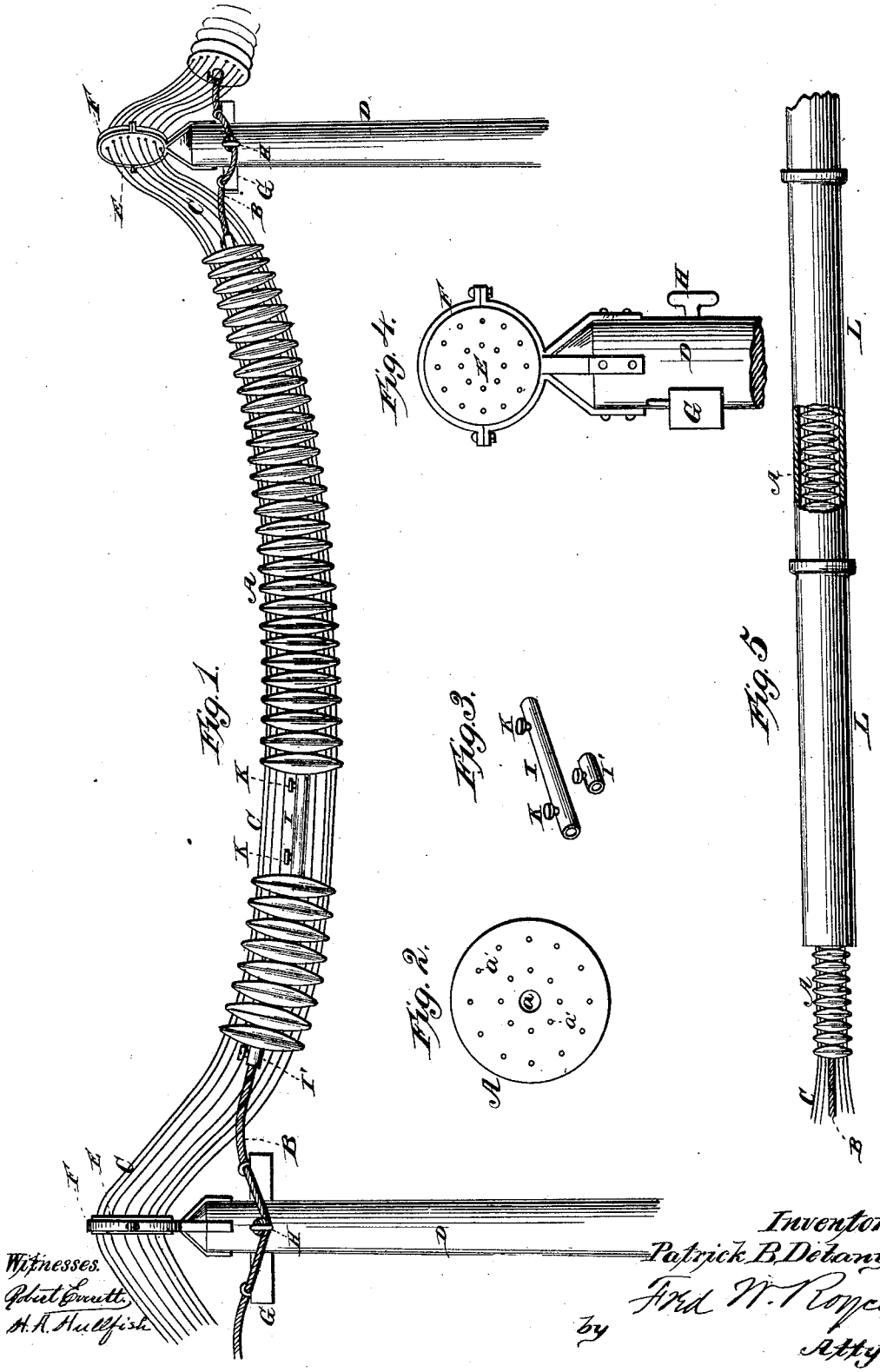
(No Model.) 2 Sheets—Sheet 1.

P. B. DELANY.

TELEGRAPH CABLE.

No. 247,146. Patented Sept. 13, 1881.



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(No Model.) 2 Sheets—Sheet 2.

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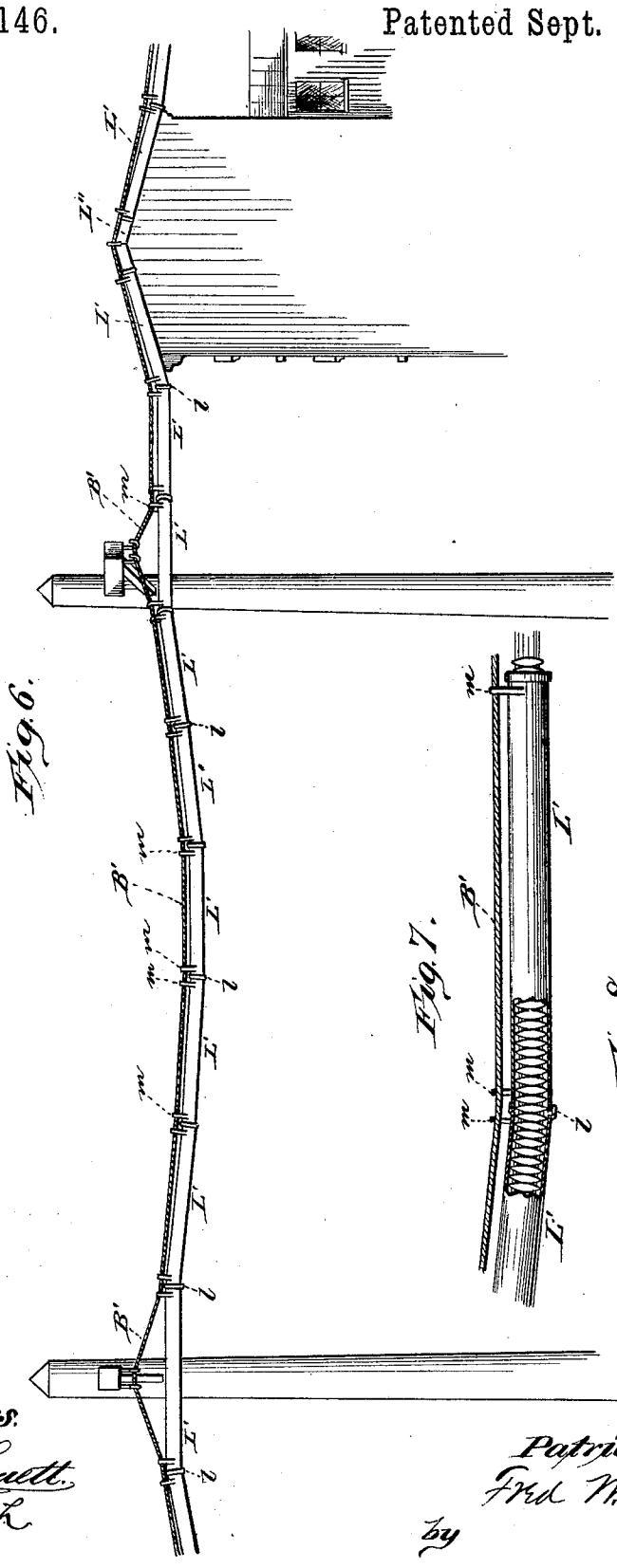

Fig. 6.

Fig. 7.

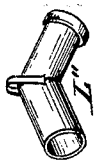

Fig. 8.

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UNITED STATES PATENT OFFICE.

PATRICK B. DELANY, OF NEW YORK, N. Y.

TELEGRAPH-CABLE.

SPECIFICATION forming part of Letters Patent No. 247,146, dated September 13, 1881.

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

To all whom it may concern:

Be it known that I, PATRICK B. DELANY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Telegraph-Cables; 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a multiple-wire telegraph-cable having great flexibility and strength, and in which the several conductors will be effectively insulated from each other and protected from contact with outside objects, said cable being adapted for use either in the air or under ground.

In the accompanying drawings, Figure 1 is a view of a portion of an aerial telegraphic cable constructed according to my invention. Fig. 2 is a view of one of the buttons detached. Fig. 3 is a view of two of the separating-stops. Fig. 4 is a detail view, illustrating a mode of supporting the cable. Fig. 5 is a view of a portion of an underground cable constructed according to my invention. Fig. 6 is a view of a portion of a modified form of aerial cable provided with a sheathing or guard-tubing. Fig. 7 is an enlarged view of a portion of said cable, partly in section. Fig. 8 is a view of a tube-bend useful in laying the cable across the comb or the edge of a roof.

The letter A indicates the insulating-buttons which support and keep separated the wires. These buttons may be made of glass, porcelain, or any other suitable insulating material, and of any desired diameter, and each has a central hole, *a*, for the passage of the supporting and strengthening rope or cable B. Between the central hole and the periphery of the buttons, and at a proper distance therefrom and from each other, are formed the small apertures *a'* for the passage of the conducting-wires C. The outer apertures for the passage of the wires should be at such a distance from the peripheries of the buttons that should the buttons come in contact with the ground, a wall, or other object the wires will be held out of contact with such object.

In constructing the cable the buttons may be first strung upon the central supporting and strengthening rope, B; or said rope and the conducting-wires, which may be naked or covered with an insulating substance, may be passed through the apertures of the buttons at the same time, the cable being constructed as it is laid or erected. The buttons will touch each other loosely, generally, but should have sufficient play to permit the bending of the cable as desired. At such points as it is found necessary to support the cable a stationary perforated button or disk is firmly secured for the support of the wires alone, and the central rope is led out from the wires and firmly secured by staples or cleats, or both, as shown in Fig. 4, where D designates a pole, at the top of which the perforated disk E, of insulating material, is firmly secured by an iron frame, F. Below the disk the pole is provided with a stout and firmly-braced cross-arm, G, to which the rope is secured by staples, and is also preferably passed around a cleat, H, secured to the pole, to prevent slipping. After passing the pole the rope returns to its central position in the cable. This rope is preferably formed of wire, and at such points as necessary may be covered with insulating material to prevent contact with the wires. The disk E may be secured to a building, wall, or roof, and the rope B secured as the circumstances of any particular case may suggest or require.

In order to secure space between any two buttons of the cable, I place upon the rope B, between said buttons, a pipe or sleeve, I, Fig. 1, of suitable length, and having a diameter too great to go through the central holes of the buttons. Screws K, passing through the pipe, impinge upon the rope and hold the pipe in place. Short sleeves I' are in the same manner placed to prevent the movement of the buttons beyond a given point. The sleeves like I will be used chiefly where it is necessary to branch one or more wires off from the cable, as in Fig. 1, or for affording room for testing or manipulating the wires for any other purpose. But few poles or other stationary supports are required for my cable as compared with the present mode of supporting telegraph-

wires in cities and other places where a large number run parallel, as the great strength given to the cable by the central rope makes it self-supporting for very long spans.

When the wire-apertures of the buttons are not all filled up additional wires may be easily run, as a ladder with a suitable fender cross-bar may be raised to and supported by the cable, the fender-bar touching only the peripheries of the buttons. In view of the addition of extra wires, the outer apertures should be left vacant, if any, for convenience, but is not absolutely necessary, as a wire may be easily added or removed near the center of the cable, the wires, of course, being properly spaced.

The buttons A, it will be observed, have an elliptical cross-section—that is, they taper from center to periphery—this being for the purpose of allowing the cable to readily bend in changing direction, or to accommodate the sag between supports, or in swaying to and fro.

Such a cable will be found especially useful in cities, as it can be laid across a roof or run alongside a wall, either inclosed in a pipe or not, without danger of interference with the wires, and hundreds of wires included in one or more of such cables may be arranged in the space heretofore required for but few.

When the cable is to be laid underground I inclose it in a protecting-pipe, as shown at L, Fig. 5, formed either of lead, iron, or earthenware sections connected by suitable joints, as shown in Fig. 5. In laying the cable underground it may be wound upon a reel and drawn thence through section after section of pipe, a very few splices being necessary.

When the cable is placed in a pipe the space unoccupied by it may be left vacant or filled with insulating material, as desired. The flexibility of the cable will permit the use of any of the ordinary pipe-bends in changing direction.

In the modification shown in Figs. 6 and 7 an aerial or underground cable is inclosed in a sheathing formed of light tube-sections L′, each having at one end a collar for the end of the adjoining section to fit into. These tube-sections may be made of sheet-iron or any other suitable light material. In this form of cable the central supporting or strain rope is omitted, and an outside supporting-rope, B′, or a wire or cable, is used, said rope being passed through loops *m*, secured to each end of each tube or sheathing section, and at points where the cable is suspended the said rope is hung upon hooks, as shown, where the cable is suspended from the arms of poles in the drawings. When a wire or wire rope is used for the support of the cable it may be soldered to the sections of sheathing. Owing to the loose joints the cable can sag without separating the sections of sheathing.

In crossing the combs of roofs and similar places, the cable lying upon the roof or other elevated object, tube-bends of suitable angle, such as shown at L″, Figs. 6 and 8, will be found useful.

The tube or sheathing sections should be painted, preferably with so-called "waterproof" paint, to protect them.

It is, of course, impracticable to use any insulating filling for this form of cable other than the buttons.

I do not limit myself to short tube-sections in this form of cable, as it is obvious that long flexible sections of light tubing of lead, india-rubber, gutta-percha, or other suitable material might be used, such sections being provided with loops for the rope at proper points.

This form of cable is especially useful in conducting the wires of electric-light circuits, over which are passed dynamo-electric currents of very high tension, which are extremely dangerous, as, when a ground-connection is accidentally made from one of such wires through the body of a human being, loss of life is likely to occur. Fatal accidents of this kind have, indeed, occurred.

What I claim is—

1. The combination, with a cable composed of one or more electrical conducting-wires run through perforations in a series of insulating-buttons strung upon said wire or wires, of a strain or supporting rope connected with and arranged to bear the entire weight of the said cable, substantially as described.

2. A telegraph-cable composed of the central supporting and strengthening rope or cable, the perforated buttons of insulating material, tapering from center to periphery and strung upon said rope or cable, and the conducting-wires arranged through the perforations of said buttons, substantially as described.

3. The combination, with the central rope and the buttons, of suitable sleeves for separating or limiting the movement of the buttons, substantially as described.

4. The combination, with a cable composed of the central rope, the tapering buttons, and conducting-wires, of an inclosing-pipe, substantially as described.

5. The combination, with a telegraph-cable composed of one or more wires, a series of insulating-buttons strung upon said wire or wires, and an inclosing sheathing or tube, of a supporting or strain rope, wire, or cable connected with said sheathing and arranged to be suspended from suitable supports, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PATRICK B. DELANY.

Witnesses:
FRANK L. WARRIOR,
A. F. HIGGINS.