

# UNITED STATES PATENT OFFICE

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## CABLE JOINT

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1

My invention relates to improvements in cable joints, more particularly to joints for connecting together two lengths of gas filled cables of the single conductor type having a gas supply channel within its electrostatic field.

Where single conductor gas filled cables having a central gas supply channel are joined together, it is necessary to provide a joint that will provide a convenient means for continuing the gas feeding channel through the insulation of the joint, and has for its object to provide a structure that will present a symmetrical distribution of the stress by utilizing a plurality of gas channels within the insulation symmetrically disposed around the central axis of the joint, each channel forming a tortuous path substantially in a plane passing through the central longitudinal axis of the joint.

A further object is to provide an increase in length of the path of the gas channel from the center of the joint to the outer case thereby reducing gradually the drop in electrical stress, as the gas passes from the center of the electrical field to the casing surrounding the joint, which is at ground potential.

A further object of the invention is to provide an improved cable joint construction of the single conductor type having passage means in the body of the splice for connecting the center hollow core of the cable conductor ends joined, to the space between the outer surface of the wrapped insulation of the joint and the inner surface of the joint casing and yet obtaining the desirable high dielectric strength of the splice. It is readily seen that such improved cable joint design could be used with advantage as a feeder joint; that is, insulating oil or gas as the case may be could be fed into the cable system from any of its joints by means of attaching an oil or gas reservoir to the joint casing.

The foregoing and other features of my invention will now be described in connection with the accompanying drawings forming part of this specification in which I have represented my cable joint in its preferred form, after which I shall point out in the claims those features which I believe to be new and of my own invention.

Figure 1 is a longitudinal cross-section of my cable joint in its preferred form.

Figure 2 is a cross-section along the line 2—2, Figure 1.

Figure 3 is an enlarged longitudinal cross-section of the connector which I employ.

Figure 4 is a cross-section of the connector along the line 4—4, Figure 3.

2

Figure 5 is a cross-section of the connector along the line 5—5, Figure 3.

Figure 6 is a diagrammatic sketch of the cable system in which my cable joint is used showing three of the joints in the line.

My cable joint is used to connect two sections of gas filled cables of the single conductor type having a gas delivery pipe within the electrostatic field.

A successful joint of this character must not only provide for a continuous and uninterrupted passage through the joint connecting the gas delivery pipes in each section to be spliced, but it must also provide a long continuous and uninterrupted passage from the gas delivery pipe to the space between the insulation and the casing covering the joint.

In the carrying out of my invention I join two ends 13 and 14 of a hollow core gas filled cable together, as shown. The lead sheath 11 and the gas passages 12 underneath the sheath 11 are cut back as shown. The conductors 20 and 21, are connected together by a connector 26 as shown in Figure 1 by soldering or pressing in accordance with present standard practice.

The gas feeding pipe of each cable length is connected to each end of the central channel 27 so that gas passage is continuous through the joint. The small spaces between the connector and the factory applied insulation of the cable are filled with wrappings of insulation 23, the electrostatic shield 3 over the exposed cable insulation of the two cable ends is removed up to a point close to the lead sheath ends and an oil presaturated paper roll 22 is wrapped tightly over the insulation of each cable end, the paper roll being of such shape that when wrapped its outer contour is substantially as shown in Figure 1.

Over the circumferential surface of connector 26 and paper roll 22 are placed a number of insulated strips 32 as shown in Figure 2, the space between two consecutive strips forming gas channels 24 in communication with one of the radial gas channels 28 of the connector, these strips to be of any desired length in accordance to the radial and longitudinal electric stress distribution desired for any particular voltage rating of the joint. Over the insulating strips 32, the connector 26 and the paper roll 22 is wrapped the first layer of substantially dry taped insulation 25 up to a desired diameter and contour as generally shown in Figures 1 and 2. Over this wrapped insulation and partially over the paper roll are placed another desired number of insulated strips 32 of any desired length forming gas