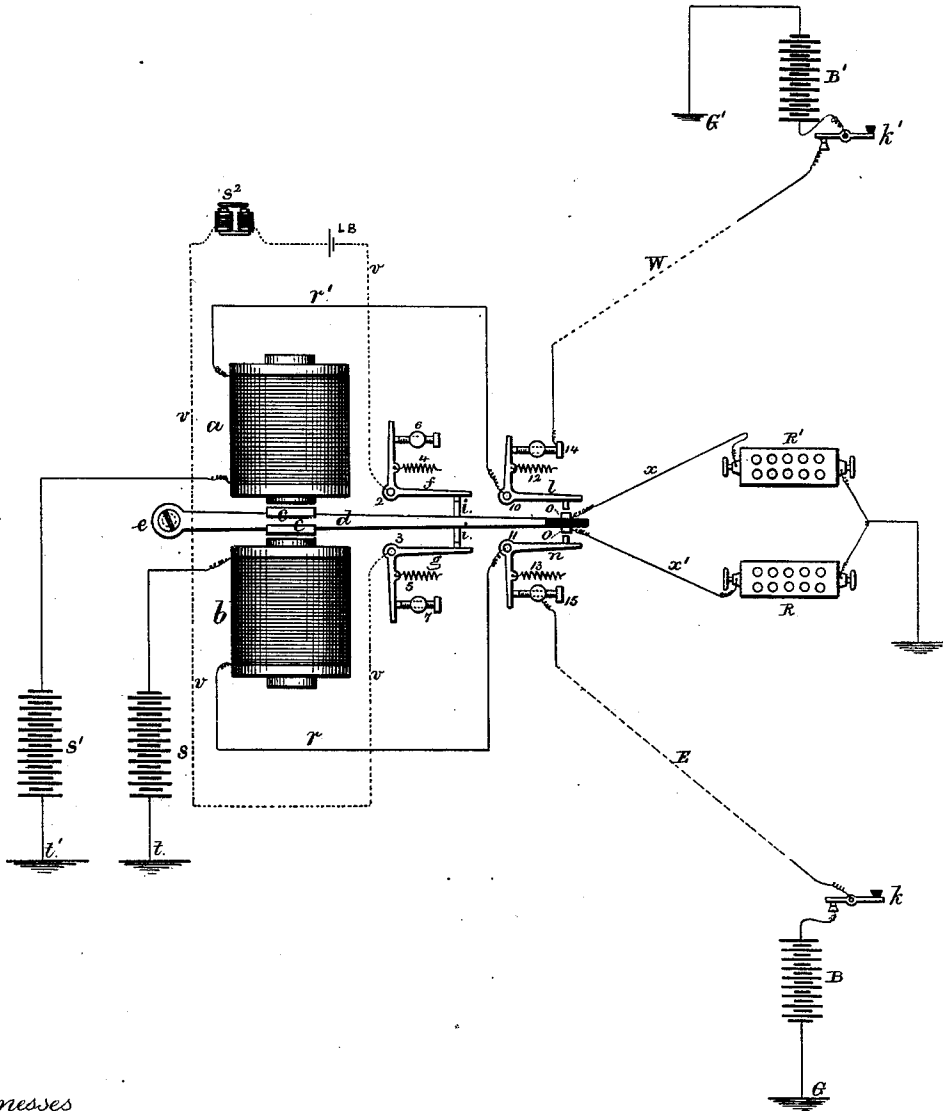


F. CATLIN.
Telegraph Repeater.

No. 231,477.

Patented Aug. 24, 1880.



Witnesses

Chas. H. Smith
Geo. T. Finckney

Inventor

Frederick Catlin
per *Lemuel W. Serrell*

UNITED STATES PATENT OFFICE.

FREDERICK CATLIN, OF BROOKLYN, NEW YORK.

TELEGRAPH-REPEATER.

SPECIFICATION forming part of Letters Patent No. 231,477, dated August 24, 1880.

Application filed February 2, 1880.

To all whom it may concern:

Be it known that I, FREDERICK CATLIN, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Telegraph-Repeaters, of which the following is a specification.

My invention consists in a repeating-instrument that works in the main lines and will relay the message coming from either direction, and that entirely independent of the polarity of the current, and without the use of any relay-sounders or local batteries, and I accomplish with two electro-magnets what has usually required six of said magnets; and my instrument is very simple and not liable to get out of order, and it is automatic, and can be used on any through or way Morse circuit.

In the drawing my invention is represented by a diagram showing the instrument and connections.

The electro-magnets *a* and *b* act in opposite directions on the armature *c*. These magnets might be placed side by side and act upon an armature that forms a *T* to the lever *d*; but I prefer to have the poles facing each other, with the armature *c* between them. The lever *d* swings upon the fulcrum *e*.

The right-angled levers *f* and *g* upon the pivots 2 3 are provided with springs 4 and 5 and stops 6 and 7, and they act against the cross-pin *i* of the lever *d*, and the tension of the springs is regulated and the position of the stops 6 and 7 so adjusted that the armature-faces will be at the proper distances from the ends of the cores, and the levers *f* and *g* will always bear upon the two ends of the pin *i*, except when the magnetic force in *a* and *b* is changed by the line-currents passing through the helices. The levers *l* and *n* on pivots 10 11, with springs 12 13 and screw-stops 14 15, are provided in connection with the insulated pins or studs *o* of the armature-lever *d*.

The line *E* passes from the distant station, where there is a battery, *B*, key *K*, and ground *G*, to the screw 15; thence through *n*, 11, and wire *r* to the magnet *b*, battery *s*, and ground *t*. The line *W* passes from the other distant station, where there is a ground, *G'*, battery *B'*, and key *K'*, to the screw 14, and by *l* and 10, through *r'*, to *a*, and thence to battery *s'* and ground *t'*.

There are ground-connections *x x'* from the pins *o*, (which are preferably insulated,) said ground-circuits having rheostats *R R'* in them, and these are adjusted to have about the same resistance as the line-circuits. The line-circuits being closed at the keys *K K'*, and the levers *l n* not being in contact with *o*, the currents through the helices *a b* act equally and the armature-lever remains in a central and normal position. If, now, the key *K'* is operated, the line-circuit *W* is broken and the attraction of *b* overpowers *a*, and the lever *d* moves toward *b* and carries with it lever *n*, separating the same from the stop 15 and breaking the circuit between the line *E* and screw 15, and hence giving the same signal to any telegraph-instrument in the circuit *E* that has been given in *W*; and in order to maintain a current through the helix of *b*, and prevent the breaking of the current of *b* at 15 demagnetizing the magnet *b*, I establish a new route for the current from *s*, through *b r 11 n o x'* and rheostat *R*, to earth, thus causing the magnet *b* to continue in action and keep the circuit of *E* broken at 15 as long as the circuit of *W* is broken at *K'*. When the circuit of *W* is again closed at *K'* the circuit of *E* is closed at 15, because the equal currents are established in *a* and *b*. If the key *K* is operated and the circuit of *E* broken, the magnet *a* causes the circuit of *W* to be broken at 14, and the artificial line *x* causes the current from *S'* to continue in *a*, so that any message coming in either direction is repeated into the other circuit with the utmost accuracy, the one repeating-instrument operating in either direction.

I make use of the armature-lever *d* to operate a local circuit and sounder in cases where it is desired to have the same at the station for use with this repeater. This local circuit is shown at *v* by dotted lines, with the sounder *s²* and local battery *L B*, the wires being connected at 2 and 3. Hence in the normal condition the local circuit will be closed through *g i f*, but when the lever moves either way the circuit is broken either between *i* and *g* or between *f* and *i*. Hence the sounder *s²* responds to either key *K* or *K'*.

I claim as my invention—

1. The combination, in a repeating-instrument, of two electro-magnets and the line and

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battery connections for the same, an armature-lever operated upon by the two electro-magnets in opposite directions, springs and stops for returning the armature-lever in a normal position, and the levers *l n*, for opening and closing the line-circuits and the ground-connections, substantially as and for the purposes set forth.

2. The combination, in the repeating-instrument, of the magnets *a b*, armature-lever *d*,

levers *l n*, and line-circuit and ground-connections, and levers *f g*, and local circuit and sounder, substantially as set forth.

Signed by me this 28th day of January, A. D. 1880.

F. CATLIN.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.