

C. WHEATSTONE.

Receiving Instruments for Electric-Telegraphs.

No. 158,156.

Patented Dec. 22, 1874.

FIG. 1.

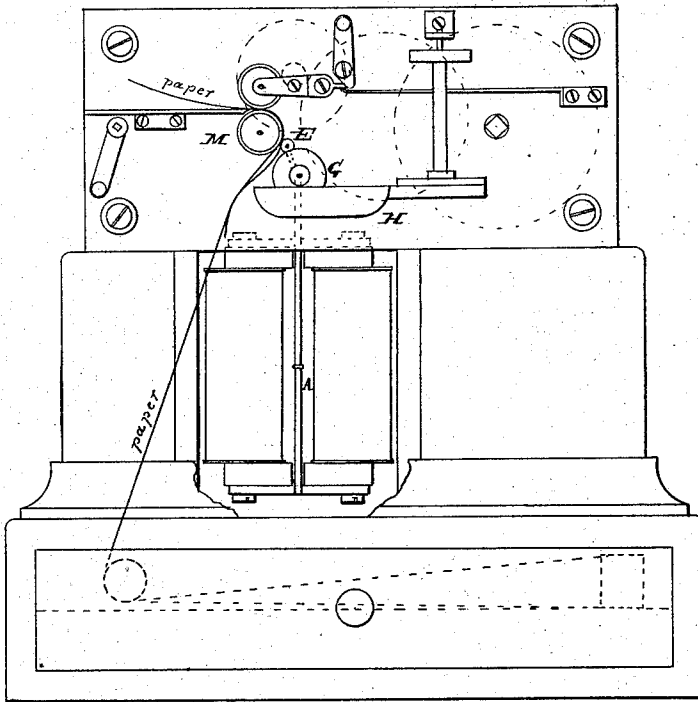
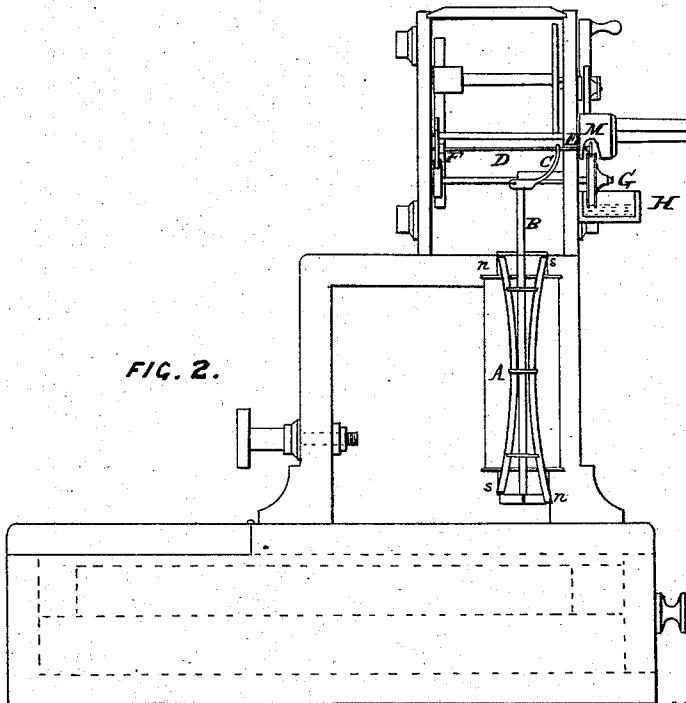


FIG. 2.



WITNESSES

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INVENTOR.

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IMPROVEMENT IN RECEIVING-INSTRUMENTS FOR ELECTRIC TELEGRAPHS.

Specification forming part of Letters Patent No. 158,156, dated December 22, 1874; application filed November 13, 1874.

To all whom it may concern:

Be it known that I, Sir CHARLES WHEATSTONE, Knight, of 19 Park Crescent, Portland Place, London, England, have invented certain Improvements in the Printing-Receiver of Electric Telegraphs, of which the following is a specification:

The automatic or fast-speed electric telegraph formerly invented by me comprises three distinct apparatuses indispensable to each other: first, a perforating-machine for preparing the messages to be sent on strips of paper or other suitable material; second, a transmitter or apparatus for receiving the strips of paper so prepared, and for transmitting the currents produced by a voltaic battery, magneto-electric machine, or other rheomotor, in the order corresponding to the holes perforated in the strip, the direction and sequence of these currents being governed by pins disposed so as to enter the perforations, and operating in manner analogous to that in the mechanism of a jacquard loom, and the strip being advanced intermittingly by the action of the pins; and, third, of a recording or printing apparatus, adapted to print or impress marks on a strip of paper, such marks corresponding in their arrangement with the currents transmitted to the telegraphic line, and with the apertures in the perforated paper.

On the 28th of January, 1867, a patent for Great Britain and Ireland was granted to me for various improvements in the constituent parts of this system, the object of which was to effect the printing of the dot-and-dash alphabet by means of positive and negative currents, which are transmitted alternately in opposite directions, the arrangement being such that the current, whether positive or negative, produces a mark of which the length varies according to the time that elapses before the current is reversed, such reversal producing an interval or blank space, the length of which continues to increase until the current in the first direction is renewed. In this system no reacting springs, and consequently no adjustments, are required in the printing apparatus, as the alternate opposite currents produce the to-and-fro motions of the marker, and lines of various lengths may be printed, even when instantaneous currents are employed.

The invention to which, in the present specification, I limit my application is the printing-receiver suitable to this system. This printing-receiver is provided with an improved method of marking lines by means of ink upon moving strips or bands of paper, the characteristic distinction of which is, that the inking-disk and tracing-disk are both independently kept in action by the maintaining power, and are not in actual contact with each other, and that the ink is retained on the circumference of the inking-disk by capillary attraction.

Its essential parts are represented by Figures 1 and 2 of the accompanying drawings.

The printing apparatus consists, first, of a trough of fluid ink; second, a vertical disk, grooved at its circumference, which takes the ink from the reservoir, and holds it in its groove by capillary attraction, while it is kept in motion by the maintaining power; and, third, of a smaller disk, called the tracer or marker, which, touching the ink retained in the groove, without coming in contact with the larger disk itself, is also kept in motion immediately by the maintaining power.

The marking or tracing disk is so mounted that its axis, while rotating, is capable of being moved by the action of the electro-magnets, so as to bring the disk in contact with the paper. A current in one direction causes the marking-disk to move toward the paper and trace the line, and the current in the opposite direction removes the disk to form the intervals, the residual magnetism of the electro-magnet retaining the magnetic armature, and consequently the tracing-disk, in its position until a contrary current inverts the magnetism, and causes the armature to move to the opposite side, and the tracing-disk to recede from the paper.

The magnetic armatures A, Fig. 1, are placed in a vertical position. The central axis B is prolonged to carry the cross-piece C, through an aperture in the extremity of which a horizontal rod, D, passes, on which is mounted, at one extremity, the small light tracing-disk E, while the opposite end, which is loosely centered, so as to be capable of a slight lateral movement, carries a small toothed wheel, F. This wheel, gearing with the maintaining power of the instrument, imparts a

rotatory motion to the tracer E, at the same time that the axis D is capable of receiving a to-and-fro motion in a horizontal plane from the movement of the armatures A and arm C. In the same vertical plane, and immediately beneath the tracing-disk, is an inking-disk, G, also caused to rotate, by appropriate gearing, with the maintaining power of the apparatus. This disk revolves in a reservoir, H, containing ink or other suitable marking-fluid. The periphery of the disk G is slightly hollowed, and the edge of the tracing-disk E just enters this hollow without contact or friction with the inking-disk. During the revolution of the disk G capillary attraction keeps the hollow full of ink, and a constant and uniform quantity is supplied to the tracing-disk. The paper intended to receive the marks is drawn forward at suitable speed over a roller, M, in close proximity to one edge of the tracing-disk.

From this arrangement it will be understood that a series of instantaneous alternate currents passing through the electro-magnets will cause a to-and-fro motion of the tracing-disk E, a current in one direction pressing the tracing-disk against the paper, where it will remain by reason of the residual magnetism of the electro-magnets retaining the armatures A in that position until a current in the opposite direction withdraws the tracer from the paper.

The printing apparatus may be provided with a means of regulating the speed, so that it may be worked either rapidly with an automatic transmitter or slowly with finger-keys; but as these objects may be effected in various known ways, and as they form no indispensable part of my invention, further description would be unnecessary.

Having now described the nature of my said invention, and the mode in which I carry the same into effect, I would have it understood that what I claim as constituting the peculiar character of the present invention is—

1. The combination, in a receiving-instrument, of an inking-disk and a tracing or marking disk independently connected to the maintaining power, substantially as described.

2. The inking-disk G, having a peripheral groove, in combination with the ink-reservoir, substantially as and for the purposes set forth.

3. The combination, with a tracing or marking disk, of the electro-magnet and armature, giving a to-and-fro movement of the disk, and an independent maintaining power continually rotating the same, substantially as and for the purposes set forth.

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Witnesses:

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