No. 881,777. PATENTED MAR. 10, 1908.

C. W. DAVIS.

TERMINAL FOR ELECTRIC CABLES.

APPLICATION FILED MAR. 31, 1906.

FIG. 1.

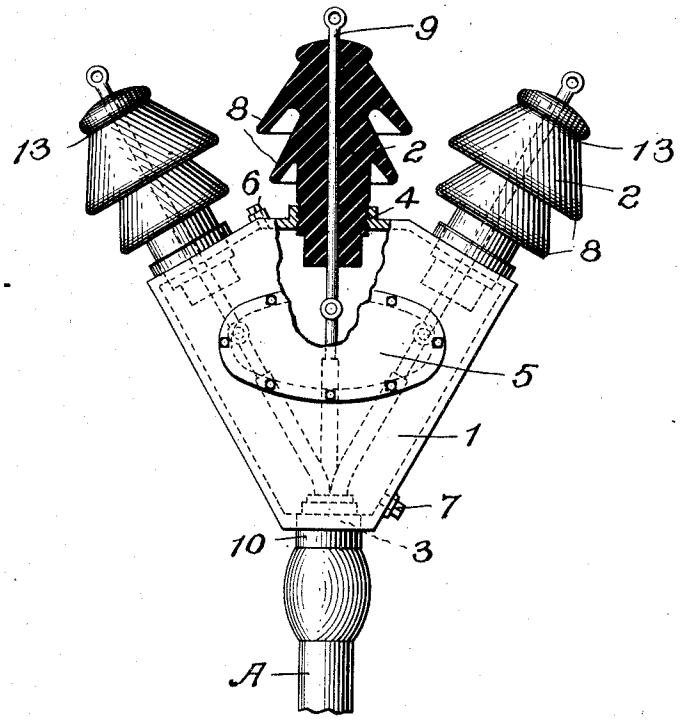
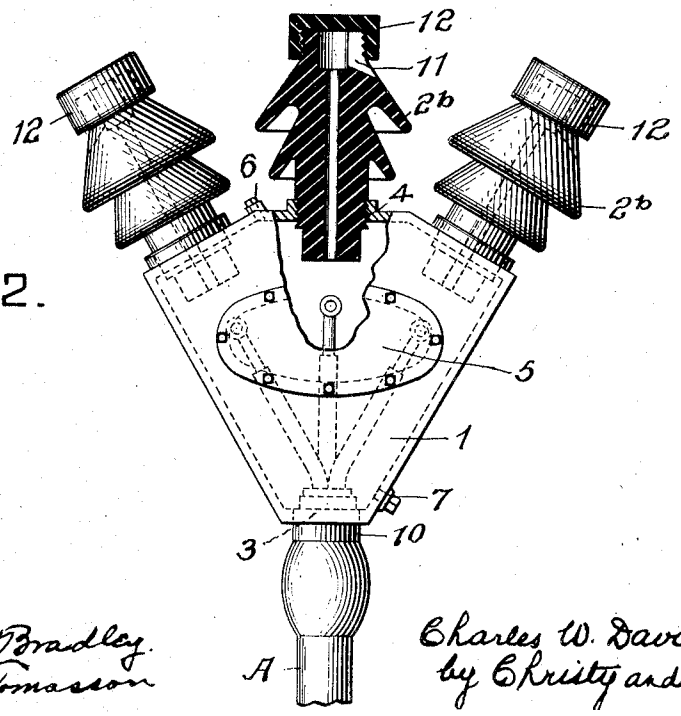


FIG. 2.



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CHARLES W. DAVIS, OF EDGEWORTH, PENNSYLVANIA, ASSIGNOR TO STANDARD UNDERGROUND CABLE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TERMINAL FOR ELECTRIC CABLES.

No. 881,777. Specification of Letters Patent. Patented March 10, 1908.

Application filed March 31, 1906. Serial No. 309,197.

To all whom it may concern:

Be it known that I, CHARLES W. DAVIS, residing at Edgeworth, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Terminals for Electric Cables, of which improvements the following is a specification.

My invention relates to improvements in terminals for electric cables.

The object of my improvement is a terminal from which moisture is excluded, in the use of which leakage is guarded against, and which possesses the advantages hereinafter mentioned.

In connecting overhead aerial lines with lead-covered electric cables made up of copper conductors insulated with hygroscopic material, such as fiber, paper, etc., it is necessary to employ a terminal, *i. e.* a joint-forming structure wherein the cable ends and from which the aerial line or lines lead—in order that moisture may be excluded from the cable insulation.

In the accompanying drawing which forms a part of this specification, Figure 1 is a view partly in elevation and partly in section, of a terminal which embodies my invention and Fig. 2 is a sectional view showing a modified form of the terminal.

The terminal consists primarily of a case or shell 1. This case may be of any desired shape, but will ordinarily be formed of metal; and is provided with openings for the ingress of the cable and the egress of the aerial lines. Opening 3 is for the cable inlet and openings 4 are for the egress of the line wire connections. The case is conveniently provided with an opening, through which access may be had to the interior for the purpose of making connections, and over this opening a plate 5 may be firmly and tightly secured. Other openings, 6 and 7, may conveniently be provided at the top and bottom of the case 1, and through them the case may, when in place and when connections have been made, be respectively filled with and emptied of an insulating material applied preferably in fluid form.

In the openings 4 of the case 1 which are provided for the connections with the outgoing aerial lines, the plugs 2 are secured. Each plug is formed of insulating material, and through each extends a conductor adapted for electrical connection at its inner end with the cable, and at its outer end with an aerial wire. These plugs are preferably formed of some one of the moldable insulating materials known on the market, such as "micanite", "electrose", etc., and they may conveniently be secured in the openings of the case 1 by a screw thread connection, as shown in the drawing.

The plug 2 in the form shown in Fig. 1 is molded on a central conducting core 9, and when so formed the contact between the core and the surrounding insulating material is intimate and moisture is excluded. In the alternative form illustrated in Fig. 2, the plug 2^b is formed with a central opening through which a conductor may be introduced. In this latter case ingress of moisture is guarded against by forming a notch 11 at the outer end of the plug, leading from the central opening laterally outward, and by applying a cap 12 to the outer end of the plug when the conductor has been introduced through the central opening in the plug, and its protruding end bent into the notch 11. In this case the plug will be maintained in the substantially vertical position shown in the drawing; and, it is preferable to form the notch with a downward and outward slope as shown. The spaces between the conductor and the plug in this alternative form may be filled if desired with some insulating substance.

In order to guard against leakage from the aerial line wires over the surfaces of the plugs, the case 1—which ordinarily is formed of metal—and thence to the cable sheath, I form upon the outer surfaces of the plugs themselves one or more petticoats 8 of familiar form. These petticoats are preferably two in number as the drawings show. Leakage over insulating surfaces becomes a matter of consequence in wet weather, and by shaping the surface of the plug into a downwardly and outwardly flaring petticoat which extends entirely around the plug, a portion of the surface is kept comparatively dry, and the otherwise free passage of electricity is thus obstructed.

In order to relieve the conductor 9 of the mechanical strain to which it would be subjected were the line wire stretched directly from the point of electrical contact, I provide a groove upon the outer surface of the

plug 2 and in this groove the line wire may be coiled, the end of the line wire being electrically secured to the outer end of the conductor 9. The strain due to the weight or tension of the line wire will then be sustained primarily by the plug as a whole. This groove will be arranged above the plane or planes of the petticoats already described, for otherwise the purpose of the petticoats would be defeated.

In Fig. 1 the groove is indicated at 13, and in the modification shown in Fig. 2 it will be observed that the cap 12 when in place forms with the adjacent exterior surface of the plug such a groove as I have described. In the inlet opening 3 of case 1 a metallic ferrule or nipple 10 may conveniently be set, and to this the sheath of the entering cable may be secured by the familiar wiped solder joint.

The parts are assembled as follows. The plug or plugs 2 are secured in place in the outlet openings of case 1. The end of the cable A, its separate conductors laid bare for a sufficient distance, is introduced through inlet opening 3 of case 1. The several conductors of the cable are electrically united with the several cores 9 of the plugs 2. The outer ends of cores 9 are connected to the several aerial lines. Nipple 10 of inlet opening 3 is secured by wiped solder joint to the lead sheath of cable A. Plate 5 is then secured in position. Insulating material in fluid state may be admitted through opening 6, filling the box and securing protecting and insulating more perfectly the contained parts. The openings 6 and 7 are conveniently closed by screw caps as shown.

If the modified form shown in Fig. 2 be followed, the assembling will be the same except that the line wire will be carried directly through the opening in the plug and electric connection made between it and a conductor of the cable. In each case however a turn of the line wire will be made in a groove in the outer surface of the plug that the plug as a whole may withstand the strain or tension of the wire.

I have in the foregoing specification spoken of the line wires which are in electric contact with the cores of the plugs as aerial lines. It will be understood that they are not necessarily aerial in the sense of being carried at elevated heights through the air. The device may be used in any situation where the conditions of moisture render the construction valuable.

In the modified form illustrated in Fig. 2, the material of which the plug 2^b is formed may be of such character that it may be softened and compressed upon the conductor after the conductor is in place, and thus a further guard against the ingress of moisture may be afforded.

I claim as my invention:

1. In a terminal for an electric cable the combination with a case or shell, of a plug for an outward leading wire, said plug being formed of insulating material molded on said wire and provided with an outwardly and downwardly flaring petticoat and provided with a groove for the reception of a line wire arranged adjacent to one end and above the plane of the said petticoat, and having at its opposite end means for attachment to a support, substantially as described.

2. The combination of a central conducting core and a plug of insulating material formed thereon, such plug being provided with an outwardly and downwardly flaring petticoat and with a groove for the reception of a line wire arranged above the plane of such petticoat, and such plug being inserted in an orifice in a case or shell and forming part of a terminal for an electric cable, substantially as described.

3. A terminal for an electric cable provided with a plug for an outward-leading wire, said plug being formed of insulating material and provided with an opening extending through it in a substantially vertical direction for the reception of a conductor and with a notch at the upper end of said opening into which such conductor may be bent, and a cap fitting over the upper end of said opening in the plug, and when seated forming together with the outer surface of the plug a groove wherein a line wire may be turned, substantially as described.

4. A terminal for an electric cable provided with a plug for an outward-leading wire, said plug being formed of insulating material, and provided with an opening extending through it in a substantially vertical direction for the reception of a conductor and with a lateral notch at the upper end of said opening into which the conductor may be bent, and a cap fitting over the upper end of said opening in the plug, and when seated holding the conductor in position in the notch and protecting the opening in the plug from ingress of moisture, substantially as described.

In testimony whereof, I have hereunto set my hand.

CHARLES W. DAVIS.

Witnesses:
CHARLES BARNETT,
BAYARD H. CHRISTY.