

(No Model.)

3 Sheets—Sheet 1.

L. J. CROSSLEY, W. EMMOTT & J. F. HARRISON.
 MEANS FOR EFFECTING COMMUNICATION IN TELEPHONE SYSTEMS.
 No. 427,974. Patented May 13, 1890.

FIG. 1.

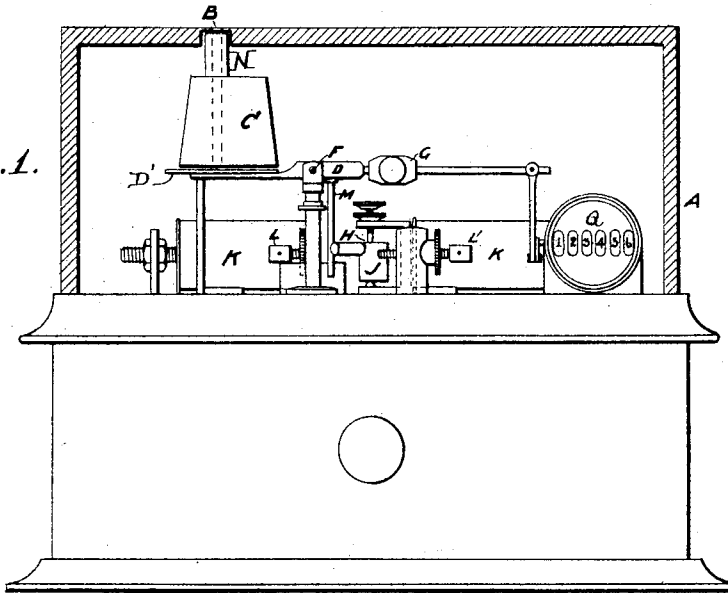
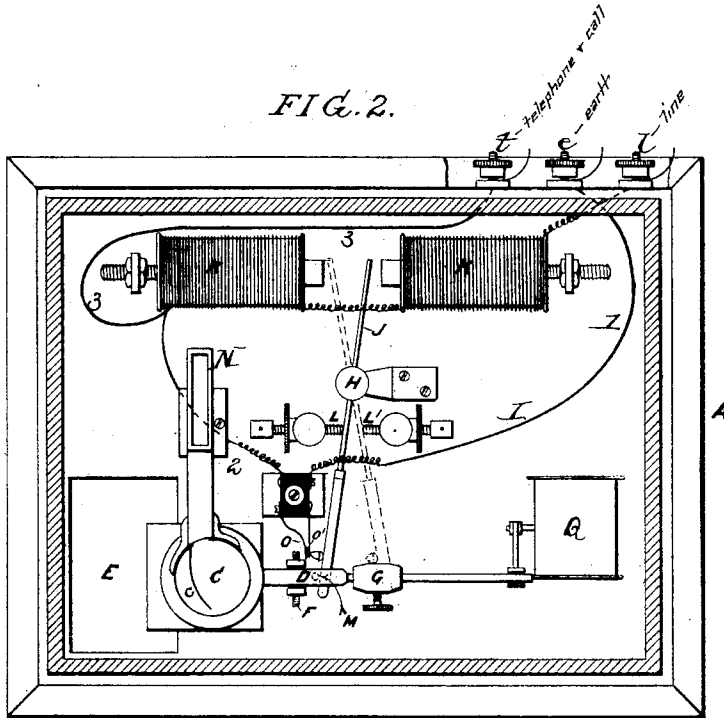


FIG. 2.



Witnesses:
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Inventors
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 by their Attorneys
Howe & Sons

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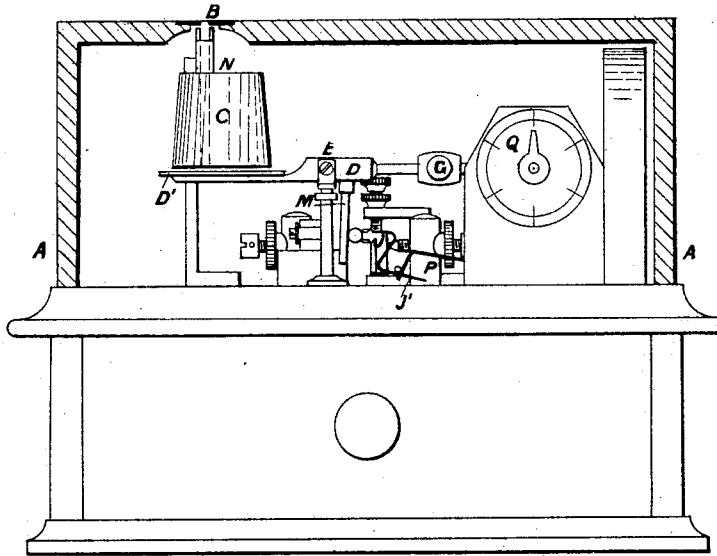


FIG. 3.

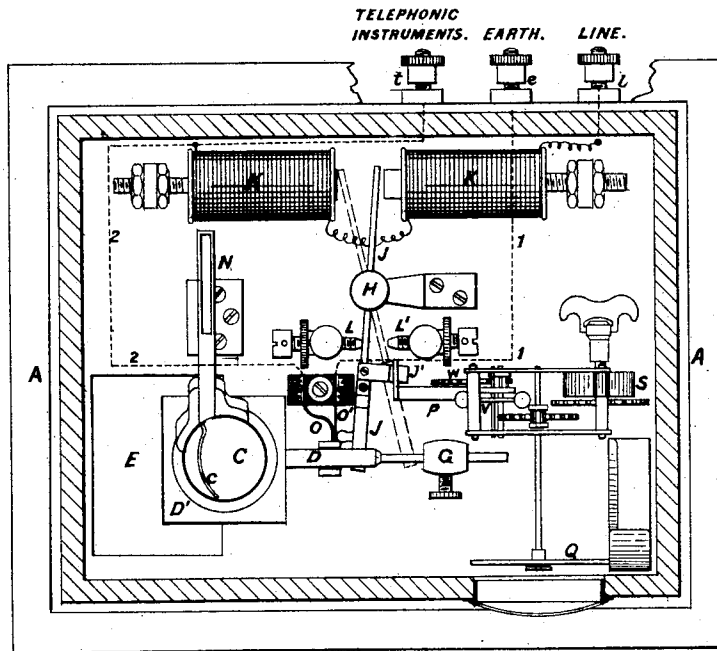
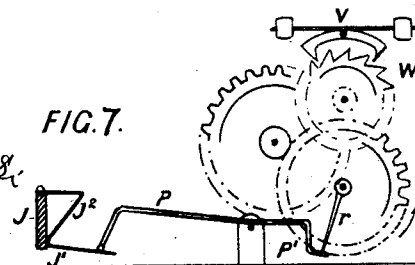


FIG. 4.

Witnesses:
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FIG. 7.



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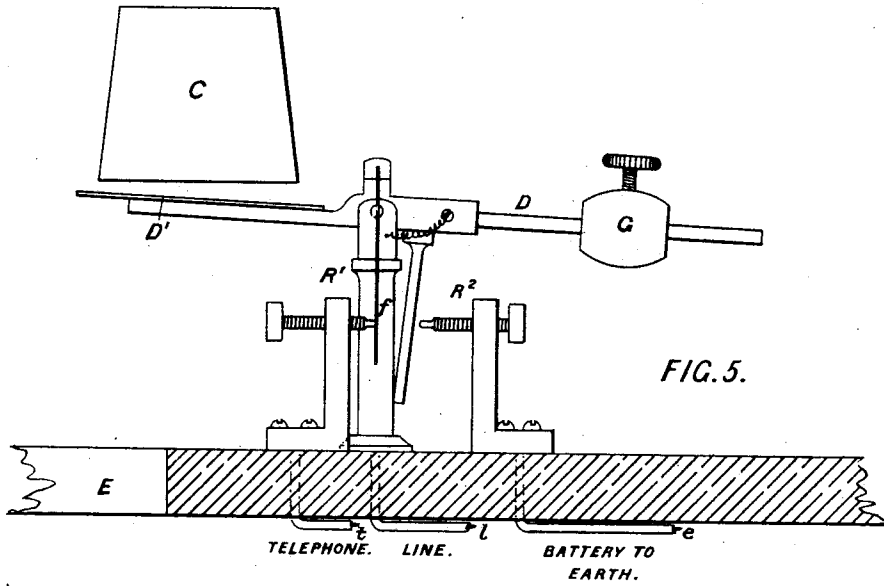


FIG. 5.

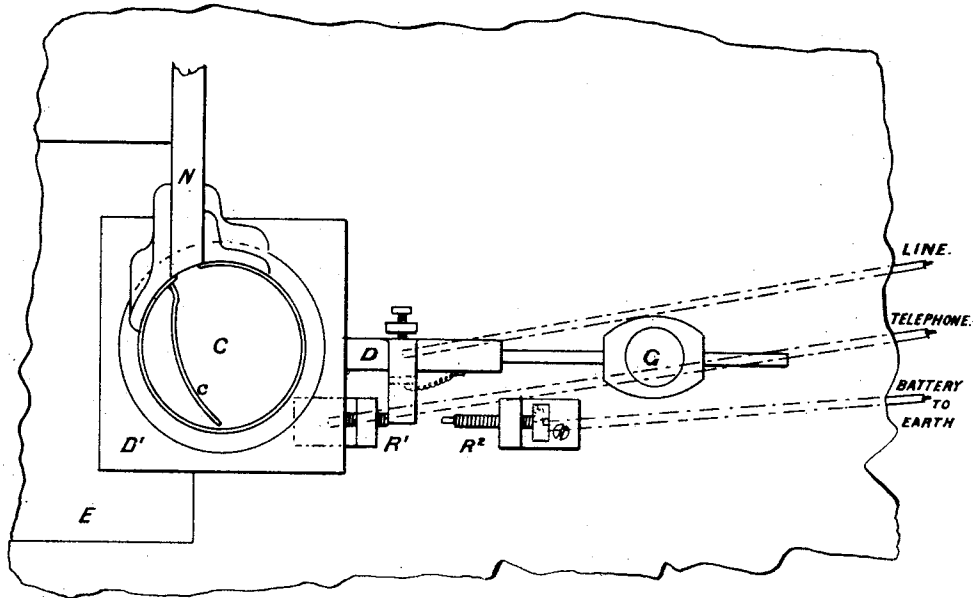


FIG. 6.

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UNITED STATES PATENT OFFICE.

LOUIS J. CROSSLEY AND WALTER EMMOTT, OF HALIFAX, AND JOHN FRED. HARRISON, OF BRADFORD, COUNTY OF YORK, ENGLAND.

MEANS FOR EFFECTING COMMUNICATION IN TELEPHONE SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 427,974, dated May 13, 1890.

Application filed July 14, 1886. Serial No. 208,030. (No model.) Patented in England September 16, 1884, No. 12,445.

To all whom it may concern:

Be it known that we, LOUIS JOHN CROSSLEY and WALTER EMMOTT, both residing at Halifax, county of York, England, and JOHN FREDERIC HARRISON, residing at Bradford, county of York, England, and all subjects of the Queen of Great Britain and Ireland, have invented certain Improvements in the Means for Effecting Communication in Telephonic Systems, (for which British Letters Patent have been granted to us, No. 12,445, dated September 16, 1884,) of which the following is a specification.

The main object of our invention is to provide means whereby a person desirous of using a telephone on a telephonic system can effect communication with the central office or exchange only by first depositing into a suitable receptacle a coin or equivalent circular disk-like device representing a monetary value equal to the toll or charge for the use of the telephone.

In carrying out our invention the coin itself or its equivalent is used to close the calling-circuit to the exchange by actuating a mechanical or electrical device which will make or close such circuit. These circuits of course will be so arranged that while it will be impossible for the user to call the exchange until the consideration or toll has been deposited, yet the operator at the exchange can, on the other hand, call up any such user or subscriber, and on the other hand can cut off communication at will.

Our invention may be carried into effect in different ways, as illustrated in the accompanying drawings, in which—

Figure 1 is a view of our improved call-box with the upper part of the case in section, and showing one form of mechanism which may be used, to be operated by the depositing of the coin to effect a communication with the central office. Fig. 2 is a plan view of the same, the upper part of the case being in section. Figs. 3 and 4 are views showing devices substantially similar to those illustrated in Figs. 1 and 2, but with an additional improvement. Figs. 5 and 6 are a side and plan view, respectively, of another modification; and Fig. 7 is a view of a part of the devices shown in Figs. 3 and 4, but drawn to a larger scale.

Referring to Figs. 1 and 2, A is the inclosing-box, which is divided into two portions, the upper part containing the operative mechanism, and the lower being preferably provided with a drawer for the reception of the coins or equivalent circular disk-like representations of monetary values, which are to be introduced through a slit B in the case when the user of the telephone desires to call up the central office.

Immediately below the slit B is an inclined chute N, opening at its lower end into a cylindrical guard C, open at the bottom and having at the side a curved finger c, which, as the coin runs down the incline onto the movable tray D', closing the bottom of the guard, tends to throw the coin flat onto its face. The movable tray D' is carried by a lever D, pivoted at F to a post on the floor of the upper part of the case. This lever D is provided with an adjustable counter-balance G, which normally keeps the tray D' close to the under side of the receiving-guard C.

In the floor of the upper part of the case, below the tray D', is an opening E, through which the coin falls into the receptacle below as the movable tray tilts downward under the weight of the coin. The pivoted or tilting lever D carries on its under side an arm M, in a position to act on an extension of the tongue J of a polarized relay K. This tongue J is pivoted at H, and its extent of movement under the action of the coils of the relay is limited by adjustable stops L L'. When the tongue of the relay is in the position shown by full lines in Fig. 2, a projection on its extension bears against one of the spring contact-fingers O O', so as to press the two contacts together. One of these contacts O' is in electrical communication through a conductor 1 with binding-post e, connected to the earth, while the other contact O is in communication through the conductor 2 and coils of the relay with the binding-post l, leading to the line. A branch 3 from the conductor 2 leads to binding-post t, to which the ordinary set of telephonic instruments connect. Normally the tongue of the relay is in the position shown by full lines in the drawings, so that the telephonic instruments

are cut off from the line by the short circuit through the contacts O O' and conductor 1 to the earth.

When the required coin is deposited in the slit B, the lever D is tilted by the weight of the coin and through its arm M throws the tongue J of the relay over to the position shown by dotted lines, the contacts O O' spring apart, the local circuit is opened, and the telephonic instruments, including the magneto call or battery, are put to line through the relay K K. The contacts O O' spring apart when the pressure of the tongue J is removed therefrom. Communication being thus effected with the exchange, the subscriber can communicate with the operator at the exchange in the usual way. The time during which the communication shall last, however, is under the control of the exchange operator, who can cut off the communication at any moment by simply sending a current of electricity of the proper polarity from a suitable battery or generator over the line, to cause the polarized relay K to bring its tongue J back to the position shown by full lines, and so short-circuit the user's telephonic instruments. The coils of the relay K are so wound as not to respond to the rapidly alternating currents produced by the magneto-generator of the subscriber, but so that a suitable battery or similar generator will cause the deflection of the tongue J to either side, as may be required.

Instead of leaving the question of the length of time during which the communication may continue to the will of the exchange operator, the above-described call-box may be provided with an attachment whereby the connection effected by the user through the deposit of the coin will be automatically terminated at the end of a specific period of time. We have illustrated such a device in Figs. 3, 4, and 7 of the drawings. This attachment consists, essentially, of a train of clock-work gearing S, Fig. 4, provided with a pallet V and escape-wheel W, as shown, and having an arm r to act on the end P' of a lever P, which in turn can act on a cam-like projection J² on the tongue J, and may also be acted on by a second cam J', also on the said tongue. When this tongue is in the position shown by full lines in Fig. 4, the lever P will be in the position shown in Fig. 7 and will retain the arm r of the clock-work. When the tongue J is thrown over to the position indicated by dotted lines by the deposit of the coin in the manner above described, the cam or inclined projection J', carried by the tongue J, will throw down the end P' of the lever P and release the finger r , which is then caused by the train of clock-work to rotate in the direction of the arrow, Fig. 7. At the end of a specified time the finger r , on completing its revolution, will come into contact with the end P' of the lever P, and, throwing up its opposite end, will, by causing such end to come into contact with the cam J² of the tongue J, cause the latter

to return to the position indicated by full lines, and so cut off connection with the central office, as above set forth.

In combination with the above-described instrument an indicator or register Q, Figs. 3 and 4, may be used to indicate the number of times the communication is effected with the central office. A counter or register Q', as shown in Figs. 1 and 2, may be used, to be operated by the lever D.

Although we prefer the above-described automatic call-box for use in connection with the ordinary telephonic instruments, we do not wish to restrict our invention thereto.

Another simple form of our invention, for instance, is illustrated in Figs. 5 and 6, in which the introduction of the coin actuates a simple mechanical device to momentarily close the calling-circuit to the central office. In this case the balance-lever D, which is tilted by the depositing of the coin in the manner described with reference to Figs. 1 and 2, carries a contact-arm f , which is normally in contact with a stop R', the latter being in electrical connection through the conductor with the telephonic instruments. The post on which the lever D is mounted and the lever itself are in electrical communication with the line through the conductor 1. On the opposite side of the contact-finger f is a stop R², which is in electrical communication through the conductor with the earth, this circuit containing a battery or other suitable generator necessary to make it a local calling-circuit.

Normally, as illustrated in Fig. 5, the finger f is in contact with the stop R' and the telephonic instruments are to line. When the coin is deposited, however, the consequent tilting of the lever D brings the finger f into contact with the stop R² and puts the calling-circuit to line momentarily, but for a sufficient length of time to call up the central office. As the lever D falls back again to its normal position, the telephonic instruments are put to line again.

We claim as our invention—

1. The combination of a telephonic exchange and a user's telephonic instruments with an automatic call-box having a slit for the introduction of a coin or other representation of monetary value, a chute for the latter, a circuit connecting the box with the exchange, a lever to be operated by the weight of the coin, and contacts to automatically close the circuit on the deposit of the coin.

2. The combination of a telephonic exchange and a user's telephonic instruments with an automatic call-box having a slit for the introduction of a coin or other representation of monetary value, a lever adapted to be moved by the weight of the latter, a line and calling circuit, and contacts therefor controlled by the lever to automatically put the calling-circuit to line on the deposit of the coin.

3. The combination of a user's telephonic

instruments in an exchange system with an automatic call-box having a slit for the introduction of a coin or other representation of monetary value, a lever adapted to be moved
5 by the weight of the coin, and contacts controlled by the lever, substantially as set forth, whereby connection is automatically effected to the line of the exchange on the deposit of the coin, substantially as specified.

10 4. An automatic call-box having a polarized relay, with contacts controlled by the tongue of the relay, and a lever controlling said tongue and adapted to be operated by the introduction of a coin or similar article into
15 the box to put the instruments to line, substantially as specified.

5. The combination of the user's telephonic instruments of an exchange system with a

polarized relay connected to said instruments and to the line, a short earth-circuit, and con- 20
tacts controlled by the tongue of the relay to put the telephonic instruments to line or short-circuit them, a lever controlling the said tongue and adapted to be operated by the deposit of a coin or similar article to effect 25
communication with the exchange, all substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LOUIS J. CROSSLEY.
WALTER EMMOTT.
J. FRED. HARRISON.

Witnesses:

JOHN GILL,
RD. B. NICHOLLS.