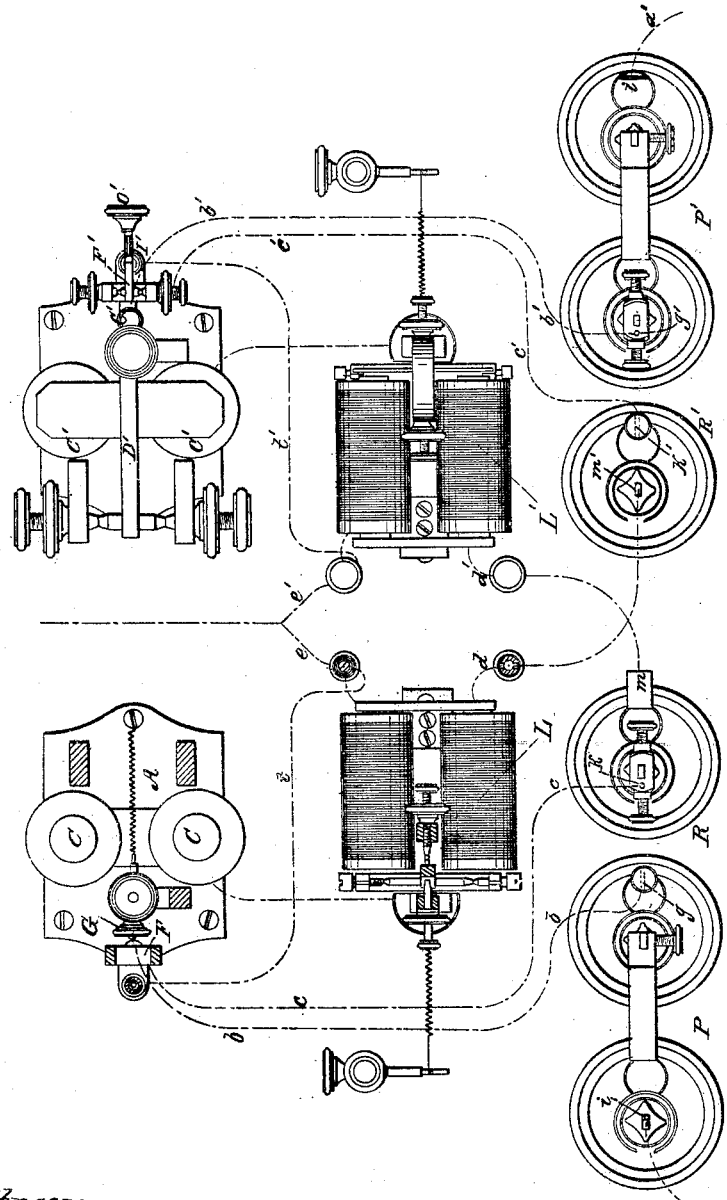
2 Sheets—Sheet 1.

W. H. HAMILTON.

Telegraphic Repeater.

No. 49,875. Patented Sept. 12, 1865.

Fig. 1.



Witnesses;
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2 Sheets—Sheet 2.

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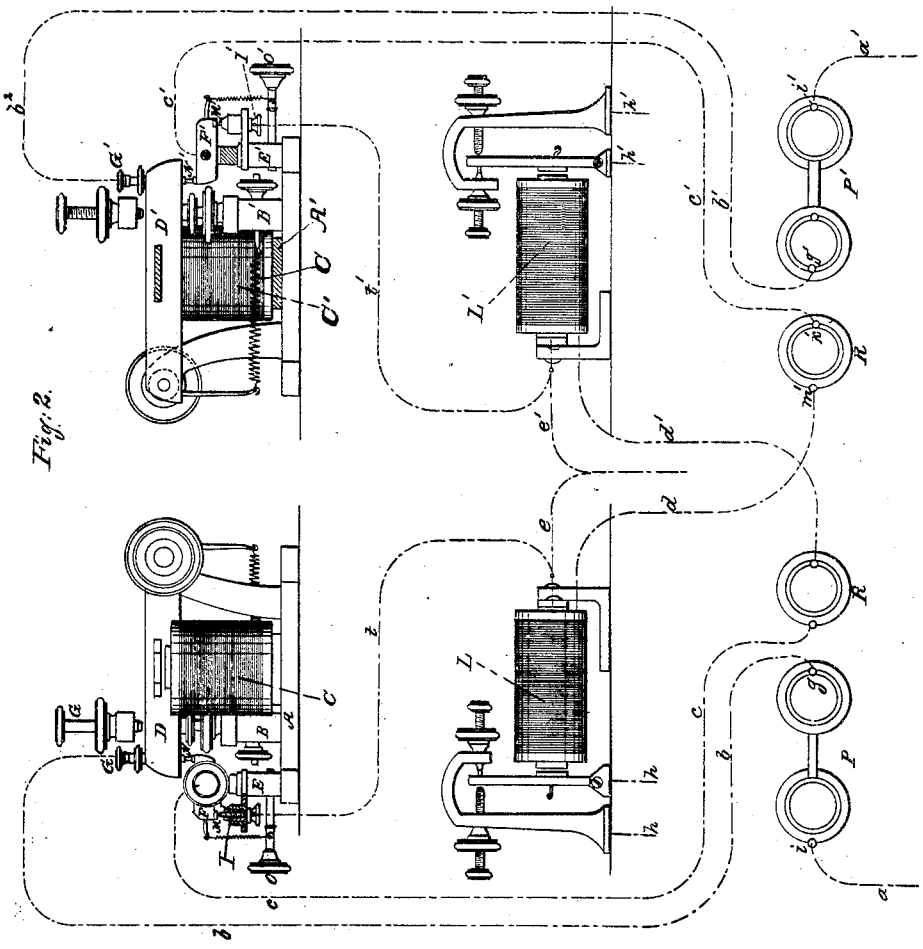

Fig. 2.

Witnesses;

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UNITED STATES PATENT OFFICE.

WM. H. HAMILTON, OF ALBANY, NEW YORK.

IMPROVEMENT IN TELEGRAPHIC REPEATERS.

Specification forming part of Letters Patent No. **49,875**, dated September 12, 1865.

To all whom it may concern:

Be it known that I, WILLIAM H. HAMILTON, of Albany, in the county of Albany and State of New York, have invented a new and useful Improvement in Telegraphic Repeating-Instruments; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a plan or top view of this invention. Fig. 2 is a diagram intended to illustrate the connection of the several parts of my instrument.

Similar letters of reference indicate corresponding parts.

This invention consists in the application of an electric current formed from a main or local battery alternately to two receiving-magnets by any suitable mechanism on a receiving-magnet, register, or sounder, simultaneously with the removal of the main current, in such a manner that impulses can be repeated from one telegraph-wire to another automatically and without liability to errors.

On telegraph-lines it is necessary and expedient to repeat from one wire to another, and vice versa. In early days of telegraphing, at the repeating-stations a button was used, placed in one position by the attending operator as first wire repeated to second, and turned to another position as second replied to first, thus requiring constant attention of the operator. Later self-repeating instruments of many forms have been introduced, and this is one of the class.

Each main wire *a a'* in my repeater requires a sounder, A or A', an ordinary receiving-magnet, L or L', and a main battery, P R P' R'.

My sounders are similar to an ordinary Morse register or sounder; but the registering-lever D or D' is made to extend a little beyond the post B or B', and through it is placed the screw G or G', platina-pointed. On the base A A' of the sounder is placed, in advance of post B or B', another insulated post, E or E', furnished with the vibrating lever F or F'. This lever has at one end a platina-point, N or N', directly under the point of the screw G or G' in the lever D or D', and at the other end a like point, M or M', projecting from its under surface directly over an insulated point, I or I', in an arm extending from the post E or E'.

To the vibrating lever F or F' is attached an adjusting-spring, which is fastened to the screw O or O' in post E or E', and this spring keeps the points M M' and I I' closed when the inner end of lever F or F' is free or not depressed by the registering-lever D or D'.

The receiving-magnets L and L' are connected at *h h* and *h' h'* to the magnets C and C' of the sounders by the usual local wires and batteries.

The first main wire, *a*, from the distant station is connected to the first main battery, P R, at the pole *i*, and the circuit passes through the battery P to the pole *g*, where the main battery is divided, thence through the wire *b* to the screw G in the lever D of the second sounder, A, through the screw G to point N of vibrating lever F, through this lever and the post E to the wire *c*, through this wire to the battery R, through the battery and wire *d* to the first receiving-magnet, L', and through the helix of this magnet and wire *e* to the ground. The second main wire, *a'*, is connected in like manner to the main battery P' R' at pole *i'*, the circuit passing through battery P', wire *b'*, screw G', lever F', post E', wire *c'*, battery R', wire *d'*, receiving-magnet L, and wire *e* to the ground.

The insulated points I and I' of the posts E and E' are connected by wires *t t'* and *e e'* to the ground.

The operation is as follows: When the circuit through the main wires *a a'* is closed the levers D D' are attracted by their respective magnets, and the points G N G' N' are in contact, and at the same time the points M I M' I' are separated. If the operator on the first wire, *a*, opens the circuit, the electric currents previously passing through the wires *b c d*, helix L', and wire *e'*, is stopped and the armature of the magnet L' is liberated. By this action the sounder-lever D' is also liberated, and this lever, in its upward motion, is followed by the vibrating lever F', which is subjected to the strain of the adjusting-spring, keeping the points G' and N' closed until the points M' and I' come in contact, arresting the movements of the lever F'. By the contact of the points M' I'

the second main battery is divided, forming for lesser part R′ a new local main circuit from pole *k′* through wire *c′* to post E′, through this post and the lever F′, insulated point I′, and wire *t′* to ground-wire *e′* and *e*, thence to magnet L, wire *d′*, and pole *m′*, back to the battery R′, a complete metallic circuit, in which is the magnet L. By the upward movement of the registering-lever D′ the repeating-points G′ and N′ are separated, and thereby the circuit of the second main wire, *a′*, is opened, and consequently the impulse from the first main wire, *a*, is repeated to the second main wire, *a′*. By this operation the main circuit has been removed from the second receiving-magnet, L; but by contact of points M′ I′ of the first sounder, A′, this magnet is under the influence of the local main battery R′ and cannot open, thus preserving the circuit through the first main wire at the repeating-points G and N, as they cannot separate. If the main circuit through the first wire, *a*, is now closed, the sounder-lever D′ returns and closes the second main circuit with the points G′ N′ and opens the local main circuit by separating the points M′ and I′, allowing the main battery P′ R′ to act as a whole, and thus the line is restored to its original condition of rest. When the second circuit is opened to reply and the first one is also open, there will be no change; but so soon as the first circuit is closed its lever D′, returning, closes the second circuit, closes the repeating-points G′ N′ of the second circuit, and opens the local main circuit by separating the points M′ I′, as described. Both main and local main currents are thus removed from the second receiving-magnet, L, and it opens and liberates its sounder-lever D, which performs precisely the same manipulations as did lever D′ when first liberated, thus repeating the impulse from second main wire, *a′*, to the first.

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

The batteries P R P′ R′, applied in combination with sounders A A′, receiving-magnets L L′, registering-levers D D′, and main wires *a a′*, substantially as and for the purpose set forth.

WM. H. HAMILTON.

Witnesses:
S. E. MAYO,
M. L. MORGAN.