

(No Model.)

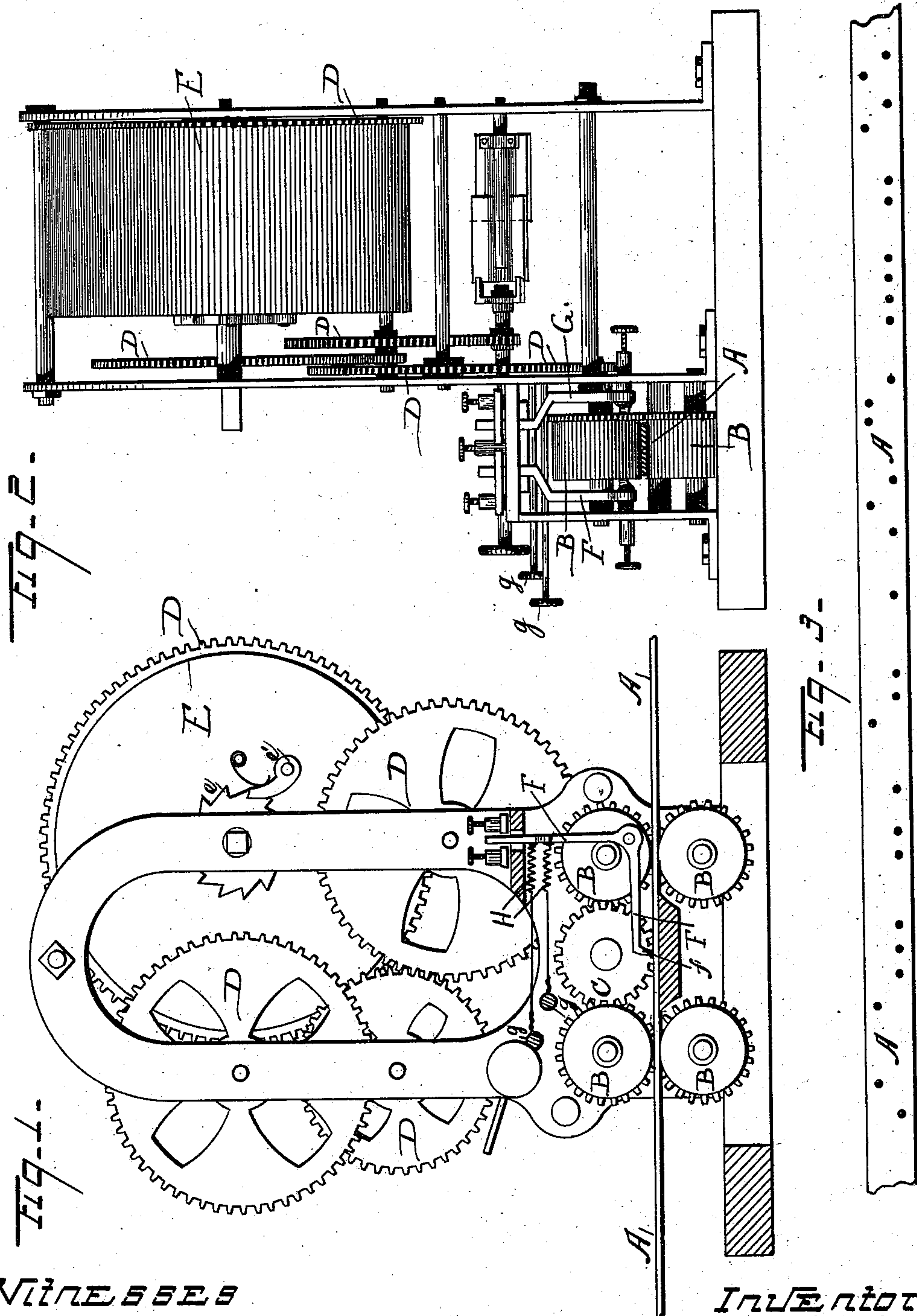
2 Sheets—Sheet 1.

Z. P. HOTCHKISS.

TELEGRAPHY.

No. 381,246.

Patented Apr. 17, 1888.



WITNESSES

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(No Model.)

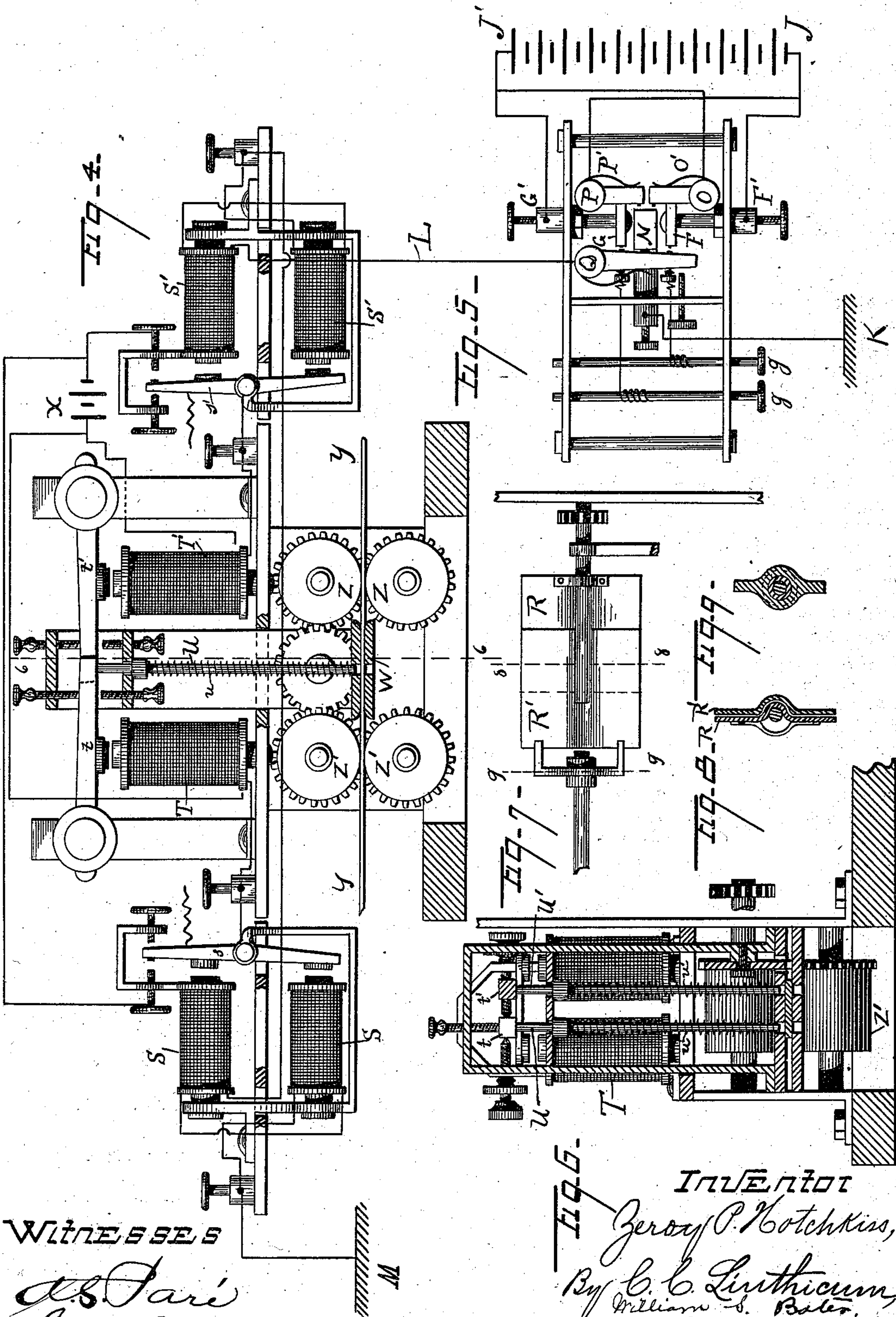
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Fig. 6.
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UNITED STATES PATENT OFFICE.

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TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 381,246, dated April 17, 1888.

Application filed February 14, 1887. Serial No. 227,506. (No model.)

To all whom it may concern:

Be it known that I, ZEROY P. HOTCHKISS, a citizen of the United States, residing at Oak Park, in Cook county, Illinois, have invented certain new and useful Improvements in Telegraphy and Telegraphic Instruments, of which the following is a specification.

It is an object of my invention to provide simple and reliable mechanism for transmitting and receiving telegraphic signals.

In carrying out my invention I employ pulsations of uniform duration, but of different polarity, the letters of the alphabet being represented by various combinations of such pulsations. When represented on paper, such pulsations may appear as signs occupying two or more parallel rows, the letters of the alphabet being represented by various combinations of the signs in the different rows. I also employ a transmitting-instrument to transmit electric pulsations of different polarity and a receiving-instrument to sort out such pulsations. I also combine with my receiving-instrument in some cases a series of punches which record its signals, at the same time automatically preparing a strip for automatic retransmission of the same signals.

My transmitter may be operated mechanically by means of a prepared strip, and my receiver may be combined with devices for making a record of the pulsations.

In the accompanying drawings I have shown a set of apparatus for practicing telegraphy according to my invention. This apparatus is designed for use with an alphabet represented by combinations of signs arranged in two parallel lines on a strip. I have made the signs in the lower row to take the place of the dots and those of the upper row to take the place of the dashes in the Morse or the Continental code. This apparatus consists of a strip having perforations in two rows for automatically operating a transmitter for sending pulsations of different polarity; a transmitter for sending said pulsations of different polarity; contact-levers forming part of said transmitter and operated by said perforated strip for connecting one or the other terminal of the main battery with the line and the opposite terminal with the ground, so as to transmit pulsations of different polarity over the line, as required; a

clock-work for feeding said perforated strip through said transmitter to operate the same; a fan-regulator for said clock-work, having an adjustable blade to adjust the speed of said strip through the transmitter; a receiving-instrument for receiving pulsations of different polarity, two punches forming part of said receiver and operated, respectively, by the pulsations of different polarity to punch a strip in one row or another according to the polarity of the pulsation, (in some cases it may be expedient to use mere pencils or markers instead of punches;) a feed mechanism to feed a strip through the said receiver for the reception of the signals, and two relays oppositely polarized to receive and sort out the pulsations and pass them on to the proper parts of the receiver.

In said drawings, Figure 1 is a transverse section through the transmitter, showing the clock-work in elevation. Fig. 2 is an end elevation of transmitter and clock-work. Fig. 3 shows a strip punched with holes in the combinations which form the letters A B C D E F G H I J, the holes in the upper line taking the place of the dashes of the Morse alphabet and the holes in the lower line taking the place of the dots. Fig. 4 is a view of the receiver, relays, and parts of the feed mechanism. Fig. 5 is a top diagram of the transmitter, showing also the main battery. Fig. 6 is a section of the receiver through the line 6 of Fig. 4. Fig. 7 is an elevation of the adjustable fan. Fig. 8 is a section through line 8 8 of Fig. 7. Fig. 9 is a section through line 9 9, Fig. 7.

A is the perforated strip for operating the transmitter.

B B are the feed-rollers for feeding the strip through the instrument.

C is an idler connecting the rollers at the right with those at the left.

D D D D are gears of the clock-work which drives the rollers B. Said clock-work may be driven by a spring in the drum E or by a weight or other convenient power.

e e' are the ratchet and pawl of the winding-arbor.

F F G G are levers which press upon the strip A, their ends f dropping into the perforations and rising out of them as the strip A passes through the instrument.

H H are springs for causing and regulating

the pressure of the levers F G on the strip A. The tension of the springs is regulated by the arbors I I.

J J' is the main battery.

5 K is the ground of the sending-station.

L is the main line and M the ground at the receiving-station.

N is a contact-block on the ground-wire K.

10 F' G' are posts connected, respectively, to the levers F G, and each connected to one terminal of the main battery J.

15 O is a contact-lever connected with the terminal J' of the main battery, as indicated in Fig. 5, and P is a similar contact-lever connected with the opposite terminal, J, of the main battery.

O' P' are springs pressing on the levers O P.

Q is another contact-lever connected to the main line.

20 R R' are the blades of the regulating-fan, Figs. 7 and 8. The blades R R' are arranged so as to slide upon each other and expose a greater or less surface to the resistance of the air, and thus constitute an effective means for
25 adjusting the speed of the feed mechanism and of the strip A.

30 S S' are two polarized relays in the main-line circuit, joined in such manner as to respond to currents from opposite terminals of the main battery.

35 T T' are magnets of the receiving-instrument. They are independent of each other, being joined in separate circuits of the local battery. Said separate circuits are made and broken, one by relay S and the other by relay S'.

t t' are the armature-levers of magnets T T'.

40 U is a punching-rod upheld by spring u and depressed by lever t when a current passes through magnet T.

U' and u' are a punching-rod and spring which bear the same relation to magnet T' and lever t'.

W is the die for the punching-rods U U'.

45 Die W is in two parts, and the receiving-strip Y is fed through between them by the feed-rollers Z Z'.

50 In operation, a strip having been previously prepared similar to Fig. 3, said strip is entered between and fed through the transmitter by the feed-rollers B B, and the speed of said rollers is adjusted by means of the fan R R'. So long as the levers F G rest upon the solid portions of the strip A no current will
55 pass over the main line; but when the end of one of the levers, as F, drops into a perforation or indentation in the strip the upper end of the lever (see Fig. 5) will move to the left. Contact-lever O, which has been held back
60 by F, will move forward and form a contact with N, thus connecting terminal J' with ground K. As soon as this contact is made F will form a contact with lever Q and break the ground-contact between Q and N, and a
65 current will pass from terminal J over main line L through relays S and S' to ground M.

Relay S' is so polarized that this current will not affect it, but relay S will close the circuit S T X. Magnet T will attract its armature t, depress punch U, and punch a hole in strip Y. 70 In a similar manner, when lever G drops into a perforation or indentation in strip A, terminal J is connected to ground K and terminal J' to main line L, and relay S being polarized against that current it does not act; but relay 75 S' makes the local circuit X S' T', and punch U' perforates strip Y. In this manner strip Y becomes a duplicate of strip A. If, now, it be desired to send on the same message to another station, strip Y may pass from the receiver through a secondary transmitter arranged in line with it, and the message be sent by said transmitter in the same manner in which it was originally sent from strip A. In this manner I avoid the delay of first transcribing the message and then preparing an automatic sending-strip by hand before sending it on, as has heretofore been done. This delay has in some cases amounted to two or three hours or more, and has necessitated much 90 additional labor and been a fruitful source of error.

Having thus described my invention and a means for practicing it, I claim—

1. The combination, substantially as set 95 forth, of the perforated sending-strip A, the levers F G, connected with opposite terminals of the main battery, the levers O P, connected with opposite terminals of the main battery, the contact N, connected to the ground, and 100 the contacts Q, connected to the line.

2. In a system of telegraphy, in combination with a telegraphic line, a duplex transmitting-instrument having levers, as F G, connected to opposite terminals of the battery 105 and adapted to be operated by a sending-strip, as A, a ground-contact, as N, contacts, as O P, connected to opposite terminals of the battery, and a contact, as Q, connected to the line, whereby currents of opposite polarity 110 may be sent over said line, and a duplex receiving-instrument having punches, as U U', and polarized relays, as S S', to separate the currents and deliver those of one polarity to a magnet which operates one punch and those 115 of opposite polarity to a magnet which operates the other punch, whereby a strip may be perforated in duplication of the sending-strip, substantially as described.

3. The combination, in a transmitting-instrument adapted, in connection with a perforated strip, to transmit electrical impulses of different polarity, of a mechanical strip-feeding mechanism and a governing-fan composed of the two flat blades R R', said blades 125 adapted to slide one upon the other to adjust the speed of said feeding mechanism, substantially as and for the purpose set forth.

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Witnesses:

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