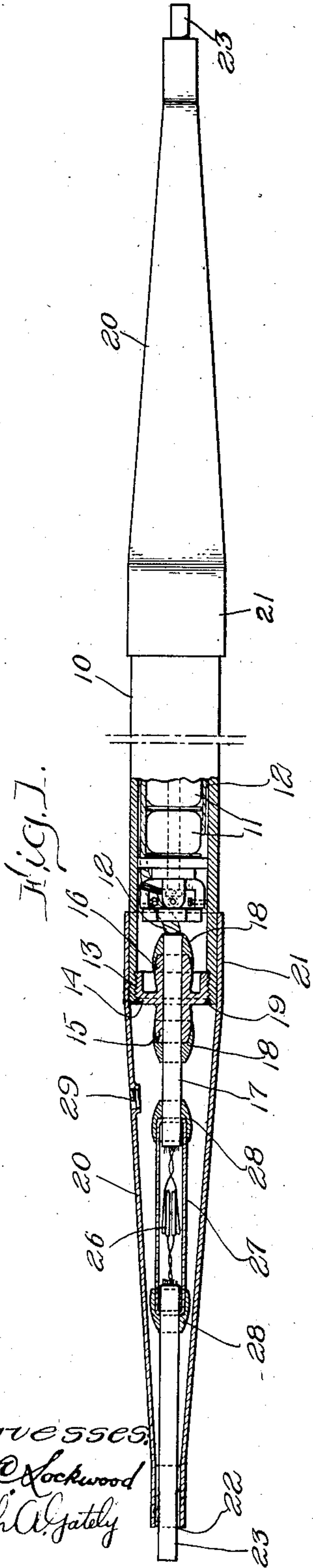


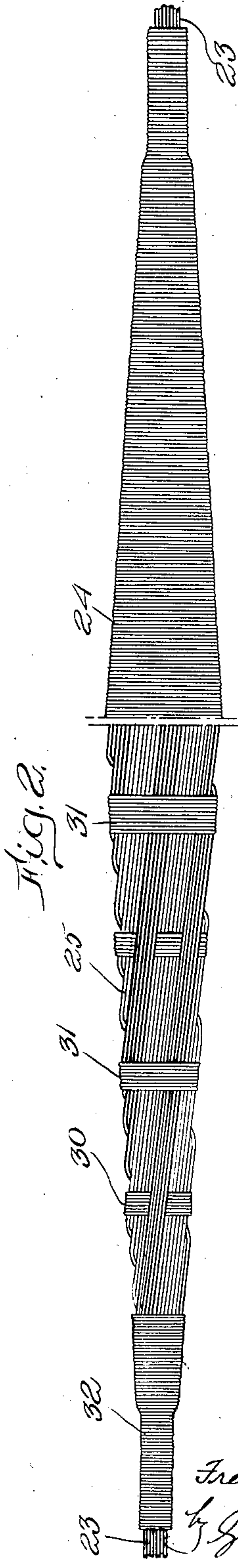
F. L. RHODES.
COIL CASE FOR INSERTION IN CABLES.
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1,103,079.

Patented July 14, 1914.



Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERICK L. RHODES, OF SHORT HILLS, NEW JERSEY, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

COIL-CASES FOR INSERTION IN CABLES.

1,103,079.

Specification of Letters Patent.

Patented July 14, 1914.

Application filed February 7, 1911. Serial No. 607,177.

To all whom it may concern:

Be it known that I, FREDERICK L. RHODES, residing at Short Hills, in the county of Essex and State of New Jersey, have invented certain Improvements in Coil-Cases for Insertion in Cables, of which the following is a specification.

My invention concerns cases for inclosing loading coils or like instrumentalities which are to be included in signaling or transmission circuits, and has for its particular objects the provision of such a case and its arrangement within the structure of a submarine cable, this association being effected without greatly increasing the diameter of the cable or lessening its strength.

In the accompanying drawing, in which like characters designate similar parts in all views, Figure 1 is a broken side elevation of an embodiment of my invention in place in a cable, parts being in section and the outer protective covering of the cable being omitted, and Fig. 2 is a broken side elevation of the cable and case therein, the armor being illustrated in its position over the case.

The main body portion or case 10 for inclosing loading or other coils 11 is in the form of a continuous tube, extra heavy wrought iron pipe being suitable for this purpose. The coils are mounted in the case in any desired manner, and short stub cables 12 carrying their terminals pass axially through the opposite ends of said case.

The inner ends of the case are each threaded at 13 to engage a screw plug or head 14 having a nipple or short tube 15 surrounding an axial opening through the head and being continued into the case by an extension 16, this tube permitting the exit from the case of the terminal cable 12. Each cable 12 has a comparatively loose section 17 of lead sheath, which extends through tube 15 and projects just inside and for a considerable distance outside the tube.

When the assembling of the case and its coils is to be completed, a moisture-proof seal is provided at every juncture between metal parts. To accomplish this the sheath section 17 is first placed in position in the tube of each head and soldered thereto by wiped joints 18; 18. Then the terminal cable is drawn through the sheath and tube, and the head screwed in place with its outer face substantially flush with the edge of the

case. The adjacent angles of the case and flange may have been previously beveled to furnish a groove 19, and along this line these elements are welded, conveniently by an oxy-acetylene flame, a strip of Norway iron being fused in to fill the groove. The coils are now incased in unbroken metal, save for the spaces between the cables 12 and their sheaths. After utilizing these spaces to test the integrity of the joints, by creating through them a vacuum in the chambers left in the case beyond the insulating compound surrounding the coils, said chambers and sheath spaces are filled by forcing in additional insulating compound.

Coöperating with each end of the main case is an independent portion or auxiliary case 20 of frusto-conical form, fitting closely over or telescoping with the exterior of the main case at 21, and tapering therefrom to a cylindrical extremity in which is an opening 22 just large enough to freely admit the sheath or inner protective covering of the main cable, the extremities of adjacent sections of said cable, being indicated at 23. When the case with its contained coils is to be inserted in the main cable, the outer protective covering of the latter, including a jute wrapping 24 and armor wires 25, is unwound and laid back to a suitable distance, and the tapered end portions 20 of the case are slipped over the surface of the cable sections. The conductors 26 of the terminal and main cables are now spliced in the usual manner, and the splices covered with lead sleeves 27 soldered to the sheaths of the main and terminal cables at 28. The conductor splices having been completed, the cones 20 are fitted over the ends of the main case. Openings closed by screw plugs 29 are provided for the introduction of suitable insulating filling. The coils and splices are therefore inclosed in a substantially continuous metal container with its ends gradually tapering to approximately the diameter of the cable sheath. Over this complete case the armor wires 25 are laid in spiral bands, the bands from the opposite cable sections alternating with one another, as is shown in Fig. 2 of the drawings, the wires indicated in light outline proceeding from the right, and those indicated by heavy lines coming from the left. One set of spiral bands having been laid in place, they are secured in firm frictional engagement with

the case by circular bands or servings 30 of galvanized iron wire. The other set of bands is then applied and servings 31 wound over both sets.

5 The connection of the armor wires to the case is completed by long servings 32 over their extremities at the junctures of the case ends and the cable sections. On account of the gradual reduction in diameter of the
10 case by the taper of these end portions, the armor wires lie smoothly without slack or abrupt angles at which they might suffer injury. Over the whole the jute covering may be carried, as is partially indicated in
15 Fig. 2, and this saturated with Stockholm pine tar or the like.

It will be seen that in such an organization, the coils, their connecting splices and the inclosing elements become parts of a
20 unitary cable structure, without materially decreasing its strength, flexibility or the ease with which it may be handled; and without sensibly increasing its weight, and that said coils and connections are effec-
25 tively protected against mechanical injury and access of moisture.

Having thus described my invention, I claim:

1. The combination with a main cable in-
30 cluding conductors and a protective covering, of a casing structure carried by the main cable and including a main case, terminal conductors extending from within and projecting on the exterior of said main
35 case and being joined to the main cable conductors, and means for connecting the protective covering to the casing structure.

2. The combination with a main cable in-
40 cluding conductors and armor wires, of a casing structure carried by but independent of the main cable structure and including a main case, and terminal conductors extending from within and projecting on the ex-
45 terior of said main case and being joined to the cable conductors of the main cable, the armor wires of said main cable being extended over the casing structure.

3. The combination with a main cable, of a casing structure carried by said main
50 cable and including a main case, a terminal cable extending from within said main case through the wall thereof and being connected to the main cable, and an auxiliary case constituting part of the casing structure,
55 said auxiliary case being joined to the main case and surrounding the connection between the cables.

4. The combination with a main cable, of a casing structure carried by the main cable
60 and including a main case, a terminal cable leading from within said case through the end wall thereof, a seal at the juncture be-

tween the cable terminal and main case, a splice connecting the main and terminal cables, and means for protecting said splice
65 carried by said main case and constituting part of the casing structure.

5. The combination with a cable includ-
ing conductors and a covering therefor con-
stituting part of the cable, of a case inde-
70 pendent of the cable structure, a portion of said covering extending into the case and another portion of said covering extending over the outside of the case.

6. The combination with a cable includ-
75 ing conductors and a covering therefor constituting part of the cable, of a case independent of the cable structure having a tapered end over which said covering of the cable extends.
80

7. The combination with a cable includ-
ing conductors and armor wires, of a case independent of the cable structure having a tapered end portion, the armor wires con-
85 tinuing from the cable over said tapered end portion and case.

8. The combination with a cable includ-
ing conductors and armor wires, of a case comprising a cylindrical main portion and an end portion telescoping with said main
90 portion, said armor wires continuing from the cable over said end and main portions of the case.

9. The combination with a main cable having a protective covering, of a casing
95 structure carried by and connected between ends of said main cable, said casing structure including a main case and two auxiliary cases attached to the ends of the main case respectively, terminal or stub cables extend-
100 ing from the main case into the auxiliary cases, and splices located in the auxiliary cases, respectively, and connecting said terminal cables with the ends of the main cable.

10. The combination with a main cable
105 and a coil adapted to be connected therewith, of a casing structure carried by the main cable, said casing structure including a main case inclosing said coil and an auxiliary case attached to and extending out-
110 ward from the main case, a terminal cable extending from the coil in the main case into the auxiliary case, and a splice between the main cable and terminal cable situated in the auxiliary case and connecting the coil
115 to the main cable.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this first day of February 1911.

FREDERICK L. RHODES.

Witnesses:

G. T. BLOOD,

H. C. CARPENTER.