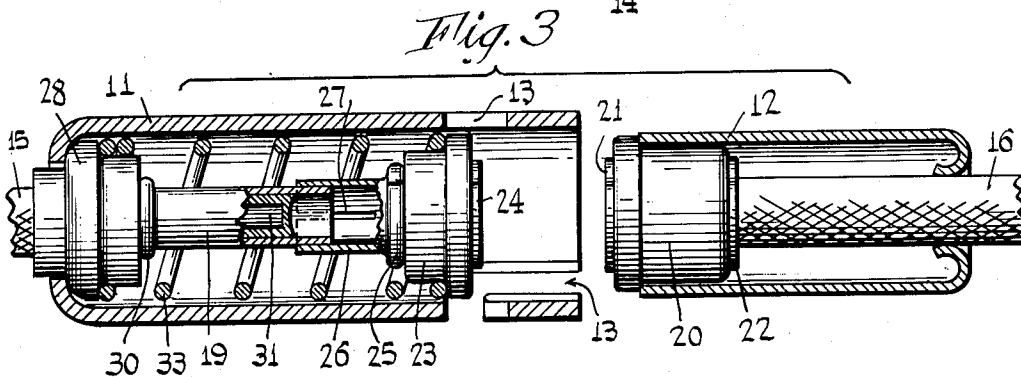
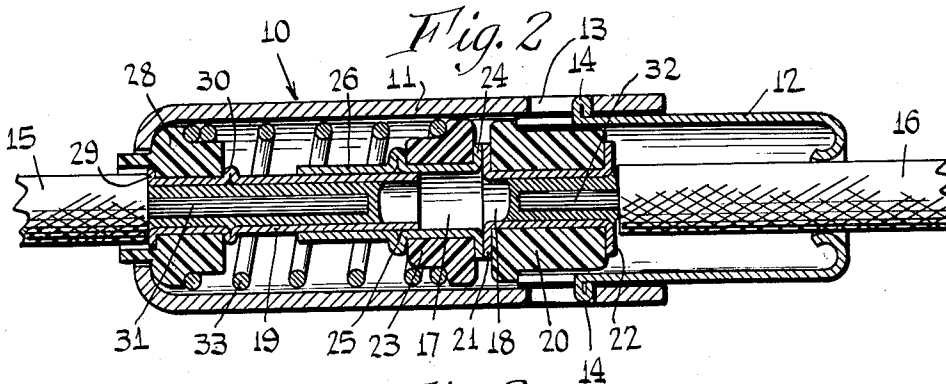
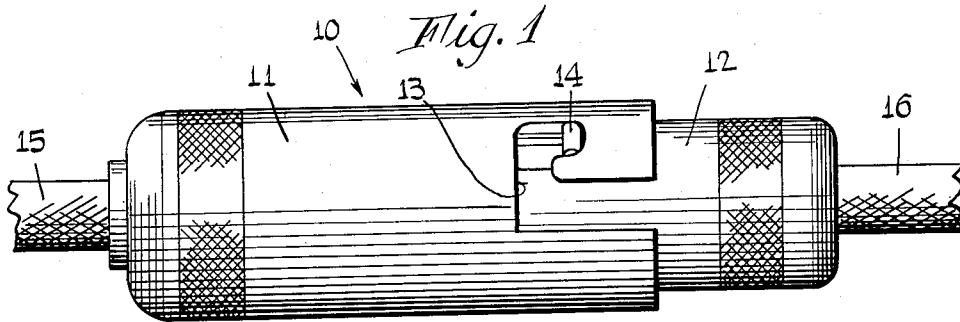


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ELECTRIC WIRE COUPLING
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ELECTRIC WIRE COUPLING

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This invention relates to electrical connectors or couplings, and more particularly to a connector of the type having butting contacts, which is adapted to connect together two ends of an electrical line or wire.

An object of the invention is to provide an improved line connector of the type having butting contacts arranged to prevent separation of the contacts if the line is subjected to a longitudinal pull, which connector is simple in construction with few parts, and economical to fabricate.

Another object of the invention is to provide an improved line connector as above set forth, which is reliable in use, and efficient in conducting the current of the line.

Still another object of the invention is to provide an improved electrical connector in accordance with the above, which is small in size and compact, and may be readily and easily operated to connect or disconnect the lines or wires.

A feature of the invention is the provision of a line coupling or connector as above set forth, which may be readily serviced when necessary, and in which the various parts may be replaced, if and when required, with a minimum of time and trouble.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a side elevational view of the improved coupling or connector of the invention.

Fig. 2 is an axial sectional view of the connector.

Fig. 3 is an axial sectional view, with some of the components shown in elevation, the two main parts of the connector being separated.

Referring to the drawing, the improved electrical connector of this invention comprises a casing 10 which is preferably formed of two drawn shells telescoping each other, an outer shell 11 and an inner shell 12. Fastening means is provided for detachably securing the shells to each other, in the form of bayonet slots 13 and bayonet pins 14 as is usual in connector constructions.

The coupling or connector of this invention is of the type having butting contacts with an arrangement whereby a longitudinal pull on the electrical lines or wires will not separate the contacts. Referring to Fig. 2, the connector joins and electrically connects together the ends of lines or wires 15 and 16, which pass into the respective remote ends of the casing shells 11 and 12.

Within the casing 10 there is provided a pair of abutting contacts 17 and 18, electrically connected respectively to the lines 15 and 16.

In accordance with the present invention an improved and simplified connector construction is provided which is simple, has few parts, is economical to fabricate, reliable in use and efficient in conducting the current passing through the lines 15 and 16. The connector is also small in size and compact, and may be readily operated to connect the lines 15 and 16 or disconnect them from each other.

In accomplishing these objects the abutting contacts 17 and 18 are made tubular, and the contact 17 is made

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to telescope with a member 19 secured to the line 15, whereby the contact 17 is axially movable in the casing 10 while the member 19 and line 15 remain stationary. Thus a very simple structure is involved, in producing the floating contact 17, which structure is not likely to get out of order and may be readily serviced when necessary.

The tubular contact 18 has, extending around it, an insulating bushing 20 which is held in place by outturned end flanges 21 and 22 of the contact, the end flange 21 constituting the abutting contacting surface of the contact 18 and presenting a relatively large contact area.

The tubular contact 17 also carries an insulating bushing 23 and has an outturned end flange 24 which positions the bushing 23 and provides an abutting contact surface engageable with the outturned flange 21 of the contact 18. Relatively large cooperable areas of contact are thereby provided by the outturned flanges 21 and 24 of the contacts 18 and 17.

The tubular contacts 17 has a crimp 25 intermediate its ends, constituting a second outturned flange which securely holds the bushing 23 in the desired position on the contact.

To the left of the crimp 25, as viewed in Fig. 2, the contact 17 has a telescoping portion 26 having longitudinal slots 27 whereby the portion 26 may be biased to continually press against the telescoping member 19 which extends into the portion 26.

The telescoping member 19 is insulatedly mounted in the shell 11, carrying an insulating bushing 28, and said member has an outturned end flange 29 and a crimp 30 by which the bushing 28 is secured in place.

The lines 15 and 16, Fig. 2, have conductors 31 and 32 respectively which extend into the member 19 and the contact 18, said conductors being soldered to these parts as shown and well understood in the art.

For the purpose of yieldably holding the movable contact 17 in engagement with the contact 18 a helical expansion coil spring 33 is provided, extending around the members 19 and 26 and engaging the bushings 23 and 28, and the spring 33 is insulated by the bushings from the telescoping members 19, 26 and the contact 17.

The bushings 20, 23 and 28 all fit within and are positioned by the inner walls of the casing 10 as shown in Figs. 2 and 3, and centralize the contacts 17 and 18 in the casing, insulating them from the shells 11 and 12.

Referring to Fig. 3 it will be observed that when the shells 11 and 12 are disconnected from each other the spring 33 expands, shifting the movable contact 17, bushing 23 and telescoping portion 26 to the right as viewed in the figure, to an extended position. The telescoping members 19 and 26 will remain in engagement with each other, however, and when the shells 11 and 12 are brought together again the spring 33 will be compressed by movement of the contact 17 to the left, and said contact will thereby be securely held in engagement with the contact 18. It will be understood that the action of the spring 33 in holding the contact 17 in engagement with the contact 18 is independent of any longitudinal pull on the lines 15 and 16, by virtue of the telescoping arrangement of the members 19 and 26.

The movable assembly constituted by the contact 17, bushing 23 and telescoping portion 26 may be thought of as a plunger which telescopically engages the member 19, the latter being in the form of a contact stud. The electrical connection between the stud 19 and the contact 17 is established by the sliding engagement between the telescoping members 19 and 26, such engagement being under continual pressure due to the bias of the slotted member 26. The sliding surfaces of the members 19 and 26 may be silver plated, if desired, where low resistivity is important.

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Servicing of the connector of this invention, or replacement of the component parts may be readily effected. The bushing 20 is slidably carried in the shell 12 and may be replaced by merely unsoldering it from the conductor 32 and soldering a new bushing and contact 18 to the conductor. The assembly comprising the telescoping members 19 and 26, the spring 33, the bushings 23 and 28 and the contact 17 is slidable out of the outer shell 11. The spring 33, contact 17, bushing 23 and telescoping portion 26 of the contact are readily removable from the member 19 for replacement without the necessity of tools. Replacement of the bushing 28 and telescoping member 19 is effected by unsoldering the member 19 from the conductor 31 and soldering a new telescoping member and bushing to the conductor. Obviously the shells 11 and 12 may be easily replaced if they should become damaged or otherwise rendered inoperative.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. An electric connector for detachably connecting together two electric lines, comprising a tubular casing having an inwardly-extended shoulder adjacent one end; a pair of contacts in the casing, having abutting engagement with each other; means mounting one contact on the casing for movement toward and away from the other contact including a pair of telescoping metal members in the casing, slidable one on the other, said one contact being rigidly secured and electrically connected to one of the telescoping members and the other telescoping member being loosely carried in and engaging the shoulder of the casing, said shoulder preventing pull-out of said other member; resilient means normally holding said one contact in abutting engagement with the other contact, said means normally retaining said other telescoping member and shoulder in engagement and means electrically connecting the ends of the lines respectively to said other contact and to said other telescoping member.

2. The invention as defined in claim 1 in which the casing comprises a pair of telescoping shells having means for detachably securing the shells to each other, one shell carrying said telescoping members and one contact, and the other shell carrying said other contact.

3. The invention as defined in claim 1 in which the said one of the telescoping members and the said one contact are tubular, and integral, said one member having a longitudinal slot and being biased to cause the portions thereof adjacent the slot to continually press against the other member.

4. The invention as defined in claim 3 in which the said other telescoping member is tubular and has one line end extending into and secured to it, and in which the slotted telescoping member extends around the outside of said other telescoping member.

5. An electric connector for detachably connecting together two electric lines, comprising a casing; a pair of contacts in the casing, having abutting engagement with each other; means mounting one contact on the casing for movement toward and away from the other contact including a pair of telescoping metal members in the casing, slidable one on the other, said one contact being rigidly secured and electrically connected to one of the telescoping members and the other telescoping member being normally stationary in the casing; resilient means normally holding said one contact in abutting engagement with the other contact; and means

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electrically connecting the ends of the lines respectively to said other contact and to said other telescoping member, said telescoping members having insulating bushings extending around them and secured to end portions of the members, and said resilient means comprising an expansion coil spring disposed around the members and at its ends engaging the said bushings.

6. An electric connector for detachably connecting together two electric lines, comprising a casing; a pair of contacts in the casing, having abutting engagement with each other; means mounting one contact on the casing for movement toward and away from the other contact including a pair of telescoping metal members in the casing, slidable one on the other, said one contact being rigidly secured and electrically connected to one of the telescoping members and the other telescoping member being normally stationary in the casing; resilient means normally holding said one contact in abutting engagement with the other contact; means electrically connecting the ends of the lines respectively to said other contact and to said other telescoping member, said contacts comprising tubular parts provided with outturned end flanges which have the said abutting engagement; and insulating bushings extending around the tubular parts and disposed against the said end flanges and engaging the casing, said tubular parts having other outturned flanges holding the bushings in position against the said end flanges.

7. The invention as defined in claim 6 in which the said one telescoping member is tubular and connected with the said other outturned flange of the one tubular contact part.

8. An electric connector for detachably connecting together two electric lines, comprising a casing; a pair of contacts in the casing having abutting engagement with each other; means mounting one contact on the casing for movement toward and away from the other contact, including a pair of telescoping metal members in the casing, slidable one on the other, said one contact being rigidly secured and electrically connected to one of the telescoping members and the other telescoping members being normally stationary in the casing; resilient means normally holding said one contact in said abutting engagement with the other contact; means electrically connecting the ends of the lines respectively to said other contact and to said other telescoping member, said contacts comprising tubular parts provided with outturned end flanges which have the said abutting engagement; insulating bushings extending around the said contacts, disposed against the end flanges thereof and engaging the casing, said tubular parts having other outturned flanges holding the bushings in position against the said end flanges and the said one telescoping member being tubular and integral with the said one tubular contact part; and an insulating bushing extending around the said other telescoping member, said casing being tubular and the inside walls thereof engaging and positioning all of said bushings.

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