No. 619,868.

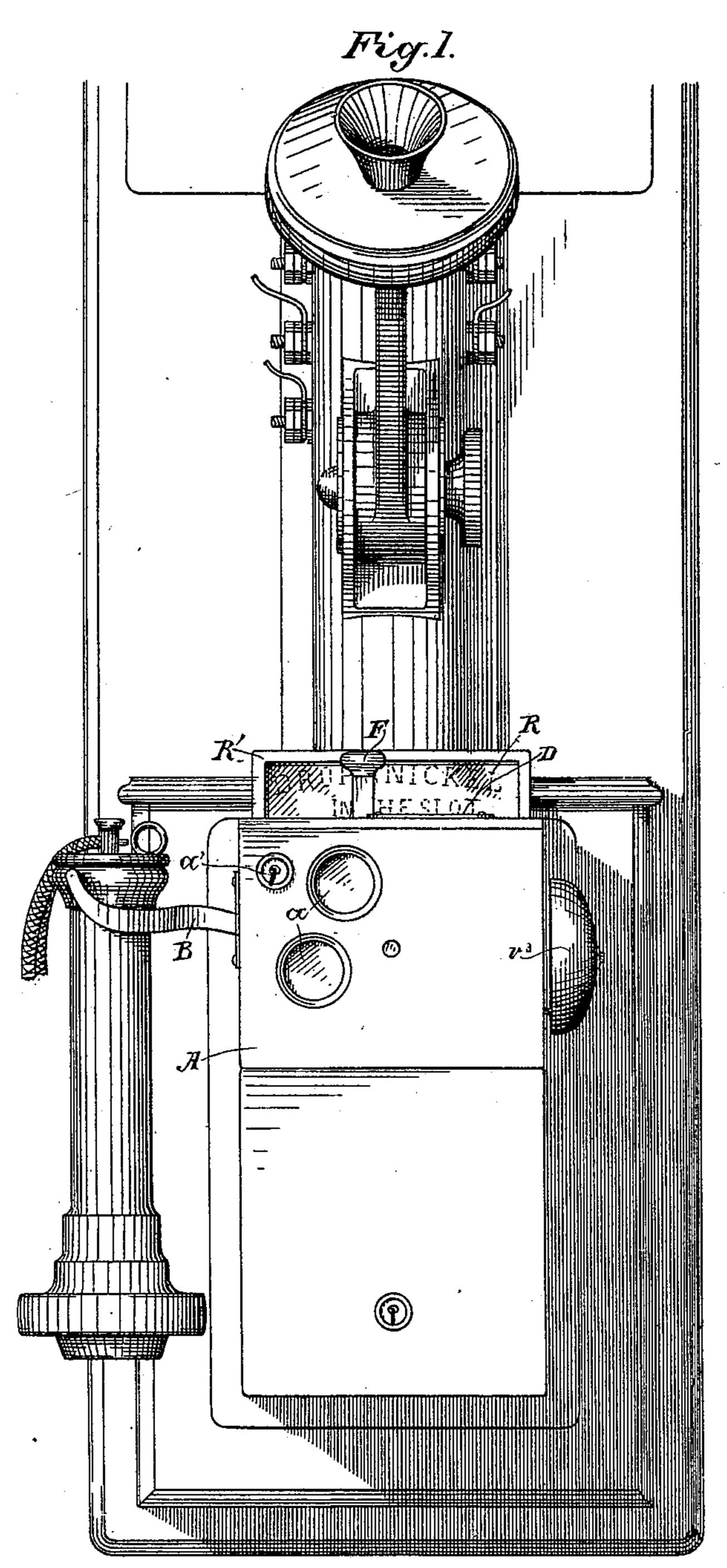
Patented Feb. 21, 1899.

R. D. CRANSTON & S. M. WILLIAMS. COIN CONTROLLED AND REGISTERING TELEPHONE APPARATUS.

(Application filed Nov. 11, 1897.)

(No Model.)

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Wixnesses, H. F. Ascheck Robert D. Cranston Sylvester M. Milliams Hy Dewey Ho.

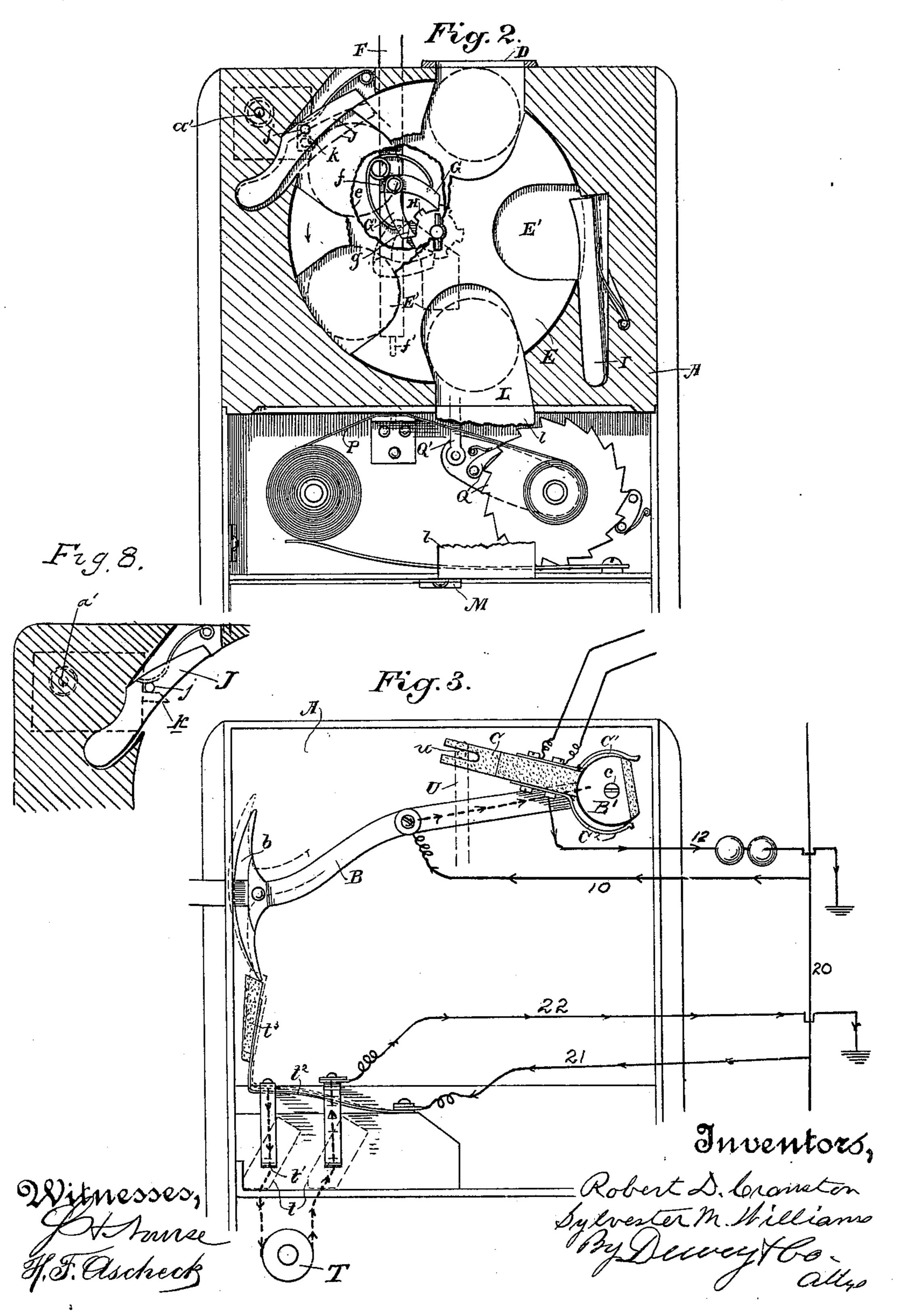
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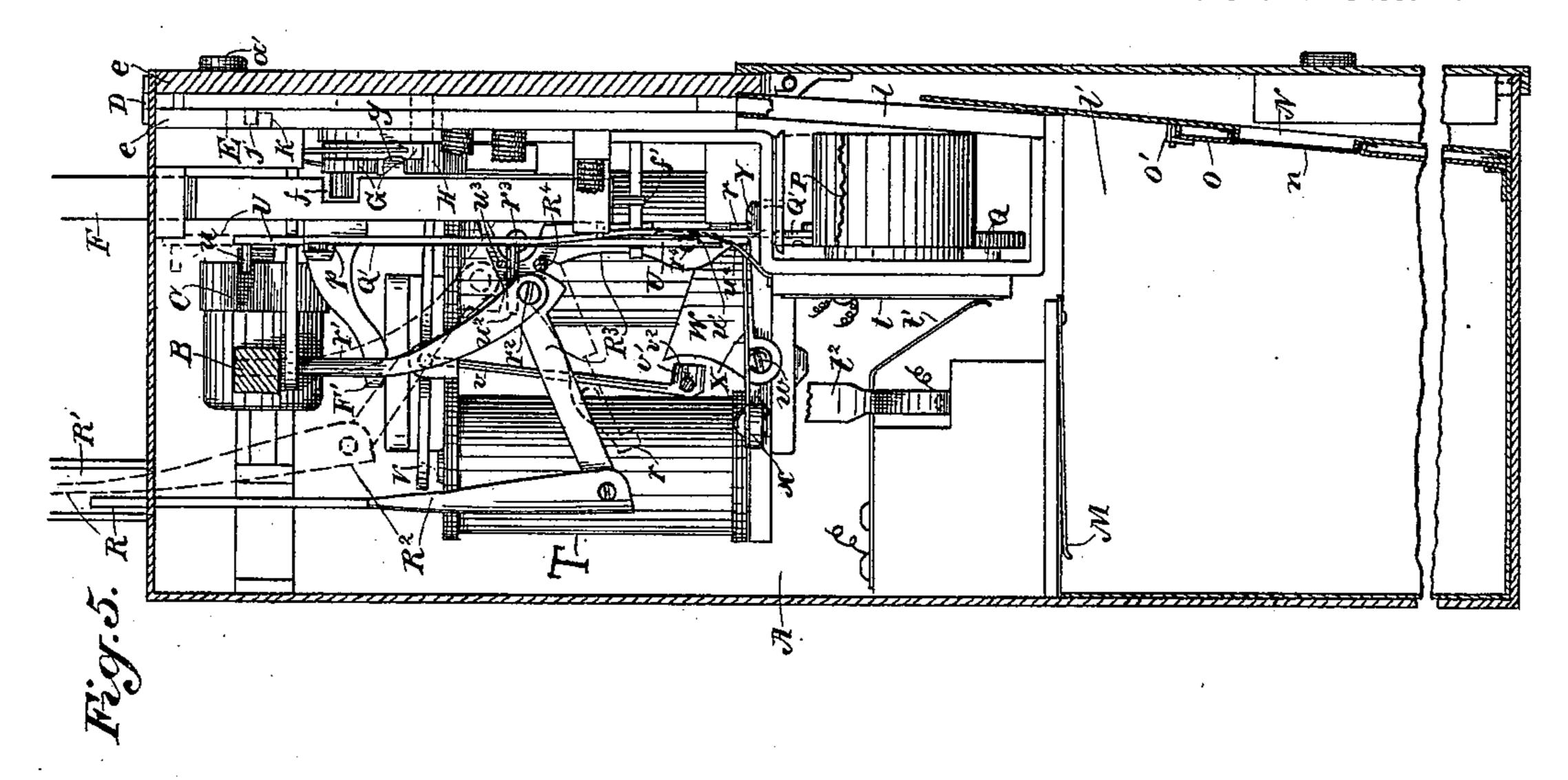
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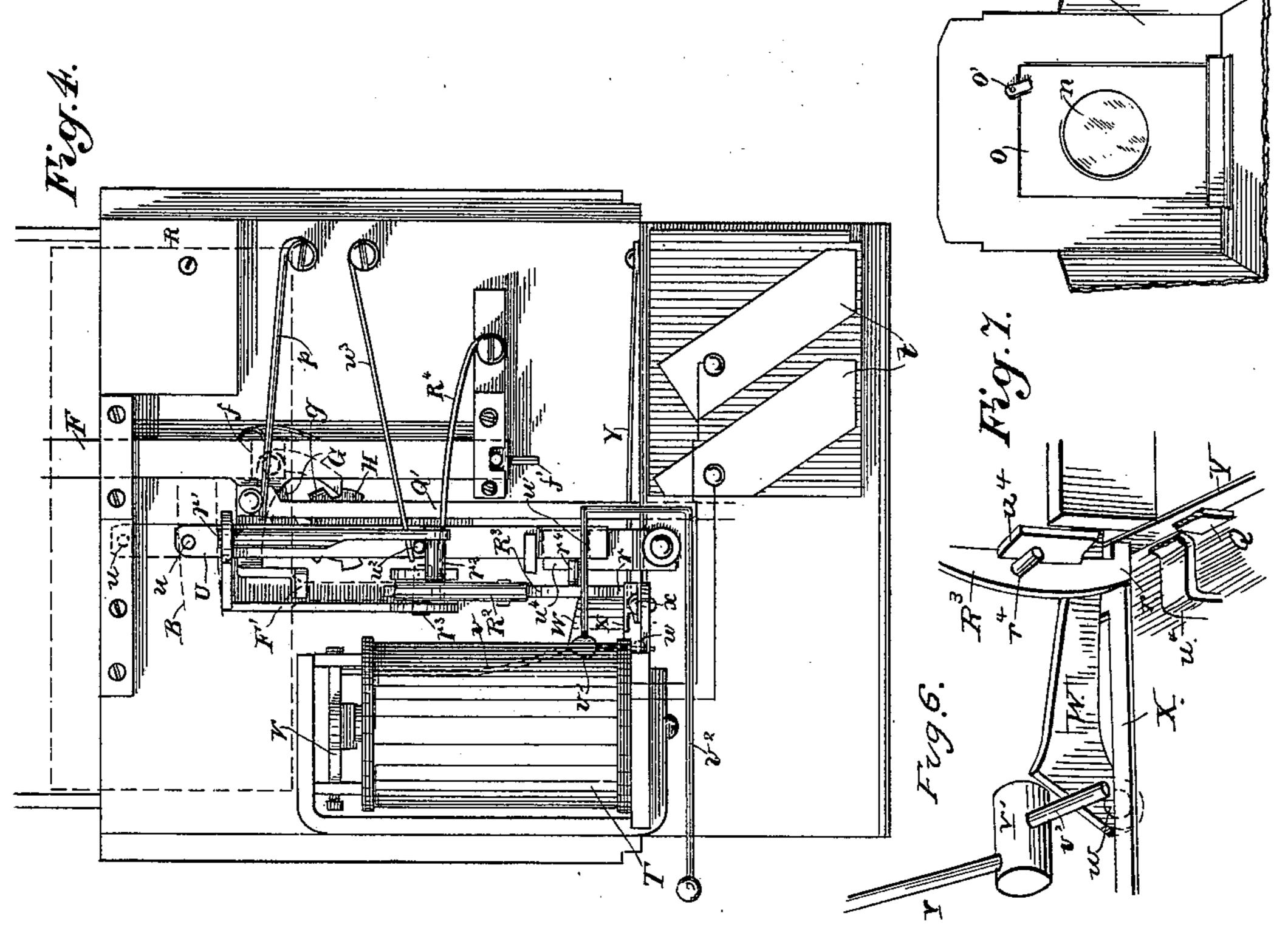
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Witnesses, H.F. Olscheck Robert & Cranston Sylvester M. Milliams By Dewey Ho. Alexans

United States Patent Office.

ROBERT D. CRANSTON AND SYLVESTER M. WILLIAMS, OF SAN FRANCISCO, CALIFORNIA.

COIN CONTROLLED AND REGISTERING TELEPHONE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 619,868, dated February 21, 1899.

Application filed November 11, 1897. Serial No. 658,113. (No model.)

To all whom it may concern:

Be it known that we, ROBERT D. CRANSTON and Sylvester M. Williams, citizens of the United States, residing in the city and county 5 of San Francisco, State of California, have invented an Improvement in Coin Controlled and Registering Telephone Apparatus; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to a coin-controlled registering apparatus which may be employed in conjunction with any device where such an apparatus is applicable. In the present case we have shown it employed in conjunc-15 tion with a telephone transmitting and receiving box.

It consists of the parts and the constructions and combinations of parts hereinafter

described and claimed.

Figure 1 is a front exterior view. Fig. 2 is a view with the front of the box removed. Fig. 3 is a view showing the parts in the rear of the box. Fig. 4 is a view of the electromagnet push-bar and connected mechanism 25 situated behind the coin-disk. Fig. 5 is a side view of the interior mechanism of the whole box. Fig. 6 is a detail view of the indicator-locking mechanism. Fig. 7 is an interior view of the coin-box looking toward 30 the front. Fig. 8 is an enlarged detail of the pawl J and its attachments.

The object of our invention is to provide a more efficient operation of coin-controlled ap-

paratus of the class described.

A is the case in which the mechanism is contained, and B the fulcrumed lever-hook upon which the receiver of the telephone is normally hung, said lever having a head B'.

C is a lever within the box having the con-40 tact-points C' C2, through which electrical connection is made. This lever is here shown fulcrumed upon the head B' of the hook-lever B, from which the receiver is suspended, and capable of independent movement, as will be 45 hereinafter described. A slot D is made in the upper part of the box adapted to receive a coin. In line beneath this slot and journaled between front and rear plates e is a

50 E' cut out, these spaces being of such diame-

disk E, having peripheral segmental spaces

ter that a coin dropped into the opening at D will pass directly into one of these pockets

or spaces E'.

Glazed openings a are made in the front of the box or case, through which a coin may 55 be seen after it is introduced. The disk is then rotated by pressing downwardly upon a push-bar F, which projects above the top of the box conveniently for the purpose. This push-bar carries spring-pressed pawls G G', 60 Fig. 2, one of which engages the teeth of a ratchet-wheel H above its center, the number of teeth in which correspond with the pockets of the disk E, and the other engages the teeth below the center, so that when the push- 65 bar is forced down the lowermost pawl engages the teeth of the ratchet, so as to turn it a part of a revolution. The upper pawl acts to return the disk to a position where one of the pockets is in line with the coin- 70 chute if the push-bar has not been pressed down to entirely complete a movement of the

parts.

The pawls G G' are mounted upon a common axis, which is loosely located at a recess 75 f in the push-bar F, and reaching over the face of wheel H is a guide-plate g. This plate raises the pawl G from its engagement when F is pressed down; otherwise the pawl would follow in the space between the same two 80 teeth, and when the bar F is released would bring the same teeth back again and with it the corresponding pocket with the same coin in it; but as plate g lifts the pawl clear out of its engagement and lets it travel over its 85 guide-face while the succeeding tooth is moved a full space underneath the pawl G will while returning drop behind plate g into the next space, thus bringing a new pocket into line with slot D. If the bar F has not 90 been pushed down its full travel, the same tooth-space will present itself again to pawl G and allow it to drop into its former place after having left guide-plate g, as shown in Fig. 2. As the ratchet-wheel is fixed upon 95 the shaft of the disk E, it will be seen that the disk will be turned each time when the push-bar is pressed down to the full extent.

A spring-pressed retaining-pawl I is so fulcrumed in a recess as to prevent the return 100

of the disk after it has once been moved forward, and its rotation is thus continued in one direction. J is another spring-pressed pawl so fulcrumed with relation to the disk that 5 when pressed down it will prevent the turning of the disk. The pawl J has a pin j projecting to one side of it, upon which its spring presses. Secured on the inside of the box is a small lock so arranged that when, by means 10 of a key and through a keyhole a' on the face of the box, its bolt k is pushed out it will suspend the pawl J and not allow it to drop into the pockets. In this position the device can be operated without a coin; but when the 15 bolt is withdrawn the spring will act upon the pawl, and if no coin has been dropped into the succeeding pocket to hold the pawl up the latter will drop into the next pocket and lock it, as shown in dotted lines, Fig. 2. 20 This will then prevent the bar F being pushed down far enough to register and compel any one in order to operate it to first drop a coin. As the disk keeps on moving the coins will gradually reach the outlet Land drop through 25 a short coin-passage l into the receiving-box l', Fig. 5. This box l' is adapted to slip into the lower part of the outer box or case A whenever the front has been removed, and when it is thus pushed in the rear edge is en-30 gaged by a spring M, which prevents the box from being again withdrawn until this spring is pushed out of engagement with the box. The front of the box has a hole N made

through it, and a plate O, having a similar 35 hole made coincident with the hole N, is fitted against the inside of the front face of the box. This plate is normally held locked against the front of the box by a button O'. The object of these plates is to allow a thin 40 destructible sheet n, such as a sheet of paper, to be clamped between the two plates, and thus close the hole or opening N. It is only possible to disengage the spring M, which locks the box in place, by breaking or tearing 45 this destructible sheet, and this is done when the inspector comes around to periodically collect the coins from the box. He then simply breaks the sheet, pushing his finger in through the opening and pressing the hold-50 ing-spring upward, so that the box can be removed. Another sheet is placed over the opening before the box is again returned, and this sheet is of such a character that it could not be readily imitated. Therefore any tam-55 pering with the box would be easily detected.

The lower end of the push-bar F carries a punch-point f', which is adapted to perforate a traveling strip of paper P, which is carried beneath the line of travel of the punch by the 60 pawl-and-ratchet mechanism Q, operated by a rod Q', which is directly connected with the bar F, so that when the latter is pushed down the punch will pass through the paper, making a hole and indicating that the machine 65 has been used. The pawl is at the same time carried along so as to engage a new tooth in the ratchet, and when the push-bar is relieved

and allowed to again rise by the action of the spring p the pawl will rotate the ratchetwheel and with it a drum upon which the 70 paper is coiled, so as to continually advance the paper with each movement of the ratchet.

R is an indicator which contains instructions for the user of the instrument and which is adapted to be thrown upwardly in a closed 75 glazed space R' above the box by having its stem R^2 connected with an angle-lever R^3 . This lever is pushed down in unison with the downward movement of the push-bar F by means of an arm F', projecting from the push- 80 bar and engaging this lever R³, so that when the push-bar is pressed down until the punch has perforated the paper the arm F' will have pushed the lever downward, thus retracting the indicator-plate into the box.

The lever \mathbb{R}^3 is essentially a bell-crank lever fulcrumed at r^3 , and the lower end r is held by a spring-catch X after it has been pushed down, as previously described, and thus remains in this condition with the indi- 90 cator retracted until it is released from the catch by an operation to be hereinafter described, when a spring R4, pressing upon the lever, will return it to its first position and throw the indicator up into view again.

A guide-rod r' is connected with the lever \mathbb{R}^3 at r^2 , the receiver-hook B resting on top of it. Adjacent to this lever is located the electromagnet T, having its wires conducted to the contact-plates t, the left-hand plate 100 making contact with the arm t', Fig. 3. A spring-arm t^2 extends from underneath the arm t' and is connected with the line-wire, while the return-wire is connected with the ground. The spring-arm has its outer por- 105 tion bent upwardly, carrying on its upper portion an insulated block t^3 , having its upper face beveled.

Attached to the receiver-hook B on the inside of the box is a crescent-shaped piece of 110 metal b, its lower horn adapted to press the block t^3 down and outwardly, thereby breaking the contact of the spring-arm t^2 with the arm t'. From this description it will be seen that when the receiver is lifted from its sus- 115 pending hook the block t^3 is released and the spring-arm t^2 contacts with the arm t', and the current passes from the line-wire 20 through the wire 21, connecting with the spring-arm t^2 , and thence through the said 120 arm and the arm t', the plate t, and magnet T, and finally returns to ground through the wire 22 and closes the circuit at this end. When the receiver is again placed on its hook, the block t^3 is depressed to break the contact 125 of spring-arm t^2 with arm t', which opens the circuit on this side.

The parts just specified are used with the usual bell of old boxes in order to cut the magnet-circuit out; but when new boxes are 130 made and the bell v^3 is used this construction will be omitted, as the magnet-circuit has to be kept closed all the time to ring the bell v^3 . U is a bar suitably guided to slide up and

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down, being actuated by a spring u^{3} , pressing on a stud u^2 , which has a tendency to press it down, but is stopped by a shoulder u' on its inner side pressing against a flat 5 spring u^4 . On its upper end it has a lug or pin u, and this lug u engages the forked end of lever C, which forms the switch for the circuit of the instrument, Fig. 3. Now by taking off the receiver the hook will rise and to give the alarm at the central in the usual manner, but the switch C will be left unmoved and held down by stud u. The spring u^4 has been previously disengaged by a pin r^4 , projecting from the side of lever \mathbb{R}^3 , when 15 the latter had been forced down and locked by a former operation. This release allowed the spring u^3 to act and force bar U down until its stud u^2 strikes the connection r^2 , thus

limiting its downward movement, and this is 20 its normal position. The armature V of magnet T has connected with it a rod v, carrying on its outer end a hammer v', from which extends another rod v^2 across and through the side of box A, having 25 a clapper on its outer end, the latter swinging in a bell v^3 . A plate W, hinged to the frame at its corner w, extends inwardly to within reach of a spring-stop X, the latter being pivoted at x, which holds the end r of lever \mathbb{R}^3 down 30 against its spring R⁴. Another spring-arm Y has its outer end in contact with plate W, the latter being placed at right angles to the spring X. This spring-arm Y is for the purpose of preventing the retraction and locking of 35 the indicator without fully registering, as the spring comes in front of the end r of lever \mathbb{R}^3 , thus preventing that end r from passing below the bottom of spring X and be thereby locked. Now after the receiver has been re-40 moved and the alarm given at the central and the necessary information given as to the desired connection the operator at the central will close the magnet-circuit at that end, causing the armature V to be attracted, and 45 the hammer v' will come down on back edge of the plate W and will at the same time ring the bell v^3 . The plate W will be forced against the spring-arm X, pushing it off the top of end r and releasing lever \mathbb{R}^3 to be 50 pushed upward by its spring R4, and thus allow the indicator to be thrown up within notice of the caller. Connection r^2 will also force bar U upward by its stud u² and with it the switch C to signal that the connection 55 has been made. As before stated, the pawl J may be in a locked condition, whereby no coin is needed, or if not a coin will now be dropped and the push-rod F pressed down until the indicator has disappeared, which 60 fact insures the correct registration. By pushing the bar F down its extension F' has

carried the lever R³ back again, has pressed the spring Y out of the way of lever end r, and the latter is now locked again by the 65 spring X, the stud r^4 has depressed the spring

 u^4 , and so allowed bar U to pass down again

to its normal position.

If the pawl J is locked and no coin put in, the pawl will stop the disk E, and consequently prevent push-rod F from registering 70 or moving spring Y enough out of the way to lock lever R³ again, and this will prevent the release of bar U to signal at the central that registering has taken place. The operation will then be as follows: If the telephone user 75 desires to communicate, he removes the receiver from the suspending lever-arm B, and this allows the latter to rise by the action of a spring in the usual manner. The lever C is not moved up with B, and a contact is thus 80 made through the point C', which connects the box with the central, the contact at C² being simultaneously broken. The operator at central station gives the desired information and at the same time produces a 85 current through the electromagnet T within the local box A. This operates a vibrating armature V, which carries the hammer v'. This hammer acts upon a lever W, and this lever-arm disengages the spring-catch X, 90 by which the bell-crank lever R³ was previously held, thus allowing the lever-arm to be thrown up and with it the indicator. At the same time the arm U, actuated by the upwardly-moving parts, moves the lever C, 95 makes a contact at C², and places the box in its operative condition—that is, with the usual bell in circuit—the current passing from the line through the wire 10, the lever B and its head B', the contact C², the wire 12, and the 100 usual bell to ground. The person using the telephone now puts in a coin and presses down upon the push-bar F, and when it has been pushed far enough to register and the latch X has engaged the end of the lever R³ the 105 arm U will be retracted, moving the lever C with it. This restores the contact at C' and breaks that at C², the current passing from the line-wire through the wire 10, the arm B and its head B', the contact C', and through 110 wires to the instruments and induction-coils in any suitable manner. The indicator is thrown down out of sight by the movements of the push-bar. The coin having been previously placed in the opening D will pass into 115 the coincident pocket of the disk and will be carried around, and by its diameter it contacts with the pawl J and pushes the latter upward, so as to allow the disk E to be rotated. If no coin has been placed in the slot, 120 this pawl J prevents the rotation of the disk E and thus prevents the operation of the machine unless the arm J is held up out of engagement by the movement of the lock-bolt when the key is turned. An important feature of the construction

here shown is the ability of the operator at the central station to place the parts of the telephone in their normal condition, so that the current can be transmitted independent 130 of the instrument in case the receiver should have been carelessly left off the hook, as by means of the mechanism previously described

this action can be effected.

In some cases it is desirable to place the telephone in condition for use by the proprietor, so that it can be operated without the coin. In this case it is only necessary to in5 troduce and turn the key within the keyhole
K to hold up the pawl J out of contact with
the disk E. The parts are then in operative

When the disk has been locked by withto drawing the bolt and allowing the pawl J to engage the disk, it prevents any sufficient movement of the disk and connected parts to allow the lever-arm R³ to engage with the latching-catch, and it also prevents the punch 15 from passing through the paper or the ratchetwheel from being revolved, the whole apparatus in this condition being inoperative.

When unlocked, the parts are in condition to

be used.

The strip or tape P, upon which the punch registers, is made in suitable lengths rolled upon centers which are adapted to fit the delivery-roller, and the free end of the tape is then connected with the receiving drum or 25 roller, which is actuated by the ratchet mechanism to gradually transfer the tape as the punches are made. In order to save time in

month or other term and to insure accuracy, 30 we mark the tape transversely at each ten punch-marks and also number them, so that it is only necessary to inspect the last number upon the tape. A space is also left for the signature of the subscriber, and the tape

counting the punch-marks at the end of the

35 is returned to the office as a voucher. As the tape moves over a greater space by the continued increase in the size of the roll upon the receiving-drum, it is found necessary to place the space-marks a gradually-increasing dis-

40 tance apart, so as to compensate for this gradual increase and the corresponding increase of distance between the punch-marks, and this insures the accurate register of the punch-

marks with the subdividing-lines.

The spring Y prevents the instrument being connected up by the suspending-lever, so that communication could be established by that means. It does this by acting as a stop to prevent the arm ${f R}^3$ from being tilted suffi-

50 ciently to be engaged and held by the spring X by the act of hanging the receiver upon its hook. The spring Y can only be moved out of the way either by pushing down the bar F until it registers, when the conditions are right

55 for communication, or, if the indicator be left up, by energizing the electromagnet of the instrument after the receiver has been hung up.

Having thus described our invention, what we claim as new, and desire to secure by Let-

60 ters Patent, is—

1. A coin-controlled telephone apparatus, including a normally-locked mechanism, means whereby it is released by a current from a central station to open a circuit, and coin-65 controlled means for restoring the broken circuit.

including a normally-locked mechanism, means whereby it is released by a current from a central station to open a circuit, and coin- 70 controlled means whereby a line-circuit broken by central is restored by the user to place the telephone in condition for use with a subscriber.

3. The combination with a box or case, a 75 normally-locked rotatable disk having chambers for the reception of coins, a pawl lying in the path of movement of the disk and normally locking the latter against movement, said disk being tripped to release the disk by 80 the contact of a coin carried by the latter, a push-bar and means whereby it operates the disk, an indicator and lever mechanism connected with and operated by the push-bar, means whereby said mechanism is locked and 85 the parts held depressed, and means whereby said mechanism is released and rendered operative by a current from a central station.

4. A coin-controlled telephone apparatus including a receiver-suspending arm, a lever 90 fulcrumed thereon and contacts controlled by said lever one of which is maintained when the receiver is removed from said arm to enable the user to communicate with the central station, a normally-locked mechanism 95 and means whereby it is released by a current from central, said contact-lever being in the path of and actuated by the released mechanism to break the first-named contact and establish a second one, and coin-controlled 100 means for restoring the circuit broken from the central station.

5. A coin-controlled telephone apparatus including a containing-case; a lever mechanism and means whereby it is held in a locked 105 condition, means whereby a release of the locked mechanism is effected from a central station; coin-controlled means for restoring a circuit broken from the central station; a registering mechanism; and a coin-box and 110 means whereby it is locked within the con-

taining-case.

6. In a telephone, a receiver-suspending arm movable when the receiver is removed to notify the central station, a second lever 115 turnable upon the same fulcrum, a normallylocked mechanism by which said lever is retained in position when the receiver is removed, contacts controlled by said lever, one of which is maintained and the other broken 120° when the receiver is removed, an electromagnet, the circuit through which is controlled from the central office, disengaging mechanism actuated by said magnet whereby the lever is released and turned to break the 125 first-named contact and complete the second, a push-bar by which the parts are returned to their original position and locked, a coincontrolled carrying device and mechanism intermediate between the carrier and the push- 130 bar whereby the latter is movable only when a coin is within the carrier.

7. A coin-controlled telephone apparatus 2. A coin-controlled telephone apparatus I comprising a rotary disk having peripheral

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chambers which are successively brought into line with the coin-chute and adapted to receive and hold a coin, a mechanism by which the disk is rotated consisting of a push-bar, 5 a ratchet fixed upon the disk-shaft and pawls actuated by the push-bar whenever the latter is depressed, a lever-arm also movable by the push-bar, a latching device by which the lever is retained after having been pushed 10 down, a magnet, a means actuated by said magnet whereby the latching device is released and the push-bar allowed to return to its normal position.

8. The combination in a telephone of a 15 push-bar, a mechanism actuated by said bar whereby the telephone is placed in communication with the central office, a coin-carrier revoluble in unison with the movements of the push-bar and a pawl mechanism whereby 20 the coin-carrier is normally locked to prevent its rotation, said pawl mechanism being disengaged to allow the movement of the pushbar when the coin has been placed in the

carrier. 9. In combination with a telephone, a receiver, a suspending-arm therefor and contacts which make a connection with the central office when the receiver has been removed, a mechanism whereby the user places it in 30 condition for communication, a push-bar by which said mechanism is actuated, a coin-carrier with which the push-bar is connected, a pawl mechanism by which said carrier and bar are locked when no coin is in the carrier, 35 said pawl being disengaged so as to allow the

movement of the carrier and push-bar when the coin has been placed therein.

10. The combination with a telephone of a rotatable coin-carrier with peripheral pock-40 ets, a chute through which the coins are delivered successively into said pockets when they arrive in line therewith, a check-pawl to prevent backward rotation, a spring-pressed lever lying in the path of the passing coins 45 contained in the pockets, capable of being lifted by the pressure of said coin to allow the carrier to advance, a receiver and suspendingarm therefor, contacts whereby the removal of the receiver makes connection with the 50 central office, a mechanism connected with the telephone whereby the user places it in condition for communication, a push-bar by which said mechanism is actuated, the movements of said push-bar being controlled by 55 the movements of the coin-carrier and its locking-lever.

11. A coin-controlled telephone apparatus comprising a rotary disk having peripheral chambers which are successively brought into 60 line with the coin-chute and adapted to receive and hold the coin, a mechanism by which the disk is rotated consisting of a push-bar, a ratchet fixed upon the disk-shaft and pawls actuated by the push-bar whenever the latter 65 is depressed, a lever-arm also movable by the depression of the push-bar, a latching device by which the lever is retained after having l

been pushed down, an electromagnet fixed within the box, connections with the central office whereby a current may be established 70 through a magnet, a means for disengaging the latch through the operation of the magnet when said current is established and a contact-lever with means whereby it is actuated to return it to a position indicating that the 75 box is in readiness for use.

12. The combination in a telephone of a receiver-suspending arm, electrical connections and contacts which are made when the receiver is removed from the arm, whereby com- 80 munication is made with the central office, an electromagnet within the local box and under the control of the central office, and mechanism actuated thereby to restore the box to its normal condition when connection has been 85 made, a coin-controlled mechanism and a carrier with a device by which the carrier is locked when no coin is within it, and a pushbar whereby the coin-carrier and the mechanism of the telephone are actuated.

13. The combination of a revoluble coincarrier having peripheral chambers adapted to be successively brought into line with the coin-passage, mechanism by which the telephone is placed in communication with the 95 central office, a registering mechanism and a push-rod and pawl-and-ratchet mechanism by which the carrier is revolved and the tele-

phone placed in communication.

14. The combination in a coin-controlled ico telephone apparatus of a revoluble coin-carrier, a mechanism by which the telephone is placed in communication with the central office, a visible indicator movable in unison therewith, and a push-rod by which said 105 mechanisms are actuated.

15. The combination in a coin-controlled telephone apparatus of a coin-carrier, a mechanism by which the telephone is placed in communication with the central office and a 110 visible indicator to show when communication has been established, and a device by which the apparatus is placed in condition for communication after the instruments are connected, said device also actuating the coin-115 carrier, and being locked thereby when no coin has been introduced.

16. The combination of a coin-controlled telephone apparatus of a push-bar by which the coin-carrier is advanced and the telephone 120 placed in communication, and locking and releasing devices whereby the telephone may be placed in condition for use only when a coin is introduced, or independently thereof.

17. A coin-controlled telephone apparatus 125 comprising a coin receiver and carrier, mechanism by which the telephone is placed in communication first with the central office and afterward with a subscriber, and means for actuating the carrier dependent upon the 130 deposit of a coin, a plate upon which said mechanism is carried, a telephone-box for which said plate forms a closure, a receiversuspending lever, contact-plates, and a de-

vice by which the contacts are made or cut off secured within the box, and devices by which the plate is removably secured to the box, and its mechanism connected with that of the box.

telephone apparatus, of a revoluble coin-carrier, a push-bar by which the coin-carrier is advanced and the telephone placed in communication, a coin-chute into which the revoluble carrier delivers the coin, and a receiving-box into which the coin is delivered with mechanism for locking said box in position within the case and sealing it therein.

19. A coin-controlled telephone apparatus comprising a revoluble coin receiver and carrier, mechanism by which the telephone is placed in communication first with the cen-

tral office and afterward with the subscriber, a means for actuating the telephone dependent upon the deposit of the coin, a locked 20 and sealed receiving-box into which the coin is delivered, a traveling indicator and mechanism by which it is actuated and a punch actuated in unison with the depression of the push-bar of the telephone, whereby the deposit of a coin is permanently registered upon a traveling strip.

In witness whereof we have hereunto set

our hands.

ROBERT D. CRANSTON. SYLVESTER M. WILLIAMS.

Witnesses:

S. H. Nourse, Jessie C. Brodie.