

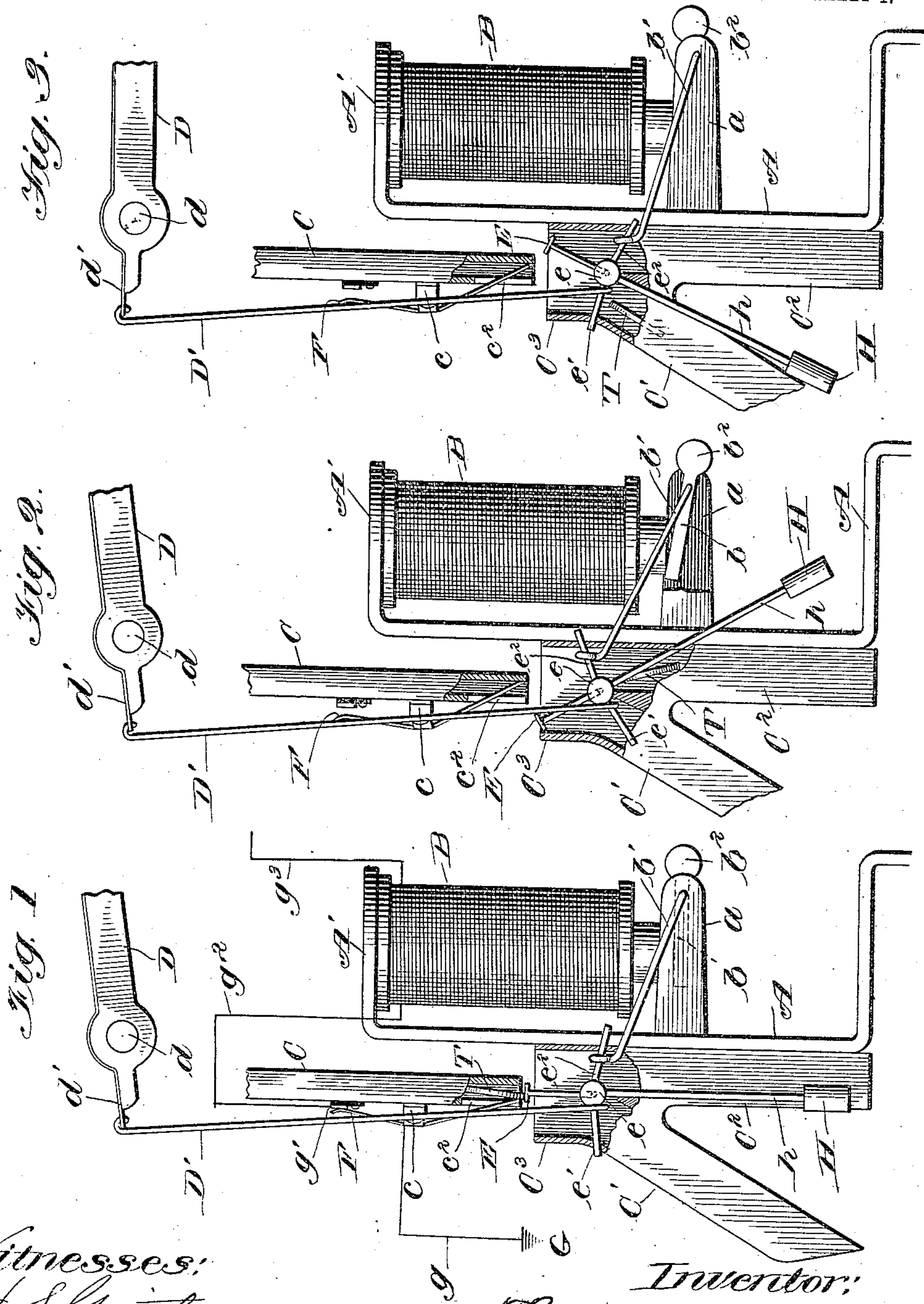
No. 848,378.

PATENTED MAR. 26, 1907.

T. R. LAING.
APPARATUS FOR TELEPHONE TOLL LINES.

APPLICATION FILED JAN. 4, 1902.

2 SHEETS—SHEET 1.



Witnesses:
H. S. Gault
Geo. L. Wilkinson

Inventor:
Theodore R. Laing
by Walter A. Chamberlain
Attorney.

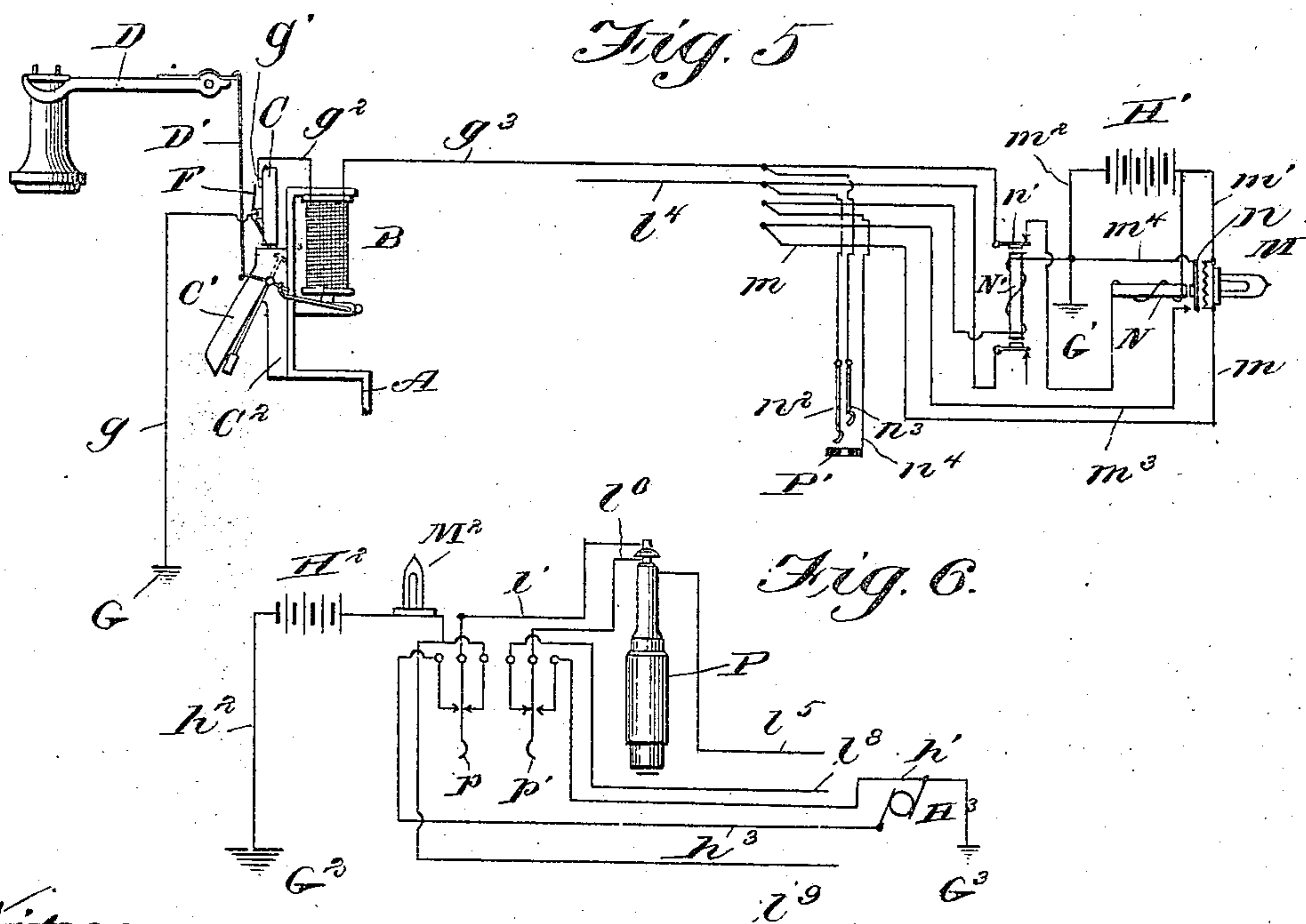
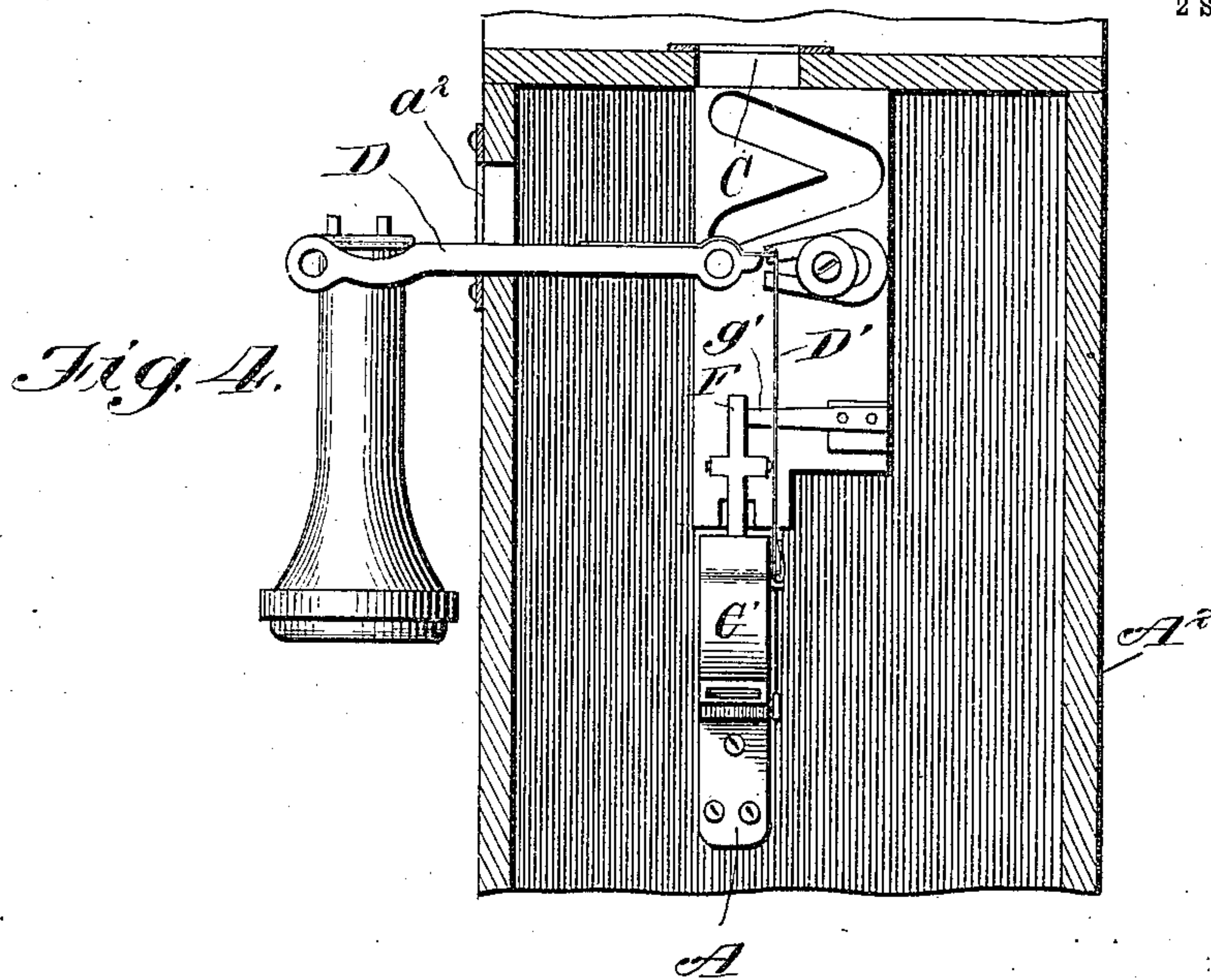
No. 848,378.

PATENTED MAR. 26, 1907.

T. R. LAING.
APPARATUS FOR TELEPHONE TOLL LINES.

APPLICATION FILED JAN. 4, 1902.

2 SHEETS—SHEET 2.



Witnesses:
H. S. Gaither
Geo. L. Hillman

Inventor:
Thaddeus R. Laing
by Walter H. Chamberlain
Attorney.

UNITED STATES PATENT OFFICE.

THADDEUS R. LAING, OF CHICAGO, ILLINOIS, ASSIGNOR TO KRAFT COMBINATION TELEPHONE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

APPARATUS FOR TELEPHONE TOLL-LINES.

No. 848,378.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed January 4, 1902. Serial No. 88,387.

To all whom it may concern:

Be it known that I, THADDEUS R. LAING, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have
5 invented a certain new and useful Improvement in Apparatus for Telephone Toll-Lines; and I declare the following to be a full, clear, and exact description of the same, such as will
10 enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates in general to toll-telephones, and more particularly to mechanism
15 for either dropping a coin or other toll-piece which has been deposited in payment for the use of the telephone into the cash-box, when the desired conversation can be had, or returning the coin to the outside of the instrument, where it may be regained by the user
20 when the desired telephonic connection cannot be obtained.

Heretofore in apparatus of the class referred to the return of the coin to a place accessible to the user has been effected either
25 by the operator at central closing a circuit through an electromagnet or by a button or other mechanical device operated by the user of the telephone or by mechanism actuated
30 by the combined efforts of both the operator and the user. These methods are open to the objection that they impose additional labor upon the operator at central either by requiring the operator to perform some act
35 or to instruct the user what he must do to regain his coin.

The primary object of my invention is to provide a toll-telephone with mechanism for returning the coin to the user actuated entirely by hanging up the receiver upon its supporting-hook.

A further object of my invention is to provide an apparatus of the character described with mechanism for signaling the operator at
45 central upon a coin of the proper denomination or other toll-piece of predetermined character being deposited and also with mechanism adapted either to be controlled by the operator at central to drop the coin
50 into the cash-box or to be actuated by the return of the receiver to its supporting-hook to deliver the coin to a position accessible to the user.

A still further object of my invention is to provide an apparatus which will be simple in
55 construction and efficient in operation.

My invention consists, generally speaking, in a switch located below the chute into which the coin is deposited, which intercepts the passage of the coin when the receiver is
60 removed from its hook and which permits the coin either to pass through a guideway to a position accessible to the user when the receiver is returned to its supporting-hook or to drop into the cash-box when an actuating-
65 magnet is energized by a circuit controlled by the operator at the central station.

My invention further consists in a circuit for signaling the operator at central upon the deposit of a toll-piece of the requisite character in an instrument, such circuit being
70 continued upon the desired telephonic connection being established until the toll-piece is transferred to the cash-box in the instrument.

The invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical
80 form, and in which—

Figure 1 represents an elevation of my improvement detached from the telephone instrument, parts being broken away to better illustrate the construction. Fig. 2 is a view similar to Fig. 1, showing the switch in
85 position to permit the coin to pass to the cash-box; Fig. 3, a view similar to Fig. 1, showing the switch in position to permit the coin to pass to a position outside of the instrument; Fig. 4, a sectional view showing
90 part of a telephone instrument with my improvement applied thereto; Fig. 5, a diagrammatic view showing my invention and so much of the telephone apparatus at central as is necessary to show the operative connection of my improvement therewith; and
95 Fig. 6 a jack-plug, the usual leads connected thereto, and an additional signal forming part of my invention.

Similar reference characters indicate the
100 same parts in the several figures of the drawings.

Reference character A designates a support of any suitable form, which is secured within the telephone instrument A², as shown
105 in Fig. 4.

A magnet B depends from the upper end A' of the support A.

a a indicate a pair of brackets extending from the support A, between which the armature *b* is pivoted. The armature may be provided with a counterbalance *b*².

D indicates the usual lever for supporting a telephone-receiver.

d indicates the pivot for the lever D, and *d'* indicates a projection located on the lever D, preferably at the opposite side of its pivot from the end which supports the receiver.

C designates a chute, the upper end of which is designed to receive a coin or other toll-piece. This chute is provided with projecting lugs *c*, between which is pivoted a movable contact F. Below the lower end of the chute C the upper ends of two other chutes C' and C² unite in a common portion or mouth C³. Within the mouth C³ is pivotally supported a switch E, consisting in a vertical portion and a substantially horizontal portion. The lower end of the switch E is secured to a spindle *e*, journaled in the sides of the mouth C³.

Rigidly secured to the spindle E and extending at substantially right angles to the switch E is a finger *e'*, which is engaged by the lower end of a rod D', the upper end of which is flexibly secured to the extension *d'* on the receiver-lever D. A second projection or finger *e*² extends from the spindle E in a substantially opposite direction from the finger *e'* and is engaged by the end of a rod *b'*, which is rigidly secured to the armature *b* and may conveniently form a continuation of a spindle which supports the armature in bearings formed in the brackets *a a*. A counterbalance H depends from the spindle *e* and is rigidly secured thereto by a rod *h*, extending in a substantially opposite direction from the vertical portion of the switch E. The contact *g'* is supported by and insulated from the chute C and is connected to a lead *g*², which in turn is connected with the winding of the magnet B. The other terminal of the coil of the magnet is connected to a lead *g*³, which continues to the usual line leading to a central station. A visual or other signal M is, as usual, located at the central station and is operated when the user of the telephone closes a circuit through the line connecting the instrument with the central station. A lead *g* is connected with the ground G at one end and at the other is connected with the movable contact F, which is pivotally supported upon the chute C.

Referring particularly to Figs. 5 and 6, *l*⁴ indicates the metallic return, which is connected to the spring-contact *n*². *n*³ indicates a spring-contact connected to the line *g*³. *P'* indicates the usual jack, while *P* indicates a plug for insertion in the jack, to which are connected leads *l*⁸ *l*⁹, adapted to be placed in communication with the second subscriber.

*l*⁵ indicates the usual test-line. H³ indicates a source of high-potential current, which is connected to the ground G³ and, by means of lead *h*³, to a contact adjacent to but normally disengaged from the switch *p*. M² indicates a visual signal connected to the subscriber's line *l*⁹, while H² indicates a battery in circuit with the visual signal M², and *h*² a lead connecting the same to ground at G².

The operation of my invention is as follows: When it is desired to use the instrument, the receiver is removed from its supporting-hook, as usual, and a coin or other toll-piece T is deposited in the upper end of the chute C. The coin drops upon the switch E, as illustrated in Fig. 1, and engages the lower end of the movable contact F, which projects through a slot *c*² in the chute C into the path of the coin. The contact F is swung about its pivot, when its lower end is engaged by the coin, so that the upper end of the movable contact engages the fixed contact *g'*, thereby closing the following circuit: ground G, lead *g*, movable contact F, fixed contact *g'*, lead *g*², the coils of the electromagnet B, lead *g*³, to line, and thence through the armature *n'* of the magnet N' to a lead connected with the coil of the magnet N, thence through the battery H' to ground at G'. The circuit just described causes the armature *n* of the magnet N to be attracted, thereby closing the following circuit: lead *m*³, to lead *m*, to signal M, which in this instance is shown as consisting in an incandescent light, to lead *m'*, to battery H', to lead *m*², to lead *m*⁴, back to the armature *n*. The signal M is consequently operated, and the attention of the operator at central is thereby directed to the fact that some one desires to use the subscriber's instrument corresponding to the signal.

If after the operator at central has communicated with the prospective user of the instrument it is ascertained that conversation may be had with the desired subscriber, the operator inserts the plug P in the jack P', so that the lines *l*⁹ and *l*⁸ are connected, through the switches *p p'*, respectively, and leads *l'* and *l*⁶, with the spring-contacts *n*² and *n*³, which are electrically connected with the lines *g*³ and *l*⁴, constituting the talking-circuit connected in the usual manner with the transmitter and receiver at the subscriber's station. The operator then presses the switch *p* into engagement with the contact at the left thereof, which establishes the following circuit: ground G³, through the high-potential source H³, to lead *h*³, to switch *p*, to lead *l'*, to spring-contact *n*³, to line *g*³, through the magnet B, to contact *g'*, to movable contact F, to lead *g*, to ground G. The high-potential current from the source H³ energizes the magnet B and causes the armature *b* to be attracted, as illustrated in Fig. 2, which through the rod *b'* and finger *e*²

oscillates the spindle e , thereby removing the switch E from beneath the toll-piece T , the latter then dropping into the chute C^2 , which may communicate with a cash-box or other receptacle for the toll-pieces within the instrument. It should be noted that the signal-circuit, which is closed by the coin when it rests upon the switch, as illustrated in Fig. 1, while it includes the magnet B , such magnet is not energized sufficiently to attract its armature b , owing to the low potential of the battery H' at central, which is included in the circuit at such time.

When the plug P is inserted in the jack P' , the circuit which operates the visual signal M is interrupted in the usual manner, and if the operator at central has failed to close the high-potential current through the magnet B , and thereby swing the switch E into the position shown in Fig. 2, in which the coin passes to the cash-box, the failure of the operator to do so will be indicated by the signal M^2 , which is placed in circuit with the signal-circuit through the coin-controlling contacts upon the insertion of the plug in the jack. The circuit of the signal M^2 is as follows: ground G^2 , to lead h^2 , to battery H^2 , to signal M^2 , through the lead which is normally engaged by the switch p , through the switch p , to lead l' , to spring-contact n^3 , to line g^3 , through magnet B , to lead g^2 , to fixed contact g' , thence to movable contact F' , to lead g , to ground at G . The signal M^2 will not be operated if the coin has been allowed to fall into the cash-box, as in such event the circuit above described is broken between the fixed contact g' and movable contact F . If the desired telephonic connection cannot be had, the user of the instrument merely returns the receiver to its supporting-hook, which oscillates the lever D and causes the connecting-rod D' to oscillate the spindle e through the connection of the lower end of the rod D' with the finger e' , so that the switch assumes the position indicated in Fig. 3, which permits the coin T to pass into the chute C' and thence to a position accessible to the user, so that he may regain his coin. It should be noted that if a coin should be deposited in the chute C before the receiver is removed from its supporting-hook the coin would pass through the instrument to the exterior thereof, owing to the position of the switch E being normally such as to guide the coin into the chute C' , as illustrated in Fig. 3.

From the foregoing description it will be observed that I have produced an apparatus for toll-telephones in which the return of the receiver to its supporting-hook causes the coin to pass to the exterior of the instrument, where it may be regained by the user in case the desired telephonic connection cannot be had, so that no action is necessary either on the part of the operator at central or on the part of the user of the instrument in addition

to the usual return of the receiver to its supporting-hook in order that the coin may be regained by the user. It will be further observed that I have provided an arrangement of circuits whereby the failure of the operator at central to transfer the coin to the cash-box after establishing the desired telephonic connection is indicated by an appropriate signal, which is placed in a lead forming a continuance of the signal-line upon the insertion of the jack in the plug.

The term "toll-piece" as used in the claims forming part of this specification is intended to designate a coin, a check, or any suitable device which may be used to control the operation of the mechanism.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit of my invention.

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

1. In a toll-telephone system, the combination with a telephone instrument comprising the usual receiver and supporting-hook therefor, of a chute normally in uninterrupted communication with a point accessible to the user, means actuated by the removal of the receiver from its supporting-hook to intercept the passage of a toll-piece through the chute and actuated by the return of the receiver to its supporting-hook to direct the toll-piece to a position accessible to the user, substantially as described.

2. In a toll-telephone system, the combination with a telephone instrument comprising a receiver and supporting-hook therefor, of a chute for receiving a toll-piece, a switch located relatively to said chute to intercept the passage of the coin or to direct the coin to one side or the other, the portion of said chute above the switch constituting a free and uninterrupted passage-way for the deposited coin, means controlled by the operator at central for moving said switch to one side, and means actuated by the return of the receiver to its supporting-hook for moving said switch to the other side, substantially as described.

3. In a toll-telephone system, the combination with a telephone instrument comprising a receiver and supporting-hook therefor, of a chute normally in uninterrupted communication with a point accessible to the user, a switch located in position to intercept the passage of a coin through said chute, an electromagnet the energization of which is controlled by the operator at central, operative connections between said magnet and said switch for swinging said switch so as to

direct the toll-piece to a position within the instrument, and means connecting said switch to the receiver's supporting-hook whereby the switch is swung so as to direct the toll-piece to a position accessible to the user, substantially as described.

4. In a toll-telephone system, the combination with a telephone instrument, of a signal-circuit connecting said instrument with a signal at a central station, contacts controlling said signal-circuit operated by a toll-piece, electrical connections for continuing said signal-circuit through a second signal at central upon telephonic connection being established with another instrument, and means for transferring the toll-piece from its operative engagement with the circuit-controlling contacts and thereby discontinuing the second signal, substantially as described.

5. In a toll-telephone system, the combination with a telephone instrument, of a signal-circuit connecting said instrument with a signal at a central station, contacts controlling said circuit operated by a toll-piece, a lead connecting said signal-circuit to a jack at the central station, a lead connected to a plug, a signal in last-mentioned lead whereby upon the insertion of the plug in the jack the signal-circuit is completed through the signal connected to the plug, and means for transferring the toll-piece from its operative engagement with the circuit-controlling contacts and thereby discontinuing the second signal, substantially as described.

6. In a toll-telephone system, the combination with a telephone instrument comprising the usual receiver and supporting-hook therefor, of a signal-circuit connecting said instrument with a signal at a central station, contacts adapted to be engaged by a toll-piece to close said circuit, means actuated by the return of the receiver to its supporting-hook to transfer the toll-piece from its operative engagement with the circuit-controlling contacts, electrical connections for continuing said signal-circuit to a second signal at central upon telephonic connection being established with another instrument, and means actuated by the operator at central for transferring the toll-piece from its engagement with the circuit-controlling contacts, substantially as described.

7. In a toll-telephone system, the combination with a telephone instrument comprising the usual receiver and supporting-hook therefor, of a signal-circuit connecting said instrument with a signal at a central station,

contacts engaged by a toll-piece to close said signal-circuit, a lead connecting said signal-circuit to a jack at the central station, a lead connected to a plug, a signal in said last-mentioned lead whereby upon the insertion of the plug in the jack the signal-circuit is completed through the signal connected to the plug, means for transferring the toll-piece from its operative engagement with the circuit-controlling contacts and thereby discontinuing the second signal, and means operatively connected to said means whereby the latter is actuated either by the return of the receiver to its supporting-hook or by the operator at central, substantially as described.

8. In a toll-telephone system, the combination with a telephone instrument, of a chute for receiving a toll-piece, means actuated by the operator at central for storing the toll-piece within the instrument, and means actuated by the establishing of telephonic connection with another instrument to indicate to the operator the failure to store the toll-piece.

9. In a toll-telephone system, the combination with a telephone instrument, of a chute for receiving a toll-piece, a switch located in position to intercept the passage of the toll-piece through the chute, means for transferring the toll-piece from said switch to a point inaccessible to the user, and means actuated upon the establishing of telephonic connection with another instrument to indicate to the operator the presence of a toll-piece upon said switch.

10. In a toll-telephone system, the combination with a telephone instrument comprising a receiver and supporting-hook therefor, of a chute for receiving a toll-piece, a switch located in position to intercept the passage of a coin through said chute, the portion of said chute above the switch constituting a free and uninterrupted passage-way for the deposited toll-piece, means for moving said switch so as to direct a toll-piece to a position within the instrument, and means actuated by the return of the receiver to its supporting-hook for moving said switch so as to direct the toll-piece to a position accessible to the user.

In testimony whereof I sign this specification in the presence of two witnesses.

THADDEUS R. LAING.

Witnesses:

GEO. L. WILKINSON,
CURT D. VOSBURGH.