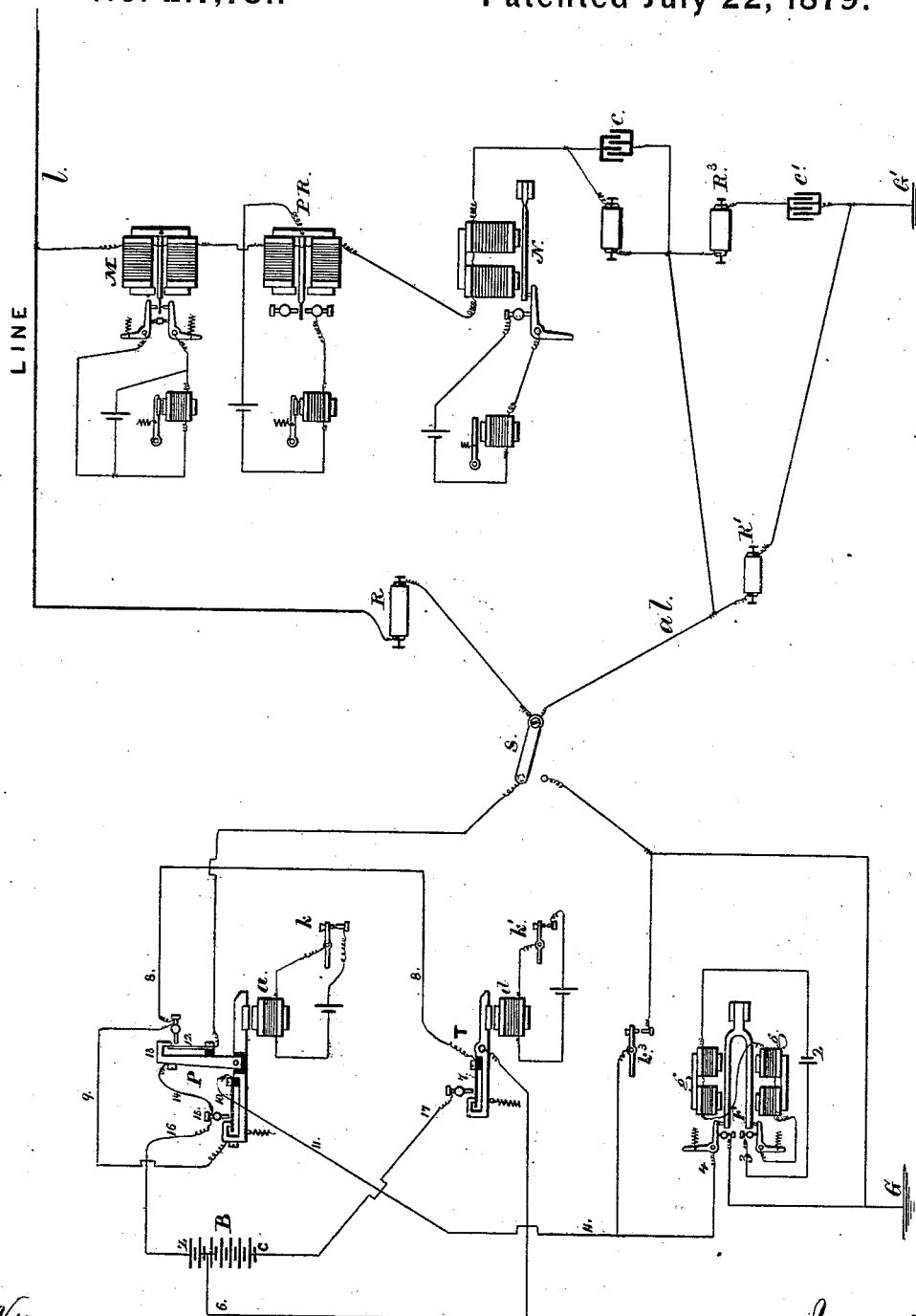


T. A. EDISON.
Sextuplex-Telegraph.

No. 217,781.

Patented July 22, 1879.



Witnesses

Chas. H. Smith
Harold Ferrell

Inventor

Thomas A. Edison.
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att.

UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY, ASSIGNOR TO
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IMPROVEMENT IN SEXTUPLEX TELEGRAPHS.

Specification forming part of Letters Patent No. **217,781**, dated July 22, 1879; application filed
May 14, 1877.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented an Improvement in Electric Telegraphs, of which the following is a specification.

This invention is an improvement upon the telegraph known as the "quadruplex," and I designate this invention as the "sextuplex telegraph."

I have discovered that the rise and fall of tension in the line and the reversals of polarity can be effected without deranging the action of one or more reeds or other instrument vibrating according to a musical tone, and reference is made to my application No. 132, in which such vibrating instrument is shown in connection with a duplex telegraph.

In my present invention I am enabled to combine an acoustic telegraph with a quadruplex telegraph, and use twelve persons to one wire, three sending from each end and three receiving at each end, there being keys to control the rise and fall of tension and the connection and disconnection of the musical pulsations with the line, and this number will be increased if there is a second or third musical transmitter and receiver introduced into the line.

In the diagram accompanying I have represented the instruments and electrical connections at one end of line, the instruments and connections at the other end of the line being similar.

The key *k* opens and closes a local circuit to the electro-magnet *a*, that operates the circuit preserving and reversing key *P*, and changes the polarity of the line by connecting *c* of the battery *B* to line when *k* is depressed, or *z* to line when the key is open, or the reverse, in the manner well known in connection with quadruplex telegraphs.

The key *k*¹ opens and closes a local to the electro-magnet *d*, that operates tension-key *T*, and connects a part or the whole of the battery *B* to the line to effect a rise and fall of electric tension. In both cases these operations are performed without the main-line circuits being broken.

The reed or tuning-fork *F* is provided with

electro-magnets *g*, that are connected in a local circuit to the battery 2, and serve to vibrate the reed or tuning-fork, the circuit at 3 being alternately broken and closed by the movement of the reed.

At 4 the main line from ground *G* is pulsated by the movement of the reed or tuning-fork *F* and sends its pulsations on the line, and the distant tuning-fork or reed in the bridge-wire at the distant station is pulsated accordingly. If, however, the key *k*³ is closed, the main line is short-circuited around the instrument *F*, and the main current will cease to be pulsated at 4; hence, if the key *k*³ in its normal condition is closed, signals will be given at the distant reed or tuning-fork by the circuit being broken at *k*³, and the reverse, for in cases where the key *k*³ is open in its normal condition the signal will be given by the interruption of the musical sound at the distant station when the key *k*³ is closed.

The circuits will go over the line *l* and the artificial line *a l* preferably by the switch *s*, that is found to be a convenience in adjusting the receiving-instruments by connecting the line directly to the ground.

When *k*¹ is open, part of the battery only will be on line, the connection being from *B* through 6 7 8 9 10 11 to ground, (through 4 or *k*³), and returning by *s* 12 13 14 15 16 to *z* of battery.

When *k*¹ is closed, the whole battery *B* will be on line from *c* through 17 7 8 9 10 11, and returning as before.

When *k* is open, the circuit is connected through *P*, as before; but when *k* is closed the circuit is reversed at *P*, regardless of rise and fall of tension, the circuit being connected through *T*, as aforesaid, and by 8 12 to line, and returning from ground through 11, 10, 15, and 16 to *z* of battery.

At the transmitting-station the receiving-instruments are not influenced by the outgoing currents, because they are in the bridge-wire, the rheostats being adjusted with reference to balancing the line *l* and *R* by the artificial line *R*¹ to *G*¹.

The receiving-instruments consist of the polarized relay *P R*, that is operated by the reversal of the polarity of the current of the magnet *M*, the armature of which responds to the

rise and fall of tension, and the reed or telephone N, all of which may be of any known character and respond to the respective electric conditions.

The signals may be given direct; but it is preferable to employ local circuits and sounders to each instrument.

The rheostats at R^2 R^3 serve to adjust the resistance in the bridge, and the condensers c c' serve to neutralize any static charge and discharge, the first one, c , serving this purpose in the bridge-wire and its local connections, and the condenser c' acting in the same capacity in connection with the line and ground connections.

It is to be understood that the different rheostats are to be adjusted and the resistances thereby varied according to the required conditions, as heretofore well known.

It will be obvious that the receiving-magnets may be wound with double coils, and the balance of the outgoing currents made by the differential system.

In my application No. 132, of even date herewith, I have set forth a reed operating by electro-harmonic pulsations and a relay-instrument and their appropriate transmitting-instruments; hence these are not claimed herein.

In my application No. 99 the telegraphic circuit has a key to vary the strength of current and a key to reverse the polarity, and in my application No. 125 synchronous vibrations are produced at the ends of the line by reeds or tuning-forks. These devices, therefore, are not herein claimed.

I claim as my invention—

The combination, in a telegraphic circuit, of a key to reverse the polarity of the current, a key to vary the strength of the current on the line, a vibrating reed acting to pulsate the current on the line, a key to shunt the main line and prevent the action therein of the pulsator, and three receiving-instruments in the bridge, one operated by reversal of current, the other by changes in the strength of the current, and the third by the pulsations of the current, substantially as set forth.

Signed by me this 8th day of May, A. D. 1877.

THOS. A. EDISON.

Witnesses:

GEO. T. PINCKNEY,
HAROLD SERRELL.