

F. De HONDT.
Fac-Simile Telegraphs.

No. 148,938.

Patented March 24, 1874.

fig. 1.

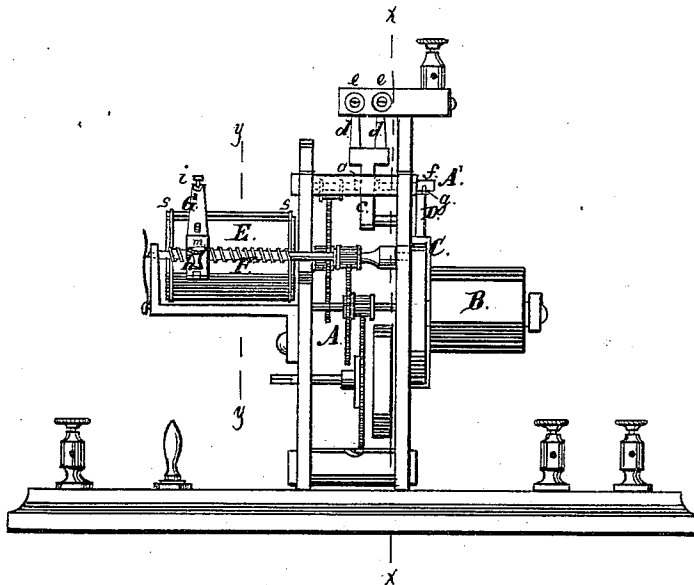


fig. 2.

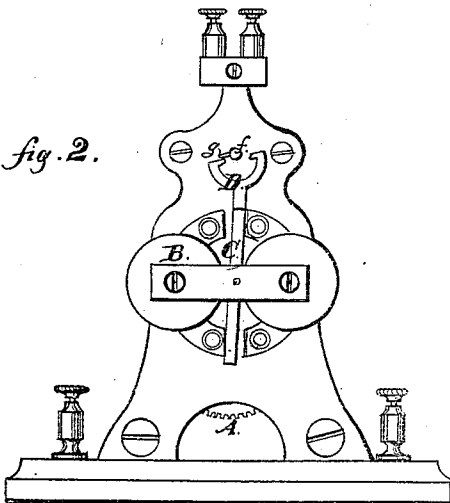
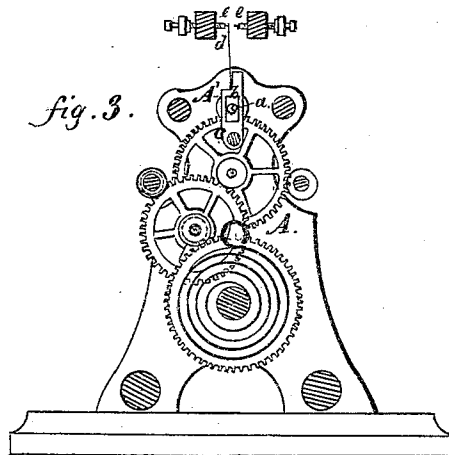


fig. 3.



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Inventor:
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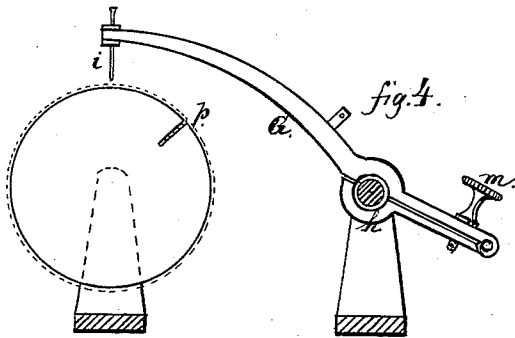


fig. 6.

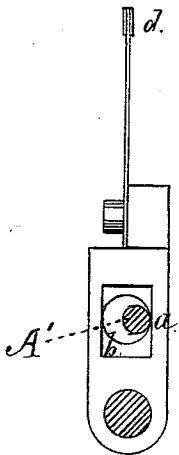
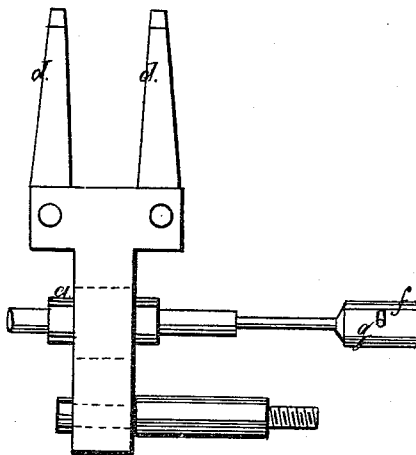


fig. 5.



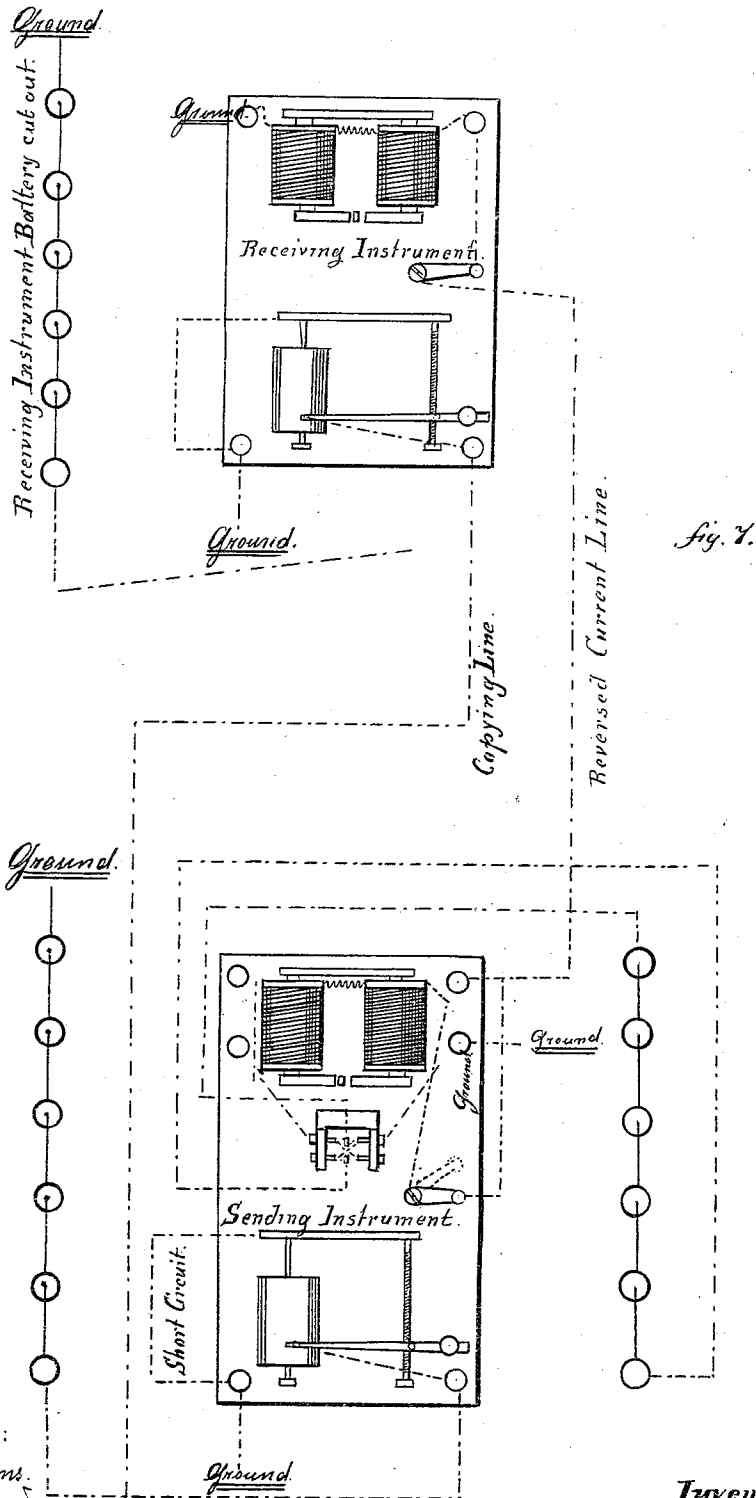
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UNITED STATES PATENT OFFICE.

FRANCIS DE HONDT, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN FAC-SIMILE TELEGRAPHS.

Specification forming part of Letters Patent No. **148,938**, dated March 24, 1874; application filed July 15, 1873.

To all whom it may concern:

Be it known that I, FRANCIS DE HONDT, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Electric-Telegraph Instruments, of which the following is a specification:

This invention relates particularly to improvements in copying-telegraphs, in which the message, written in a non-conducting ink upon tin-foil, is reproduced upon chemical paper in fac-simile; and the invention consists in the construction, arrangement, and combinations especially claimed at the close of this specification.

In the accompanying drawings, which form a part hereof, Figure 1 is a front elevation of the machine. Fig. 2 is a side view thereof, taken from the right hand. Fig. 3 is a section on the line *xx* of Fig. 1. Fig. 4 is an enlarged section on the line *yy* of Fig. 1. Fig. 5 is an enlarged view of the battery-terminals and lever of the pole-changer detached. Fig. 6 is a side view of the same. Fig. 7 is a diagram of the circuit.

To enable those skilled in the art to make and use my invention, I will proceed to describe the same with particularity, making use, in so doing, of the aforesaid drawings by letters of reference thereto.

I employ a single train of wheel-work, A, to each instrument in the line. This train of wheel-work may be supplied with power by any ordinary means—such as weight or spring. Upon the ultimate shaft A' of this train I place a cam, *a*, which revolves in a slot, *b*, in the pivoted arm *c*, which carries the pair of battery-terminals *d*, which are thus vibrated between two pairs of points, *e*, constituting a mechanical pole-changer, which is connected with the magnet B, causing its armature C to vibrate. (It will, of course, be understood that this armature C is a permanent magnet.) To the end of the said ultimate shaft is affixed an adjustable collar, *f*, which may be loosened and turned or moved farther in or out. To this collar is affixed a radial pin or projection, *g*. Upon the vibrating armature a verge contrivance, D, is attached, in such manner that when the verge is at rest the projection *g* will strike against one of its jaws, and arrest the escape of the wheel-work.

Now, when a current is sent through the

magnet, the train is instantly released by the motion of the verge, and the pole-changer, coming into play at the same instant—because it is driven by the train—continues the vibration of the armature, and moves the verge back and forth with such a timing as to cause the teeth of the verge, each time, to pass out of the way of the projection *g*, and allow the wheel-work to escape steadily without interruption.

In working a line of instruments, it is only necessary to have a pole-changer upon one of the instruments, as one is sufficient to reverse the current along the whole line. In setting up several instruments, some pains should be taken to have the train in each as near alike as possible, so that they will work nearly together. Of course it is impossible to make two trains work synchronously; but the instrument upon which the pole-changer is placed will govern all the rest, because if any other instrument goes faster, its verge will arrest it. The verges of all the instruments vibrate synchronously, as will be readily understood from the fact that their vibration depends upon the reversal of the current through the magnet, and this reversal takes place through a single pole-changer, whose action is timed by the governing instrument.

This combination of parts for producing synchronous or equal-timed escape of several instruments is adapted not only to use in chemical copying-telegraphs, but it may, with good effect, be applied to printing or other telegraphs by a proper adaptation.

It will be seen that so long as the current through the magnet B remains unbroken the equal-times vibration of the verges in all the connected instruments of the line will continue, and the several trains of wheel-work will escape uninterrupted, and with equal speed; but, if the current is broken, the verges come to a stand-still, and immediately arrest the escape of the trains. The ultimate shaft will only make one half-revolution after the verges stop vibrating, as it will come into contact with one or other of the jaws of the verge.

Operated by the same train of wheel-work is a metal cylinder, E, and a revolving screw, F, lying parallel to each other. The screw F carries an arm, G, fitted with a nut, *h*, which is hinged or halved, so that the arm may be re-

moved when it has gone as far along as the length of the screw will permit, and replaced at the other end, and secured by a lock-screw, *m*. This arm *G* is fitted with a platinum style, *i*, which rests down upon the surface of the revolving cylinder, and, by the two motions of cylinder and screw, is caused to traverse the surface of said cylinder in a spiral line.

At the sending-instrument the message, written, in shellac or other non-conducting ink, upon tin-foil, is placed upon the cylinder, and at the receiving end a piece of the well-known sensitized or chemical paper is applied. An independent circuit, the battery of which is arranged with reference to a proper polarity, is connected at one pole to the ground, and from the other pole to the platinum style *i*, and from the metal cylinder upon which the style rests to the ground. Between the style and the battery a wire is connected, forming the main-line or long circuit, connected to the style of the receiving-instrument, and, through its cylinder, to ground.

When the style at the sending-instrument rests upon the writing in shellac, the style and cylinder are insulated, and the current passes through the long circuit to the receiving-instrument, and discolours the chemical paper; but, when the style at the sending-instrument reaches the tin-foil surface uncovered by the ink, the current prefers the short circuit, and no current goes to the receiving-instrument.

As the cylinders of the receiving and sending instruments, and the styles also, move synchronously, the message written upon tin-foil is reproduced in fac-simile upon the chemical paper. This employment of a long and short circuit is the well-known means of operating chemical telegraphs, and I do not claim to have invented it. I simply use it in combination with a second circuit, which operates to time and regulate the flow of the mechanism of a train of wheel-work, which gives the necessary motion to the paper, foil, and styles.

To render the removal and replacing of the metal cylinder easy, I fit the cylinder with a fixed shaft and pinion, and place it in contact with the proper wheel of the train, and hold it in place by a spring, in any suitable manner.

The metal cylinder *E* is cut with a longitudinal slit, *p*, into which one end of the paper or foil—being rolled around the surface of the cylinder—is secured by means of two elastic bands, *s s*, which may be of rubber, or of any other suitable elastic material. These bands hold down the paper or foil securely, and yet may be easily removed and replaced.

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

1. The combination of an electro-magnet having a vibrating polarized armature, fitted with a verge and a mechanical pole-changer, operated by a train of wheel-work, the verge vibrating clear of the wheel-work when the circuit through the magnet is unbroken, but when the circuit is broken the wheel-work is arrested at a half-revolution of the shaft thereof, substantially as and for the purposes set forth.

2. The combination, with a single train of wheel-work, of an electric circuit, which governs the escape of the train, and a transmitting or message-writing mechanism, operated by the same single train, substantially as specified.

3. In an electric chemical copying-telegraph, the two independent circuits, one to govern the motion of the mechanism, and the other to produce the chemical effect, in combination with the transmitting and receiving mechanisms, substantially as specified.

4. The cam-shaft *A' a*, actuated by the trains to vibrate the lever *c*, carrying the battery-terminals *e*, the adjustable sieve *f*, fitted with projections *g*, and the verge-lever *D*, vibrated by the armature *C* of the magnet *B*, combined, arranged, and operated substantially as specified.

5. In combination with the arm or style-lever *G* and screw *m*, the jointed nut *h*, substantially as and for the purpose specified.

FRANCIS DE HONDT.

Witnesses:

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