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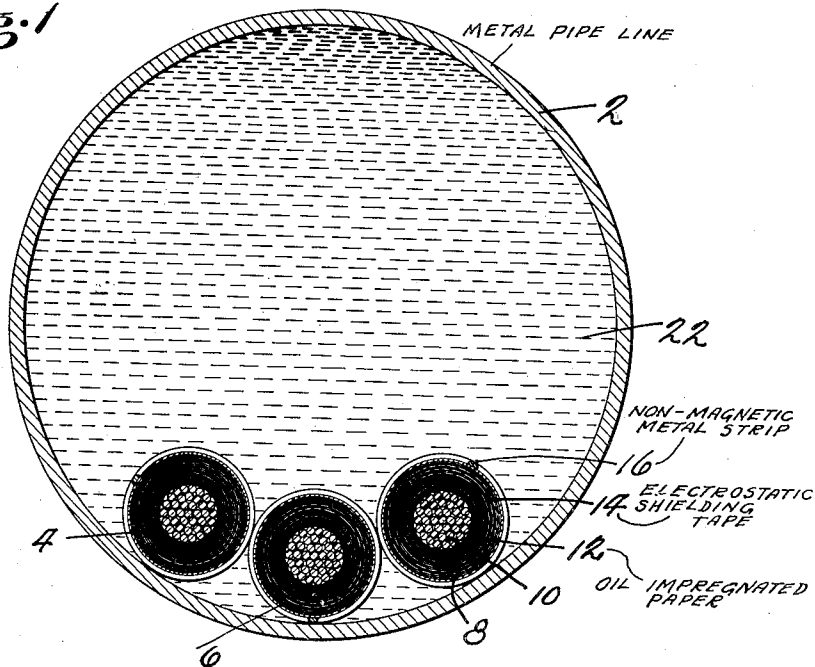
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2,222,932

ELECTRIC CABLE

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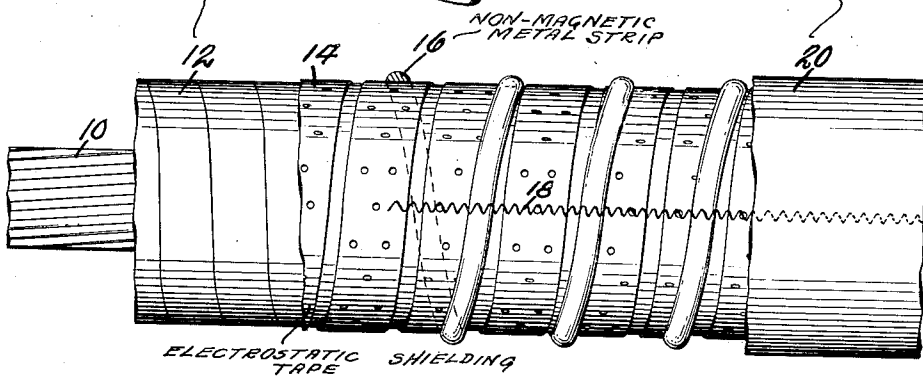
Fig. 1



OIL IMPREGNATED PAPER

Fig. 2

TEMPORARY LEAD SHEATH



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ELECTRIC CABLE

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2 Claims. (Cl. 174—10)

This invention relates to an improvement in electric cables, particularly to high voltage cables which are installed in pipe lines.

These cables as heretofore constructed are usually composed of copper conductors insulated with laminated paper insulation. Over this insulation a suitable electrostatic shielding tape is applied and then some kind of protective covering such as braid, canvas tape or similar materials. This outer covering protects the paper insulation against abrasion when pulling the cable into the pipe line.

It has been found that the frictional resistance to pulling such cables into a pipe when a canvas or similar covering is used makes it difficult to pull long lengths, of the order of several thousand feet for example.

I have found that by installing a metallic covering instead of the canvas the frictional resistance to pulling in is very materially reduced. Actual tests have indicated a coefficient of friction one-half that of a non-metallic covering. It has been suggested to concentric armor the exterior of the cable, but this requires considerable material and the added weight tends to offset the gain in lessening the coefficient of friction.

In the proposed construction of this invention I employ a half round high resistance or non-magnetic metal strip wound spirally about the cable with gaps say of one-half inch between successive turns. When the shielding tape is installed a very thin cotton or paper tape is interlocked between successive turns of the shielding tape, the D section or half round outer non-magnetic strip touching and making contact with the shielding tape wherever the two metallic surfaces come together. This construction therefore short circuits the shielding tape at numerous intervals, the half round strip contacting the wall of the pipe line in which the cable is installed. The shielding tape in effect, therefore, is grounded continuously throughout its length.

Where shielding tape is installed with a paper or other insulated space between successive turns and then covered with canvas, as above mentioned, it is necessary to keep the successive turns of shielding tape short circuited as much as possible, for should the spirally wound shielding tape become open-circuited quite high voltages can be obtained in the tape under certain conditions of surge voltages or currents in the main conductors. This induced potential may be of such value that damage may be done to

the cable insulation. Under some conditions a sparking voltage continuously induced would sooner or later deteriorate the insulation.

The disadvantages and drawbacks referred to in the preceding paragraph are overcome by the present invention.

An embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a cross sectional view of a three phase cable of the present invention, installed in a pipe line; and

Fig. 2 is an elevational view of one of the cables of Fig. 1 with parts broken away at different levels for clarity of illustration.

Referring to the drawing in detail, 2 designates an iron or steel pipe line in which the cable is to be installed. A three phase system has been illustrated, the separate cables being designated 4, 6 and 8 respectively.

These cables are alike and one has been illustrated in detail and on a larger scale in Fig. 2.

With reference to this figure of the drawing, 10 designates the conductor, which is insulated with oil impregnated oil filled paper tape 12. About this insulation is spirally wound electrostatic shielding tape 14. This tape may be thin copper for example, and it may if desired be interlocked with a very thin cotton or paper tape.

Over the shielding tape 14 and contacting therewith, I spirally apply a half round or D section non-magnetic metal strip 16. This is applied with its convex face outward, the flat face lying in contact with the shielding tape 14.

Extending lengthwise of the cable over the strip 16 is a crimped piano wire 18, and about the whole assembly is applied an outer sheath, as for example a thin lead sheath 20. This sheath 20 is removed by ripping the same open with the piano wire 18 as the cable is drawn into the pipe line 2.

After the three phases have been pulled into the pipe line the latter is filled with oil under pressure designated 22.

It will be appreciated that by crimping the piano wire 18 the cable may be reeled for shipment without endangering the wire. It will be apparent also that by employing a half round strip over the shielding tape the frictional resistance to pulling the cable into the pipe line is very materially reduced as compared with canvas and the like, with the added advantage that, inasmuch as this half-round strip contacts the metal pipe line and the shielding tape, the latter will be short circuited substantially continuously throughout its entire length.

It is to be understood that changes may be made in the details of construction and arrangement of parts above described within the purview of this invention.

5 What I claim is:

1. An electric cable comprising in combination an insulated conductor, electrostatic shielding tape interlocked with a non-metallic tape wrapped about the insulation, and a solid metal strip of substantially half-round cross section wrapped about the said electrostatic shielding with its flat face in contact with the shielding.

2. An electric cable comprising in combination a conductor, impregnated insulation for the conductor, electrostatic shielding tape surrounding the insulation, a solid metal strip of substantially half round cross section wrapped about said shielding tape with its flat face in contact with the shielding, a crimped wire extending lengthwise of the cable and overlying said strip, and an outer sheath adapted to be ruptured by said wire to remove the same from the cable when the latter is installed.

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