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DEVICE FOR INSULATING THE TWISTED ENDS OF ELECTRIC WIRES.

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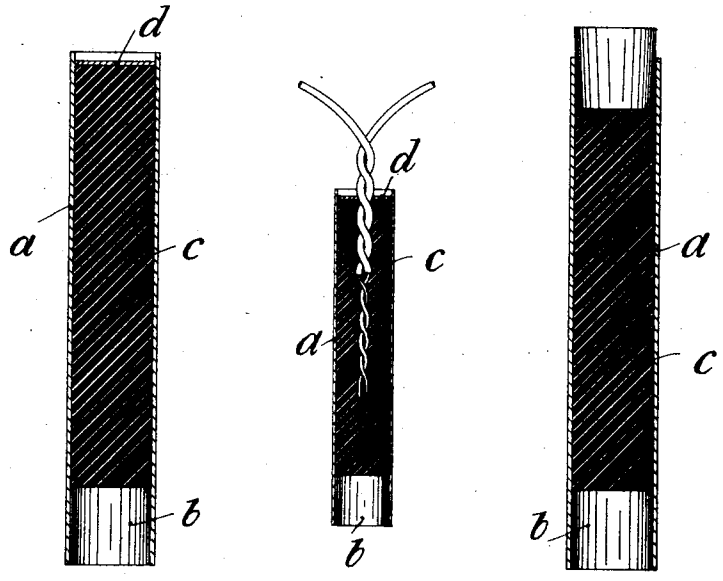
997,066. Patented July 4, 1911.

Fig. 1. Fig. 2. Fig. 3.

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# UNITED STATES PATENT OFFICE.

JOHANN KRANNICHFELDT, OF COLOGNE, GERMANY.

## DEVICE FOR INSULATING THE TWISTED ENDS OF ELECTRIC WIRES.

997,066. Specification of Letters Patent. Patented July 4, 1911.

Application filed November 22, 1910. Serial No. 593,740.

*To all whom it may concern:*

Be it known that I, JOHANN KRANNICHFELDT, a subject of the King of Prussia, residing at Cologne-on-the-Rhine, in the Kingdom of Prussia and German Empire, have invented a new and useful Improved Device for Insulating the Twisted Ends of Electric Wires, of which the following is a specification.

When using the electric ignition for explosions in moist earth, especially in sinking shafts, difficulties frequently occur, owing to by and earth circuits being formed, particularly when the amount of water entering the shaft is so great that, not only the igniter itself, but also the wire connections are necessarily under water. According to the regulations, the connections, in such cases, must be wrapped with an insulating ribbon, but this operation occupies considerable time, and it must be done very carefully, in order to answer the purpose. The conditions are particularly unfavorable, when the water contains salt or iron and is, consequently, a good conductor, because then, short or by circuits occur very frequently, and they render the success of every ignition extremely questionable.

The object of the present invention is to overcome these drawbacks. For this purpose, the twisted naked ends of the wires are pressed into a tube containing a viscous, water-tight, insulating material, such as a mixture of goudron with tar, wax, or paraffin. Such tubes are preferably made of paper, and one end thereof can be closed by a tightly fitting cork, wood plug, or the like. After filling said tube, which, in order to increase its insulating properties, is preferably impregnated with paraffin, or ceresin, it is closed by a thin film of paraffin, or the like, which must be of such a consistency that the twisted ends of the wire can perforate it. The viscosity of the filling must, of course, be so chosen that, it is soft enough to conveniently allow of the wires being pressed in, but, on the other hand, is sufficiently hard to prevent it flowing out of the tube during the transport, or while in use, and to prevent the tube from falling off the wires. The film of paraffin or other material, which serves as a cover for the viscous material in the tube, is of sufficient hardness to prevent the escape of such filling in case of high temperature and owing to its thinness it permits the easy thrusting through it of the wires into the filling. Instead of closing the tube at one end by a film of paraffin, a cork, or the like stopper, can be employed to close the tube, although a cork has the drawback that, it easily becomes stuck in the tube, and frequently breaks in being pulled out. In order to strengthen the tube, a lining of metal may be used.

In the drawing illustrating my invention Figure 1 shows, in longitudinal section, an insulating tube ready for use, Fig. 2, the same tube as employed to insulate the twisted ends of two electric wires, and Fig. 3, another construction of the device.

*a* is the tube, *b*, a cork closing one end thereof, *c*, the viscous insulating material, and *d*, a thin layer of paraffin, or the like.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A portable wire-ends insulator comprising a tube closed at one end and open at the other end for receiving the twisted ends of the wires to be insulated, a viscous insulating material in said tube for surrounding said ends and a puncturable layer of harder insulating material covering and protecting said viscous material and permitting the thrusting of the wires therethrough.

2. A portable wire-ends insulator comprising a tube closed at one end and open at the other end for receiving the twisted ends of the wires to be insulated, a viscous insulating material in said tube for surrounding said ends and a puncturable layer of paraffin covering and protecting said viscous material and permitting the thrusting of the wires therethrough.

3. The described water-tight insulating device, comprising in combination, a tube, a stopper closing one end of said tube, a filling of viscous insulating material in said tube, and a layer of paraffin closing the other end of said tube, substantially as, and for the purpose, set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHANN KRANNICHFELDT.

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