

April 16, 1935.

E. A. CASEY

1,997,627

ELECTRIC FITTINGS

Filed Aug. 16, 1932

2 Sheets-Sheet 1

Fig. 1.

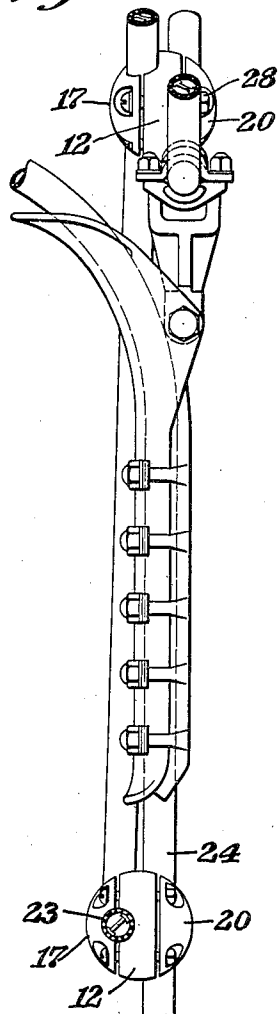


Fig. 2.

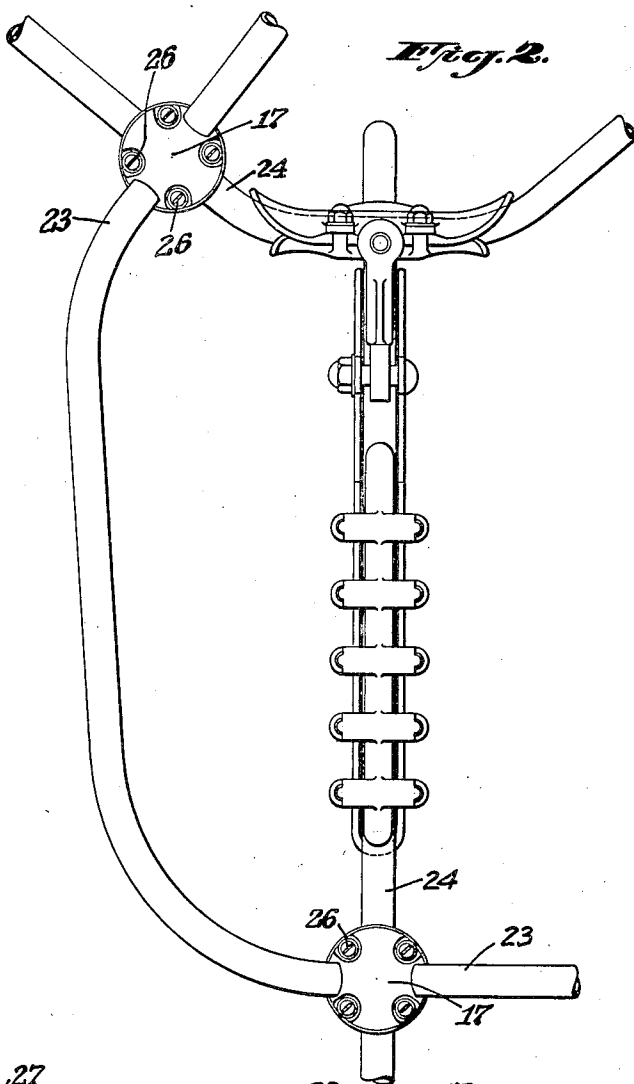


Fig. 3.

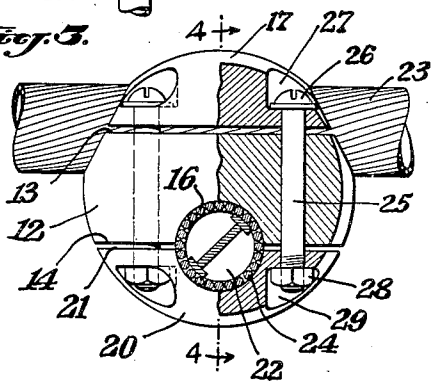
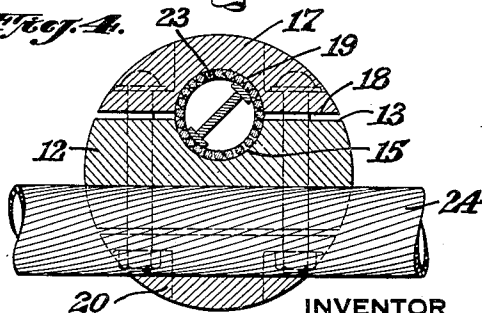


Fig. 4.



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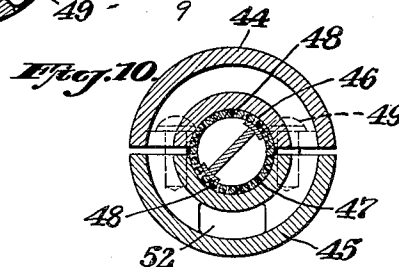
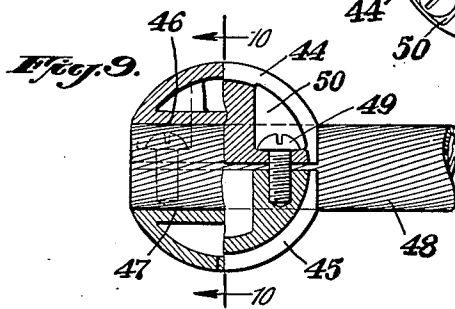
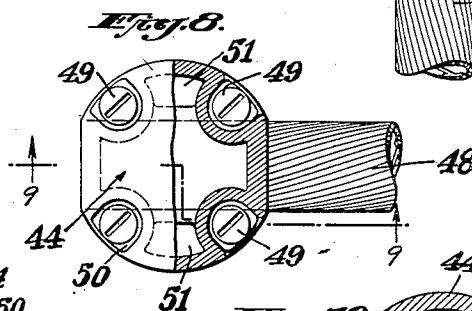
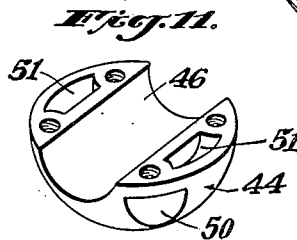
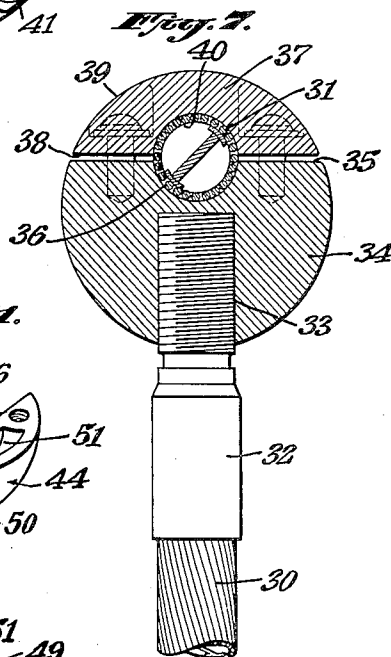
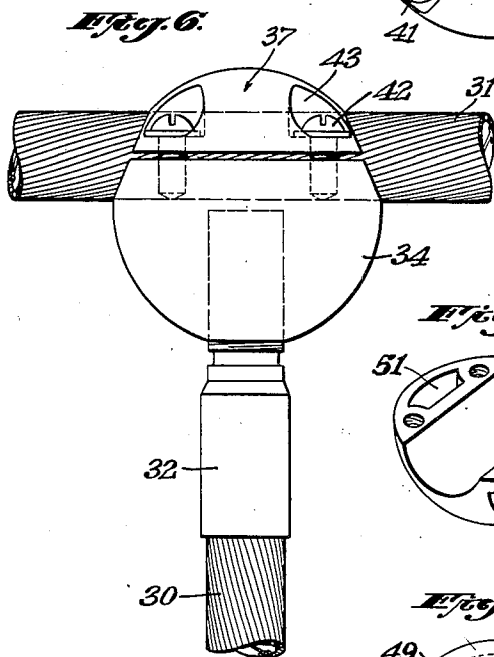
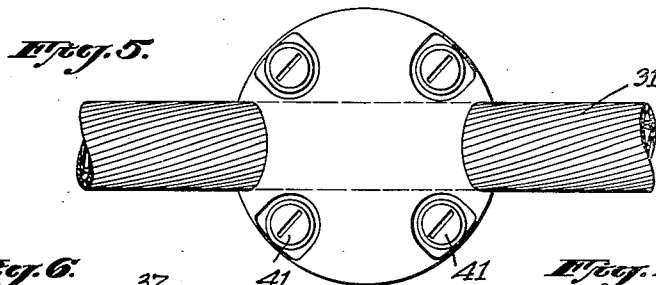
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2 Sheets-Sheet 2



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ELECTRIC FITTINGS

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Application August 16, 1932, Serial No. 628,961

5 Claims. (Cl. 173-263)

My invention relates to fittings for electric installations, particularly for high tension alternating current transmission lines and apparatus.

The passage of electricity at a high tension tends to create silent discharges, ionization or related phenomena known as corona, giving rise to certain losses in electrical energy which are known as current losses. The tendency toward corona effects is more pronounced wherever sharp edges or points are present, and is reduced to a minimum on rounded or spherical surfaces free from sharp points, and particularly on rounded surfaces of minimum curvature. In transmission lines it is at times necessary to terminate the conductor or to join it to another conductor, or to make a connection between two intersecting conductors. The fittings heretofore used for making such connections necessitated the formation of projections or edges which promoted corona effects and current losses.

An object of my invention is to provide fittings for electrical conductors and other apparatus in which the use of projecting parts or of edges or areas of sharp curvature is avoided, or in which such parts are concealed or contained within the surface of curvature of some associated parts which nullifies the presence of such projections.

Other objects of the invention are to provide fittings of the above type that enable the various electric elements of an electric system to be quickly and easily assembled, and in which the mass and weight of the fittings is a minimum.

With these and other objects in view which will appear more fully from the following description, the invention comprises the various devices described in the following specification and claims.

The various features of the invention are illustrated in the accompanying drawings, in which—

Figs. 1 and 2 are, respectively side and front views of a common type of electric connections illustrating the use of the fittings of the present invention.

Fig. 3 is a vertical view, partly in section, of a cross connecting fitting embodying the invention.

Fig. 4 is a section of the fitting taken on line 4-4 of Fig. 3.

Figs. 5, 6 and 7 are, respectively, plan and side elevation and cross section of a T-fitting embodying the invention.

Fig. 8 is a side view, partly in section, of a terminal fitting.

Fig. 9 is a section of the terminal fitting taken on the line 9-9 of Fig. 8.

Fig. 10 is a cross section of the terminal fitting of Fig. 8.

Fig. 11 is a perspective view of an element of the terminal fitting.

In my invention the various fittings are made in the form of spheres composed of separable sections between which the electric conductors or other parts are engaged and clamped. The sections have complementary grooves which, when the sections are bolted together, form passages in which the electric conductors are engaged. The sections have countersunk niches in which the heads and nuts of connecting bolts are placed so as to lie within the curvature of the sphere. In this manner there are no projections or points of discharge of any kind between or from the conductors. Only spherical surfaces, affording minimum tendency for corona, are present.

Referring more particularly to Figs. 1, 2, 3, and 4 of the accompanying drawings, a coupling fitting is shown which comprises a central section or member 12 having two plane surfaces 13 and 14 and an intermediate surface of spherical curvature. In the upper plane surface 13 there is formed a semi-cylindrical groove 15 and a similar groove 16 is formed in the lower surface 14, the groove 16 lying in a transverse direction or at right angles to that of the groove 15.

An upper section 17 is provided with a plane surface 18 and a semi-cylindrical groove 19 therein fitting the surface 13 and complementary to and completing the cylinder of the groove 15 respectively. The upper surface of the section 17 has the same spherical curvature as that of the section 12 and forms a continuation of the latter. Similarly, a lower section 20 is provided having a plane surface 21 and a semi-cylindrical groove 22 fitting the surface 14 and complementary to the groove 16 respectively. The outer face of the lower section 20 also has the semi-spherical curvature as the central part 12 so as to form a complete sphere with the parts 12 and 17. There are thus provided two cylindrical passageways between the sections which encircle and clamp the separate transversely extending conductors 23 and 24. Hollow conductors are shown by way of example, but it will be understood that solid or other types of conductors may be used with the fittings of the present invention. The sections 12, 17 and 20 are held and clamped in assembled position by means of bolts 25, four of such bolts being shown by way of example. The heads 26 of the bolts 25 are contained within niches 27 of the sections 17, and the clamping nut 28 is contained within a niche 29 of the lower section 20. It will be un-

derstood, of course, that the position of the bolts may be reversed from that shown.

The heads 26 and nut 28 being contained within the niches 27 and 29 respectively, lie within the curvature of the fitting and do not, therefore, provide any points or edges projecting beyond this curvature and which might, therefore, tend to build up current effects and corona losses.

The application of the above fitting is illustrated in Figs. 1 and 2, in which the upper conductor 23 may be joined to either of two lower conductors 24 so as to connect the two lower conductors in a suspension assembly through the chambered cable 23. The connecting fittings in Figs. 3 and 4 may be used in this and other standard arrangements of high tension conducting systems.

The fitting shown in Figs. 5, 6 and 7 is used to join a conductor 30 to a main conductor 31. For this purpose the conductor 30 is provided with a threaded terminal 32 which is threaded into a tapped recess 33 in a lower section 34 of a globular connector. The section 34 has a plane upper surface 35 in which a groove 36 of semi-cylindrical shape is formed. An upper section 37 has a lower plane surface 38 fitting and coinciding with the plane surface 35 and an outer surface 39 of spherical curvature forming a complete sphere with the lower section 34. The plane surface 38 is provided with a semi-cylindrical groove 40 complementary to and overlying the groove 36 and forming a passageway in which the conductor 31 is gripped.

The two sections 34 and 37 are clamped together by means of screws 41, the stems of which pass through the upper section 37 and are threaded into the lower section 34. The heads 42 of the screws 41 are contained within niches 43 so as to lie within the curvature of the plane.

Figs. 8, 9, 10 and 11 show an embodiment of the invention forming a terminal to a conductor line. This terminal is formed of two hemi-spherical parts 44 and 45, having semi-cylindrical grooves 46 and 47 into which a cable 48 extends. The two hemi-spherical parts are placed in complementary position on the conductor 48 and are then secured together by means of screws 49 which clamp the halves onto the conductor 48, the heads of the screws 49 being received in niches 50 formed in one of the hemi-spherical halves. The conductor 48 may extend the entire length of the semi-cylindrical grooves 46 so that its end is flush with the globe formed by the parts 44 and 45 or, it may terminate within the globe. It should not, however, extend beyond the globe as this would expose the sharp edges of the conductor.

The invention as applied in Figs. 8 to 11 forms a terminal or end of a conductor which, being globular, is best situated to avoid corona losses.

In order to make the globular terminal as light as possible, the hemi-spherical elements 44 and 45 are formed with communicating openings 51 and with a vent 52 to permit escape of moisture that might seep into the globe.

Through the above invention, cables and other conductors may be joined, or terminated, or crossed and secured to each other without forming any sharp edges or points of silent discharge that would favor corona phenomena and losses. Any sharp or irregular surfaces that are acquired in the assembling of the devices are entirely within the surface of curvature of the connecting parts and, therefore, their effects are nullified or shielded.

What I claim is:

1. A fitting for high tension electric lines which comprises a metal sphere composed of separable sections, one of said sections having a socket to receive the end of a conductor, and said sections having complementary grooves at their contacting faces to receive and clamp a cable.

2. A fitting for high tension electric lines which comprises a metal sphere composed of a larger and a smaller section, said larger section having a socket to receive the end of a conductor, and said sections having complementary grooves on their contacting surfaces, screws for securing said sections together to clamp them about a conductor in said groove, the smaller of said sections having niches to receive the heads of said screws.

3. A fitting for high tension electric lines which comprises a metal sphere composed of an inner section having a spherical surface and plane surfaces, grooves in said plane surfaces passing in transverse directions one to the other, and sections completing said sphere and having grooves complementary to those of said inner section, and means to secure said sections together.

4. A fitting for high tension electric lines which comprises a metal sphere composed of an inner section having a spherical surface and plane surfaces, grooves in said plane surfaces passing in transverse directions one to the other, sections completing said sphere and having grooves complementary to those of said inner section, and bolts to secure said sections together, the outer of said sections having niches to receive the heads and nuts of said bolts respectively.

5. A fitting for high tension lines which comprises a metal sphere composed of sections, said sections having a pair of complementary grooves on contacting surfaces positioned, when said sections are assembled, to grip a transmission line and means associated with one of said sections to engage and hold a second transmission line.

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