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C. E. SCRIBNER.

TOLL COLLECTING APPLIANCE FOR TELEPHONE STATIONS.

(Application filed June 5, 1896.)

(No Model.)

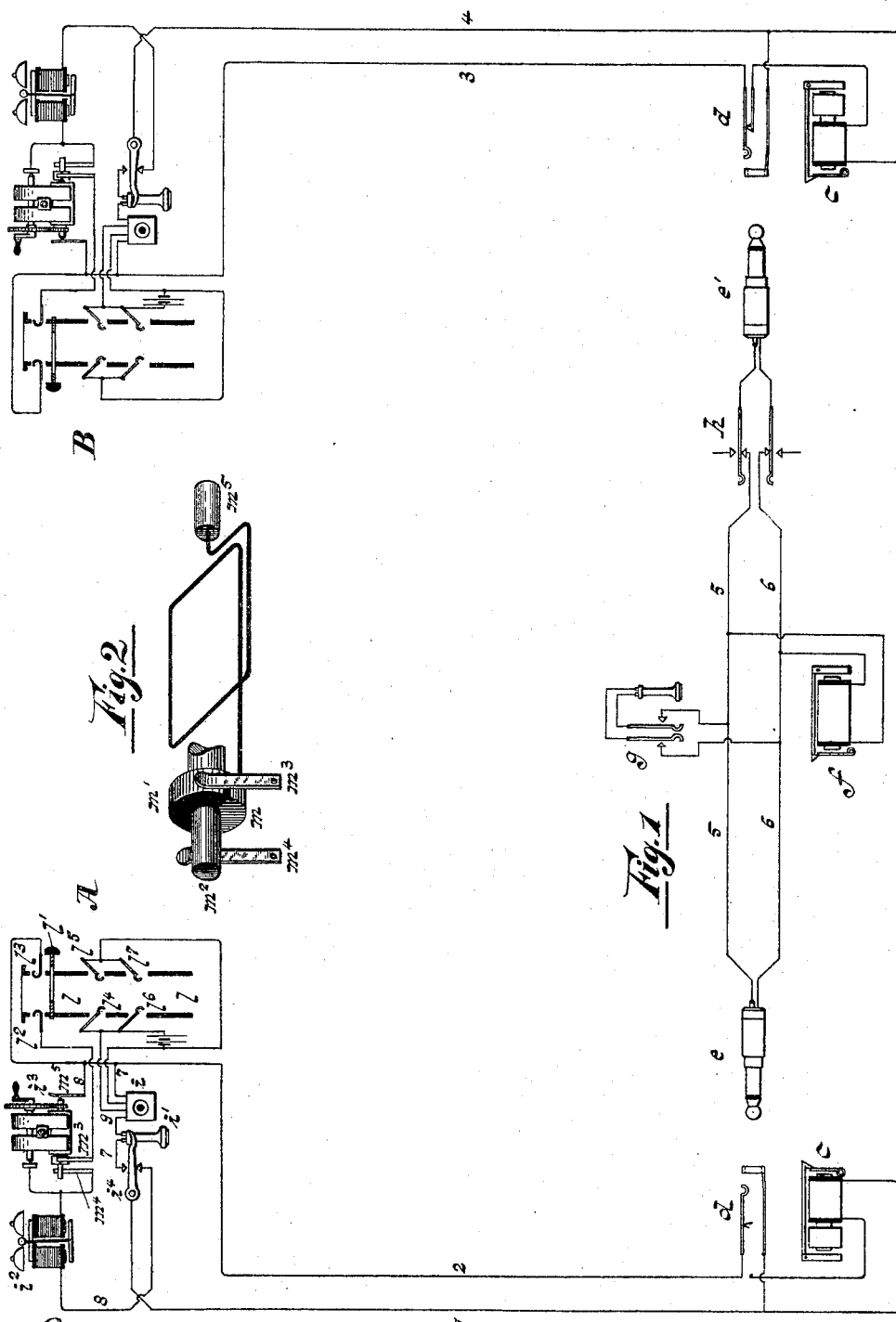


Fig. 2

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TOLL-COLLECTING APPLIANCE FOR TELEPHONE-STATIONS.

SPECIFICATION forming part of Letters Patent No. 638,480, dated December 5, 1899.

Application filed June 5, 1896. Serial No. 594,418. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Toll-Collecting Appliances for Telephone-Stations, (Case No. 420,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention is an appliance for use in connection with telephone toll-stations for insuring the production of a required toll or coin as a preliminary to the sending of an initial call to the central station and for signaling to the operator there the deposit of the coin after the call has been sent.

Hitherto it has been common in certain systems to provide, in connection with the signaling apparatus at a toll-station, mechanism actuated or controlled through the medium of a deposited coin to permit the sending of a call for a connection, and in other systems various modes have been practiced of notifying an operator of the deposit of a coin after the required connection has been obtained. It is found in practice, however, that in the former system the mechanism for necessitating the deposit of the required toll as preliminary to sending the call-signal has involved the loss of the coin to the user of the telephone when he has failed to obtain the desired connection, and has further demanded the use of special apparatus for sending the signal for disconnection different from that employed in sending the initial call. In the latter system the user of the telephone does not produce or obtain the coin required as a toll for the use of the telephone until the connection has been completed, and great inconvenience and loss of time are caused both to the attendant at the central office and to the correspondent by the delay ensuing on this account. The present invention is designed to require the production and deposit in a coin-chute of a toll preliminary to sending a call-signal without, however, depriving the subscriber of access to the coin and without necessitating any such procedure in the act of sending a signal for disconnection, and it also involves means for

causing the deposit of the coin in the coin-receptacle after the required connection is obtained and for notifying the operator of such deposit. For the accomplishment of these purposes I have provided, in combination with the telephone-line and the line-annunciator and clearing-out annunciator thereof at the central station, a generator of signaling-current at the substation adapted to transmit currents of two different characters, one for operating the line-annunciator and the other for operating the clearing-out annunciator, and circuits which in the normal condition of the apparatus permit the generator when operated to transmit current for exciting the clearing-out annunciator, but which are altered through the agency of a coin deposited in the coin-chute of the toll-box to permit the transmission of current for exciting the line-annunciator. The coin-chute is preferably so constructed that while the coin is in position to allow the operation of the line-annunciator the coin is still accessible to the user of the instrument and may be withdrawn in case the desired connection is not obtained.

With the apparatus above described I combine a part adapted for manual operation in response to the command of the operator at the central station acting to discharge the coin into the coin-receptacle or cash-box and simultaneously to transmit a signal to the operator indicating the deposit of the coin.

A suitable form of the calling apparatus of the invention comprises a line-annunciator in connection with the line responsive to pulsating currents, but not to alternating currents; a clearing-out annunciator arranged for temporary connection with the line sensitive to alternating currents; a signaling-generator at the substation which normally transmits an alternating current, and contact-points in the coin-chute made operative through the agency of the deposited coin connected to short-circuit alternate pulsations of current of the generator, and thus to convert the current into one of constant direction in the line. The coin is released and permitted to fall into the coin-receptacle of the toll-box by a push-key in the box, and a series of contact-points are placed in the coin-chute in the path of the falling coin connected with the

telephone-circuit in such a way as to produce a series of impulses of current in the telephone-line which may affect the telephone of the operator at the central station and which thereby serve as a signal denoting the deposit of the coin. If in this organization the generator be operated when no coin has been deposited, a current will be transmitted which will be ineffective as an initial call. When the required toll has been placed in the coin-chute, however, the operation of the generator will cause the display of the line-annunciator. If the operator responding to the call should not succeed in obtaining the required correspondent, the user of the telephone may withdraw the deposited coin from the coin-chute; but if the connection with the correspondent be completed the operator will instruct the user to press the key whereby the coin will be permitted to fall into the coin-receptacle, and at the same time the passage of the coin through the chute will be indicated to the attendant at the central station.

This form of the invention is shown in the accompanying drawings, wherein—

Figure 1 is a diagrammatic representation of the apparatus and circuits at the substation and central station. Fig. 2 shows the construction of a special commutator for the generator of the signaling-current.

In Fig. 1 two telephone-lines 1 2 and 3 4 are shown extending from substations A and B, respectively, to a central station and each including an annunciator *c* and connected with a spring-jack *d* in the switchboard at the central office. The line-annunciators *c* are of any suitable construction by which they are adapted to display their signals when traversed by pulsating or intermittent currents of constant direction, but to remain inert when alternating currents pass through their coils. A suitable annunciator is described in Patent No. 509,186, issued to me November 21, 1893, in which invention the instrument is used as a clearing-out annunciator. This appliance comprises a tubular magnet, a thick cylinder of copper surrounding the pole of the core, a pivoted armature, and a shutter or indicator which is displayed when the armature is attracted. The spring-jack *d* is arranged to interrupt the connection of the line with the line-annunciator when a plug is inserted into the jack.

The switchboard is supposed to be furnished with the usual pairs of connecting-plugs *e* and *e'*, with plug-circuits 5 6 uniting the like contact-pieces of the different members of each pair. A clearing-out annunciator *f* is connected in a bridge of the plug-circuit. A listening-key *g* is also provided for bringing the operator's telephone into connection with the plug-circuit, and the switch-contacts of a calling-key *h* are interposed in the plug-circuit, the key being adapted to connect a generator of signaling-current with the calling-plug *e'*.

The substations are equipped each with a transmitting-telephone *i*, receiving-telephone

i' in one branch 7 of the line-circuit, a polarized bell *i²* and a generator *i³* in a branch 8 of the circuit, and a telephone-switch *i⁴*, adapted to close these branches alternately to bring either the telephones or the signaling appliances into the line-circuit. The transmitting-telephone is included in a local battery-circuit 9, which also may be controlled by the switch *i⁴*.

As the substations of this system are pay or toll stations, at each station a toll-box is placed provided with a coin-chute *l*, leading into the box. Near the upper end of the coin-chute is a movable stop *l'*, projecting through the side of the chute into the path of the coin and adapted when in its normal position to prevent the passage of the coin through the chute, but when pressed in by means of the button to release the coin and permit it to fall. The position of the stop in the chute is such that ordinarily it prevents the coin from falling sufficiently far into the chute to become inaccessible. Projecting into the coin-chute above this stop are a pair of insulated contact-springs *l² l³* in the path of the coin, which are adapted to be connected together through a coin placed in the chute above the stop. Below the stop in the coin-chute other insulated contact-fingers *l⁴ l⁵ l⁶ l⁷*, arranged in pairs, project into the path of the coin in such positions that the different members of each pair will be crossed together through the coin as it falls in the chute.

The generator *i³* is fitted with a commutator of peculiar construction. (Shown in Fig. 2.) This commutator consists of two segments *m* and *m'*, of metal and of insulating material, respectively, fixed to the shaft, the segment *m* being provided with a cylindrical extension *m²*. A spring *m³* bears upon the rotating commutator and another spring *m⁴* makes contact with the cylindrical extension *m²*. One end of the armature-coil is connected with the frame *m⁵* of the machine. The other extremity of the armature is connected with the segment *m* of the commutator. While the generator is in operation, an alternating current may be obtained between the frame *m⁵* of the machine and the spring *m⁴*. If, however, the spring *m³* be connected with the frame of the machine through a complete circuit, the current derived from the generator will be of pulsatory character, since a short circuit will be closed about the armature during one-half of each rotation, so that only pulsations of a single direction will flow to line. The generator may be provided with the usual automatic shunt adapted to cut it out of the circuit 8 when it is not actually in operation. In associating this generator with the other mechanism at the substation the spring *m⁴* and the frame of the machine are connected with the severed portions of wire 8. Spring *m³* is connected with one spring *l²* in the coin-chute, while the frame of the machine is connected with the other spring *l³* of the pair and with one line-wire.

The process of using this apparatus to obtain connection with a desired correspondent is as follows: The user first deposits the required coin in the coin-chute l , permitting it to rest against the stop l' . Through the medium of the coin the springs l^2 and l^3 then become connected together. The handle of the generator l^3 is then rotated, whereby the automatic shunt about the appliance is opened and a pulsating current is transmitted through the line. It will be understood that the current is of constant direction, since the springs m^3 , l^2 , and l^3 , with their circuit connections, constitute a complete shunt of the generator during one-half of each rotation. As such current is adapted to operate the line-annunciator, a signal is displayed before the operator at the switchboard. The operator then makes connection with the line by means of a plug e , as usual, bringing her telephone into the circuit by key g , and learns from the subscriber his order for the desired connection. She then makes connection by means of the other plug e' with the line called for, sends a signaling-current to ring the bell at the station B, and having obtained the correspondent instructs the user at the calling-station to press the button of stop l' . When that button is operated, the coin is permitted to fall through the coin-chute. In its descent it connects together the members of the different pairs of springs l^4 , l^5 , l^6 , and l^7 , successively. Each such connection momentarily closes a short circuit of the induction-coil of the substation-transmitter, and thus induces in the telephone-line a corresponding series of currents, which produce clicks in the operator's telephone. These clicks serve as an indication to the operator that the coin has passed through the coin-chute. After the termination of conversation either subscriber may send a signal for disconnection by rotating his calling-generator. The current thus sent will be of alternating character, since at neither station is there a coin in contact with the springs l^2 l^3 , and will actuate the clearing-out annunciator.

Obviously if the user of the telephone should attempt to send a call without having first deposited the required toll an alternating current similar to that sent for operating the clearing-out annunciator would be created in the line and the line-annunciator would remain irresponsive.

My invention is not limited in its scope to the particular means herein shown for causing the operation of the line-annunciator under certain circumstances and of the clearing-out annunciator under other circumstances. Numerous devices are known in the art of telephony in the nature of appliances for sending and for responding to currents of different characters or of shifting circuits in such a manner as to prevent or cause the operation of the line-annunciator or the clearing-out annunciator at will which might be applied to work in substantially the same way

for the same results. The spirit of my invention embraces all such contrivances in which a clearing-out annunciator may be operated at all times and the line-annunciator may be actuated only through the medium of circuits altered through the agency of a deposited coin. Neither is the invention limited to use with any particular system of telegraphing or indicating to the listening operator the final deposit of the coin nor, indeed, to any means for such indication.

I claim, broadly, as new and desire to secure by Letters Patent—

1. The combination with a telephone-line, of a line-annunciator in connection therewith, a generator of signaling-current adapted to operate the line-annunciator, a coin-chute at the substation, mechanism in the chute adapted to cooperate with a deposited coin to alter the circuits of the source of signaling-current to permit the transmission of a call, other mechanism in the coin-chute actuated through the cooperation of the said stop and the deposited coin adapted to transmit in the telephone-line a characteristic signaling-current, an operator's telephone and means for connecting the telephone with the line to receive the said characteristic signal, substantially as described.

2. The combination with a telephone-line, of a line-annunciator therefor responsive to current of a particular character, a clearing-out annunciator and means for connecting it with the line, a generator of signaling-current adapted normally to send in the line a current for operating the clearing-out annunciator, a coin-chute, and mechanism therein operated through the agency of a deposited coin, to adapt the current from the signaling-generator to actuate the line-annunciator; whereby the sending of a clearing-out signal is permitted at any time, but the transmission of an initial call is possible only after the deposit of a coin.

3. The combination with a telephone-line, of a line-annunciator in connection therewith, a generator of signaling-current adapted to operate the line-annunciator, a coin-chute at the substation, a manually-operated stop in the coin-chute, mechanism in the chute adapted to cooperate with a deposited coin to alter the circuits of the source of signaling-current to permit the transmission of a call, other mechanism in the coin-chute actuated through the cooperation of the said stop and the deposited coin adapted to transmit in the telephone-line a characteristic signaling-current, an operator's telephone and means for connecting the telephone with the line to receive the said characteristic signal, substantially as described.

4. The combination with a telephone-line, of a line-annunciator responsive to currents of constant direction, a clearing-out annunciator responsive to alternating currents, and means for associating the clearing-out annunciator with the line, a generator of alter-

nating signaling-current at the substation of the line, a shunt of the said generator normally open at two points, a commutator on the generator adapted to close the said shunt
5 at one point during half of each revolution, a coin-chute, and switch-contacts operated through the agency of a deposited coin connected to close the shunt-circuit at the other point, substantially as described.
10 5. The combination with a telephone-line, of a line-annunciator sensitive to pulsating currents connected with the line, a clearing-out annunciator and a telephone and means for connecting them with the telephone-line,
15 a generator of signaling-current at the substation adapted to transmit alternating currents normally, a shunt about the generator open at two points, a commutator on the gen-

erator adapted to close said shunt at one point during half of each rotation of the armature, 20 a coin-chute, switch-contacts in the said chute adapted to be closed through the agency of a deposited coin controlling the other break in said shunt, a manually-operated stop in the coin-chute adapted when depressed to release 25 the coin, and other mechanism in the path of the coin below said stop adapted to transmit in the telephone-line a characteristic signaling-current indicating the release of the coin, substantially as described. 30

In witness whereof I hereunto subscribe my name this 7th day of April, A. D. 1896.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,
LUCILE RUSSELL.