No. 650,972. Patented June 5, 1900.

# L. HACKETHAL.

## ELECTRIC CONDUCTOR.

(Application filed Dec. 20, 1898.)

(No Model.)

Fig. 1.

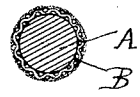
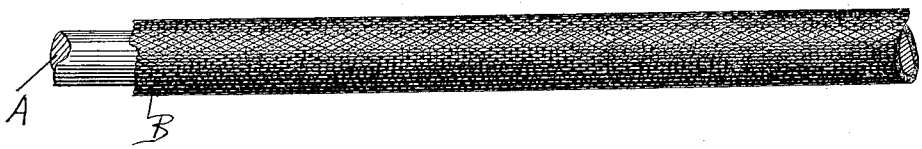



Fig. 2




Witnesses:
J. M. Fowler Jr.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

LOUIS HACKETHAL, OF HANOVER, GERMANY.

## ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 650,972, dated June 5, 1900.

Application filed December 20, 1898. Serial No. 699,820. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS HACKETHAL, a subject of the King of Prussia, Emperor of Germany, residing at Hanover, in the Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Electric Conductors, (for which I have applied for patents in England, dated November 18, 1898; in Austria, dated November 16, 1898; in Hungary, dated November 23, 1898; in France, dated November 19, 1898; in Belgium, dated November 19, 1898; in Italy, dated November 22, 1898; in Denmark, dated November 16, 1898, and in Germany, dated May 25, 1898,) of which the following is a specification.

The object of my invention is to produce an electrical conductor having an insulating coating which shall have the properties of resisting the influences of the weather and of avoiding short circuits or grounds.

To this object my invention consists in a conductor coated with a fibrous material, preferably a textile fabric which has been soaked or saturated with red oxid of lead and oil, preferably linseed-oil, and dried under the influence of the air.

Figure 1 shows a cross-section, and Fig. 2 a side elevation, of my conductor.

As a result of experiments extending over some years I have discovered that red oxid of lead of the better qualities contains but few metallic or non-oxidized particles. It possesses a high degree of purity and a high proportion of oxygen. By reason of its richness in oxygen the red lead forms an intimate chemical combination with the rubber-like ingredients of the oil, the resulting product having somewhat-gummy properties. This process can be accelerated by heat. Neither the red lead nor the oil separately considered possess a very high degree of insulation. It is only when their combination by the action of the air approaches its final form that the insulation qualities reach a considerable value. It is not possible to bring about this resulting condition of the mixture of red oxid of lead and oil by coating bare wires, because it will be necessary to have the wires hang freely in the air for too long a time. I have therefore studied the action of a mixture of red lead and oil in connection with fibrous material, whether textile fabrics or paper, and have found that such mixture, by reason of the oily qualities which it has at the start, penetrates the pores of the fibrous material, fills them up, and becomes thick under the action of the air. In order to accelerate the action, the superfluous quantity of the impregnating mixture is brushed off, and air is thus brought into more direct contact with the coated fiber. After the fabric has been impregnated, but before the oxidation is complete, I can subject the coating to pressure, and thereby increase the density and the insulation of the same. Although this process can be carried out at ordinary temperatures, it is preferable to use heat. In this manner the impregnated fibrous material loses its hygroscopic qualities and assumes in its final form such strength that it is not influenced by moisture or such heat or cold as is found within the limits of atmospheric temperature. Describing this process of impregnation more in detail I may say that I take fibrous material, preferably about a half-millimeter in thickness, wrap or spin the same about the wire, and then soak the wrapped wire in a fluid mixture composed of five parts, by weight, of red lead and one part, by weight, of linseed-oil. The superfluous coating is then removed, and the wire thus coated is subjected to the action of air for a period of from three to five days. At this time the wire is passed through rollers of proper cross-section in order to compress the coating, whereupon it is again subjected to the action of air until the oxidation has been completed.

The drawings show the conducting-wire A and the fibrous or textile covering B surrounding the same, which covering has been saturated with the mixture described.

It is manifest that the process of wrapping, saturation, and drying may be repeated, so that there will be several layers of saturated fibrous material about the wire instead of a single layer.

What I claim is—

1. An electrical conductor covered with a

fibrous material impregnated with a mixture of red lead and oil, substantially as described.

2. An electrical conductor covered with a fibrous material impregnated with a mixture of five parts of red lead and one part of oil, substantially as described.

3. An electrical conductor covered with a fibrous material impregnated with a mixture of red lead and linseed-oil, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

LOUIS HACKETHAL.

Witnesses:
KIRKE LATHROP,
LEONORE KASCH.