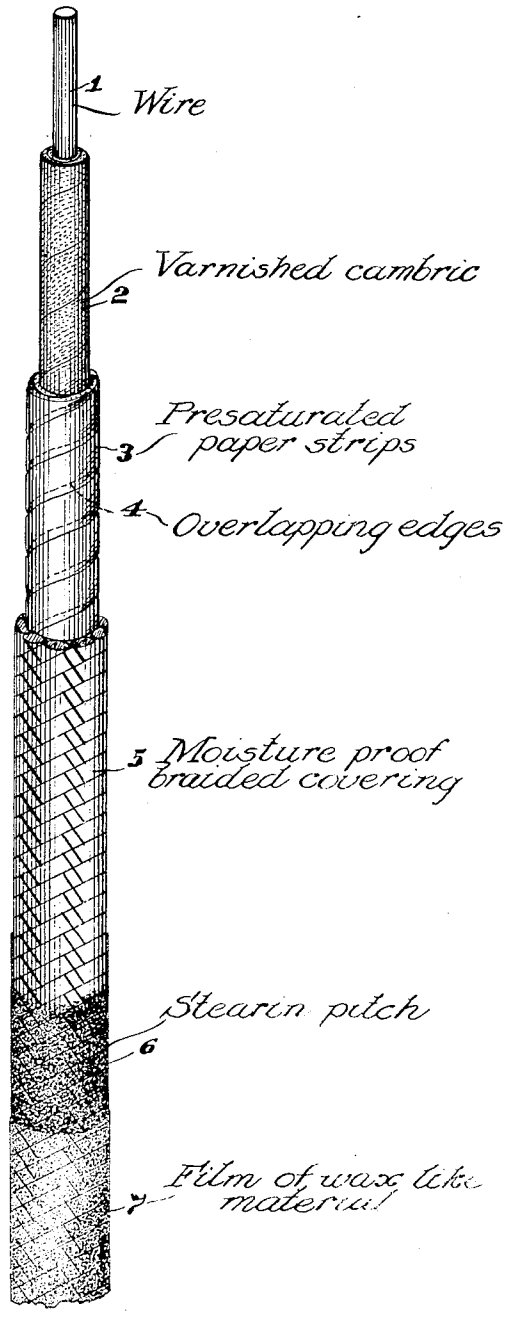
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ELECTRIC CONDUCTOR

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ELECTRIC CONDUCTOR

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This invention relates to electric conductors and aims to provide such a conductor which shall be adapted for use in relatively high temperatures and humid atmospheres such as may be found in some switchboard installations, in boiler rooms, in engine rooms of battleships and the like without being seriously affected by the high temperature and moisture conditions to which it is exposed.

Insulated conductors as commonly constructed consist of a metal wire having a rubber jacket over which may be provided one or more layers of fibrous material, and it has been proposed heretofore to treat the fibrous material with compounds to render such material moisture-proof. The rubber jacket placed about the conductor in the constructions as heretofore commonly made, is an excellent insulator, but where it is subjected to relatively high temperatures during use the rubber jacket deteriorates and becomes hard and inelastic, so that when bent the rubber jacket is liable to break or crack in some parts, thus causing current leakage.

It has heretofore been proposed to wrap the wire with a varnished fabric or the like, and impart fire resistant qualities to the conductor by a covering of asbestos, but while the asbestos was fire resistant, it was moisture absorbent, thus rendering the covered conductor unsuited for use under conditions where heat and moisture were present. Such combined conditions usually exist together in such places as engine rooms, boiler rooms, some switchboard installations, and the like, with the result that conductors, as above constructed with an asbestos covering, were objectionable and unsuited for use under the conditions noted. It has been proposed also to place a cotton braid or the like about the rubber covered conductor and to wind strips of paper crumpled or otherwise formed, and to treat the conductor by a bath of moisture and/or fire repellent compound. Such conductors, as above generally outlined, are adapted for satisfactory and advantageous use under many conditions or installations, but where the conductor is subjected to high temperature and moisture during use such prior constructions have been found objectionable. In the first place, the moisture absorbent nature of the asbestos or the deteriorated rubber jacket is liable to permit current leakage, particularly should the conductor be bent, and the application of a moisture and/or fire repellent bath to the paper wrapping is liable to cause the paper wrappings to adhere to the underlying covering to such an extent as that the overlapping edges of the paper wrappings themselves are held from relative movement one upon the other when the conductor is turned or bent at sharp angles. These manifestations in the constructions heretofore made become pronounced when the conductor is used under circumstances where it is subjected to relatively high temperatures and moisture.

One of the objects of the present invention is to provide an electric conductor which may not only resist the high temperatures and moisture to which it is exposed in use, but which may be bent at sharp angles at any time without causing current leakage or obstructing relative movements of the overlapping edges of the paper wrappings.

The drawing represents a section of an electric conductor made in accordance with the present invention wherein the conductor wire 1 is provided with a primary insulating covering 2 which is substantially unaffected by relative high temperature conditions during use. Such primary covering may be formed of varnished cambric, cellophane or the like wound about the conductor. The varnished strips of material formed as above stated may be supplied with varnish advantageously by passing the cambric or other material through a bath of varnish and permitting the varnish to dry.

It is then proposed, in accordance with the present invention, to wind strips of paper 3 about the covered conductor, and since the invention contemplates that such paper strips shall have their edges overlapping as indicated at 4 and be supplied with a moisture repellent composition, the strips of paper before being placed about the covered conductor are presaturated with a moisture resisting compound such as is afforded by a bituminous product.

Should, however, the bituminous product be applied to the paper after it has been wrapped about the covered conductor the overlapping edges of the paper itself will become stuck together and preclude ready bending of the conductor without at the same time rupturing the paper itself.

Moreover, some of the bituminous product when applied after the paper has been wrapped about the covered conductor will find its way to the inner coils of the paper wrapping and cause such wrappings to tenaciously adhere to the covered conductor and these two factors combine to preclude to a large extent any bending of the conductor around sharp angles without at the same time causing a rupture of the paper wrappings or unyielding relative movement of their overlapping edges.

The problem thus presented has been solved,

however, in the present invention by pretreating or saturating the paper strip or strips 3 with the bituminous product and permitting the latter to become set or dried before it is applied about the covered conductor, with the result that there is no substantial adhesion between the paper wrapping and the covered conductor, and the overlapping edges 4 of the paper covering may readily yield as the conductor is bent without opening spaces between the coils of the paper and the underlying covering of the conductor.

A cotton braid or "loom" covering 5 is then placed about the paper wrappings and is treated with a bituminous product, such as asphaltum, so that when the cotton braid is thus treated in the preferred form of the invention it, and the presaturated paper wrappings, present a moisture resisting medium.

The conductor thus far described presents a heat resisting and a moisture resisting structure, and in order that the conductor as a whole may be made flame repellent a fire resisting compound 6, such as stearin pitch, is placed over the cotton braid.

The stearin pitch 6 is overlaid by a film of wax-like material 7, and in case a conductor is to be given a color in order to distinguish circuits, a coloring matter well known in the art is placed between the stearin pitch and the film of wax-like material.

From the construction described it will be apparent that the present invention has provided an electric conductor which is heat resisting by reason of the varnished material placed about the conductor itself, and consequently can be used under conditions of heat above normal. The presaturated paper strips which are wound about the covered conductor, with their edges overlapping, and the cotton braid, present a moisture-resistant medium so that the conductor may be advantageously used in high temperatures where humidity of the air is usually above normal, and in case the conductor is to be bent the presaturated paper windings 3 may yield relatively to each other and also with respect to the primary covering of the conductor.

The application of stearin pitch or other fire-resistant compound and film of wax-like material, either with or without a coloring matter between, imparts to the conductor as a whole, a flame resisting character. Thus the present invention provides a conductor which may be used without deterioration under conditions of high temperature and moisture, and may be bent about small arcs without causing any rupture of the component parts. It is heat resisting, moisture resisting, and flame resisting.

What is claimed is:—

1. In the art of electric insulation, an electric conductor having a primary insulating covering unaffected by relatively high heat conditions during use, one or more transversely crumpled paper strips presaturated with a moisture resistant bituminous product and laid about the insulating covering with the edges of the paper strips in overlapping relation to permit the overlapped edges free yielding movement relatively when the conductor is bent.

2. In the art of electric insulation, an electric conductor having a primary insulating covering unaffected by relatively high heat conditions during use, one or more transversely crumpled paper strips presaturated with a moisture resistant bituminous product and laid about the insulating covering with the edges of the paper strips in overlapping relation to permit the overlapped edges free yielding movement relatively when the conductor is bent and a coating of fire resistant material covering the paper wrappings.

3. In the art of electric insulation, an electric conductor having a primary insulating covering unaffected by relatively high heat conditions during use, one or more transversely crumpled paper strips presaturated with a moisture resistant bituminous product and laid about the insulating covering with the edges of the paper strips in overlapping relation to permit the overlapped edges free yielding movement relatively when the conductor is bent, a moisture resistant textile covering applied about the paper wrapping, and a coating of fire resistant material applied about the textile covering.

4. In the art of electric insulation, an electric conductor having a primary insulating covering unaffected by relatively high heat conditions during use, one or more transversely crumpled paper strips presaturated with a moisture resistant bituminous product and laid about the insulating covering with the edges of the paper strips in overlapping relation to permit the overlapped edges free yielding movement relatively when the conductor is bent, a moisture resistant textile covering applied about the paper wrapping, a coating of fire resisting material overlying the textile covering and a film of wax-like material laid about the fire resistant material with a coloring substance therebetween.

5. In the art of electric insulation, a conductor having a primary covering of varnished cambric unaffected by relatively high heat conditions during use, one or more strips of paper presaturated with asphaltum and covering the varnished cambric, a layer of textile material impregnated with a waterproof material covering the paper strips, and a flame resisting coating applied to the layer of textile material.

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