

No. 704,268.

Patented July 8, 1902.

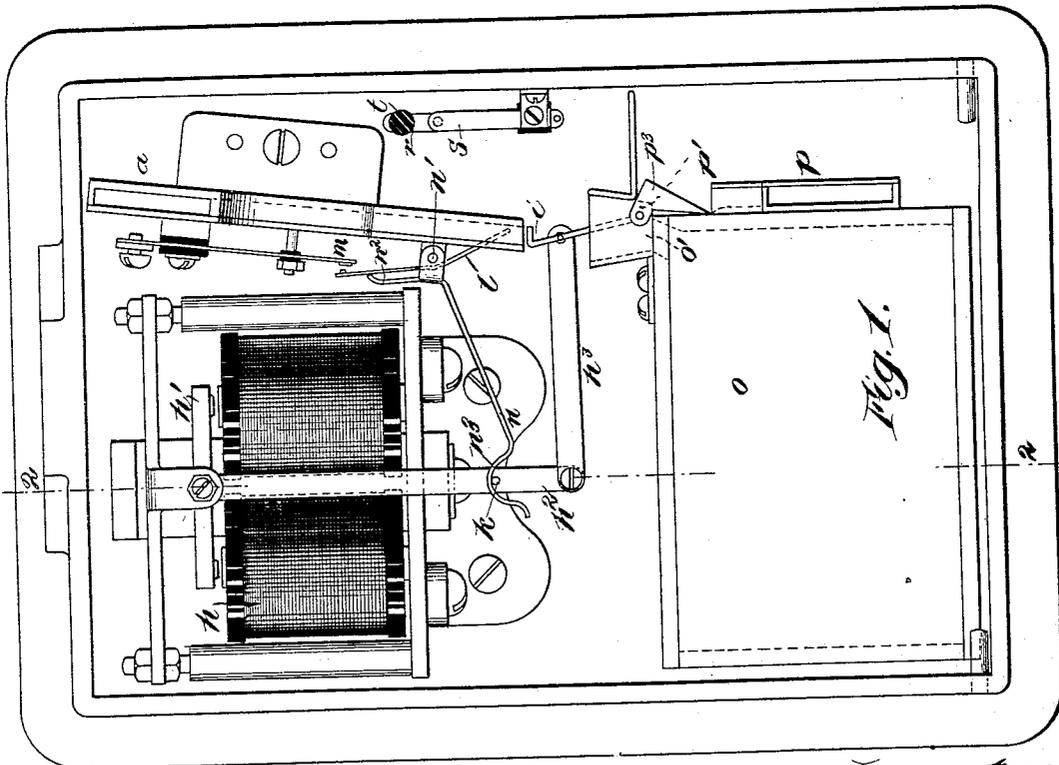
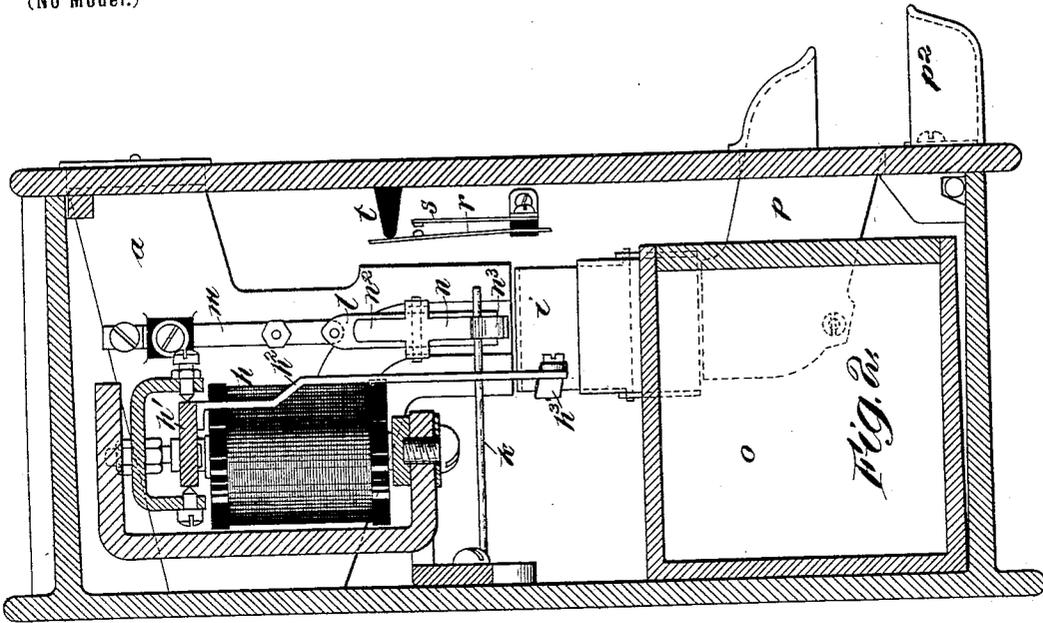
J. J. O'CONNELL.

COIN COLLECTOR FOR TELEPHONE TOLL LINES.

(Application filed Oct. 17, 1900.)

2 Sheets—Sheet 1.

(No Model.)



Witnesses:
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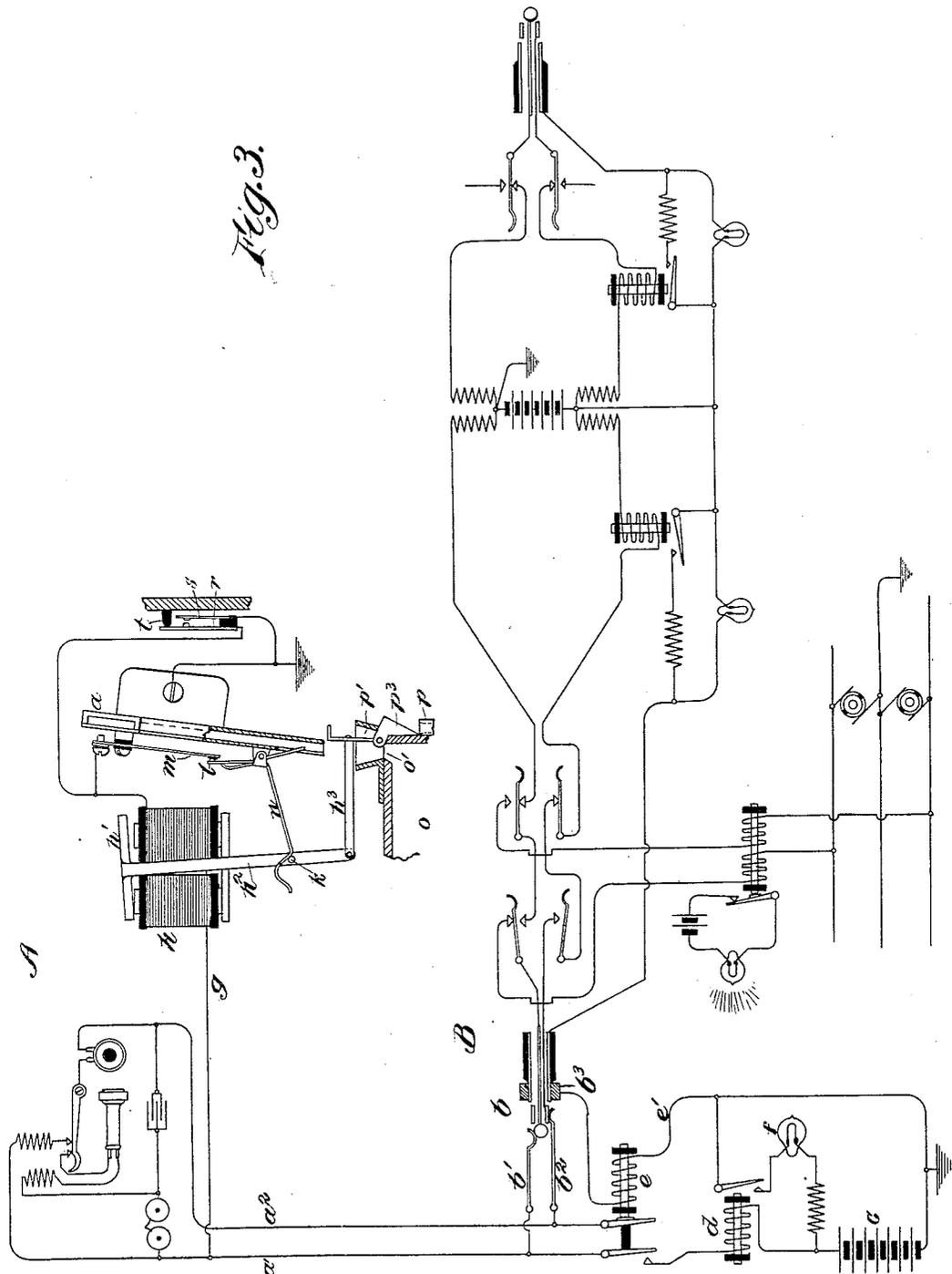
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2 Sheets—Sheet 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH J. O'CONNELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

COIN-COLLECTOR FOR TELEPHONE TOLL-LINES.

SPECIFICATION forming part of Letters Patent No. 704,268, dated July 8, 1902.

Application filed October 17, 1900. Serial No. 33,334. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. O'CONNELL, 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 Coin-Collectors for Telephone Toll-Lines, (Case No. 6,) of which the following is a full, clear, concise, and exact description.

My invention relates to a toll device or coin-collector for telephone systems; and its object is to improve and simplify the structure of an existing type of toll-box.

A toll-collecting appliance for telephone-exchange systems which is at present in somewhat extensive use is described in Letters Patent No. 665,874, granted January 15, 1901, to Albert M. Bullard. In the device of the said Bullard patent the central office can be signaled from the subscriber's station only by the deposit of a coin in the toll-box, the coin serving to close together two contacts which control the circuit through the line-indicating apparatus at the central office. The coin remains in the chute until the operator at the central office has ascertained whether or not the connection desired can be made, and an electromagnetic coin-distributing apparatus is provided whereby the operator may cause the coin at the subscriber's station to be either deposited in the cash-box or in case the connection cannot be had released and discharged from the toll-box through a return-chute. For this purpose a polarized electromagnet is employed whose armature is normally maintained in a central position, but is adapted to tilt to one side or the other, according to the direction of the current flowing through the magnet-coils. The tilting armature is connected by lever mechanism with a swinging valve which is located at the lower end of the coin-chute. The valve is normally maintained in a central position under the discharging end of the coin-chute and acts as a stop against which the coin strikes in rolling down the chute, so that the coin is held at this point until the valve is moved out of the way. If the valve is moved to one side, the coin is allowed to fall out of the chute and is discharged either into the cash-box or into the

return-chute, according to the side to which the valve is moved. The coils of the polarized coin-distributing electromagnet are included in a branch circuit to ground from one limb of the telephone-line at the substation, and positive or negative current from a suitable grounded source at the central office may be thrown on the line by the central-office operator to cause the magnet to attract its armature to one side or the other, according as it is desired to deposit the coin in the cash-box or to return it. This grounded branch at the substation, in which the magnet is included, is also a portion of the circuit of the line-battery which operates the line-indicators, and the two contacts before referred to, which are closed together by a deposited coin, control the continuity of the said grounded branch.

In order that the circuit through the coin-distributing magnet may not be broken and the armature of said magnet caused to flutter when the coin is released from the chute, Mr. Bullard provides a shunt around said contacts, said shunt being controlled by relay-contacts operated by the armature of the electromagnet, so that when the armature is thrown to one side and the coin released the circuit through the magnet will not be interrupted, but a path for the current will be afforded by way of the shunt.

In accordance with my invention I dispense with the shunt-circuit and the relay-contacts therefor and provide instead means whereby the two contacts, which are initially closed together by the deposit of a coin, are mechanically maintained in contact independent of the coin after the latter has been released.

I will describe my invention more particularly by reference to the accompanying drawings, wherein—

Figure 1 is a view in elevation of a toll-box or coin-collector for telephone systems constructed in accordance with my invention. Fig. 2 is a transverse vertical sectional view thereof on line 2 2 of Fig. 1; and Fig. 3 is a diagrammatic illustration of a telephone-toll line extending from a substation to a central office, together with a portion of the appara-

tus at the central office, the system being provided with the toll-collecting apparatus of my invention.

Similar letters of reference are used to designate the same parts wherever they are shown.

Referring first to Fig. 3, a telephone-line consisting of two branches $a' a^2$ extends from the subscriber's station A to the switchboard B at the central office of the exchange, the branches $a' a^2$ of the telephone-line terminating in line-springs $b' b^2$, respectively, of the spring-jack b . A line-signal battery c is connected with the limb a' of the telephone-line through the helix of the line-relay d by way of the armature and back contact of a cut-off relay e . A signal-lamp f is included, together with a source of current, in a local circuit controlled by the line-relay d , so that when the said relay is energized by current from the line-signal battery c flowing through the same the local circuit will be closed and the signal-lamp lighted. The helix of the cut-off relay is included in a grounded branch e' from the third contact or test ring b^3 of the spring-jack b , so that when an ordinary connecting-plug the sleeve-contact whereof is connected with a grounded source of current is inserted in the spring-jack the cut-off relay will be energized to remove the signal apparatus from the telephone-line circuit. The telephone talking and signal-receiving apparatus at the substation A is of the usual character and need not be particularly described.

The limb a' of the telephone-line is connected at the subscriber's station with a grounded branch circuit g , which includes the helices of the polarized electromagnet h and is normally open, being controlled by coin-actuated contacts $l m$. The engagement of these two contacts with one another to close the circuit of the branch g to ground, besides being caused by the deposit of a coin, may also be effected by the movement of the armature of the magnet h in a manner which I will presently describe. The closing together of said contacts by any means will complete the circuit of the grounded line-signal battery c at the central office through the line-relay, and will thereby cause the signal-lamp f to be lighted, thus notifying the operator that subscriber A desires a connection.

Referring to Figs. 1 and 2, a coin-chute a is provided in the toll-box at the substation. The lower end of said chute is open except for the valve i , which is normally maintained in a central position immediately under its mouth. A coin dropped into the chute a will therefore be stopped at the lower end of said chute by the upper edge of the valve i . The valve i is pivoted at its lower edge, so that it may be rocked in either of two directions, the movement thereof being controlled by the polarized electromagnet h . The armature h' of said magnet is provided with an extension

ing valve by means of a link h^3 . A centralizing-spring k is fastened at the rear of the box and projects forward, passing through a hole in the extension or arm h^2 of the armature-lever, so that the said arm h^2 and armature-lever h' are normally held in a central position, as illustrated in Fig. 1. The rocking lever l , the upper end whereof carries a contact-point, is pivoted at the side of the chute, the lower end of said rocking lever normally projecting into the chute through a hole in the side thereof. A contact-spring m is stationarily mounted upon but insulated from the coin-chute, said contact-spring being connected with the limb a' of the telephone-line through the windings of the polarized electromagnet h . The frame of the coin-chute, with which the rocking contact-lever l is electrically connected, is grounded.

When a coin is deposited in the chute, it rolls down until it is stopped by the upper edge of the valve i , and resting here presses against the lower end of the rocking contact-lever l , so that the upper end of said contact-lever is brought into engagement with the contact-spring m , thus completing the circuit of the branch g from the limb a' of the telephone-line to ground.

A cam-lever n is pivoted at n' concentrically with the rocking contact-lever l . The upper end n^2 of the lever n engages the upper end of the contact-lever and the lower end n^3 is bent into a cam shape and rests upon the projecting end of the centralizing-spring k , which passes through the arm h^2 of the armature-lever. When the arm h^2 , therefore, is moved out of its central position, the projecting end of the spring k will engage the cam portion n^3 of the lever n and raise the same, rocking the lever about its pivot n' and causing the upper end n^2 to push the rocking contact-lever l into engagement with the contact-spring m , as shown in Fig. 3.

Referring to Fig. 1, it will be seen that if the armature of the polarized electromagnet is tilted in a counterclockwise direction the valve i will be rocked to the right, so that its upper edge is removed from under the mouth of the chute and the coin in the chute is released and guided into the passage-way o' , which leads into the cash-box o . Should the armature be tilted in a clockwise direction, the valve will be moved to the left, guiding the coin into the passage-way p' , which leads to the return-chute p , so that the coin will roll out through the return-chute into the return-cup p^2 , from which it may be taken by the subscriber. It will be observed that in whichever direction the valve may be moved the lower end of the rocking contact-lever l will be moved out of the chute, so as not to hinder the discharge of the coin therefrom, and at the same time the upper end of said contact-lever will be maintained in engagement with the contact-spring m .

A swinging guard p^3 may be provided in

connection with the return-chute to prevent the insertion of a wire through the return-chute for the purpose of interfering with the mechanism.

5 Means are provided at the central office whereby the operator may direct positive or negative current over the telephone-line to control the operation of the polarized magnet *h*, and so to dispose in one way or the other of a coin within the chute.

10 The operation of the system as a whole is fully disclosed in the application of Bullard before referred to, and I do not deem it necessary to describe the same particularly in this specification.

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

20 1. In a toll-collecting appliance for telephone-lines, the combination with a chute for receiving a coin, of a coin-distributing electromagnet and mechanism connected therewith for directing the course of the coin, an electric circuit, a pair of contact-terminals
25 controlling the continuity of said circuit, said contact-terminals being adapted to be closed together to complete said circuit by a coin deposited in said chute, and mechanism operated by the armature of said electromagnet, for closing said contacts together independently of the coin, substantially as described.

30 2. In a toll-collecting appliance for telephone-lines, the combination with a chute for receiving a coin, of a polarized coin-distributing electromagnet and an armature therefor adapted to tilt to one side or the other, according to the character of the current flowing through the coils of said magnet, mechanism operated by said armature for directing the coin to one side or the other as it leaves the chute, means for yieldingly maintaining said armature in a central position, an electric circuit, a pair of contacts
45 controlling the same, said contacts being adapted to be closed together by a coin deposited in said chute, and means, operated by the armature of said electromagnet, for closing said contacts together independently
50 of a coin when the armature is moved out of its central position, substantially as described.

3. The combination with the coin-chute *a*, of a valve *i* for directing the course of a coin,

a coin-distributing electromagnet *h* and an armature therefor adapted to operate said valve, a contact-lever *l* adapted to be actuated by a coin within the chute, an electric circuit including the winding of said electromagnet, said circuit being controlled by said contact-lever, and a lever *n* operated by the armature of said electromagnet, adapted to actuate said contact-lever *l* independently of a coin, substantially as set forth.

4. The combination with the coin-chute *a*, of an electromagnet and mechanism operated thereby for directing the course of the coin, a contact-lever *l* adapted to be actuated by a coin within the chute, a contact-anvil *m* adapted to be engaged by said contact-lever, an electric circuit including the winding of said electromagnet, said circuit being controlled by the contact-pieces *l m*, and an actuating-lever *n* adapted to be moved by said electromagnet, simultaneously with the coin-distributing mechanism, said lever *n* engaging with the contact-lever *l* and serving to maintain the same in engagement with its contact-anvil *m* after the coin has passed from the chute, substantially as set forth.

5. The combination with the coin-chute *a*, of a polarized electromagnet, an armature therefor adapted to tilt to one side or the other under the influence of current flowing in the coils of said magnet, according to the direction of such current, a valve *i* for directing the course of a coin as it leaves the chute, a mechanical connection between the valve and said armature, whereby the valve is caused to tilt to one side or the other by the movement of said armature, a centralizing-spring *k* adapted yieldingly to maintain the armature and valve in central positions, an electric circuit including the winding of said electromagnet, contact-pieces *l m* controlling said circuit, said contact-pieces being adapted to be closed together by a coin within said chute, and an actuating-lever *n* moved through the agency of the electromagnet when the same is energized, for maintaining said contact-pieces in engagement, substantially as set forth.

In witness whereof I hereunto subscribe my name this 16th day of May, A. D. 1900.

JOSEPH J. O'CONNELL.

Witnesses:

DE WITT C. TANNER,
W. W. LEACH.