(No Model.)

W. P. WARE.

Telegraph Cable.

No. 243,180. Patented June 21, 1881.

Fig. 2

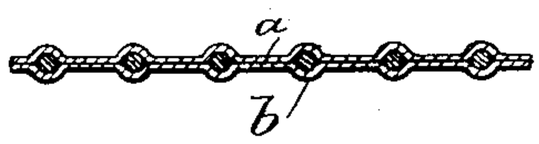


Fig. 1.

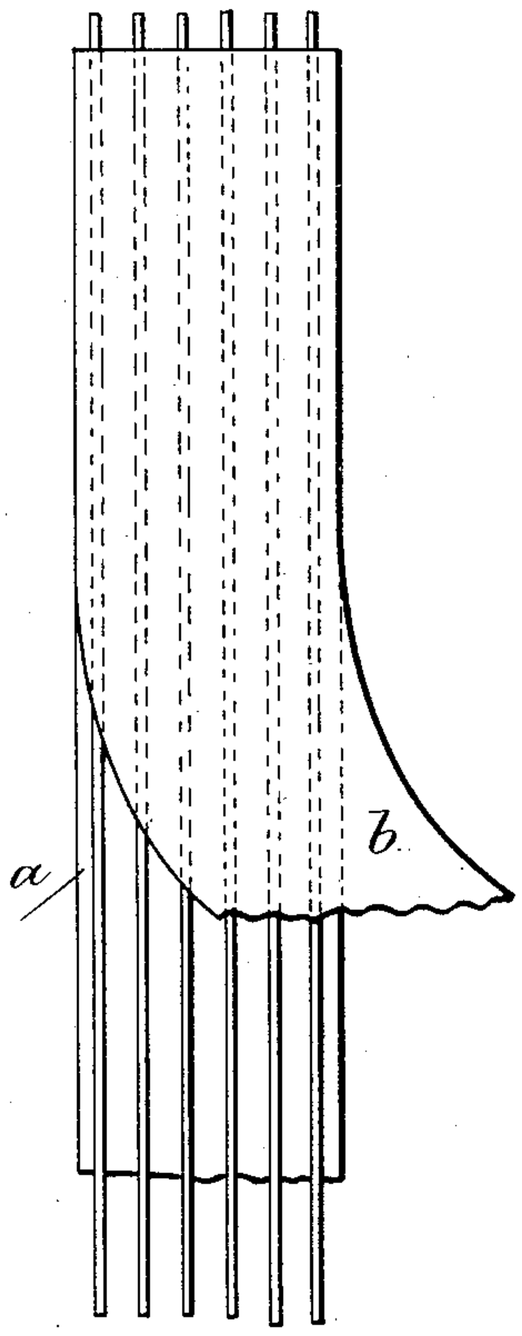


Fig. 5.

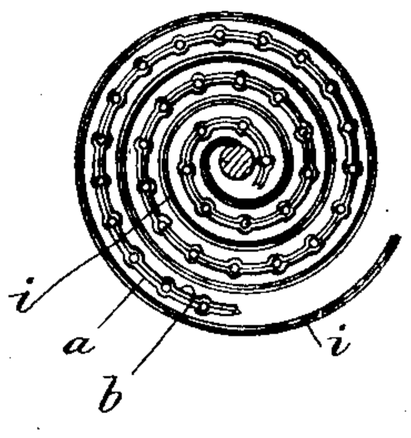


Fig. 3.

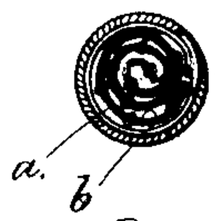
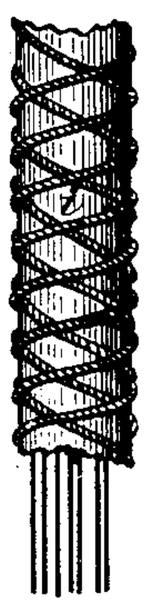


Fig. 4.



Witnesses

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J. Hall

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UNITED STATES PATENT OFFICE.

W. POWELL WARE, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND DAVID W. FAIRCHILD, OF SAME PLACE.

TELEGRAPH-CABLE.

SPECIFICATION forming part of Letters Patent No. 243,180, dated June 21, 1881.

Application filed May 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, W. POWELL WARE, of the city and State of New York, have invented an Improvement in Insulating Telegraphic Conductors, of which the following is a specification.

Before my invention wires for telegraphic purposes had been introduced into a woven fabric, and also between two sheets or strips of fabric, with lines of sewing between one wire and the next. India-rubber, gutta-percha, and other materials have been used in an adhesive condition in connection with the covering of telegraph-wires.

My invention relates to an improvement in insulating wires for telegraphic and telephonic purposes; and it consists in inclosing numerous wires in a water-proof sheath made of two layers having adhesive surfaces, so that the layers will be joined together between one wire and the next by pressure applied to the layers, and I combine therewith a layer of thin metal—such as foil—for preventing any inductive action, especially in telephone-lines.

In carrying out this invention I make use of two strips of muslin coated with india-rubber or two strips of india-rubber or india-rubber cloth in an adhesive condition, and I lay the telegraph-wires at regular intervals and parallel between such adhesive surfaces, and cause the two layers to adhere by pressure, so that the conductors will be kept at the proper distances from each other and entirely surrounded by the sheets or layers, and then the strip of such material containing the wires is to be rolled transversely into a cable or cylindrical form with a strip of thin sheet metal inclosed by the convolutions, and the whole wrapped and adapted to be inserted into tubes or otherwise protected for either air or underground lines.

In the drawings, Figure 1 is a perspective view of the layers and wires as they are being laid together. Fig. 2 is a cross-section in larger size. Fig. 3 is a cross-section of the insulated material rolled up into the form of a cable. Fig. 4 shows the outside of part of a cable, and Fig. 5 is a section, in larger size, illustrating the conductors and their envelope partially rolled up.

The sheets or strips *a b* are of cloth, india-rubber, india-rubber cloth, or other suitable material, and the inner surfaces are rendered adhesive by suitable cement. The wires or conductors are laid parallel to each other at a distance apart that is proportioned to the size of the wire, so that when the strips are applied at opposite sides of the parallel wires and pressed together firmly the surfaces will adhere together between the wires, and thereby inclose each wire and form a flat strip with the numerous conductors insulated from each other. The strip is to be rolled up transversely, so that the wires are bunched into a form similar to that of a cable, and a winding of wire or other material may be used to keep the parts together, and in order to exclude moisture the cable may be coated with paraffine or other similar material. If any one conductor becomes injured the winding may be taken off and the strip laid out flat and the conductor-coverings inspected and repaired, if necessary. Several of these cables may be laid into one pipe or box, and provision should be made at the testing-points or man-holes for the removal of any defective cable. The layers should be numbered at both ends and at each testing-place, and the separate wires also may be numbered or marked upon the surfaces of the inclosing-layers, so as to facilitate the proving of the cable and the repairs of any defects in the wire or insulation.

In order to lessen any inductive effect, especially with telephone-lines, I make use of a strip of metallic foil or thin sheet of metal, *i*, which is rolled up with the conductors and their envelope, and hence intervenes between one layer and the next, and it may also form a wrapping around the cable. I find that tin or lead foil upon paper or muslin may be used for this purpose, and also that thin sheet metal—such as lead or iron—may be used, and that this lessens and neutralizes the inductive effect of adjacent wires, especially in telephonic lines, when the said sheet or strip is connected with the ground. If a foil cemented upon cloth is used, then it may be a wider strip than the envelope of the wires, so as to form a wrapping of cloth around the cable to protect the same from abrasion in introducing it into or withdrawing it from the pipes; and, if desired, a central plain wire

may be rolled into the cable to aid in lessening induction, it being grounded at its ends.

The layers of foil may be used between the layers of conductors when in a flat condition, if desired.

I claim as my invention—

In combination with the parallel metallic conductors and the two layers of water-proof insulating material, one at each side of the conductors, a strip of thin sheet metal intervening between the said insulated conductors, substantially as set forth.

Signed by me this 26th day of April, A. D. 1881.

W. POWELL WARE.

Witnesses:

GEO. T. PINCKNEY,

WILLIAM G. MOTT.