

Geo. L. Anders.

Telegraphic Printing Mechanism.

117239

PATENTED JUL 25 1871

Fig. 1.

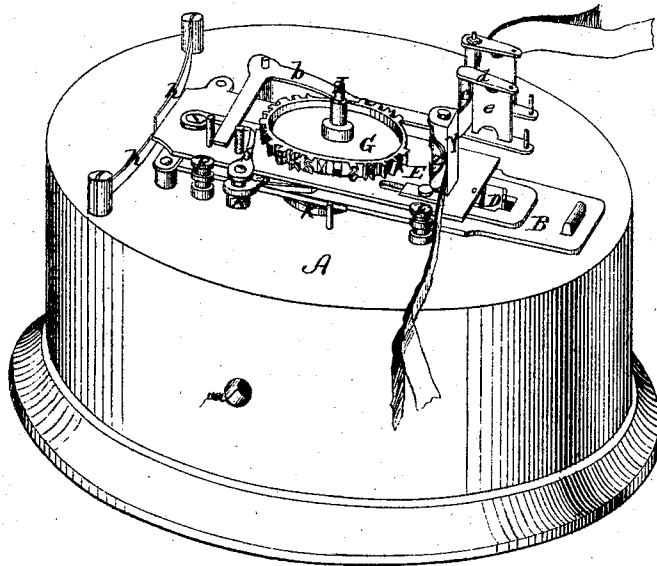


Fig. 3.

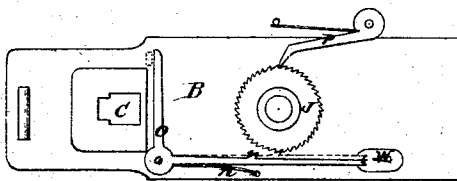


Fig. 2.

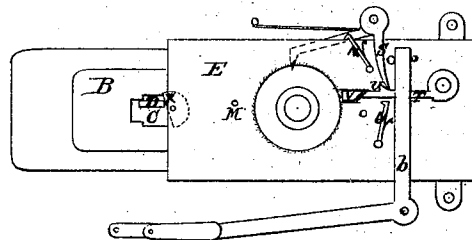


Fig. 5.

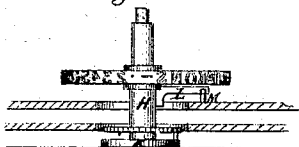


Fig. 4.

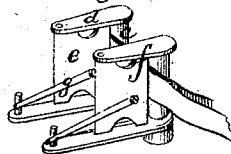
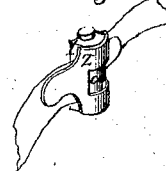


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE L. ANDERS, OF BOSTON, ASSIGNOR TO E. B. WELCH, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN PRINTING-TELEGRAPH APPARATUS.

Specification forming part of Letters Patent No. 117,239, dated July 25, 1871.

To all whom it may concern:

Be it known that I, GEORGE L. ANDERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Printing-Telegraph Instrument, of which the following is a specification:

Figure 1 is a perspective view of my invention; and Figs. 2, 3, 4, 5, and 6 are views of parts in detail.

The object of this invention is to facilitate the operation of a telegraphic-printing apparatus employing a reciprocating type-wheel, and also to secure accuracy in the operation of the same; and it consists, first, in the combination, with the printing mechanism, of a magnet which is fully described in Letters Patent issued to myself and E. B. Welch, bearing date November 1, 1870, said magnet being provided with a projecting armature-lever which operates two reciprocating plates, said armature-lever being actuated by currents alternating in their direction in such manner as to revolve the type-wheel until the desired letter reaches the necessary position for printing, when, by sending an additional current in the same direction as the one preceding, the two plates are locked together, and a press or paper-holder located on one of them is brought in contact with said wheel, thereby causing an impression to be made on the paper. It also consists in providing the shaft of the type-wheel with a spiral spring, which is coiled up by the forward movement of the type-wheel, which spring, after each printing operation has been performed, forces the wheel back to a given position, from whence it is moved forward in selecting the next character to be printed, said characters being arranged on the periphery of the wheel, in the order in which they are most frequently used, nearest the point on which the wheel from which the forward movement of the same is commenced. It also consists of other details of construction, which, with the method of operation, will be more fully described hereinafter.

In the drawing, A represents the casing of the instrument, in which is located the electro-magnet, which is shown and described in the application above referred to, said electro-magnet having a pivoted soft-iron armature, a lever of which projects upward through casing A, and is attached to sliding plate B, which plate is provided with a graduated slot or orifice, C. D represents

a lever or director, which is attached to a permanent magnet vibrating laterally between the poles of the electro-magnet, its lower end being pivoted so as to allow a longitudinal motion of the same. The upper end of director D projects through slot C, its width being sufficient to fill the space between the wide end of said slot and the shoulders on the sides of the same. E represents a plate located above plate B, both of which plates slide in grooved standards F, and are provided with orifices or slots, through which passes the standard I, on which the type-wheel G is located, said wheel being provided with a sleeve, H, which revolves on said standard, the latter being attached to casing A. The sleeve H of wheel G is provided, near its lower end, with a ratchet, J, from the lower side of which projects a pin, i, which engages with a coil spring, K, which latter rests on the surface of and its extremity is attached to the casing A. L represents an arm, which projects from one side of sleeve H under wheel G, and bears against pin M, which rises from plate E and arrests the backward motion of wheel G. N N represent spring-detents or catches, located in the path of the extremity of lever L, which detents arrest its backward motion at these points, from which a forward motion may be commenced. O represents a rectangular lever, which is pivoted to the upper side of plate B, and is provided with a tooth or pawl, o, which engages with the ratchet J. On the opposite side of plate B is a spring-pawl, P, sleeved to a standard, R, which rises from the casing A. The pawl P bears on the ratchet J and holds the same from revolving backward, and has attached to it the arm S, which engages with tooth U on lever T, which latter has its bearings on plate E. The lever T serves to disengage pawl P from ratchet J by the returning motion of the plate E; said lever also engages with a pallet, V, which is fixed to plate B and projects upward through plate E. W represents a pallet, which projects from casing A through a slot in plate B, as shown in Fig. 3. X represents a plate or guide, which is pivoted on the lower side of plate E, near the outer end of the same, as shown in Fig. 2. The guide X projects over the wide end of slot C diagonally. Y represents a standard or press, which rises from the front end of plate E, and is provided with a curved plate, Z, which has an orifice, a, which orifice is directly opposite the type-

wheel G. *b* represents a rectangular lever, which is pivoted to casing A at one side of plates B E, one of its ends projecting over plate E and being confined between two projecting pins on the same, as shown in Figs. 1 and 2. On the other end of lever *b* is a pillar or standard, *c*, having an arm, *d*, between which and the lever *b* is pivoted a clamp, *e*, one edge of which is serrated and is caused to bear against the pillar *c* by spring *g*; this device constitutes a feed for the paper. *f* represents a similar arrangement, located at one side of lever *b* on casing A. *h h* represent springs, which bear against the rear ends of plates B E. The characters on the type-wheel are arranged in the order in which they most frequently occur in printing, and are presented in this order by one or more detents, N N M. It has been found that the letters *e t a i o n s* are used oftener than any others in the alphabet, and these are accordingly placed first in order, nearest the press. Following these are the remaining letters of the alphabet, arranged thus: *h r d l u c f g m p b k v j w y x z q*. Next in order are the numerical characters, 1 2 3 4 5 6 7 8 9 0, and lastly the fractions, $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{8}$ $\frac{7}{8}$ $\frac{1}{16}$. This order of fractions it is not necessary to strictly adhere to, as any desired order may be employed; but the grouping of the characters and order of letters on the wheel are found to greatly expedite the printing operation in connection with the mechanism herein described.

A vibratory motion is imparted to the armature of the electro-magnet in the usual way, and a reciprocating motion is thus imparted to the plate B, the lever O of which, in moving forward, leaves the contact with a projection on the lower side of plate E, and is swung inward by a spring, *n*, which bears against the same, its tooth *o* engaging with the ratchet J and imparting a partial revolution to the same, together with the type-wheel G, until the notched end of lever O comes in contact with the pallet W, which stops the forward motion of plate B and type-wheel G, which plate is then forced back by its spring *h*, while the spring-pawl *p* engages with the ratchet J and holds the same in the position in which it was left by the lever O. It will now be seen that every forward motion of plate B imparts a partial revolution to the type-wheel G, each motion moving the same forward in such manner as to bring a different character opposite the press Y, which during this part of the operation remains stationary, the plate E not being moved. Meanwhile the director D is vibrated across the slot C by transmitting currents alternating in their direction through the magnet, and in its vibration it is prevented from entering either side of the recessed end of said slot by the pivoted guide-plate X, which projects diagonally over the same, as shown in Fig. 2; and, as the director swings across the slot, the projecting plate prevents it from entering either of the recessed sides, as above stated. At every forward motion of the plate B the outer end of slot C comes in contact with the edge of director D, and pushes the same slightly forward, thereby swinging the guide X around, and causing its opposite corner to pro-

ject over the opposite recess of slot C just before the director vibrates backward, and prevents the same from engaging with said opposite recess.

This operation goes on as long as the alternating currents are transmitted, which are continued until the type-wheel is adjusted for printing, when, instead of a current of opposite direction to the one preceding, one of the same direction is transmitted, which forces the director D into one of the recessed sides of slot C, and the end of the recess, engaging with the director, drives the plate E forward until the paper in the standard or press Y is pressed against the adjacent character on the type-wheel and receives an impression of the same through an intervening ribbon of transferring-paper, which passes along with the impression-paper, as shown in Fig. 1. At this stage of the operation, when the plate E has been moved forward to its utmost extent, the tooth U of arm T passes by the end of arm S and engages with the same, said arm T being pressed outward by a spring; and after the desired impression has been taken from the type-wheel the spring *h* forces the plate E backward, and the tooth of arm T, engaging with arm S, throws the pawl P out of connection with the ratchet J, (the pawl P and arm S being both sleeved together on standard K,) and allows said ratchet, together with the wheel G, to spring back to their former position, where they are held by means of the arm L and pin M or detents N. When the plate E is moved forward to receive the impression on the paper the plate B also moves as in the first operation, and the tooth of lever O is prevented from engaging with ratchet J by the projection on plate E being carried with lever O, thus escaping a forward motion of the type-wheel, which is held in position by pawl P in ratchet J. When the plate E is forced back by spring *h* a lever, T, disengages pawl P from ratchet J and allows the coiled spring to force back arm L to detents N N M, thus securing rapidity and accuracy in the selection of the characters on the type-wheel and in printing the same.

From the foregoing description it will be understood that the type-wheel is revolved until the desired character is reached, the director meanwhile vibrating across its slot by the transmission of alternating currents, while, by the transmission of two currents in succession in the same direction, the type-wheel is held stationary, and the paper is caused to bear against the type-wheel and receive the impression of the character thereon, after which the type-wheel is released by the backward motion of plate E, which disengages the pawl P from ratchet J, and caused by its spring K to resume its original position from whence it commences to revolve after every impression. By this feature and the peculiar arrangement of characters on the type-wheel a great saving of time is effected in operating, as it is not necessary to effect an entire revolution of the type-wheel to secure a letter preceding the last one printed, which is the case in other instruments of this nature, wherein one wire only is employed and the type-wheel revolved in one direction.

The paper is drawn through the press by the feeding mechanism, operated by the sliding of plate E, which swings the rectangular lever *b*.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of operating one or more telegraph-printing instruments in a circuit by the transmission of electrical currents alternating in their direction to secure the selection of a character on the type-wheel, and subsequently taking an impression of the same by the transmission of a final, separate, and distinct current in the same direction as the one preceding, substantially as described.

2. The employment of one electro-magnet in a telegraph-printing instrument whose electro-motive force is applied to the selecting or impressing parts of said instrument through the agency of a permanent magnet, when said permanent magnet does not control an electrical circuit, thus avoiding the use of an automatic polarized or other circuit-breaker, and insuring a steady resistance in a circuit containing one or more instruments.

3. The plate B provided with the graduated slot or orifice C, and the plate E provided with pivoted guide X, in combination with the director D, as and for the purposes specified.

4. The plates B E provided with the rectangular lever O, pawl P, and arm T actuated by the vibrating armature, in combination with the type-wheel G having ratchet J, substantially as described.

5. The type-wheel G provided with arm L, in combination with one or more spring-detents or stops, N, operating, in connection with spring K, in such manner as to arrest the wheel in its backward motion and hold the same in any desired position, substantially as described.

6. The sliding plates B E, in combination with the rectangular lever *p* and pivoted feed-plates *r*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. L. ANDERS.

Witnesses:

CARROLL D. WRIGHT,
CHARLES F. BROWN.