulating material, preferably more or less rigid in character, and 2 represents a generally tubular metallic insert disposed within the sleeve.

The sleeve 1 may be constructed as desired, but is preferably provided with aligned substantially cylindrical recesses 3 and 4, separated by a rib or partition 5. This partition is preferably made integral with the sleeve and is provided with an annular aperture or hole 6 of a diameter somewhat less than the diameters of the recesses 3 and 4 and forms a passage between the latter. The opposite faces of this partition or bases of the recesses are preferably arranged in parallel relation and transverse to the longitudinal axis of the sleeve whereby to provide a pair of abutments or shoulders 7 and 8.

2

As stated above, one important object of this invention is to provide improved means for locking the insert 2 within the sleeve and this is accomplished by providing the insert with a plurality of resilient or yieldable independently operable holding portions such as 9 and 10 which straddle the partition 5 and more or less engage the abutments 7 and 8.

The insert may be constructed as desired and, as illustrated in Figure 5, is preferably constructed from a square or rectangular piece of rather thin sheet metal resilient stock. Each longitudinally extending marginal edge of the insert is preferably provided with a pair of holding portions, projections, or tongues 9 and 10, and are preferably formed by the relief slots 11 and the interruption or centrally disposed opening 12. It will be evident that the pairs of tongues 9 and 10 are oppositely disposed and project in a direction transverse with respect to the longitudinal axis of the insert, and that the tongues 9 are preferably arranged on one side of the center of the insert and the locking portions 10 on the other side of the center in order to provide a well-balanced construction. When the development in Figure 5 is fashioned as illustrated in Figures 3 and 4 the extremities 13 and 14 of the insert provide means to which conductors may be secured and such means is preferably in the form of split tubular terminal receptacles adapted to receive plug conductors of the character illustrated in Figure 1. A detent such as 15 may be provided in each receptacle for cooperation with the groove in the plug conductor whereby to assist in holding the conductors with respect to the insert. When the insert is fashioned or formed into the desired shape certain of the holding or tongue portions, such as 10, are preferably left extended so that they project outwardly or laterally with respect to the remainder of the insert.

To assemble the insert with respect to the sleeve 1, the extremity or receptacle 13 of the insert is merely inserted into the aperture 6 of the partition 5 via the recess 4 until the portions 10 engage the shoulder or abutment 8, whereupon a suitable tool may be inserted into the other recess 3 in a manner whereby to forcibly press the tongues 9 outwardly with respect to the remainder of the insert to an extent or distance, substantially corresponding to that of the tongue portions 10, to more or less engage the abutment 7 and thus positively lock the insert in place. Due to the fact that the locking portions 9 and 10 are spaced apart longitudinally and the fact that the partition 5 provides a bearing for part of

3

the insert, the plug conductor receptacles 13 and 14 or means to which the conductors may be secured, are arranged in concentric spaced apart relation with respect to the recesses 3 and 4, respectively. More specifically, in this respect, it is to be noted that the locking tongues 9 and 10 project outwardly to an extent substantially equivalent to the radial extent of the partition 5 so that the longitudinal axes of the insert and sleeve, as viewed in Figure 1, coincide.

Referring to the second embodiment of the invention illustrated in Figure 6 of the drawing, the connector includes an insulator 20 and an insert 21. In this embodiment the insulator or sleeve is provided with a lug 22 which is chordal in character and not entirely annular as the partition 5 above referred to. The insert 21 is provided with a plurality of holding portions 23 and 24 which correspond to the tongue portions 9 and 10, above referred to, and these holding portions receive the lug 22 to lock the insert in place. By this arrangement that portion or portions of the insert opposite the portions 23 and 24 will engage a wall of the aperture 25 formed in the insulator 20. More specifically, the insert is engaged substantially throughout its entire length by the wall defining the aperture 25 of the insulator, or to put it another way, the yieldable holding portions 23 and 24 resiliently support the insert and press the insert against a portion of the wall of the aperture, and at the same time maintain another portion or portions of the insert in spaced apart relation to another portion of the aperture wall.

A pair of resilient or yieldable tongue portions or projections 26 more or less corresponding to the yieldable holding portions 23 and 24 preferably provided adjacent each extremity of the insert and acting to resiliently support the insert at its extremities.

In view of the foregoing, it will be evident that a number of improved means have been provided whereby a conducting member or insert may be secured or locked in place and resiliently supported within a sleeve of insulating material.

Having thus described my invention, it is obvious that various modifications may be made in the same without departing from the spirit of the invention; and, therefore, I do not wish to be understood as limiting myself to the exact forms, constructions, arrangements, and combinations of parts herein shown and described. In this connection, it is to be distinctly understood that insofar as this invention is concerned, it is immaterial as to the cross-sectional character of the inserts and sleeves; in other words, they may be triangular or square in cross-section, and the like.

I claim:

1. Electrical connection means including, a tubular insulator having an abutment therein, a conducting member insertable into either end of said insulator disposed in said insulator having means to which a conductor may be secured, spaced apart resilient means provided on said member receiving said abutment for locking said member within the insulator, and resilient means

4

provided adjacent the extremities of the member and adapted to engage the inner wall of said insulator for resiliently supporting said extremities.

2. Electrical connection means including, an insulator provided with a hole having an abutment therein, a conducting member disposed in said hole, said member having means to which a conductor may be secured, and resilient projections provided adjacent the extremities and intermediate the extremities of said member engaging a wall of said hole whereby to resiliently support the member, said projections intermediate said extremities interlocking with said abutment whereby to lock said member within said insulator.

3. Electrical connection means including, an insulator having an opening provided with abutment means therein, an insert disposed in said opening, said insert being provided with means to which a conductor may be secured, longitudinally spaced apart resilient projections provided on said insert adapted to engage a wall of said opening whereby to resiliently support at least one extremity of the insert, and other resilient projections provided on said insert cooperating with said abutment means for locking the insert in place and engaging the wall of said opening for resiliently supporting the central portion of said insert.

4. A circuit continuing member adapted for connection with an insulator, said member being in the form of a generally cylindrical split tube, the extremities of which are adapted to have substantially cylindrical conductors detachably connected thereto, said member having resilient portions intermediate said extremities whereby the portions may be employed to assist in securing the member with respect to said insulator, and said member also having resilient tongues adjacent one extremity which may be employed to resiliently support at least a part of said member with respect to said insulator.

CHARLES S. PENFOLD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,257,317	Wade	Sept. 30, 1941
2,180,923	Del Camp	Nov. 21, 1939
2,158,003	Douglas	May 9, 1939
2,299,787	Beal	Oct. 27, 1942
2,255,553	Funk	Sept. 9, 1941
2,158,004	Douglas	May 9, 1939
1,747,896	Gates	Feb. 18, 1930
2,303,384	Penfold	Dec. 1, 1942
1,875,270	Slade	Aug. 30, 1932
2,291,434	Hollopeter et al.	July 28, 1942
2,318,648	Penfold	May 11, 1943

FOREIGN PATENTS

Number	Country	Date
417,219	Germany	Aug. 8, 1925