

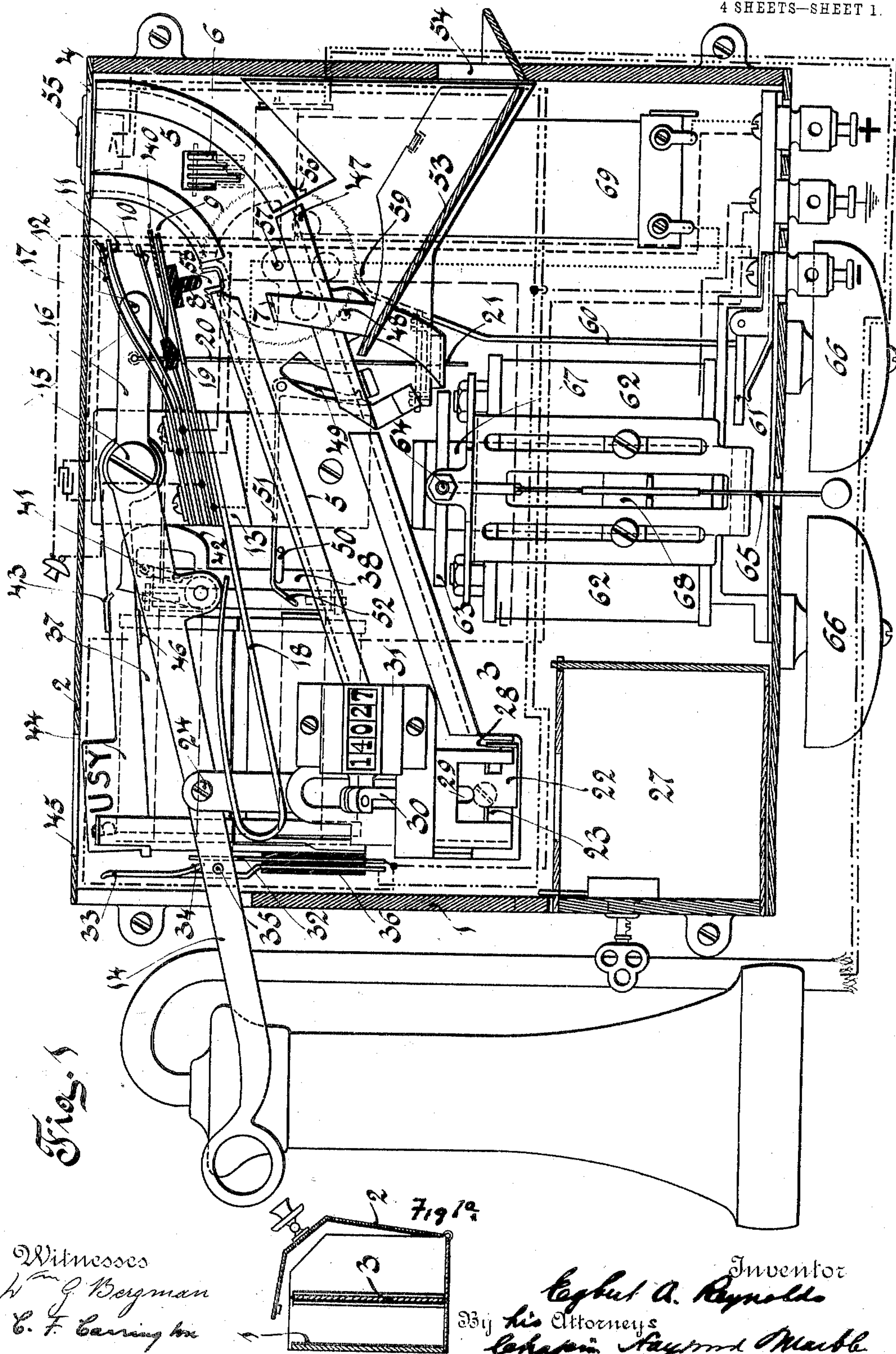
No. 817,389.

PATENTED APR. 10, 1906.

E. A. REYNOLDS.
COIN CONTROLLED TELEPHONE SYSTEM.

APPLICATION FILED AUG. 19, 1904.

4 SHEETS—SHEET 1.



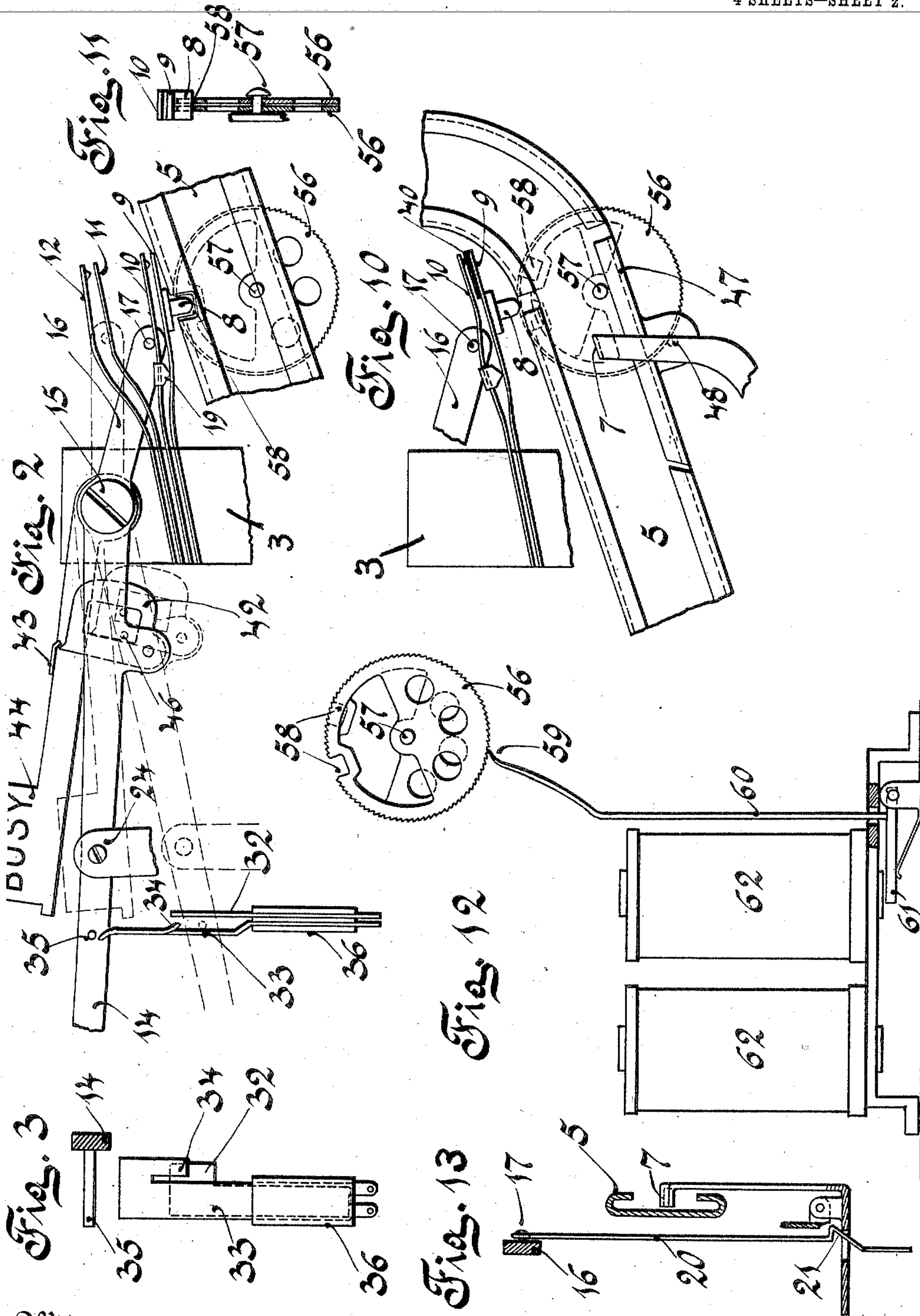
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Witnesses
W. G. Bergman
C. F. Carrington

Inventor
E. A. Reynolds
By his Attorneys
Chapin Raymond Marble

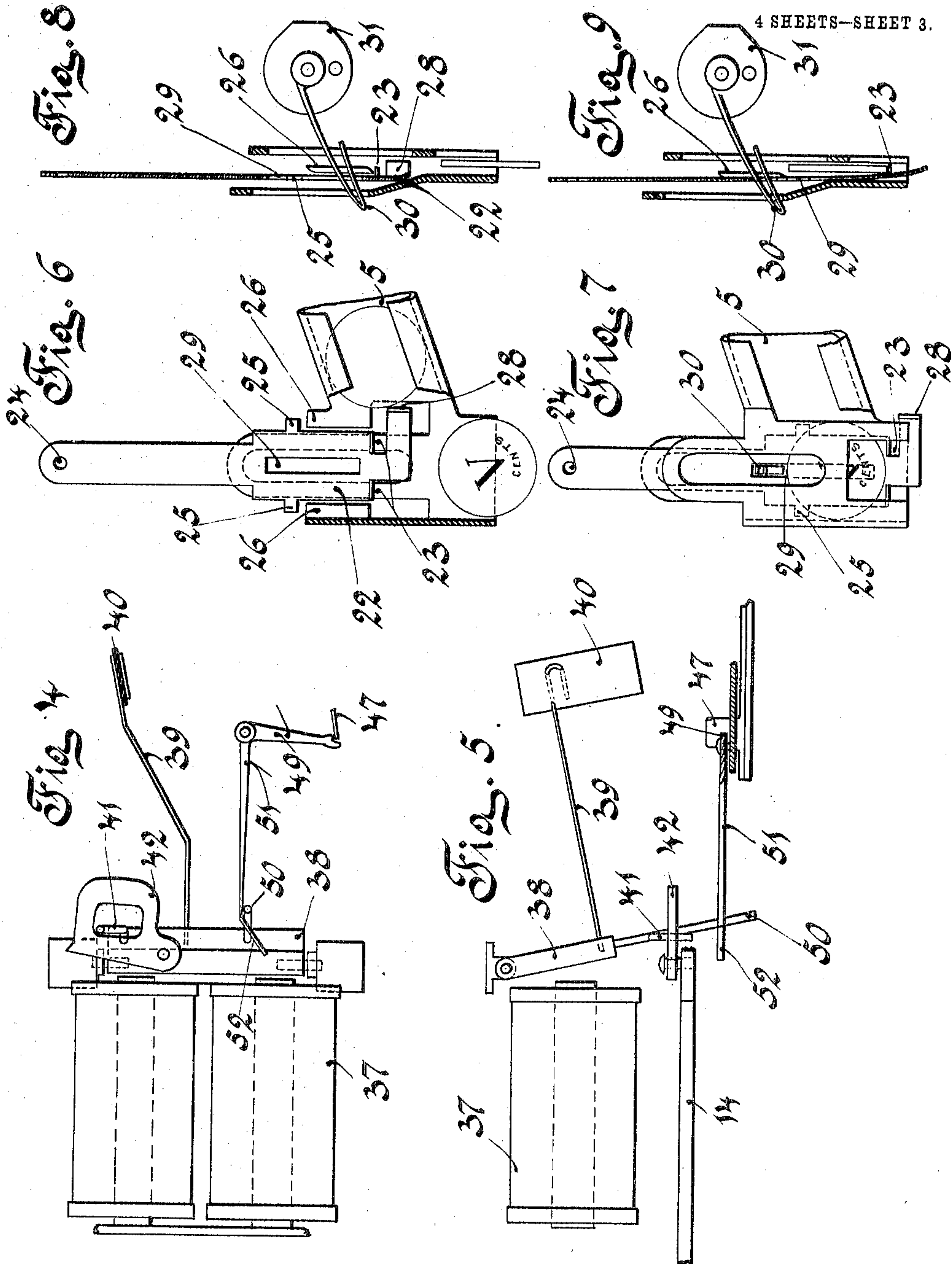
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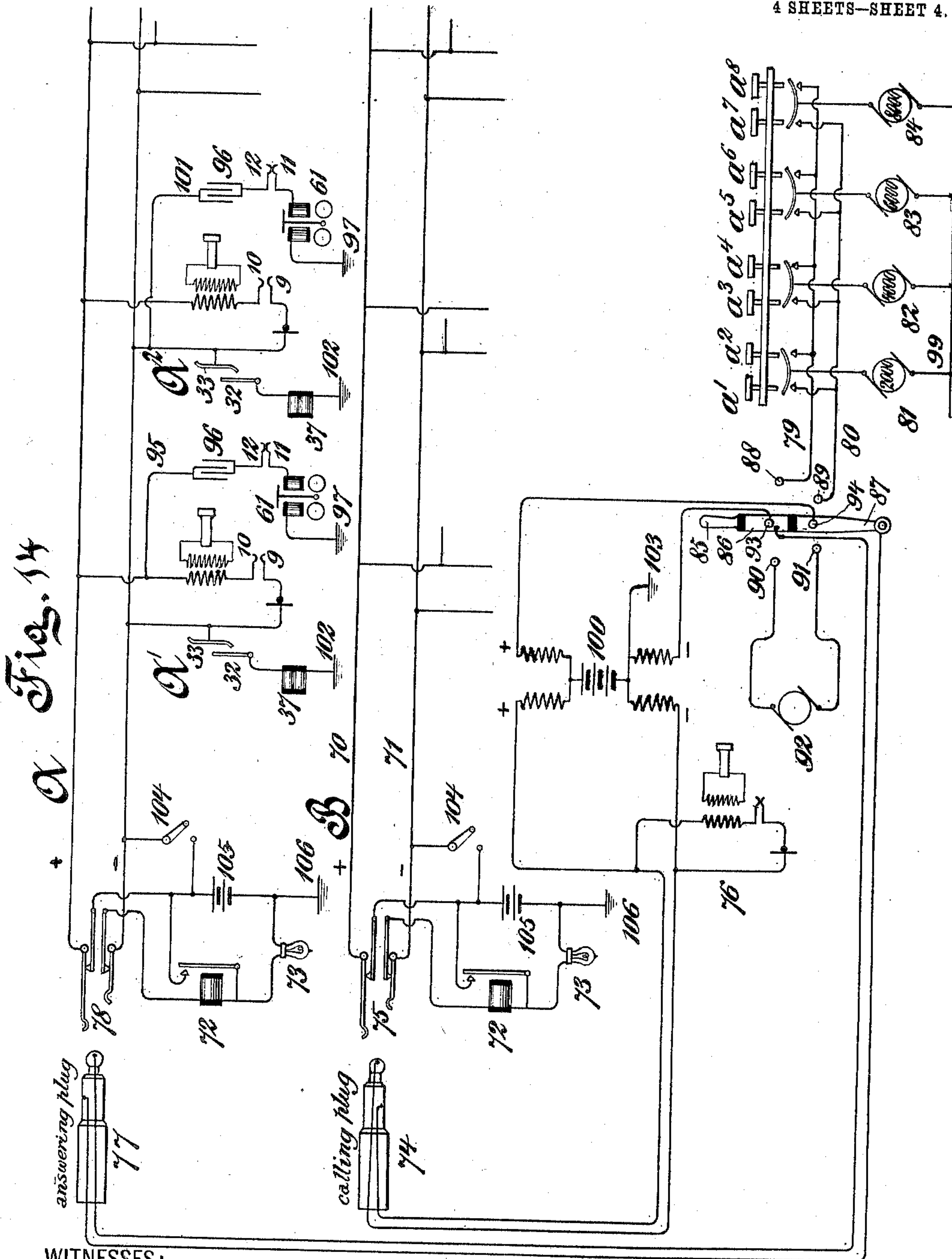
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4 SHEETS—SHEET 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EGBERT A. REYNOLDS, OF NEW YORK, N. Y., ASSIGNOR TO IRON TELEPHONE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF SOUTH DAKOTA.

COIN-CONTROLLED TELEPHONE SYSTEM.

No. 817,389.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed August 19, 1904. Serial No. 221,361.

To all whom it may concern:

Be it known that I, EGBERT A. REYNOLDS, a citizen of the United States of America, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Coin-Controlled Telephone Systems and Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in coin-controlled telephone systems and apparatus, and particularly to party-line instruments controlled from a source of central energy.

My invention consists in certain improved coin-controlled devices whereby it becomes necessary to place a coin in the apparatus before calling central, but in which means are provided for returning the coin should central fail to give the connection with the number called for; in certain improved means whereby the subscriber called may use his instrument without the necessity of dropping in a coin; in certain improved means for taking care of the coin and registering same; in an improved privacy and busy-signal device, and in certain improved details of construction and combination of parts, as will hereinafter be more fully pointed out.

My invention also consists in certain novel electrical connections and arrangement of switches, contacts, &c., comprising a novel telephone system, as will hereinafter appear.

In coin-controlled telephones it has been usual heretofore for a subscriber to first call central, informing the operator there of the number desired, whereupon the central operator has endeavored to obtain the number and, if successful, notified the caller and instructed him to drop a coin into the machine. Then when the coin was placed in the machine a signal was operated at the central station informing the central operator of the fact that the subscriber had paid his toll, and the central operator then connected the caller with the party called for. Such a system has been responsible for grave delays and has had the effect of either greatly reducing the speed at which the calls can be handled at central or has required a greater number of central operators for a given number of lines, for it will be readily understood that the switch-

board is "held" from the time the subscriber first calls central to the time he is placed in talking connection with the party called for. This has brought coin-controlled instruments into disrepute with telephone companies. It is one of the main objects of my present invention to overcome this difficulty, and to this end I have so designed and constructed my improved system and apparatus that a coin-controlled instrument operating in accordance therewith will cause no more delays at central than will an ordinary instrument. In my improved instrument the toll must be paid before central is called, and therefore central does not assume any of the responsibility for the payment of the toll, nor have to wait after the called number has been obtained until the caller pays the toll before she can complete connection between the subscriber calling and the party called for. A call from a coin-controlled instrument may be treated by the central operator exactly as a call from ordinary instruments, except that if the central operator fails to obtain the number called for provision is made whereby she may return the amount of the toll to the subscriber.

So far as the instrument itself is concerned my object is to combine in one instrument all of the desirable features in a party-line coin-controlled system particularly adapting the same for residential purposes. Other objects are to simplify and improve the apparatus and reduce the cost of manufacture, to construct the various parts so that they are easy of access for adjustment and repairs, and to reduce to a minimum the number of electrical contacts employed.

I will now proceed to describe a telephone apparatus and system embodying my invention and will then point out the novel features in claims.

In the drawings, Figure 1 is a front view of a telephone set embodying my invention. Fig. 1^a is a diagrammatic sectional view of the instrument box or case. Fig. 2 is a detail view of certain parts, showing particularly the ringing and talking contacts, the busy-signal, and the privacy-device-circuit closer. Fig. 3 is a detail view, in side elevation, of the privacy-device-circuit closer. Fig. 4 is a detail view, in front elevation, of the privacy-device coils and certain correlated

parts. Fig. 5 is a top view of the same. Fig. 6 is a detail view, in front elevation and partially broken away in section, of the lower end of the coin-chute, the coin-slide, 5 and certain correlated parts. Fig. 7 is a similar view with the parts in different position. Figs. 8 and 9 are respectively views in central vertical section of the parts shown in Figs. 6 and 7. Fig. 10 is a detail view 10 showing a portion of the coin-slot, the talking contacts, and the gravity-wheels for controlling same during an incoming message. Fig. 11 is a view in vertical transverse section through the said gravity-wheels. Fig. 12 is a detail view of the ringer-coils, the 15 gravity-wheels, and the mechanism operated by the ringer-coils for imparting movement to the said gravity-wheels. Fig. 13 is a detail view of the finger tripping device. Fig. 14 is a diagrammatic view of a simplified 20 circuit, showing the electrical connections in a system embodying my invention.

In the embodiment of my invention herein illustrated I have shown all the various de- 25 vices comprising a complete telephone set in a single metallic casing 1. The front part of the casing 1 comprises a door 2, suitably hinged to the main portion of the casing and provided, if desired, with a lock, 30 whereby it may be locked in its closed position. A diaphragm 3 divides the casing into two chambers, the rear chamber of which may be employed for receiving the condenser, preferably employed in connection 35 with the ringer of the instrument, and the front chamber for receiving the mechanism now to be described.

The coin-chute 5 preferably extends from the upper right-hand corner of the box or casing toward the lower left-hand corner, the 40 coin being received within a slot 4, communicating with the said chute, as shown. Near the upper end of the chute 5 I provide a number of fingers 6, arranged by gravity to swing into the path of movement of the coin, but 45 designed to be thrown aside by the coin in its descending movement. After the coin has passed the fingers they will again swing in the path of movement of the coin and will prevent return of the coin, so that a coin once 50 having passed them cannot be drawn back again. A coin dropped into the chute 5 will pass down same until it is stopped by a finger 7, arranged in the path thereof, which finger is 55 pivoted and preferably held by gravity in its normal position. When in position against the finger 7, the coin will be immediately below an insulating-block 8, carried by a contact-spring 9. The contact-spring 9 is one of 60 two sets of springs constituting circuit making and breaking devices for the talking-circuit and the ringing-circuit. Contact-springs 9 and 10 belong to the talking-circuit and are normally open or out of electrical engage- 65 ment with each other, while contact-springs

11 and 12 belong to the ringing-circuit and are normally closed or in electrical contact with each other. At their rear ends the said contact-springs are rigidly supported upon a bracket 13, carried by the diaphragm 3, but 70 are carefully insulated therefrom and from each other.

The receiver-hook 14 is pivoted at 15 to the diaphragm 3 and is provided upon the opposite side of its pivotal center with an 75 arm 16, from which a stud 17, preferably of insulating material, laterally projects. The stud 17 projects laterally between the lower contact-spring 11 of the ringer-contacts 11 and 12 and the upper contact-spring 10 of 80 the contacting springs 9 10 and is so arranged that when the receiver is on the hook it will tend to press the spring 11 against the spring 12, while when the receiver is off the hook and the hook moves up the said pin will 85 move down between the spring 10 and the spring 11, which will then separate by its own resilience from the spring 12 and will tend to press the spring 10 into electrical con- 90 tact with the spring 9. The usual bow-spring 18 operates to move the telephone-hook upward when the receiver is removed therefrom. The force of the spring 10 down- 95 ward, however, tends also to force the spring 9 downward because of the presence of a block 19 of insulating material, which is arranged between the contact-springs near their point of support, and if both springs are thus per- 100 mitted to move down when the telephone-hook is released no electrical contact will be made between the springs 9 and 10. If, 105 however, the lower spring 9 is supported and prevented from moving downwardly, then under these conditions the upper spring 10 will be forced into electrical contact there- 110 with and circuit completed. A coin of the proper dimension in the chute and stopped by the finger 7 will be immediately beneath the insulating-block 8, carried by the strip 9, and will be of such a diameter as to prevent 115 the said block 8, and hence the spring 9, from moving downward but a short distance and will support the spring so that the operation of the telephone-hook will bring the contact- 120 spring 10 into electrical engagement with the said contact-spring 9. A link 20 is pivotally connected at its upper end to the arm 16 of the telephone-hook and at its lower end is provided with a shoulder or abutment 21, adapted to engage a portion carried by the finger 125 7, so as to trip same at each upward or return movement of the said arm. When, therefore, the telephone-receiver is returned to the hook and the hook lowered into place once more, the finger 7 will be tripped, thereby 130 releasing the coin and allowing it to travel down the chute to the lower end thereof. At the lower end the coin is received by a slide 22, having lips 23, which will support the coin and prevent it from dropping down. 135

This slide is pivotally connected at its upper end to the telephone-hook, as at 24, so that the slide will move up and down as the hook moves up and down. The slide has laterally-projecting fingers 25, which in the upward movement of the slide pass in front of flanges 26, and the slide as a whole is held forward thereby. The coin, however, is in front of the said flanges, and as the slide reaches the top of the flanges it springs back and is withdrawn from engagement with the coin, so that the coin will be instantly released and allowed to drop down into the coin-safe 27, located immediately beneath the lower left-hand end of the chute. The slide 22 is also provided with a laterally-projecting toe 28, arranged in the uppermost position of the slide to close the end of the chute 5, so as to prevent a coin passing directly from the chute to discharge without being first received on the slide. The slide has a slot 29 therein, which slot is almost, but not quite, covered by the coin when first received upon the slide. (See Fig. 7.) This slot receives the end of an arm 30, constituting the operating member of a coin-register 31. If a coin is in position, the said arm 30 will be confined between the upper shoulder of the slot 29 and the periphery of the said coin, as is shown in Figs. 7 and 9, and a reciprocating movement of the slide caused by an up-and-down movement of the telephone-hook will operate the counter in a manner well known. If, however, there is no coin in the slide, the slide may reciprocate freely without imparting any movement to the arm 30, the said arm resting in the slot 29 at such time. I will not explain in detail the mechanism of the counter, as such forms no part of my present invention. Suffice it to say that each reciprocation of the operating-arm 30 gives one impulse to the said counter, thereby registering successive units.

So far as the device has been at present described it will be seen that under normal conditions the ringing-circuit is closed. Removal of the telephone from the hook will open the ringing-circuit and tend to close the talking-circuit. If, however, there is no coin in the chute, the talking-circuit will not be closed; but if a coin has been previously dropped into the chute before the taking of the receiver off the hook the talking-circuit will be closed thereby and the telephone may be used in the ordinary way. Hanging up of the receiver will trip the finger 7, allowing the coin to roll down the chute onto the slide 22, where it will rest until the next successive movement of the telephone-hook. The next time the telephone is used and the receiver removed from the hook the slide will be lifted and the coin discharged, as above explained, while the operating-arm of the counter will also be lifted. The counter may operate on the lifting or on the depressing

movement of the arm 30, the replacing of the receiver on the hook lowering the arm 30 to its normal position and bringing the slide back to the next count. By the foregoing it will also be seen that a coin of the required diameter is necessary in order to operate the register. A coin of a smaller diameter would not lift the lever or arm 30 sufficiently.

Privacy device and busy-signal.—Located at the upper left-hand corner of the box or casing is a switch comprising a stationary contact member 32 and a movable contact member 33. The movable contact member is arranged with a portion 34 thereof in the path of a pin 35, carried by the telephone-hook 14. At the first upward movement of the telephone-hook the pin 35 will engage the portion 34 of the spring contact-piece 33 to force it against the stationary contact 32, so as to form electrical connection between the two. Further upward movement of the telephone-hook will cause the pin 35 to slide along the strip 33 until finally it passes beyond same, when the strip will fly back by its own resiliency. On the return movement the pin 35 will pass down the inside of the said spring member and will prevent contact from being made between the two contact-pieces until the next upward movement. The contact-pieces 32 and 33 are mounted upon an insulating-block 36, by which they are insulated from each other and from the remainder of the device. The contact-springs 32 33 are arranged in the circuit with coils 37 of an electromagnet of low resistance, which is connected in between the returning-leg of the main-line circuit and the ground. If there is current along the line at the time the telephone-hook is lifted, a small quantity of the same will be momentarily short-circuited when the telephone-hook is released, through the coils 37, to energize same and attract the armature 38 thereof. Connected to the armature 38 is a wire or rod 39, carried in a thin plate of insulating material 40. The insulating-plate 40 is arranged in position at the rear of the contact-springs 9 and 10 and in a plane intermediate thereof. When the armature is attracted, this piece of insulating material will be inserted between the two contact-springs 9 and 10, so that even though the spring be supported by a coin electrical contact will not be made. The armature 38 also carries a pin or projection 41, which engages a detent 42, carried by the telephone-hook 14. The movement of the armature 38 toward its coils throws the detent 42 to the left and in the path of movement of a lip 43 upon an indicator 44, pivoted loosely upon the pivot 15. When this happens, the raising of the telephone-hook will lift the indicator 44, disclosing the word "Busy" through a slot 45 in the casing 1. This will indicate to the person wishing to use the telephone that the line is occupied or "busy," while the

insulating-piece 40 will act as a privacy device to prevent him from listening to what is being said. Upon the return of the telephone-hook 14 to its normal position the indicator 44 will drop to its normal position by gravity, and the detent 42 will also return by gravity to its normal rest position out of the path of the lip 43. An abutment 46 forms a limit-stop for limiting the forward movement of the detent.

In the foregoing contingency the coin should be returned to the user, because no service has been rendered therefor, while if means were not otherwise provided the coin would upon hanging up of the receiver pass down the slot to be recorded and received within the safe 27. In order that the coin may be returned when it has not been earned, the chute is provided with a swinging gate 47, pivoted at 48. This gate forms a part of the bottom of the chute, but may swing on its pivot 48 under certain conditions. Normally the said gate is locked in position by means of a latch 49, which engages same. The armature 38, however, is provided with a finger 50, upon which rests a rod 51, connected to the said latch 49. The end of the rod 51 is bent obliquely, as at 52, forming a cam against which the finger 50 will operate when the armature 38 is attracted. At such time the rod 51 will be lifted, swinging the latch 49 out of engagement with the gate, which will then be free to swing upon its pivot. If now the coin be resting on the gate, upon the opposite side of the pivot 48, the gate will swing around, and the coin will fall therefrom onto the return-chute 53, from which it may be removed through the opening 54 in the side of the casing. Immediately the coin is thus returned the gate 45 will swing back to its normal position, being slightly overbalanced upon the left-hand side of its pivot, and will reengage the latch 49, which is but momentarily tripped during the brief period that the coils 37 are energized. By the foregoing it will be seen that should a person desiring to use the instrument drop in a coin while the line is busy, busy-signal will inform him of the fact, a privacy device will prevent him from hearing what is being said upon the line, and his coin will be returned to him. Provision is also made for returning the coin should the operator be unable to procure the number desired, and for this purpose I have provided a push-button 55, which is arranged in multiple with the contact-springs 32 and 33. Pressing the push-button 55 will close circuit through the coils 37 to ground, and a circuit-closing device will be provided at central to momentarily throw in a generator from ground through the return-leg of the main-line circuit, so as to energize the coils, which will trip the gate 47 in the manner above described and return the coin.

So far as here described, it will be seen that in order for the telephone to operate it is necessary that the coin be in the chute beneath the contact-spring 9, so that contact may be made between the springs 9 and 10 when the receiver is removed. When, however, the telephone is to be used on a call from central or from another party, it is not the custom for the person called to pay a toll, and hence I provide means whereby the telephone may be used without the insertion of a coin on a call from the central office—i. e., for what is known as an "incoming" message. For this purpose I employ one or more gravity-wheels 56, loosely mounted upon a stationary pivot 57 and overbalanced as to gravity, so that they will normally hang in a predetermined position when at rest. The said wheel or wheels are provided with notches 58, which in the rest position of said wheels register with each other and are immediately beneath the insulating-block 8 and are of such size as to fully receive the said insulating-block, so that they will not impede the downward movement of the spring 9. If all or any of the wheels be moved from their normal or rest positions at the time the springs 9 and 10 are depressed, the block 8 will be received on the peripheries thereof and will be held against descent, just as if a coin were in the chute 4 against the finger 7. In order to operate the wheels, I have provided a pawl 59, which is adapted to engage teeth on the periphery of the said wheels, said pawl carried by a rod 60, controlled in its movements by an armature 61, arranged within the magnetic field of one or both of the ringer-coils 62. When, now, current is sent along the line through the ringer-coils to operate a signal, the armature 61 will be rapidly vibrated to rapidly reciprocate the pawl 59. The effect of this will be to swing the wheels from side to side, as a pendulum is swung, and the wheels so set in motion will continue to vibrate for some period of time—say thirty seconds—after the ringer has ceased to operate, the wheels being so turned during this time as to present their peripheral surfaces beneath the block 8. A person answering the telephone, therefore, within, say, thirty seconds of the completion of a signal will be able to use the telephone without dropping a coin in the chute. In practice it will be customary to send a series of signals not less than thirty seconds apart until the telephone-hook is removed or until the central operator concludes that there is no one to answer the call. Immediately upon returning the receiver to its place upon the hook, and so relieving the wheels of pressure, such as has been sufficient to prevent the wheels from returning by gravity to their normal rest positions, the wheels will so return, and the instrument will once more be in its normal condition.

The ringer herein shown comprises the

coils 62, just referred to, a rocking armature 63, pivoted at 64, a clapper 65, and bells 66. The coils 62 are polarized in the usual manner by means of a permanent magnet 67, and the clapper 65 is steadied at a point intermediate its length by an adjustable slide 68. The ringer *per se* forms no part of the present invention, and any suitable form of ringer may be employed. The present type of ringer forms the subject-matter of a separate application, filed coincidentally herewith. The ringer is designed as a part of a selective ringing system, the ringer of each individual instrument being tuned to respond only to impulses of a predetermined frequency. The induction-coil (shown at 69) is suitably connected electrically in the manner to be presently described.

In Fig. 14 I have shown a diagram illustrating the electric circuits of the device in order that the operation of the device may be quite clear, and in these circuits I have left out many of the switches, connections, and devices, such as the clearing-out drops, &c., usually employed, in order to simplify the same, and show only such parts as are necessary for a clear understanding of the invention. In the diagram I have shown two lines A and B and will assume that a subscriber on line B desires to talk with a subscriber on line A. In line A, I have shown two telephone sets, representing two subscribers A' and A². The subscriber on line B will remove his receiver from the hook, closing the circuit across the positive and negative lines 70 71 thereof, and by energizing a coil 72 at the central office will operate the signal 73 to inform the operator that subscriber B is calling. The operator will insert the calling-plug 74 in the jack 75, which will cut out the signal in the ordinary manner, and connect the cord-circuit with the line. 100 designates the generator of a central-energy system of well-known form, which will now be connected with line, and the central operator will now cut in her instrument 76, which is bridged across the cord-circuit of the calling-plug 74, to ask the subscriber B what number is wanted. Subscriber B stating that he wishes to talk to subscriber A', the central operator will insert the answering-plug 77 in the jack 78 of the line A and will then connect the cord-circuit of the answering-plug with conductors 79 80 of a selective signaling set of generators 81 82 83 84. For the purpose of making this connection I have shown a switch-lever 85, having two electrically-conductive portions 86 and 87 insulated from each other and respectively connected to the two wires of the answering-plug cord-circuit. The conductors 79 and 80 terminate in contact-points 88 and 89, adapted to be placed in operative connection with the contact portions 86 and 87 of the switch-lever 85. Similarly, contact-points 90 91 form terminals for

a generator 92, and contact-points 93 94 form terminals connecting with the central-energy generator 100 on the opposite side to the connection of the calling-plug. In order to call the subscriber A', the central operator throws the switch-lever to connect the cord of the plug 77, as above stated, with the conductors 79 and 80 and then presses a key *a'*. The key *a'* connects the generator 81 with the conductor 80, from whence current passes through the sleeve of the answering-plug to the positive wire of the main line A, through the wire 95, condenser 96, (ordinarily employed,) contact-springs 12 and 11, which, it will be remembered, are normally closed, ringer-coils 61 to ground 97, and back through generator to ground 98 and common return 99 to generator 81. This will give subscriber A' a signal that he is wanted and by vibrating the gravity-disks 56 will permit him to use his instrument without payment of a toll. Directly the subscriber A' removes his telephone from the hook the central-office operator will throw the switch-lever 85 to connect the cord-circuit of the answering-plug 77 with the central-energy generator 100, thereby connecting B with A'. The switch-lever 85 is shown in this position in the diagrammatic figure of the drawings. The generator 92 may be employed where a selective system of ringing is not required—that is to say, where a subscriber has entire control of the line. If subscriber B had wished to speak to subscriber A² instead of to subscriber A', the key *a²* should have been pressed instead of the key *a'*. The conductor 79 would then be connected with generator 81 instead of the conductor 80, current passing thence through the tip of the answering-plug 77, thence to the negative wire of the circuit A to the wire 101, through the ringer 61 of subscriber's instrument A² to ground 97 thereof, and back to generator 81. The generators 81, 82, 83, and 84 are intended to have different frequencies, such frequencies being represented, for instance, by "2,000," "4,000," "6,000," and "8,000," and it is intended that the ringers 61 of instruments A' and A² shall be tuned to respond to current undulations of "2,000" frequencies only—that is to say, they shall not respond to the currents of generators 82, 83, and 84. In this manner six other telephones may be arranged in the line A, two of the ringers thereof responding to generator 82, two others to generator 83, and two others to generator 84, the said pairs of ringers being connected, as the ringers of A' and A², to the positive and negative legs of the main circuit A, respectively. A selective system giving an eight-party line is thus made possible.

To comprehend the privacy-device circuits, it will be assumed for the moment that subscriber A' is using his instrument at the moment subscriber A² lifts his receiver off the hook. The line A will be energized and a

portion of the current thereof will be momentarily shunted through the contact-springs 32 and 33 of instrument A² through the coils 37, which will be preferably of very low resistance, and through ground 102 to ground 103, connecting with the negative side of the central-energy generator 100. This will operate, as above stated, to insert the insulating-piece 40 between the contact-springs 9 and 10 of instrument A² to prevent the subscriber at A² hearing what is being said on the line and will also operate the busy-signal. The closing of circuit through contact-strips 32 and 33 is only momentary, and hence A's use of his instrument will not be interrupted. Similarly, of course, if A² were using his set and A' were to lift his telephone off the hook current would be momentarily short-circuited through the coils 37 of instrument A', as will be well understood.

I have provided each line (or the cord of each line) with a switch-key 104 at the central office, such switch arranged to temporarily connect the negative or return leg of a line with generator 105. This key may be used by a central operator when the subscriber is instructed to close circuit through his coin-button 55, circuit then being established from generator 105, through switch 104, return leg of the line A, through coin-button 55, (in multiple with contact-springs 32 and 33,) through coils 37 to ground 102, back through ground 106, to generator 105. The momentary closing of this circuit, it will be remembered, operates to release the swinging gate 47, and so to return a coin should the operator be unable to give the subscriber the number required.

In this application I have claimed the busy-signal and privacy device in its combination with a coin-controlled apparatus; but it will be understood that such privacy device and busy-signal may be useful in connection with other than coin-controlled apparatus, and hence I have made the same the subject-matter of a separate application, filed coincidentally herewith, and have claimed the same broadly therein.

It will be obvious that the foregoing is but one embodiment of my invention, and that the same is capable of many and varied modifications within the spirit and scope of my invention, and, further, that certain parts may be employed in connection with other parts of different construction. Hence I do not desire to be limited only to the precise details of construction and combination of parts herein.

What I claim is—

1. In a coin-controlled telephone instrument, the combination with contact-points, a coin-holder and a receiver-hook, of means operated jointly by a coin in such holder and by movement of said receiver-hook, for bring-

ing said contact-points together, said contact-points adapted to connect the telephone instrument in talking-circuit with the line.

2. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of circuit-closing contacts arranged to connect the instrument in talking-circuit with the line, a receiver-hook, and means operated by the receiver-hook and controlled by the coin when so arrested in the chute for closing the said contacts.

3. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of contact-springs arranged above the point at which the coin is arrested and normally out of electrical contact with each other, a receiver-hook, and means carried thereby operating to engage the said contact-springs upon the upward or release movement thereof, and by coaction with a coin in the chute, to cause the said contact-springs to engage each other.

4. In a coin-controlled telephone instrument, the combination with a coin-chute and a finger for temporarily arresting a coin therein, of a contact-spring arranged above the coin-chute and provided with an insulating-block arranged to engage the periphery of a coin retained in the chute, another contact-spring arranged in proximity thereto, and a telephone-hook having a projecting stud arranged to press the said contact-springs together upon release movement of the telephone-hook, provided the lower spring is supported by a coin in the chute, but adapted to move the springs without electrically connecting them should the lower spring be unsupported.

5. In a coin-controlled telephone instrument, the combination with a coin-chute and a finger adapted to temporarily arrest a coin in the chute, of means connected to the receiver-hook and operated by the movement thereof in one direction for tripping the said finger to release the coin, said means yielding to avoid moving the finger when the receiver-hook moves in the other direction.

6. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of circuit-closing contacts arranged to connect the instrument in talking-circuit with the line, a receiver-hook, means operated by the receiver-hook and controlled by the coin when so arrested in the chute for closing the said contacts, and means connected with the telephone-hook for tripping the said coin-arresting means.

7. In a coin-controlled telephone instrument, the combination with a circuit-closer and a receiver-hook, of means arranged to be controlled by a coin for operating said circuit-closer upon release movement of said

receiver-hook, and other means for controlling the operation of said circuit-closer upon a similar release movement of said receiver-hook.

5 8. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of a circuit-closer, a receiver-hook, and means carried by said receiver-hook for operating the said circuit-closer during release movement thereof when a coin is in position in the chute, and means arranged for temporary substitution for the coin for controlling the circuit-closing operation upon such
10 release movement of the receiver-hook.

9. In a coin-controlled telephone instrument, the combination with a coin-chute, means for temporarily arresting a coin therein, and a contact-spring arranged to be
20 pressed upon the periphery of a coin so arrested in said chute, of a gravity device pivoted in proximity to the point in the chute in which the coin is held, said gravity device arranged normally out of the path of movement of the said spring, but adapted, when
25 desired to be swung in the path thereof, to support same in substitution for the coin.

10. In a coin-controlled telephone instrument; the combination with a coin-controlled
30 circuit-closer, of a gravity device and means for operating same to control the circuit-closer in substitution for the coin-controller.

11. In a coin-controlled telephone instrument, the combination with a coin-controlled
35 circuit-closer, of a gravity device, signaling means, and means operated by the signaling means for operating said gravity device arranged to control the circuit-closer in substitution for a coin.

40 12. In a telephone instrument, the combination with a coin-controlled circuit-closer for the talking-circuit thereof, ringer-coils in the ringing-circuit thereof, a gravity device arranged to control the circuit-closer independent of a coin, and means operated by
45 the ringer-coils for operating the gravity device.

13. In a coin-controlled telephone instrument, the combination with a coin-controlled
50 circuit-closer and a signaling device, of means operated by the signaling device for also controlling the said circuit-closer.

14. In a telephone system and apparatus, the combination with a subscriber's telephone instrument including a coin-receiver, and a circuit-closer for closing circuit in the line controlled by a coin received therein, of electromagnetic means for discharging the coin from the receiver and returning same to the subscriber, said means including a circuit-closer arranged in series with another circuit-closer at central, between the return leg of the line and ground, whereby closing of circuit through both said circuit-closers is
65 necessary to operate the said coin-discharging

ing means, and same will be operated regardless of whether the line-circuit is open or closed.

15. In a telephone system and apparatus, the combination with a subscriber's telephone instrument including a coin-receiver, and a circuit-closer for closing talking-circuit in the line controlled by a coin received therein, of means under the joint control of the central operator and the subscriber for
70 expelling and returning the coin from the coin-chute, said means included in one side only of the line.

16. In a telephone system and apparatus, the combination with a subscriber's telephone instrument, including a coin-receiver and a circuit-closer for closing talking-circuit in the line, controlled by a coin received therein, of means under the joint control of the central operator and the subscriber for
80 expelling and returning the coin from the coin-chute while talking-circuit is closed in the line.

17. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of a pivoted gate forming a part of the said coin-chute, a locking device for normally holding said gate in position, said gate
90 arranged to be overbalanced by a coin when arrested in said coin-chute, means for tripping said locking device to permit said coin to overbalance the pivoted gate, whereby said coin may be expelled from the chute and returned.
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18. In a coin-controlled telephone instrument, the combination with a coin-chute and means for temporarily arresting a coin therein, of a pivoted gate forming a part of the said coin-chute, a locking device for normally holding said gate in position, said gate
105 arranged to be overbalanced by a coin when arrested in said coin-chute, means for tripping said locking device to permit said coin to overbalance the pivoted gate, whereby
110 said coin may be expelled from the chute and returned, said gate arranged to return to its normal position when the coin is discharged, by gravity.

19. In a coin-controlled telephone instrument, the combination with a coin-chute and coin-controlled mechanism for closing electric circuit when a coin is inserted in the chute, of a privacy device and means for rejecting the coin from the chute when the privacy device is operated.
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20. In a coin-controlled telephone instrument, the combination with a coin-chute and coin-controlled mechanism for closing electric contacts, of a privacy device arranged
125 upon its operation to prevent closing of said electric contacts.

21. In a coin-controlled telephone instrument, the combination with a coin-chute and coin-controlled mechanism for closing electric
130

tric contacts, of a privacy device arranged upon its operation to prevent closing of said electric contacts and for rejecting and returning the coin employed for such control.

22. In a telephone system and apparatus, the combination with a normally open line-circuit, of coin-controlled means for closing circuit in the said line, and means for preventing the closing of said circuit if a circuit has already been closed in the line.

23. In a telephone system and apparatus, the combination with a normally open line-circuit, of coin-controlled means for closing circuit in the said line, and means for preventing the closing of said circuit if circuit has already been closed in the line, and for rejecting and returning the coin used for such control.

24. In a coin-controlled telephone instrument, the combination with a coin-chute provided with a pivoted gate and a coin-controlled circuit-closer, of a privacy device including an electromagnet, and means operated by said electromagnet for tripping the said gate.

25. In a coin-controlled telephone instrument, the combination with a coin-chute provided with a pivoted gate for rejecting and returning a coin deposited therein, and a coin-controlled circuit-closer, of means for locking the said gate in position, a privacy device including an electromagnet and an armature therefor, and means operated by the armature in its movement for releasing the gate-locking means.

26. In a coin-controlled telephone instrument, the combination with a coin-controlled circuit-closer, of a privacy device including an electromagnet, a busy-signal controlled by said electromagnet, and means operated by the electromagnet synchronously with the operation of the privacy device for rejecting and returning the coin.

27. In a telephone system and apparatus, the combination with a coin-controlled circuit-closer, a privacy device, and means for rejecting a coin upon operation of the privacy device, of a hand-operated circuit-closer arranged in multiple with the coils of the privacy device.

28. In a telephone system and apparatus, the combination with a coin-controlled circuit-closer, a privacy device, and means for rejecting a coin upon operation of the privacy device, of a hand-operated circuit-closer arranged in multiple with the coils of the privacy device, and means at the central station for completing circuit through the pri-

vacy-device coils and the hand-operated circuit-closer.

29. In a coin-controlled telephone instrument, the combination with a receiver-hook and a coin-chute, of a slide connected to the receiver-hook and adapted to receive a coin thereon from the chute, a coin-counter and means operated by the slide in its movement for operating the coin-counter.

30. In a coin-controlled telephone instrument, the combination with a receiver-hook, a coin-chute and a slide connected with said receiver-hook adapted to receive coins from the said chute, of a coin-counter, means operated by said slide in its movement when a coin is therein for operating said counter and for rejecting the coin after it has been employed for control of said counter.

31. In a coin-controlled telephone instrument, the combination with a coin-chute and a receiver-hook, of a reciprocating slide connected with said receiver-hook and arranged to take its movement therefrom, said slide arranged to receive coins from said coin-chute, a coin-counter, operating means therefor in proximity to the said slide, said operating means engaged by a coin when contained in the slide and upon reciprocating movement thereof.

32. In a coin-controlled telephone instrument, the combination with a coin-chute and a pivoted receiver-hook, of a slide connected to said receiver-hook, said slide provided with a slot, a coin-counter, an operating-lever therefor, one end of which is received within the said slot in the slide, said slide having means for supporting a coin thereon in a position to partially cover the said slot, whereby the portion of the lever received therein is confined between the periphery of the coin and the end of the said slot, substantially as and for the purpose specified.

33. In a coin-controlled telephone instrument, the combination with a coin-chute of a reciprocating slide adapted to receive coins therefrom, and means for causing the said slide to pass through a different path of movement when moving in one direction to the path of movement it passes through when moving in the other direction, substantially as specified.

In witness whereof I have hereunto set my hand this 15th day of August, 1904.

EGBERT A. REYNOLDS.

Witnesses:

FRANK B. VERMILYA,
D. A. REYNOLDS.