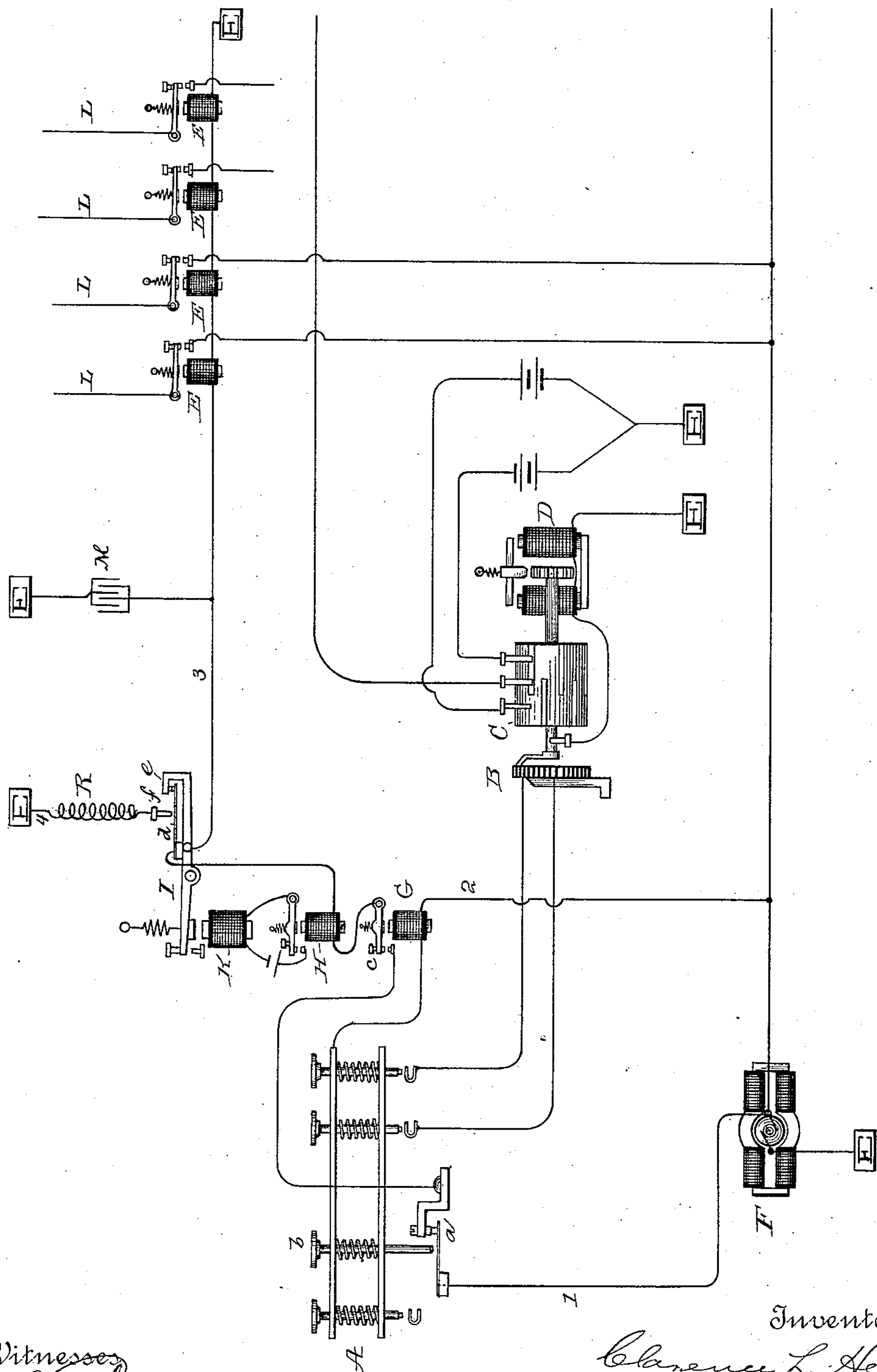


(No Model.)

C. L. HEALY.
PRINTING TELEGRAPH.

No. 407,729.

Patented July 23, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

CLARENCE L. HEALY, OF BROOKLYN, ASSIGNOR TO THE COMMERCIAL TELEGRAM COMPANY, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 407,729, dated July 23, 1889.

Application filed November 28, 1887. Serial No. 256,313. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE L. HEALY, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Printing-Telegraphs, of which the following is a specification.

In operating printing-telegraphs it has been found desirable, in order to attain the maximum speed and produce the best copy, to short-circuit the relays controlling the printing-circuits by a magnet acting with the printing-circuit relays, so that the printing-circuits will be opened immediately independent of the transmitting-operator, and only momentary current impulses will traverse these circuits, as described in patent to Stephen D. Field, numbered 290,556.

In applying this device to a number of printing-circuit relays with a shunt common to all of such relays the cutting out of circuit of a resistance so considerable as that offered by the numerous relays produced a largely-increased and injurious flow of current through the local circuit, so that when the repeat-key is used to open and close this circuit for repeating the breaking-points are injured or destroyed by the current. In my patent, No. 365,994, I overcome this difficulty by the use of three relays which act to short-circuit the printing-relays and to introduce an equivalent resistance into the circuit; but the apparatus of that patent, while a great improvement over that of the Field patent, has some objectionable features which it is the object of this invention to overcome.

By my present invention, instead of shunting the printing-relays I open that circuit and simultaneously close another circuit with a resistance equal to or greater than the combined resistance of the relays. This is done by a continuity-preserving lever acted upon by a magnet in a local circuit, which local circuit is controlled by a magnet in the circuit common to both the printing-relays and the extra resistance. The points controlled by the repeat-key are in this circuit, which is further controlled by a magnet in the transmitter key-board or operating-circuit or directly by a mechanically-operating circuit-controller at the transmitter. A condenser is

employed to absorb the spark at the points at which the printing-relay circuit is broken.

The accompanying drawing, forming a part hereof, shows principally in diagram enough of the parts of a printing-telegraph transmitter for the understanding of my invention.

A is the key-board, B the sunflower, C the cylinder, and D the clutch-magnet, of the transmitter.

E represents the printing-relays, each controlling a printing-circuit L. The circuit 1 from the dynamo F passes through the breaking-points *a*, controlled by the repeat-key *b* at the key-board, through the front contact-point and armature-lever *c* of a magnet G in the transmitter key-board or operating-circuit 2, and through the coils of the magnet H, to the spring *d* of the continuity-preserving lever I. From the body of the lever I the branch 3, including the printing-relays, is taken, this branch being made a part of the circuit 1, when the spring *d* touches the hook *e* of the lever. With the circuit-point *f* is connected a branch 4, including an artificial resistance R, which may be the same or greater than the resistance of the printing-relays. The lever I is acted on by a magnet K, which is in a local circuit controlled by the magnet H, as shown. Connected with the relay branch 3 is a condenser M, which absorbs the spark when the branch 3 is broken.

The printing-relays E and the resistance R form two legs or branches from the circuit 1, the circuit 1 being completed through the relays or the resistance, according to the position of the lever I. Now, it will be seen that when the key-board circuit 2 is closed the magnet G will close the circuit 1, giving current to the printing-relays. At the same time the magnet H will be energized and will close the local circuit, including the magnet K, which will attract the lever I, shifting the circuit 1, without breaking it, from the printing-relays to the resistance. The time required to charge the magnets H and K will give the printing-relays time to act. If it is desired to repeat the letter or figure, the key-board circuit is kept closed and the repeat-key *b* is depressed with a tap, breaking and again closing the circuit 1. This breaking of

the circuit 1 causes the magnet H to open the circuit to the magnet K, which permits the lever I to fall back, shifting the circuit from the resistance again to the printing-relays, 5 when the closing of circuit 1 will cause the printing-relays to act and the magnets H and K will close in succession, shifting the circuit again to the resistance.

It will be understood that the resistance R 10 can be made much greater than the printing-relays, if desired, since the magnet H will require only a small current to hold its lever on the front point when once there.

By arranging the parts to open the relay- 15 circuit and shift to a resistance by a continuity-preserving lever the apparatus is made more prompt and reliable in action than the apparatus of my patent, No. 365,994. It is simpler, the magnets do not require such a 20 nice adjustment, and they are less liable to get out of adjustment.

What I claim is—

1. In printing-telegraphs, the combination, with the repeat-key circuit, of a number of 25 printing-circuit relays located in a branch circuit, an artificial resistance located in another branch circuit, and a circuit-controller shifting the repeat-key circuit from the relay branch to the resistance branch, substantially 30 as set forth.

2. In printing-telegraphs, the combination, with the repeat-key circuit, of a number of printing-circuit relays located in a branch 35 circuit, an artificial resistance located in another branch circuit, and a continuity-preserving lever operated by a magnet and acting to shift the repeat-key circuit from the relay branch to the resistance branch, substantially as set forth.

3. In printing-telegraphs, the combination, with the repeat-key circuit, of a number of 40 printing-circuit relays located in a branch circuit, an artificial resistance located in another branch circuit, a circuit-controller shifting the repeat-key circuit from the relay 45

branch to the resistance branch, and a condenser connected with the relay branch to absorb the spark, substantially as set forth.

4. In printing-telegraphs, the combination, with the repeat-key circuit, of a number of 50 printing-circuit relays located in a branch circuit, an artificial resistance located in another branch circuit, a circuit-controller shifting the repeat-key circuit from the relay branch to the resistance branch, a magnet 55 controlled by the repeat-key circuit working this shifting circuit-controller, and a transmitter-circuit controller controlling the repeat-key circuit, substantially as set forth.

5. In printing-telegraphs, the combination, 60 with the repeat-key circuit, of a number of printing-circuit relays located in a branch circuit, an artificial resistance located in another branch circuit, a circuit-controller shifting the repeat-key circuit from the relay 65 branch to the resistance branch, a magnet controlled by another magnet located in the repeat-key circuit working this shifting circuit-controller, and a transmitter-circuit controller controlling the repeat-key circuit, sub- 70 stantially as set forth.

6. In printing-telegraphs, the combination, with the repeat-key circuit, of a number of printing-circuit relays located in a branch 75 circuit, an artificial resistance located in another branch circuit, a circuit-controller shifting the repeat-key circuit from the relay branch to the resistance branch, a magnet controlled by another magnet located in the repeat-key circuit working this shifting cir- 80 cuit-controller, and a magnet in the key-board circuit controlling the repeat-key circuit, substantially as set forth.

This specification signed and witnessed this 19th day of November, 1887.

CLARENCE L. HEALY.

Witnesses:

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