

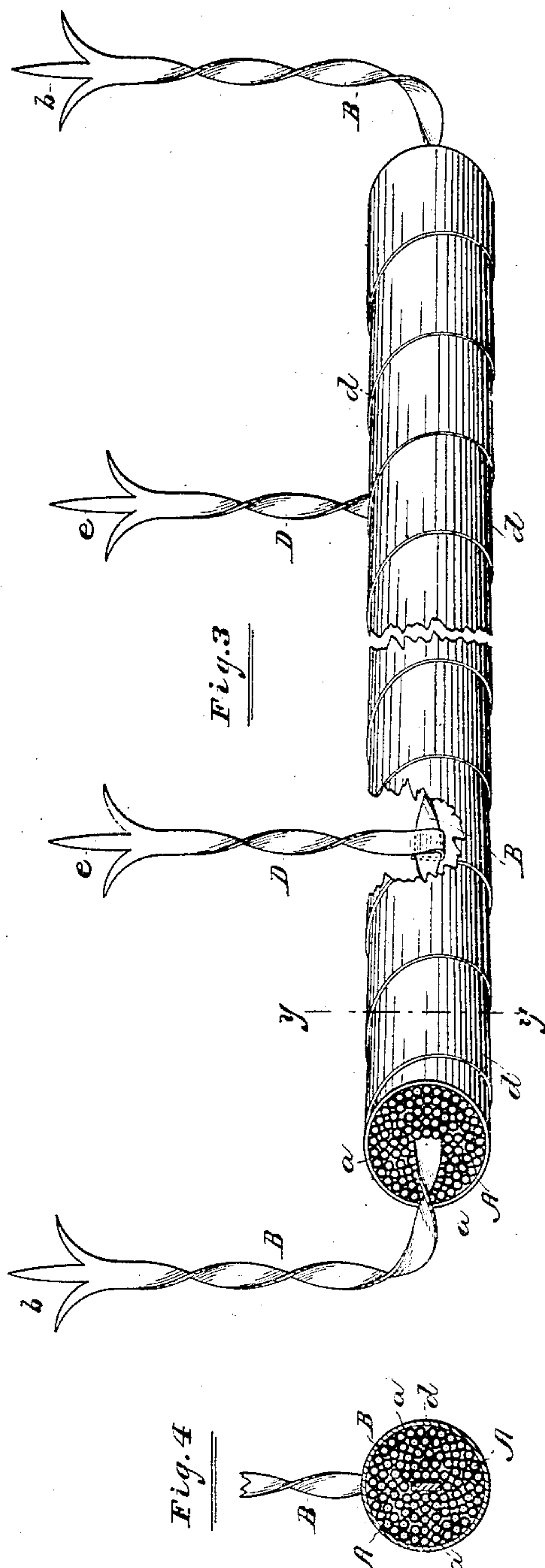
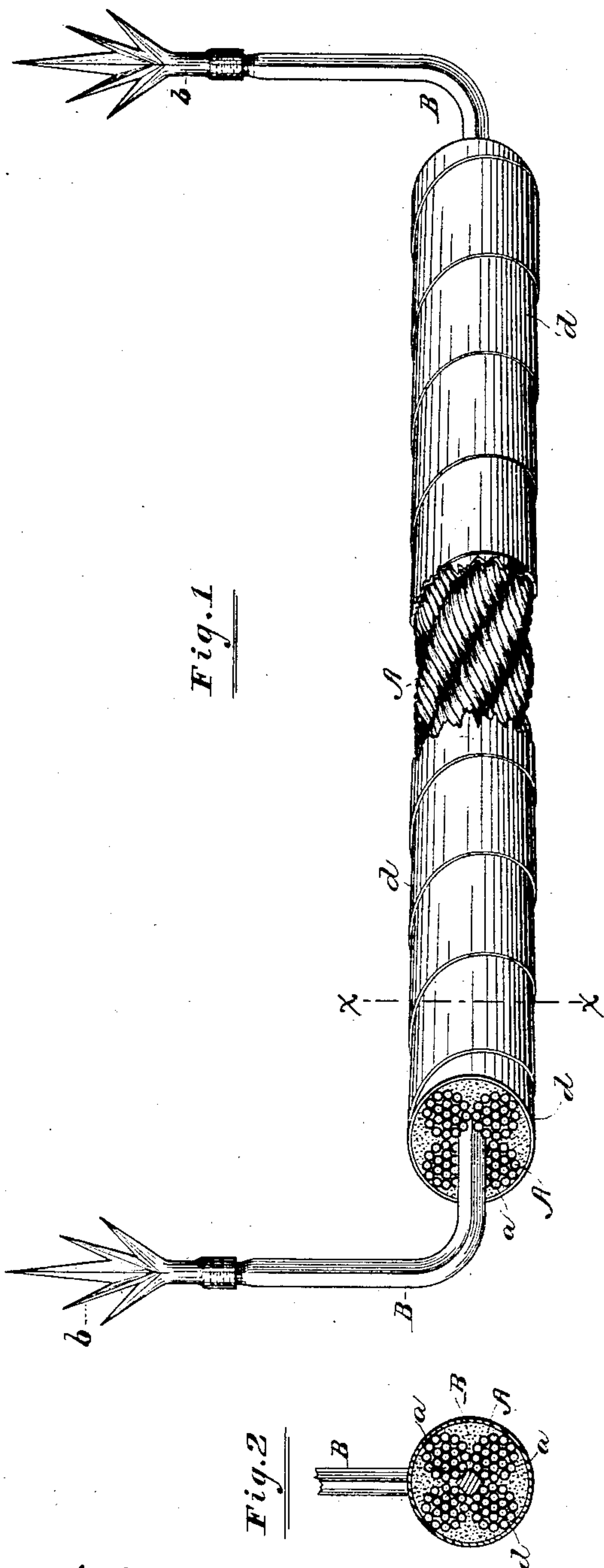
(No Model.)

J. C. CHAMBERS.

TELEGRAPH AND TELEPHONE CABLE.

No. 289,891.

Patented Dec. 11, 1883.



Witnesses,
Henry Truesdell,
W. L. Baker.

Inventor,
Josephus C. Chambers,
per. Gridley & Co
his Attorneys,

UNITED STATES PATENT OFFICE.

JOSEPHUS C. CHAMBERS, OF CINCINNATI, OHIO, ASSIGNOR OF PART TO
JAMES S. VINE, OF SAME PLACE, WILLIAM A. JACKSON, OF DETROIT,
MICHIGAN, AND NELSON C. GRIDLEY, OF CHICAGO, ILLINOIS.

TELEGRAPH AND TELEPHONE CABLE.

SPECIFICATION forming part of Letters Patent No. 289,891, dated December 11, 1883.

Application filed August 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPHUS C. CHAMBERS, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain
5 new and useful Improvements in Telegraph and Telephone Cables, of which the following, in connection with the accompanying drawings, is a specification.

It is well known that when two or more conductors of electricity are placed in electrical
10 proximity to each other, as in telegraph and telephone lines and cables, every signal or sound transmitted over one by the variations of the electrical current will produce in the
15 others induced currents in the opposite direction, and which disturb and interfere with the use of the others for separate and distinct signals or sounds.

The object of my invention is to greatly reduce, if not wholly prevent, this disturbing
20 action of induction in aerial, underground, and submarine telegraph and telephone cables; and my invention consists in a group or series of telegraph and telephone electric conductors, each provided with an insulating-
25 covering, and connected with the batteries, and grounded in the usual manner, and one or more induction wires, rods, bands, or strips, preferably not covered with insulating material,
30 and so arranged as to be surrounded by some or all of the series or groups of telegraph and telephone electric conductors, and insulated therefrom, from the supports, and from the earth, and so as not to form a complete or
35 closed circuit, substantially as hereinafter more particularly described and claimed.

The mode of carrying my invention into effect will be understood by reference to the accompanying drawings, in which—

40 Figure 1 is a perspective representation of a telegraph or telephone cable embodying my invention. Fig. 2 is a transverse section of the same through the line *xx*. Fig. 3 is a perspective representation of a telegraph or telephone cable of modified form embodying my
45 invention; and Fig. 4 is a transverse section of the same through the line *yy*.

Like letters of reference indicate like parts.

In the drawings, A represents one or more groups or a series of telegraph or telephone
50 electrical conductors, each of which is provided with a covering, *a*; of any known insulating material and when in use are connected with batteries and grounded in the usual manner.

55 Through the center of the series or groups of the electrical conductors A, and so as to be surrounded by and in electrical proximity to some or all of such conductors, is arranged or placed one or more induction wires, rods, bands,
60 or strips, B, preferably not covered with insulating material, and the terminal ends of which are extended beyond the ends of the cable proper, and upturned and provided with one
65 or more points, *b*. When only one induction wire or band, B, is employed, it should be preferably constructed so that its surface should equal, or nearly so, the combined surfaces of
70 the electrical conductors A employed in the cable.

The telephone or telegraph electrical conductors A may be formed in groups or cables,
and with the induction wire, rod, band, or strip B twisted together, and the interstices filled
75 with suitable insulating material, as shown in Figs. 1 and 2; or the electrical conductors A, with the induction-wire B, may be bunched together, as shown in Figs. 3 and 4. Around
80 the cable so formed I wrap a covering of any known insulating and water-proof fabric or material, *d*, so as to be firmly secured thereto,
and preferably in the form of a strip or band, wound spirally; as shown, so that the same
85 may be readily removed at any point desired to give access to the conductors for the purpose of repairs or otherwise, and also replaced.
The induction wires or bands B are insulated
90 from the electrical conductors A by means of the insulating material covering each of such conductors, and from the earth by means of the surrounding insulating and water-proof covering *d*, and so as not to form a complete or closed circuit.

In long-distance or multiple aerial telegraph or telephone lines I prefer to construct the
95 induction wire, rod, band, or strip B in spiral

form, so that the edges thereof shall present points in opposite directions, and to attach thereto at suitable intervals between the terminal ends thereof, and so as to project therefrom and from the cable, similar wires, rods, bands, or strips, D, provided with one or more points, *e*, for the purpose of more completely diffusing the induced electricity contained upon the induction-wire B, and which is opposite to that contained upon the electric conductors or wires A, upon said conductors or wires A, thereby greatly reducing, if not wholly preventing, the disturbing or retarding action of the inductive influence of said electric conductors or wires upon each other, and of the atmospheric electrical disturbances upon said conductors or wires.

It is well known that if a charged conductor of electricity be brought near an uncharged conductor which is insulated and not connected with the earth the charged conductor acts upon the uncharged conductor by induction and separates its polarities, and that the charged conductor attracts the dissimilar electricity nearest to it and repels the similar electricity to the farthest points of the uncharged conductor. It is also well known that an electrical conductor, when insulated from the earth, receives its electricity by induction, and is opposite from that of the body from which it was induced, and that a conductor receiving electricity by conduction or from contact receives the same kind as contained upon the body in contact therewith; hence it will appear in the example shown that the telegraph or telephone electrical conductors A, which are connected with the earth, receive, to illustrate, negative electricity therefrom, or the same kind with which the earth may be charged, and, if brought in electrical proximity to the induction wire, rod, band, or strip B, will induce upon the base of B positive electricity, when both the positive and negative will approach each other and become equalized, and the inductive action of the conductors or wires A will be on the induction-wire B, and not upon each other, and thereby greatly reduce, if not wholly prevent, the disturbing or retarding action of induction upon the conductors or wires A.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a telegraph or telephone cable, one or more induction wires, rods, bands, or strips insulated from the electrical conductors and

from the earth, and having the terminal ends thereof extended beyond the ends of the cable proper and upturned and provided with one or more points, substantially as and for the purpose specified.

2. The combination, with a series or groups of telegraph or telephone electrical conductors severally having coverings of insulating material, of one or more induction wires, rods, bands, or strips arranged in electrical proximity to the telegraph or telephone electrical conductors, and insulated therefrom and from the earth, and having disconnected terminal ends, so as not to form a complete or closed circuit, substantially as and for the purpose specified.

3. The combination, with a series or groups of telegraph or telephone electrical conductors severally having coverings of insulating material, of one or more induction wires, rods, bands, or strips arranged in electrical proximity to the telegraph or telephone electrical conductors, and insulated therefrom, and having disconnected ends, so as not to form a complete or closed circuit, and a surrounding covering of insulating and water-proof fabric or material, substantially as and for the purpose specified.

4. The combination, with a series or groups of telegraph or telephone electrical conductors severally having coverings of insulating material, of one or more induction wires, rods, bands, or strips arranged in electrical proximity to the telegraph or telephone electrical conductors, and insulated therefrom and from the earth, and having its terminal ends upturned and provided with one or more points, substantially as and for the purpose specified.

5. The combination, with a series or groups of telegraph or telephone electrical conductors severally having coverings of insulating material, of one or more induction wires, rods, bands, or strips arranged in electrical proximity to the telegraph or telephone electrical conductors, and insulated therefrom and from the earth, and having attached thereto between its terminal ends, and so as to project therefrom, one or more similar wires, rods, bands, or strips, D, provided with one or more points, *e*, substantially as and for the purpose specified.

JOSEPHUS C. CHAMBERS.

Witnesses:

W. S. BAKER,
N. COWLES.