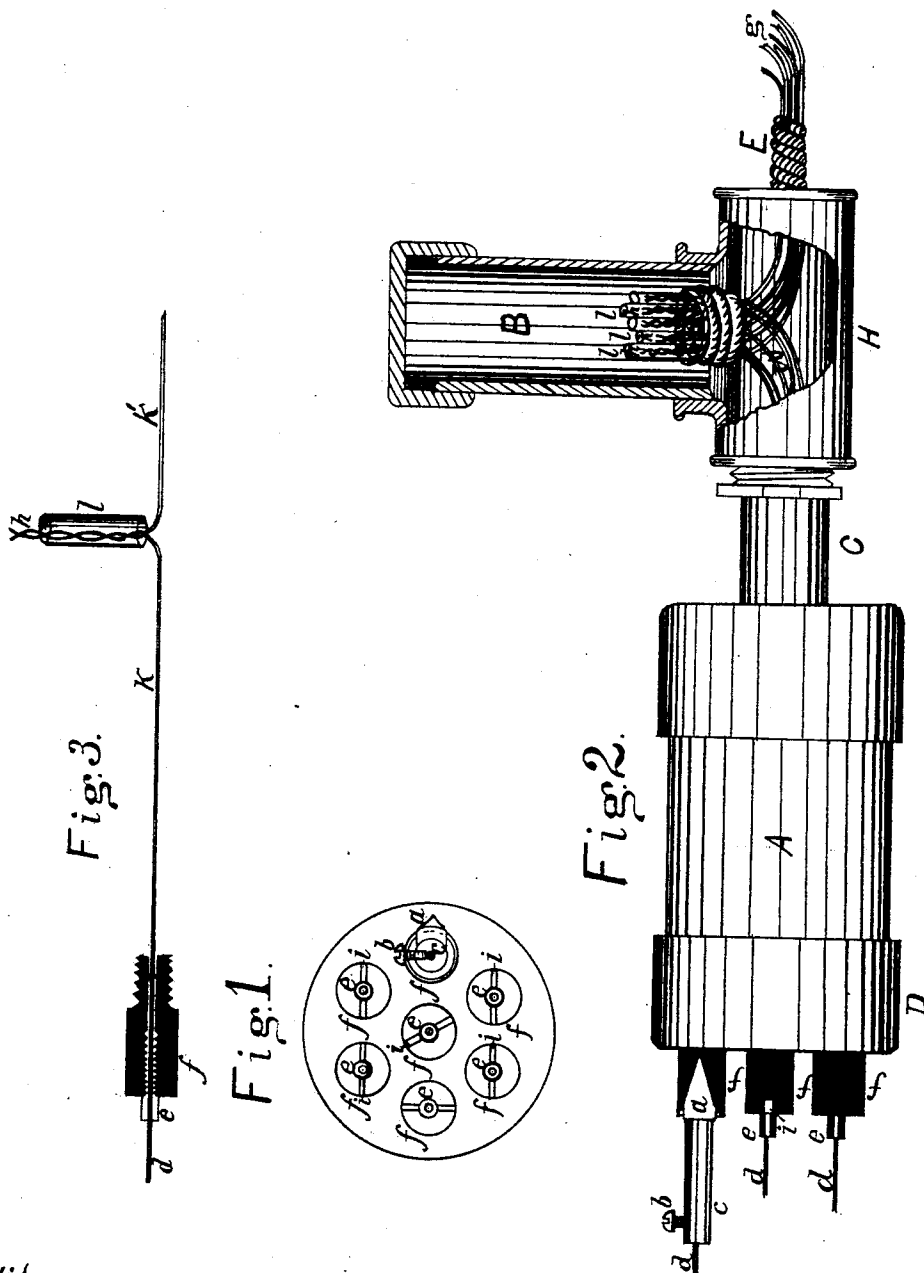


W. R. PATTERSON.
Terminal for Underground Telegraph Lines.

No. 233,162.

Patented Oct. 12, 1880.



Witnesses:
Wallace L. De Wolf,
George P. Barton.

Inventor:
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UNITED STATES PATENT OFFICE.

WILLIAM R. PATTERSON, OF EVANSTON, ASSIGNOR TO WESTERN ELECTRIC MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS.

TERMINAL FOR UNDERGROUND-TELEGRAPH LINES.

SPECIFICATION forming part of Letters Patent No. 233,162, dated October 12, 1880.

Application filed October 23, 1879.

To all whom it may concern:

Be it known that I, WILLIAM R. PATTERSON, of Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Terminals for Under-ground-Telegraph Cables, of which the following is a full, clear, concise, and accurate description, reference being had to the accompanying drawings, forming a part thereof.

The cable to which my invention appertains consists of insulated wires bound together and drawn within an iron pipe, which may be embedded in the earth or laid under water, and by means of a stand-pipe or otherwise the pipe must always be kept full of oil, and thus the wires are protected. We will speak of the pipe thus filled with the wires and oil as the "cable," and will designate the mechanism at an end of a section of cable, whereby the oil is retained while the wires respectively are permitted to pass out of the pipe insulated therefrom and from each other, as the "terminal."

Prior to my invention the only terminal that was in public use or known, so far as I am informed, consisted in passing the bundle of wires through a pipe as small as possible, and filling the crevices with some adhesive substance, which was poured in hot and allowed to cool. Pitch, resin, paraffine, and shellac have been used for this purpose, but no suitable substance was found insoluble in oil and capable of resisting the changes of temperature and the hydrostatic pressure of the oil to which the terminal must be exposed.

In my improved terminal I use a section of large pipe fitted to the cable-pipe and provided with a solid cap, through which pass insulated metal pins, which furnish electrical connection through the cap.

In the drawings, Figures 1 and 2 are end and longitudinal views, respectively, of my terminal. Fig. 3 shows, in detail, a single wire and its connections.

The cast-iron piece B, Fig. 2, is represented as cut away, and the wires *w* and *g* are left partially uncovered, so as to show the joints *h h*, &c., within the glass tubes *l l*, &c.

E is a cord, which is wound around the wires *g* and *w*, as shown. The part C may be of the normal size of the cable.

A corresponds in size with the cap D, which must be large enough to accommodate the number of wires in the cable, as it must be provided with as many holes as there are wires.

f (shown in detail in Fig. 3) is of hard rubber, and is provided with a central opening. *e* is a hollow metallic pin. Through this pin a wire, *d K*, is passed, and soldered, preferably, at the inner point of the pin. Then the portion K of the wire is passed through the rubber bushing *f*, and the pin, moistened with shellac varnish, is screwed into the piece of hard rubber, as shown in Fig. 3. The pin should extend but partially through the bushing, so that the wire, where it is soldered to the pin, may be protected.

The bushing is now ready to be screwed into one of the holes provided in the cap D, and shellac varnish is used as before.

The portion of the wire K is of sufficient length to extend through the lateral opening in the piece H, Fig. 2, where it is spliced with a corresponding wire, K', Fig. 3, of the main portion of the cable, as shown at *h*, the part *h* being insulated by the glass tube *l*, or in any suitable manner. When the wires are all thus adjusted the piece B is screwed into piece H, and then the cable is ready to receive the oil.

The cable is usually placed in a vertical position, and the main portion of the cable is adjusted to the open end of H and extends therefrom in any direction.

A binding-post, *e*, may be screwed to the pin *e*, or the two may be cast in a single piece. When thus constructed *d* may be a distinct piece of wire and connected by means of the binding-post, and held in place by the screw *b*, as shown more clearly in Fig. 1. A lightning-arrester, as *a*, may be attached in any suitable manner.

When the cable rises higher than the terminal the hydrostatic pressure of the oil must be provided for. I have tested my terminal, constructed as herein described, for more than a month under the pressure of a perpendicular column of oil of over fifty feet, and not a drop of oil leaked out.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The wire *d* K, in combination with the hollow pin *e* and bushing *f*, so adjusted in cap D or its equivalent as to afford electric connection with a corresponding wire of the cable while the oil is retained within the pipe.

2. A terminal consisting of the enlarged portions of the pipe A D and H B, connected by the part C, in combination with the parts *d*, *e*, and *f*, the wire *d* extending through and spliced, substantially as shown and described, and for the purpose specified.

3. Cap D, provided with holes, in combination with shellac varnish, hard-rubber bushing *f*, &c., hollow pins *e*, &c., and wires inserted therein and soldered at their inner ends, all substantially as and for the purpose specified.

4. In a terminal for oil-cables in which the oil is kept under hydrostatic pressure, the

combination of metallic pin *e* and bushing *f*, so adjusted in cap D or its equivalent that the oil under pressure will be retained within the pipe, while electric connection is afforded by means of pin *e* between the wire of the cable and its corresponding outside wire, substantially as shown and described.

5. In a terminal for oil-cables in which the oil is under pressure, the combination of solid cap D, or its equivalent, with metallic pins insulated from each other and so adjusted or set in said cap as to retain the oil under pressure within the pipe, while electric connection is afforded by said pins between the wires of the cable and their corresponding outside wires, substantially as specified.

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Witnesses:

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