2 Sheets--Sheet 1

G. M. PHELPS.

Printing-Telegraph.

No. 161,151. Patented March 23, 1875

Fig. 2.

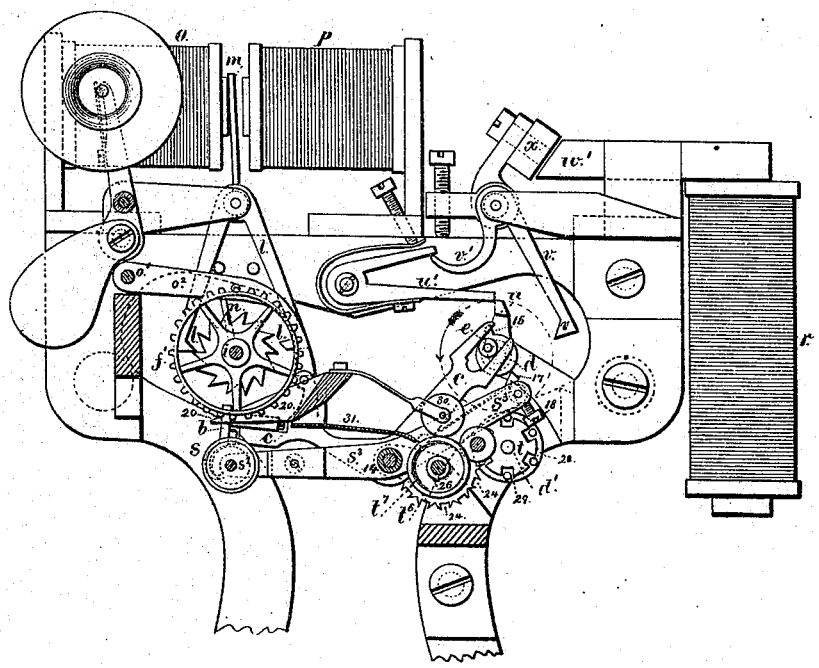
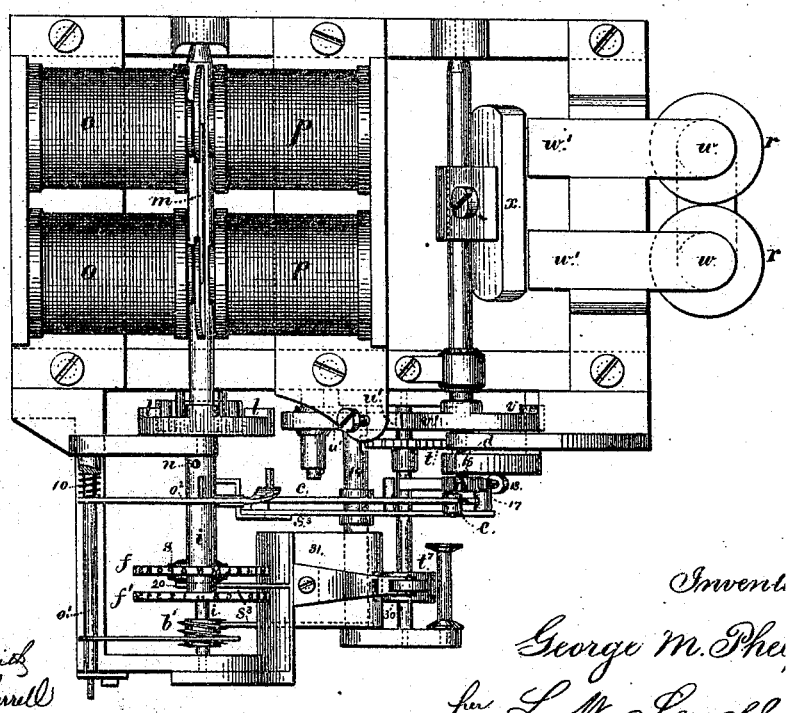


Fig. 1.



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2 Sheets--Sheet 2.

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Fig. 7.

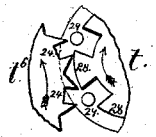


Fig. 6.

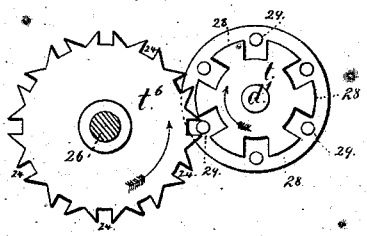


Fig. 3.

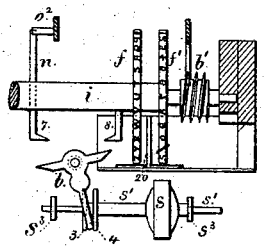


Fig. 4.

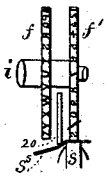
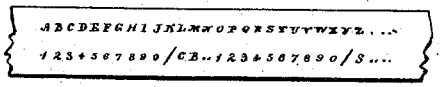


Fig. 5.



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UNITED STATES PATENT OFFICE

GEORGE M. PHELPS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **161,151**, dated March 23, 1875; application filed August 22, 1874.

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:

The current over the line is alternated by positive and negative pulsations, and these operate in electro-magnets to move a polarized armature first one way and then the other, and set the type-wheel. A pause causes the liberation of mechanism that gives the impression.

My present invention relates to improvements upon the machine patented by me November 4, 1873, No. 145,285. In the said patent the impression is given while the printing-shaft is turning one-half of a revolution. If only one-half revolution is employed in an instrument containing two type-wheels then the mechanism for shifting the printing-pad would be operative during this half-revolution, and might be left in a position to interfere with the subsequent movement of the type-wheels.

To avoid this difficulty I construct the escapement that liberates the printing-shaft in such a manner that about a three-quarter revolution is given; the first portion of which operates to shift the pad when it is to be shifted, and the latter portion of that movement carries the shifting mechanism away from the parts that move with the type-wheel and gives the impression, thereby preventing any possibility of the subsequent movement of the type-wheel being interfered with.

I employ a screw unison-stop and liberating-lever, and a shifting device to change the impression from one type-wheel to the other. These receive their movement from a lever that is operated positively by the revolution of the crank, and the impression is given by a blow from a cam.

The feeding mechanism that draws along the paper is constructed so as to be operative in the first part of the impression movement, but to stand still during the termination of that movement, when the impression itself is made.

The type-wheels are made with characters arranged so as to lessen the number upon each wheel, and to facilitate the printing of stock and other quotations in which figures, letters, and fractions are used.

In the drawing, Figure 1 is a plan of the machine; Fig. 2 is an elevation with portions of the frame removed; Fig. 3 is an elevation of the type-wheels and shifting mechanism; Fig. 4 shows the type-wheel and paper-deflector; Fig. 5 represents the characters as printed in the order they stand upon the type-wheels, and Figs. 6 and 7 show the "pause" gearing that operates the paper-feed.

The magnets *o p r* are in the main-line circuit, and the current is sent in pulsations of alternating polarity, so as to move the armature *m* and escapement *l*, and allow the type-wheel to be turned by the train of gearing and spring or weight, as in my aforesaid patent No. 144,285, and the lateral projections *w'* from the cores *w* act upon the armature *x* to liberate the revolving shaft *d*, when a pause occurs in the alternations of the pulsations, so as to allow the train of gearing and the second spring or weight to revolve the shaft *d* and impress the paper upon the type-wheel.

These parts, operating similarly to those in said patent, do not require a more detailed statement. I will therefore proceed to describe the features of difference.

I make use of two type-wheels, *f f'*, on the shaft *i*, and I apply to one, *f*, the letters of the alphabet and the punctuating-marks. To the other type-wheel, *f'*, I apply numbers in two sets, as seen in Fig. 5, together with the fractional dashes, or signs and letters, such as B for buyer, S for seller, and other letters of special significance.

By using two type-wheels the number of pulsations required to make one complete revolution is lessened. Hence greater rapidity is attained.

By employing two sets of figures on the other wheel I am enabled to print at least two figures in one revolution, and often three or four, and the fractional dash or sign can be printed at least once in each revolution, as there are two such dashes, thus increasing the speed of the machine.

The impression of the paper on the type is made by the elastic roller s upon a shaft, s^1, that slides endwise in the swinging frame s^3, and upon this shaft are disks 3 4, between which one arm of the three-armed shifter b passes. This shifter b is upon the lever c, that receives its motion from the crank pin or roller e of the shaft d, so that the shifter is first moved by the crank, and, if the type-wheels are at such a place in their rotation that the arm 7 or 8 is over one end of the shifter or the other, the impression-roller will be moved one way or the other or remain stationary. A similar operation has been performed in either shifting the pad or in moving the type-wheels, but the shifter was moved by the impression-lever. I do not move the shifter by the impression-lever, as hereafter shown.

The screw-unison b' gives an end movement to the shaft o' and finger o^2, and this finger arrests the arm n upon the type-wheel shaft i, to stop the wheels $f f'$ at unison, and the parts are liberated, when the lever c is moved, by the crank pin or roller e, and the spring 10 returns the parts to their normal position.

The impression-roller s is carried by a frame, s^3, that swings upon the same fulcrum-stud 14 as the lever c, but it is independent thereof, and there is a cam-projection, 16, on the disk at the outer end of the shaft d that strikes against the projection 17, that is adjusted by the screw 18 on the frame s^3, and gives a movement to that frame and the impression-roller s just before the revolution of the shaft d is stopped, and this impression-roller acts by percussion upon the paper and drops back sufficiently to relieve the paper from the type-wheel.

Between the type-wheels there is a fixed deflecting arm or plate, 20, the lower edge of which is slightly below the faces of the letters. The paper passes between the feed-roller t^7 and pressure-roller 30, over the plate 31, and below this deflector 20, and therefore is kept from contact with the types, except when the blow from the impression-pad brings the paper s^5 into contact, on one side of the deflector, with the type-wheel, as in Fig. 4.

The train of gearing tends to revolve the shaft d and pin e in the direction indicated by the arrow, the arm u being arrested by the spring-lever w', but when the magnet r is energized the arm v' of the armature x moves this lever w' and liberates the arm u, and that and the shaft d makes about three-quarters of a revolution, and the arm u stops against the lever v until the magnet r is demagnetized and the movement of the parts liberates u from v, and it revolves the other quarter move and stops against w'.

During the three quarters movement the lever c and shifting mechanism are first moved so that if the arms 7 and 8 of the type-wheel shaft are in position to act, the roller 3 is shifted either one way or the other, and, the movement being more than a half-revolution, the shifting devices are withdrawn again out of the way of the type-wheel whenever subsequently moved, and meanwhile, during the latter part of the three-quarters revolution, the impression is given by the cam 16 acting on the lever s^3 and the blow of the impression-roller s resulting therefrom.

The shaft d' turns when the arm u and shaft d are liberated, and upon the shaft d' is the pause-wheel t, that is made with segmental stop-surfaces 28 and pins 29 in the intervening notches, and upon the feed-roller shaft 26 is a wheel, t^6, with notches 24, that are a less distance apart than the distance between the pins 29. Hence, as these pins 29 give motion to the wheel t^6 by entering such notches, there is a pause in the movement of the feed roller t^7 while the wheel t is turning, as indicated in Fig. 7, and the position of these parts is such, in relation to the mechanism that gives the impression, that at rest the pin 29 is in the notch 24, as in Fig. 6, and hence the paper-feed commences the moment the arm u is liberated from w', and the pin 19 clears its notch when the arm u has made about half a revolution, thereby allowing the paper-feed to stand still while the last quarter movement takes place and the impression is given.

It is to be understood that a transmitting instrument is used containing as many keys as there are divisions around the type-wheel; that upon these keys the two sets of characters are marked corresponding with the arrangement shown in Fig. 5, A and 1 being on the first key, B and 2 on the second, and so on, and the last two keys are used for shifting the impression and making the spaces between words, &c., so that when the operator is printing words he uses the key that is next to the end, and, when figures are to be used, the last or space key for figures is operated, which both brings the impression to the figure-wheel and continues the impression to the figure-wheel, and continues the impression from that wheel so long as required, thus dispensing with the separate keys heretofore used for changing the impression and using the respective space-keys for that purpose.

I claim as my invention—

1. The shifting-lever b, carried by the lever c that is operated by the crank e and shaft d, in combination with the shifting impression-roller s and the independent frame s^3, carrying that roller and the cam 16 for moving the same, substantially as set forth.

2. The deflecting-plate 20 placed between the type-wheels, in combination with the movable impression roller or pad s, as and for the purposes set forth.

3. The spring-lever w', in combination with the magnet r, armature x, levers v v', and revolving arm u, for operating the printing mechanism, substantially as set forth.

4. The pause-wheel t gearing into the wheel t^6, in combination with the paper-feed, substantially as set forth, so as to allow the paper to remain stationary while the impression takes place.

5. The arrangement of two sets of figures, fractional signs, and letters on one type-wheel, combined with a second type-wheel containing letters, substantially as set forth.

6. In a printing-telegraph with two type-wheels and a mechanism for shifting the printing from one to the other, the combination of the arm u, the detents therefor controlled by an electro-magnet, the wrist-pin or a cam operating the roller-shifting mechanism and the cam operating the printing mechanism, arranged relatively to each other, substantially as shown, the shifting mechanism being thereby operated and then removed from the parts moving with the type-wheel before an impression is given, as set forth.

Signed by me this 19th day of August, A. D. 1874.

GEO. M. PHELPS.

Witnesses:
CHAS. H. SMITH,
GEO. T. PINCKNEY.