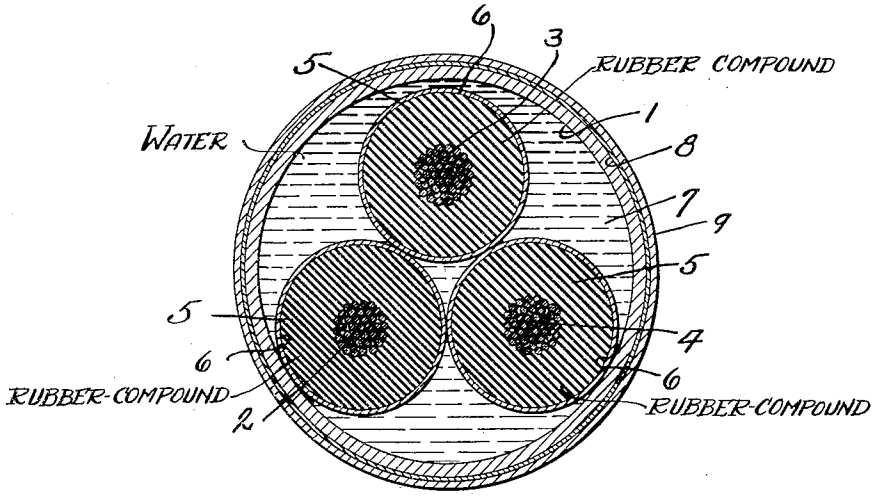
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ELECTRIC CABLE

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ELECTRIC CABLE

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This invention relates to an improvement in electric cables or electric cable systems and has for one of its objects the provision of a relatively inexpensive cable, capable of carrying heavy electric power loads economically.

My improved cable possesses also other advantages such as elimination of all fire hazard, ease of installation, low maintenance, high cooling characteristics, etc.

Briefly my invention comprehends a cable or cable system for carrying electric power loads in which a lead or other soft metal sheath loosely encloses an insulated conductor or a plurality of insulated conductors, the insulation being water impervious material, such as rubber, rubber compounds, gutta percha, etc., all referred to herein for brevity of description as rubber compounds. The space in the soft metal enclosure unoccupied by the cable conductor or conductors is kept filled with water. This water may be at atmospheric pressure, or it may be maintained under superatmospheric pressure say of the order of 200 pounds to the square inch.

My invention provides a cable which has many advantages over the ordinary oil-impregnated paper cable without sacrifice of the adaptability of the latter for installation purposes. For example, my improved cable is just as flexible as the paper cable and, therefore, can be wound on reels for shipping purposes; it can be pulled into existing duct systems as easily as the paper cable; the splicing of my improved cable is much simpler than that for a paper cable; oil is always a potential fire hazard, whereas the water present in this type of cable will be an aid to the extinguishing of a fire in case one should take place; oil is very expensive, whereas water is very cheap, thereby saving in the cost of a cable; due to the superior heat conduction and heat capacity characteristics of water as compared to oil, I greatly improve the cooling characteristics of the cable and, therefore, increase the current carrying capacity of the cable; it is possible without prohibitive expense to circulate the water in the cable or even continually to discharge it through the cable, thereby further increasing the current carrying capacity, this being very helpful in the case of generator leads where very heavy currents are usual and space requirements for the leads is limited, the importance of these leads also making it advisable to maintain them at as low a temperature as conveniently can be obtained; as the cable insulation is submerged in water, I obtain perfect grounding of the entire surface of the insulation and, therefore, eliminate the formation of corona which readily attacks rubber and has been the major factor in the limitation of using rubber compounds on high voltages.

In the accompanying drawing I have shown a cross section of my improved cable.

Referring to the drawing, 1 designates a soft metal flexible casing of lead or suitable alloy well known to those versed in this art. This casing loosely encloses the cable conductors 2, 3 and 4, each of which is insulated with a water impervious insulating material 5, referred to above as a rubber compound.

About this insulation I may or may not apply a shielding material 6, which may be conducting metal tape such as is well known in the cable industry. Alternatively I may employ a fabric impregnated with conducting material such as graphite, or a fabric treated with a rubber compound containing sufficient material such as graphite, for instance, to make it conducting; again the shielding material may be a rubber compound containing sufficient conducting material such as graphite, carbon black, etc. to make the compound conducting. This compound may be applied directly to the insulation of each conductor and vulcanized at the same time that the insulation is vulcanized. It is to be noted that no fillers are used in the interstices of the insulated conductors.

Inasmuch as the casing 1 in which the cable conductors are enclosed is of soft metal, no reeling or installation difficulties will be experienced.

After installation the cable casing 1 is kept filled with water designated 7. As mentioned above the water may be at atmospheric pressure, or when operating on higher voltages than ordinarily permissible for the wall thickness of insulation used then the water may be kept under superatmospheric pressure, 200 pounds to the square inch, for example. In this event it is desirable to reinforce the soft metal casing 1 by metal tape 8 or a suitable fabric tape, a suitable sheath 9 of soft metal being applied, if desired, about the reinforcing tape.

It should be noted that while I have referred to my invention as one in electric cables for carrying electric power loads, I wish it to be understood also that this expression "electric cables" is intended to include all methods of transferring electric power between two points, such as, for example, the transmission of power over long distances at high voltages between generating stations and/or sub-stations and/or distribution

points, but generator leads as well, in stations, transformer leads, bus leads and connections from within to the outside equipment of stations.

It is to be understood also that the showing of a three phase cable is merely illustrative inasmuch as it is within the contemplation of my invention to employ one or a plurality of conductors in the practice of my invention.

What I claim is:—

1. An electric cable for the transmission of high tension electrical energy comprising in combination a flexible imperforate enclosing casing, a conductor insulated with a solid water impervious material of high dielectric strength which is capable of being improved by the application of pressure thereto loosely enclosed within the said casing, and water under super-atmospheric pressure sufficiently high materially to increase the dielectric strength of the said conductor insulation filling the space within the casing unoccupied by the conductor and its insulation and in direct contact with the surface of the conductor insulation.

2. An electric cable for the transmission of high tension electrical energy comprising in combination a flexible soft metal imperforate water impervious casing, a conductor insulated with a rubber compound of high dielectric strength which is capable of being improved by the application of pressure thereto loosely enclosed within said casing, and water under super-atmospheric pressure sufficiently high materially to increase the dielectric strength of said conductor insulation filling the space within the casing unoccupied by the conductor and its insulation and in direct contact with the surface of the conductor insulation.

3. An electric cable for the transmission of high tension electrical energy comprising in combination a flexible imperforate enclosing casing, a conductor, insulated with a water impermeable material of high dielectric strength which is capable of being improved by the application of pressure thereto and with shielding material about the insulation, loosely enclosed in said casing, and water under super-atmospheric pressure sufficiently high materially to increase the dielectric strength of said insulating material filling the space within the casing unoccupied by the conductor and its insulation and directly contacting with said insulation.

4. An electric cable for the transmission of high tension electrical energy comprising in combination a flexible imperforate metal casing, a plurality of conductors each insulated with a water impermeable material of high dielectric strength, loosely enclosed in said casing, and water under super-atmospheric pressure sufficiently high to increase the dielectric strength of said insulating material filling the space within the casing unoccupied by the conductors and their insulation and directly contacting with the surface of said insulation.

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