

(No Model.)

S. M. PLUSH & W. P. PHELPS.

PRINTING TELEGRAPH.

No. 264,961.

Patented Sept. 26, 1882.

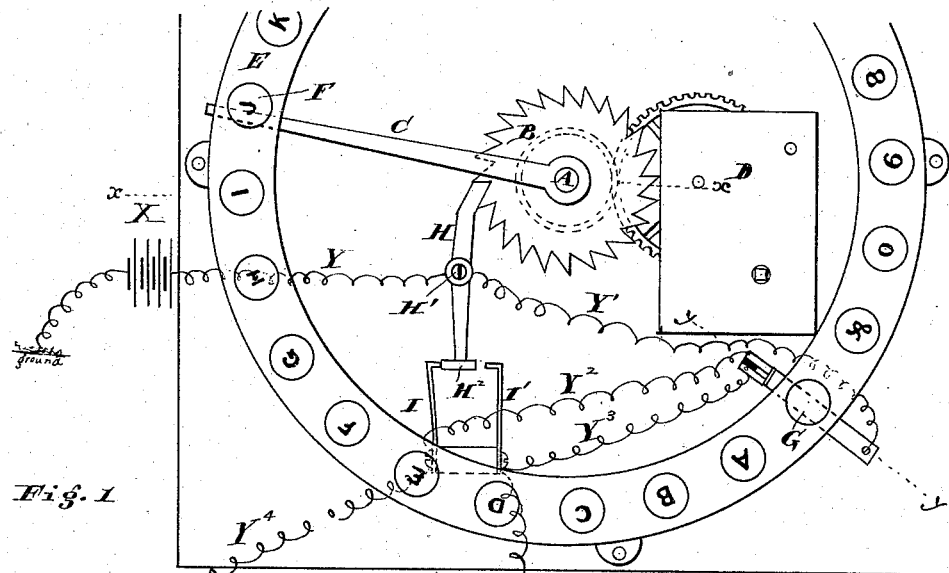


Fig. 1

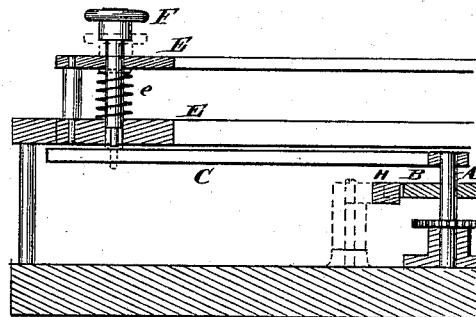
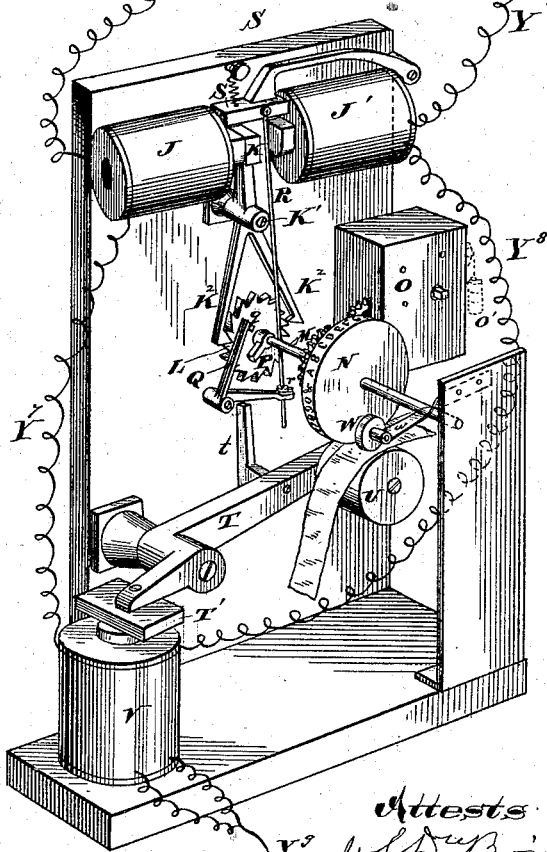


Fig. 2

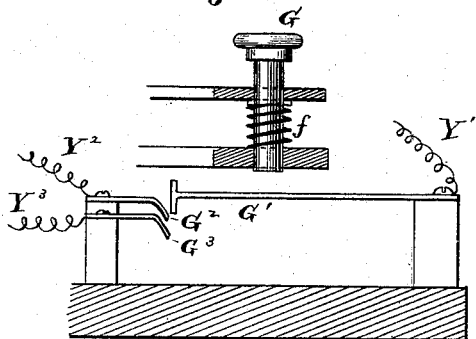


Fig. 3

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J. L. DuBois
L. J. Mates

Inventor
Samuel M. Plush &
William P. Phelps
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[Signature]

UNITED STATES PATENT OFFICE.

SAMUEL M. PLUSH AND WILLIAM P. PHELPS, OF PHILADELPHIA, PA.

PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 264,961, dated September 26, 1882.

Application filed December 13, 1881. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL M. PLUSH and WILLIAM P. PHELPS, both of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Printing-Telegraphs, of which the following is a specification.

Our invention, as distinguished from all other telegraphs, relates to the use of a type-wheel driven by a weight or spring and controlled by two electro-magnets charged alternately by two separate circuits when combined with a differentially-wound press-magnet, the object of which is to obtain a higher rate of speed than has hitherto been possible with absolute certainty of action.

While we are aware that improvements have been made in printing-telegraph instruments in which two or more circuit or line wires were employed, we believe that in no case has the combination of parts set out in this application been used for the purpose of controlling the movements of the type-wheel, but are employed to drive the same.

Our invention is further distinguished from all other telegraphs in the mechanism for setting the type wheel or wheels, commonly called the "unison-stop," those in common use being operated by the movement of the type-wheel, requiring two or more revolutions of the same for that purpose, while ours requires in no case more than one revolution of the type-wheel, and is under the control of the transmitting-operator, and is operated through the combined type-wheels' circuits.

Our press-magnet is also novel in its operation, being wound differently, the two type-circuits passing through it in opposite directions. Hence when both type-circuits are passing through it the magnetic result is nothing; but it responds slowly to either circuit operated separately.

In the drawings, Figure 1 is a general view of our improved apparatus for printing electrically, showing part in plan and part in perspective. Fig. 2 is a sectional elevation of part of same on line *xx*, and Fig. 3 is a sectional elevation of part of same on line *yy*.

A is a shaft, upon which is secured the ratchet-wheel B and arm C, and is driven by

clock-work mechanism D or weights or any other equivalent devices. The arm C is adapted to rotate below a frame, E, carrying the push-buttons F and G, held up by springs *e* and *f*. The ratchet-wheel B in its rotation reciprocates or rocks the end of lever H, which is pivoted at H', and carries on the other end a hammer or contact-piece, H². This hammer H² vibrates between the spring-fingers I and I', breaking contact with one and making contact with the other, and vice versa. The battery X is in circuit with lever H by the wire Y, and the fingers I I' are respectively connected with the line-wires Y⁴ and Y⁵, which are connected at the receiving-station with electro-magnets J and J', respectively. The electro-magnets J and J' are arranged upon either side of the armature K, which is pivoted at K', and which is adapted to vibrate between the attracting-faces of said electro-magnets, and carries upon its lower end escapement-arms K², provided with teeth or pallets, which control the rotation of the toothed wheel L, secured upon the shaft M, which carries the type-wheel N, and which is driven by means of a clock-work, O, or a weight.

Pivoted above the electro-magnets is an armature, S, arranged to be attracted by both of said electro-magnets J and J', and may be properly balanced by a spring, S', so as not to respond to either one of said electro-magnets separately, but to instantly respond when both of said electro-magnets are electrically charged. This armature S actuates a rod, R, provided near the bottom with a collar, *r*, and having the part below said collar working loosely through the end of one leg of the bell-crank Q, having upon its other leg a projection or catch, *q*, which, when it is pressed down by the armature S through the agency of the rod R, catches the rotating arm P and arrests the revolving type-wheel N at its zero or starting point. This device constitutes the unison-stop. As described above, the armature S responds only when both electro-magnets J J' are simultaneously electrified, and this is accomplished by connecting the battery X with the contact-finger G' by wire Y', and connecting the line-wires Y⁴ and Y⁵, respectively, to spring-fingers I and I' by wires Y² and Y³. Now, by pressing

upon the push-button G the spring-contact G' puts the battery-current to both lines. Any other device may be used for this purpose, if desired.

5 The press armature-lever T carries on one end the rubber press-roller U and on the other the armature T', which is actuated by a sluggish electro-magnet, V, wound differentially, or, in other words, with two helices wound in
10 opposite directions. One of these helices connects with magnet J and its line-wire by wire Y⁷, and the other helix connects with magnet J' and its line-wire by wire Y⁸. The other ends of said helices are grounded, as shown at Y⁹, or passed to magnets J J' of another instrument and then grounded. The press-roller
15 end of lever T carries an arm, t, which is adapted to raise the unison-stop bell-crank Q out of connection with arm K² after it has been put in action by armature S, which simply presses it down, but does not draw it up. A spring, w, carries on its end a pressure-roller, W, which holds the paper to be printed
20 down upon the press-roller U.

25 The operation is as follows: The clock-works D and O being wound up, the arms C swings around, rotating the ratchet-wheel B, throwing the battery-current alternately into the two line-wires Y⁴ and Y⁵, alternately charging
30 magnets J and J', and causing the escapement to vibrate, allowing the type-wheel N to rotate with a step-by-step motion, but with rapidity, as it is driven by the clock-work O, and is simply controlled by the escapement
35 K². Now, if one of the push-buttons, F, is pushed down, it will arrest the movement of the arm C, and also the type-wheel N. With each charging of magnets J and J' the press-magnet V is also charged, but it, being made
40 to act sluggishly, does not have time to draw down its armature until the whole mechanism is brought to rest by pressing down one of the push-buttons, F, and when this occurs the type-wheel is in position to print the letter or
45 symbol corresponding to that upon the push-button F. After sending the message the unison-stop should be put in action to insure the instrument being in proper working order for the next message. This is done by pressing
50 down the push-button G, causing the battery-current to pass down both line-wires and charge both magnets J and J', causing the armature S to respond and throw the bell-crank Q into position to catch the arm P.
55 When this is done the magnet V is inert, as the line-currents are passing through it in opposite directions, one current counteracting the effect produced by the other, and thereby preventing any possibility of the arm t pressing
60 up the bell-crank Q out of reach of the arm P. Now, if the push-button G is released and the arm C allowed to rotate, the escapement will operate to allow the ratchet-wheel B and type-wheel N to rotate until the arm P is caught by
65 the bell-crank Q. This brings the type-wheel to a zero-point, or in practice to A.

To use the instrument it is first necessary to

release the arm P from bell-crank Q by pressing down the push-button F, which will cause the magnet V to raise the arm t and throw
70 up the bell-crank Q.

In this application we do not claim broadly the combination of a type-wheel driven by weights, springs, or their equivalent, located at the printing-station, with two electro-magnets to control the rotation of said type-wheel,
75 which are charged alternately by two separate circuits, as this will form subject-matter of a future application.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a printing-telegraph, an armature arranged to vibrate, in combination with two electro-magnets, two electro-circuits respectively in circuit with said electro-magnets,
85 means to pass an electric current through both of said electro-magnets simultaneously from the sending-station, a type-wheel provided with a stop, a unison-stop arranged to be thrown
90 into position to arrest the rotation of type-wheel by the vibration of the armature, means to rotate said type-wheel, and means independent of the armature to throw said unison-stop
95 out of position upon printing or attempting to print.

2. A printing-armature, in combination with a printing-magnet wound with two wires in opposite directions, and means to pass an electric current through either one of said wires
100 alone or through both of said wires simultaneously, so that when a current of electricity passes through either of said wires alone the magnet is operative, but when currents pass
105 through both of said wires simultaneously it is inoperative.

3. In a printing-telegraph, a type-wheel, means to rotate it, and a reciprocating armature and escapement to control its rotation, in combination with a unison-stop provided with
110 an actuating armature and connecting mechanism, two electro-magnets, two line-wires respectively in circuit with said electro-magnets, and means to close both of said line-circuits at the same time to attract the armature which
115 actuates said unison-stop to throw it into position to arrest the type-wheel at the proper place.

4. In a printing-telegraph, a unison-stop and an armature, and connecting mechanism adapted to throw said unison-stop into position to
120 arrest the type-wheel, but not out of said position, in combination with a type-wheel, means to rotate said type-wheel, two electro-magnets to attract said armature, and means to charge
125 both of said electro-magnets simultaneously.

5. The combination of two line-wires, two electro-magnets respectively in circuit with said line-wires, means to pass a current through
130 both of said electro-magnets at the same time, an escapement actuated by said electro-magnets, a type-wheel driven by power developed at the printing-station and controlled by the escapement, a press-magnet wound differen-

tially with wires respectively in circuit with the electro-magnets which actuate the escapement, and a unison-stop provided with an actuating-armature arranged to be attracted by said electro-magnets when currents are simultaneously sent through both of them.

6. In a printing-telegraph, the combination of a type-wheel driven by power developed at the printing-station with two line-wires, means actuated by the electrical currents conducted by said wires to control the rotation of the type-wheel, a press-magnet wound differentially with part of said line-wires, and means to pass an electric current through both of said line-wires simultaneously.

7. In a printing-telegraph, the combination of a type-wheel driven by power developed at the printing-station with two line-wires, two

electro-magnets respectively in circuit with said line-wires, an escapement to control the rotation of said type-wheel, an armature attached to said escapement and adapted to vibrate between said electro-magnets, a press-magnet wound differentially with wires respectively in circuit with said line-wires, and means to pass an electric current through either one of said line-wires alone or through both simultaneously.

In testimony of which invention we hereunto set our hands.

SAMUEL M. PLUSH.
WILLIAM P. PHELPS.

Witnesses:

R. M. HUNTER,
R. S. CHILD, Jr.