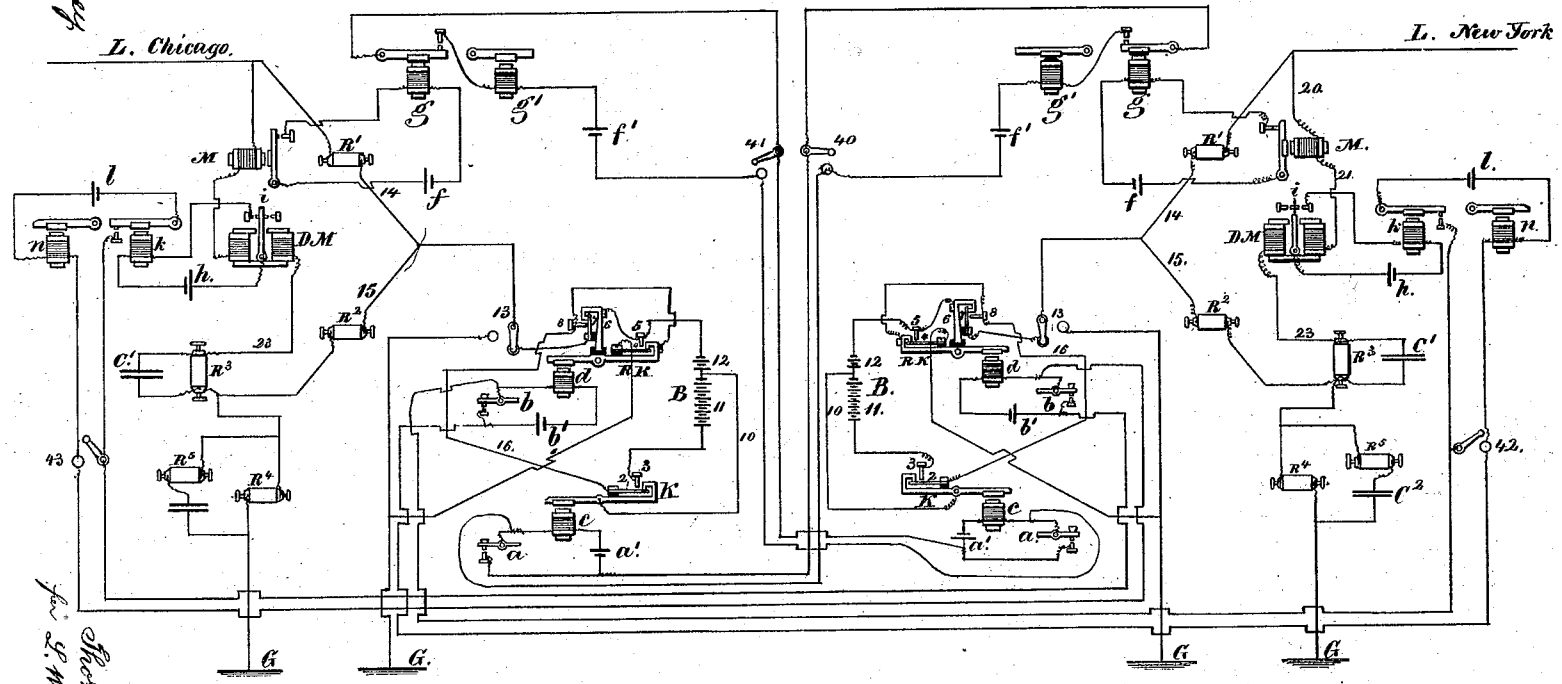


F. A. EDISON.
 Quadruplex Telegraph Repeaters.

No. 209,241. Patented Oct. 22, 1878.



Witnesses,
 Charles D. ...
 Geo. D. ...

L. Chicago.

L. New York

Inventor,
 F. A. Edison
 by S. M. Sewall

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF HIS RIGHT TO GEORGE B. PRESCOTT.

IMPROVEMENT IN QUADRUPLIX-TELEGRAPH REPEATERS.

Specification forming part of Letters Patent No. 209,241, dated October 22, 1878; application filed March 23, 1875.

CASE NO. 113.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Newark, in the county of Essex and State of New Jersey, have invented an Improvement in Quadruplex Telegraphs, of which the following is a specification:

The object of this invention is to repeat from one quadruplex circuit into another quadruplex circuit.

In my present invention I make use of two quadruplex circuits, in which the signals are made by rise and fall of tension in one relay-magnet, and by change of polarity in the other relay-magnet, which is polarized. The modes of connecting and operating have been fully set forth in applications heretofore made by me.

The present improvement relates to the connections from one quadruplex telegraph to another, whereby the circuits work into and operate each other, so that the messages are repeated automatically in one circuit by the receiving-instrument of the other circuit, instead of the finger-key being operated by hand.

The entire apparatus and connections for repeating, as aforesaid, are shown in the diagram, which, although it appears complicated, is very simple. One line, L, comes, for instance, from New York to one set of instruments at an intermediate station—say Buffalo—and the other line, L, extends to the distant instruments—say at Chicago—in the other direction.

The keys and instruments are duplicated and exactly the same, only there are two distinct sets of instruments.

Suppose that a message over the wire L from New York acts by rise and fall of tension in the relay-magnet M, and that this message is repeated into the sounder or receiving-instrument *g'*. If the switch 40 in the local circuit of the battery *f'* is closed, the message goes no farther; but if the switch 40 is open the circuit of the battery *f'* extends to the electro-magnet *e*, the switch of the key *a* being open. Thereby the message received at M on one line is repeated by *e* and K into the next

line. So, in like manner, the message received from New York in the differential magnet D M and repeated in the sounder *n* will go no farther if the switch 42 is closed; but if the switch 42 is open the message will be repeated to Chicago at the key *b* by the magnet *d* and key R K, that reverses the circuit in the same manner as if the finger-key *b* were operated.

Of course, by opening the switch 41 the message coming over the line L from Chicago and received in M will be repeated to New York, and the same thing will occur in relation to the message received in D M from Chicago if the switch 43 is closed. Thus one or more messages may be automatically repeated in long lines without interfering with the working of the other portions of the quadruplex instruments in either direction from the intermediate station.

In an application for Letters Patent filed by me September 4, 1874, Case 99, circuit-preserving keys for changing the polarity of the current and for increasing or decreasing the electric tension, like those shown in this application, and instruments for responding to the pulsations sent by these keys are shown. I therefore do not herein lay any claim to the same.

What I claim is—

1. In combination with two main-line circuits, each capable of quadruplex operation, the repeating-magnets, local circuits, switches, and connections, arranged substantially as set forth, so that either message may be repeated independently of other messages, substantially as set forth.

2. The combination, with the receiving-sounders in one line, of repeating-instruments, local circuits and switches, and transmitting-instruments in the other line, arranged and operating substantially as and for the purposes set forth.

Signed by me this 24th day of February, A. D. 1875.

THOMAS A. EDISON.

Witnesses:

GEO. T. PINCKNEY,
GEO. D. WALKER.