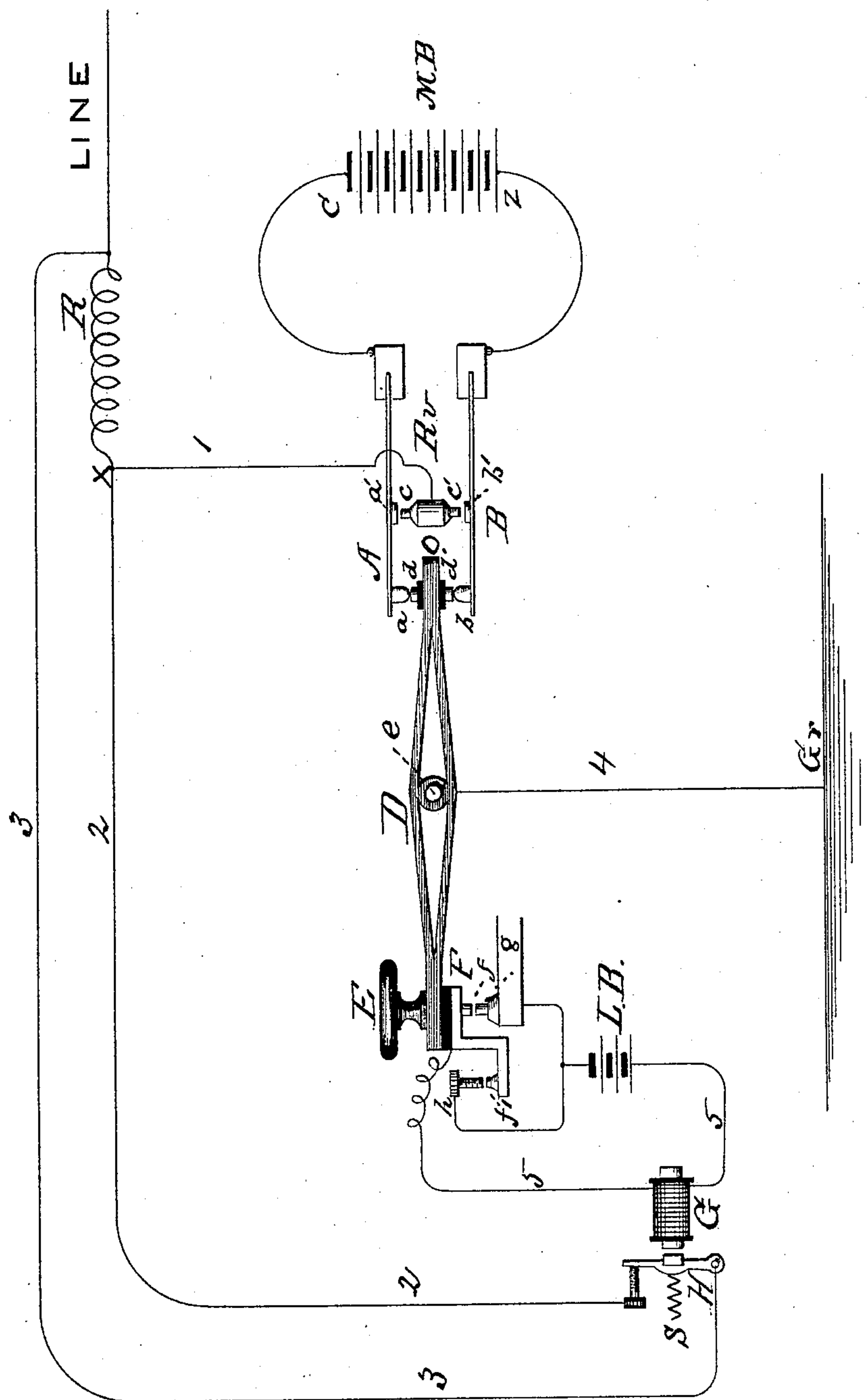


(No Model.)

S. D. FIELD.
ELECTRIC TRANSMITTER.

No. 287,267.

Patented Oct. 23, 1883.



Attest:

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att'y

UNITED STATES PATENT OFFICE.

STEPHEN D. FIELD, OF NEW YORK, N. Y., ASSIGNOR TO THE COMMERCIAL
TELEGRAM COMPANY, OF SAME PLACE.

ELECTRIC TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 287,267, dated October 23, 1883.

Application filed August 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. FIELD, of New York, in the county of New York and State of New York, have invented a new and
5 useful Improvement in Electric Transmitters; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.
10 As is well known, reversed currents, or currents of alternating polarity, are used in many forms of telegraphy, they being transmitted to operate polarized magnets in the receiving-instrument, whose action is dependent upon
15 the polarity of the current effecting them. Often it seems desirable to retain in the circuit a current of the same polarity as that effecting the operation, in order to maintain the parts of the receiver in the relation given them
20 by the current of such polarity. When, however, a full-strength current is used for this latter purpose, it is apt to cause the armature to "stick" or cling to the pole of the magnet, difficulty in again starting the instrument re-
25 sulting therefrom. In other apparatus some part is maintained in a desired relation by keeping the circuit charged to a small percentage of its normal working strength, so that a transmitter is required which shall throw the
30 full strength of the current into the circuit during its operation, but upon stoppage shall cause only a definite percentage thereof to be left in the circuit. The latter is notably the case in certain printing-telegraphs invented
35 by me, and for which I have made proper application for patents, wherein the unison or some other device is kept out of action by a magnet in a circuit normally charged to a small percentage of the current required to
40 cause other magnets in the same circuit to accomplish their work.

The object of this invention, therefore, is to furnish a transmitter which, while in action, shall reverse or change the polarity of the cur-
45 rent thrown upon the line and shall throw such current upon the line as of the full or maximum strength of the battery employed, while when inactive it shall throw to line a current of only some definite percentage of the strength
50 thereof and of the polarity determined by the last movement of the transmitter. To accom-

plish this, between the main battery and the line a resistance is placed, so calculated with reference to the line as to weaken to a definite degree the effect of the current in the line. 55
The reversing-key, controlling this main battery, is provided with contact-points insulated from the body of the reverser, and adapted to close the circuit of a local battery at either extreme of play of the reverser. In this last 60
or local circuit is placed a relay having an armature whose retractile force is so adjusted that, owing to the rapid makes and breaks of its circuit effected by the movement of the reverser while in operation, the magnet does 65
not become sufficiently charged to withdraw the armature from its back stop. Through its back stop this armature controls a shunt-circuit around the resistance mentioned and leading to the main line. The result thereof is 70
that during the operation of the reversing-transmitter the resistance noted is cut out of circuit and the battery is upon the line as of full strength. When, however, the reversing-transmitter is brought to rest, it closes the 75
local circuit sufficiently for the magnet therein to break the shunt-circuit, whereupon the battery is still upon the line, but through the resistance, which weakens its effect thereon to the desired point. This carries into effect a sub- 80
stantially new method of operating telegraphic instruments—viz., positioning the electromagnetic portions thereof by currents of a maximum potential, and maintaining them so long as desired in such position by a current 85
of less potential.

In the accompanying drawings is represented, mainly diagrammatically and conventionally, a reverser, suitable connections, and associated parts for carrying my invention into 90
effect.

D represents an ordinary lever-key, pivoted at *e*, provided at one end with the button or finger-piece E, and at the other end with the contacts *d d'* in electrical connection with its 95
body. This key is used to operate the reverser Rv, and here is only typical of any suitable form of manually or mechanically operated key adapted to work a reverser. The reverser Rv consists of the springs A B, one 100
connected to the Z, the other to the C, end of a main or line or other battery, M B, whose cur-

rent is to be reversed. These springs are provided with contacts, as at *a b*, adjusted to both contact with *d d'* when the key is in a neutral or non-operative position, and with contacts *a' b'*, adjusted to not contact with the double anvil *c c'* when the key is in that position. These contacts are also so adjusted that as the key is moved, say, to left A, *a* and *b* will remain in contact, *a'* and *c* be further separated, and *b'* and *c'* come into contact as or just before *b* and *d'* are separated. The double anvil is connected to the line by wire 1, and the key D to the ground by wire 4.

As thus far described the operation of the parts, as may be seen, is that of a simple reverser.

Between the double anvil *c c'* and the line, however, is placed a resistance, R, which may be an ordinary adjustable resistance, and calculated, ordinarily, so that when in the circuit it shall weaken the effective force of M B upon the line and in the instruments to be operated to the desired per cent. From the point *x*, however, a shunt around R is provided, *via* 2, the armature-lever H of a magnet, G, its back-stop, and 3, to the line. This magnet G is in a local circuit, 5 5, having a local battery, L B, and controlled by contacts *f f'* on the free end of the key D.

Upon the free end of the key, but insulated therefrom, is fastened the piece F, formed, as here shown, with two right angles, and carrying the contacts *f f'*, which contact with anvils *g h* in the local circuit 5 5. The form of F is not material, so long as the contacts *f f'* are so arranged thereon that contact with *g* shall be made at the end of movement of the key in one direction, while contact with *h* is made at the end of movement of the key in the other direction. The retractile force of the spring S of the armature-lever H and the magnetic force of G are so adjusted that G does not become sufficiently powerful to attract H from its back stop during the rapid makes and breaks at *g h* incident to manipulations of the key, but that a slight pause on either contact is necessary therefor. It fol-

lows, then, that during the operation of the reverser—say for setting a distant type-wheel or positioning any other apparatus—the path of the current is *via* 1 2 *i* H 3 to line, shunting the resistance; but when the reverser is stopped upon the setting or positioning, the local circuit 5 is closed long enough at either *g* or *h* for G to become charged sufficiently to attract H, breaking the shunt-circuit, wherefore the path of the current is *via* 1 and R to line, R weakening its practical effect on the distant apparatus to the desired extent. By such means I am enabled to effect the proper positioning of distant apparatus by a current of, say, maximum strength, and to retain it in such position so long as necessary by a weakened current, or maintain for other purposes a normally-weak charge upon a line during the non-operation of the transmitter.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The improved method of operating a telegraph-line herein described, consisting in causing the transmitter to throw upon the line a current of maximum strength during its action to position the electro-magnetically controlled parts of a distant instrument, and causing the transmitter to automatically throw upon the line a weakened current during its non-action to retain the distant electro-magnetically controlled parts in the position given them by the stronger current, substantially as set forth.

2. The combination of a main battery, a key or transmitter, a resistance between the key or transmitter and the line, a shunt-circuit around the resistance, a magnet, and local circuit controlling the shunt-circuit and controlled by the key or transmitter, substantially as set forth.

This specification signed and witnessed.

STEPHEN D. FIELD.

Witnesses:

GEO. N. CASPER,
LUTHER E. SHINN.