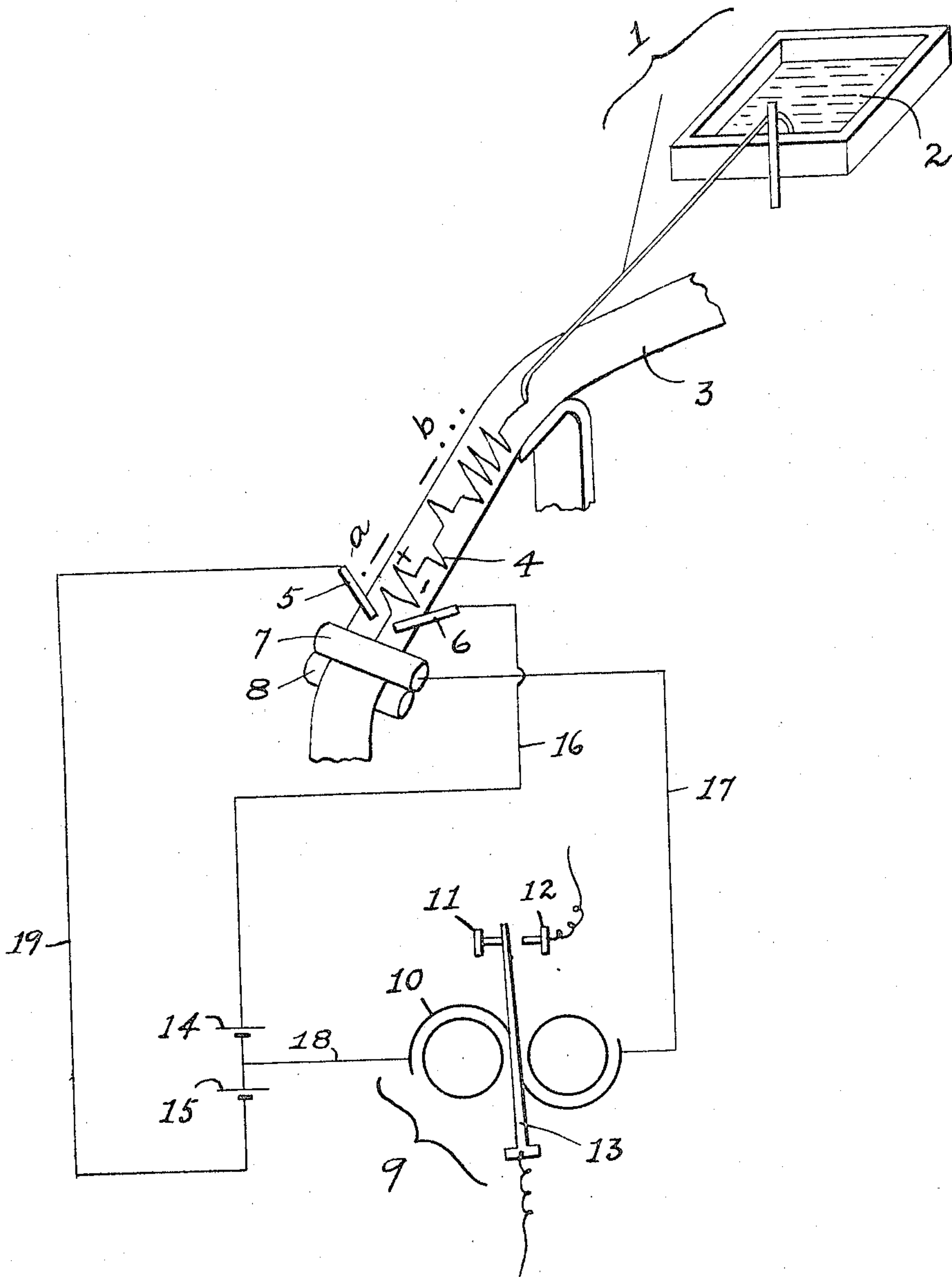


I. KITSEE.
CABLE TELEGRAPHY.
APPLICATION FILED DEC. 5, 1907.

Patented July 14, 1914.

1,103,421.



WITNESSES:

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CABLE TELEGRAPHY.

1,103,421.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ISIDOR KITSEE, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cable Telegraphy, of which the following is a specification.

My invention relates to an improvement in cable telegraphy.

It has more special reference to the means to receive and translate received impulses.

In cable telegraphy, the ingenious device of Lord Kelvin, known as the siphon recorder, is most generally employed. With the aid of this device, the message is recorded on a moving paper.

With the system of to-day, an impulse of one polarity is impressed upon the line to indicate a dot and an impulse of the opposite polarity to indicate a dash. At the receiving station, the siphon moves to the right or left in accordance with the received impulse and thereby produces right hand or left hand records. In reality, the production of the record is not as regular as just outlined, for the reason that the moving of the zero does not allow the siphon to return to its former position after each impulse. In a system wherein true reversals are transmitted, the time unit between the impulse of one polarity and a succeeding impulse of opposite polarity designates the character to be transmitted. A short interval between the two impulses designates a dot and a long interval a dash. At the transmitting station, these impulses are recorded as follows:—a dot by a line above the zero line followed by a line below the zero line and a dash by a line above the zero line, a short zero line, and a line below the zero line.

My invention has more special reference to that system of cable telegraphy wherein true reversals are transmitted and recorded as above stated.

It is the aim of my invention not only to record the impulses received, but also to translate the same into the usual time-interval or Morse impulses, so that they may be received by sound, print, or be relayed to a second cable.

The underlying principle of this, my invention, consists therein that the impulses are recorded in a manner so that the record

makes conducting part of the surface and these parts are then made to operate a localized circuit containing necessary translating device.

In my experiments, I have used different conducting fluids as the recording material, but I have found that no arrangement answers better than the one in which the tape is first immersed in a conducting fluid, then dried, and the ink itself is made slightly conducting. I have found in these experiments, that it is best to carry the tape first through a caustic solution of about ten degrees Baumé. The tape should be left to dry perfectly and the ink used, such as common water, is made caustic so as to give one hundred and two Baumé. If it is preferred, any desired color may be added thereto, so that the record may be read without having recourse to translating. In certain of my experiments, I have ascertained that with such an arrangement, the extensions or curves on the recording tape, due to the deflection of the siphon, have a resistance varying from twenty thousand to forty thousand ohms. It is possible to reduce this value by using a siphon of larger bore, but then the resistance between the siphon and paper is such as to greatly impair the sensitiveness of the instrument.

The drawing represents in partial perspective and partial diagrammatic view part of a siphon recorder and the recorded tape provided with my improvement.

1 is part of a siphon recorder. I have only illustrated here the siphon, the ink well and the fluid contained therein, as the parts necessary for such device are well understood by persons versed in the art.

2 is the fluid contained in the well and this fluid is preferably made, as said above, conducting. The means found most practical are a caustic, such as hydroxid of sodium.

3 is the tape or record member. This tape should also be impregnated with a material adapted to make that part conducting which is made moist through the recorded lines and I have also found that it is best to impregnate the paper with a caustic solution and then dry the paper so as to make the same non-conducting.

4 are the recorded lines. These lines are a facsimile of lines produced over a cable

with the aid of true reversals. These lines represent the characters of the letters a and b; the Continental code for such letters is attached thereto.

5 and 6 are two brushes, or contact members coöperating with the tape along different longitudinal paths, the brush 5 connected through wire 19 with one pole of the source of current, here shown as the negative pole of the battery 15. The brush 6 is connected through wire 16 with another pole of the second source of current, here shown as the positive pole of the battery 14.

9 is a polarized relay or translating device comprising the winding 10, the armature 13, and the stops 11 and 12.

7 and 8 are two rollers, of which at least the roller 7 is conducting and this roller is connected through wire 17 with one terminal of the winding 10 of the device 9, the other terminal of said winding being connected through wire 18 with the wire connecting the sources 14 and 15 to each other.

The operation of the device is as follows:—When the brush 5 or 6 touches only the non-conducting part of the tape 3, then the circuit connecting one or the other of the sources 14 or 15 is opened; but when through the moisture of the recording lines, one or the other of the brushes touches the conducting part, a circuit is established including either the brush 5 and source 15 or the brush 6 and source 14 and the winding 10 of the device 9.

It is now assumed that when the line is idle, the armature 13 rests normally on the point or stop 11. It is also assumed that a dot is characterized by one positive and one negative impulse, the impulses following each other in quick succession and it is assumed that through the positive impulse, the siphon will be deflected to the left, thereby recording a line projecting above the imaginary zero or normal line, and that through the negative impulse, the siphon will be deflected to the right, thereby recording a line projecting below the imaginary zero line and that these deflections and therefore lines follow each other in quick succession.

When the tape is drawn by the usual mechanism through the brushes 5 and 6 and the rollers 7 and 8, then the brush 5 will first be brought in contact with the upper recorded line and will close a circuit including said upper line, the brush 5, the wire 19, the source of current 15, the wire 18, the winding 10 of the device 9, the wire 17, the conducting roller 7 and the extension of the recorded line. Through the closing of this circuit, the armature 13 will be drawn away from the stop 11 and will be drawn toward and in contact with the stop 12, thereby closing a local circuit containing the necessary translating device. This local circuit is

not illustrated here, but the means to connect the same with the stops and armature respectively are illustrated as short wires. After the brush 5 has passed the line above zero, the lower brush will come in contact with the line below zero. The brush 5 will break the circuit containing the battery 15 as soon as the same has left the conducting line and the brush 6 will make a circuit, as soon as it comes in contact with the lower recording line, including the lower recording line, the brush 6, the wire 16, the battery 14, the wire 18, the winding 10, the wire 17, the conducting roller 7 and extension of said lower line; and as this battery is connected oppositely to the first battery and the winding 10, it is obvious that the armature will be drawn from stop 12 toward stop 11 and will come to rest at this point. As long as the armature was resting at stop 12, the local circuit containing the translating device was closed, but as soon as the armature left the stop 12, then the local circuit was broken. It is supposed that this local circuit contains an ordinary sounder. The sounder, therefore, will answer in the usual manner. It will give a short down-stroke or a longer down-stroke in accordance with the time unit that the armature rests against the stop 12, and as this time unit coincides with the time unit between the recorded line above and the recorded line below the zero line, and as the time unit between the recording of both lines coincides with the character to be sent—dot or dash—it is obvious that the sounder will translate the recorded lines into dots and dashes produced by direct current impulses having different time intervals. It is unnecessary to state that instead of a sounder other translating devices may be placed in this local circuit.

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

1. In a telegraph system transmitting signals in accordance with a particular system, a receiving apparatus comprising means for producing a record-line representing the transmitted signals, and means contacting with said record-line for translating the transmitted signals into those of another system.

2. In a telegraph system transmitting current-reversal signals, a receiving apparatus comprising means for producing a conducting line in accordance with the transmitted signals, and means coöperating with said conducting line for translating the current-reversal signals into direct current time-interval signals.

3. In a telegraph system transmitting current-reversal signals, a receiving apparatus comprising means for producing a conducting line in accordance with the transmitted signals, and means including an electro-

magnetic device and contact members cooperating with said conducting line for translating the current-reversal signals into audible time-interval signals.

4. The combination with a movable record member having a conducting line, of contact members cooperating with the line along different paths, electromagnetic translating means, and a circuit connecting the contact members with the translating means, the circuit through each contact member differently actuating said electromagnetic translating means.

5. The combination with a movable record member having a conducting line, of two contact members cooperating with the line along different paths, polarized electromagnetic translating means, a source of electrical energy, and a circuit connecting opposite poles of said source with the translating means through the contact members.

6. The combination with a movable record member bearing a conducting line having series of projections on opposite sides of a normal line, of contact members separately cooperating with each series of projections, an electromagnetic translating device, and a circuit joining the winding of the translating device to both contact members.

7. The combination with a telegraph tape provided with a conducting record line having series of projections on opposite sides of a normal line, of means for moving the tape, a brush contacting with each series of projections, a polarized relay, a battery, and a circuit including the battery, winding of the polarized relay and the brushes.

8. The combination with a movable mem-

ber bearing a record line having series of projections, of a contact member cooperating with the line throughout its length, a contact member cooperating with the line-projections only, an electromagnetic translating device, and a local circuit connecting the translating device and contact members.

9. The combination with a movable member bearing a record line having series of opposite projections, of a contact member cooperating with the line throughout its length, a contact member cooperating with each series of projections, a polarized electromagnetic translating device, a source of current, and a circuit including the current source, the winding of the translating device and the contact members.

10. In a telegraphic device, in which the received impulses are recorded on a moving paper, means to make conducting the lines of record, a local circuit containing an electromagnetic device and means to operate said local circuit through the moist part of said paper.

11. In combination with a telegraphic recorder adapted to make conducting, through the recording lines, that part of the paper on which said lines are recorded, a localized circuit, and means therefor to make and break said circuit through the conducting path due to said recorded lines.

In testimony whereof I affix my signature in presence of two witnesses.

ISIDOR KITSEE.

Witnesses:

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