

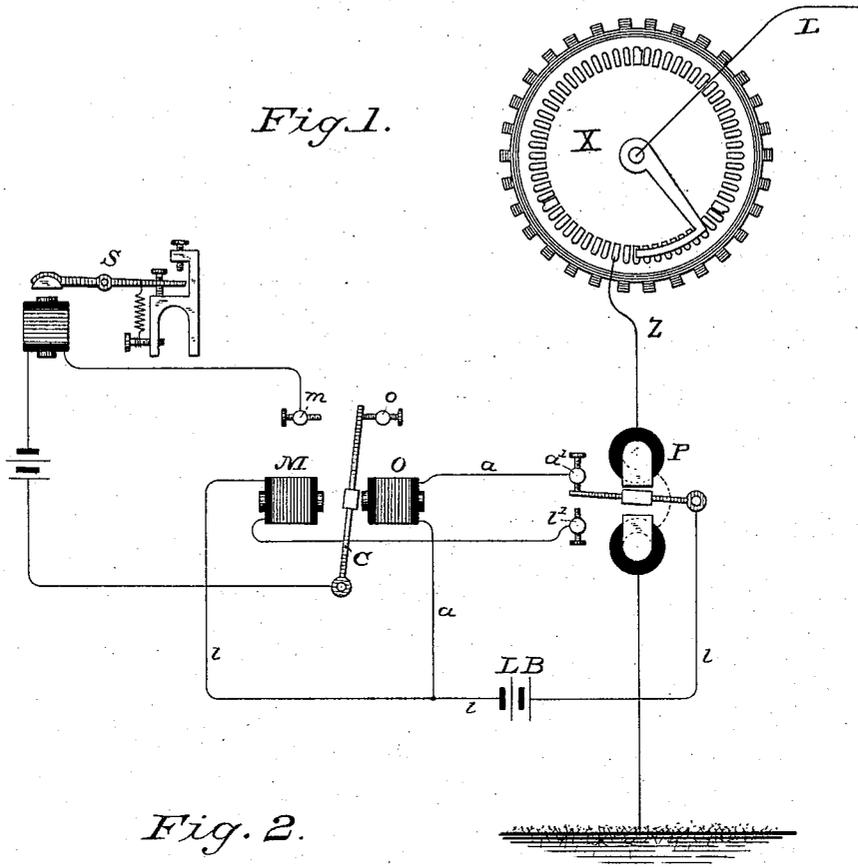
(No Model.)

P. B. DELANY.

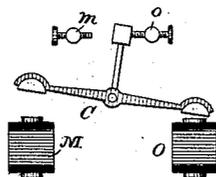
RECEIVING APPARATUS FOR SYNCHRONOUS TELEGRAPHS.

No. 322,688.

Patented July 21, 1885.



*Fig. 2.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

PATRICK B. DELANY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE STANDARD MULTIPLEX TELEGRAPH COMPANY, OF SAME PLACE.

## RECEIVING APPARATUS FOR SYNCHRONOUS TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 322,688, dated July 21, 1885.

Application filed October 23, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK B. DELANY, a citizen of the United States, and a resident of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Telegraphy, of which the following is a specification.

The object of my invention is to improve the reception of messages by giving a full, distinct action of the sounder, and obviate all chattering or singing in the various systems of telegraphy where such defects are incident to the use of vibratory currents or are caused by the weakening of the current from leakage or other causes. The primary purpose of the invention, however, is to improve the working of sounders in my system of synchronous telegraphy in which signals are transmitted over a continuously and rapidly interrupted circuit.

My invention consists, primarily, in an improved organization involving the use of electro-magnets interposed in a local circuit between the primary or main line relay and the sounder.

My invention comprises certain peculiarities of organization and operation which will now be described.

In the accompanying drawings, Figure 1 is a diagrammatic view illustrating the invention in connection with my synchronous telegraph system. Fig. 2 is a view of a modified arrangement of the intermediate magnets and armature.

In sundry Letters Patent of the United States granted to me October 9, 1883, No. 286,278, my synchronous system of telegraphy is fully and elaborately set forth, and it is deemed unnecessary to here repeat the description.

X represents the table of contacts over which traverses a trailing finger connected with the main line and through the main line with a similar finger which traverses a similar table of contacts. If the line Z be connected with several of the contacts on the table X, and the corresponding contacts at the distant station are connected with a suitable battery and transmitting-instruments, it is obvious that

as the trailing fingers synchronously rotate, the circuit from the transmitting-instruments to the relay P will be completed and broken with a rapidity depending upon the speed of rotation of the trailing fingers. The transmitting-current is therefore made up of fine interruptions or vibrations.

The present invention overcomes the bad effect of such vibrations on the receiving-sounder in the following manner: L is the main line, the circuit of which passes through the coils of a polarized relay, P, to ground. One pole of a local battery, L B, is connected with the armature of the polarized relay. A wire, *l*, runs from the opposite pole of the battery around the cores of a magnet, M, to the contact *l'* of the polarized relay-armature. A branch circuit, *a*, taken from the line *l* between the battery L B and the coils of the magnet M, runs through the coils of an opposite magnet, O, and from thence to the other contact, *a'*, of the relay-armature. A vibrating armature, C, is arranged between the opposite poles of the magnets M and O. The terminals of the local circuit of the sounder S are respectively connected with the armature C and one of its stops *m*. The armature C is so adjusted that when attracted toward either of the magnets O or M it will remain by its own gravity in that position until drawn in the opposite direction by the other magnet. When the armature of the polarized relay is drawn against its contact *l'*, it will be perceived that there is a circuit from one pole of the battery through the armature-contact line *l* and coil of the magnet M to the opposite pole of the battery. The branch circuit *a*, which includes the coils of the magnet O, will be open at the contact *a'*, and no effect is therefore produced in it. If the polarized relay-armature is on its contact *a'*, the circuit will be completed through the armature contact line *a*, coils of the magnet O, and by a portion of the line *l* to the battery again. In this position it will be perceived that the coils of the magnet M are neutral, because the line *l* is open at the contact *l'*. When the armature of the polarized relay, therefore, is against the contact *l'*, the armature C is drawn toward

the magnet M and the local sounder-circuit is closed. No chattering or vibration of the polarized relay-armature on its contact *l'* will affect the armature C, which remains against its contact *m*; nor will any change take place until the armature of the polarized relay passes over to its opposite contact *a'*, when the current through the coils of the magnet M will be broken and the magnet O will be energized and will draw the armature C against its contact *o*, thus positively opening the sounder-circuit. No chattering of the armature of the polarized relay on its contact *a'* will affect the position of the armature C. The signals produced on the sounder are, therefore, full, distinct, accurate signals, and are unaffected by the minute vibrations of the main-line relay-armature.

The sounder S illustrated is of a somewhat peculiar construction, the reading-stroke being delivered by the pull of the armature-spring. This is immaterial, so far as my present invention is concerned, as the ordinary sounder may of course be used. Of course it is entirely immaterial what kind of a main-line relay is used, as precisely the same connections may be made with a neutral or other relay.

In Fig. 2 a somewhat modified construction, which operates precisely in the manner already described, is shown. In this figure the magnets are arranged with their poles facing in the same direction, and the armature vibrates in front of them.

I am aware that heretofore it has been proposed to employ a polarized sounder, either differentially wound, the current being completed first through one set of coils and then through the other, or singly wound and worked by reversals of current, in connection with a main relay, the local circuit of which is so connected that the sounder-armature will not be affected until the relay-armature has passed entirely from one contact-stop to the opposite one. Such an arrangement is shown in the patent of D'Infreville, No. 274,112, patented March 20, 1883.

I am also aware that, broadly, a supplemental relay placed between the main-line relay and sounder for the purpose of preventing the chattering of signals is common and well known, and is disclosed in much earlier publications than the patent just mentioned. In the former case just mentioned, in the differentially-wound polarized sounder when the current is made and broken in one set of coils, extra currents are induced back and forth in

the other set of coils, and this creates a halting or imperfection in the magnetization, which interferes with quick work and prompt action of the sounder. The increased mass of magnetic metal in the polarized sounder also largely increases the induced currents. Where a singly-wound polarized sounder is operated by reversals of current, the reversals of current, in addition to the bad effects created by the rapid magnetization and demagnetization of the sounder, generate extra or induced currents in the coils. In my improved arrangement two independent magnets, M and O, are employed to actuate the armature which controls the sounder-circuit. The evils, therefore, which arise from reversals of current or from differential winding, or from rapidity of magnetization or demagnetization, are all obviated, because one of the magnets is always resting while the other is magnetized, and reversals of current in the coils or reversals of magnetism in the cores never take place in either of the magnets.

I claim as my invention—

1. The combination of a main line, a relay therein, its contact-stops, two independent electro-magnets, an electric circuit which is completed through the coils of one of said magnets when the relay-armature is on one of its contacts, a circuit which is completed through the coils of the other magnet when the relay-armature is on its opposite contact, an armature actuated by said independent magnets, the local circuit controlled by said armature and the telegraphic sounder in said local circuit.

2. The combination, in a synchronous system of telegraphy, of a main-line mechanism, as described, for continuously rapidly interrupting said line, a relay in the line, its contact-stops, two independent electro-magnets, an electric circuit which is completed through the coils of one of said magnets when the relay-armature is on one of its contacts, a circuit which is completed through the coils of the other magnet when the relay-armature is on its opposite contact, an armature actuated by said independent magnets, the local circuit controlled by said armature, and the sounder in said local circuit.

In testimony whereof I have hereunto subscribed my name this 18th day of October, A. D. 1883.

PATRICK B. DELANY.

Witnesses:

E. C. DAVIDSON,  
NELLIE HOLMES.