H. P. LIVERSIDGE.

POTHEAD OR END BELL.

APPLICATION FILED APR. 6, 1910.

1,115,447.

Patented Oct. 27, 1914.

FIG. 4.

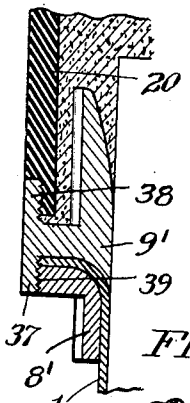


FIG. 1.

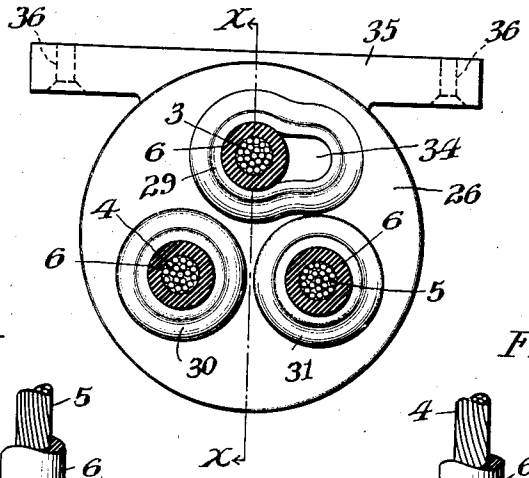


FIG. 2.

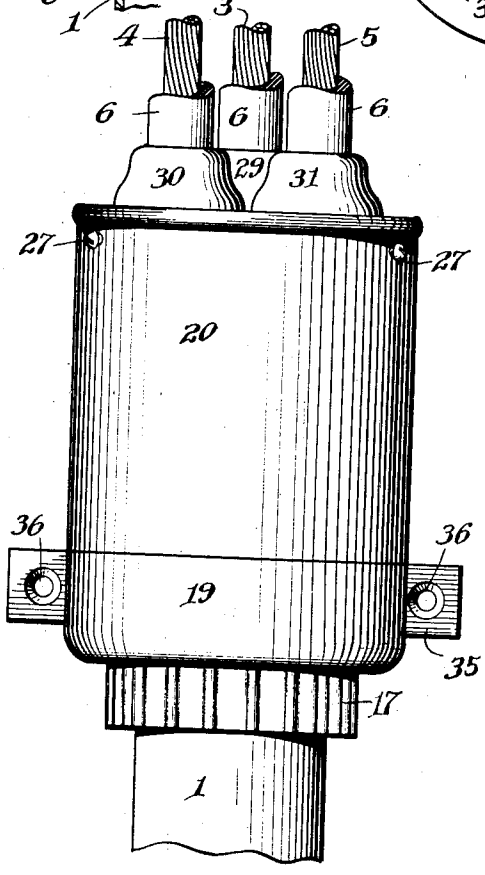
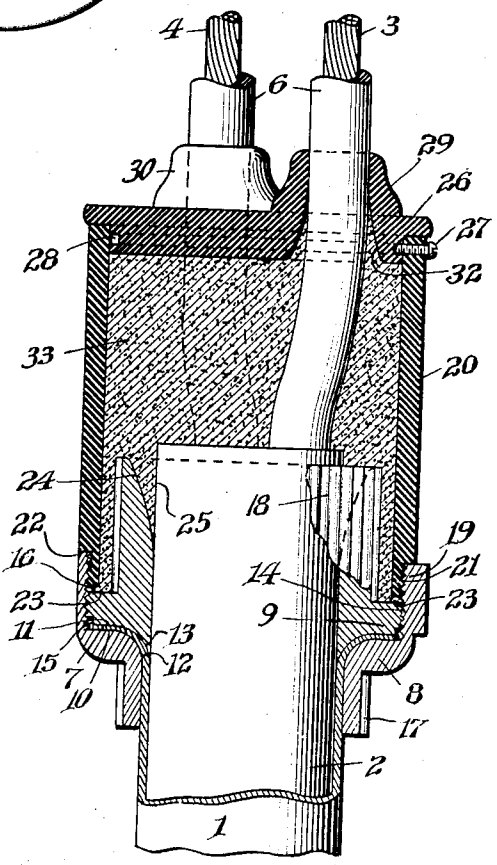


FIG. 3.



WITNESSES

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POTHEAD OR END BELL.

1,115,447. Specification of Letters Patent. Patented Oct. 27, 1914.

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To all whom it may concern:

Be it known that I, HORACE P. LIVERSIDGE, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain new and useful Potheads or End Bells for High or Low Tension Lead-Covered Electrical Conductors, of which the following is a specification.

A purpose of my invention is to provide a clamping pot-head having provision for avoiding injurious effect upon the cable due to electro-static discharge.

A further purpose of my invention is to clamp a cable sheath between members having curves preferably of different character or upon different centers of the same curve.

A further purpose of my invention is to clamp a cable sheath between metallic members, to complete a pot-head construction upon them by insulating materials and to fill the space between with insulating compound.

A further purpose of my invention is to provide a metallic pot-head clamp base member and a coöperating metallic clamp member threaded therein with a preferably insulating intermediate section or casing and cover.

I prefer to designate the structure used above the base as a "body", to include the intermediate section or casing and any top which may be desired. The clamping members are preferably formed with ribs or irregularities for engagement by a wrench, and the clamping member nearest the end of the cable is preferably belled away from the cable convexly to space from the conductors and protect against electro-static discharge therebetween and to carry off the static stresses evenly.

A further purpose of my invention is to provide clamping base members for engagment with the cable casing or sheath, clamping in the direction of its length, which are preferably separate from the sides of the pot-head to be completed thereon in order that the clamping members may be fully accessible while they are being set, and preferably to place a casing and cover thereon subsequently to be filled with insulating compound.

A further purpose of my invention is to provide a clamping base member for a pot-head with a coöperating clamping member and a casing both threaded therein so that the outer casing or the outer casing in connection with the filling compound shall act as a lock-nut or check against possible release movement of the clamping members.

A further purpose of my invention is to cause one of the pot-head clamping parts to spread the sheath away from the insulation of the cable avoiding danger from possible compression of the sheath into the insulation in cutting and causing the insulating compound to heal any injury done to the insulation in the cable cutting.

A further purpose of my invention is to bolt or otherwise join the cable sheath to the ground through the metal base of the pot-head in order to carry off any electro-static foreign current and stop pitting by electrolysis and to protect from charges due to leakage between the conductor and the covering.

A further purpose of my invention is to make a single clamping action upon the cable sheath effective for sealing, mechanical retention upon the parts, and ground connection, to spread the sheath away from the cable by it, and to save the insulation from injury however tightly the clamp may be set, forcing the lead away from, instead of toward the insulation.

While I recognize that my invention is applicable to other forms and in different constructions to suit varied characters of conductor or cable it has been necessary for me to select some form for illustration and I have therefore illustrated the form herein shown which discloses my invention to excellent advantage and which has been found practical, durable, convenient and efficient in actual practice.

Figure 1 is a top plan view of one form of my invention. Fig. 2 is an elevation of the structure seen in Fig. 1. Fig. 3 is a longitudinal section upon line *x*—*x* of Fig. 1. Fig. 4 is a broken longitudinal section of a modified form of my invention.

1, designates the sheathing of a cable having insulation 2 next thereto and surrounds conductors, which I have illustrated as three in number—3, 4, and 5. While, of course, the number will correspond with the requirements of the individual case, this form

is much in use for so called theee wire feeding system. Each conductor is separately insulated as at 6.

I divide my pot-head for convenience in description into the base comprising the clamping member and body, comprising the casing or side and the top.

In the practice of my invention I remove a portion of the cable sheath and the remainder as at 7 forms a gasket. I clamp this between members 8 and 9 whose clamping faces are preferably formed so as to be nearer together at their outer clamping edges 10 and 11 than at their inner edges 12 and 13, in order that the outer edge of the flared sheath may be more compressed than that portion adjacent to the body of the cable. Between these edges 10, 11 and 12, 13, the distance between the faces of the clamping members is graduated. By this means I form clamping surfaces mechanically retaining the sheath and sealing against the gasket effectively, avoiding the usual joint with its attendant evils.

The clamping member 9 is provided with outer edge 14 threaded nearly to the bottom but in which the threads are preferably not carried all the way down to the bottom 15, in order that there may be no seating of these threads in the bottom portion of the inner thread 16 of the outer clamp member during the operation of tightening upon and gripping the flared end 7. This is a desirable but not necessary feature of protection against interference with clamping and can be taken care of in other and obvious ways.

The clamping members 8 and 9 are preferably provided with ribs as at 17 and 18 or otherwise made to depart from true cylindrical shape, so as to be readily grasped by a wrench upon this non-circular contour without the necessity for special tools and without injury to the normal operation of the clamp; and the clamp 9 has this non-circular or wrench engaging surface extended sufficiently to permit of its being gripped readily without interference therewith by the threaded flange 19 of the member 8. The lower edge at 13 of the clamp member 9 is effective to lift the sheath away from the insulation of the cable avoiding danger from accidental compression of this sheath into the insulation from careless cutting and supporting the sheath in this position.

The separability of the base and side 20, which carries threads 21, makes the accessibility of the wrench engaging surface of the clamp member 9 possible and at the same time permits the base to be made of any material, preferably brass, which will afford a good grip upon the sheath, while the side 20 is made of an insulating material giving additional protection from current leakage.

The side 20 may be reduced in exterior diameter and provided with a threaded annulus 22, so that the exterior shoulder formed may be engaged by flange 19 of member 8, and insulating material may flow into the space between the lower edge of annulus 22 and the upper surface of annulus 23 upon member 9, locking the member 9 in place as shown. Obviously a similar result could be effected by continuing the threaded portion of member 20 to act as a lock nut.

The upper part of the clamping member 9 is for some purposes effective as a continuation of the cable sheath and is flared therefrom at 24 while the flared part is maintained in concentric relation therewith. I prefer to make this flare curved in longitudinal section and to have the convex side of the curve toward the cable conductors as the separation therefrom is thus more gradual at the start and may be gradually increased to any desired degree and distance within the casing. Abrupt change of direction in proximity to the insulation of the cable is thus avoided.

The flared end is smooth inside and gradually separates from the outer surface 25 of the cable insulation 2 and provides a metallic face which uniformly and gradually diverges from the conductor, thus guarding against the concentration of static charges due to irregularities in the metal face exposed to the conductor, and reducing or eliminating any injurious pitting from electro-static discharge between the cable and the clamping member. The filling of compound still further reduces danger from this.

Upon the end of the body 20 I place a cap 26 preferably retained by means of screws 27 fitting into an annular recess 28. The cap is provided with openings for the passage of the required number of conductors or sets of conductors, in this case three, being provided preferably with thimbles or projections 29, 30 and 31 through which these openings are made, in order that the surface leakage distance between conductors may be increased and the compound may be made to rise in them. The outer surface of these thimbles provides the requisite outer surface leakage separation and the requisite inner surface leakage separation is provided by means of the internal tapering of these thimbles or projections as at 32.

I provide an opening, preferably in end 26, by which any suitable insulating compound 33 may be poured within the pot-head to completely fill the space there left, providing mechanical support as well as insulation therefor and keeping out moisture. In the form illustrated I have shown this opening as a lateral extension as at 34 of the opening in one of the thimbles, but it may obviously be otherwise provided.

The pot-head or end-bell which I have

illustrated is obviously suitable for the protection of a cable terminal whether in vertical or other position and can be supported primarily by the strength of the cable itself or secured to another part. For the purpose of applying it to a frame or support, I have illustrated a bracket 35 having screw holes therein, the bracket being connected rigidly with the member 8.

The member 20 may be made of any suitable material desired but an insulating material is preferred.

The bracket 35 is rigidly held in metallic connection with the cable sheath and forms an excellent ground connection therefor, being preferably supported upon a grounded member or well connected thereto.

In Fig. 4 I have shown the clamping member 9′ belled and forming the connection between the other clamping member 8′ and the body 20, the connections being shown as made by internally threaded flanges 37, 38 upon 9′ engaging with external threads 39, 21 upon the clamps 8′ and body 20 respectively. Other arrangements and assemblages of these parts to carry out my invention will be obvious to those skilled in this and allied arts.

Obviously the forms of the various parts as well as their sizes and relative proportions may be greatly varied without departing from the spirit and scope of my invention as defined in the appended claims and I desire to be protected in my invention under whatever guises it may appear.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the character stated, a cable having an inclosing sheath and an inclosed insulation, a pair of interfitting sheath-clamping members, one of which engages the interior of the sheath and has its interior outwardly flared about its circumference gradually away from the insulation, an insulating material surrounding the belled end of the inner clamping member, and side and top structure coöperating with said members.

2. In a device of the character stated, outer and inner members threaded for engagement with each other and having coöperating cable-sheath-clamping surfaces facing each other and extending at an angle to the direction of the length of the cable, one being belled gradually to relieve the cable insulation of injury due to electrostatic discharges, an insulating material surrounding the belled end of the inner clamping member, an outer insulating casing adapted to surround the cable between the clamping members and the end of the cable and a top for the casing.

3. In a device of the character stated, an outer clamping member internally threaded, an externally threaded inner clamping member belled at its opposite end from the clamp, the belled portion extending axially beyond the threaded part of the outer member, an outer insulating casing threaded to engage with one of the clamp members, an insulating material surrounding the belled end of the inner clamping member, and a cap for said casing.

4. In a device of the character stated, an outer clamping member internally threaded, an inner clamping member externally threaded to engage therewith, a cylindrical casing threaded into the outer clamping member, and insulating compound coöperating with the casing to lock the clamp members together.

5. In a device of the character stated, an outer clamping member ribbed at its lower end and internally threaded at its upper end, an inner clamping member having a different clamping curvature from that of the outer clamping member, outwardly threaded at its lower end and ribbed at its upper end to engage the outer clamping member the ribbed end extending axially beyond the threaded portion of the outer member and a casing threaded into the outer member.

6. In a device of the character stated, an insulating casing, and a metallic cable-sheath-clamping base therefor adapted to surround the cable and belled at its extremity to diverge progressively from the insulation of the cable.

7. In a pot head, an outer casing, a base member, and a member adapted to surround the cable where the sheath has been removed, terminating at one end in a tapered surface in proximity to the insulation of the cable, and belled at the other end to progressively flare away from the insulation and insulating material surrounding the said belled end.

8. In a pot head, a base gradually belled away from the cable and having the belled portion of exterior non-circular section, a body portion surrounding the belled portion of the base and separable from the base and insulating material surrounding said belled portion.

9. In a pot head, a body, a base member therefor tapered at one end to spread a cable sheath and gradually belled at the other end to distribute static discharge and a coöperating member of different taper from the taper of the base member.

10. In a device of the character stated, a casing, a metallic, cable-sheath-clamping base therefor adapted to surround the cable, a belled member of generally cylindrical form adapted to surround the cable and to diverge progressively from the insulation of the cable, said member being adapted to receive electrostatic charges from the cable.

11. In a cable terminal, a pair of cable-sheath clamping members adapted to grip

the inner and outer faces of the cable-sheath, that gripping the inner face extending at its opposite end to a distance radially from the cable insulation, a casing extending axially in a direction away from the sheath over the exposed cable insulation to a point beyond the clamping members and insulating composition having specific inductive capacity greater than air and filling the space between the cable insulation and the casing and against the clamping member.

12. In a cable terminal, inner and outer cable-sheath clamping members, the inner member terminating at its non-clamping end at a distance radially from the cable insulation, a casing extending axially beyond the cable-sheath to a distance beyond the inner clamping member and insulating composition having specific inductive capacity greater than air and filling the space about the inner clamping member against the cable insulation and the casing.

HORACE P. LIVERSIDGE.

Witnesses:
J. C. VOGEL,
WILLIAM STEEL JACKSON.