2 Sheets—Sheet 1.

G. M. PHELPS.

PRINTING TELEGRAPH TRANSMITTER.

No. 186,215. Patented Jan. 16, 1877.

Fig. 4.

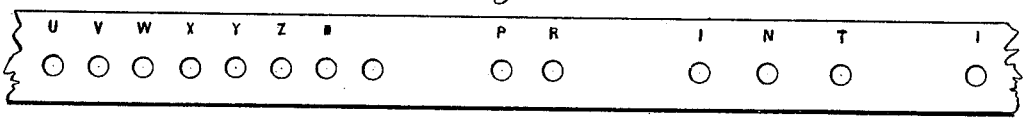
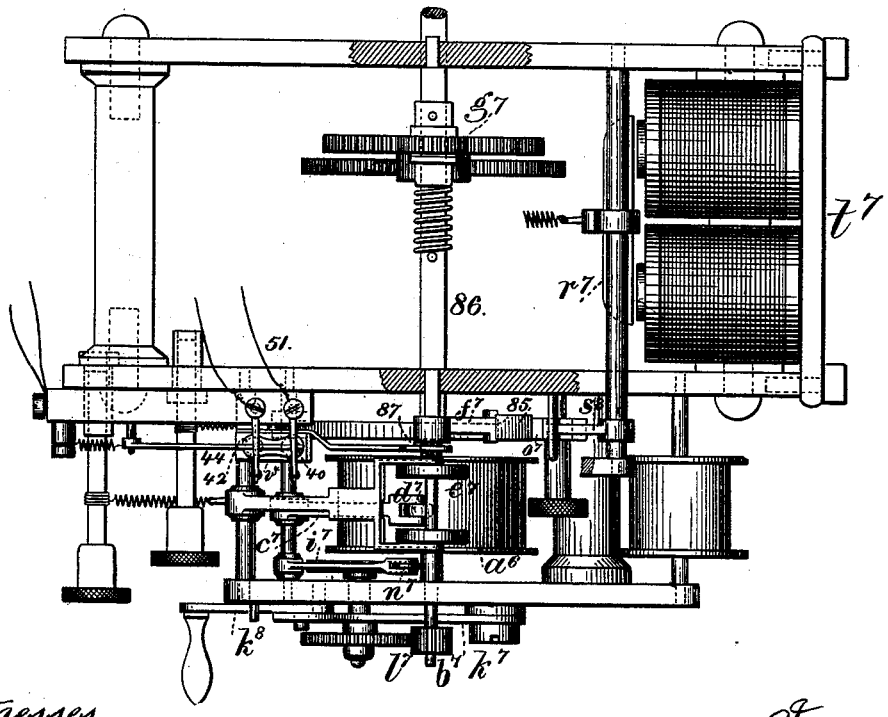


Fig. 1



Witnesses

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2 Sheets—Sheet 2.

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PRINTING TELEGRAPH TRANSMITTER.

No. 186,215. Patented Jan. 16, 1877.

Fig. 2.

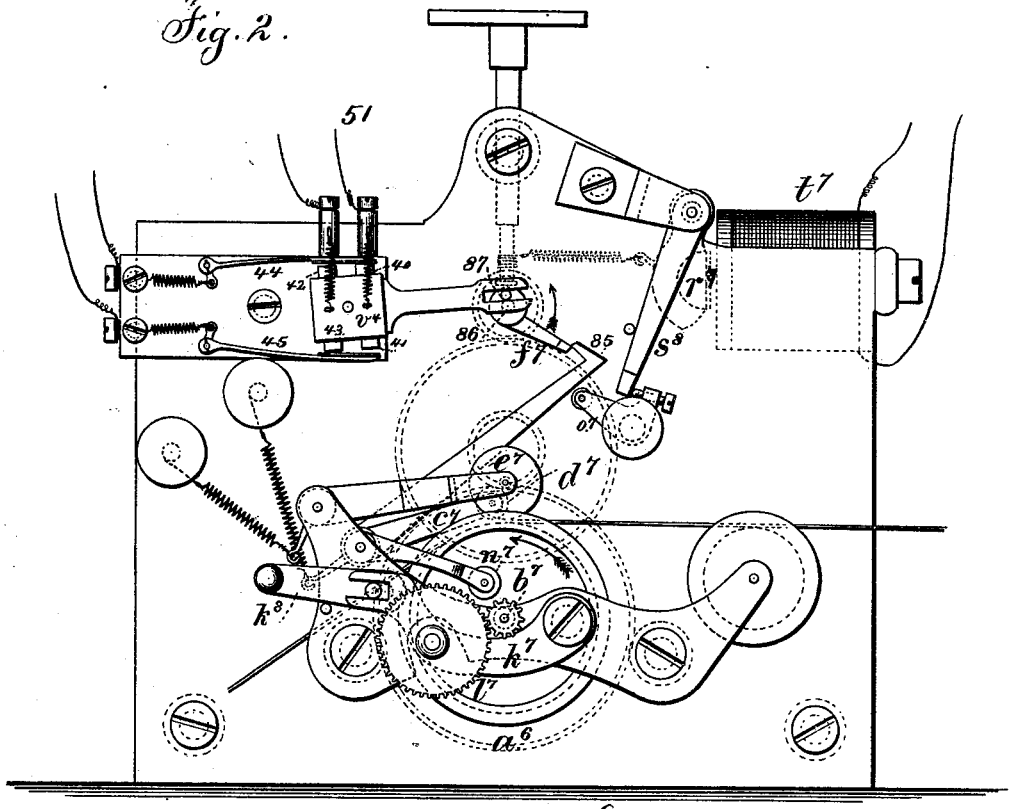
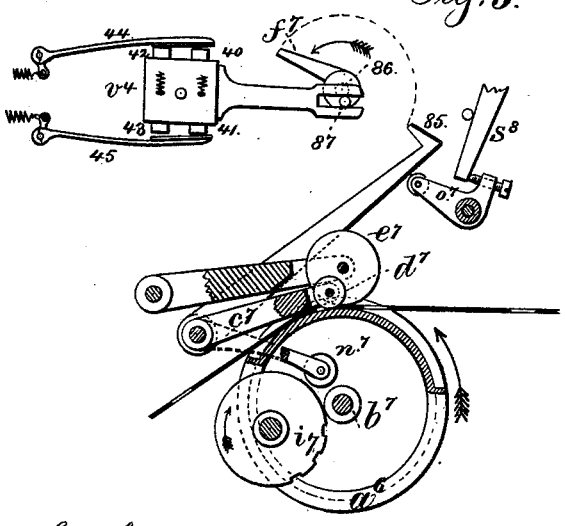


Fig. 3.



Witnesses

Chas. F. Smith

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UNITED STATES PATENT OFFICE.

GEORGE M. PHELPS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRINTING-TELEGRAPH TRANSMITTERS.

Specification forming part of Letters Patent No. **186,215**, dated January 16, 1877; application filed October 26, 1876.

To all whom it may concern:

Be it known that I, GEORGE M. PHELPS, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Printing-Telegraphs, of which the following is a specification:

In Letters Patent granted to me October 19, 1875, No. 168,919, a machine is described for punching holes in a strip of paper at the intervals required for producing electrical pulsations corresponding to those that would occur if sent by a finger-key transmitting-instrument, so that the proper letters of the revolving type-wheel at the distant station will be printed, the strip of perforated paper being run by the transmitter synchronously with the type-wheel of the receiving-instrument.

My present invention relates to the instrument for transmitting by the strip of paper perforated as aforesaid.

In the drawing, Figure 1 is a plan of the instrument with the frame partially in section. Fig. 2 is an elevation of the same. Fig. 3 is a view of parts of the instrument detached, and in the position they assume when the circuit is closed by a roller passing into a perforation in the strip of paper. Fig. 4 represents the perforated strip of paper.

The roller a^6 is run by an electro or other motor acting upon the shaft b^7, and the speed of the roller harmonizes with the speed of the type-wheel that prints the message at the distant station, so that it will correctly draw along a strip of paper containing perforations corresponding to the letters required on the rotating receiving type-wheel.

The arbor of a lever, c^7, carries an arm and small roller, d^7, lying between the two traction-wheels e^7, that apply pressure to cause the roller a^6 to move the paper along regularly; and this roller d^7 is of a size to fall into the perforation of the paper, and allow the lever c^7 to be moved as each perforation passes. There is a hook, 85, upon the same fulcrum as the lever c^7, and said hook catches the revolving finger f^7, the same being upon a shaft, 86, with a pinion, g^7, that is revolved rapidly, and provided with a friction to turn the shaft completely the moment the hook 85 moves back from f^7. The shaft of f^7 has a crank-pin, 87, that operates the circuit-closing rocker v^4, that has contacts 40 42 contiguous to the spring 44, and contacts 41 43 adjacent to the spring 45; and the circuit-connections are so arranged that every time a perforation in the strip of paper passes under the roller d^7 that roller drops enough to release the hook 85, and allow the finger f^7 and crank 87 to revolve, and thereby move said rocker v^4, and close the circuit to the printing-magnet of the receiving-instrument, either directly or through a relay, and cause the proper letter of the type-wheel to be printed from. It will now be understood that the distance between one perforation and the next in the paper corresponds to the distance between the same letters of the type-wheel, with an additional length representing the pause of the wheel in printing, the same as named in aforesaid patent; that although the strip of paper keeps on moving, and the type-wheel stops while it is printed from, still one does not gain upon the other, but the paper at the sending-station moves in harmony with the type-wheel at the receiving-station, and the printing is done with such rapidity that all the letters of the type-wheel could be printed successively in one rotation of the type-wheel, and one or more letters or spaces will be printed each revolution of said type-wheel, thus obtaining the greatest rapidity possible in a printing-telegraph.

Provision is made for bringing the sending and receiving motors to synchronism, as follows: The wheel i^7, with three notches, is mounted upon a lever, k^7, and driven by the gearing l^7. The roller i^7 and the lever k^7 are raised by the arm k^8 and pin, so that when there is no paper on the roller a^6, n^7 will rest upon the wheel i^7, and will hold the hook 85 up in the path of the revolving finger f^7; but when the three notches in the wheel i^7 pass under the roller n^7, said roller will drop in said notches, respectively, and the finger f^7 will revolve three times, and move the circuit-closer, so as to act at the distant instrument, and print the same letter three times in succession. Nine revolutions of the type-wheel take place before the three notches will again operate to repeat the three same letters, provided the motors are running synchronously. If the same letters do not appear the receiving-

operator adjusts the speed of his motor until the same letters appear at each successive repeating by the three notches. This is generally done on commencing work. The lever k^8 and roller i^7 are moved back out of the way, the receiving-instrument at the distant station runs to unison as usual, and stops, and the instruments are ready.

The sending-operator introduces his strip of paper with the dash-perforation always the first one on the strip; hence that liberates the type-wheel at the distant station, and the type-wheel runs in harmony with the strip, as aforesaid.

In order to stop the transmission of electric pulsations the tumbler o^7 is employed to hold the hook 85 in the path of the finger f^7. This tumbler has a button-head, so that it may be turned either way by hand; and I also use an armature, r^7, lever s^8, and electro-magnets t^7, to move this same tumbler o^7 by a local magnet, so that the distant receiving-operator can energize the electro-magnet t^7 by throwing his battery on the line, and by its armature r^7 and lever s^8 move the tumbler o^7, and hold the finger f^7 from revolving, so that the sending-operator may thereby have a signal that indicates lack of adjustment and necessity for the message to be repeated, which is done by the sending-operator drawing his strip of paper back until he reaches a dash-perforation. In the meanwhile the receiving type-wheel has been stopped by the unison, and the instruments are ready to be started, as before.

I claim as my invention—

1. The combination, with the rollers a^6 and d^7 and lever c^7, of the hook 85, revolving finger f^7, crank 87, circuit-rocker v^4, and connections to the distant printing-telegraph instrument, substantially as set forth.

2. The signal-wheel i^7 and roller n^7, in combination with the rollers a^6 and d^7, lever c^7, hook 85, revolving finger f^7, and circuit-rocker v^4, substantially as and for the purposes set forth.

3. The combination, with the rollers a^6 and d^7, lever c^7, hook 85, and revolving finger f^7, of the tumbler o^7, armature-lever s^8, electro-magnet t^7, and connections to the distant receiving-instrument, for the purposes set forth.

4. The combination, in a printing-telegraph, of a transmitting-roller and circuit-closing mechanism, operated by perforated paper, and an electro-magnet controlled from the receiving-station, and acting to lock the transmitting mechanism, substantially as described.

Signed by me this 23d day of October, A. D. 1876.

GEO. M. PHELPS.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.