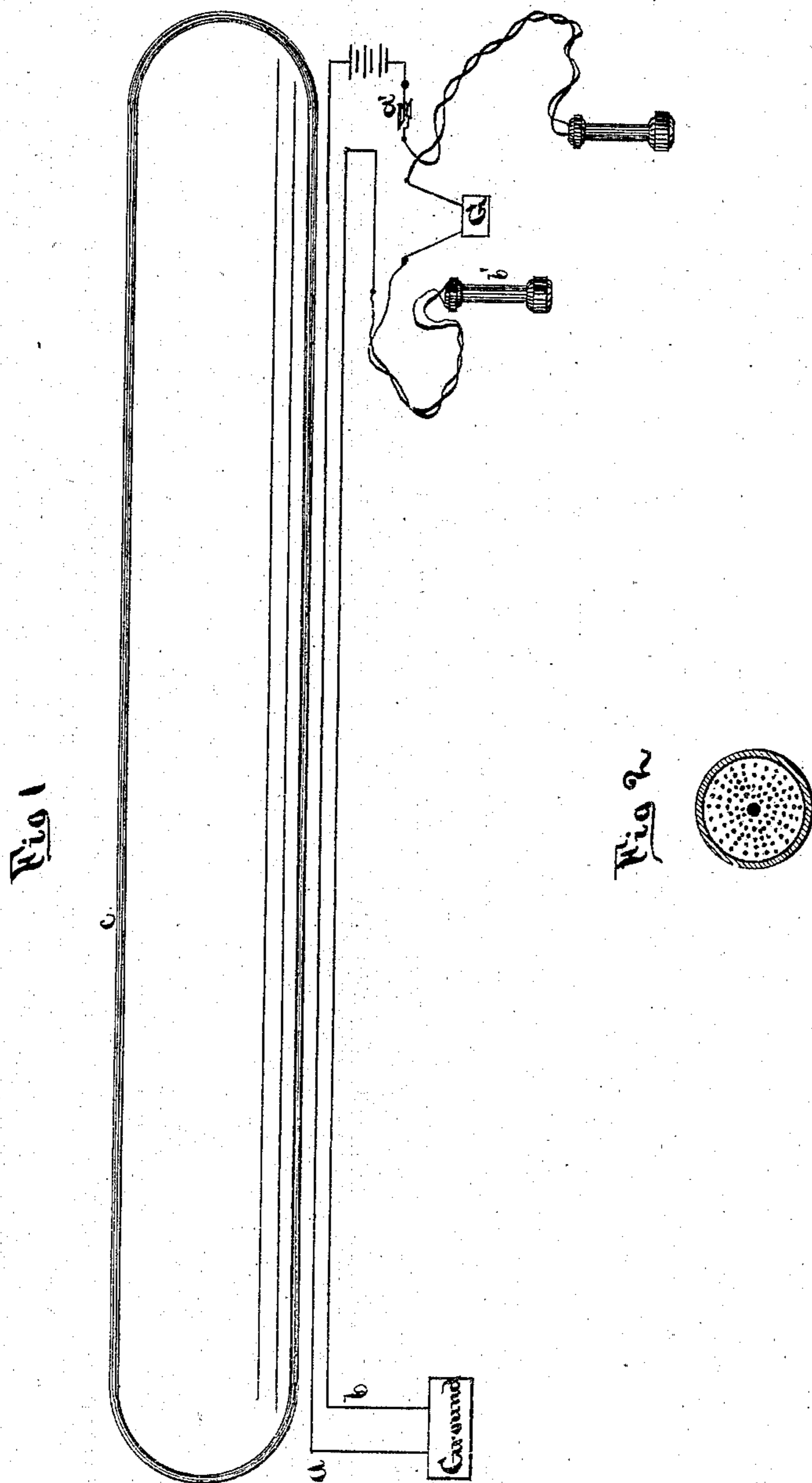


(No Model.)

W. R. PATTERSON.
ANTI INDUCTION CABLE.

No. 252,511.

Patented Jan. 17, 1882.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM R. PATTERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC MANUFACTURING COMPANY, OF SAME PLACE.

ANTI-INDUCTION CABLE.

SPECIFICATION forming part of Letters Patent No. 252,511, dated January 17, 1882.

Application filed July 14, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. PATTERSON, of Chicago, county of Cook, Illinois, have discovered a certain new and useful Improvement in Anti-Induction Cables, of which the following is a full, clear, concise, and exact description.

My improvement consists in combining a circuit of low resistance with the telephone-line circuits in such manner as to neutralize the effect of the secondary currents. Prior to my invention this circuit of low resistance was formed, in whole or in part, of metallic sheaths wrapped about the insulating-coverings of the different conductors. The establishment of a current in any conductor causes an induced current in the opposite direction in all the other circuits, including the low-resistance circuit. It follows from Ohm's law that, the current being equal to the electro-motive force divided by the resistance, a much greater tertiary current will be induced from the circuit of low resistance than from any of the others. I find that when the resistance of this circuit is very low in comparison with that of any of the others—say from one-tenth to one-fifteenth, or less—this tertiary current will practically neutralize the secondary currents in the small conductors.

In the drawings, Figure 1 is a diagram of the circuits of a telegraph-cable embodying my improvements. Fig. 2 is a transverse section of a cable containing many telephone-lines and the wire of low resistance.

The telephone-line may be closed to battery by tapping on the key *a'*. Secondary currents are thus induced in the other lines that are closed, as in telephone-line *b*, and also in the low-resistance conductor *c*. The currents induced in conductor *c* will tend to induce tertiary currents in line *b*, which will practically neutralize current induced in line *b* by interrupting the current in line *a*. This may be demonstrated by listening at telephone *b'* while

the circuit of the battery is being interrupted. As long as the circuit of low resistance is closed there will be apparently but very little induction; but on opening the circuit of low resistance the ordinary effects of induction will be observed.

Resistance may be placed in line *c* instead of opening its circuit, and with like results.

As to the state of the art prior to my invention, reference is made to English Patent No. 1,475 of 1880, and United States Letters Patent No. 231,085, to H. G. Pearson, dated August 10, 1880, and No. 242,651, to W. W. Jaques, dated June 7, 1881.

I claim—

1. The combination of a complete metallic circuit of low resistance placed in the interior of the cable among the other conductors, with one of said conductors used as a primary circuit and several of said conductors used as secondary circuits, whereby the effects of induction are overcome, substantially as and for the purpose specified.

2. In a telegraph-cable, the combination of separately-insulated conducting-wires with a complete metallic circuit of low resistance, which is placed centrally among the said conducting-wires, as and for the purpose set forth.

3. A telegraph-cable containing several primary wires, in combination with a complete metallic circuit of low resistance placed centrally among the other conductors, whereby tertiary currents are induced, as and for the purpose set forth.

4. The combination of primary line *a*, key *a'*, or its equivalent, one or several secondary lines, *b*, and the low-resistance wire *c*, whereby tertiary currents are induced in said line or lines *b*, as and for the purpose set forth.

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