

No. 886,031.

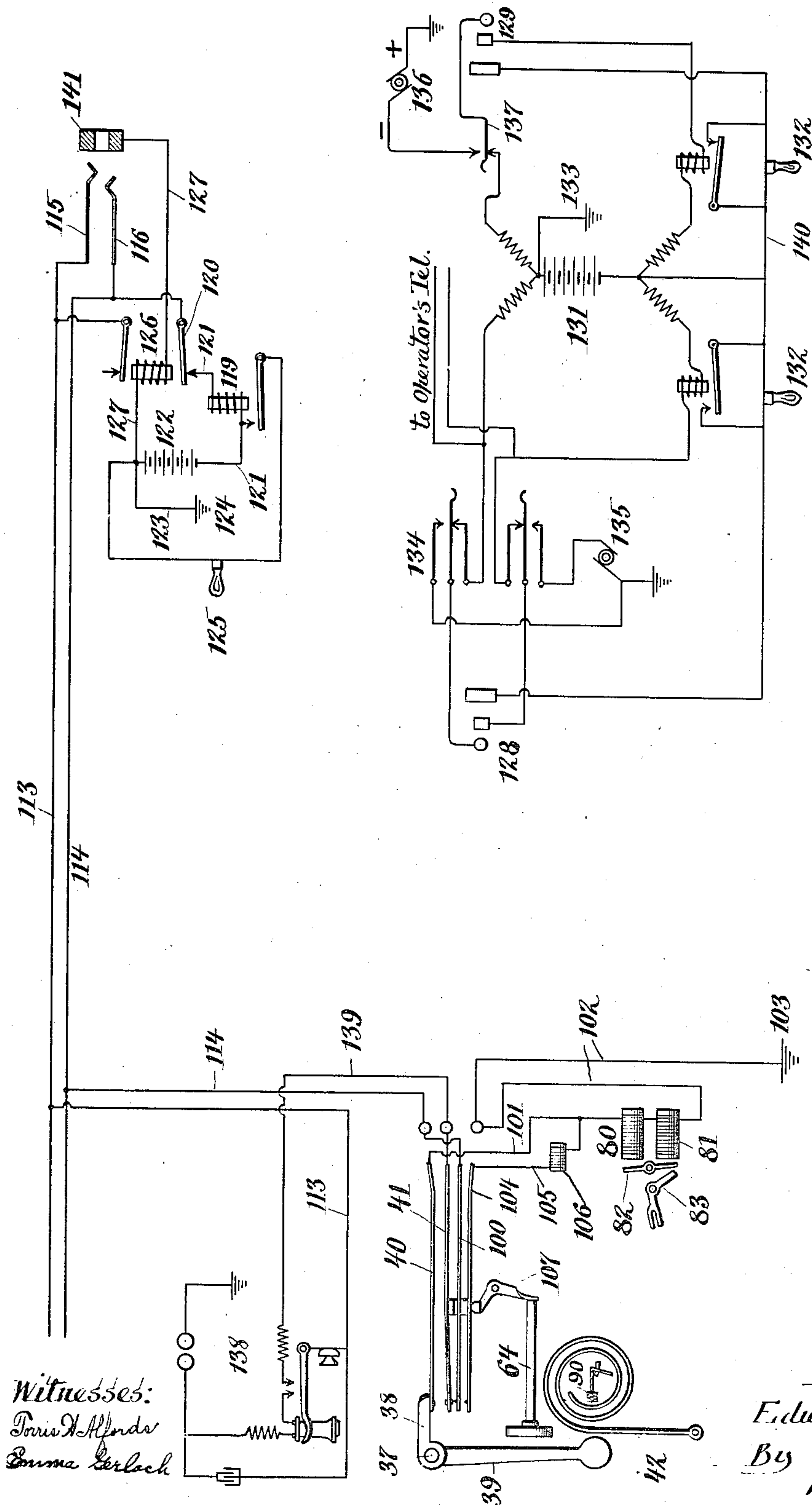
PATENTED APR. 28, 1908.

E. P. BAIRD.

TOLL TELEPHONE SYSTEM.

APPLICATION FILED JAN. 27, 1902. RENEWED MAR. 19, 1906.

4 SHEETS—SHEET 1.



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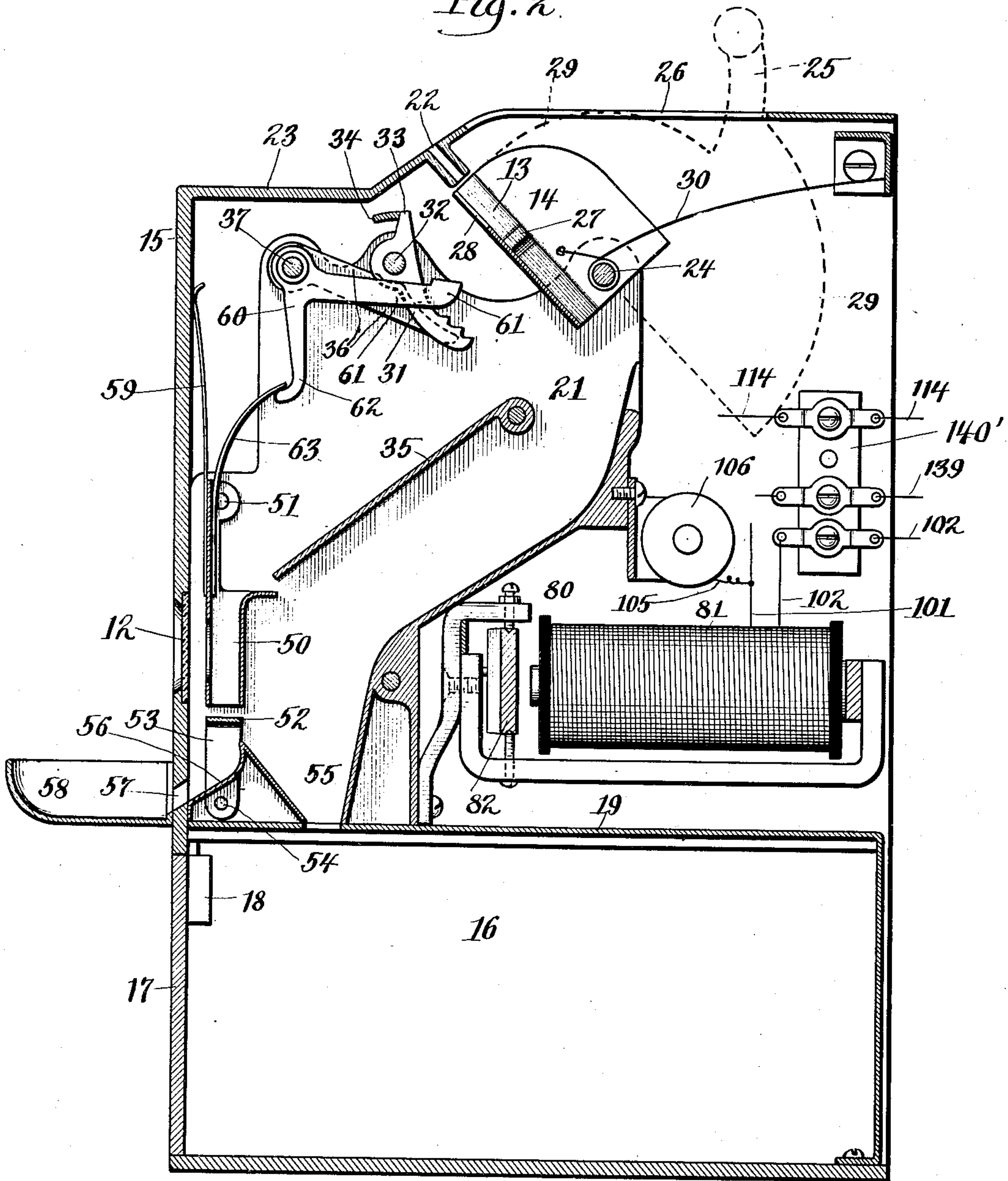
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4 SHEETS—SHEET 2.

Fig. 2.



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4. SHEETS—SHEET 3.

Fig. 3.

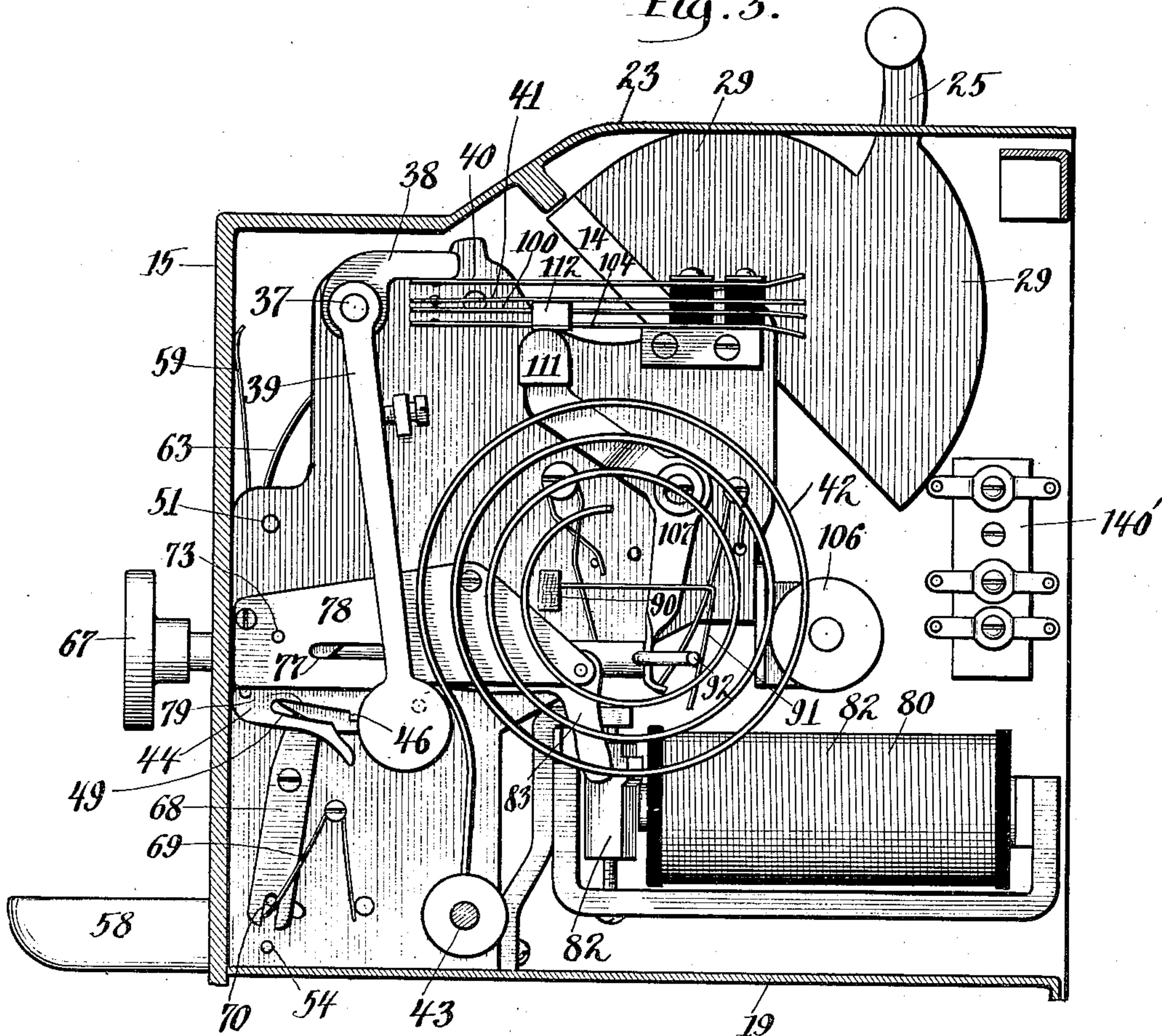
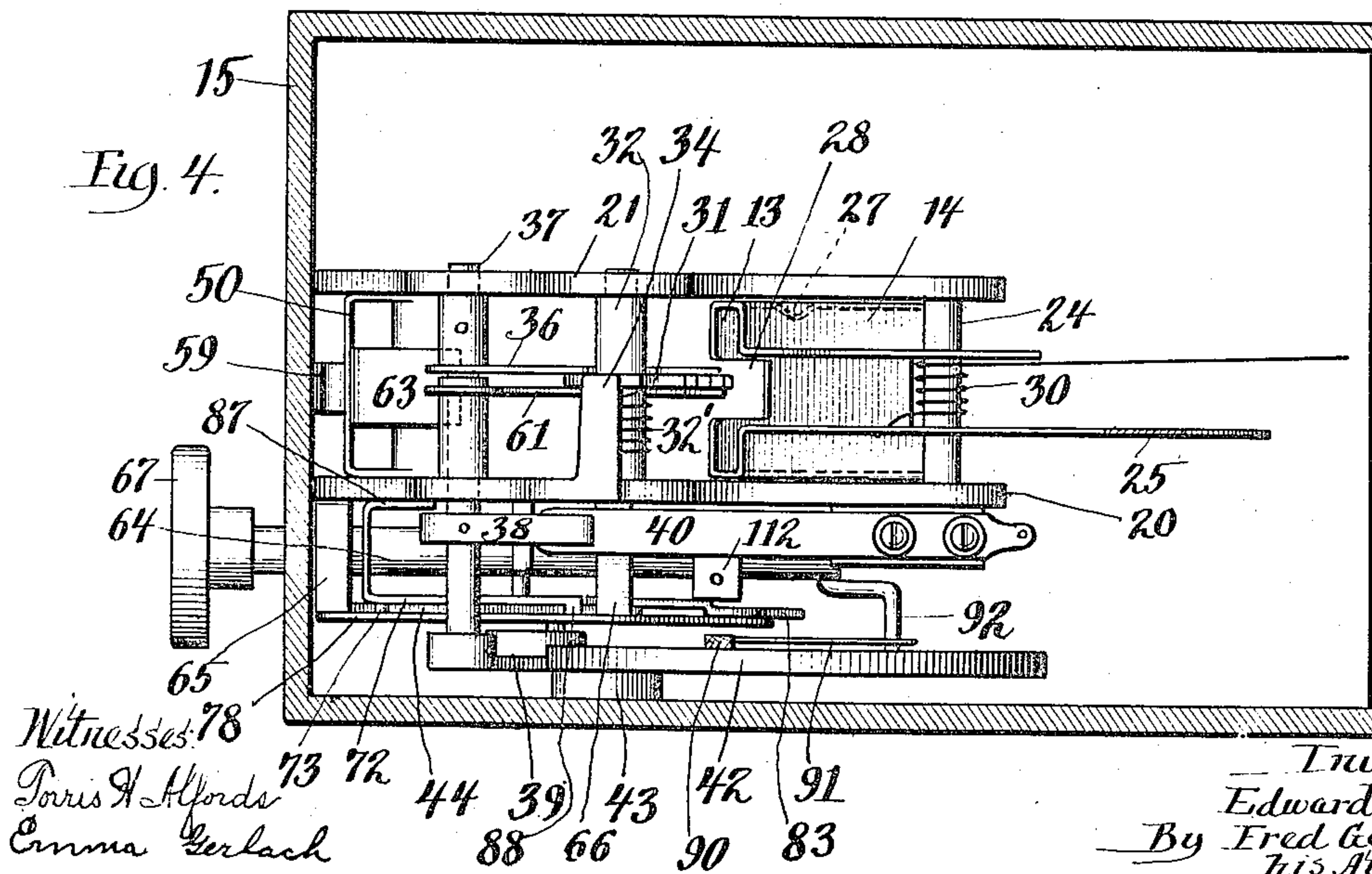



Fig. 4.



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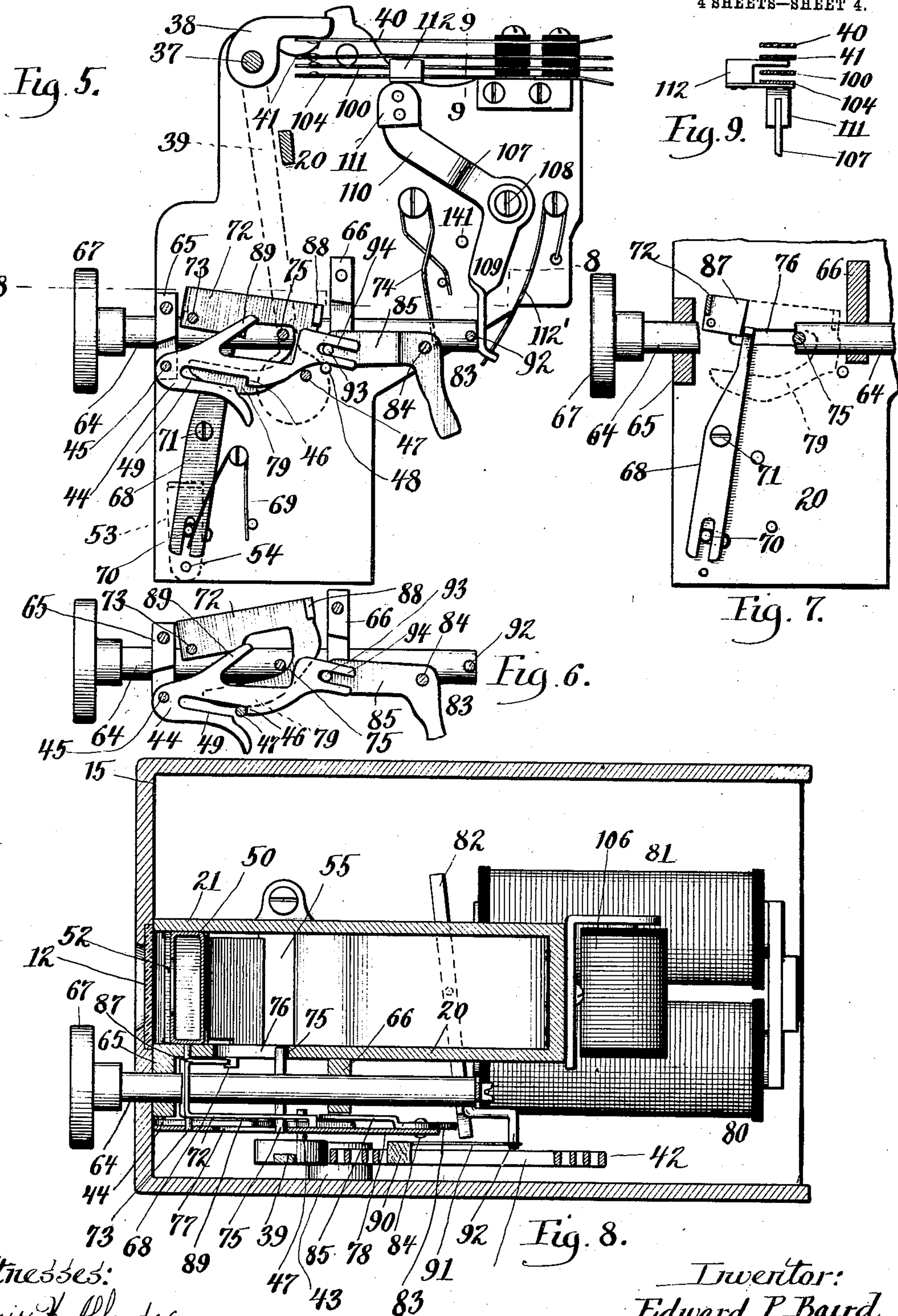
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UNITED STATES PATENT OFFICE.

EDWARD P. BAIRD, OF EVANSTON, ILLINOIS, ASSIGNOR TO BAIRD MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TOLL TELEPHONE SYSTEM.

No. 886,031.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed January 27, 1902, Serial No. 91,345. Renewed March 19, 1906. Serial No. 306,908.

To all whom it may concern:

Be it known that I, EDWARD P. BAIRD, a resident of the city of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Toll Telephone Systems, of which the following is a full, clear, and exact description.

The invention relates more particularly to apparatus for collecting toll, and to telephone-lines associated therewith.

The invention designs to provide the following, viz: an improved toll-receiving apparatus; an improved apparatus which requires the deposit of a coin to cause the actuation of the line-signal at central office, and which permits refund of a coin in event the desired service cannot be given; a toll-apparatus in which the coin distributor-mechanism can be manually actuated to refund a coin, and including means whereby the refunding mechanism can be secured against manual operation; a toll telephone system in which the coin distributor-mechanism of the toll-apparatus is actuated by the depositor, and in which the central operator can secure the refunding mechanism against manual operation to refund a coin; a toll-receiving apparatus, in which the distributor-mechanism is manually actuated to displace a coin into the coin-receptacle, during the deposit of a coin, with coin-refunding-means operable by the depositor; a toll-apparatus which requires the deposit of a coin to actuate the line-signal at central office, and which comprises coin-refunding means operable to refund a coin if the signal-circuit is inoperative, so the line-signal will not be actuated; an improved toll-telephone system which requires the deposit of a coin to cause the actuation of the line-signal at central-office, and which includes coin refunding means, the manual actuation whereof, is under control of the central operator, and whereby the coin can be withdrawn by the depositor, if the telephone-line is inoperative; an improved toll-apparatus in which a polarized or selective relay is employed to control the operation of the distributor-mechanism, and in which means are provided for preventing alternating current which actuates the call-signal at the substation, from actuating the polarized relay; improved means for holding the coin-controlled switch which controls the passage of current over a signal circuit, in

shifted position; improved mechanism for controlling the actuation of a manually actuated coin distributor-mechanism; and a toll-telephone system which is simple in construction and efficient in operation.

The invention consists in the several novel features hereinafter described, and more particularly defined by claims at the conclusion hereof.

In the drawings: Figure 1 is a diagrammatic view of a telephone-line associated with the improved toll-apparatus; Fig. 2 is a view in central vertical longitudinal section of a toll-apparatus, embodying the preferred form of the invention; Fig. 3 is a view in side elevation, the inclosing case being shown in section; Fig. 4 is a plan view, the inclosing casing being shown in section; Fig. 5 is a detail view in side elevation of the frame and parts secured thereto, and parts being shown in normal position; Fig. 6 is a detail view showing some of the parts shown in Fig. 5, in shifted position; Fig. 7 is a detail view of the locking-dog, and the lever whereby the distributor-mechanism is operated to refund a coin; Fig. 8 is a view of the toll-apparatus in horizontal section taken on line 8—8 of Fig. 5; Fig. 9 is a sectional view taken on line 9—9 of Fig. 5.

A case 15 having an open back, and containing the several parts of the toll-apparatus is usually secured to the back-board of a telephone, so the audible signals produced by the toll-apparatus at the substation will be clearly conducted over the telephone-line to central station. Case 15 is of any suitable construction, and is usually provided with a compartment or receptacle 16 for containing the coins or toll-representing checks, received in payment for telephone service. A door 17 secured in the case by a lock 18, affords access to compartment 16, so coins or checks can be withdrawn. A support or frame comprising side-walls 20 and 21, and secured to horizontal wall 19, sustains the operating-mechanism of the toll-apparatus.

A coin-receiving slot 22 is formed in the top-wall 23 of the case. A manually-actuated coin-carrier 14 is pivotally sustained by rod 24 sustained in walls 20, 21, of the frame. Coin-carrier 14 is normally inclined, provided with a coin-channel or guide 13 extending entirely therethrough, and with a lever 25 extended through slot

26 in the case. A stop 27 located in the coin-channel 13, holds a coin of proper size in the carrier, while a coin of smaller size will pass therethrough, and thence into coin compartment 16. A notch 28 formed in the carrier, and adjacent the front or upper edge thereof, exposes a portion of a coin, for engagement with mechanism hereinafter described, during the shift of the coin-carrier.

10 The free terminal of lever 25 is located outside of the case, so the depositor can actuate the carrier manually. Lever 25 is provided with wing 29, which obstructs lever-slot 26 and prevents the insertion of articles there-
15 through, and also obstructs the receiving-slot except when the carrier is in normal position. Coins are positively shifted by the carrier to effect positive shift of the coin-actuated or controlled parts of the toll-appa-
20 ratus.

A spring 30 imparts reverse movement to the coin-carrier, and retains the carrier normally in position to receive a coin inserted through receiving-slot 22. A dog 31 pivotally sustained by cross-rod 32 journaled in frame 20, 21, is provided with a series of teeth, and is pressed normally into position shown in Fig. 2, and into the path of travel of a coin in carrier 14, by a spring 32'. The
30 teeth of dog 31 are successively engaged by the coin during the descent of the carrier, and prevent retraction of the carrier, until carrier and coin have passed below the dog and the coin has been discharged. Spring
35 32' engages dog 31 and holds an extension 33 of dog 31 against stop 34 secured to wall 20. A coin discharged from the carrier will gravitate into a distributor-mechanism, being directed thereto, by a guide or wall 35.

40 The apparatus is designed to require the deposit of a coin before the "line signal" at central station is actuated, and to refund the coin, if the desired service cannot be given. A coin-distributing mechanism is provided,
45 whereby a coin will be temporarily retained, and whereby the coin will be displaced into compartment 16, or refunded to the depositor. The coin-distributor-mechanism (see Fig. 2) comprises a chute 50 pivotally
50 sustained at 51 in the side-walls of the frame, and a coin-rest 52 positioned normally beneath the chute, and sustained by arms 53 pivotally sustained at 54. Passage
55 55 at the rear of rest 52 directs a coin into coin-compartment 16, when chute 50 is shifted to displace the coin. If desired, an opening and translucent plate 12 may be provided to display a coin held in chute 50, so a bogus coin can be detected.

60 Guide 56 beneath movable rest 52 directs a coin from chute 50, (when rest 52 is shifted) through an exit 57, and into a receiver 58 secured to the outside of the front wall of the case.

65 A spring 59 retains chute 50 normally in

position above rest 52 (see Fig. 2). Displacement of a coin into coin-compartment 16, is effected manually by the shift of the carrier during the transit of the next deposited coin to the distributor-mechanism, *i. e.*,
70 a deposited coin for which service has been given remains in the distributor-mechanism until another coin is deposited, and during the transit of the latter coin to the distributor-mechanism, the previously deposited coin
75 will be displaced into coin-compartment 16. The mechanism for shifting the coin-chute to displace a coin into coin-compartment 16, comprises a bell-crank lever 60 pivotally sustained by cross-shaft 37, and hav-
80 ing an arm 61 extending normally into the path of movement of a coin in the carrier, and an arm 62, engaging a slightly flexible extension or strip 63 secured to distributor-chute 50. Arm 61 is engaged by a coin dur-
85 ing the initial part of the downward shift of coin and carrier.

The operation of the mechanism for displacing coins into the coin-compartment, will be as follows: A coin held in the carrier
90 will, during the initial part of the shift thereof, engage arm 61, shift bell-crank lever 60, and swing the chute rearwardly against the force of spring 59, and into position to re-
95 move the previously deposited coin (if any), from rest 52, and into guide or passage 55, and thence into the coin-compartment. As the coin in the carrier engages arm 61 only
100 during the initial part of the downward movement of the carrier, arm 61 will be released and spring 59 will restore distributor-chute 50 to normal position before the coin
105 is discharged from the carrier. During each deposit of a coin, and its transit to the distributor-mechanism, the distributor-mechanism will be operated to displace a pre-
110 viously deposited coin, (if any), into the coin-compartment, and the distributor-chute will be restored to normal position in readiness to receive the last deposited coin. A coin
115 inserted by a depositor desiring service will be retained in the distributor-chute. If the desired telephonic connection can be obtained, the coin remains in the distributor-chute until displaced into the coin-compartment by the succeeding operation of the carrier.

A shifter-arm 36 projecting normally into the path of travel of a coin in the carrier, is secured to a cross-shaft 37 journaled in
120 the frame. Shaft 37 extends through side-wall 20 of the frame, and has secured thereto, a switch-arm 38 of insulating material. Switch-arm 38 engages a spring-contact 40 interposed in a signal circuit, hereinafter de-
125 scribed, and closes the circuit when shifted by a deposited coin. When the signal circuit is closed, the "line signal" at the central station will be actuated to notify the operator that, a coin has been deposited, and a
130

connection is desired, and the switch-arm will retain the circuit closed, until the switch-arm is released.

Simultaneously with the closing of the 5 signal-circuit, a striker-lever 39 secured to shaft 37 will be shifted in readiness to be released, to cause the production of an audible signal. Striker 39 actuates a gong 42, sustained as at 43 by one of the side-walls of the 10 case. A latch 44 pivotally sustained at 45 is provided with a hook 46 which engages an inwardly projecting stud 47 of the striker 39, and holds the striker and switch-arm in shifted position. A fixed stop 48 (see Fig. 5) restricts the downward movement of 15 latch 44 and a slot 49 insures the descent of latch 44 and the engagement of hook 46 and stud 47 during the shift of the striker. Stud 47 travels forwardly of hook 46 and passes 20 into slot 49. Spring contact 40 exerts an upward pressure against the switch-arm, and holds the switch-arm and striker normally in position shown in Fig. 5. When shifted by the deposit of a coin, the striker will be held 25 (by latch 44) in position to actuate the sound-producing body 42, when the striker is released.

Switch-arm 38 being secured to shaft 37 will be held in position to close the signal- 30 circuit, while the striker-lever is held by latch 44. The audible signal produced by striker 38 and gong 42 confirms the actuation of the line-signal at central station, and notifies the central operator that the signal- 35 circuit has not been closed by fraudulent means. The actuation of the device for producing an audible signal is deferred until the central operator has connected the operator's circuit with the substation so the line-signal 40 at central station will remain actuated for the same period. Latch 44 retains switch-arm 38 and striker 39 in shifted position, until the coin is withdrawn by the depositor.

The present invention designs *inter alia* to 45 provide an improved apparatus which requires the deposit of a coin to cause the actuation of the line-signal (or other device whereby the central office is "called") at central office and which will permit the deposited coin to 50 remain in control of the depositor until the central operator responds to the call. For example, if the telephone line is out of order, so communication cannot be had with the central office, the deposited coin can be with- 55 drawn. The operation and construction of the coin - distributor - mechanism are such, that a coin deposited to establish communication with central office, and cause the actuation of the line-signal, can be withdrawn 60 by the depositor until the central operator operates the releasing mechanism and locks the coin refunding means. The mechanism for locking the refunding means is under control of the central operator, so the locking- 65 mechanism can be released to permit the de-

posited coin to be manually withdrawn if the desired telephonic connection cannot be established.

The coin refunding means is operable by 70 the depositor, and comprises a rod 64 mounted in manner free to slide in guide-lugs 65, 66, of the frame, a handle 67 secured to the front terminal of rod 64, and whereby the rod may be shifted and a lever 68 pivotally 75 secured to the frame at 71, and having its lower end connected by a stud and slot 70 to one of the arms 53 of the movable coin-rest 52, of the distributor mechanism. A locking-dog 72 is pivotally sustained in the 80 frame as at 73, and thereby the operating-lever 66 of the movable coin-rest is secured against shift in that direction in which the withdrawal of the coin is effected. A spring 74 holds rod 64 normally in position seen in 85 Fig. 5, and restores the rod to normal position after shift in forward direction. Rod 64 is secured against rotation, and reciprocatory play thereof is limited by a stud 75, secured to said rod, and extended into a slot 76 in side-wall 20 of the frame, and into a 90 slot 77 formed in a plate or supplemental frame-side 78 secured to lugs 65 and 66 of the frame. The inwardly projecting portion of stud 75 is positioned to engage the 95 upper terminal of lever 68, and shift said lever and the movable coin-rest. The outwardly projecting portion of stud 75 is arranged to engage an arm or extension 89 on latch 44 and lift the latch to release the 100 striker and switch-arm when rod 64 is shifted to refund a coin, while striker 39 and switch-arm 38 are in shifted position. Spring 69 holds lever 68, and coin-rest 52 in normal position seen in Fig. 5. An arm 87 of the 105 locking-dog secures lever 68 against shift by rod 64 when the dog is in normal position. An extension 97 of locking-dog 72 is engaged by stud 47 of the striker, while the striker is in shifted position, and thereby the locking-dog will be held in raised position to 110 retain arm 87 out of the path of coin-rest operating-lever 68, while the striker-lever is in shifted position, and said parts serve to hold the locking-mechanism so the refunding means is operable until the releasing mechanism under control of the central operator 115 is actuated to restore switch 38 to normal position. Locking-dog 72 is provided with a lug 88 positioned to be engaged by latch 44. Such means provide mechanism where- 120 by the releasing mechanism can shift the locking dog to render the refunding means operable by the depositor independently of the mechanism for holding striker and switch in shifted position. 125

When switch arm 38 and striker 39 have been shifted the holding mechanism will be in position seen in Fig. 6 of the drawings. And, if the telephone-line is operative, the line-signal at central office will be actuated. 130

After having ascertained that the circuit whereover conversation is conducted is operative and establishing communication with the substation, the operator will actuate a releasing mechanism, which causes the switch-arm, the striker, the latch, and the locking-dog, to be restored to normal position. If, however, the telephonic communication cannot be established with central office, so the line-signal cannot be actuated, the depositor can withdraw the deposited coin, by pulling rod 64. The parts being then in shifted position, (see Fig. 6) forward shift of rod 64 will cause stud 75 to engage lever 68, which will shift coin-rest 52 backwardly and allow the deposited coin to gravitate from the distributor-mechanism, through exit 57 into receiver 58. Manifestly, therefore, the depositor can withdraw a deposited coin if no response is received from central office. Such withdrawal of a deposited coin, will also cause stud 75 to engage arm 89, and lift the latch. Such shift of the latch will free the striker and permit the striker and switch-arm to be restored to normal position. When rod 64 is released the locking-dog will descend into normal position, and secure lever 68 against forward shift.

When the coin-refunding means is operated, the production of an audible signal is prevented by a muffler 90 sustained by a flexible support 91. A finger 92 secured to rod 64 engages the muffler-support 91, and holds the muffler out of contact with gong 42, while the rod is in normal position, and when the rod and finger are drawn forwardly to withdraw a coin, the muffler will promptly engage the gong and prevent the production of an audible signal by the striker. Such means prevent the actuation of the device for producing the confirmatory audible signal, unless the coin which has caused the actuation of the line-signal is allowed to remain in the apparatus. If the audible signal is not heard, when the central operator sends current over the line to operate the releasing mechanism, the operator will know that the deposited coin has been withdrawn.

The releasing-mechanism for shifting locking-dog 72 into and out of position to secure the distributor-mechanism against manual operation, and for releasing the striker to actuate gong 42, comprises a polarized relay 80 provided with electro-magnets 81, an armature 82, and a releasing lever 83 pivotally sustained as at 84 in plate 78, and having an arm arranged in the path of travel of one terminal of armature 82, and an arm 85 connected by stud 93, and slot 94 to latch 44. Relay 80 is secured to the frame in any convenient manner. Electro-magnets 81 are interposed in the signal-circuit, and the magnet is wound in such manner that the terminal of armature 82 adjacent the releasing

lever 83 will be attracted when current of one sign *e. g.*, positive, is impressed into the signal-circuit. The armature is normally positioned by a suitable spring on the releasing-lever, so the end adjacent the releasing lever is against the magnet. Therefore positive current will not shift the armature. When current of the other sign, *i. e.*, negative, is impressed into the signal-circuit by the central operator, the opposite end of the armature will be attracted by the polarized relay, and the end adjacent releasing-lever 83, will be repelled and engage releasing lever 83. When striker 39, switch-arm 38, and dog 72 are in shifted position, and the releasing mechanism is operated, the releasing-lever will lift latch 44 out of engagement with stud 47 of the striker 39, thus releasing the striker, and switch-arm, and withdrawing stud 47 from engagement with arm 79 of the locking-dog, so the dog will be restored to normal position and will secure lever 68 against movement.

When the releasing-mechanism is actuated by the central operator while switch 38 and locking-dog 72 are in normal position, releasing lever 83 will lift latch 44, which will then engage lug 88 of the dog and lift the dog so the refunding-means can be operated. Negative current is impressed into the circuit, when the operator has established communication with the calling substation, and had ascertained that the telephone-line is operative. When such current is sent over the line, and the striker and switch-arm are in shifted position, the releasing-mechanism will thus cause the release of the switch-arm to break the signal-circuit, the release of striker 39 to cause the production of a confirmatory audible signal, and release of the locking-dog, which secures the coin-rest 52, so the deposited coin cannot be manually withdrawn. All of the mechanisms will then be restored to normal position, in readiness for succeeding operations.

A switch-lever 107 controls normally closed contacts 41, 100, included in the telephone-line extending between central exchange and substation, and a contact 104, whereby circuit is completed for the operation of the releasing mechanism. Lever 107 is pivotally secured at 108 to wall 20 of the frame, is provided with an arm 109, held normally against the inner terminal of rod 64, by a spring 112', and with an arm 110 having a terminal 111 of insulating material. The forward movement of lever 107 is restricted by a stop 141. Terminal 111 of the switch lever 107 is arranged to engage contact 104, and shift said contact against contact 100, when switch-lever 107 is shifted out of normal position, and a block 112, of insulating material, and secured to contact 104, straddles contact 100, (see Fig. 9) is extended beneath contact 41, and simultaneously separated

rates the normally engaged contacts 41 and 100, and breaks the circuit over which conversation is conducted when switch-lever 107 is shifted. A resistance coil 106 is conveniently secured to the frame, and is included in the circuit controlled by contact 104. A terminal block 140' provided with binding-posts in suitable number, is secured in case 15 for convenience in connecting the electrical conductors of the apparatus with the telephone-line.

Referring more particularly to Fig. 1, 113 and 114 are branches of a telephone-line connecting a substation and a central exchange, and terminate respectively in line-springs 115 and 116 of a spring-jack of usual construction. A line-relay 119 is associated with each subscriber's line, and is included in a signal circuit comprising branch 114 of the telephone-line, switch 120, conductor 121, 20 extending to battery 122, and conductor 123 grounded at 124. When energized, line-relay 119 causes actuation of visual signal (such as a lamp) 125 in a local circuit. A cut-out relay 126 included in a circuit which extends from ground at 124 and by conductor 127 to the test-ring, excludes the line-relay from the signal-circuit, when the operator inserts a plug into the spring-jack.

A cord-circuit and usual associated parts are provided at central station, and include plugs 128, 129, centralized battery 131, supervisory signals 132, grounded conductor 133, "ringing key" 134 and alternating-current generator 135 connected together in 35 manner well understood in the art. Current of the negative sign for the operation of the releasing mechanism may be impressed into the line from a suitable generator or other source of potential 136, normally excluded from the cord-circuit at switch 137.

At substation, branch 114 terminates at contact 100 of the toll-apparatus, and branch 113 connects with a telephone-set 138 comprising the usual parts and including a transmitter, induction-coil, signal-bell, and switch hook, connected together as shown and as well understood in the art. A conductor 139 extends from a terminal adjacent the switch-hook to contact 41 of the toll-apparatus. 45 Contacts 100 and 41 retain the telephone-line normally closed at the toll-apparatus, to render the telephone-line operative for communication between the exchange and the substation. Contact 104 of the toll-apparatus is arranged beneath and normally out of contact with terminal 100, of the telephone-line, and is connected with conductor 105 having resistance-coil 106 (say 500 ohms) included therein, and which is connected with a conductor 101. Contact 40, which is shifted by the coin-controlled switch-arm, is connected by conductor 101 with magnets 81 of relay 80, and by conductor 102 with ground 65 as at 103. Contact 40 controls the signal-

circuit and when shifted, will close the signal circuit to cause the actuation of the line-signal. Current impressed into the signal-circuit to actuate the line-relay is of that sign which will not shift armature 82 of the releasing-mechanism from its normal position. 70 Armature 82 is normally held with the side adjacent the releasing lever in position nearest its magnet, and therefore when the signal-circuit (wherein polarized relay 80 is included) is closed by the shift of switch-arm 38 and the line signal is actuated, armature 82 and releasing lever 83 will remain in normal position, while striker 39 and switch-arm 38 will remain in shifted position. 75 80

Coil 106 prevents operation of the releasing-mechanism by alternating current used to actuate the call signal at substation. Rod 64 has a limited initial play before engaging the locking-dog, and during the initial part of forward movement of said rod, switch-lever 107 will shift contacts 104 and 41, and force contact 104 against contact 100, and simultaneously disengage contacts 100 and 41 to exclude the telephone set from the line. 85 90 When negative current is impressed into the line at central office, and rod 64 is shifted, such current can pass from branch 114, by contacts 100, 104, conductor 105, through resistance 106, magnets 81, and thence by conductor 102 to ground. Negative current used to operate the releasing-mechanism is of sufficiently high potential to pass through coil 106 and energize relay 80. 95

The operation of the apparatus will be as follows: A patron desiring service will deposit a coin into the carrier and actuate the carrier to deposit the coin or token into the distributor-chute. During such operation, a previously deposited coin (if any) will be displaced into the coin-compartment, striker 39 will be set in position to produce an audible signal and switch-arm will be shifted and held to close the normally open signal-circuit at contacts 40, 41. Latch 44 will then retain the striker and switch-arm in shifted position, and stud 47 will hold locking-dog 72 out of the path of lever 68, so the distributor-mechanism can be actuated by the depositor to withdraw a coin. 100 105 110 115

If the telephone-line is inoperative so central exchange cannot be "called", the depositor will pull rod 64 and cause stud 75 to shift lever 68 and coin-rest 52 so the deposited coin will be refunded. During such manual withdrawal of a deposited coin, locking-dog 72, striker 39, switch-arm 38, will be restored to normal position, and muffler 90 will engage gong 42 and prevent production of an audible signal. 120 125

If the signal-circuit is operative, current will pass from ground at 124, through conductor 123, battery 122, conductor 121, line-relay 119, switch 120, branch 114 of the line, contacts 100, 41, 40, at the substation, con- 130

ductor 101, magnets 81 of relay 80, and conductor 102 to ground 103. The signal-circuit will then be closed, and the line-signal 125 will be actuated, but such current, being
 5 of the positive sign, will not operate the releasing-mechanism.

Central operator in response to the "line signal" will insert plug 129 into the spring-jack of the switch-board, establish telephonic
 10 connection with substation in usual manner, and inquire of the depositor what connection is desired. If no response is received from substation, central operator will know that the line is inoperative, and will withdraw
 15 plug 129 from the spring-jack and leave the toll-apparatus in position assumed after deposit of a coin. The depositor can then withdraw the coin.

Upon being informed of the connection
 20 desired, the operator will know that the telephone system is operative, and will shift switch 137 to cause current of the negative sign to pass over the line and effect the operation of the releasing-mechanism. Such
 25 current will then pass from ground 103, through conductor 102, magnets 81 of relay 80, conductor 101, contacts 40, 41, 100, conductor 114, respectively, and through line-spring 116, plug 129, switch 137, to generator
 30 136 and thence to ground. Armature 82 will then be shifted to operate releasing-lever 83, and lift latch 44. Thereupon the striker will be released from latch 44, and actuate gong 42 to produce a confirmatory audible signal,
 35 switch-arm 38 will be restored to normal position to break the signal-circuit at contacts 40, 41, and the locking-dog will be restored to secure lever 68 whereby the coin-rest is shifted to refund the coin, against movement.
 40 The audible signal notifies the central operator that the deposited coin has remained in the toll-apparatus. The operator will then ascertain if the desired connection can be made, and establish the desired communication if such can be done. If the desired
 45 service is given, no further operation by the operator is necessary as the deposited coin, is no longer under control of the depositor and will remain in the distributor-chute until
 50 displaced into the coin-compartment during the succeeding deposit of a coin.

If the desired connection cannot be given, *e. g.*, if the line called for, is "busy", the operator will inform depositor orally, or by
 55 "busy signal", as well understood in the art, that the desired service cannot be given, and again impress current of negative sign into the line by switch 137. The depositor will then pull rod 64 to effect the withdrawal
 60 of the deposited coin. During the initial forward shift of rod 64, switch-lever 107 will be shifted, the talking circuit will be broken at contacts 41, 100, and contact 104 will be lifted into engagement with contact 100.
 65 Negative current will then pass from ground

103 through conductor 102, magnets 81, conductor 105, resistance-coil 106, contacts 104, 100, conductor 114, line-spring 116 plug 129, and switch 137 to generator 136, and
 70 thence to ground. Energization of magnets 81, by such current will cause the operation of releasing-lever 85 and effect the shift of latch 44 which will engage lug 88 of dog 72 and lift said dog out of the path of lever 68,
 75 so that during the latter part of the forward shift of rod 64, the lever will be vibrated to shift coin-rest 52, and permit the coin to gravitate into receiver 58. During such
 80 shift of rod 64, the telephone-line which is normally closed at contacts 41, 100, is opened and current is grounded through resistance-coil 106.

Upon completion of circuit for passage of negative current, supervisory signal 132
 85 will notify the central operator of the refunding-operation at the substation. Upon separation of contacts 100, 41 of the toll-apparatus, the telephone-line is broken and passage of current from battery 131 and the
 90 conductor connecting said battery and the sleeve of plug 129 is discontinued, and the supervisory-relay breaks the shunt-loop around the supervisory-signal, so current will pass through said signal and over a circuit as follows, viz: ground 133, battery 131,
 95 conductor 140 (wherein supervisory-signal 132 is included), body of plug 129, test-ring 141, conductors 127, 123, and ground 124. Thus the supervisory-signal notifies the exchange operator of the refund of the coin,
 100 whereupon the operator makes disconnection of the cord-loop from the switch-board.

Resistance-coil 106 prevents actuation of the releasing-mechanism by the alternating
 105 current employed to actuate the call signal, should attempt be made to withdraw a coin in the distributor-chute, while alternating current is passing over the line, because shift of rod 64 will promptly open the line at
 110 contacts 41, 100, and ground the current through conductor 105, and resistance-coil 106.

Manifestly, the invention provides toll-apparatus which can be associated with
 115 party line telephones. The invention possesses several important advantages. The toll-apparatus is simple in operation and construction. If the service desired by a patron can be given, no operation upon the part of
 120 the central operator is necessary to displace the deposited coin into the coin-drawer, because during the transit of the next deposited coin to the distributor-mechanism, the previously deposited coin will be displaced into
 125 the coin-compartment. The mechanism for controlling the actuation of the line signal is coin controlled and positively shifted by a coin. The confirmatory audible signal notifies the operator that the deposited coin has
 130 not been withdrawn, and that the signal cir-

cuit has not been closed by fraudulent means, at subscriber's station. If the signal circuit is inoperative, the coin can be withdrawn by the depositor, and furthermore, if the circuit over which conversation passes is inoperative, the operator will become aware of the defect, and refrain from placing the coin beyond control of the depositor. The refunding mechanism while manually operated, is so constructed that the deposited coin cannot be withdrawn unbeknown to the operator. The toll-apparatus can be associated with party line telephones in which a grounded call signal is used, and the operation of the releasing-mechanism which controls the manually operated distributor-mechanism cannot be effected by alternating current used to actuate the call signal. The distributor-mechanism is normally locked against manual shift. The contacts and conductors of the toll-apparatus are normally disconnected from the telephone-line, and do not interfere with the passage of current over the circuit over which conversation is conducted.

The term "coin" as used herein is to be understood to include not only coins, but all toll representing tokens, which may be used in lieu thereof.

Obviously, the invention is not to be understood as restricted to the construction and arrangement shown and described, but may be varied within wide limits without departing from the spirit of the invention, and furthermore, the novel features may be employed severally without adoption in entirety.

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

1. In a toll-apparatus, the combination with coin-refunding-means of shifting-means operated by the depositor, for operating the refunding-means, and means whereby the shift of the refunding-means by the shifting-means can be controlled.

2. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, shifting-means operable by the depositor, for operating the refunding-means, and means whereby shift of the refunding-means by the shifting-means can be controlled by the exchange-operator.

3. In a toll-apparatus, the combination with coin-refunding-means, of shifting-means operated by the depositor, for operating the refunding-means, and means whereby the shift of the refunding-means by the shifting-means can be controlled, said refunding-means being normally inoperative.

4. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, shifting-means, operated by the depositor, for op-

erating the refunding-means, and means whereby the operation of the refunding-means by the shifting-means can be controlled by the exchange-operator, said refunding-means being normally inoperative.

5. In a toll-apparatus, the combination with coin-refunding-means, of shifting-means for operating said refunding-means, and means rendering the refunding-means shiftable by the shifting-means when a coin is deposited.

6. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, of shifting-means for operating said refunding-means, said refunding-means being normally inoperative, means rendering the refunding-means operative by the shifting-means, when a coin is deposited, and means whereby the exchange operator can control the operation of the refunding-means.

7. In a toll-apparatus, the combination with coin-refunding-means, of shifting-means for operating said refunding-means, said refunding-means being normally inoperative, means rendering the refunding-means operative by the shifting-means when a coin is deposited, and means rendering the refunding-means inoperative when a coin is refunded.

8. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, of shifting-means for operating said refunding-means, said refunding-means being normally inoperative, means rendering the refunding-means operative by the shifting-means when a coin is deposited, means rendering the refunding-means inoperative when a coin is refunded, and means whereby the exchange-operator can control the operation of the refunding-means.

9. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, shifting-means operated by the depositor for operating the refunding-means, and means whereby the exchange operator can prevent the shift of the refunding-means by the shifting-means.

10. In a toll-apparatus, the combination with coin-refunding-means, of coin-shifting-means operated by the depositor, for operating the refunding-means, means preventing shift of the refunding-means by the shifting-means, and means controlling said preventing-means.

11. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, shifting-means operated by the depositor, for operating the refunding-means, means preventing the operation of the refunding-means by the shifting-means, and means whereby the exchange-operator can control the operation of the preventing-means.

12. In a toll-apparatus for telephones, the combination with coin-refunding-means, operated by the depositor, of means whereby a coin can be displaced into a receptacle, means
5 operating said displacing means during each deposition of a coin, to displace a previously deposited coin, and means for controlling the actuation of the refunding-means.

13. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means operated by the depositor, means whereby a coin can be displaced into a receptacle, means
10 operating said displacing means during each deposition of a coin to displace a previously deposited coin, and means whereby the exchange-operator can control actuation of the refunding-means.

14. In a toll-apparatus for telephones, the combination with coin-refunding-means operated by the depositor, of means whereby a coin can be displaced into a receptacle, means
20 operating said displacing-means during the transit of a coin to said displacing-means, to displace a previously deposited coin.

15. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means operated by the depositor, of means whereby a coin can be displaced into a receptacle, means
30 operating said displacing-means during the transit of a coin to said displacing-means, to displace a previously deposited coin, and means whereby the exchange-operator can control the actuation of the refunding-means.

16. In a toll-apparatus for telephones, the combination with coin-refunding-means, of shifting-means for operating the refunding-means, and means securing the refunding-means against shift by the shifting-means.
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17. In a toll-telephone-system, the combination with a telephone-line, of a toll-apparatus comprising coin-refunding-means, of shifting-means operated by the depositor,
45 for operating the refunding-means, means securing the refunding-means against operation by the shifting-means, and means whereby the exchange-operator can release the refunding-means to render the refunding-means operative by the shifting-means.
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18. In a toll-apparatus the combination with coin-refunding-means, means normally securing the refunding-means against operation to refund a coin, and means whereby
55 the securing-means will be released to render the refunding-means shiftable by the shifting-means.

19. In a toll-telephone-system, the combination with a telephone-line of a toll-apparatus comprising coin-refunding-means, shifting-means operated by the depositor for operating the refunding-means, means normally securing the refunding-means against operation, means whereby the securing-means will be operative by the shifting-means.
65

means when a coin is deposited to permit operation of the refunding-means by the depositor, and means whereby the exchange-operator can shift the securing-means to render the refunding-means operable by the depositor. 70

20. The combination with a telephone line, extending from a sub-station to a central office, of a toll-apparatus at the substation having manually-operated refunding mechanism, a switch board circuit including a source of current, a connecting switch for connecting the same to the line, and an electro-magnetic lock for the refunding mechanism responsive to the current applied by said connection switch. 75 80

21. The combination with a telephone line, of a toll-apparatus having a temporary coin receiver, a return chute leading therefrom, manually operated refund mechanism for transferring the coin from the temporary receiver to said return chute, blocking mechanism adapted to prevent the operation of the refund mechanism, an electric magnet controlling the blocking mechanism, having a winding connection with the telephone line, a source of current, and means for connecting the same with the line, to actuate the said magnet. 85 90

22. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, a lock for securing said refunding means against actuation, and means whereby the central operator can control the operation of the refunding means. 95 100

23. In a toll-apparatus, the combination with coin-refunding-means, of shifting-means operated by the depositor, for operating the refunding-means and a lock whereby the refunding-means can be secured against operation by the depositor. 105

24. In a toll-telephone system, the combination with a telephone-line of coin-refunding means, means whereby the depositor can shift the refunding-means, a lock whereby the refunding-means will be secured against actuation by the depositor, and means whereby the central operator can cause the shift of said lock. 110 115

25. In a toll telephone system the combination with a telephone line, of coin-refunding means, a lock whereby the refunding-means can be secured against actuation by the depositor to refund a coin, and means whereby the central operator can cause the shift of said lock to permit refund. 120

26. In a toll-apparatus the combination with coin refunding means operable by the depositor, of locking-means for securing said refunding means against actuation by the depositor, and means whereby the refunding-means will be rendered operative, when a coin has been deposited. 125

27. In a toll-telephone system, the combination with a telephone line, of a toll-apparatus comprising coin-refunding means, a lock for securing said refunding means against actuation by the depositor, and means whereby the central operator can cause the shift of said lock to permit refund. 130

nation with a telephone-line, of a toll-apparatus comprising coin refunding means operable by the depositor, locking-means for securing the refunding means against actuation by the depositor to refund a coin, means whereby the refunding means will be rendered operative, when a coin has been deposited, and means whereby the central operator can control said locking-means to prevent actuation of the refunding means.

28. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, locking-means for securing the refunding means against actuation to refund a coin, means whereby the central operator can effect the shift of said locking-means to release said refunding means, and means operated by the depositor for operating the refunding means.

29. In a toll-apparatus for telephones the combination with coin refunding means, of a locking-means for securing the refunding means against actuation to refund a coin, means for causing the shift of said locking means to release said refunding means, means whereby said refunding means can be actuated by the depositor to refund a coin, and means which will cause said locking-means to be restored to position to secure the refunding means after such refunding.

30. In a toll-apparatus for telephones, the combination of coin refunding means, locking-means for securing the refunding means against actuation to refund a coin, means for causing the shift of said locking-means to release the refunding means, and means for holding said locking-means in shifted position.

31. In a toll-apparatus for telephones, the combination with coin refunding means, of a lock for securing the refunding means against actuation to refund a coin, means for causing said lock to be shifted to release said refunding means, said means comprising a relay, and means whereby the refunding means can be actuated by the depositor to refund a coin.

32. In a toll-apparatus for telephones, the combination of coin refunding means, locking-means for securing the refunding means against actuation, means for causing the shift of said locking-means to release said refunding means, means for holding said locking-means in released position, and means whereby said refunding means may be actuated by the depositor.

33. In a toll-apparatus for telephones, the combination with coin refunding means, of locking-means for securing the refunding means against actuation, releasing mechanism for causing the shift of said locking-means, means for causing the locking-mechanism to be held in shifted position, and means whereby the refunding means can be actuated by the depositor.

34. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, of locking-means for securing the coin refunding means against actuation, releasing-mechanism for causing the shift of said locking-means, means whereby the central operator can cause the locking-means to be held in shifted position, and means whereby the refunding means can be actuated by the depositor.

35. In a toll-apparatus for telephones, the combination with coin refunding means, of locking-means for securing the refunding means against actuation to refund a coin, means for causing said locking-means to release said refunding means, means for retaining said locking-means in released position, means whereby said refunding means can be actuated by the depositor and means which will cause said locking means to be restored to position to secure the refunding means after said refunding.

36. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, locking-means for securing said refunding means against actuation to refund a coin, means for holding said locking means in position to permit actuation of the refunding means to refund a coin, releasing mechanism whereby the central operator can cause the locking-means to release the refunding means, means which will cause said locking-means to be restored to position to secure the refunding means after actuation of said mechanism to refund a coin, and means whereby said refunding means can be actuated by the depositor.

37. In a toll-apparatus for telephones, the combination with coin refunding means, of locking-means for securing the refunding means against actuation, mechanism for holding said locking-means in position to release the refunding means and means whereby said locking-means can be shifted independently of said mechanism to release said refunding means.

38. In a toll-apparatus for telephones, the combination with coin refunding means, locking-means for securing said refunding means against actuation to refund a coin, mechanism for holding said locking-means in position to release the refunding means, means whereby said locking-means can be shifted independently of the holding-mechanism to release said refunding means, said shifting means being under control of the central operator, and means whereby the refunding means can be actuated by the depositor.

39. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation, for controlling passage of current over said circuit.

cuit, coin refunding means, means whereby the refunding means can be actuated by the depositor, and means whereby the refunding means can be secured to prevent refund of a coin.

40. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, coin refunding means, means whereby the refunding means can be actuated by the depositor, and means whereby the central operator can cause the refunding means to be secured against actuation by said actuating means.

41. In a toll-telephone system, the combination with a telephone-line, and a signal circuit including a line-signal at the central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, coin-refunding-means, means whereby the refunding-means can be operated by the depositor, the refunding-means being operative by said means when said switch has been shifted to cause the actuation of the line-signal, and means whereby operation of the refunding-means by the operating-means can be prevented.

42. In a toll-telephone system, the combination with a telephone-line and a signal-circuit including a line-signal at the central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, coin refunding-means, means whereby said refunding-means may be actuated by the depositor, said refunding-means being operative by said actuating-means when said switch has been shifted to cause the actuation of the line-signal, and means whereby the central operator can cause the refunding-means to be secured against actuation.

43. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at the central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, coin-refunding means, means whereby said refunding-means may be actuated by the depositor, said refunding-means being free to be actuated by said actuating-means when said switch has been shifted to cause actuation of the line-signal, and normally secured against actuation by the depositor, and means whereby the central operator can secure the refunding-means against actuation by the depositor.

44. In a toll-apparatus, the combination with coin refunding means, of a coin-controlled switch, locking-mechanism for securing the refunding means against actuation by the depositor, means for holding said switch in shifted position to cause the actuation of the line-signal, the refunding means

being free to permit withdrawal of a coin while said switch is held in position to actuate the line-signal, and releasing-mechanism for said switch.

45. In a toll-telephone system, the combination with a telephone-line and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation, coin refunding means, shifting means for operating the refunding means, locking-mechanism for securing said refunding means against actuation by the depositor, means for holding said switch in position to cause actuation of the line-signal, said refunding means being free to permit withdrawal of a coin while said switch is held in position to actuate the line-signal, and releasing-mechanism whereby the central operator can cause the switch to be restored to normal position.

46. In a toll-telephone system, the combination with a telephone-line, a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit means for holding said switch in shifted position, coin refunding means, means whereby said refunding means may be actuated by the depositor to refund a coin, means whereby said refunding means will be secured to prevent actuation thereof, means whereby said means for securing the distributor will be held in position to permit actuation of the refunding means while the switch is in shifted position, and means whereby the central operator can simultaneously release said switch holding means, and cause the securing means to secure the refunding means.

47. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, means for holding said switch in shifted position, coin refunding-means, means whereby said refunding-means may be actuated by the depositor to refund a coin, means whereby said refunding-means will be secured to prevent actuation thereof, means whereby said switch-holding means will be shifted to cause the release of said switch, and means whereby the securing-means will be shifted to secure the refunding-means when the switch is released.

48. In a toll-telephone system, the combination with a telephone-line and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the substation for controlling passage of current over said circuit, coin-refunding-means, shifting-means operated by the depositor for operating the refunding-means, said refunding-means being operative by the shifting-means when a coin has been deposited, and inde-

pendently of the signal-circuit, so inoperativeness of the line will not prevent refunding of a coin, and means for controlling the operation of the refunding-means when the signal-circuit is operative.

49. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the sub-station for controlling passage of current over said circuit, a latch for holding said switch in shifted position, coin refunding means, means whereby the refunding means can be actuated by the depositor to refund a coin, means whereby said refunding means will be secured to prevent actuation thereof, means whereby said latch will be shifted to release said switch and means whereby the securing means will be shifted to cause the refunding means to be secured when the switch is released.

50. In a toll-telephone system, the combination with a telephone-line, a signal-circuit including a line-signal at central office, of a coin-controlled switch at the sub-station for controlling passage of current over said circuit, a latch for holding said switch in shifted position, coin refunding means, means whereby said refunding means can be actuated by the depositor to refund a coin, a locking-dog for securing the refunding means against actuation, means whereby said latch will be shifted to release the switch, and means which will cause the shift of said dog to secure the refunding means when said switch is released.

51. In a toll-telephone system, the combination with a telephone line, and a signal-circuit including a line-signal at central office, of a coin-controlled switch at the sub-station for controlling passage of current over said circuit, a latch for holding said switch in shifted position, coin refunding means, means whereby the refunding means can be actuated by the depositor to refund a coin, means whereby the refunding means will be secured to prevent actuation thereof, means whereby the central operator can cause the simultaneous shift of said latch to release said switch and the shift of the securing means to cause the refunding means to be secured.

52. In a toll-apparatus for telephones, the combination with a coin-controlled switch, of coin shifting means, coin refunding means, a locking-mechanism, means for holding said locking-mechanism and said switch in shifted position, and releasing mechanism for the switch and the locking-mechanism.

53. In a toll-apparatus for telephones, the combination with a coin-controlled switch, of coin shifting means, coin refunding means, means for holding said switch and locking-mechanism in shifted position, and releasing-mechanism for the switch and the locking-

mechanism, said releasing-mechanism serving also to release the locking-mechanism independently of the switch.

54. In a toll-apparatus for telephones, the combination with a coin-controlled device for producing an audible signal, said device comprising a sound producing body and an actuating part, means for shifting one of the parts of the said device to produce a signal, and means whereby the production of a signal can be prevented when one of the parts of said device is shifted to actuate said device.

55. In a toll-apparatus for telephones, the combination with a coin-controlled device for producing an audible signal, said device comprising a sound producing body and an actuating part, means for shifting one of the parts of the said device to produce a signal, and a muffler whereby the production of a signal can be prevented when one of the parts of said device is shifted to actuate said device.

56. In a toll-apparatus for telephones, the combination with coin refunding means of a device for producing an audible signal, said device comprising a sound producing body and a striker, means whereby said mechanism may be actuated by the depositor, means for causing engagement of the parts of said device, and means for preventing the production of a signal when the refunding means is operated.

57. In a toll-apparatus for telephones, the combination with coin refunding means, of a device for producing an audible signal, said device comprising a sound producing body and a striker, means whereby said mechanism may be actuated by the depositor, means for causing engagement of the parts of said device, and a muffler for preventing the production of a signal when the refunding means is actuated.

58. In a toll-telephone-system, the combination with a telephone-line, of an electric-circuit including a coin-controlled-switch at the substation, a line-signal and a conductor at the substation, having a polarized relay included therein, said relay being responsive to current employed in causing actuation of the line-signal, and a toll-apparatus comprising a part shifted by said relay, when current in reverse direction is impressed into the circuit, said part remaining inoperative when the line-signal-current passes through said relay, and a source of potential for said circuit.

59. In a toll-telephone-system, the combination with a telephone-line, of an electric-circuit including a coin-controlled-switch at the substation, a line-signal a grounded conductor at the substation and having a polarized relay included therein, said relay being responsive to the current employed for causing actuation of the line-signal, and a toll-apparatus comprising a coin-distributor-

mechanism, controlling means for said mechanism and shifted by said relay when current in reverse direction is impressed into the circuit, the controlling means remaining unshifted by said relay, when line-signal-current is impressed into the circuit, and a source of potential for said circuit.

60. In a toll-telephone system, the combination with a telephone-line of an electrical circuit, a toll apparatus including a normally open switch at the sub-station, a conductor leading from said switch, a normally closed switch included in the telephone-line, a relay included in said conductor, means whereby the normally closed switch will be shifted to exclude the telephone, when the normally open switch is shifted to close said circuit, and a source of potential for said circuit.

61. In a toll-telephone system, the combination with a telephone-line, an electrical circuit a normally open switch included in said circuit and located at the sub-station, and a conductor connected with said switch, of a toll-apparatus comprising a coin-distributer-mechanism, a controlling mechanism including a relay included in said conductor, a normally closed switch included in the telephone-line, and means whereby said normally closed switch will be opened to exclude the telephone when said normally open switch is shifted to cause actuation of said relay.

62. In a toll-telephone system, the combination with a telephone-line, an electrical circuit, a normally open switch included in said circuit, and located at the sub-station and a conductor connected with said switch, of a toll-apparatus comprising a coin-distributer-mechanism which may be actuated by the depositor, a controlling-mechanism including a relay included in said conductor, a normally closed switch included in the telephone-line, means whereby said normally open switch will be shifted when the distributor-mechanism is actuated by the depositor, and means whereby said normally closed switch will be shifted to exclude the telephone when said normally open switch is shifted.

63. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, operating means for the refunding means and shifted by the depositor and a controlling-mechanism including a relay, an electrical circuit wherein said relay is included, a normally open switch at the subscriber's station, and for controlling passage of current over said circuit, and through said relay, a source of potential for said circuit, a switch at central station under control of the central operator and means whereby the depositor will shift said normally open switch to cause actuation of said relay when the operating means is shifted by the depositor.

64. In a toll-telephone system, the combination with a telephone-line of a toll-apparatus comprising coin refunding means, operating means for the refunding means, and operated by the depositor, and a controlling-mechanism including a relay an electrical circuit wherein said relay is included, a normally open switch for controlling passage of current over said circuit, and through said relay, a source of potential for said circuit, a switch under control of the central operator, and means whereby said normally open switch will be shifted to cause current to pass through said relay when the operating means is shifted by the depositor to refund a coin.

65. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus at the sub-station a signal-circuit including a line-signal at central office, a normally open coin-controlled switch included in said circuit, a grounded conductor connected with said switch, a polarized relay included in said conductor, a source of potential for causing actuation of the line-signal when said switch is closed, mechanism shifted by said relay, said relay being responsive to line-signal current and permitting said mechanism to remain in normal position when current is passing over said circuit to cause actuation of the line-signal and means whereby the central operator can impress current in reverse direction into said circuit to actuate said relay and shift said mechanism.

66. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus at the sub-station, and comprising a coin-distributer-mechanism which can be actuated by the depositor, mechanism for controlling the actuation of the distributor-mechanism by the depositor, a signal-circuit including a line-signal at central-office, a normally open coin-controlled switch included in said circuit, a polarized relay included in a grounded conductor leading from said switch, said relay serving to shift said controlling mechanism, and being constructed to permit said mechanism to remain in normal position when current is passing over the circuit to cause actuation of the line-signal, means whereby the central operator can impress current in reverse direction into said circuit to actuate said relay and cause the shift of said controlling-mechanism, and a source of potential for said circuit.

67. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus at the sub-station, and comprising a coin-distributer-mechanism which can be actuated by the depositor, mechanism for controlling the actuation of the distributor-mechanism by the depositor, a signal-circuit including a line-signal at central office, a

normally open coin-controlled switch, included in said circuit means for holding said switch in shifted position, a polarized relay included in a grounded conductor leading from said switch, said relay serving to shift said controlling mechanism and holding-means, and being constructed to permit said mechanism to remain in normal position when current is passing over the circuit to cause actuation of the line-signal, means whereby the central operator can impress current in reverse direction into said circuit to actuate said relay, and cause the shift of said controlling-mechanism, and the release of said switch, and a source of potential for said circuit.

68. In a toll-telephone system, the combination with a telephone-line, and a signal-circuit including a line-signal at central office, of a toll-apparatus comprising a coin-distributor-mechanism, a coin-controlled switch, a switch which can be shifted by the depositor, a relay, both of said switches being connected with a conductor wherein said relay is included and a source of potential for said circuit.

69. In a toll-telephone system, the combination with a telephone-line and a signal-circuit including a line-signal at the central office of a toll-apparatus comprising a coin-distributor-mechanism, a normally open coin-controlled switch, a controlling-mechanism comprising a relay included in a conductor connected with said switch, a switch controlled by the depositor and whereby current can be passed through said relay when said coin-controlled switch is open, and a source of potential for said circuit.

70. In a toll-telephone system, the combination with a telephone-line and a signal-circuit including a line-signal at the central office, of a toll-apparatus comprising a coin-distributor-mechanism, a normally open coin-controlled switch, a controlling-mechanism comprising a relay included in a conductor connected with said switch, a switch controlled by the depositor and whereby current can be passed through said relay when said coin-controlled switch is open, means for holding said coin-controlled switch in closed position, means which will cause said holding means to release the coin-controlled switch when said relay is actuated means whereby said switch may be released by the depositor, and a source of potential for said circuit.

71. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising coin refunding means, operating means for said refunding means and operated by the depositor, a relay, a nor-

mally open switch, shifted by the depositor when the refunding means is to be operated, said switch serving to cause passage of current through said relay, a switch whereby the central operator can impress current into said circuit, and a signal at the central office, and which will indicate to the central operator when the switch at the sub-station is shifted to close said circuit.

72. In a toll-telephone system, the combination with a telephone-line, of a toll-apparatus comprising a coin-distributor-mechanism, means whereby said mechanism can be actuated by the depositor, controlling-mechanism comprising a relay, a normally open switch, the shift whereof is caused by said means, said switch allowing passage of current through said relay, a switch whereby the central operator can impress current into said circuit, a source of potential for said circuit, and a supervisory signal at the central office, and which will indicate closing of the circuit at the sub-station.

73. In a toll-telephone system, the combination with a telephone-line, including a normally closed switch at the sub-station, of a toll-apparatus comprising a coin-distributor-mechanism, means whereby said mechanism may be actuated by the depositor, a controlling mechanism including a relay, a switch shifted by the depositor and for allowing flow of current through said relay, and arranged to connect with the telephone-line, and means for preventing actuation of said relay when the switch which is shiftable by the depositor is shifted by the depositor, when alternating-current is impressed into the telephone to actuate the call-signal at the sub-station.

74. In a toll-telephone system, the combination with a telephone-line including a normally closed switch at the sub-station, of a toll-apparatus comprising a coin-distributor-mechanism, means whereby said mechanism may be actuated by the depositor, a controlling-mechanism including a relay, a normally open switch which is shiftable by the depositor, a grounded conductor connected with said normally open switch, a resistance included in said conductor and for preventing actuation of said relay by alternating current employed to actuate the call-signal, and means whereby the normally closed switch will be shifted to open the line, when the normally open switch is shifted by the depositor.

EDWARD P. BAIRD.

In presence of—

FRED GERLACH,
EMMA GERLACH.