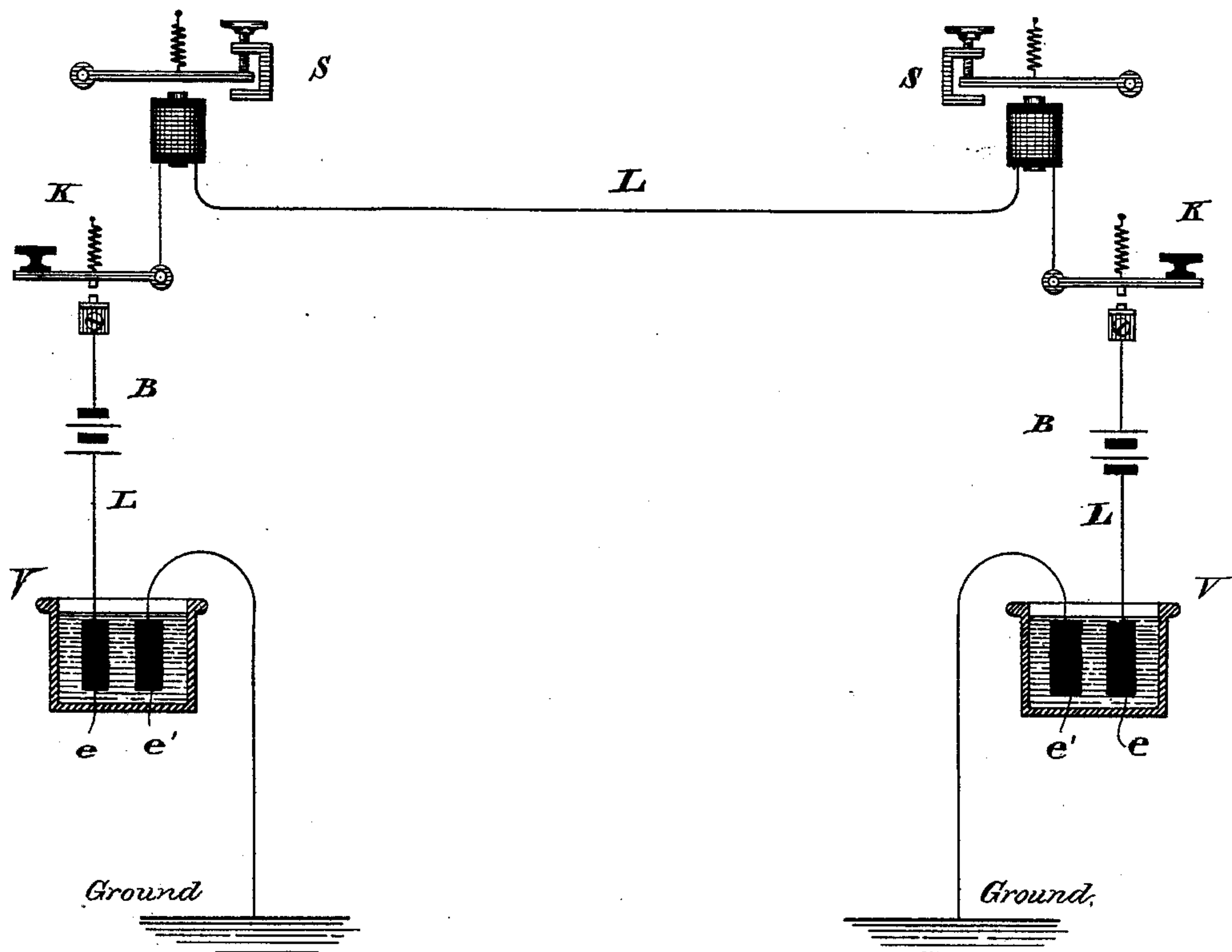


(No Model.)

O. LUGO.
Electric Telegraphs.

No. 235,159.

Patented Dec. 7, 1880.



WITNESSES

Wm. A. Skink
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By his Attorneys

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ELECTRIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 235,159, dated December 7, 1880.

Application filed June 10, 1880. (No model.)

To all whom it may concern:

Be it known that I, ORAZIO LUGO, a citizen of the United States, residing in the city, county, and State of New York, have invented
5 or discovered certain new and useful Improvements in Telegraphy, of which improvements the following is a specification.

Great difficulty is often experienced in operating parallel and adjacent lines of telegraph
10 by the transference of signals made upon one line to another. This is especially the case when a wire charged and worked with a strong battery-current approximates one operated with a magneto-current or with a weaker electric current, as in the case of the speaking-telephone.
15 The theory generally accepted prior to my invention has been that this interference was entirely caused by "induction," so called. Numerous attempts have been made to get over
20 this difficulty by braiding, twisting, or arranging wires parallel and close together, so that the so-called "induced current" passing in one direction might be neutralized by an opposite or reversed current of induction.

25 The difficulty above mentioned is believed not to arise in the case of a metallic circuit perfectly insulated from the earth or from connection with other lines; but such metallic circuits are seldom practically used on account
30 of the expense and the difficulty of maintaining insulation.

My invention is based upon the discovery made by myself that this so-called "induction" from one parallel line to another consists
35 really in the continuity of the circuit through the ground-connections of the respective lines, the intensity of the so-called "induction currents" being dependent on the perfectness of the operation of the ground as a conductor.

40 The object of my invention is to obviate this so-called "induction" in adjacent telegraph-lines, which end I attain by preventing communication between the ground-connections of the respective lines.

45 The invention by which I attain this object is based upon another discovery of my own, that the electro-motive force of the battery, after doing its work upon the line, can be neutralized, dissipated, or extinguished by decomposing an electrolyte, and the ground-connections thus be dispensed with, or the cur-

rent at least be so attenuated or reduced before reaching the earth as to be practically ineffectual to disturb the other lines.

My invention therefore, broadly stated, consists in a novel art, method, or system of neutralizing by electrolysis the electro-motive force of the battery after its work upon the telegraph-line is accomplished.

The subject-matter of my invention is specifically set forth in the claims at the end of the specification.

I attain the objects of my invention by a novel organization of old instrumentalities, the essential features of which organization are a telegraphic circuit, including a battery, a line-wire, receiving and transmitting instruments, suitable connecting-wires, and, in addition, in lieu of the ordinary earth-connections, a decomposing or electrolytic apparatus interposed
70 between the line and the earth.

My invention contemplates the use of the most efficient apparatus of the present day, the construction of which is well known, and therefore need not be herein described, especially as the details of construction of such apparatus form no part of the subject-matter of my invention.

In the accompanying drawing, which is a diagram of my improved apparatus, terminal
80 stations only are shown. Obviously, however, any desired number of intermediate stations may be used in the ordinary way, the only thing necessary being to interpose an electrolytic or decomposing apparatus between the
85 line and the earth at each station.

The electrolytic apparatus I prefer to use is constructed on the principle of the well-known voltameter, and consists, preferably, of two carbon or platinum electrodes, e e' , immersed
90 in a suitable electrolytic fluid contained in a vessel, V , one of said electrodes, e , being connected with the line-wire L , while the other, e' , which is separated a suitable distance from it, may, if preferred, be connected with the
95 earth.

Sulphuric acid and water make a very good electrolyte, as is well known. Means must, of course, be adopted for replenishing the electrolytic fluid from time to time to compensate
100 its decomposition by the action of the electric current.

In the diagram, B represents the batteries, K the keys, and S the sounder or receiver. The diagram shows only one line; but obviously any number of lines may be employed, each one being provided with its separate electrolytic or decomposing apparatus.

When organized in accordance with my invention, telephone or telegraph lines working with different strengths of battery may be intermingled or approximated without interference, as I have demonstrated by experiment.

The operation of the apparatus, being in accordance with the well-known laws of chemical electricity and physics, needs no further elucidation.

I claim as of my own invention—

1. The hereinbefore-described improvement in the art of telegraphy, which improvement consists in neutralizing, dissipating, or extin-

guishing the electro-motive force of the battery after its work is done by interposing an electrolytic or decomposing apparatus between the line-wire and the earth.

2. The combination, substantially as hereinbefore set forth, of the electric circuit, including line and connecting wires, batteries, and receiving and transmitting instruments, with an electrolytic or decomposing apparatus interposed between the battery and earth to neutralize the electro-motive force of the battery after its work has been performed.

In testimony whereof I have hereunto subscribed my name this 5th day of June, 1880.

ORAZIO LUGO.

Witnesses:

WM. D. BALDWIN,
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