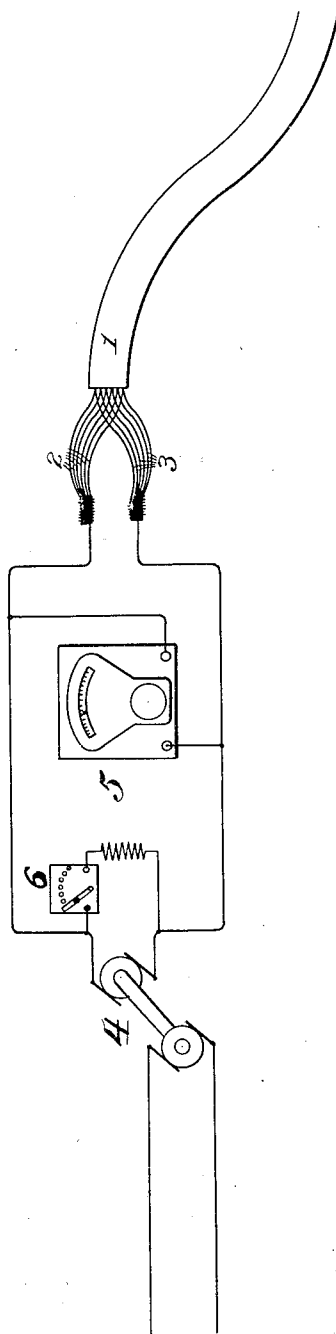


No. 851,747.

PATENTED APR. 30, 1907.

W. B. HALE.
PROCESS OF DRYING ELECTRIC CABLES.
APPLICATION FILED MAR. 12, 1906.



Witnesses:
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UNITED STATES PATENT OFFICE

WILLIAM B. HALE, OF MEXICO, MEXICO, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PROCESS OF DRYING ELECTRIC CABLES.

No. 851,747.

Specification of Letters Patent.

Patented April 30, 1907.

Application filed March 12, 1906. Serial No. 305,738.

To all whom it may concern:

Be it known that I, WILLIAM B. HALE, a citizen of the United States, residing at Mexico city, Mexico, have invented a certain new and useful Improvement in Processes of Drying Electric Cables, of which the following is a full, clear, concise, and exact description.

My invention relates to a process of drying the cores of electric cables, and has for its object to provide an improved method which will be simple, rapid, economical and effective.

The common method of drying cables involves the passage of a strong current through the conductors thereof, to heat the cable sufficiently to vaporize the moisture contained therein, the vapor being then withdrawn by means of an air pump applied to the end of the cable. This process, besides requiring the use of special apparatus, is somewhat slow and expensive.

In accordance with my invention, an electromotive force or difference of potential is established between different conductors of the cable sufficient to cause a flow of current through the moisture remaining in the insulating medium which separates said conductors, and the moisture is thereby electrolytically decomposed. As decomposition progresses the insulation resistance gradually increases; and in order to maintain a flow of current strong enough for such decomposition, (that is, above the critical value required for electrolysis) the impressed electromotive force may be gradually raised, but not, of course, beyond the dielectric strength of the cable. If required, in some cases, the current necessary to carry on the process of electrolysis may be further maintained by temporarily reducing the resistance of the path across the insulation by means of heat, which may be developed either in the conductors of the cable by current flowing therein, or in the dielectric itself by the application of an alternating electromotive force.

In the accompanying drawing I have illustrated one of a number of arrangements of apparatus which may be adopted in practicing my process.

1 is a telephone cable of the well known type comprising a certain number of conductors twisted into pairs, formed into a core and covered with a lead sheath. In the drawing the conductors of cable 1 are shown

divided into groups 2 and 3, each of said groups comprising a conductor from each pair in the cable. The two groups are connected to a generator capable of giving the required range of voltage, one group being connected to each terminal. Regulating the voltage by means of a field regulator 6 or otherwise, so that the voltmeter 5, connected across the terminals indicates an electromotive force of say one hundred volts, the voltage may be gradually increased, at intervals of half an hour or so, as the insulation resistance rises, due to the decomposition of moisture, until said resistance is increased to the required value. This may take say from two to six hours. The increase in voltage is, of course, limited by the dielectric strength or breaking-down point of the cable being dried; and if the insulation resistance is still below the desired value when this limit is approached, the intensity of current required for electrolysis may then be further maintained by temporarily increasing the conductivity of the moisture remaining in the insulating medium, by means of heat. This may be produced by applying an alternating e. m. f. from a suitable generator to the two groups of wires 2, 3, to develop the heat in the dielectric itself by molecular action set up therein; or strong current may be passed through some or all of the conductors of the cable to heat said conductors by the I^2R effect. To facilitate the drying out of the cable any or all of the foregoing means may be employed; but ordinarily a cable would have sufficient dielectric strength to withstand the voltage required to produce the necessary electrolyzing current, without resorting to the heating process.

Although I have chosen to illustrate my process by describing its application to a cable of the above mentioned type, it will readily be understood that it is equally applicable to other forms. Moreover, the disposition of the wires described herein is only one of the many arrangements that may be employed. For example, the electrolyzing current may be passed from all the wires to the metallic sheath of the cable, from one layer of wires to another, from one wire to another, or from any group of wires to a single wire or to another group of wires.

By the process herein described, the insulation resistance of a cable when exceedingly

low, due to the presence of moisture, may be raised to meet standard requirements. The removal of the moisture furthermore materially reduces the capacity of the cable.

5 I claim:—

1. The process of drying electric cables which consists in maintaining a flow of electric current through the insulating material of the cable, of sufficient strength to electro-
10 lyze the moisture therein.

2. The process of drying electric cables, which consists in establishing a difference of potential between different conductors of the cable, and thereby causing a flow of current
15 through the insulation surrounding said conductors sufficient to decompose the moisture therein.

3. The process of drying electric cables which consists in establishing an electromo-
20 tive force between different conductors of the cable, thereby causing a flow of current through the insulation surrounding said conductors, sufficient to electrolyze the moisture therein, and progressively increasing the im-
25 pressed electromotive force as the insulation resistance rises, to maintain the current flow above the critical value for electrolysis.

4. The process of drying electric cables, which consists in establishing a flow of cur-
30 rent between different conductors of the cable through the moisture remaining in the insulating medium, said current being sufficient to cause electrolytic decomposition of such moisture, and electrically heating said
35 insulating medium to temporarily increase the conductivity of said moisture so as to per-

mit the maintenance of said current above the critical value for electrolysis.

5. The process of drying electric cables which consists in establishing, by an im- 40 pressed electromotive force, a flow of current through the insulating medium of said cable, such current being sufficient to electrolytically decompose the moisture therein, and heating said medium to temporarily increase 45 its conductivity to a point which will permit the maintenance of said current at the required intensity for such decomposition without increasing the impressed electromotive force to a point beyond the dielectric resist- 50 ing strength of the cable, said heating being produced by the application of a suitable electromotive force to the conductors of said cable.

6. The process of drying electric cables, 55 which consists in establishing a flow of current between different conductors of the cable through the moisture remaining in the insulating medium, said current being sufficient to cause electrolytic decomposition of 60 such moisture, and heating said insulating medium to temporarily reduce the insulation resistance of the cable so as to increase the current which will flow under a given electro-
65 motive force.

In witness whereof, I, hereunto subscribe my name this 26th day of February A. D. 1906.

WILLIAM B. HALE.

Witnesses:

THOMAS G. NEE,
FERNANDO GIL.