

(No Model.)

R. K. BOYLE.

TELEGRAPH.

No. 248,697.

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Fig. 1.

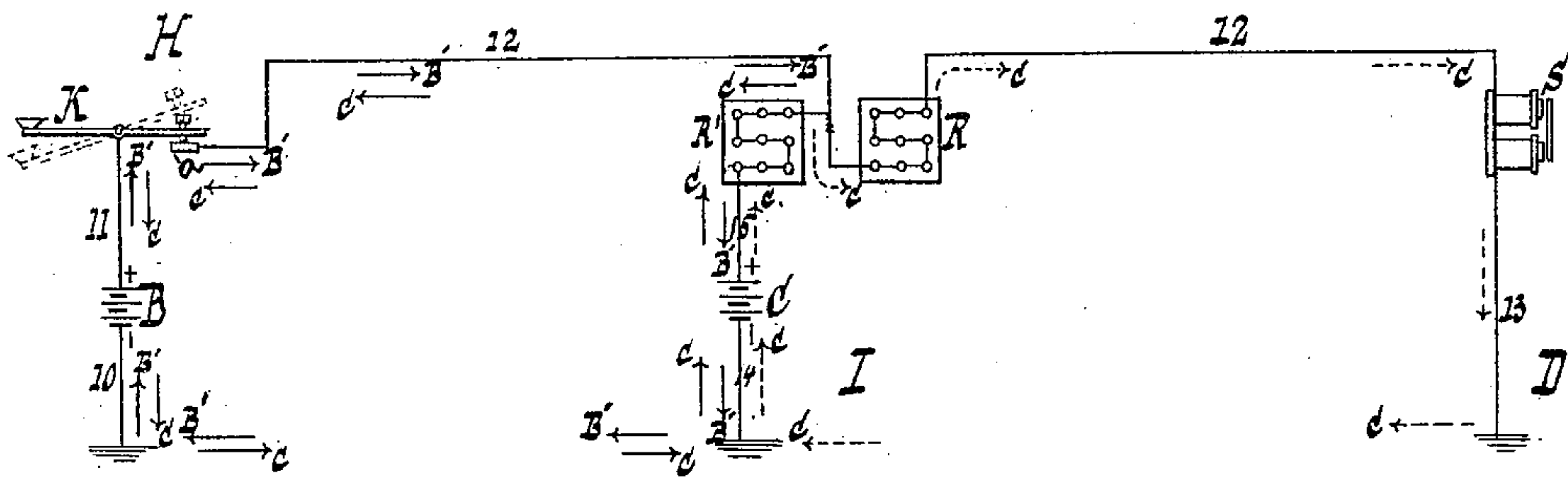


Fig. 2.

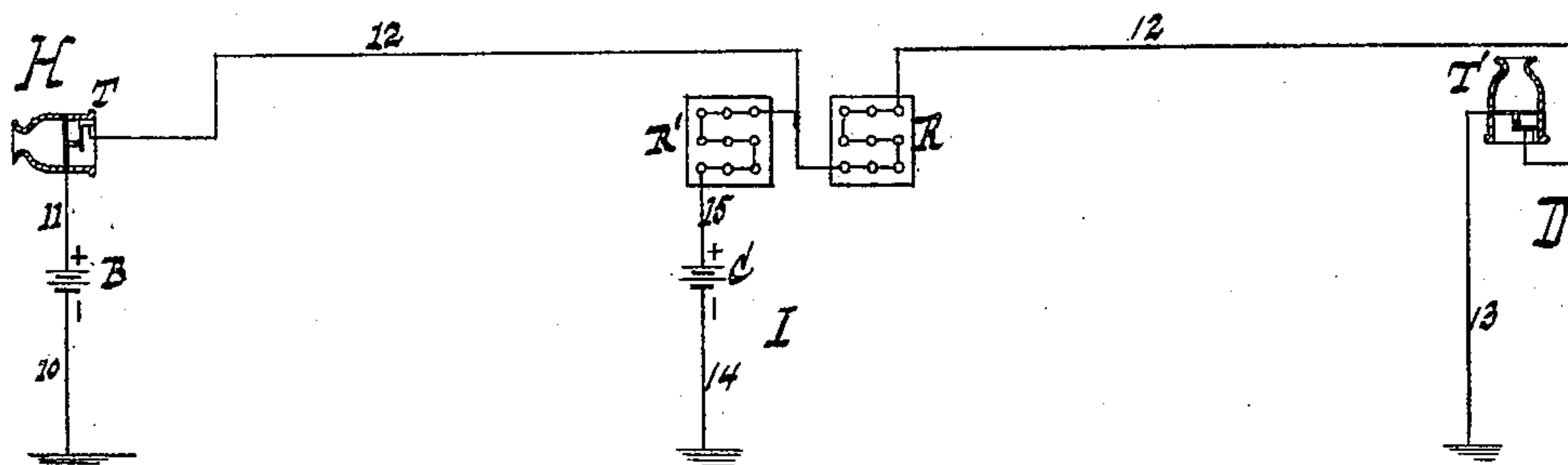


Fig. 3.

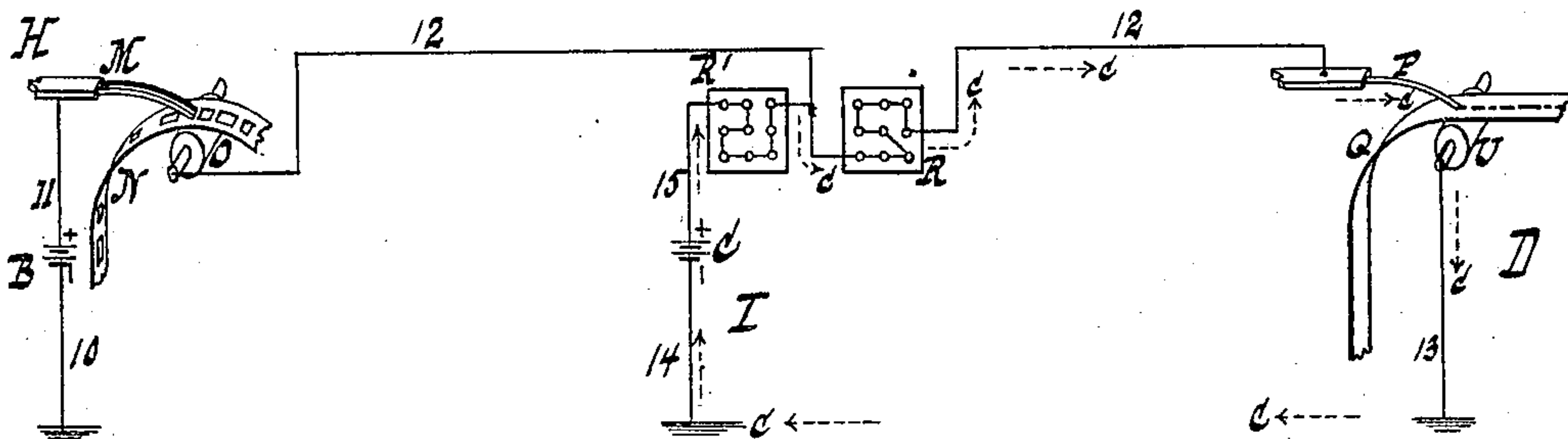
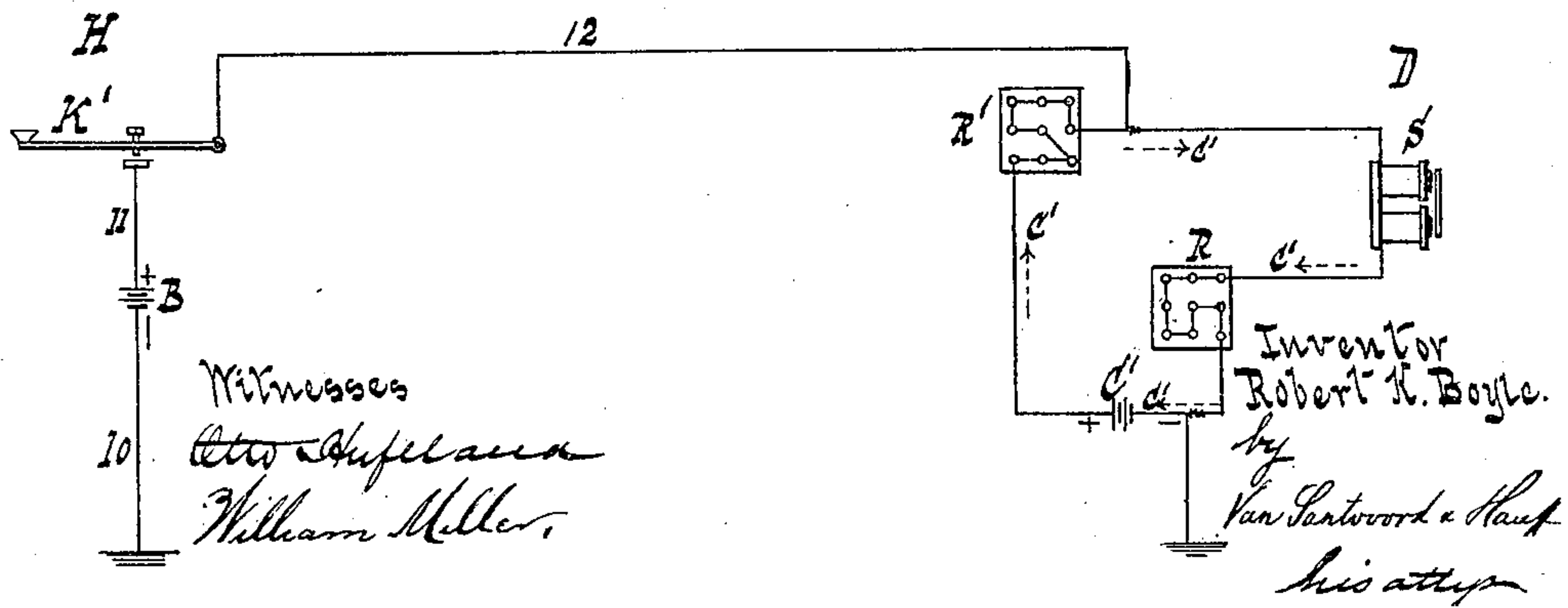


Fig. 4.



Witnesses

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TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 248,697, dated October 25, 1881.

Application filed March 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROBERT K. BOYLE, a subject of the Queen of Great Britain, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in System for Transmitting Signals by Electricity, of which the following is a specification.

This invention relates to an improved system for transmitting signals by electricity, which consists of a through circuit, extending from one end of the line to the other, or, in other words, from the transmitting-station to the receiving-station, a partial circuit, two resistance-coils or rheostats, both of which are embraced in the partial circuit, while only one of them is embraced in the through circuit, a suitable transmitter in the home or transmitting station, and a suitable receiver in the distant or receiving station, so that by actuating the transmitter an alternate action of the partial circuit is produced, and thereby the desired signals are obtained in the receiving or distant station.

My invention is illustrated in the accompanying drawings, in which Figure 1 represents a diagram of my system for transmitting signals by means of an ordinary key in the transmitting-station and an ordinary sounder in the receiving or distant station. Fig. 2 is a diagram illustrating the application of my system to telephones. Fig. 3 is a diagram illustrating the application of my system to chemical telegraphs. Fig. 4 is a diagram illustrating a modification of the system shown in Fig. 1 as used for a short line and local circuit.

Similar letters indicate corresponding parts.

In the example shown in Fig. 1, the letter B designates the line-battery in the home or transmitting station H, the negative pole of which connects by a wire, 10, with the earth, while its positive pole connects by a wire, 11, with the key K, which, when closed, rests upon a metal plate, *a*, from which extends the line-wire 12, through the rheostat R to the distant or receiving station D, which contains a sounder, S, or any other suitable receiving-instrument, connected to the line-wire 12 and to a wire, 13, which runs to the earth. In a station, I, about midway between the stations H and D, is placed a battery, C, the negative pole

of which connects by wire 14 with the earth, while its positive pole connects by a wire, 15, with a rheostat, R', and through this rheostat with the line-wire 11. The resistance produced by the rheostats R R' is so adjusted that when the key K is closed, as shown in full lines in Fig. 1, the current of the battery B will be neutralized by the current of the battery C, the circuit of this last-named battery being closed in that case, as shown by full arrows C, while the circuit of the battery B would be closed, as indicated in full arrows B'. Consequently no current will pass through the sounder S; but as soon as the key K is opened, as indicated in dotted lines, the circuit of the battery B is broken and the circuit of the battery C is closed through both rheostats, wire 12, sounder S, and wire 13, as indicated in dotted arrows *c*, the armature of the sounder is attracted, and the desired signal is produced.

If a telephonic transmitter, T, is substituted for the key K in the home station H and a telephonic receiver, T', for the sounder S in the distant station, as shown in Fig. 2, and a person speaks into the transmitter T, the current of the intermediate battery, C, is caused to reproduce the words so spoken in the receiver T' of the receiving-station, said current being at one moment neutralized by the current of a line-battery, B, and at the next moment being free to act on the receiver T' in the distant station, according to the vibrations imparted to the diaphragm in the transmitter T, produced by the words spoken into the same.

In Fig. 3 I have shown my system as applied to a chemical telegraph. In this case the key K is replaced by a brush, M, which bears upon a perforated strip, N, of paper, that passes over a metallic roller, O.

The receiving-instrument consists of a metallic pen, P, which bears upon a chemically-prepared paper, Q, supported by a metallic roller, U. The connections of the line-battery B, the intermediate battery, C, and the rheostats R R' are the same as in Fig. 1, and will be readily understood from Fig. 3 of the drawings. If the brush M bears upon a solid portion of the perforated strip N, the circuit of the intermediate battery, C, is closed, as indicated by the dotted arrows *c*, Fig. 3, and the pen P produces a dot or stroke on the prepared paper

Q; but if the brush M passes over one of the perforations in the strip N, the current of the line-battery B is neutralized by the current of the intermediate battery, C, the line is cleared, 5 and the pen P produces no effect.

It will be seen from the foregoing examples that by my system as applied to a long telegraph-line the signals given in the home station are produced in the distant or receiving 10 station by the action of the battery C in the intermediate station, so that a comparatively weak battery in the home station and another battery in the intermediate station are sufficient to produce the desired signals at a long distance. My system can, however, also be applied to short lines, as shown in Fig. 4. In this 15 figure the letter K' represents the key in the transmitting-station; B, the line-battery; C', a local battery; S, a sounder, and R R' two rheostats, all in the receiving-station. When 20 the key K' is open, as shown in Fig. 4, the local battery is on the loop-circuit, (indicated by dotted arrows c' in Fig. 4,) and the armature of the sounder is attracted; but if the key K' is 25 depressed, the current thrown on the line-wire 12 from the line-battery B is neutralized by the current thrown on the line from the local

battery C', the loop-circuit through the sounder is broken, and the armature of the sounder S falls back. By manipulating the key K', therefore, the desired signals are produced in the receiving-stations. 30

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

The within-described system for transmitting signals by electricity, consisting of a 35 through circuit extending from a battery in the transmitting-station to the receiving-station, a partial circuit extending from a battery in an intermediate or in the receiving station, two rheostats, both of which are embraced 40 in the partial circuit, while only one of them is embraced in the through circuit, a suitable transmitter in the home or transmitting station, and a suitable receiver in the distant or 45 receiving station, substantially as herein set forth.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

R. K. BOYLE. [L. S.]

Witnesses:

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