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TERMINAL HOUSING FOR CABLES

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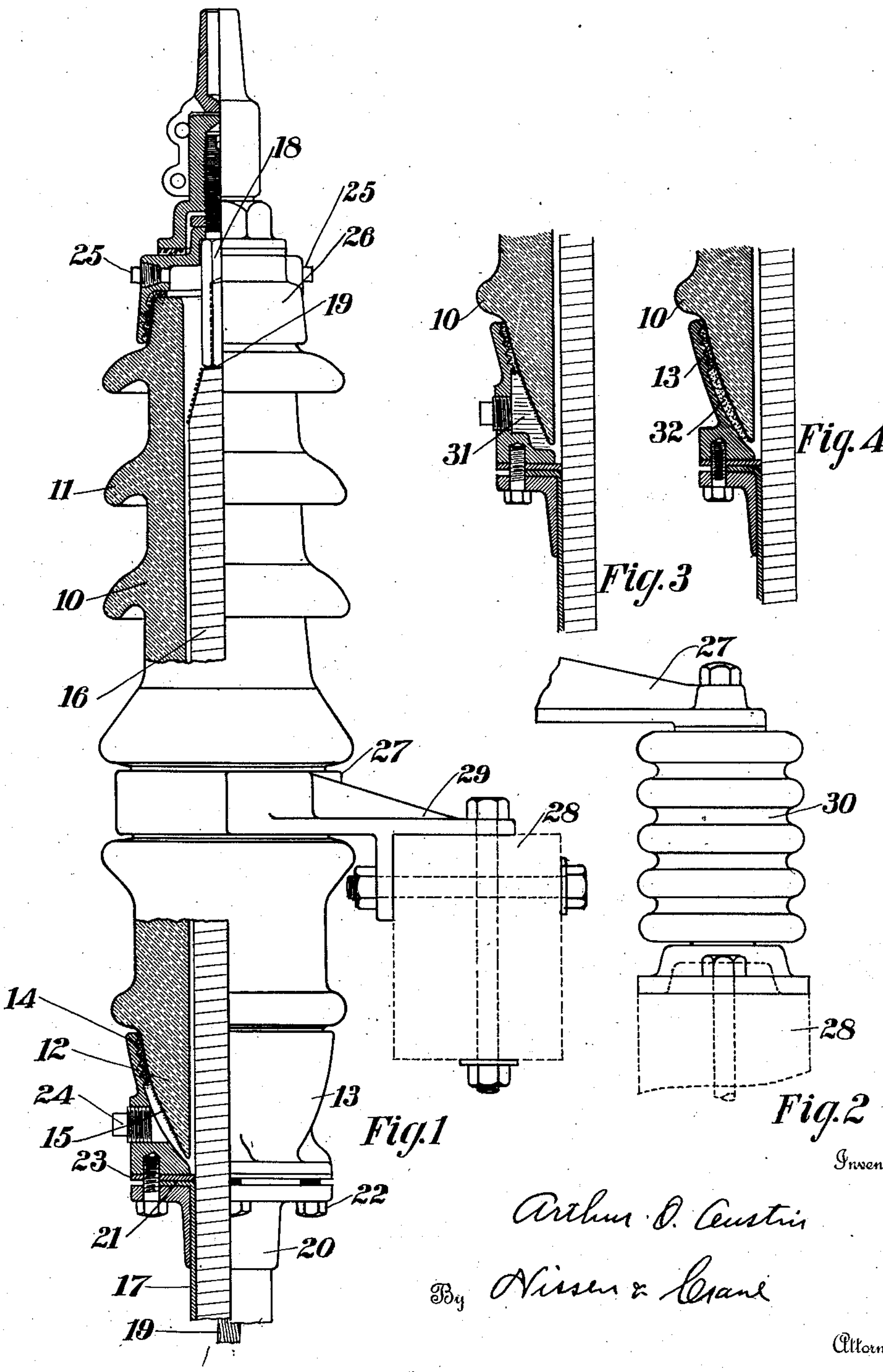

Fig.1

Fig.3

Fig.4

Fig.2

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UNITED STATES PATENT OFFICE

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TERMINAL HOUSING FOR CABLES

Application filed August 5, 1926. Serial No. 127,436.

This invention relates to terminal housings or potheads for leading out a high potential cable at the end of the cable insulation and sheath, and has for one of its objects the provision of a construction which will prevent concentration of electrostatic flux, which will be simple to install, economical to manufacture and efficient in operation.

Other specific objects will appear from the following description.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawing and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawing—

Fig. 1 is an elevation, with parts in section, showing one embodiment of the present invention;

Fig. 2 is a fragmentary view showing a different form of mounting for the terminal housing;

Fig. 3 is a fragmentary vertical section showing a modified arrangement of terminal bell; and

Fig. 4 is a view similar to Fig. 3 showing another modification.

In terminating insulated cables, more particularly those used for high voltage, it is usually necessary to terminate the conductor in an insulator. These high voltage cables are usually covered with a lead sheath and depend upon varnished cambric or paper impregnated with oil or other insulating material for their insulation. Where the lead sheath terminates it is usually difficult to prevent the weakening of the cable owing to a concentration of stress at this point. In the ordinary installation it is necessary to form a wiped joint with the lead sheath. The heat during this operation may damage the insulation of the cable and at best the operation is difficult to perform. With the improved type of pothead, a wiped joint is not necessary and it is possible to develop the maximum insulation of the cable, as the dielectric member picks up the stress gradually without producing a concentration or a hard spot in the insulation of the cable which may cause breakdown at a low voltage.

In the form of the invention shown in Fig. 1, a dielectric member 10 is provided with weather sheds 11 and a lower conical section 12. A metal bell 13 is attached to the lower end of the dielectric member by cement or other suitable joint 14. The lower outer surface 15 is preferably metallized by the method disclosed in my previous Patent No. 1,536,749, granted May 5, 1925. The insulation 16 of the cable 19 is made up of layers of varnished cambric or paper and has the lead sheath 17 stripped the required distance. A terminal bolt 18 is attached to the conductor 19 in the center of the cable. The flange 20 is slipped over the lead sheath which is then flared as at 21. The terminal bolt 18 with cable attached is then drawn up through the insulator and flange 20 is bolted to the bell 13 with bolts 22. A gasket 23 may be used between the lead sheath and the lower face of the bell or casting 13 to insure a tight joint. After the joint is tight the space between the cable and the inner walls of the insulator 10 may be filled by either oil or insulating material through the opening by removing plug 24 or the plugs 25 in the cap 26 secured to the top of the insulator 10. A split collar 27 is used for attaching the bushing to a cross-arm 28 by means of a bracket arm 29. The arrangement provides insulation between the flange 27 and the bell 13 which reinforces the insulation at the upper end of the insulator in separating the grounded sheath 17 from the cap 26 and also removes any ground from the supporting member 27 or structure 28. This is frequently a decided advantage where the potheads are small and the voltage rather high, as birds or squirrels standing on the structure may cause a short with the conductor. With the additional insulation, however, separating the structure from ground, this danger is greatly reduced.

Where it is desired to increase the insulation very materially, an insulator 30 shown in Fig. 2 may be used for supporting the arm 27. Various forms may be used for the bell 13.

In the arrangement shown in Fig. 3 the

lower bell has a large pocket 31 to permit easy filling.

In Fig. 4, the entire space between the dielectric member 10 and the bell 13 is filled with cement or conducting material 32. Where the insulator is made of a dielectric which has a relatively high specific inductive capacity, the electrostatic stress may be picked up gradually and thus avoid a hard spot which would tend to break down the cable at high voltage. An insulator made up in this way having a dielectric, such as porcelain, has many advantages over a pothead where the diameter is increased by the use of varnished cambric or paper at the point of entry and it further has the advantage in that the construction permits of simple installation without the necessity of using heat, although, of course, a wiped joint may be formed between the flange 20 and the lead sheath 17. The clamping method permits the easy removal or replacement should an insulator become damaged from any cause whatever.

I claim:—

1. The combination with a cable having an insulating covering and an outer sheath of conducting material, of a rigid tubular member having fluid tight walls of dielectric material forming a weather proof casing member surrounding said insulating covering and having one end thereof tapered outwardly and disposed adjacent the end of said sheath, the outer tapered surface of said dielectric member being coated with conducting material electrically connected with said sheath.

2. In combination, a cable comprising a conductor, an insulating cover for said conductor, and an outer metal sheath, an outwardly flared metal bell secured to said metal sheath at the end thereof and forming a tight joint with said sheath, a rigid tubular member having fluid tight walls of dielectric material forming a weather proof casing member and having one end thereof tapered to conform to the interior of said metal bell and disposed within said bell, and means for forming a tight joint between said dielectric member and the inner face of said bell.

3. The combination with a cable having a conductor, a layer of insulation surrounding said conductor and an outer metal sheath, of an outwardly flared bell secured to said metal sheath and forming a tight joint therewith at the termination of said metal sheath while said cable and insulating covering therefor extends into said bell, and a rigid tubular member having fluid tight walls of dielectric material forming a weather proof casing member surrounding said insulating covering within said bell, the outer surface of said tubular dielectric member being shaped to conform to the interior of said bell and having a coating of conducting material thereon electrically connected with said bell, and means for securing the inner face of said bell to the outer surface of said tubular dielectric member.

4. The combination with a cable comprising a conductor, an insulating covering and an outer metal sheath, of a terminal housing for said cable comprising a rigid tubular member having fluid tight walls of dielectric material forming a weather proof casing member surrounding said insulating covering and terminating adjacent the termination of said metal sheath, the end of said tubular member adjacent said metal sheath being tapered inwardly toward said insulating covering, a metal bell surrounding the tapered end of said dielectric member and secured to said dielectric member to form a tight joint therewith, and means for clamping the end of said metal sheath to said metal bell to form a tight joint between said sheath and bell.

5. The combination with a high potential cable comprising a conductor, an insulating covering for said conductor and an outer metal sheath surrounding said covering, of a terminal housing comprising a rigid tubular member having fluid tight walls of dielectric material forming a weather proof casing member and having one end thereof tapered and disposed adjacent the termination of said metal sheath while said conductor and dielectric covering are continued within the interior of said tubular dielectric member, means for forming a tight joint between said sheath and the outer surface of said tubular dielectric member, and a terminal for said conductor disposed at the end of said tubular dielectric member opposite the connection between said tubular dielectric member and sheath, said terminal and sheath being spaced apart and insulated from each other by said tubular dielectric member.

6. In combination, a cable comprising a central conductor, a covering of insulation surrounding said conductor and an outer metal sheath, said sheath being terminated at a point spaced from the end of said conductor while said insulating covering continues beyond the termination of said sheath, a porcelain tube constituting a weather proof casing member surrounding the exposed portion of said insulation and terminating adjacent the termination of said sheath, the end of said tube adjacent the end of said sheath being gradually flared outwardly, conducting means connected with the end of said sheath and following the contour of the flared portion of said dielectric member, and a contact member secured to said conductor and supported on said tube at the end of said tube opposite the termination of said sheath and insulated from said sheath by said tube.

7. The combination with a high potential cable comprising a conductor, an insulating covering surrounding said conductor and an outer metal sheath, of a terminal housing for

said cable comprising a weather proof tubular dielectric outer casing member having a tapered end extending to a point adjacent the termination of said sheath and surrounding a portion of said insulating covering which projects from the end of said sheath, a metallic cover for said tapered end to divert discharge from the surface of said insulating covering, means for forming a tight joint between said sheath and one end of said tubular dielectric member, a cap for closing the opposite end of said tubular dielectric member, and means for connecting said conductor with said cap.

8. The combination with a high potential cable comprising a conductor, an insulating covering surrounding said conductor and an outer metal sheath, of a tubular porcelain member having a tapered end extending to a point adjacent the termination of said sheath and surrounding a portion of said insulating covering projecting from the end of said sheath, a metallic bell secured to the end of said sheath and enclosing the end of said tubular dielectric member adjacent said sheath, and means for connecting said bell to said tubular dielectric member to form a joint therewith, said bell having an opening therethrough for the introduction of an insulating compound.

9. The combination with a cable comprising a conductor, a covering of dielectric material surrounding said conductor and an outer sheath, of a terminal housing for said cable comprising a rigid, imperforate tubular dielectric member having a tapered end extending to a point adjacent the termination of said sheath and surrounding a portion of said insulating covering projecting from the end of said sheath, means for forming a tight joint between said sheath and one end of said tubular dielectric member, a cap for closing the opposite end of said tubular dielectric member, means for connecting said conductor with said cap, and an opening through said cap for the introduction of insulating compound into the interior of said tubular dielectric member.

10. The combination with a cable comprising a conductor, a layer of insulation surrounding said conductor and an outer metal sheath, of a terminal housing for said cable comprising a tubular dielectric member enclosing a portion of said conductor and insulating covering projecting beyond the end of said sheath, said tubular dielectric member having the end thereof adjacent said sheath tapered inwardly and covered with conducting material, a metal bell surrounding the tapered portion of said tubular dielectric member and cemented to the outer face thereof and electrically connected with the conducting covering for the end of said dielectric member, a collar surrounding said metal sheath and having a flange thereon disposed adjacent the end of said bell, and screws for securing said flange to said bell, the end of said sheath being flared outwardly and interposed between said flange and bell.

11. The combination with a cable comprising a conductor, a layer of insulation surrounding said conductor and an outer metal sheath, of a tubular dielectric member enclosing a portion of said conductor, an insulating covering projecting beyond the end of said sheath, the end of said tubular dielectric member adjacent said sheath being tapered inwardly, a metal bell enclosing the tapered end of said tubular dielectric member and cemented thereto, a sleeve having a flange thereon surrounding said metal sheath, the end of said sheath being flared outwardly between said flange and bell, screws for clamping the flared portion of said sheath between said flange and bell, a terminal member mounted on the opposite end of said tubular dielectric member and forming a tight joint therewith, means for connecting said conductor with said terminal member, flanges on said tubular dielectric member, said tubular dielectric member having a peripheral groove intermediate the ends thereof, a support for said tubular dielectric member, and a bracket engaging said peripheral groove and mounted on said support.

In testimony whereof I have signed my name to this specification on this 30th day of July A. D. 1926.

ARTHUR O. AUSTIN.