July 17, 1928. 1,677,734

L. O. SMITH

CONNECTER

Filed May 11, 1927

Fig. 1.

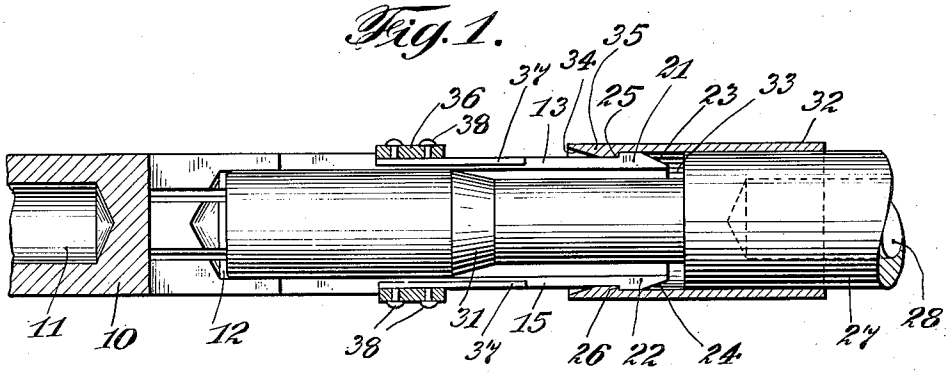


Fig. 2.

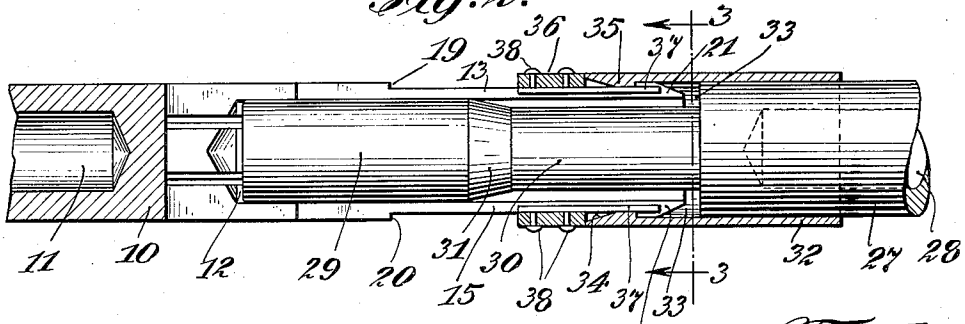


Fig. 3.

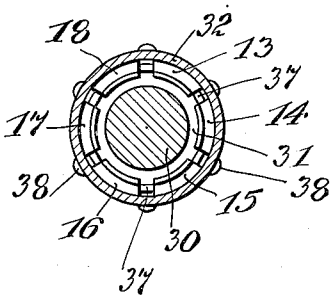


Fig. 4.

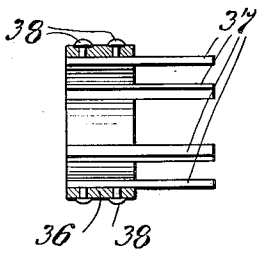
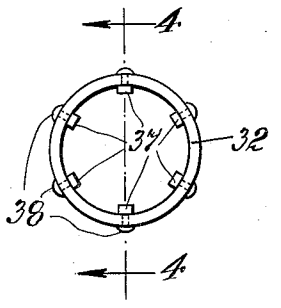


Fig. 5.



INVENTOR
Leo O. Smith
BY
Lancaster
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

LEO O. SMITH, OF BROOKLYN, NEW YORK, ASSIGNOR TO COLUMBIA MACHINE WORKS AND MALLEABLE IRON CO., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

CONNECTER.

Application filed May 11, 1927. Serial No. 190,392.

This invention relates to an improvement in connecters employed in completing electric circuits between terminals in the third rail and motor circuits in electric railways, between the cars of electric railway trains, and in other similar places. The connecter constructed in accordance with the present invention is a modification in and an improvement upon that shown and described in my copending application, Serial No. 170,442, filed February 24, 1927.

Due particularly to the manner in which connecters of this type are employed, it is necessary to make a tight joint between the parts of the connecter and those with which they are associated when in position for use, and heretofore, in connecters of this type it has generally been necessary to bend and to also twist the cables associated with the parts of the connecter in order to properly seat the same in the sockets with which they are commonly employed. This double movement, that is the bending and twisting movement of the cable tends within a short time to cause the wires to crack and eventually to break, so that the object of the invention in the present case is similar to that in the provision of the apparatus as shown in the application aforesaid, in making a connecter the parts of which may be secured in position without the bending and twisting movement being imparted to the cable or cables associated with the parts of the connecter. The improvement in the form of the invention as embodied in this case is the provision of devices for preventing the accidental displacement of the members employed for insuring the proper joint being made between the parts of the connecter, and this feature of the apparatus will be hereinafter more particularly described.

In the drawing Figure 1 is a central longitudinal section and parital elevation of a connecter made in accordance with the present invention illustrating the parts thereof in one position.

Fig. 2 is a similar view showing the parts thereof in another position.

Fig. 3 is a section on line 3—3, Fig. 2.

Fig. 4 is a section of the collar and associated parts employed to prevent the accidental displacement of the members of the connecter when associated with each other for use, and

Fig. 5 is an end view of the parts shown in Fig. 4.

Referring to the drawing the connecter made in accordance with this invention comprises a socket member having a body portion 10 extending into which from one end thereof there is a bore 11. This bore 11 is adapted to receive and have secured therein the bared conductor wires of a cable. Extending into the socket member from the other end thereof there is a bore 12. This end of the socket member is provided with a plurality of longitudinally disposed tongues indicated at 13, 14, 15, 16, 17 and 18. These tongues are provided by longitudinally slotting this tubular end of the socket member. In the outer portion thereof each tongue is provided with a shoulder, for example that in the tongue 13 as indicated at 19 and that in the tongue 15 as indicated at 20, whereby the tongues are each provided with a section of reduced thickness or diameter. Each tongue at its extremity is provided with a lug for example, the lug at the end of the tongue 13 is indicated at 21 and the corresponding lug at the end of the tongue 15 is indicated at 22. The outer extremities of the tongues are preferably tapered. On the outer surface thereof the tapered end of the tongue 13 is designated at 23 and the tapered end of the tongue 15 for example is designated at 24. The thickness or outer diameter of the lugs 21 and 22 is substantially that of that portion of the body of the socket member so that at its inner end each lug provides a shoulder, that formed by the lug 21 being indicated at 25 and the shoulder formed by the lug 22 being indicated at 26.

The connecter also includes a plug member the body of which is indicated at 27. Extending into one end of the body of the plug there is a bore 28. Like the bore 11, this bore 28 is adapted to receive the bared ends of the wires forming a cable which are secured therein in any suitable manner. Extending from the body of the plug there is a head having the outer portion thereof as indicated at 29 of substantially the same diameter as that of the bore 12 in the socket

member. This head includes a section of reduced diameter as indicated at 30 and a conical section 31 intermediate of the outer section 29 and the section of reduced diameter 30. Suitably fitted on the body of this plug member there is a sleeve 32. This sleeve extends appreciably beyond the outer end of the plug member so as to overlie the greater portion of the section 30 and to form therewith an annular space 33. The end of the sleeve is interiorly tapered or beveled as indicated at 34 and provided with an interior rib as indicated at 35, the rib forming a shoulder at the inner end thereof.

In uniting the socket and plug members of this connecter, the section 29 of the head of the plug is inserted between the tongues of the socket and the parts brought together to the position indicated in Fig. 1, in which as will be understood, the tapered ends of the tongues engage the tapered end of the sleeve and in the movement of the parts to place cause the tongues to yield inwardly until the lugs at the ends thereof pass beyond the rib at the end of the sleeve, when as will be understood the ribs being released, snap back to substantially their normal positions so that the shoulders on the outer surfaces of the tongues at the ends thereof engage the shoulder at the inner end of the rib on the sleeve, thereby securely connecting the parts to one another with the section 29 of the head of the plug in place in the bore 12 of the socket.

In order to prevent the accidental separation of the parts of the connecter, I employ devices for insuring the continuous engagement between the extremities of the tongues, that is the lugs thereon and the inner surface of the sleeve. As illustrated, these devices include a collar 36 and a plurality of arms 37 connected thereto by means of rivets 38 or otherwise, and extending appreciably from one side thereof. The collar 36 is adapted to fit on the reduced portions of the tongues as clearly indicated in the drawing and to slide thereon, while the arms 17 are so formed and dimensioned as to lie in the grooves or slots between the tongues thereby normally completing the continuity of the slotted outer end of the socket. When the parts are disconnected the collar and its arms are in the position shown in Figure 1 whereby the extremities of the tongues are free to yield in entering the annular space in the sleeve of the plug. After the parts of the connecter are brought to the position shown in Fig. 1, the collar 36 and its arms 37 are shifted to the position shown in Fig. 2, whereby as will be understood, it is substantially impossible to cause the tongues to yield and to thus become disconnected from the sleeve. When however, it is desired to separate the parts of the connecter, the sleeve and its arms are shifted to the position shown in Fig. 1 and the outer ends of the tongues moved inwardly sufficiently far and by any suitable tool to cause the shoulders on the tongues to clear the shoulder on the rib of the sleeve, making it possible to then withdraw the plug from the socket.

I claim as my invention:

1. In a connecter for electric cables and the like, a socket member having a plurality of spaced longitudinal slots in a cylindrical wall thereof to provide therein a series of spaced tongues, a plug member having a head adapted to fit within the tongues of the socket member, means associated with the plug member for engaging the ends of the tongues to maintain the parts in an associated relationship, a collar fitting over and slidable on the said tongues, and a series of spaced arms connected to and carried by the collar and adapted to fit within the said slots between the tongues, the said collar and arms being shiftable from one position in which the outer ends of the tongues are yieldable to pass into the means for engaging the same on the plug to another position in which the collar and the arms carried thereby prevent any yielding movement of the tongues and thereby prevent the accidental disengagement of the said tongues from the said means.

2. In a connecter for electric cables and the like, a socket member having a plurality of spaced longitudinally disposed slots in a tubular wall thereof to provide therein a corresponding series of spaced tongues, a plug member having a head adapted to fit within the said tongues, a sleeve forming part of the said plug member and adapted to receive and engage the extremities of the said tongues to normally maintain the parts in an associated relationship, a collar fitting on the said tongues, and a plurality of arms carried by the said collar, the said arms being adapted to lie within the said slots and fit between the said tongues, the collar and arms being shiftable from one position in which the ends of the tongues are yieldable inwardly to enter the said sleeve and become engaged therewith, to another position in which the ends of the tongues are prevented from yielding inwardly and thereby from accidentally becoming disengaged from the said sleeve.

3. In a connecter for electric cables and the like, a socket member having a plurality of spaced longitudinal slots in a cylindrical wall thereof to provide therein a series of spaced tongues, a plug member adapted to fit within the tongues of the socket member, means associated with the plug member for engaging the ends of the tongues to maintain the parts in an associated relationship, a member fitting over and movable on the said tongues, and a series of spacer

devices connected to and carried by the said member and adapted to fit within the slots between the said tongues, the said member and spacer devices carried thereby being shiftable from one position in which the tongues are yieldable to pass into the means for engaging the same with the plug to another position in which the said member and spacer devices carried thereby prevent any yielding movement of the tongues and thereby prevent the tongues from becoming accidently disengaged from the said means.

Signed by me this 3rd day of May, 1927.

LEO O. SMITH.