(No Model.)

E. D. McCRACKEN.

INSULATED ELECTRICAL CONDUCTOR.

No. 455,904. Patented July 14, 1891.

Fig. 1.

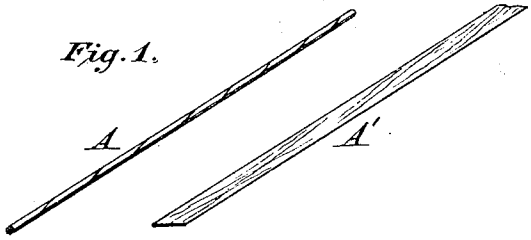


Fig. 2.

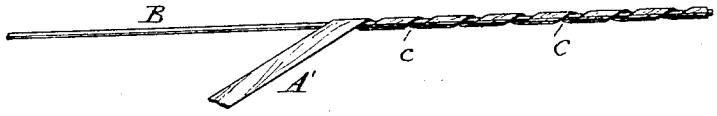


Fig. 3.

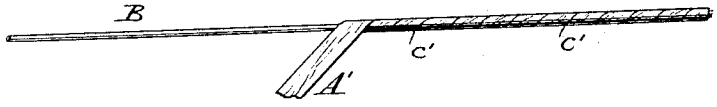


Fig. 4.

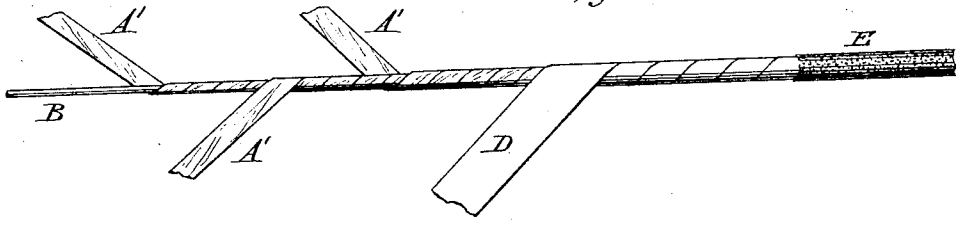


Fig. 5.

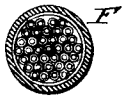
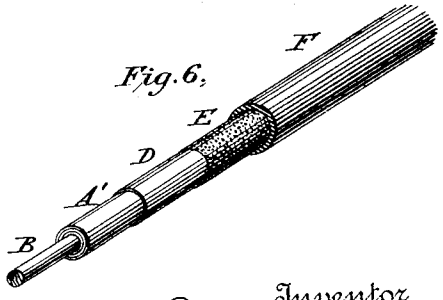


Fig. 6.



Witnesses
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Harry Starrett.

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By his Attorneys
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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INSULATED ELECTRICAL CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 455,904, dated July 14, 1891.

Application filed March 5, 1891. Serial No. 383,861. (No model.)

To all whom it may concern:

Be it known that I, EDWIN DODD McCRACKEN, a citizen of the United States, residing at Alpine, in the State of New Jersey, have invented certain new and useful Improvements in Insulated Electrical Conductors, of which the following is a specification.

My invention relates to that class of insulated conductors in which paper is employed as the insulating medium.

The object of the invention is to so insulate a conductor that the paper insulation wound around it may have a high tensile strength and may at the same time be so narrow that the ribbons, strands, or tapes of paper may be wound spirally around relatively small conductors, such as are employed for telephonic and other purposes, either in open spirals—that is, with a spiral space between the edges of the paper strand or tape—or be wound with the edges abutting or overlapping, if desired. In insulating telephone-wires it would be desirable to wind the paper ribbon or tape in open spirals, so that air-spaces may be provided throughout the insulation in order to reduce the static capacity of the conductor to a minimum. This is, however, unnecessary where the conductor is to be used for currents of a different character. Where it is desired to wind the insulating paper ribbons or tapes in open spirals it is practically impossible to wind flat ribbons around small conductors such as are used for telephonic purposes—say, for instance, around a No. 18 wire—because the relation of bias and diameter are such that a ribbon of paper that could be wound around such a conductor in an open spiral would have to be so narrow that its tensile strength would not be sufficient to permit the winding of the ribbon upon the conductor in any way that would be practicable. To overcome this difficulty, and also to increase the tensile strength of paper insulation however wound around electrical conductors, and yet employ a flat strand or tape of paper, I proceed as follows: Paper cord or paper twisted more or less to approximate the compactness of ordinary paper cord, or indeed paper twisted much more loosely, is preferably dampened by steaming or otherwise and is then passed through rolls or otherwise pressed out into the form of a flat ribbon or tape, which will necessarily be composed of multiple layers of paper. This tape has great tensile strength, and, as is obvious, may be made relatively narrow, so that it may be wound upon small or large conductors in any manner desired.

In the accompanying drawings, Figure 1 shows a paper cord or a ribbon of paper twisted more or less tightly and the same cord rolled into a flat tape. Fig. 2 illustrates the application of such a tape to an electric conductor, the tape being wound in an open spiral. Fig. 3 is a similar view showing the tape wound upon a conductor with its edges abutting. Fig. 4 shows the application of a number of paper tapes or ribbons to an electrical conductor. Fig. 5 is a cross-section of a cable of conductors insulated according to my invention, and Fig. 6 is a perspective view of the end of an electric light or power conductor similarly insulated.

A indicates a section of twisted paper or paper cord. A′ shows the same cord after being rolled into the form of a tape.

B indicates the electrical conductor.

In Fig. 2 the tape is wound upon the conductor so as to leave an open spiral space *c* between its edges. In Fig. 3 the tape is wound upon the conductor with its edges abutting, as indicated by *c′*. In Fig. 4 I have shown three tapes A′ wound one upon the other, the successive tapes being of increasing width and wound so as to break joints. I may, if desired and as shown in this figure, wind a flat paper ribbon D around the insulation A′ and may coat this ribbon with an insulating, waterproofing, and sealing compound E. Conductors insulated in this manner may be laid up into cables, as indicated in Fig. 5, and protected by an exterior lead sheath F.

As shown in Fig. 6, each conductor may be enveloped in a lead or other suitable sheath F, where the size of the conductor and the purpose for which it is intended render it desirable.

If the paper insulation herein described is applied while in a damp condition, in drying it will contract and firmly embrace the conductor.

As is ordinarily practiced in applying insu-

lation of this general character, the insulated conductor may be passed through a die or series of dies to compact the insulation thereon and reduce the insulation to a uniform cross-section.

I claim as my invention—

1. An electrical conductor having wound thereon a paper tape composed of twisted paper or paper cord flattened, as described.

2. An electrical conductor having an insulating tape wound thereon in an open spiral, said tape being formed of twisted paper or paper cord flattened, as described.

In testimony whereof I have hereunto subscribed my name.

EDWIN D. McCRACKEN.

Witnesses:
FRANK S. OBER,
EDWARD C. DAVIDSON.