July 30, 1940. E. M. DEEMS 2,209,912

BOOTLEG

Filed Nov. 11, 1936 2 Sheets-Sheet 1

Fig. 1.

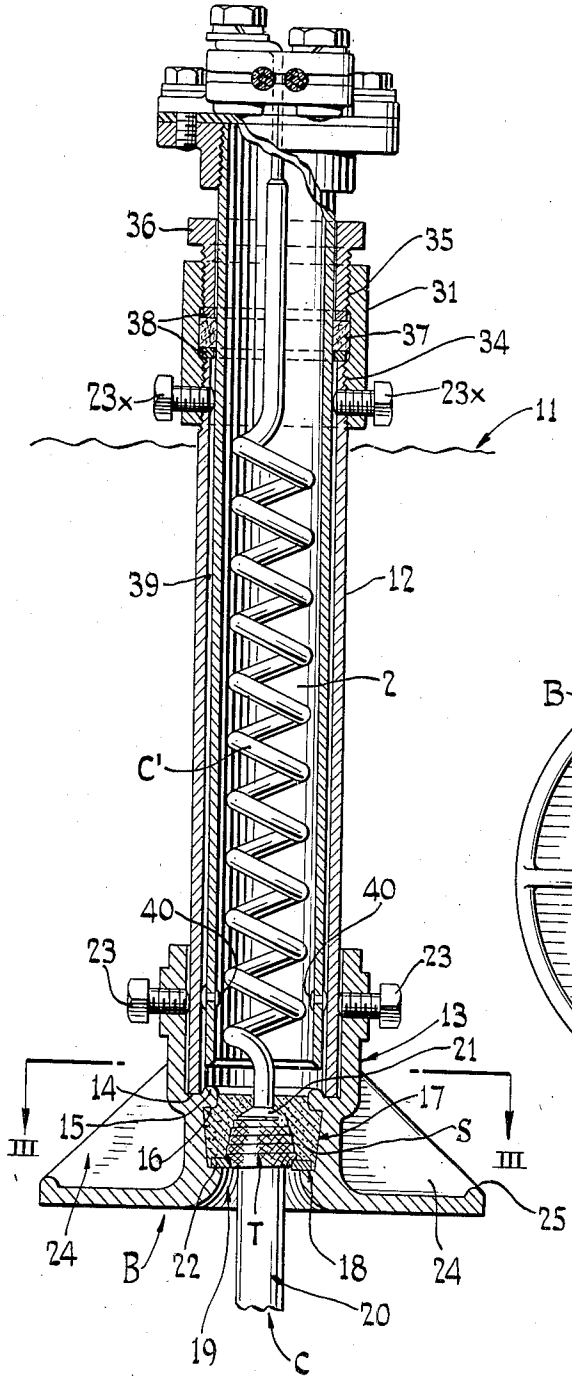


Fig. 2.

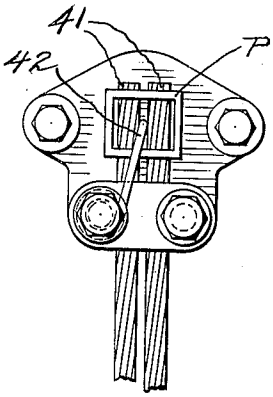
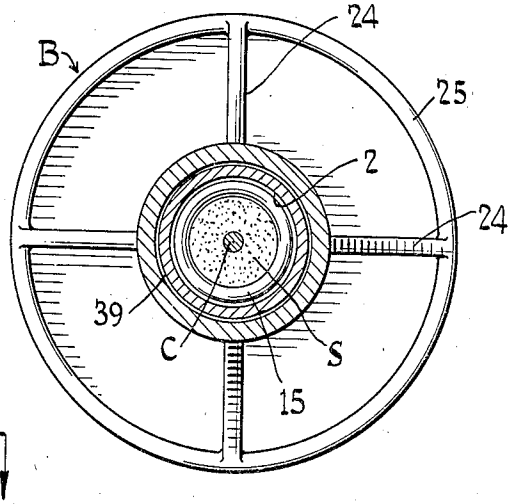


Fig. 3.



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Fig. 4.

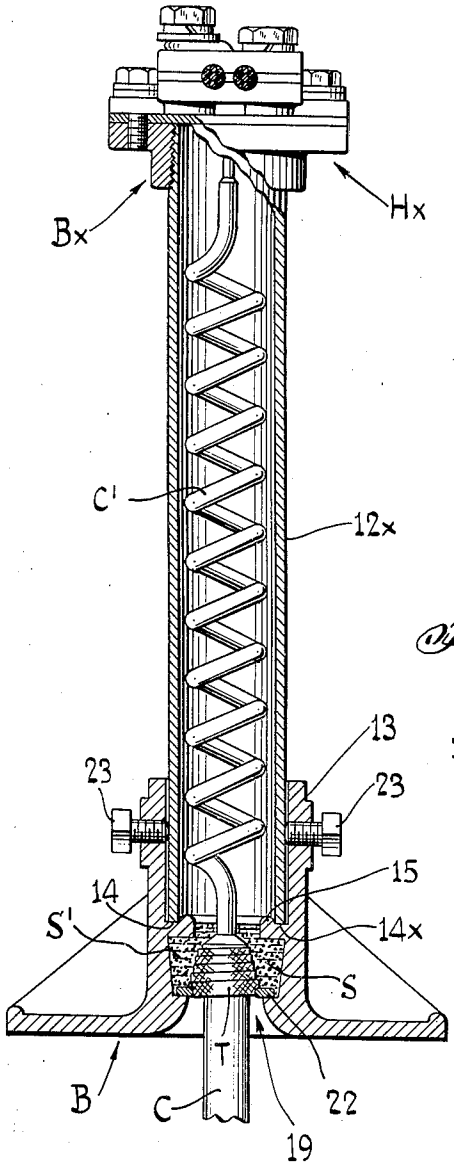


Fig. 6.

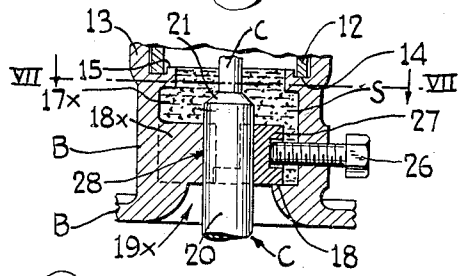


Fig. 5.

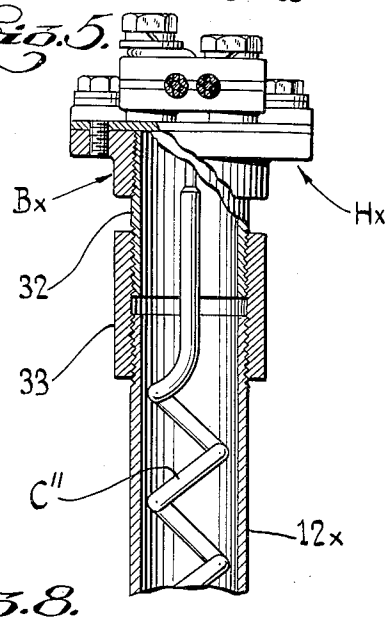


Fig. 8.

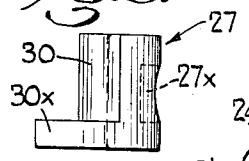
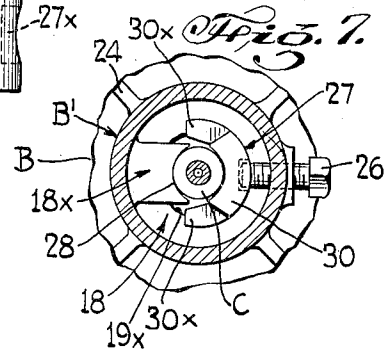


Fig. 7.



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UNITED STATES PATENT OFFICE

2,209,912

BOOTLEG

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Application November 11, 1936, Serial No. 110,265

9 Claims. (Cl. 174—75)

This invention relates to a protective conduit member for an electrical cable, especially to such a device for use in an electrical signalling system, and more particularly to a parkway bootleg, by which the bared end of an armored electrical cable is protected when brought to the surface of the ground for connection with an electrical bonding device running therefrom to the track rails.

It is a known practice to bury in the parkway an upright metal tube having fixed upon its lower end a base-collar, flange or anchor, and to dispose within such a bootleg riser tube an insulated cable end, which extends upward throughout the length of the tube, having its upper end bared for the rail connection. Such a bootleg is exemplified in the patent to Lavarack et al., No. 1,665,629, which illustrates also provision for sealing the conductor in the upper end of the conduit by means of a suitable plastic composition.

While the nature of the seal and its distance from the upper end or mouth of the bootleg tube may vary somewhat, it has been the invariable practice, so far as known to the present applicant, to form the seal at least in the upper region of the bootleg tube, and usually directly at the top thereof, or very near it, for the purpose of aiding to exclude vagrant water or moisture from gaining access to the tube, with deteriment to the insulation of the conductor therein enclosed.

Whenever a sealing compound is used to make the seal, the latter is applied, without variation, so far as known to this applicant, in a position designed to surround the cable end at the region where the usual protective soft metal covering or sheath, such as lead, is trimmed away from the insulated conductor, and the underground end of the bootleg, at its base, is left without protection by the sealing composition, although the use of loose sand has been suggested as an expedient to prevent moisture from seeping into the cable structure, with not altogether satisfactory results, on account of the hygroscopic character of the sand.

It has thus become the accepted theory, though without adequate basis in fact, and evidently upon a mistaken assumption, that the termination of the lead sheath, with its concomitant seal, must not be placed at a relatively low region of the bootleg. However, as the result of many years' experience and research by the present applicant, covering wide areas in the field of designing and installing railway signalling system, it has recently been discovered by applicant that unexpected and unobvious advantages can be secured by a complete reversal of the existing practice above recited.

According to the present invention, the armored cable is relieved of its protecting sheath of lead at or near the bottom of the bootleg riser tube, and a high grade seal of suitable plastic compound is there formed, the free end or portion of the insulated conductor being carried upward through the unobstructed section of the bootleg thus available to the above-ground mouth thereof, where any suitable form of terminal-carrying head may be fitted upon the upper end of the bootleg, providing for a good electrical connection with a bonding cable, for any purpose that the bootleg device as a whole is intended to accomplish.

Under such conditions it is an object of the present invention to provide a compact, sturdy and effectively sealed bootleg of the class described, in which the seal is formed at the base thereof, in a member or anchor of novel structure, devised particularly to contain, support and protect such a composition seal, and also to provide means for seating the lower end of a bootleg riser tube solidly, without interfering with the seal; and to accomplish the foregoing objects by forming the base of the bootleg with its sealing arrangements, as an entity complete in itself, so that the bootleg tube can be removed while the base and seal remain in place, the seal and bootleg tube being wholly without contact with each other.

Another object of the invention is to provide for disposing within the bootleg tube a stretch of coiled, insulated conductor which can be of unusual length by reason of the disposition of the seal at the bottom of the bootleg, leaving the tube free to receive this reserve coiled stretch of cable and, and thus the invention provides for ready extension in length of the bootleg in any suitable manner, without the need for making new electrical connections at the time of such extension, or for disturbing the seal in any way. The necessity for such extension may supervene, for example, when additional ballast is to be applied to the right of way, and it is desirable to raise the head of the bootleg to surmount the extra piled material.

In pursuance of this object of the invention, a particular object is to provide in several ways for the ready extension in length of the bootleg tube structure, and as a now-preferred form of such provision to construct the bootleg tube with

plural telescoping sections, having means to assure their maintenance in assembled relation; also to provide means for their ready securement in selected adjustive positions; and further to provide for the ready movement lengthwise of the upper section to vary the effective length of the bootleg structure without disturbing the seated position of the lower section in the base, and without disturbing the seal.

Still another object is to provide for the addition to a base-and-riser bootleg structure, which may be of a standard construction in general, including its length, of an auxiliary or supplemental tubular extension of any desired and suitable length; also to provide for securing this extension in place by means of a known type of sleeve coupling which will interfit with abutting threaded ends of both sections of the bootleg; and to provide a bootleg head which will screw upon the upper end of a single bootleg tube, or with equal facility upon the upper end of any extension thereof.

Another object is to provide facilities for completing an electrical connection of unusually high conductivity between the bared adjacent ends of the bonding cables and of the cable conductor, when brought into juxtaposition with each other, by means of a small solder pot formed as a unitary part of the bootleg head, in readily accessible position, upon its exposed face.

Other objects and advantages of the invention will be made to appear as the description of the particular physical embodiment selected to illustrate the invention progresses.

In the accompanying drawings, like characters of reference have been applied to corresponding parts throughout the several views of the drawings, in which:

Figure 1 is a view in vertical sectional elevation of a parkway bootleg in the telescopic construction of which the present invention has been embodied; Fig. 2 is a fragmentary, detail view in plan of the bootleg head-member, with the electrical connections completed as in use, the bonding cables being shown only in part, and no rail structure being illustrated; Fig. 3 is a fragmentary detail view in horizontal section on the line 3—3 of Fig. 1, the arrows at the ends of the line indicating the direction in which the view is taken; Fig. 4 is a view in vertical sectional elevation, similar to Fig. 1, but with a single bootleg riser tube, in place of the telescopic assembly shown in Fig. 1; Fig. 5 is a fragmentary detail view in vertical sectional elevation of an extended bootleg tube embodying a modified form of the invention; Fig. 6 is a fragmentary detail view in vertical section of a modified form of seal and its supporting parts; Fig. 7 is a view in horizontal section on the line VII—VII of Fig. 6; Fig. 8 is a detail view of a clamping part of the structure of Figs. 6 and 7, shown separately.

In a now-preferred embodiment of the invention, referring to Fig. 1, the ground line is designated by the reference character 11, and below this ground line extends, for a desired distance, the parkway bootleg tube 12, preferably a section of standard iron or steel pipe.

In pursuance of the present invention, the bootleg comprises a base element B of novel structure and improved mode of operation, which differs from the conventional base-flange (usually screwed permanently upon the lower end of a bootleg tube), in that the base herein disclosed forms an element having an entity separate from that of the riser 12 and which performs a double purpose, to be now described in detail.

In the first place, the base B is formed with a hollow boss 13, of ample diameter to receive any of a series of riser tubes 12, of which only two are shown, but which may be of selected and suitable length, and need have at their lower ends no finish other than an evenly and squarely cut end, as shown in Fig. 1 at 14, and in Fig. 4 at 14*x*.

This lower end is seated in a groove defined interiorly by a rib 15 upon a shoulder which overhangs a cavity 17 designed to receive a generous mass of sealing compound of known or suitable composition, designated S, which has for its lower support another annular shoulder 18. The latter shoulder surrounds an orifice 19, flaring in shape preferably, as shown, through which the parkway cable enters the bootleg, having its lead sheath 20 trimmed away at 21 in usual fashion, but at a novel region, inasmuch as this terminus of the lead sheath is disposed within the base B and therefore constitutes a wholly novel and distinctive provision or feature of the present invention, regardless of other structural novelties of the present invention, but coordinated therewith, as will be clear from the following disclosure.

This part of the cable C is preferably wrapped with tape, as indicated at T, to constitute an enlargement of the cable at this point, so that this turban-like enlargement can cooperate with a washer 22 of annular form which rests upon the ledge 18 and serves in its turn to prevent casual withdrawal or unintended displacement of the cable C. The whole contour of this intra-base joint with the cable is novel, and it is very conformable to freedom of approach by the cable to the bootleg at the time of their installation in assembled relation, for the flaring entrance aids to avoid destructive bending. This base accordingly is the subject of generic claims in the present application.

It may desirably be provided with various facilities for its connection with the other elements of the bootleg structure, including a set of set-screws 23 by which the bootleg tube may be secured in place after its lower end 14 has been seated snugly in the manner already described; and the webs 24 and peripheral rib 25 aid to constitute this base a very sturdy anchor element.

Under many conditions of service, it is found that the major strain between the bootleg and a lead-sheathed cable or conductor entering it from the parkway is encountered within the base B, and in order that the integrity of the seal S may not be impaired by such strain, provision has been made in the present invention of a mechanical means adapted to relieve the seal from the burden of supporting the cable C and holding it in place.

The preferred form of means for this purpose is illustrated in Figs. 6, 7 and 8, taking the form of a movable clamping device 27 which cooperates with an abutment 18*x* forming part of the shoulder 18 to which reference has been already made as constituting the support for the lower boundary of the seal S.

The face 28 of the abutment 18*x* is curved in general conformity with the periphery of the cable C, and the clamping member 27 is of generally crescent shape, (see Fig. 7), having a body 30 of considerable height, as shown in Fig. 8, to afford an adequate clamping surface for engagement with the cable.

The wings 30x of the crescent-shaped body afford extending means to rest upon the surrounding shoulder 18, as can be seen readily in Fig. 7, wherein the cable C is illustrated in place, embraced between the abutment face 28 and the clamping part 30, the clamping pressure being adjustable by a set screw 26.

In Fig. 7 the parts are illustrated in their cooperating position ready to receive the sealing material S, which is shown in Fig. 6 as completed.

Various forms of bootleg riser tubes may be combined advantageously with a base of the above novel type, in order to permit the use of a wide range of height in the riser, thus to accommodate the bootleg for use where the cable is to be buried at different depths below the ground line 11.

The simplest form of such a riser is illustrated at 12x in Fig. 4 in which a straight tube 12x is provided with a connector heat Hx having a boss Bx threaded to screw upon the upper threaded end of riser 12x. The form of head Hx illustrated in Figs. 1, 2, 4 and 5 is like that disclosed and claimed in the patent to W. H. B. Lavarack, No. 1,887,271 granted November 8, 1932, to which reference may be made for a more extended description of the details of its structure.

A novel feature of this head, however, emerges in the provision of a compact solder pot P into which the bared ends 41 of the bonding cables and the bared end of the insulated underground parkway cable 42 are brought into juxtaposition with each other and may be readily united electrically by the simple operation of pouring a small quantity of solder into the pot P.

It will be evident from the foregoing disclosure, that different useful sizes of tubes, which may be kept in stock will be made available for use by this invention; also that the base will accommodate a riser of desired length which may be cut from a stock tube of indefinite length. So, also, if it be desired to increase the length of such a simple form of riser, it will suffice to attach thereto, as shown in Fig. 5, in abutting arrangement, or coaxial alignment, an extension nipple or section 32, of any desired length, suitably threaded to interengage the threaded boss Bx of the same head Hx as that shown in Fig. 4, and a standard form of coupling sleeve 33.

Adjustments can thus be made over a very wide range of lengths, and the conductor C' of Fig. 4 can be stretched out as indicated at C'' in Fig. 5 to compensate for the increased length of the bootleg so provided, without any disturbance of the section 12x or of the seal S'.

In the now-preferred form of the invention illustrated in Fig. 1, the capability for extension is shown as provided for by inserting within the tube 12 an inner tube 2, of sufficient inside diameter to receive the coiled insulated conductor C', which can be stretched out in the same manner as that shown at C'' in Fig. 5, when the inner tube shall have been drawn out lengthwise from the tube 12 in a manner readily understood from the arrangement of these parts as shown in Fig. 1.

Just as the screws 23 are provided to hold the tube 12 in its seated position within the base B, so also the screws 23x can be used to hold the inner tube 2 in any position to which it may be drawn out telescopically. The last-named screws also transfix and hold in place the sleeve 31 screwed upon the threaded end 34 of the tube 12, and within the outer end 35 of which is screwed the gland 36 of a stuffing box which includes packing rings 37 and 38 of known form and arrangement, suitable to assure a snug fit of the tube 2 within the tube 12, and also to exclude all access of moisture to the space 39 between the tubes 2 and 12.

At 40, a set of at least two rivets is shown, these serving to aid in maintaining the inner tube 2 centered within the tube 12. These rivets are also effective as stops to limit the extent to which the inner tube may be withdrawn, up to the region of the screws 23x.

Although I have described particularly the construction of several physical embodiments of the invention, and explained the operation and principle thereof, nevertheless I desire to have it understood that the forms selected are merely illustrative, and do not exhaust the possible physical embodiments of the idea of means underlying the invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a bootleg structure, in combination: a base having a hollow boss with a shoulder of annular form adapted to seat the lower end of a bootleg riser tube; said base having a cavity below said annular base-shoulder and having a lower shoulder with an orifice through which extends a metal- sheathed insulated cable; and a seal constituted by a mass of sealing compound formed in said cavity surrounding said metal-sheathed insulated cable.

2. A bootleg structure having a base formed with a cavity having openings upward and downward, a mass of sealing material filling said cavity and sealing said openings, an insulated conductor of indefinite length passing upward through said openings and cavity transfixing said mass and sealed thereby, and means to confine said mass locally within said cavity, preventing positively any lengthwise movement of said confined portion of the conductor; said bootleg being further characterized by having a seal-free bootleg riser tube of indefinite length supported in fixed position upon said base surrounding that portion of said conductor extending to the surface of the ground, being readily removable from said base by a non-rotative co-axial movement of said riser bodily while said base retains its position with said conductor sealed therein.

3. A bootleg structure having a base formed with a cavity adapted to receive a mass of sealing compound, and having spaced, annular, seal-retaining shoulders defining the upper and lower boundaries of said cavity, and with axially aligned orifices to receive an insulated metal-sheathed cable transfixing said compound and sealed thereby into said base; said bootleg being further characterized by having a bootleg riser tube supported in a fixed position upon said base, and means to secure an extension bootleg tube in endwise alignment with said first-named tube, said riser tube and extension bootleg tube being together removable readily from said base.

4. A bootleg structure having a base formed with a cavity adapted to receive a mass of sealing compound, and provided with means to prevent positively any lengthwise displacement of said seal, and having an insulated metal-sheathed cable transfixing said compound and sealed thereby into said base; said bootleg being further characterized by having a bootleg riser tube supported in fixed position upon said base, being supplemented by an extension bootleg tube, and means, remote from said base, adapted to secure

said supplemental tube adjustably in telescopic disposition relatively to said first-named tube, said tube in every adjusted position having a wide axial bore unobstructed for a dominant portion of their combined length to confine a coil of said cable.

5. In a bootleg structure, in combination: a bootleg base having a hollow boss with a shoulder of annular form adapted to seat the lower end of a bootleg riser tube, said base having a cavity therewithin below said annular base-shoulder, and having a lower shoulder through which extends a metal-sheathed insulated cable; a seal constituted by a mass of sealing compound formed in said cavity surrounding said metal-sheathed insulated cable; a bootleg riser tube supported upon said base-shoulder first-named; an auxiliary tubular member adjustably mounted in position to extend said tubular bootleg structure; and a coiled reserve of said cable adapted to be stretched out within said bootleg riser, and within its extension, to compensate for increased bootleg length without disturbing said seal.

6. A telescopic bootleg structure, as claimed in Claim 4, in which a stuffing-box is provided between said tubes to exclude access of moisture between their upper ends.

7. As a new article of manufacture; a bootleg-base of annular form having a hollow axial boss with an annular shoulder adapted to seat the lower end of a bootleg riser tube; said base having a cavity therewithin below said annular base-shoulder, and also having a lower shoulder formed with an axial orifice adapted to receive a metal-sheathed insulated cable or armored conductor; said cavity being also adapted to confine and retain a seal constituted by a mass of sealing compound formed in said cavity surrounding said cable.

8. As a new article of manufacture; a bootleg-base as claimed in Claim 7, in which said orifice is formed with a mouth flaring downwardly and outwardly.

9. A bootleg-base formed with a cavity adapted to receive a mass of sealing compound and to receive a metal-sheathed insulated cable transfixing said compound and sealed thereby into said base; and means acting positively to confine said seal, and the portion of said cable transfixing said compound, against lengthwise displacement within said base; said bootleg being further characterized by having above said cavity a seat of annular form to seat the lower end of a bootleg riser tube and also being characterized by having a hollow boss to confine said lower bootleg tube end.

EDWARD M. DEEMS.