T. J. McTIGHE.

Coupling for Underground Telegraph-Lines.

No. 220,936. Patented Oct. 28, 1879.

Fig. 1.

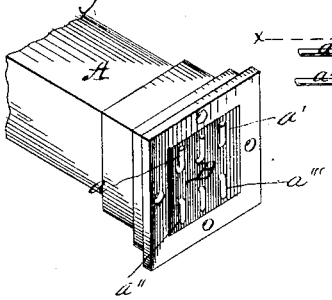


Fig. 3.

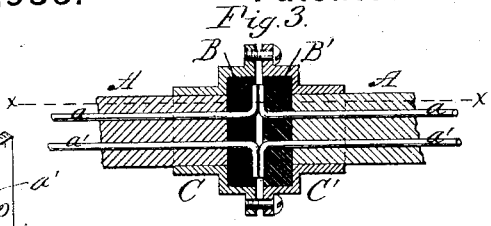


Fig. 2.

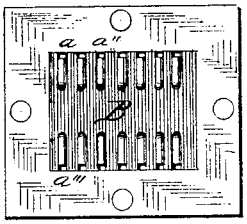


Fig. 4.

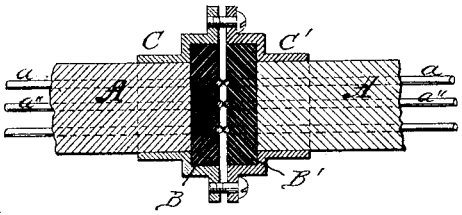


Fig. 5.

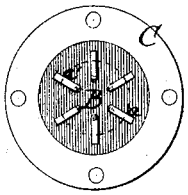


Fig. 6.

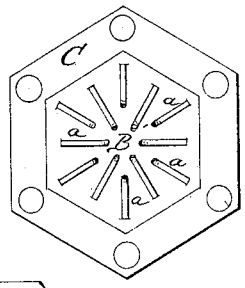


Fig. 8.

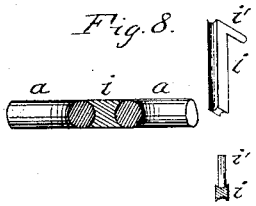


Fig. 7.

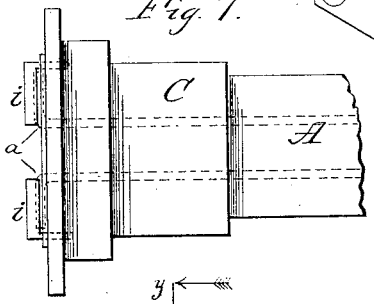


Fig. 10.

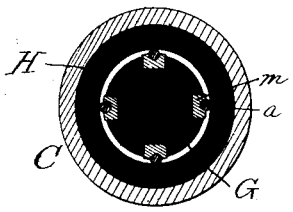


Fig. 9.

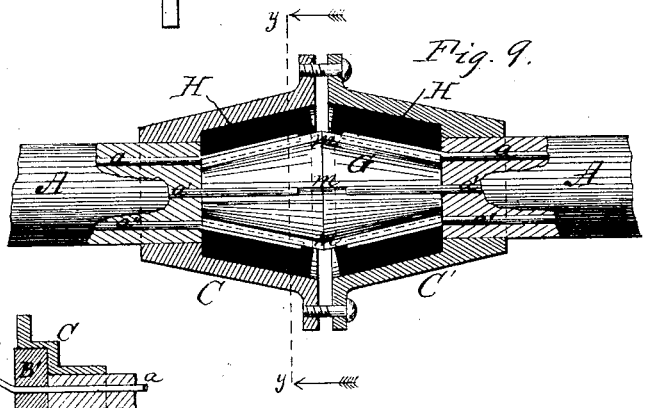


Fig. 11.

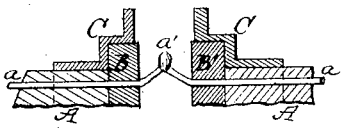
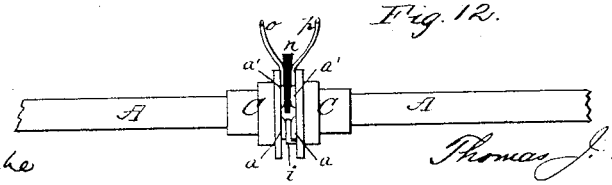


Fig. 12.



Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS J. McTIGHE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN COUPLINGS FOR UNDERGROUND-TELEGRAPH LINES.

Specification forming part of Letters Patent No. **220,936**, dated October 28, 1879; application filed July 21, 1879.

To all whom it may concern:

Be it known that I, THOMAS J. McTIGHE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Couplings for Underground-Telegraph Lines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective of one-half of coupling; Fig. 2, a front view of same; Fig. 3, a longitudinal vertical section of a joint complete; Fig. 4, a plan-section of Fig. 3 on line *x x*. Figs. 5 and 6 are front views of modifications. Fig. 7 is a side elevation of modification; Fig. 8, details of same. Fig. 9 is a longitudinal section of a modification, and Fig. 10, section *y y*, of same. Fig. 11 shows how the joint may be soldered. Fig. 12 illustrates my mode of tapping a line.

My invention relates to a coupling for the different sections or lengths of the so-called "underground-telegraph lines," which generally consist of two or more wires incased in an insulating envelope, serving at the same time as a coupling for any sort of electrical conductor containing a number of lines which it is desired shall be insulated one from the other at the joint.

The invention consists, broadly, in inclosing the ends of the sections in metallic sleeves having coupling-flanges and means for securing the flanges together, the wires being suitably connected inside; and it further consists in the construction and combination of parts, substantially as hereinafter fully described and claimed.

Figs. 1, 2, 3, and 4 illustrate the invention in one of its simplest forms.

A designates the body of incased lines, *a a'*, &c., being the wires. To simplify my description, I will state that A may be of any material or form whatever, and will be referred to throughout this specification as simply the "protector."

The wires *a* are left projecting slightly beyond the ends of the lengths of protector A, in order to allow of the fittings being placed to them. In the figures referred to, wires *a* are passed through a block, B, of insulating material, such as hard rubber, paraffine-soaked wood, glass, leatheroid, vulcanized fiber, or other suitable material possessing good insulating qualities. The protruding ends of the wires *a* are then bent down against the outer faces of the respective blocks B B', so that when the two blocks are brought together the wires *a a* will come in contact, wires *a' a'* also, and so on, the wires being bent in opposite directions when the number and arrangement demand it. Then the two blocks are powerfully forced together by any suitable means. As one such means I propose the flanged sleeves C C', which embrace the protector A, and inclose insulating and compression blocks B B', and are drawn powerfully together by bolts or keys or other suitable means.

After coupling is completed the entire joint is surrounded with paraffine, pitch, resin, sulphur, or other suitable insulating material, so as to prevent the access to the joint of water, moisture, or air, the first two of which might destroy or lessen the insulation after a time, and the last might oxidize the wires and abate the conductivity of the contact. The metal sleeves C, while thus serving to force the wires together, also serve to stiffen the line, since they embrace the protector for a short distance each side from the joint.

By this bending of the wires out of line I can obtain any desired amount of surface-contact, since I can make the wires touch over a greater or less length, so that by making the contact long enough it becomes equivalent to the full section of the wire. The same result is accomplished by my modified form, as in Figs. 7 and 8. In this the wires *a* are bent out of line, as before; but instead of meeting edge to edge, a double-concave strip of conducting material, *i*, is inserted between the ends so arranged. For convenience in setting I make the strips *i* with a pin, *i'*, which fits in a hole made in the block B.

In coupling two sections on this plan, after the wires are bent on one section the strips *i* are set on that section and the other brought against it. The convexed wires then lie in the concaved sides of the strips, and a very perfect contact secured by pressing the blocks B, as before.

Another modification is shown by Figs. 9

and 10. Here, again, the wires *a* are bent out of line somewhat, though to a less degree than before. Previous to placing the sections together a biconical or wedge-shaped block, G, of insulating material, and having grooved strips *m* of conducting metal longitudinally set in it, is placed between the sections. The wires *a* are then arranged to lie in the grooves of strips *m*, as shown, the wires not coming in contact with each other, but with the strips. Then an annular block, H, of insulating material, is passed up the incline, and forced against the wires powerfully by the metal sleeves I, which are substantially the same as before described.

The contact thus secured is excellent and reliable, though the construction may be somewhat more expensive than the first form shown. It can be made so as not to project inconveniently, and for this reason, under some conditions of surroundings, may be found more desirable.

The block G may be round, square, or other shape in cross-section, and in any shape will act in the same way. Of course the annular block and sleeve would correspond in shape.

Besides the simple pressure contact I propose in some cases to solder the wires together, as shown by Fig. 11; or, instead of soldering, in places where it may be found practicable the ends may be amalgamated together by a globule of mercury.

Should it be desired to switch a wire out for a local station, the coupling need only be loosened somewhat, as in Fig. 12, the strips *i* inserted between all the wires but those forming the line to be switched. Then a plug, *n*, having its body of insulating material and metallic strips on its sides connecting with line-wires *o p*, is inserted between said wires to be switched, after which the coupling is tightened up, and the work is done. Of course the strips *i* and the plug *n* would be of a given uniform width.

The plug *n* would form an admirable temporary tapping device for testing after the location of a flaw or break, should such occur.

The coupling in any of its forms may be made as shown for a straight line, or may be beveled or mitered for a turn or right angle, thus making the joint as good at a street corner or a dip under a culvert as upon a straight run.

From the foregoing it will be seen that I do not confine myself to the employment of any special insulating material, nor that of any particular material for the sleeves; nor do I restrict the application to any one form or style of protector, as the invention will serve for a variety of forms and styles of such; nor yet do I limit myself to the specific forms of coupling shown in this specification, as the mere form or shape can be indefinitely varied to suit the requirements of any given line.

What I do claim as my invention is—

1. In a coupling for sections of underground-telegraph lines, two sleeves of metal having coupling-flanges and suitable means of connecting them together, said sleeves inclosing the ends of the sections, substantially as described, whereby the flanges serve to connect the sections and the sleeves to stiffen the line.

2. The coupling consisting of two perforated blocks of insulating substance, having corresponding grooves on their adjacent faces, in combination with suitable means of forcing them together.

3. The coupling consisting of two perforated blocks of insulating material, suitable means of forcing them together, and the grooved conducting-strips *i*, substantially as set forth.

4. The coupling consisting of two blocks, B B′, of insulating material perforated for the passage of the wires, and the sleeves C C′, shouldering against said blocks, and provided with suitable means of being forced together.

In testimony that I claim the foregoing I have hereunto set my hand.

THOMAS J. McTIGHE.

Witnesses:
THOS. CONNOLLY,
JOHN M. PATTERSON.