

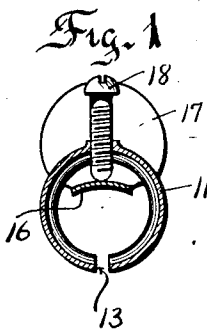
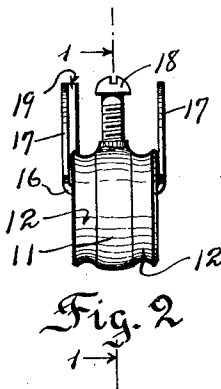
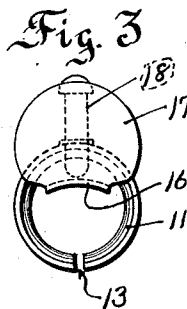
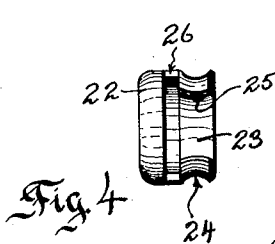
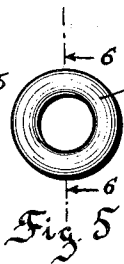
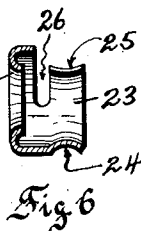
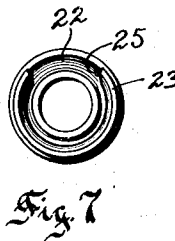
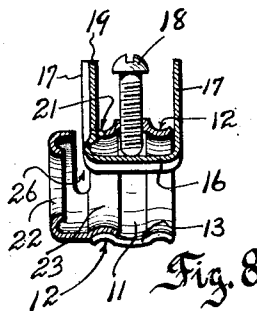
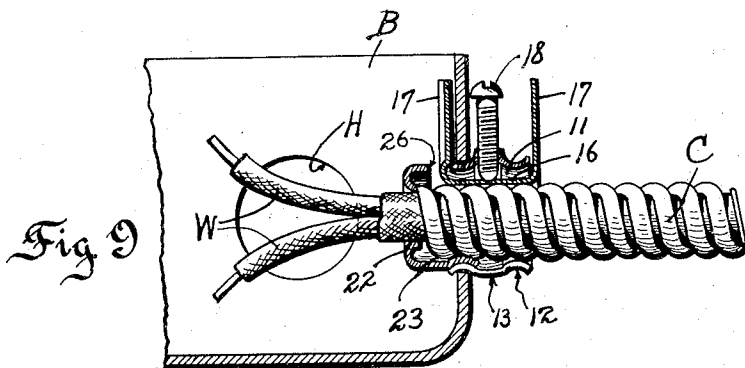
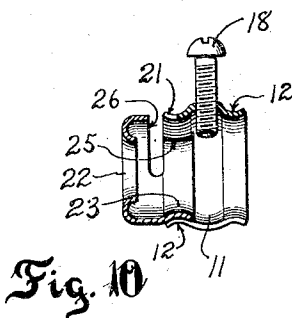
Jan 6, 1931.

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1,787,668

CABLE CONNECTER

Filed Dec. 27, 1926



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CABLE CONNECTER

Application filed December 27, 1926. Serial No. 157,012.

This invention relates to cable connectors and to bushings therefor. More particularly the invention relates to connectors and bushings capable of universally anchoring
5 all sizes, shapes and kinds of cable to electric outlet and fixtures boxes, i. e. it relates to adapter connectors. Especially the invention relates to improvements in bushings for use in connection with adapter cable connectors when the connector is to be used with
10 armored cable.

Broadly, an object of the invention is to produce a quick detachable bushing whether for connectors of the adapter type or of the
15 usual kind to thereby convert a connector for use with unarmored cable to one for use with armored cable or vice versa.

Another object of the invention is to produce a bushing of low cost and which is capable of being quickly and easily attached to
20 or detached from a cable connector so the bushing may be used if working with metal armored cable or not used if working with unarmored cable as the case may be, whether
25 the connector is of the adapter type or is of the ordinary type.

Accordingly, a bushing is so constructed and arranged as to be snapped onto a cable connector to act as a stop for the ragged
30 sharp edge of a metal armored cable as well as to guide the wires and protect their insulation from abrasion by the sharp cable end. More particularly, a full fashioned unmutilated bushing is carried with an expansible
35 sleeve complementary to the interior surface of a sleeve type connector member, and is adapted to be snapped onto a connector or within a sleeve type connector when metal armored cable is to be bushed and attached to
40 the box.

A further object is to produce a bushing to work with an adapter type connector of the kind including a cable clamp which may
45 or may not have shutters to close the ends of the sleeve or to close a box hole, or to work with a connector having only an operating member, such as a screw, to clamp the cable. The bushing may be readily inserted within
50 the connector member and clamped there-

within by spring snap means and by the cable secured to the connector.

The invention also seeks to provide a removable snap-in bushing which may be readily fashioned from a single piece stamping
55 and which is capable of being readily contracted with minimum effort for insertion in a sleeve. Accordingly a bushing ring is made with a contractible snap-in sleeve formed with the bushing ring for a portion of its
60 circumference but separated therefrom for another portion of its circumference by a circumferentially extending sleeve weakening slot. That portion of the sleeve separated
65 from the ring may be split longitudinally to permit easy contraction thereof and the edges of the split spaced apart where necessary, to permit up and down movement of a cable clamping member, say an adapter part
70 where said adapter is employed.

A still further object of the invention is to produce a cable connector including a cable clamp plate having means to guide the movement of the clamp plate in relation to
75 and in or on the connector member to maintain the necessary working relation or alignment between the clamp plate and operating means without obstruction by the detachable bushing. To this end a shutter, or ear on the cable clamp plate or a rib thereon, is adapted
80 to be guided by a notch in the connector member and to reciprocate freely in the weakening groove and/or a cut away portion of the snap sleeve of the bushing.

These and other objects of the invention
85 and the means for their attainment will be more apparent from the following description of the accompanying drawing illustrating embodiments and examples of the invention, in which:
90

The first three figures show a type of adapter connector which readily combines and works with the snap-on bushing constituting this invention.

Figure 1 is a transverse sectional view on the line 1—1 of Figure 2; Figure 2 is a side elevation; and Figure 3 is an end elevation of the adapter connector.

Figures 4 to 7 inclusive show the snap-on
95 100

bushing which I have invented for use in connection with the adapter connector.

Figure 4 is a top view of the improved detachable bushing; Figure 5 is a view of the inner end, i. e. the bushing end; Figure 6 is a lengthwise section; and Figure 7 an outer end view, i. e. a view of the sleeve end of the bushing.

Figure 8 is a longitudinal sectional view of the adapter cable connector with the bushing assembled or snapped therein.

Figure 9 is a box assembly view in longitudinal section showing the adapter connector, with bushing attached, mounted in an electric outlet box with an armored cable secured therein.

Figure 10 is a view similar to Figure 8 but with the adapter clamp omitted to show the application of the invention, i. e. the bushing, to an ordinary non-adapter connector.

Electric outlet boxes B are manufactured with knock out openings or holes H to receive either soft or armored cable, i. e. metal armored or unarmored cable, anchored therein by cable connectors and the insulation covered wires W are manipulated inside the box B to make electrical connections in the usual way. My improved bushing is more particularly for use on metal armored cable C, but where soft cable such as fiber armored cable is to be attached to the box, this bushing may be cast aside and not used if that is desired.

A cable connector to which the improved bushing may be applied is illustrated in Figures 1, 2 and 3 as comprising a connector member 11, usually a sleeve formed from a resilient metal plate or stamping, which is rolled into cylindrical shape, with box hole anchorage means such as a groove or grooves 12 proximate one or both ends. Opposite edges of the stamping come together to form a longitudinal split 13 which permits the connector member 11 to be contracted, that is, its circumference reduced, for insertion within the box hole H. The box hole edge is engaged upon expansion of the connector member 11 within one of the grooves 12 to effect anchorage of the connector member 11 in a box hole. While a sleeve type connector member 11 is shown, other forms of construction may be used upon which to mount and carry the movable parts of the connector.

The connector member 11 is adapted to receive a cable C, either an armored or a soft cable. Frequently, it is necessary to secure small size cable C in a standard size box hole H and the open space through the connector sleeve leading into the box not occupied by the cable, requires box hole or sleeve closing means to prevent the entrance of dirt and plaster into the outlet box.

Within or upon the connector member 11 there is mounted an adapter element com-

prising a cable clamp plate 16 formed from a plate or stamping whereof the respective ends 17 may be substantially circular to form closing shutters at one or both ends of the sleeve. Furthermore the shutters 17 and 19 close the box hole which is important. These shutter ends 17 are bent upwardly, are parallel, and serve as positioning or guiding means as well, whereby the adapter element 16—17 may be moved laterally or radially in respect to the connector axis and in respect to the axis of cable C and in respect to clamp operating means such as a screw 18 threaded through a hole formed in the connector member 11 to force the cable clamp plate 16 against the cable C to clamp it in the connector and thereby cause the expansion of the connector sleeve 11 within the box hole H to anchor both the connector and cable therein.

The shutter ends 17 may also serve as positioning means for the clamp plate 16 to prevent axial or rotary displacement and as guiding means therefor as it is moved toward or away from the cable C by the screw 18. To retain the cable clamp plate 16 in alignment with the operating means or screw 18 and to prevent rotation of the adapter 16—17 in the sleeve 11 about the axis of the cable C, clamp plate guide means are provided between the clamp plate 16 and the connector member 11. For this purpose there is formed a rib 19 on one surface of a shutter 17 to slidably engage within a notch 21 formed in the sleeve 11, the rib and notch being preferably disposed in the same longitudinal plane in which the screw 18 operates. This rib and notch means is a mere example of instrumentalities to prevent rotation of the sleeve 11 in relation to the clamp plate 16.

It is necessary in some instances to attach metal armored cable to the box B, while, in other instances, fibre covered or what may be termed soft cable must be secured to the box. To prevent the sharp jagged armored cable end from projecting into the outlet box and to also protect the insulation covered wires from cuts or abrasions thereby, the invention seeks, in one of its aspects, to provide a quick detachable bushing which may or may not be used, with the connector as circumstances demand. In other words, the mechanic on the job is provided with one standard form of connector 11 which may be used with all varieties of cable, and is provided with a bushing 22 which may be detached if soft cable is to be installed in the box B. An example of the improved conveniently detachable bushing is separately shown in Figures 4 through 7. The bushing comprises a solid full fashioned unbroken ring bushed portion or annulus 22 thru which wires W are led into the box B, and having formed on the periphery thereof a snap-in means, such as

a sleeve 23. The bushing end or sleeve 23 is grooved as at 24 to conform to the interior surface of the connector sleeve 11 in the area including one of the box hole anchorage grooves 12. The snap sleeve 23, which is generally cylindrical, is cut away at one portion thereof as at 25, to form a wide open notch and permit contraction of the sleeve 23 for insertion thereof within the connector sleeve 11 and to permit radial free movement of the clamp plate 16 with the connector member 11, and the opening 25 in the bushing sleeve is wide enough to permit passage of the clamp plate 16 therethru. As a weakening means, to permit ready contraction of the snap-in sleeve 23, a circumferentially extending slot 26 partly separates the snap-in sleeve 23 from the bushing end 22.

The snap-in bushing sleeve 23 may be contracted and inserted within the end of the sleeve 11 until the groove portion 24 snaps onto the inner face of the anchorage groove 12, since the sleeve 23 is split as at 25 and 26 to permit sleeve contraction. When the sleeve 23 is released on entering the connector member 11 it expands causing the cooperating grooved surface 24 and the convex inner surface formed by the groove 24 in sleeve 22 to interengage and retain the connector 11 and bushing 22 together.

After the cable C is inserted and the screw 18 run down against the cable C or against the clamp plate 16, the snap-in sleeve 23 is firmly clamped against the connector sleeve 11 and firmly retained in place both by the interengaging grooves 12 and 24 and by the pressure of the cable inside the connector and the bushing is permanently anchored to the inner end of the connector inside the box to protect and guide the wires W and stop the cable C thereagainst.

Figure 10 illustrates a cable connector 11 combined with a snap-in bushing in which the adapter element is omitted. In this connector, the sleeve 11 receives the grooved expansible snap-in sleeve 23 in the manner previously described and the bushing 22 carried by the sleeve 23 serves as a stop for cable within sleeve 11 which cable is clamped against the connector sleeve 11 and snap-in sleeve 23 by the operating screw 18, as will be understood. The connector in Figure 10 is the same construction as in all the other connector views and is merely presented to show how the mechanic on the job may bend one of the shutters down and remove the adapter element 16—19 out of the sleeve thru the slot 13 if it is found that, in any particular job, the adapter is not wanted. For very large cable this may sometimes be necessary.

It is seen how I have produced a small size bushing of short length and small size which can be used with a connector 11 having a large size shutter plate 17. The bushing sleeve 23 is adequate to hold the bushing 22—23 in

the sleeve 11. The bushing will fit either end of the connector sleeve 11 when the anchorage means 12 is the same for both ends, since the bushing sleeve opening, slit or cut-away portion 25, will readily fit over either shutter plate 17.

Various modifications in the configuration of the cooperating connector parts and bushing will occur to those skilled in the art and in their use individually and collectively without departing from the spirit of the principle of the invention.

What I claim is:

1. A connector including box hole edge anchorage means at each end thereof, and comprising, a connector member, operating means carried therewith; and a detachable connector bushing including, a bushing ring, a sleeve carried with the ring, means formed on the sleeve on the ring to permit contraction and expansion thereof in relation to the ring, and means included on the sleeve to engage the anchorage means at either end of the connector member inside thereof.

2. A connector comprising, a longitudinally split expansible connector sleeve provided with a box hole anchorage groove, operating means to engage a cable, and a separable bushing to be carried with the connector, provided with a sleeve longitudinally split to permit contraction and expansion, and said split bushing sleeve being provided with a circumferential groove to engage the anchorage groove of the connector sleeve.

3. A connector comprising a longitudinally split expansible connector sleeve formed with a box hole anchorage groove, operating means to engage a cable, and a separable bushing provided with a longitudinally split snap sleeve partly separated from the bushing whereof the edges of the split are spaced to permit expansion and contraction, and said split bushing sleeve being provided with a circumferential groove to engage the anchorage groove of the connector sleeve.

4. A connector comprising a longitudinally split expansible connector sleeve having box hole anchorage means, a movable cable clamp plate carried with the connector, an operating screw to engage the cable clamp plate, and a separable bushing having a longitudinally split snap sleeve spaced by a peripheral slot from the bushing, and whereof the edges of the split are spaced apart for the passage of the cable clamp plate.

5. A connector comprising a longitudinally split expansible connector sleeve formed with a box hole anchorage groove, a cable clamp plate carried with the connector and formed with a shutter at each end to close the sleeve, an operating screw to engage the cable clamp plate and a separable bushing having a longitudinally split snap sleeve, said snap sleeve being partly spaced from the

bushing by a peripherally extending slot in which a shutter operates.

6. A connector comprising a longitudinally split expansible connector sleeve formed with a box hole anchorage groove, a cable clamp plate carried with the connector and formed with guide means to engage the sleeve, operating means for the cable clamp plate, and a separable bushing having a longitudinally split snap sleeve whereof the edges of the split are spaced apart to permit expansion and contraction and for the passage of guide means.

7. A separable bushing for electrical wiring connectors comprising, a rigid annulus to bush a cable, and a longitudinally split expansible sleeve carried with the rigid annulus.

8. A separable bushing for connectors comprising, an annulus to bush a cable, and a longitudinally split expansible sleeve carried with the annulus and partly spaced therefrom by a circumferentially extending slot.

9. A connector bushing comprising; an apertured ring thru which wires pass including, a sleeve integral with the ring, a peripheral slot in part separating the sleeve from the apertured ring, a slit connecting with the peripheral slot and extending thru the sleeve to the other end thereof, and means carried with the sleeve to detachably engage a connector.

10. A connector bushing comprising; an apertured ring thru which wires pass including, a sleeve integral with the ring, a peripheral slot in part separating the sleeve from the apertured ring, a slit connecting with the peripheral slot and extending thru the sleeve to the other end thereof, and said sleeve provided with a peripheral groove to detachably engage a like groove in a connector.

In testimony whereof I affix my signature.

LEWIS H. CHURCH.