

(No Model.)

L. A. McCARTHY.

DUPLEX TELEGRAPH.

No. 321,992.

Patented July 14, 1885.

Fig. 1.

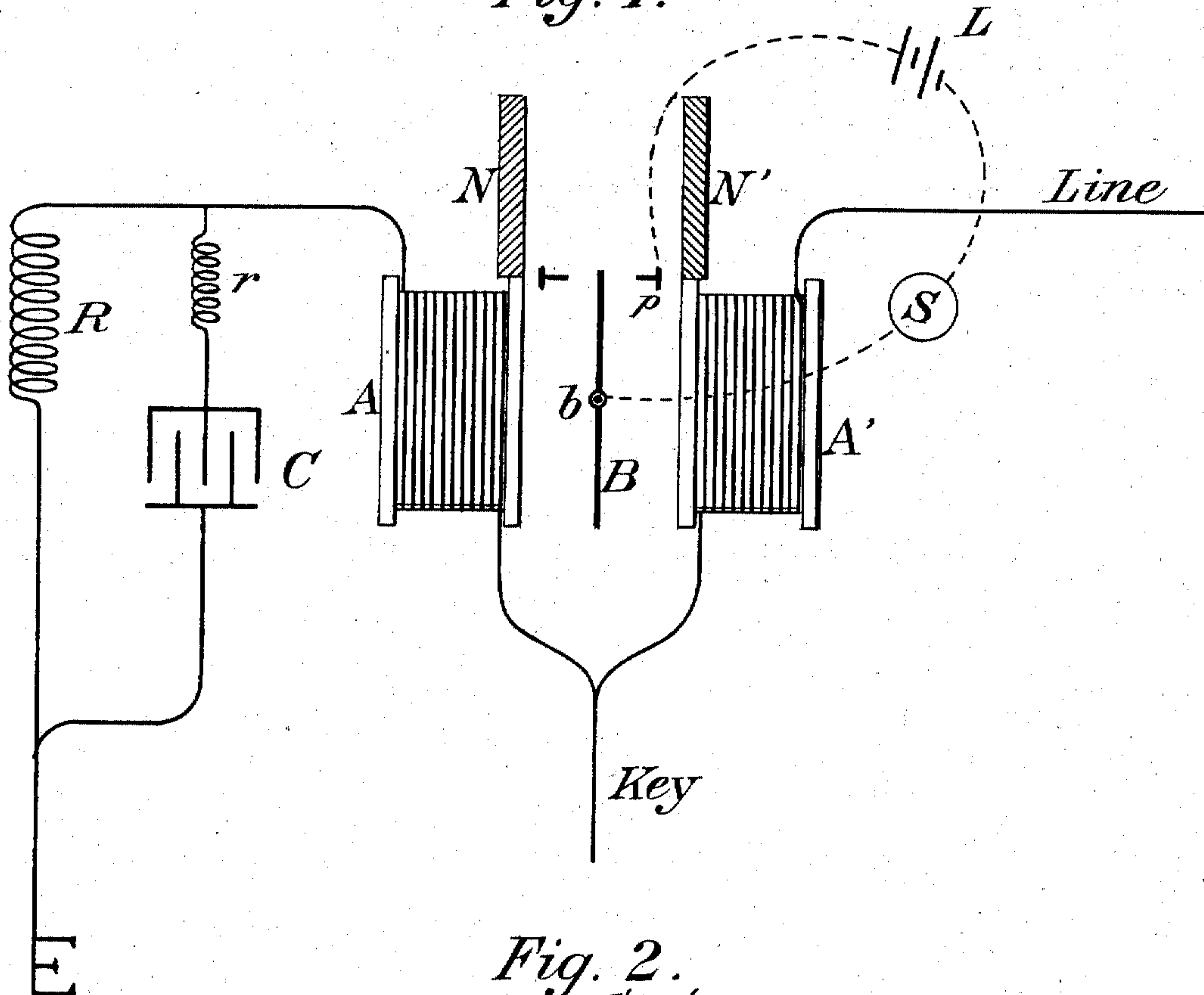
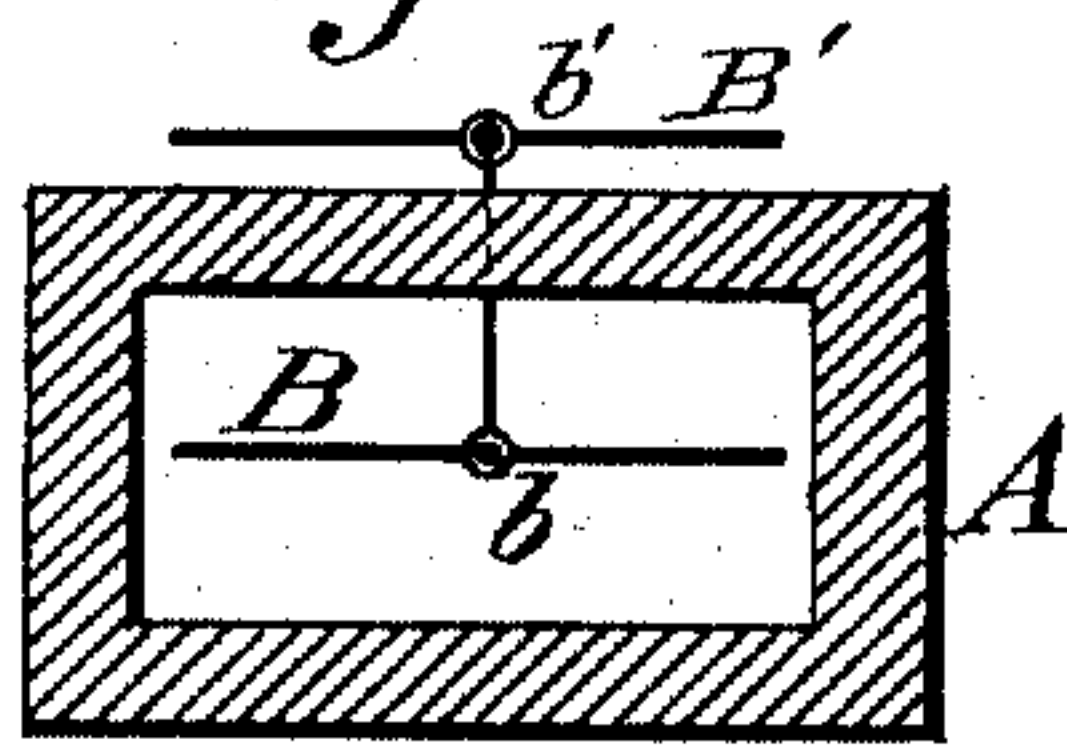


Fig. 2.



Witnesses :

George M. Brooks

Thomas H. Haley

Inventor :

L. A. McCarthy
By J. B. Sabine
his Attorney

UNITED STATES PATENT OFFICE.

LAWRENCE A. MCCARTHY, OF BROOKLYN, NEW YORK.

DUPLEX TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 321,992, dated July 14, 1885.

Application filed August 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, LAWRENCE A. MCCARTHY, a citizen of the United States, and a resident of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Duplex and Multiplex Telegraphy, of which the following is a specification.

My invention relates to improvements in duplex and multiplex telegraphy.

The object of my invention is to provide an improved method whereby two or more distinct communications may be simultaneously transmitted over one telegraph conductor in the same or opposite directions without interference.

My invention consists of an improved relay or receiving apparatus composed of coils of wire cores surrounding, inclosing, or facing magnetized needles, said needles suspended or pivoted so as to vibrate or rotate before, between, or in said coils, for the purpose of responding to impulses of electricity sent from the opposite end of the wire or circuit, and for the further purpose of controlling other main circuits or local circuits, and also, in combination with said relay, any of the well-known forms of condenser or other instrument for neutralizing or compensating static discharge or induced currents of electricity, in combination with said relay and condensers the necessary rheostats and key system for duplex or multiplex telegraphy.

One form of the receiving apparatus above referred to is shown in the accompanying drawings, which are made a part of this specification, and in which—

Figure 1 is a diagram of a duplex set and connections in which a top view is shown of the receiving-instrument, showing two coils of wire with magnetized needle pivoted to rotate between them and control a local circuit. It is obvious that other arrangements of this principle would answer the same purpose to a certain extent—for instance, one coil with a needle suspended in the center thereof; and while I prefer the form shown I do not confine myself thereto.

Fig. 2 shows a side view of hollow coils of wire with one needle arranged to rotate in the center of the coils, and a second needle above

the coils, both fastened to the same pivot or bearing.

Similar letters refer to similar parts throughout the two views.

Referring to Fig. 1, A and A' represent two hollow coils of wire, said coils wound either singly or differentially, as required, preferably differentially; B, a magnetized needle pivoted or suspended at point *b* so as to move before, between, or in the hollow center of coils A A'. I also show in this diagram permanent bar-magnets N and N', which, however, are not essential in every case, but are here shown for convenience in representing one means of magnetizing the bar or needle. Any form of permanent magnet may be used, as occasion requires.

R represents a rheostat or resistance-coils forming an artificial line, as used in duplex or multiplex telegraphy.

C represents a condenser for the purpose of neutralizing or compensating static discharges or induced currents from the line.

r represents a resistance for the purpose of varying the distance between condenser C and relay A A' as and when required.

Again referring to Fig. 1, I here show a local circuit from stop *p*, through local battery L, sounder *s*, and needle B, but do not confine myself to these points of contact.

The most satisfactory result obtained with the relay shown is by using reversed currents of electricity, one polarity attracting the needle to one side, the opposite polarity to the other, and thereby actuating the secondary circuit.

I am aware that there are needle instruments needed for telegraphic purposes. I am also aware that inventions have been patented for the combination consisting of relays composed of electro-magnets, with condensers and rheostats, and I disclaim all right to use such combinations; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a duplex system of telegraphy, a receiving-instrument composed of hollow coils of wire, magnetized needles, and repeating-points, said needles arranged to vibrate before, between, or in said coils, and between the repeating-points, together with a local circuit,

in combination with the resistance r , placed between the condenser and the artificial line, to vary the distance between the receiving-instrument and the condenser, all substantially as described, and for the purpose specified.

2. In a duplex system of telegraphy, the combination of a receiving-instrument composed of hollow coils of wire, magnetized needles, and repeating-points, said needles arranged to vibrate before, between, or in said coils, and between the repeating-points, with a rheostat forming an artificial line, all substantially as described, and for the purpose specified.

3. In a duplex system of telegraphy, the combination of a receiving-instrument composed of hollow coils of wire, magnetized

needles, and repeating-points, said needles arranged to vibrate before, between, or in said coils, and between the repeating-points, together with a rheostat forming an artificial line, with condensers for neutralizing or compensating static discharge or induced currents of electricity, all substantially as described, and for the purpose specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 10th day of July, 1884.

LAWRENCE A. McCARTHY.

Witnesses:

G. E. HINMAN,
HOWARD SUPPLE.

It is hereby certified that in Letters Patent No. 321,992, granted July 14, 1885, upon the application of Lawrence A. McCarthy, of Brooklyn, New York, for an improvement in "Duplex Telegraphs," an error appears in the printed specification requiring correction, as follows: In line 19, page 1, the word "cores" should be omitted; and the Letters Patent should be read with this correction therein to make it conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 11th day of August, A. D. 1885.

[SEAL.]

H. L. MULDROW,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.