(No Model.) 2 Sheets—Sheet 1.

H. MAHNKEN.

PRINTING TELEGRAPH RECEIVER.

No. 422,604. Patented Mar. 4, 1890.

Fig. 1.

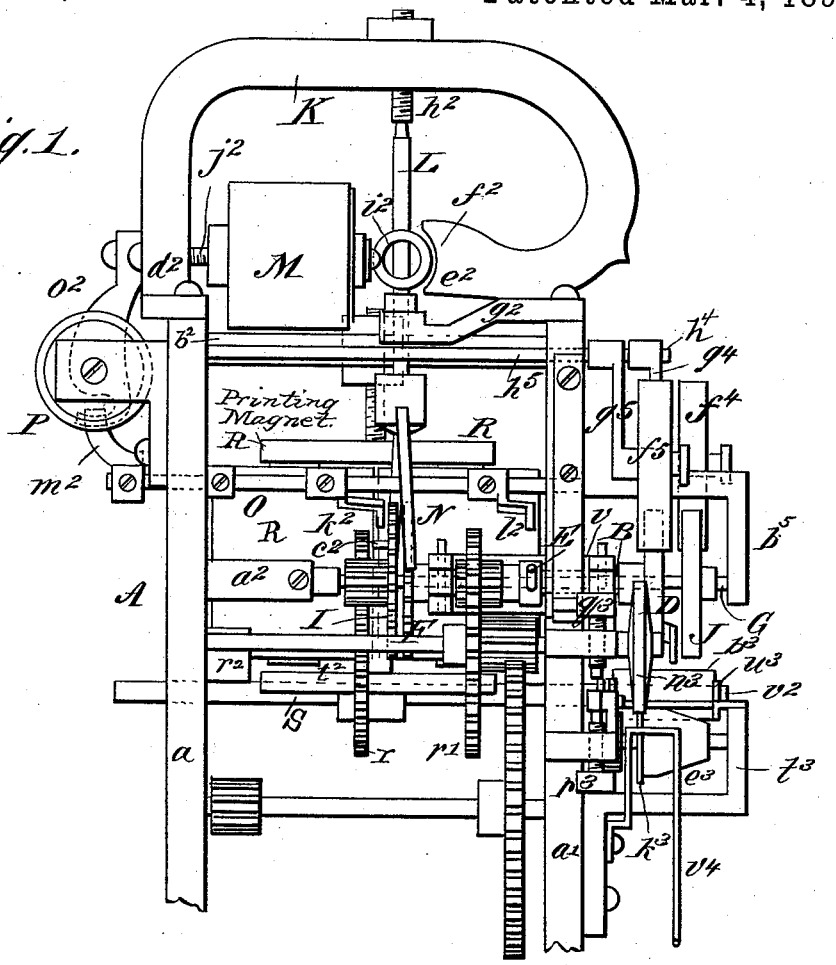
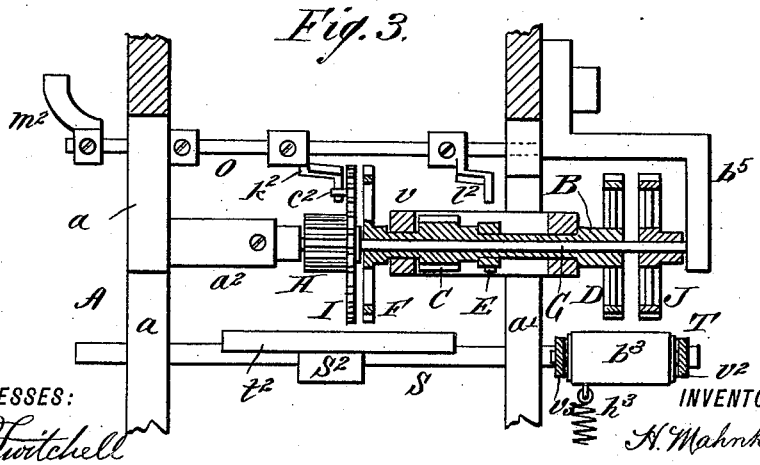


Fig. 3.



WITNESSES:

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C. Sedgwick

INVENTOR:

H. Mahnken

BY Munn & Co

ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

H. MAHNKEN.

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No. 422,604. Patented Mar. 4, 1890.

Fig. 2.

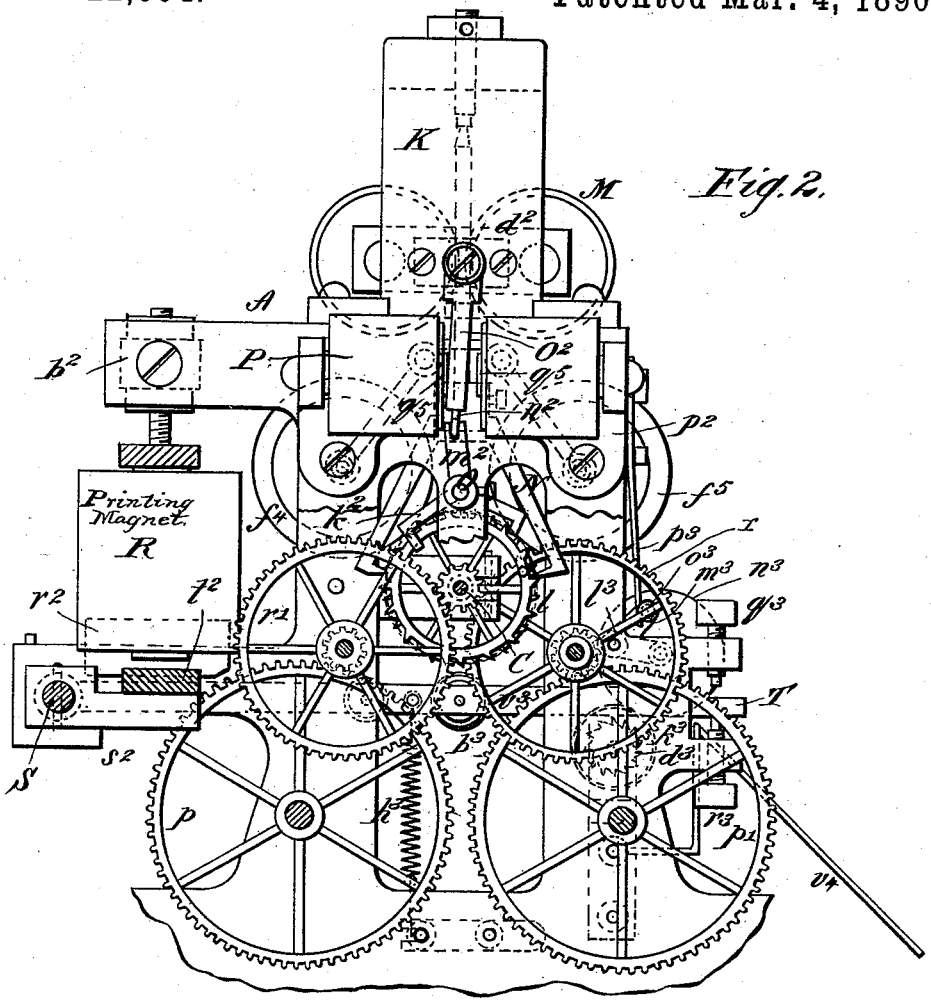
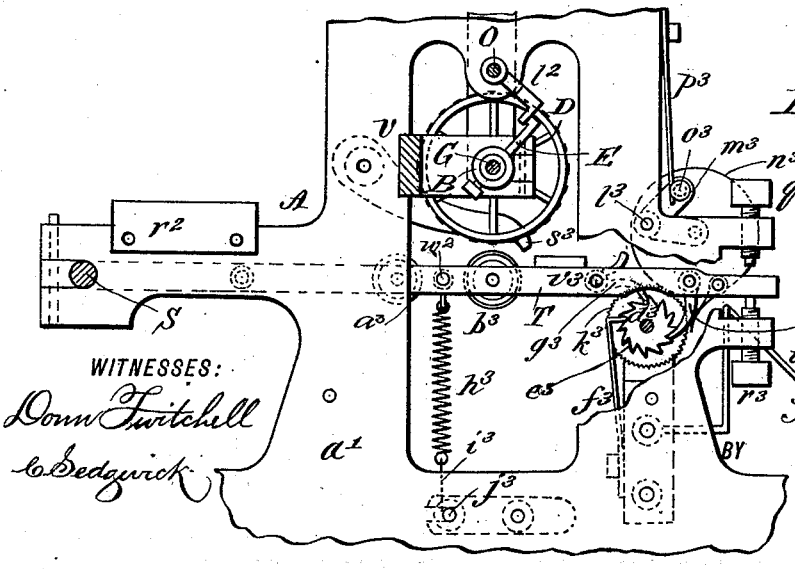


Fig. 4.



WITNESSES:
Donn Twitchell
C. Sedgwick

INVENTOR:
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UNITED STATES PATENT OFFICE.

HENRY MAHNKEN, OF NEW YORK, N. Y., ASSIGNOR TO THE COMMERCIAL TELEGRAM COMPANY, OF SAME PLACE.

PRINTING-TELEGRAPH RECEIVER.

SPECIFICATION forming part of Letters Patent No. 422,604, dated March 4, 1890.

Application filed April 19, 1889. Serial No. 307,667. (No model.)

To all whom it may concern:

Be it known that I, HENRY MAHNKEN, of the city, county, and State of New York, have invented a new and Improved Printing-Telegraph Receiver, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a side elevation of my improved printing-telegraph receiver. Fig. 2 is a rear elevation, partly in section. Fig. 3 is a plan view, partly in section; and Fig. 4 is a detail rear elevation of the feed mechanism.

Similar letters of reference indicate corresponding parts in all the views.

My invention relates to the class of printing-telegraphs in which two series of characters are printed by means of two type-wheels arranged to rotate in different planes.

The object of my invention is to provide means by which a greater certainty in the action of the escapement and unison mechanism may be secured, and in which delicate adjusting and liability to get out of repair will be avoided.

The invention will first be described, and then specifically pointed out in the claims.

In describing my improved printing-telegraph receiver it will be unnecessary to enter into the description of the mechanism by which the message is transmitted, it being sufficient to describe the character and direction of the current passing through the magnets of the machine.

My invention will be described in connection with a machine operated by two line-wires; but some portions of the invention are equally applicable to machines operated by a single line-wire.

All the working parts of my improved printing-telegraph receiver are supported by a frame A, formed of the frames a a' and the cross-bar b^2 and other bars not shown. In the frame A are arranged two trains of gearing for driving the scape-wheels. These trains of gearing, being of the ordinary kind, will require no special description. In a bracket v, attached to the side frame a', is journaled a tubular shaft B, which is provided with a pinion C, which is engaged by the spur-wheel r'. Upon the outer end of the tubular shaft B is placed the type-wheel D, and upon the said shaft, between the pinion C and the outer arm of the bracket v, is placed the unison-arm E. Upon the inner end of the said tubular shaft B is secured the scape-wheel F.

In the tubular shaft B and in supports a^2 b^5, projecting from the frame A, is journaled the shaft G. To the inner end of the shaft G is attached a pinion H, which is engaged by the spur-wheel r, and to the said shaft G, between the pinion H and the scape-wheel F, is secured a scape-wheel I. In the side of the said scape-wheel I is inserted a stud c^2, which is engaged by the unison mechanism, presently to be described. On the outer end of the shaft G is placed the type-wheel J in close proximity to the type-wheel D. It will thus be seen that the two scape-wheels I F are arranged in close proximity to each other, and that they are capable of being driven independently in the same direction by the two sets of gearing already described.

To the top of the frame A is secured the permanent magnet K, having one of its poles d^2 at the top of the frame, while the other pole e^2 projects horizontally inward toward the center of the machine and is provided with a concave face f^2. In an arm g^2, placed between the inwardly-turned end of the magnet K and the upper end of the said frame A, is journaled a vertical spindle L, the upper end of which turns in a screw h^2, inserted in the central part of the magnet K.

Upon the spindle L, opposite to and near the concave face f^2 of the magnet K, is placed an armature i^2, and between the armature and the pole d^2 of the magnet K is placed an electro-magnet M, which is supported by screws j^2, passing through the end of the magnet K. The polar extremities of the magnet M are opposite and near the armature i^2, so that when the said magnet is energized it is capable of acting upon the armature. To the end of the spindle L which is prolonged below the arm g^2 is secured an escapement-pallet N, which is capable of engaging either of the scape-wheels I or F. The escapement-pallet N is of the usual form, but is arranged to vibrate in a plane at right angles to the

plane of rotation of the scape-wheels. By this arrangement a single pallet is able to control the movement of both of the scape-wheels.

In the upper part of the frame A is journaled a rock-shaft O, which extends across the frame and carries two arms k^2 l^2, the said arms being provided with right-angled ends for stopping the scape-wheels. The arm k^2 is capable of engaging the pins c^2, projecting from the face of the scape-wheel I, and the arm l^2 is capable of engaging the arm E, carried by the tubular shaft S. To the end of the shaft O which projects through the side frame a is attached a forked arm m^2, which engages a finger n^2, carried by the armature o^2, which is pivoted to the pole d^2 of the magnet K. To the side frame a is attached the yoke p^2 of the magnet P, the poles q^5 of the said magnet being arranged opposite each other and upon opposite sides of the armature o^2. The said armature o^2 is polarized by contact with the end d^2 of the magnet K.

To the bar b^2 of the frame A is adjustably secured the printing-magnet R, which is further held by guides r^2, attached to the sides of the said frame A, and in the frame is journaled a rock-shaft S, carrying an armature-lever s^2, which supports an armature t^2 within the field of the printing-magnet R.

To the rock-shaft S, outside of the frame A, is attached the printing-lever T, formed of the side arms v^2 v^3 and the cross-bars w^2. In the lever T is journaled the guide-roller a^3 and the printing-roller b^3. The arm v^3 is prolonged beyond the printing-roller b^3 and carries a spring-actuated pawl c^3, which engages the ratchet d^3, attached to the feeding-roller e^3. A spring-detent f^3, secured to the side of the frame A, prevents the ratchet d^3 from retrograde motion; but the said spring-detent f^3 does not prevent the ratchet from being thrown forward by a quick movement of the lever T.

In machines of this character as ordinarily constructed no provision is made for preventing the forward movement of the feed-roller e^3 beyond the prescribed limit, and in such machines the consumption of tape is much greater than is required for the printing done by the machine. To avoid the undue forward motion of the feed-roller, I apply to the arm v^3 of the printing-lever T an auxiliary detent g^3, which strikes into the space between two adjacent ratchet-teeth and arrests the motion of the said ratchet as soon as the pawl c^3 has moved the ratchet one notch, and thus prevents the ratchet d^3 from moving more than one notch at a time. The roller e^3 is provided with a serrated wheel k^3 for engaging the paper guided through the machine by the said roller. In the face of the side frame a is inserted a stud l^3, which supports an angled lever m^3, carrying upon one of its arms a wheel n^3, which is arranged opposite the serrated wheel k^3. The other arm of the lever m^3 carries a stud o^3, which is engaged by a spring p^3, secured to the edge of the frame, the said spring being arranged to tilt the lever m^3, and thus bring the wheel n^3 into contact with the paper tape, which passes over the roller e^3 and the serrated wheel k^3. The pressure of the wheel n^3 upon the paper holds the paper in positive engagement with the serrated wheel k^3. The printing-lever T is drawn downward after each action of the magnet R by a spiral spring h^3, having one end attached to the said printing-lever, while the other end is connected with a thread i^3, wound around a windlass j^3, which adjusts the tension of the said spring. The motion of the printing-lever T is limited by the screws q^3 r^3, arranged above and below the prolongation of the arm v^3 of the printing-lever.

To the front of the frame A is secured an arm s^3, which extends downwardly between the type-wheels D J, curving the paper tape, and also preventing it from adhering to the said wheels. To the arm t^3, which supports the feeding-roller e^3, is attached a guide u^3 for retaining the paper tape in the proper position in its passage through the machine. To the same arm t^3 is also attached a wire guide v^4 for guiding the paper tape.

The type-wheels D J are supplied with ink from felt rollers f^4 f^5, carried by the arms g^4 g^5, secured to shafts h^4 h^5, journaled in the frame A, the said felt rollers resting by their own gravity upon the peripheries of the said type-wheels.

The operation of my improved printing-telegraph receiver is as follows: When an alternating current is sent through the line-wire connected with the magnet M, the armature i^2 is oscillated, imparting a corresponding movement to the segmental pallet N, which acts upon one or the other scape-wheel I F, allowing it to move forward with a step-by-step motion, the scape-wheel being propelled by the driving weight through the train of gearing. One of the arms k^2 l^2 is always in position to lock one of the scape-wheels I F when the wheel returns to zero, and the wheel which is locked by the said arm cannot move until it is released in the manner presently to be described. The other wheel moves forward until the proper letter, figure, or character is brought to the point of printing by the motive power of the train. When the alternating current through the escapement-magnet ceases, the scape-wheel operated by the magnet stops and the current is sent through the printing-magnet R in the second line-wire, thus bringing up the printing-lever, carrying the paper tape into contact with the type-wheels, and producing the impression of the desired letter, figure, or character. The wheel not in use, being locked and immovable, exposes a blank space at the point of printing, so that no printing takes place upon that wheel. So long as the current through the printing-magnet is sent in the same direction no shifting of the scape-wheels or type-wheels will take place; but when it is

desired to shift from one type-wheel to the other the current through the printing-magnet and through the unison or shifting magnet P, which is in the same circuit, is reversed, thereby shifting the position of the polarized armature o^2, consequently tilting the lever m^3, rocking the shaft O, unlocking the type-wheel which has been inactive, and locking the one which has been in use, thereby permitting the escapement-pallet to act upon that scape-wheel. The type-wheel which was before inactive now rotates upon the oscillation of the segmental pallet, and the printing is effected as before. This wheel continues in action until the current is again reversed in the circuit of the printing-magnet R and in the shifting or unison magnet P. Whenever the printing-lever T, after being carried up to produce an impression, is released by the printing-magnet R, the downward movement of the said lever turns the ratchet d^8 one notch in the manner already described and feeds the paper forward to receive a new character. When it is desired to move the paper without printing, both the type-wheels are brought to zero and the current produces effects in the printing-magnet, its armature, and parts connected therewith only, thereby causing the printing-lever to oscillate and operate the feed-roller e^3 without producing any impression upon the paper.

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

1. In a printing-telegraph receiver, the combination, with a pair of scape-wheels placed with their axes coincident so that they rotate in parallel planes, of type-wheels connected with the scape-wheels, a pallet common to both scape-wheels, arranged to oscillate in a plane at right angles to the planes of the scape-wheels, a spindle carrying the pallet, an armature attached to the spindle, an escapement electro-magnet adapted to operate either scape-wheel through the medium of its armature, and pallets connected with the said armature while the other is stopped, an electro-magnet for operating the shifting mechanism, and a permanent polarizing magnet common to the pallet-operating armature and the armature of the shifting mechanism, substantially as specified.

2. In a printing-telegraph receiver, the combination of two independently-operated scape-wheels controlled by a single escapement-pallet, a magnet placed in a line-circuit furnished with a polarized armature and adapted to oscillate the escapement-pallet by means of an alternating current, a shifting-magnet for controlling the action of the scape-wheels, printing mechanism adapted to be operated by a momentary direct current in the printing-circuit, and a polarizing-magnet common to the escapement-magnet and shifting-magnet, substantially as specified.

3. In a printing-telegraph receiver, the combination of two trains of motor-gearing, two scape-wheels propelled independently of each other by the motor-gearing, two type-wheels operated by the scape-wheels, a pallet common to both scape-wheels, a polarized armature, and a magnet for operating the pallet, a rock-shaft provided with arms for arresting the motion of one or the other of the scape-wheels, a shifting electro-magnet and polarized armature for operating the rock-shaft, a polarizing-magnet common to the pallet-operating armature and the armature of the shifting-magnet, and the printing and paper-feeding mechanism, substantially as specified.

HENRY MAHNKEN.

Witnesses:
GEO. M. HOPKINS,
C. SEDGWICK.