

G. L. ANDERS.
 Printing Telegraph.
 No. 210,894. Patented Dec. 17, 1878.

Fig. 1.

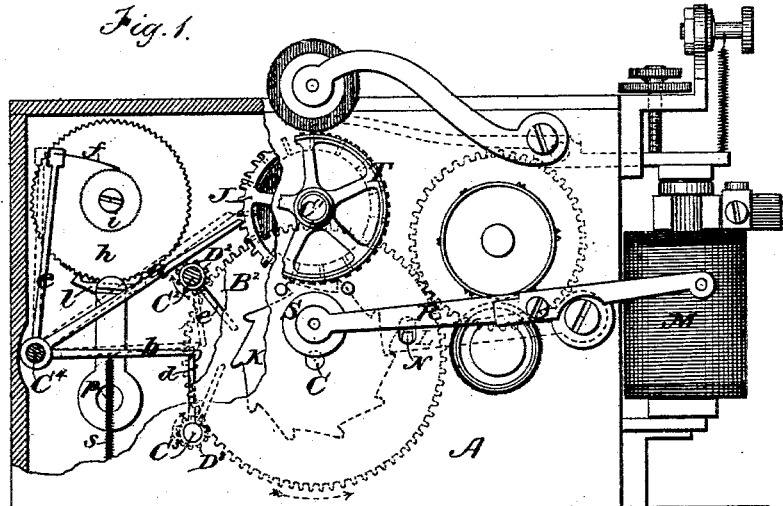
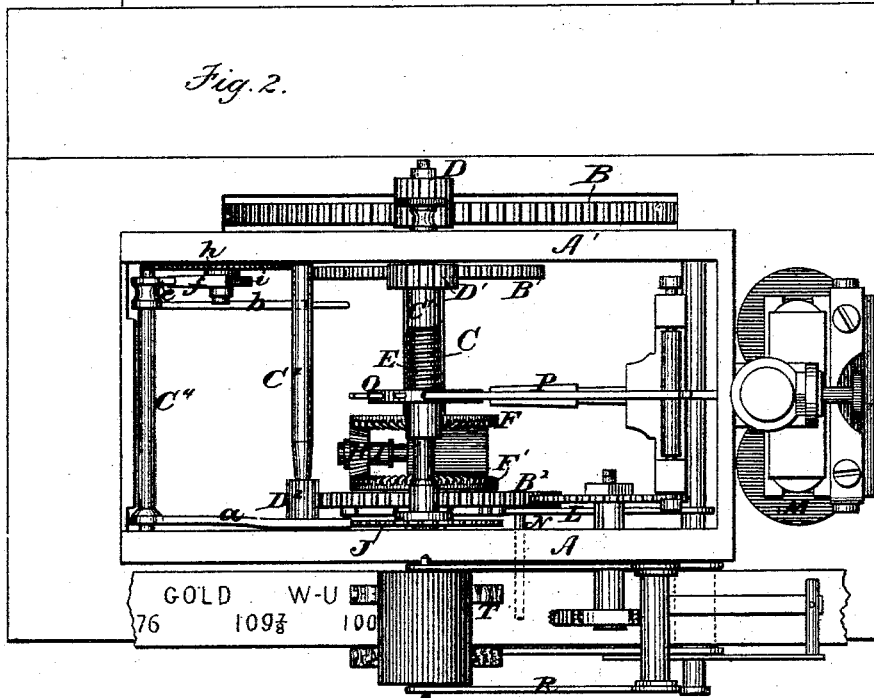


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE L. ANDERS, OF BOSTON, ASSIGNOR TO E. BAKER WELCH, OF
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IMPROVEMENT IN PRINTING-TELEGRAPHS.

Specification forming part of Letters Patent No. **210,894**, dated December 17, 1878; application filed July 25, 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 the type-wheel is rotated step by step either by the direct action upon a ratchet-wheel fixed upon the type-wheel arbor of a suitable propelling-pawl vibrated by electro-magnetism, or by the action upon a ratchet-wheel similarly placed of an escapement similarly vibrated, in connection with a train operated by suitable power and imparting a constant tendency to the type-wheel arbor to rotate, and the press mechanism is moved to effect the printing on a pause in the step-by-step movement of the type-wheel.

The invention consists in the combination, with the printing mechanism, of a toothed wheel or its equivalent fixed upon the type-wheel arbor or its equivalent; an oscillating arm or its equivalent, the end of which bears upon the periphery of the toothed wheel, and is moved by the teeth of said wheel as they are successively presented to the end of the arm on the rotation of the type-wheel arbor or its equivalent, but is moved in the other direction by the action of a retracting-spring or its equivalent; a device acting to retard the movement of the arm in one direction but permitting its free movement in the other direction, said device consisting of a serrated disk rotated by the action upon the disk, or upon a ratchet-wheel fixed upon the arbor of the disk, of a propelling-pawl attached to the oscillating arm, said pawl being so constructed that it acts to rotate the disk only when the oscillating arm moves in one direction, but slips over the teeth of the ratchet-wheel or serrated disk when the arm moves in the other direction, in combination with an escapement which prevents the disk from being rotated except at a certain rate; and a device which

determines the action of the printing mechanism, the result accomplished by this arrangement of mechanism being that while the type-wheel is rotating the oscillating arm will not have time between the successive impulses given to it by the teeth of the toothed wheel on the type-wheel arbor to move in the opposite direction given by these impulses sufficiently to determine the action of the press, owing to the action of the retarding device; but when the motion of the type-wheel is arrested the arm will move sufficiently to set the press mechanism in action and cause the impression of a letter.

The method of effecting the rotation of the type-wheel or effecting the movement of the printing mechanism forms no part of this invention, which relates solely to the combination, with any device for rotating a type-wheel with a step-by-step motion, of mechanical means for automatically effecting the action of any suitable press-moving device when the step-by-step rotation of the type-wheel is arrested on bringing the letter which is desired to print in proper relation to the press; and the invention is applicable to telegraph-instruments in which power is used for rotating the type-wheel and operating the press, and to those in which the type-wheel is propelled by the direct action of electro-magnetism and the press mechanism operated by a magnet placed in a local circuit or in the main circuit.

For the purpose, however, of more clearly explaining the construction and operation of my improvement, I have shown the invention applied to a particular form of telegraph apparatus, which forms the subject of an application for a patent of even date with this. In this instrument there is but one main driving-train; but the type-wheel train and press-train derive motion from the same main power, and the two sets of gearing are connected by an epicyclic gearing of novel construction, which I have described and claimed in another application for a patent; and also the escapement-wheel on the type-wheel shaft is released by an escapement attached to the armature of a Siemens polarized magnet, acted upon by alternate positive and negative currents, the ar-

rangement for moving the type-wheel being similar to that shown and described in my patent of October 28, 1873, and others.

In the accompanying drawings, Figure 1 is a side view in elevation of this telegraph-instrument, a portion of the framing being broken away for the purpose of showing the retarding mechanism; and Fig. 2 is a plan view of the same.

In these figures similar letters refer to similar parts.

Referring to these figures, A A' are two plates, forming the framing of the instrument, supporting its several parts, and affording bearings thereto. B is the gear-wheel of the main driving-train, which is suitably inclosed under the framing A A', and is driven by a weight or spring. C is an arbor, bearing in the framing A A', and having upon it a pinion, D, which gears with the wheel B. Attached to the arbor C, at right angles thereto, is an arm, I, upon which, as a bearing, is the beveled pinion H, which gears with two bevel-gears, F F', opposed to one another. These bevel-gears are attached each to sleeves E E', upon the arbor C, and upon each of these sleeves, respectively, are fixed the gear-wheels B¹ B². The gear-wheel B¹ is connected, by a pinion, D¹, with the type-wheel arbor, and the gear-wheel B² gears into the arbors C² and C³ of the press-escapement by means of the pinions D² D³. By this arrangement of gearing, when the movement of the press mechanism is prevented by the action of its escapement the power of the main driving-train will operate the type-wheel arbor through the pinion D, arbor C, arm I, beveled pinion H, bevel-gear F, gear-wheel B¹, and pinion D¹; and when the press-escapement releases the press mechanism, and the type-wheel escapement holds the type-wheel arbor, the power of the main driving-train will operate the press through the pinion D, arbor C, arm I, beveled pinion H, bevel-gear F', gear-wheel B², and ratchet-wheel K.

O is the escapement-wheel on the type-wheel arbor. M is the polarized Siemens magnet, and P the escapement. The type-wheel is shown at T.

The mechanism for moving the press, which press is shown at S, consists of a ratchet-wheel, K, attached to the sleeve of the gear-wheel B², and a lever, L, pivoted on the inside of the frame-plate A, the end of which lever bears against the ratchet-wheel, so that it is raised by the teeth of the ratchet-wheel when the latter rotates. A pin, N, projects through the plate A, and when the lever L is raised this pin raises the lever R, to which the press-pad S is attached, and the impression is made.

I have described and claimed this device for moving the press in another application filed at the same time with this.

Having described the devices for moving the type-wheel and the press, I will now proceed to describe the construction and operation of the device for causing the action of the

press when the rotation of the type-wheel is arrested.

Fixed upon the type-wheel arbor C¹ is a wheel, J, provided with teeth or pins. C⁴ is a rock-shaft, properly supported in the framing, and *a* is an arm attached thereto, the end of which arm rests upon the teeth or pins on the wheel J, so that as these teeth or pins, on the rotation of the type-wheel arbor, are successively presented to the end of the arm *a*, the said arm and its rock-shaft will be vibrated. *e* is another arm, also attached to the rock-shaft and vibrating with it, the end of which is provided with a spring-pawl, *f*. *h* is a serrated disk, mounted on an axis on the frame-plate A', and *i* is a smaller toothed wheel upon its arbor. *p* is a pendulous piece of metal pivoted to the frame-plate A', having attached to it an anchor-escapement, *l*, which bears against the serrated wheel *h*, so that when the wheel or disk rotates it will cause the pendulum to oscillate by the action of the escapement, and the disk will be prevented from rotating, except at the rate determined by the time required for the pendulum to make its oscillations.

It is obvious that if the anchor-escapement is placed by the side of the serrated wheel instead of under the same, as shown, the pendulum attachment will not be necessary, as the escapement will then vibrate or oscillate in the same manner as a pendulum.

Instead of the escapement above described, any suitable escapement which will accomplish the same result may be used.

The pawl *f*, by acting upon the toothed wheel *i*, rotates the disk when the arm *e* moves to the position shown in full lines; but when the arm *e* moves to the position shown in dotted lines, the spring-pawl *f* will slip over the teeth of the toothed wheel without moving it. Attached to the rock-shaft is another arm, *b*, to which is attached a spring, *s*, which has a tendency to draw the arm down or into the position shown in full lines. The arm *e* may be attached to the arm *a* instead of to the rock-shaft.

When the teeth on the wheel J strike against the end of the arm *a* the end of the arm is raised up, the rock-shaft is moved, and the spring-pawl glides over the teeth of the wheel *i* without rotating it; but, when the end of the arm escapes from the pin or tooth on the wheel J and commences to drop down from the position shown in dotted lines to that shown in full lines, the pawl *f* will act upon the toothed wheel *i*; but, for the reason that the rotation of this wheel is retarded by the action of the pendulum, the arm *a* will have time to move only a short distance before it is again elevated by the presentation to it of the next succeeding tooth or pin on the wheel J.

When the arm is allowed to fall its full distance the press mechanism is released, but not until then, and consequently as long as the type-wheel arbor rotates the press will be prevented from acting.

The toothed wheel J may be placed upon any arbor connected with the type-wheel arbor.

The press-escapement consists of two arbors, C² C³, mounted in the framing, one above the other, and driven by the wheel B², by means of pinions D² D³. Each of these arbors has an arm attached to it, the arm e', attached to the arbor C², extending downward, and the arm d, attached to the arbor C³, extending upward, so that the ends of these arms nearly meet. Between the ends of these arms plays the arm b upon the rock-shaft C⁴, and when the arm b is drawn down by the spring s to the position shown in full lines in Fig. 1, the arm d strikes against a lip on the under side of the arm b, so that the revolution of said arm d will be prevented and the press mechanism held fixed; and when the arm b is elevated to the position shown in dotted lines, the arm e' will be prevented from moving by striking the end of b, and the press mechanism will be held.

The position of the arms e' and d in relation to each other is such that while the arm b is passing between e' and d and the press-train is free to move it will be able to move the distance of one tooth on the ratchet-wheel, and sufficient to move the press once.

Instead of the above-described escapement, any other suitable form of escapement may be made use of which will accomplish the same result—namely, a momentary release of the press mechanism sufficient to effect an impression when the arm a is allowed to drop down.

The press mechanism, instead of being operated mechanically, as described, may be operated by an electro-magnet whose circuit is controlled by the action of the retarding device, in any suitable manner; or the press-magnet may be placed in the main-line circuit, and its action prevented by the retarding device until a sufficient pause in the step-by-step rotation of the type-wheel takes place.

I am aware that a device which retards the action of the press mechanism is not new in printing-telegraphs; but I am not aware of any device which has the mode of operation of that which I have described, and which is equally simple in construction and efficient in action.

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

1. In a printing-telegraph, the combination, with the press mechanism, of a toothed wheel or its equivalent fixed upon the type-wheel arbor or its equivalent, controlling the press mechanism, and an escapement which permits the free movement of the controlling device in one direction, but retards its movement in the other direction, substantially as and for the purpose set forth.

2. In a printing-telegraph, the combination, with the press mechanism, of a toothed wheel or its equivalent fixed upon the type-wheel arbor or its equivalent, an arm oscillated by the action of the toothed wheel and controlling the press mechanism, a spring-pawl attached to the said arm, a serrated wheel rotated by said pawl, and an escapement, substantially as and for the purpose set forth.

3. In a printing-telegraph, the combination, with the toothed wheel J or its equivalent fixed upon the type-wheel arbor or its equivalent, of the oscillating arm a, rock-shaft C⁴, arm e, pawl f, toothed wheel i, serrated wheel h, escapement l, pendulum p, and arms b d e', substantially as and for the purpose set forth.

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

GEORGE LEE ANDERS.

Witnesses:

DAVID J. HOBART,
CHARLES W. HOBART.