(No Model.)

E. D. McCRACKEN.

INSULATED ELECTRIC CONDUCTOR.

No. 456,120. Patented July 14, 1891.

Fig. 1.

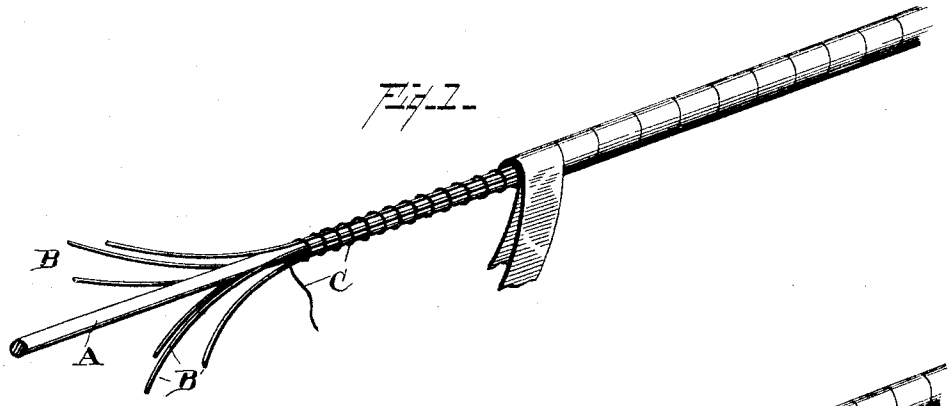


Fig. 2.

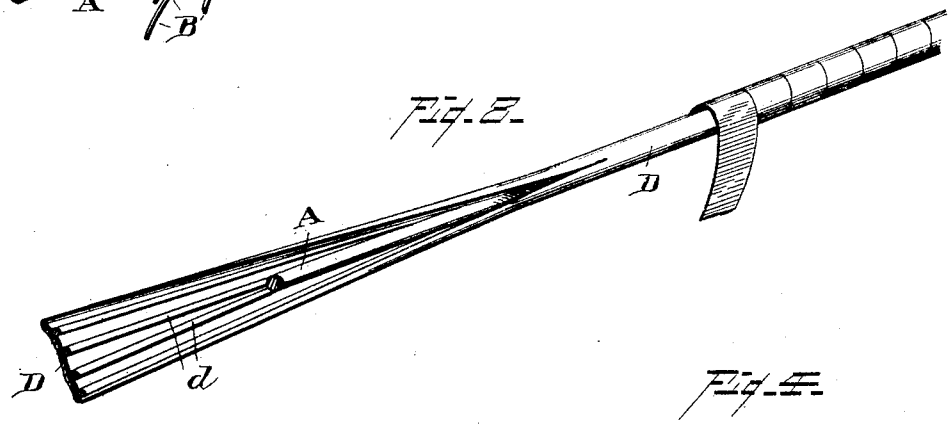


Fig. 3.

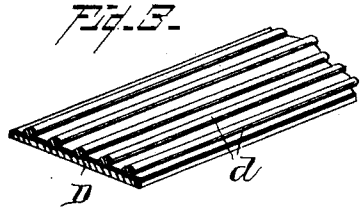
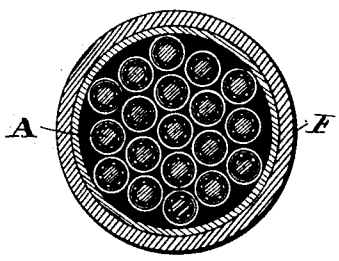


Fig. 4.



Witnesses
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INSULATED ELECTRIC CONDUCTOR.

SPECIFICATION forming part of Letters Patent No. 456,120, dated July 14, 1891.

Application filed March 4, 1891. Serial No. 383,748. (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, county of Bergen, and State of New Jersey, have invented certain new and useful Improvements in Insulated Electric Conductors, of which the following is a specification.

The purpose of my invention is to produce an insulated electrical conductor having a minimum static capacity or a cable of insulated conductors, each having a minimum static capacity. It is now well known that when an electrical conductor is suspended in dry air out of contact with any substance the static capacity of that conductor is at its minimum. Recognizing this fact, it has been proposed to keep down the static capacity of insulated conductors by providing air-spaces in the insulation next to the conductor. This has been accomplished in a large variety of ways, which it is unnecessary to recite. My theory is that the influences, extra currents, or whatever they may be that give rise to what is known as "static capacity" in an insulated conductor tend to operate on straight lines parallel with the conductor, and that walls of insulating material in their path constitute obstacles, which increase the static capacity in proportion to their number in a given length of conductor. A theoretically perfect insulated electrical conductor according to my theory would be one in which there was the least possible surface of contact between the conductor and the insulating material and the greatest area of air-spaces running parallel with the conductor. It may be further stated that true concentricity of the insulation around the axial center of the conductor should also, as far as possible, be preserved. The question of static capacity is a material one in telephonic conductors, but is not of special importance in electric light and power conductors.

My invention is not limited to the use of any specific insulating material. As, however, conductors insulated in paper have a small static capacity as compared with conductors insulated with many other materials, I prefer to use paper.

In carrying out my invention I lay parallel and in contact with the conductor threads or cords of insulating material separated from each other to provide air-spaces parallel with and next to the conductor, and over such threads I apply insulating material that holds the cords in position.

The accompanying drawings show two ways of carrying out my invention.

Figure 1 is a perspective view showing the end of a conductor insulated according to my invention. Fig. 2 is a similar view; Fig. 3, a perspective view of a paper strip, somewhat enlarged, that I may employ in carrying out my invention. Fig. 4 is a cross-section of a cable of conductors insulated according to my invention.

In Fig. 1 I lay longitudinally along the wire and at equal distances from each other two or more—six being shown—strands of fine cord or thread preferably of such hardness that they will not flatten under the pressure of a binding-thread that is passed around them.

A indicates the conductor; B, the cords parallel, or substantially so; and C the binding-thread. Over the thread-binding I prefer to place an insulation consisting of a solid ribbon of paper wound spirally, any desired number of papers being employed to give the desired thickness.

In Figs. 2 and 3 I have shown a strip or ribbon of insulating material, preferably of paper, having attached to or incorporated into its surface a series of parallel threads or cords of a diameter properly related to the wire around which the ribbon is placed. D indicates the ribbon and *d* the cords or raised parallel projections upon its face. Such a ribbon is folded longitudinally around a conductor A, as indicated. In both of the forms described the insulation would be applied by suitable machinery that would in the one case so apply the cords B to the wire as to maintain their parallelism with it, and consequently also the parallelism of the air-spaces between the cords; in the other case to so apply the ribbon to the conductor to so maintain the parallelism of the cords *d* and the intervening air-spaces with the electrical conductor.

Wires so insulated may be laid up into

cables in any desired manner and covered with a lead sheath, as is usual and as is indicated in Fig. 4, F being the lead sheath.

I claim as my invention—

The combination, substantially as set forth, of the conductor, the insulating-cords arranged parallel, or substantially so, and in contact therewith, but separated from each other, and exterior insulating material that holds the cords in place.

In testimony whereof I have hereunto subscribed my name.

EDWIN D. McCRACKEN.

Witnesses:

FRANK S. OBER,

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