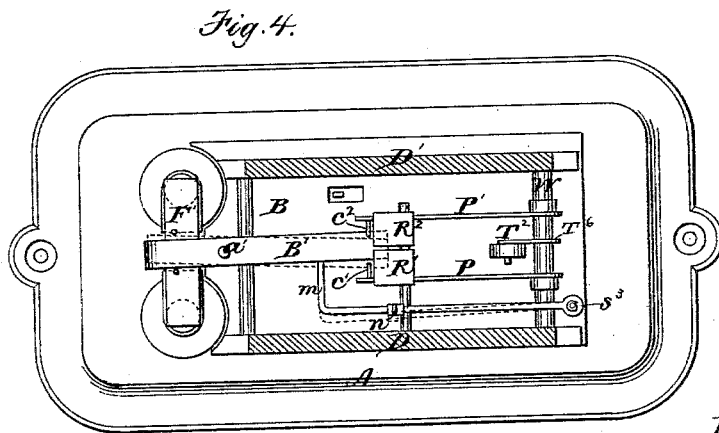
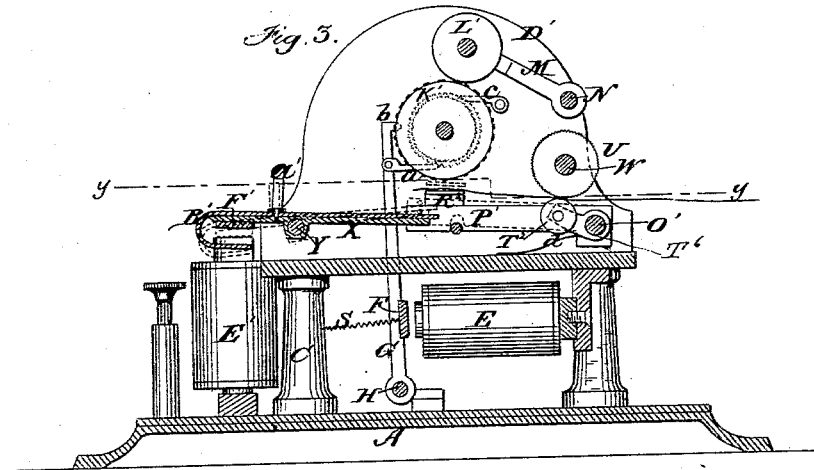
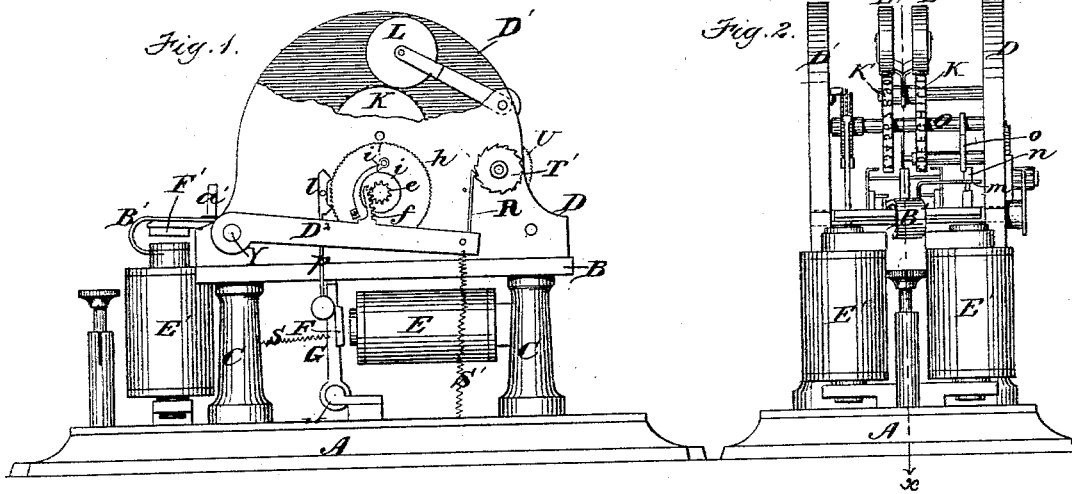


G. L. ANDERS.
 Printing Telegraph.
 No. 210,893. Patented Dec. 17, 1878.



Witnesses.
C. T. Brown
E. B. Churchill

Inventor
George Lee Anders
 by his attorney
Chas. L. Hayes es.

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **210,893**, dated December 17, 1878; application filed
April 30, 1878.

To all whom it may concern:

Be it known that I, GEORGE LEE ANDERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Printing-Telegraphs, of which the following is a full, clear, and exact description, reference being had to the drawings accompanying and forming part of this specification.

This invention relates to that class of printing-telegraphs in which there are two contiguous type-wheels, either of which may be used at will; and consists, mainly, of the combination, substantially as hereinafter more fully set forth, with two independently-actuated printing-pads, of a polarized director operated by a change in the polarity of the current to determine the action of one or the other of the printing-pads.

It also consists in the combination, substantially as hereinafter more fully set forth, with said director, of a certain unison device that is operated thereby, and which holds the type-wheels at unison when the director is in one position, and permits them to rotate freely when the director is in the other position.

In Letters Patent of the United States No. 108,867, granted to me November 1, 1870, I have described a polarized steel tongue situated between the poles of an electro-magnet by changes in the polarity of the current and acting to determine the action of either the type-wheel mechanism or the press mechanism according to the polarity of the exciting-current. This polarized tongue I there entitle a "director."

I have also in another application for a patent described a similar director, operated in a similar way, to determine the rotation of either of two contiguous type-wheels independently rotated according to the polarity of the exciting-current.

The director referred to in the present application is of similar construction and operation. It is described and represented as applied to the magnet which moves the printing-pad; but it may be operated by the type-wheel magnet or by an independent magnet.

The accompanying drawings represent a printing-telegraph instrument containing my improvements.

Figure 1 is a side view, in elevation, of this instrument, a part of one of the side plates being broken away. Fig. 2 is an end view, in elevation, of the same. Fig. 3 is a side view, partly in section on the line *x x*, Fig. 2, of the same; and Fig. 4 is a plan view of the same on the line *y y*, Fig. 3.

In these several figures the same letters refer to the same parts.

A is the base-plate of the instrument. B is another plate, supported by the pillars C C above the base-plate; and D D' are two parallel side plates attached to the plate B, which side plates afford bearings for the type-wheel arbor, the arbor of the feeding-roller, the printing-pads, and the retarding device.

E is an electro-magnet, properly supported under the plate B; and F is the armature of this electro-magnet, which armature is attached to a lever, G. This lever is pivoted at its lower end at H to a support attached to the base-plate, extends up through the plate B, and carries on its upper extremity suitable pawls *a b*, which engage with a suitable ratchet-wheel on the type-wheel arbor, and thereby cause the rotation of the type-wheels to be effected by the oscillations of the lever G. *c* is a pawl, which prevents the ratchet-wheel from slipping backward. A suitable retracting-spring, S, is attached to the lever G.

Instead of rotating the type-wheel in this manner, it may be rotated either step by step or continuously by any suitable mechanism.

O is the type-wheel arbor, and K K' are the type-wheels, fixed on the same. These type-wheels are placed side by side, and one may be used for printing letters, and the other may be used for printing figures. L L' are the inking-rollers, which are supported above the type-wheels by an arm, M, attached to a support, N, extending from one of the side plates. O' is a suitable arbor connecting the side plates, and upon this arbor are independently sleeved two levers, P P', side by side, and which extend under the type-wheels and carry the printing-pads R¹ R².

On the arbor O', between the sleeves of the levers P P', is sleeved an arm, T⁶, which carries a roller, T²; and above this roller T² is a toothed wheel, U, rotating upon an arbor, W, attached to the plate D D'. A spring, *d*, un-

der and attached to the arm T^5 , acts to keep the roller T^2 in contact with the toothed wheel U . The paper strip is fed between the roller T^2 and the toothed wheel U .

E' is another electro-magnet, also supported on the base-plate A , and in the same circuit with the magnet E ; and F' is the armature of this magnet, which is attached to a lever, X , fixed at right angles to an arbor, Y , having its bearings in the side plates, $D D^1$. Upon this lever is pivoted, at a' , the polarized director B' , one end of which extends under the printing-pads, and the other is bent over and under the armature F' , and lies between the poles of the electro-magnet E' .

I adopt this form for convenience, but I do not confine myself to it, and any arrangement may be adopted which will insure one extremity of the director acting upon the printing-pads, either mediately or immediately, and the other end lying between the poles of the magnet E' .

Attached to the inner sides of the levers P P' are two pins, $c^1 c^2$, one on each lever, opposite to each other, and having their extremities at such a distance from each other that when the director B' is moved from one side to the other it will come under one or the other of these pins.

The printing-magnet E' of this instrument is prevented from effecting an impression except when a prolonged current is transmitted through the said printing-magnet E' by the retarding device which I have described and claimed in a previous application for Letters Patent of the United States. This device consists of a lever, D^2 , attached to the arbor Y , and carrying a ratchet, f , which engages with a pinion, e , fixed to the toothed wheel i , which wheel i is connected by the pawl i' to the serrated wheel h , properly supported upon an arbor attached to the side plate, D , the rotation of which wheel is retarded by the escapement l , attached to the pendulum p . A retracting-spring, S^1 , is attached to the lever D^2 , and also a pawl, R , which engages with a ratchet-wheel, T^1 , on the arbor of the toothed wheel U .

The unison device consists of an arm, m , which is pivoted to a suitable support on the plate B , and is so shaped that one end lies against the director B' . A spring, S^3 , acts on the arm m to keep its extremity in contact with the director B' , so that the arm follows the movement of the director from side to side. Upon this arm m is a pin or projection, n , which forms a stop to an arm, o , attached to the type-wheel arbor or its equivalent.

The operation of this printing-telegraph is as follows: The type-wheel is rotated in the usual manner by a series of interruptions in the exciting-current until the character on the type-wheel which it is desired to print is over the printing-pad. By then prolonging the current the armature F' of the printing-magnet E' (which armature has been prevented by the retarding device while the type-wheel was being rotated from moving sufficiently to effect the printing) will be fully attracted,

and the director B' will force the printing-pad, under which the said director is placed, according to the polarity of the current, against the corresponding type-wheel. If it is desired to print from the other type-wheel the polarity of the current must be reversed. The bent end of the director B' will then be attracted to the other pole of the magnet E' , and the other end of the director will be moved under the pin upon the other printing-pad. When the type-wheel is being rotated by currents of one polarity of shorter duration than is necessary for printing, the end of the director B' will be under the pin c^2 , the spring S^3 pressing the arm m and director to this side, as shown in full lines in Fig. 4, the pin or projection n on the unison-lever m will be thrown out of the path of the unison-arm o on the type-wheel arbor, the type-wheel will be free to revolve as long as currents of this polarity are transmitted, and an impression may be taken from any character by prolonging the current. When currents of opposite polarity are transmitted the director B' will be thrown under the pin c^1 , as shown in dotted lines in Fig. 4, the pin or projection n on the unison-lever m will be brought into the path of the unison-arm o on the type-wheel arbor, and the type-wheel on being rotated will be arrested at the unison-point if it is desired to assure unison; but in order to avoid the arrest of the type-wheels at this point when continued printing or movement is required, a current of opposite polarity is transmitted at the time that the end of the unison-arm would strike the pin or projection on the unison-lever, the director and unison-lever are thrown over to the opposite side, and the arm o is allowed to pass the lever m , after which the director and unison-lever resume their former position. The unison-arm is always so placed on the type-wheel arbor as to engage with the projection upon the unison-lever when the spaces on both type-wheels are presented to the printing-pads, and thus the transmission of an opposite current for moving the unison-lever does not interfere with the printing of any of the characters.

It will be seen that the printing of a character from either of the two type-wheels can be effected in any position of their rotation by simply changing the polarity of the current.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a printing-telegraph having two contiguous type-wheels, either of which may be used at will, the combination, with two independently-actuated printing-pads, of a polarized director operated by a change in the polarity of the current to determine the action of one or the other of the printing-pads, substantially as and for the purpose set forth.

2. In a printing-telegraph having two contiguous type-wheels, either of which may be used at will, the combination, with a polarized director carried by the lever X , of the lever m

and stop *o* on the type-wheel shaft, acting to hold the type-wheels at unison when the director is in one position, and to permit them to rotate when the director is in the other position, according to the polarity of the exciting-current, substantially as and for the purpose set forth.

3. In a printing-telegraph having two contiguous type-wheels, the printing-levers *P P'*, the polarized director *B'*, constructed and operating as described, and acting to move either one of the said printing-levers, according to the polarity of the current, substantially as and for the purpose set forth.

4. The combination of the lever *X*, the polarized director *B'*, pivoted thereto and bent

at the end round and under the end of the lever *X*, the armature *F'*, and magnet *E'*, substantially as and for the purpose set forth.

5. The combination of the polarized director *B'*, the arm *m*, constructed and operating as described, and provided with a projection, *n*, and the unison-arm *o* upon the type-wheel arbor, or its equivalent, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand on this 2d day of April, 1878.

GEORGE LEE ANDERS.

Witnesses:

ALEX. L. HAYES,
SAMUEL SNOW.