

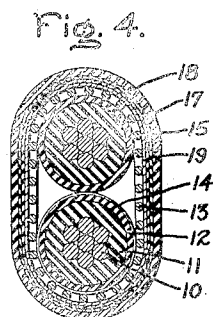
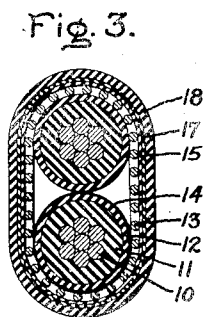
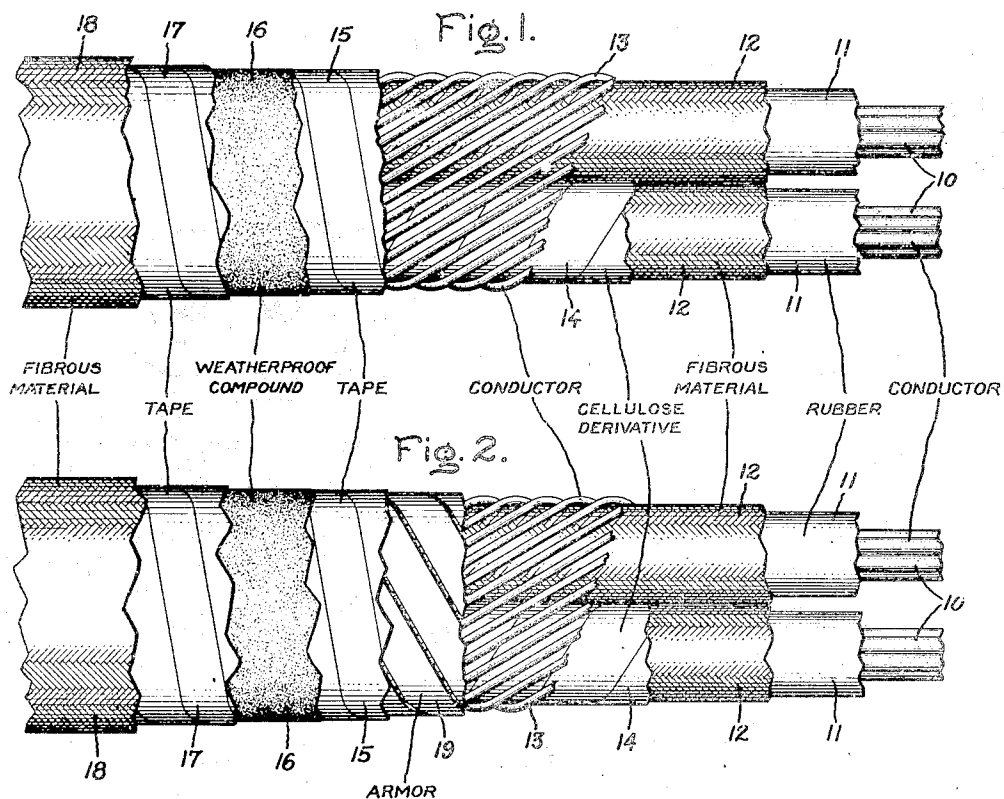
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ELECTRIC CABLE

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ELECTRIC CABLE

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2 Claims. (Cl. 174-107)

This invention relates to electric cables, and more particularly to armored cables for outdoor use.

It is customary in providing an electric main for the conduction of current from a pole to a house-wiring system to employ for part of the main an armored cable having sufficient conductors for a two-wire or three-wire system, and one which is heavily armored and weatherproofed to discourage malicious tampering therewith and to resist exposure to the elements. Such a cable is commonly known to the trade as "service entrance cable" and comprises two insulated conductors arranged side by side within an overlying sheath of stranded conductors or armor and an outer insulating material. In various installations it is necessary to subject the cable to frequent bends or twists; this is rather difficult to do in those cases where the parallel conductors must be bent on edge in view of the heavy overlying armor and insulating wraps which closely engage the conductors and hinder them from moving relatively to each other.

It is an object of the invention to provide an improved electric cable of the type described which may be easily bent in any direction without difficulty and without injury to the conductors thereof.

In the accompanying drawing Fig. 1 is a view of the cable stripped back to show the elements thereof; Fig. 2 is a similar view of a modified form of cable; Fig. 3 is a sectional view through the cable of Fig. 1; and Fig. 4 is a sectional view through the cable of Fig. 2.

Referring to the drawing, the electric cable is formed with a plurality of conductors 10 each provided with a heavy insulating covering 11 of rubber, or the like, which, in turn, is overlaid with a fibrous covering 12, for example, a cotton braid. In order to moisture proof the individual conductors, the braids are impregnated with an asphalt saturant and coated with a pitch filler. For the purpose of polarity identification one of the conductors may be painted a distinguishing color, the paint being applied directly over the pitch film. The individual conductors are now cabled together in side by side relationship with an overlying stranded metallic conductor 13. The strands are applied in the form of a spiral wrap directly over the individual conductors.

Prior to cabling of the conductors, the unpainted one is provided with an overlying wrap 14 of smooth insulating material, for example, regenerated cellulose. The cellulosic wrap may be applied in the form of a spiral, or it may be

longitudinally wrapped around the insulated conductor. By this arrangement the saturant in the braid and the pitch filler are retained behind a relatively impervious layer so that they cannot become mixed with the coloring compound of the other conductor. This means that the conductors may always be easily identified. In addition, the layer of regenerated cellulose being an excellent insulating material greatly increases the dielectric strength between the individual conductors 10 and the concentric outer conductor 13 thereby reducing the chances of breakdown of the cable.

When in cabled position the individual conductors are closely gripped by the overlying strands 13 of the conductor inasmuch as the fibrous insulating material, such as the impregnated braid 12, forms a relatively rough sticky surface giving a high frictional contact with the strands. This means that edgewise bending of the oblong-shaped cable assembly is resisted due to the inability of the conductors to move relatively to the outer conductor in those cases where the smooth layer of regenerated cellulose is omitted. In such cases, slight longitudinal movement of the insulated conductors relative to one another is likewise retarded due to the frictional engagement of the impregnated braids 12 causing further resistance to bending of the cable. Cases have been known in which edgewise bending of the cable has caused buckling and kinking of the conductor on the inner side of the bend with consequent failure of the insulation. However, by providing a layer of regenerated cellulose around one of the conductors, it is possible to greatly reduce the frictional resistance to sliding between the conductors as well as that between the strands 13 and the braids 12. The smooth finish of this layer facilitates relative sliding movement between the insulated conductors and the strands 13 to such an extent that edgewise bends of the cable may easily be made. It has been found that a layer of regenerated cellulose on one of the insulated conductors is sufficient to accomplish the purpose of easy bending. In some cases, however, it may be desirable to wrap both of the conductors with this material; for example, if it were desired to increase the dielectric strength of the cable. Edgewise bending of the cable in either direction places the wrapped conductor under either tension or compression causing it to move slightly relative to the outer strands 13 and the other conductor. Very little movement takes place between the latter elements so that the

cable assembly is not distorted. While it is preferred to make the layer 14 of regenerated cellulose, other materials may be used, for example, cellulose acetate or a smooth material such as varnished cambric. The advantages of using a cellulosic derivative are that it is smooth and tough and will stand hard usage; it is a good insulator; it is relatively thin and does not appreciably increase the overall dimensions of the cable; it is transparent permitting the use of a colored paint beneath it, or it may itself be colored for polarity identification of the conductors.

Over the stranded conductor 13 is placed a rubber faced tape 15, a layer of asphalt compound 16 and another rubber faced tape 17. This arrangement provides an effective weatherproof covering for the assembled conductors. The tapes prevent the asphaltic layer from coming in contact with the stranded conductor, so that the latter may be easily handled and the cable stripped without difficulty. An overall braid 18 surrounds the tape 17 and provides mechanical protection for the assembly; it is saturated with moisture-resisting and flame-retarding compounds, for example, asphalt and stearine pitch, to further protect the cable. The saturated cover may be painted to provide a smooth dry finish and one which presents a pleasing appearance and is easy to handle.

In those cases where the cable is connected to a three-wire system the strands 13 are connected to form the third or neutral conductor while in a two-wire system the strands may form simply an armor which may or may not be grounded. In both cases, however, the strands protect the inner conductors from blows, and make it difficult for one to tamper with the cable or tap the inner conductors. Should the outer covering and armor become damaged the inner live conductors are nevertheless protected by the heavy insulating layer of rubber and the individual coverings of weatherproofed braid. This means that the cable is well adapted for use in exposed positions.

In those cases where extra protection for the

cable is desirable a flat band armor may be applied directly over the stranded conductor 13 beneath the tape 15, as shown at 19, in Fig. 2. The advantages of such a construction are that the stranded conductor is protected from damage and unwarranted tampering with the cable is made especially difficult.

What we claim as new and desire to secure by Letters Patent of the United States, is:

1. An electric cable comprising a plurality of conductors, insulation for each of said conductors including a layer of fibrous insulating material having a rough surface, a wrap of smooth insulating sheet material surrounding and completely enclosing the fibrous insulating material on at least one of said conductors, the conductors thus insulated being assembled together in side by side parallel relationship, a conductor comprising individual strands spirally wrapped around the assembled conductors and an overall insulating covering over said stranded conductor, said smooth insulating material providing for slippage between the individual insulated conductors and the stranded conductor upon edgewise bending of the cable.

2. An electric cable comprising a plurality of conductors, insulation for each of said conductors including a layer of fibrous insulating material having a rough surface, a wrap of sheet material comprising regenerated cellulose having a smooth outer surface surrounding and completely enclosing the fibrous insulating material on at least one of said conductors, the conductors thus insulated being assembled together in side by side parallel relationship, a conductor comprising individual strands wrapped spirally around the assembled conductors, and an overall insulating covering over said stranded conductor, said wrap of regenerated cellulose providing a smooth surface for slippage between the insulated conductors and the stranded conductor upon edgewise bending of the cable.

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