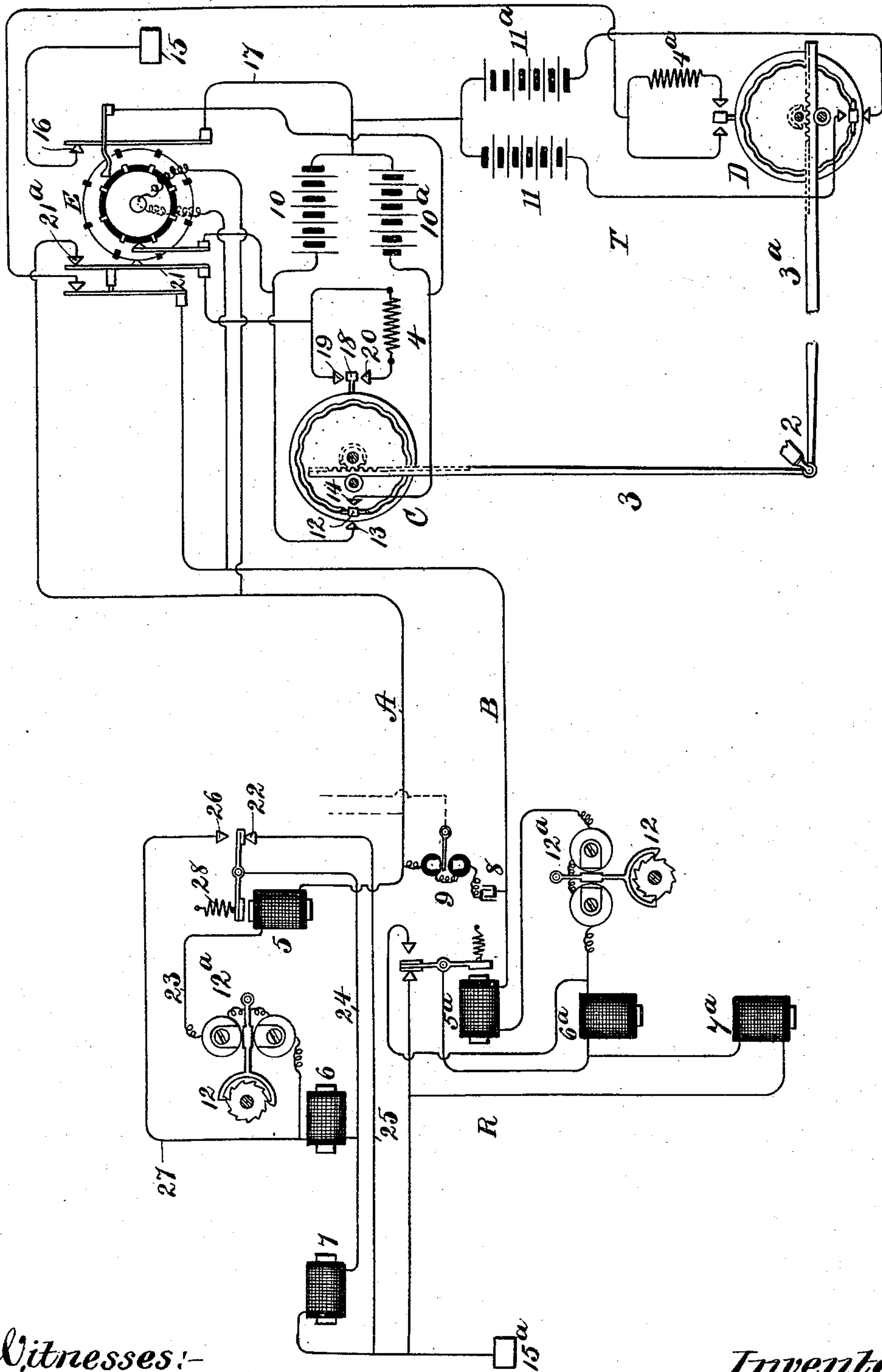


(No Model.)

J. H. ROBERTSON.
WRITING TELEGRAPH.

No. 543,428.

Patented July 23, 1895.



Witnesses:-
M. E. Barber
W. C. Pinckney

Inventor:-
James Hart Robertson

UNITED STATES PATENT OFFICE.

JAMES HART ROBERTSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO
WILLIAM E. GUMP, OF SAME PLACE.

WRITING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 543,428, dated July 23, 1895.

Application filed March 21, 1895. Serial No. 542,622. (No model.)

To all whom it may concern:

Be it known that I, JAMES HART ROBERTSON, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in the Transmission of Autographic Signs, of which the following is a specification.

My invention relates to writing-telegraphs of the character described in my application for patent, Serial No. 532,891.

In this application I employ, as in application Serial No. 542,621, a condenser and polarized relay bridged across the incoming line-wires at the receiving end to control the pen-lifting mechanism, and also an automatic commutating apparatus at the transmitting end and two main-line wires only, as in the aforesaid application.

The object of my present invention is to adapt the apparatus of my aforesaid application, Serial No. 542,621, for a system where pulsations of successively-opposite polarity are sent over the line-wires instead of impulses, as in application Serial No. 542,621. I accomplish this object by the means hereinafter described and made the subject of claims at the end of this specification.

In the accompanying drawing, forming a part of this specification, there is illustrated, diagrammatically, apparatus and connections adapted for carrying out my invention.

Referring to the drawing, T indicates the transmitting apparatus, R the receiving apparatus, and A B the main-line wires connecting said apparatus.

C D indicate the circuit-interrupters at the transmitter, and 2 the transmitting-pen mechanically connected to the circuit-interrupters by arms 3 3^a.

E indicates the commutating device.

The construction of the circuit-interrupters C D and commutator E is fully explained in my aforesaid application and will therefore not be described herein.

To adapt the mechanism for sending impulses of successively-opposite polarity over the main line I introduce at the transmitter the resistances 4 4^a. These resistances may be located as shown or elsewhere in the connections between the transmitting apparatus and the main lines. At the receiver I introduce in main line A the magnets 5, 6, and 7,

and in main line B the magnets 5^a, 6^a, and 7^a.

The drawing also shows at the receiver a condenser 8 and polarized relay 9, bridged across the incoming line-wires for controlling the pen-lifting mechanism. (Not here shown.)

The mechanism at the receiver which gives the lateral motions of writing is arranged in proper relation to magnets 6 7 and 6^a 7^a.

The form of this mechanism will be preferably that shown in my application, Serial No. 542,621. The present drawing shows at the escapement of the feeding mechanism, and instead of the polarized magnet of my previous application, by which the movement of the feed-wheel is reversed, the magnets 6 7 are made use of. The said magnets will be arranged at the respective ends of the feed-wheel shaft and adapted to attract said shaft in either direction. The batteries at the transmitter are indicated by 10 10^a and 11 11^a.

The magnet 5, which is always in circuit with line A, serves to cut out or in the magnets 6 or 7, according as the transmitter-arm co-operating with circuit-interrupter controlling line A is moved to or from the operator. The magnet 5^a, in circuit with line B, serves a like function in the movements taking place on line B.

The operation of the commutator E is identically the same as explained in my former application herein mentioned. The batteries used to send impulses over line A for giving one of the lateral movements of writing, as well as the line B and ground, are electrically connected with the commutator in the same manner as explained in the aforesaid application, and the function of the commutator in transforming the main lines and batteries into a single metallic circuit is as described in the said application.

The impulses on the main line A pass from batteries 10 or 10^a, according to whether pivoted contact-maker 12 is in contact with points 13 or 14. The movement of the transmitter-pen puts the contact-maker 12 in contact with 13 or 14, and all impulses—the same being successively opposite in polarity—are from ground 15 to contact 16, wire 17 to batteries 10 10^a, then to contact-points 13 14, respectively, through contact 18 of circuit-interrupter C, to contacts 19 or 20 to spring 21, and by way of contact 21^a to line A, thence to elec-

tromagnet 5, to polarized magnet 12^a, then through either magnet 6 or 7 to ground. As seen in the drawing, the armature of electromagnet 5 is shown away from the pole of the said magnet, its extension being in contact with point 22. The impulses sent over line A now pass through magnet 5, wire 23, polarized magnet 12^a, electromagnet 6, wire 24, armature of magnet 5, which is in contact with point 22, then through wire 25 to ground. In this condition of the system the resistance 4 at the transmitter is in the circuit of line A.

When the resistance 4 is cut out by reversing the movement of the transmitting-arm the magnet 5 is energized sufficiently to change the position of the armature of said magnet, throwing its extension in contact with point 26, the impulses in this position of said armature being from line A to magnet 5, through wire 23, to polarized magnet 12^a, thence through line 27 to contact-point 26, through armature of electromagnet 5 by way of wire 24, through electromagnet 7 to ground 15^a. In either position of the armature of electromagnet 5, whether in contact with point 22 or 26, the current will pass through both magnets 6 and 7 of the reversing mechanism, but a small portion only through one of them, the bulk of the current passing through that magnet which influences the feed-shaft for the time being. When the bulk of the current is passing through the magnet 7 the movement of the pen is in accordance with the movement of that side of the reversible gear controlled by said magnet, and a contrary movement of the reversible gear takes place when the bulk of the current passes through electromagnet 6.

When the resistance 4 is cut out it is desirable to have the armature of electromagnet 5 come into magnetic contact with the core of said magnet, and the parts are so adjusted as to effect this object. If this were not the case, when the impulses are sent over the line the armature of said magnet would be liable to be held in a state of suspension and no contact made with the desired contact-point at the proper time.

Where it is provided that there shall be positive contact made between the armature and the core of the magnet, the residual magnetism in said core is sufficient to hold the armature in contact with the core against the pull of the spring 28. It is, of course, understood that the motions or movements in line B are similar to those above explained with reference to line A.

In this application I have not broadly claimed the fundamental combinations which have made it possible to produce a writing-telegraph system in which only two wires join the communicating-stations, and in which the fundamental telautographic operations of moving the receiver-pen and controlling the direction of its motion, lifting and lowering this pen and shifting the receiver-paper, are effected by actual currents transmitted over

the line-wires, both positive and negative currents being used, since these are broadly claimed in my other application for Letters Patent of the United States, filed January 9, 1894, renewed December 24, 1894, Serial No. 532,891, which, it is intended, shall issue on the same day with this application.

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

1. In a writing telegraph transmitter, the combination of a transmitter pen and mechanism operated thereby for controlling the connection to line, comprising a circuit interrupter for controlling the connection to line, and a contact maker for connecting the line up through a resistance or around the same, according to the direction of movement of the transmitter pen, substantially as set forth.

2. In a writing telegraph transmitter, the combination of a transmitting pen and mechanism operated thereby for controlling the connection to line, comprising a circuit interrupter constructed to send alternating pulsations to line, and a contact maker for connecting the line up through a resistance or around the same, according to the direction of movement of the transmitter pen, substantially as set forth.

3. In writing telegraphs, a resistance arranged at the transmitter, through which the impulses made by only one of the movements (either the forward or the backward) of the transmitting pen pass into a main line with a connecting line without a resistance for the other impulses, in combination with a controlling magnet at the receiver, which controls the reversing magnets of the feeding mechanism on that line, substantially as set forth.

4. In writing telegraphs, two resistances arranged at the transmitter through which the impulses made by only one of the movements of the transmitting pen (either the forward or the reverse), pass into the main lines, and connecting lines without resistances for the impulses of the opposite movements, in combination with two controlling magnets at the receiver which control the reversing magnets of the feeding mechanism on each line, substantially as set forth.

5. In writing telegraphs two contact points co-operating with the reversing arm of a circuit interrupter, one of said contact points electrically connected to a main line wire and the other contact point also electrically connected to the same line wire through a resistance, in combination with a controlling magnet at the receiver, which controls on that line the feeding mechanism of the receiving pen, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 2d day of February, A. D. 1895.

JAMES HART ROBERTSON.

Witnesses:

F. J. EMLEY,
J. R. SHUMAKER.