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ELECTRICAL INSULATION

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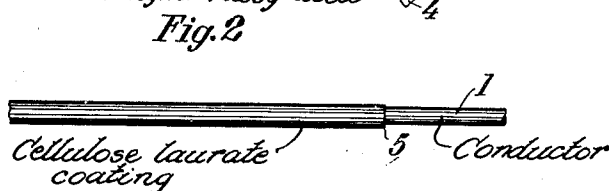
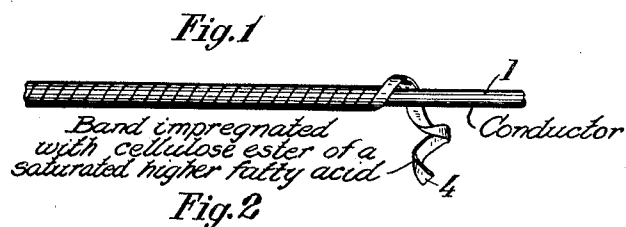


Fig. 3



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ELECTRICAL INSULATION

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7 Claims. (Cl. 173—264)

The following invention relates to improvements in electrical insulation and is based on the observation that cellulose esters of higher organic acids, comprising unsubstituted and substituted, saturated higher fatty acids and cycloparaffine acids such as naphthenic acid, mixtures of such esters and mixed esters or ether-esters of cellulose with such a higher acid are extraordinarily useful for making insulating materials for electrical purposes.

It is required of insulating material for electrical purposes that it shall be as insensitive as possible to the effect of moisture. There have been many proposals to make insulating material from artificial resins. Also mixtures of bituminous substances and cellulose esters of fatty acids have been suggested for electrical insulation, without, however, any practical result.

By the present invention cellulose esters of saturated higher fatty acids alone, without the addition of bituminous substances, are used for making insulating materials for electrical purposes and particularly for insulating wires. The dielectric constant of ebonite, for example, is 2.7 at 18° C. and that of cellulose dilaurate is 2.5 to 3. An ebonite sheet of 1 mm. thickness has a dielectric strength of 30 k. v. The dielectric strength of a like sheet of cellulose dilaurate amounts to twice this value. The new insulating material has a remarkable resistance to water. The dielectric strength of a rubber sheet laid in water for 24 hours sank to one-half, whereas a wire insulated with an equally thick layer of cellulose dilaurate showed no appreciable diminution in dielectric strength after having lain in water for several days.

There can be used for the invention an ester of any unsubstituted or substituted, saturated higher fatty acid, that is one containing more than 10 carbon atoms, for example cellulose stearate, cellulose laurate, cellulose naphthenate. These cellulose esters may be used in the form of sheets, or paper or textile fabric may be impregnated with a solution of the ester and then used as insulation. The object to be insulated may be coated with a varnish which contains the cellulose derivative. When the ester in question is not soluble in an organic solvent, the insulating material may be made by bringing the cellulose

derivative into the desired form without the aid of a solvent, by mechanical pressure at a raised temperature below that at which the cellulose derivative flows; in this operation threads, fabrics or other carriers may be incorporated with the insulating material. The selection of the cellulose ester to be used depends on the purpose for which the insulating material is required.

Mixtures of two or more cellulose esters may be used as well as mixed esters or ether-esters of cellulose with higher fatty acids, for example celluloseacetate-celluloselaurate, cellulose-ethyl-etherlaurate, cellulose-acetate-butyrate-laurate.

In the accompanying drawing Figs. 1 to 3 show an electric conductor in form of a wire insulated according to the present invention.

In Fig. 1 the wire 1 is insulated by a band 4 impregnated, for instance, with cellulose stearate and wound around the wire.

Fig. 2 shows the wire 1 insulated by a coating 5 of cellulose laurate.

Fig. 3 shows a section of the wire represented in Fig. 2, the wire 1 being surrounded by the coating 5 of cellulose laurate.

I call attention to the fact that the term "higher fatty acids" as used in this specification and in the claims hereto annexed includes unsubstituted and substituted, saturated higher fatty acids and cyclo paraffine acids such as naphthenic acid.

What I claim is:—

1. An electrical conductor insulated with a cellulose derivative containing in its molecule at least one radical of a saturated higher fatty acid.
2. An electrical conductor insulated with a mixed ester of cellulose containing in its molecule at least one radical of a higher saturated fatty acid.
3. An electrical conductor insulated with a cellulose ether-ester containing in its molecule at least one radical of a saturated higher fatty acid.
4. An electrical conductor insulated by a cellulose derivative containing in its molecule at least one radical of lauric acid.
5. An electrical conductor insulated with cellulose dilaurate.
6. An electrical conductor insulated with cellulose-ethylate-laurate.
7. An electrical conductor insulated with cellulose-acetate-butyrate-laurate.

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