

(No Model.)

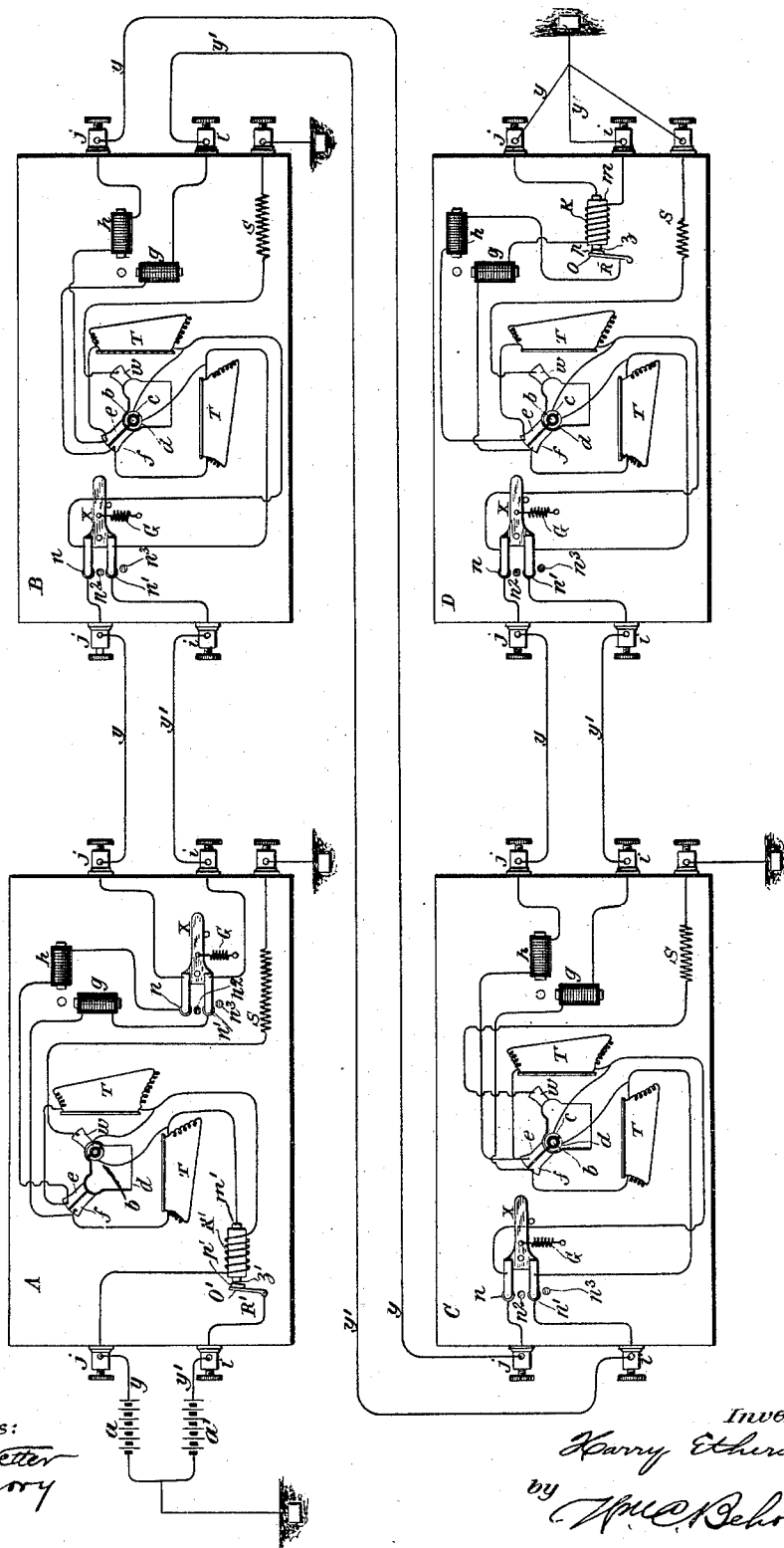
2 Sheets—Sheet 1.

H. ETHERIDGE.
WRITING TELEGRAPH SYSTEM.

No. 477,652.

Patented June 28, 1892.

Fig. 1



Witnesses:
Raphael Vetter
W. H. Amory

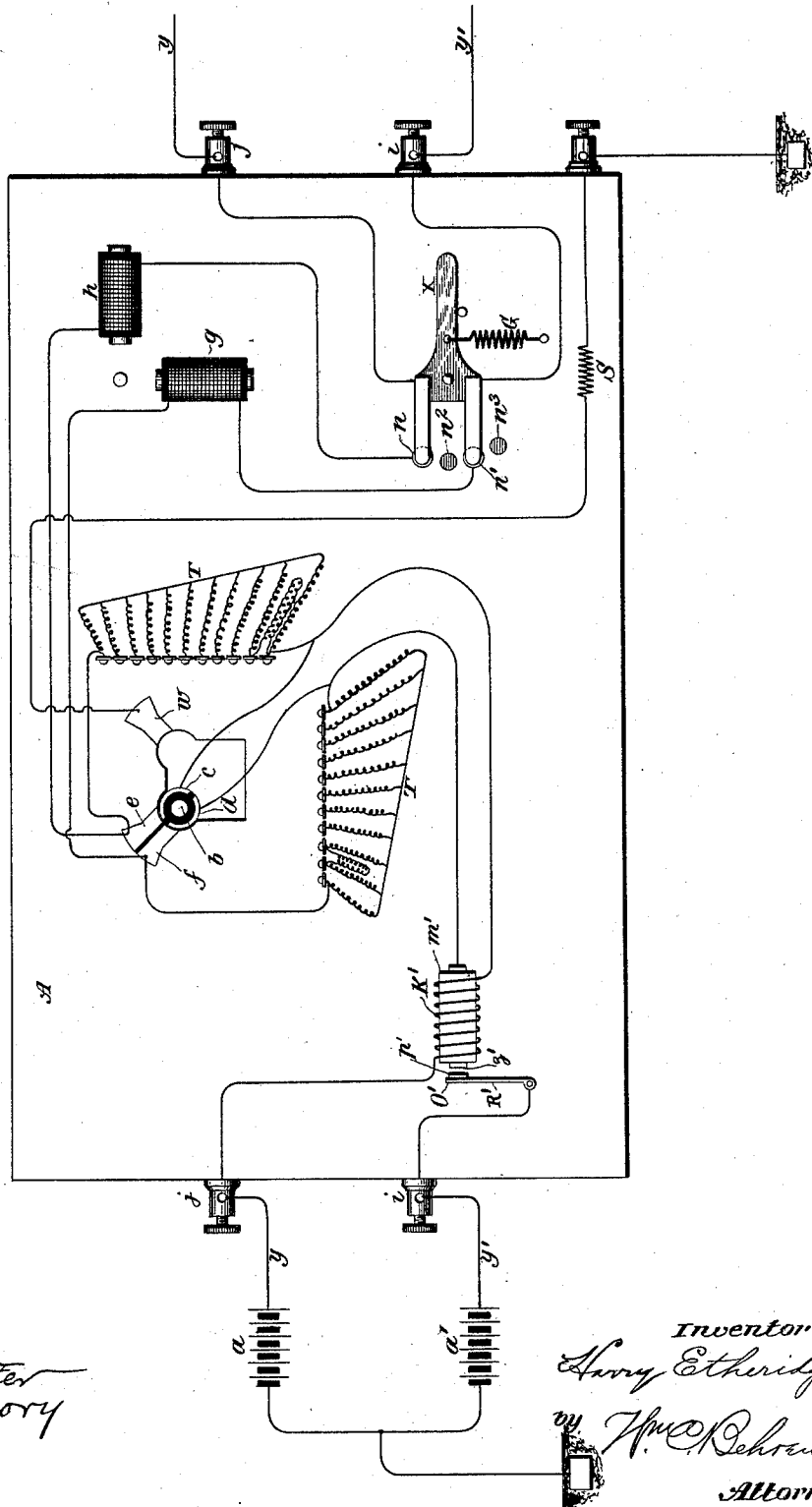
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Fig. 2



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UNITED STATES PATENT OFFICE.

HARRY ETHERIDGE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE
WRITING TELEGRAPH COMPANY, OF NEW YORK, N. Y.

WRITING-TELEGRAPH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 477,652, dated June 28, 1892.

Application filed September 10, 1890. Serial No. 364,522. (No model.)

To all whom it may concern:

Be it known that I, HARRY ETHERIDGE, a subject of the Queen of Great Britain, and a resident of Pittsburg, Pennsylvania, have invented a new and useful Improvement in Writing-Telegraph Systems, of which the following is a specification.

My invention relates to a writing-telegraph system; and the object of my invention is to enable any one subscriber of two or more connected with each other to start and operate the receiver or receivers of the other subscriber or subscribers without first calling up by a signal to switch in receiver, as has heretofore been necessary.

My invention consists in the combination of elements hereinafter described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 represents a number of writing-telegraph instruments connected in series and controlled by different subscribers, the same embodying my invention; and Fig. 2 is a plan view of the instrument at the first station, showing more clearly the electrical connections concerned with the automatic switch and also the switch mechanism for restoring the circuit to its normal position after use.

Referring to Fig. 1, A, B, C, and D represent four stations, each of which is provided with a writing-telegraph instrument embracing receiver and transmitter. Said instruments are connected in series, the first and last instruments only being grounded. The batteries *a a'* operate the two lines connecting said series of instruments. One of said lines embraces one of the magnets of each receiver, while the other line embraces the other magnet of each receiver. For example, the line *y* embraces all the receiver-magnets *h*, controlling the right and left movements of the receiving-stylus, and these magnets will therefore be designated as "lateral-movement-controlling magnets," while the other line *y'* embraces all the receiver-magnets *g*, controlling the up and down movements of the said stylus, and said magnets may therefore be termed the "vertical-movement-controlling magnets." The terminals at each station of the two lines are designated by *i* and *j*, respectively. In connection with the

line *y* at the first station A, I arrange an electro-magnet *K'* and armature *O'*, the latter connected to flexible support *R'* and to line *y'*. The said magnet has a core *m'*, also connected to line *y'*, and said core, as well as the armature co-operating therewith, is provided with platinum contacts *p'* to avoid oxidation. At the last station D, in connection with the other line *y'*, I arrange a magnet *K*, similar to *K'*, having an armature *O*, connected to a flexible support *R'*, the armature *O* and the core *m* of magnet *K* being connected to line *y*. Core *m* and armature *O* are also provided with platinum contacts *p*. The magnets *K'* and *K* are placed only at the first and last stations, one being included in the circuit of the lateral-movement-controlling magnets, the other in the circuit of the vertical-movement-controlling magnets.

As the transmitter *T*, I can use the mechanism shown in J. H. Robertson's patent, No. 353,593, dated November 30, 1886, or the transmitter shown in my application Serial No. 343,073, filed March 7, 1890, Patent No. 445,715, dated February 3, 1891. I prefer to use the latter, and have illustrated the same.

The stylus-rod *b* of the transmitter is provided with two insulated contacts *c d*, electrically connected to the lines *y y'* and arranged to co-operate with the stationary contacts *e f*, also connected to lines *y y'*. Said contacts are located in the top plate, which latter for the sake of clearness is omitted from the drawings, but is shown in my application hereinbefore referred to. The stylus-rod in this case is not grounded. A third stationary contact *w*, co-operating with contact *c* on stylus-rod, is connected to ground through a resistance *S*. The two lines *y y'* are also connected to a double switch *X*, the contact-arms of which are insulated from each other, and two contacts *n n'*, with which said switch is kept in contact automatically by spring *G*. When said switch is turned to make contact with the neutral points *n² n³*, the circuits are of course broken. It will be noticed that in each line there is a break. In line *y* there is a break at *z* at the last station and in line *y'* there is a break at *z'* at the first station. When an instrument is not in use, its stylus-rod will rest in the left-hand corner and the contacts

c and *d* will touch the contacts *e* and *f*, thus shunting the transmitter out of the circuit.

The mode of operation is as follows: When a subscriber, for example, at station A desires to write, he moves his stylus toward the right to touch contact *w*, whereby the circuit of line *y* for his instrument is completed through resistance *S*. The closing of this circuit energizes magnet *K'*, which, attracting armature *O'*, closes the only break in line *y'* in the whole series of instruments. As said line *y'* includes in its circuit the magnet *K* at the last station, it follows that the energizing of said magnet closes the only break in the other circuit *y* for the whole series, thus completing both circuits through all the instruments thus connected together. The operator can then withdraw his stylus-rod from contact with *w*, as the integrity of the circuits is now maintained without said contact, and proceed to write his message. All the instruments in the series will respond and reproduce the message. When he has finished writing, he operates the switch *X*, so that it makes contact with the neutral points *n² n³*, whereby the circuits are broken and the armatures *O O'* at the last and first stations allowed to return to normal position. Upon releasing his hold on switch *X* the spring *G* returns it to normal position to allow the instruments to be again operated, as before explained. The operators at all the other stations can likewise bring all the instruments into operation. The resistances *S* of the several instruments vary, they being so adjusted as to allow only a certain amount of current to circulate in the instrument or instruments that may be between it and the battery, so as to prevent any excessive attraction of the armatures in each receiving-magnet. Said resistances therefore gradually decrease in value as the number of instruments between the same and the battery increases.

Wherever in the claims I refer to "a number of autographic-telegraph instruments" it is to be understood that I mean two or more.

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

1. The combination, with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of two automatically and consecutively acting circuit-closing means arranged one in each circuit for closing said two circuits, substantially as described.

2. In combination with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of two electro-magnets and armatures for closing said circuits, arranged one in one circuit at the first instrument and the other in the other circuit at the last instrument, and means at each instrument for temporarily grounding at said instrument one of said circuits, whereby the other circuit

is automatically closed throughout, thus energizing its electro-magnet for closing automatically the first-named circuit throughout, substantially as described.

3. In combination with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of an electro-magnet and armature in each circuit, the armature of each magnet closing the other circuit from that in which the coil of the magnet is included, substantially as described.

4. In combination with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of an electro-magnet and armature therefor in each circuit, the armature and core of each magnet being included in the other circuit from that in which the coil of the magnet is included, substantially as described.

5. In combination with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of an electro-magnet and armature arranged with the coil of the magnet in one circuit and its core and armature provided with platinum contact-surfaces, substantially as described.

6. The combination, with two circuits normally broken, of an electro-magnet and armature in each circuit, the armature and core of each magnet arranged in the other circuit from that in which the coil of the magnet is included, substantially as described.

7. The combination, with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of two consecutively-acting circuit-closing means arranged one in each circuit for closing said two circuits, a separate grounded conductor located at each instrument and connectible with one of said two circuits, and connecting means for electrically connecting said conductor to said circuit, substantially as described.

8. The combination, with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of a number of separate grounded conductors located one at each instrument and connectible with one of said two circuits, each conductor provided with a resistance decreasing with the increase of the distance of its instrument from the battery, and connecting means for electrically connecting said conductors to said circuit, substantially as described.

9. The combination, with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of an electro-magnet and armature in each circuit, the armature of each magnet closing the other circuit from that in which the coil of the magnet is included, a

separate grounded conductor located at each instrument and connectible with one of said two circuits, and connecting means for electrically connecting said conductor to said circuit, substantially as described.

10 10. The combination, with a number of autographic-telegraph instruments arranged in series on two circuits, both of which are normally broken, of consecutively-acting circuit-closing means for closing said two circuits, and resistances, one for each instrument, de-

creasing with the increase of distance from the battery.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of April, 1890.

HARRY ETHERIDGE.

Witnesses:

F. O. McMULLEN,
W. J. KOERNER.