D. H. SOUTHWORTH.

TELEGRAPH CABLE.

No. 46,613. Patented Feb. 28, 1865.

Fig. 1.

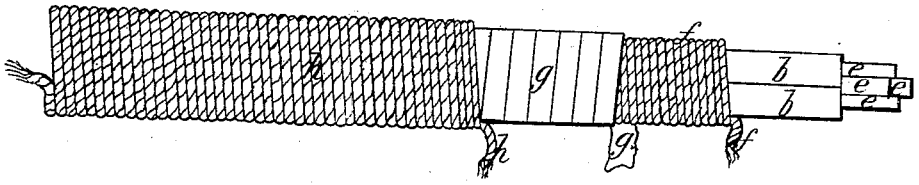


Fig. 4.

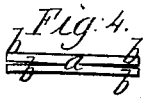


Fig. 5.

Fig. 6.

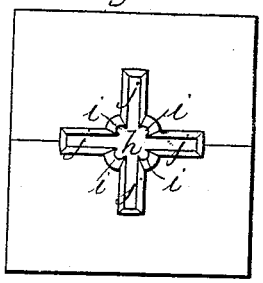


Fig. 2.

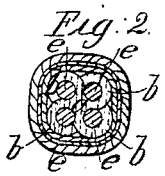
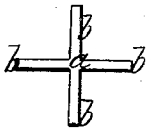


Fig. 3.



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UNITED STATES PATENT OFFICE.

DANL. H. SOUTHWORTH, OF NEW YORK, ASSIGNOR TO HIMSELF, BLASE LORILLARD, AND CHAS. FERRIS, OF WHITE PLAINS, N. Y.

IMPROVEMENT IN TELEGRAPH-CABLES.

Specification forming part of Letters Patent No. **46,613**, dated February 28, 1865.

To all whom it may concern:

Be it known that I, DANIEL H. SOUTHWORTH, of the city, county, and State of New York, have invented a new and useful Improvement in Telegraph Cables or Conductors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal view of a piece of a telegraph-cable constructed according to my invention. Fig. 2 is a transverse section of the same. Fig. 3 is a transverse section of what I call the "insulating-piece" in a condition for the reception of the wires or conductors. Figs. 4 and 5 illustrate different modes of constructing the insulating-piece. Fig. 6 is a front view of a die which is employed to introduce the wires or conductors into the insulating-piece.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a novel mode of inclosing and separately insulating several telegraph wires or conductors within one cable.

It consists in a novel construction of and mode of applying an insulating-piece of gutta-percha, india-rubber, or other material or fabric which is a non-conductor of electricity, whereby the said piece is made to serve both as a central core for the separation of the several wires or conductors and an envelope for inclosing the same, and to insulate each from the others, so that it may be used as a separate and independent conductor.

To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawings.

The insulating-piece is composed of a separate core, *a*, having a number of longitudinal fins or flanges, *b b*, corresponding with the num- of wires or conductors *e e* to be inclosed. It may be made of gutta-percha or india-rubber by forcing such material, in a plastic state, through a suitable die, with the fins or flanges radiating from the central core, *a*, as shown in Fig. 3, or be produced by taking a strip of gutta-percha or vulcanized india-rubber of suitable thickness and slitting it with a suitable cutting-instrument, as shown at *c c* in Fig. 4, to within a suitable distance from the center to form the fins or flanges *b b*, or by taking strips of woven fabric and sewing them together along their centers, as shown at *d* in Fig. 5. The wires or conductors *e e* are placed between the fins or flanges *b b*, which are afterward turned over and made to envelop and inclose them separately, as shown in Fig. 2, and secured by one or more coverings of wire, cord, yarn, or tape, or of all or any number of those fabrics, applying also as many coatings as may be desirable of flexible and water-proof materials or compositions or varnishes, such as gutta-percha, india-rubber, or solutions or compounds of those substances.

In the example of my invention represented the insulating-piece is secured around the wires by winding around it a covering of yarn or cord, *f*. A tape, *g*, is afterward wound upon this yarn or cord, and an outer covering of yarn or cord, *h*, is wound upon the exterior of the tape, and this outer covering is supposed to be thickly coated with a suitable varnish. The cable thus formed is suitable for overland telegraphs; but for a submarine cable, or any cable submerged in water, I would use an outer covering composed of wire, coiled around the cable, and coated with gutta-percha or other water-proof material or composition. Wire might also be substituted for the yarn or cord *f*, or the insulating-pieces may be inclosed by wires arranged closely together lengthwise of the cable.

The best mode of applying the insulating-piece to the wires or conductors is to pass the whole together through a die of steel or other metal of the construction shown in Fig. 6. This die has an opening through it of a suitable form for the passage of the insulating-piece, and with suitable grooves *i i* in the central portion, *h*, of the said opening, between the radiating portions *j j*, through which the fins or flanges *b b* of the insulating-piece pass. These grooves are for the passage of the wires or conductors *e e*, which are brought thereinto from suitably-arranged spools or coils. The fins or flanges *b b* of the insulating-piece are turned over the wires or conductors, as shown in Fig. 2, by passing the whole through a rotating hollow mandrel having a bore of the same circumference as the exterior of the center piece will have when so turned over, but having a taper or funnel like entrance, the outer portion or mouth of which has a circumference not less than that of a circle circumscribing the outer edges of

the fins or flanges *b b*. The coverings of yarn, cord, or wire and tape are afterward wound around the insulating-piece by means of suitable revolving fliers, through which the insulating-piece and inclosed wires are drawn by suitable means.

The cable represented contains four wires or conductors, but it may be made to contain a larger or smaller number by constructing the insulating-piece with a corresponding number of fins or flanges, and in such case the die, otherwise constructed as represented in Fig. 6, must have a corresponding number of radial openings, *j j*, and grooves *i i*.

What I claim as my invention, and desire to secure by letters Patent, is—

Inclosing and separately insulating several telegraph wires or conductors in a cable by means of an insulating-piece having fins or flanges, and otherwise constructed substantially as herein specified.

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