

No. 670,062.

Patented Mar. 19, 1901.

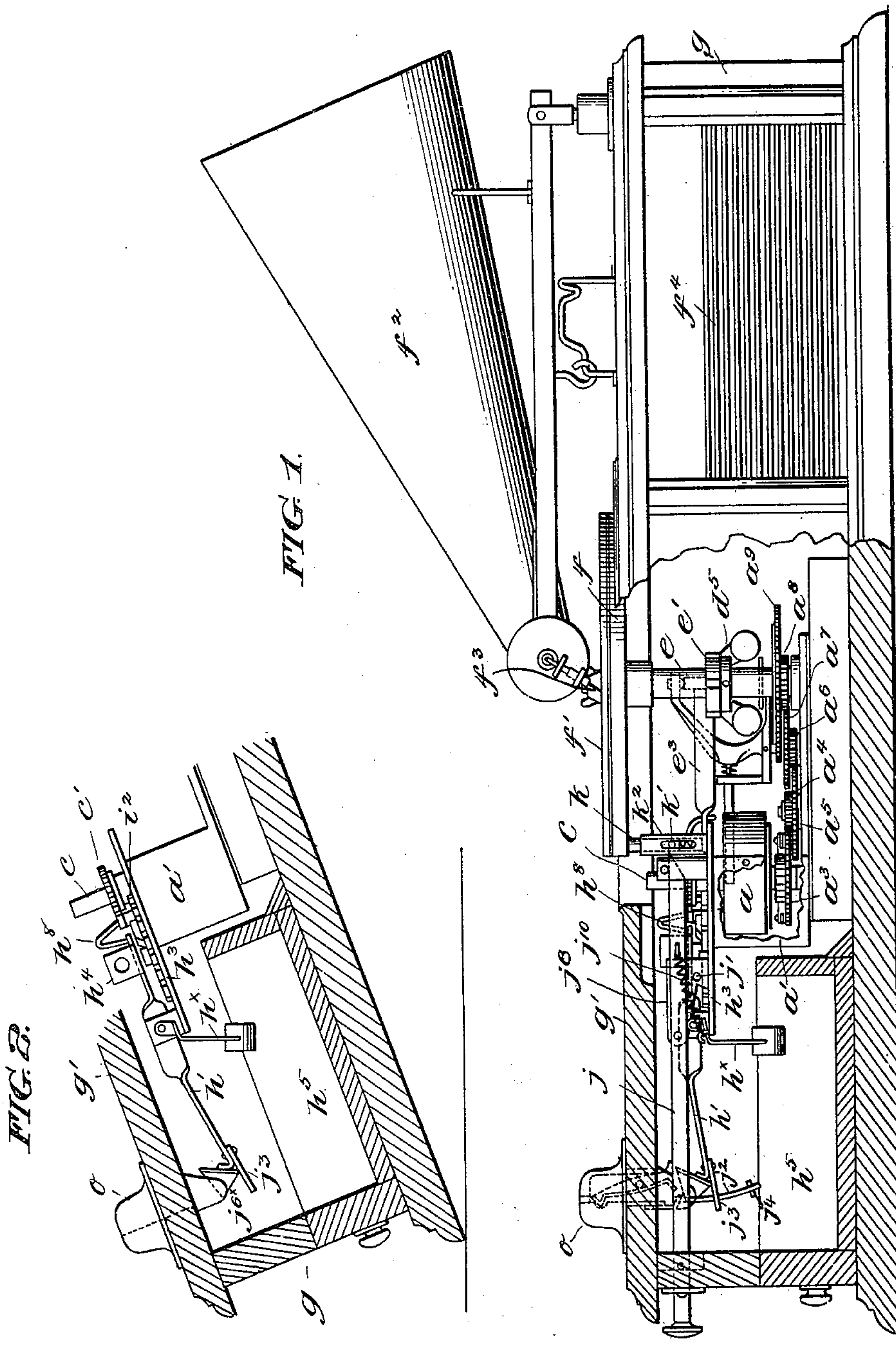
B. G. ROYAL.

COIN FREED APPARATUS FOR GRAMOPHONES.

(Application filed Nov. 13, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:
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Jno. T. Cross

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by *John T. Cross*
his Attorney.

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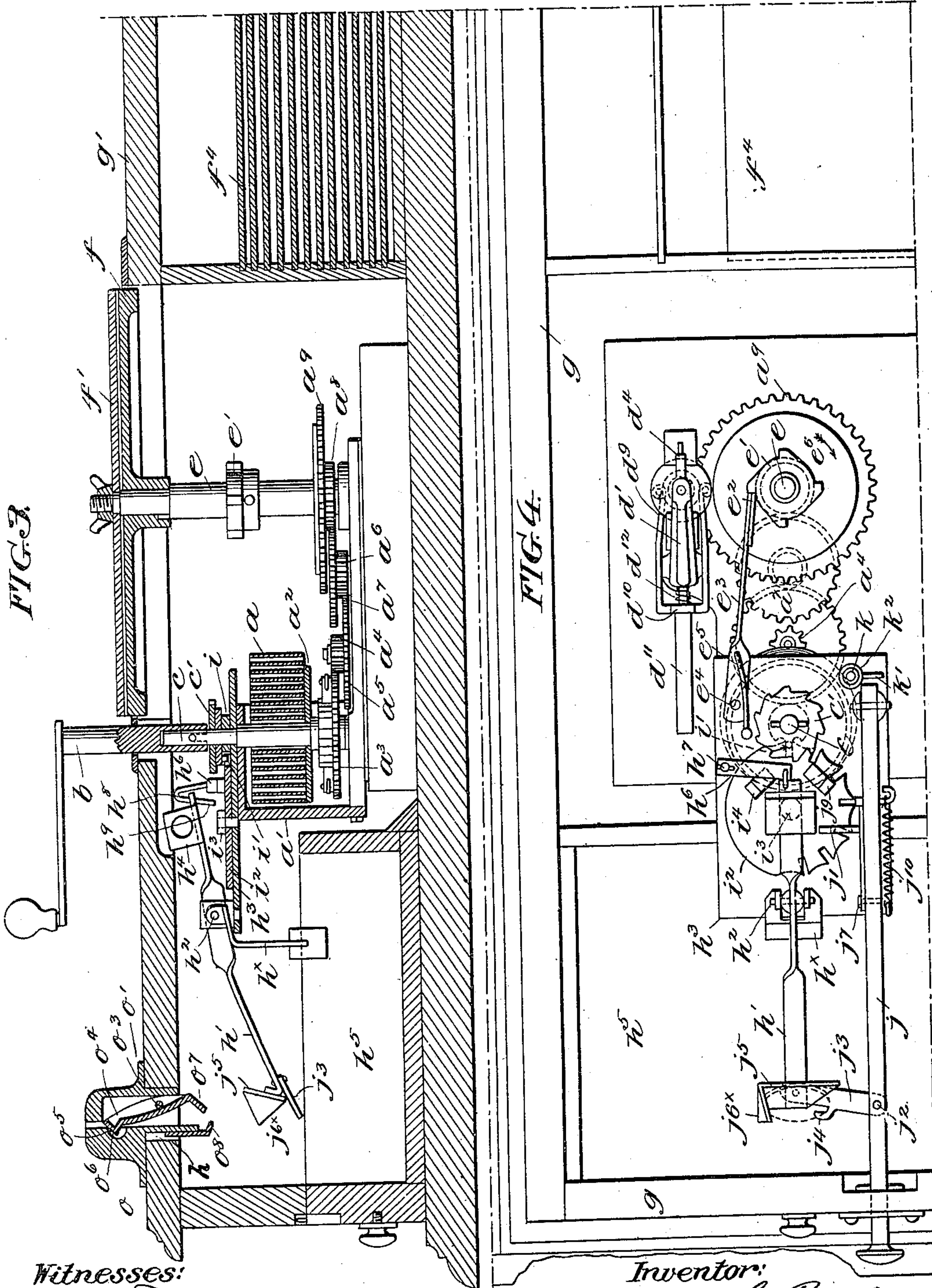
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(Application filed Nov. 13, 1899.)

4 Sheets—Sheet 2.

(No Model.)



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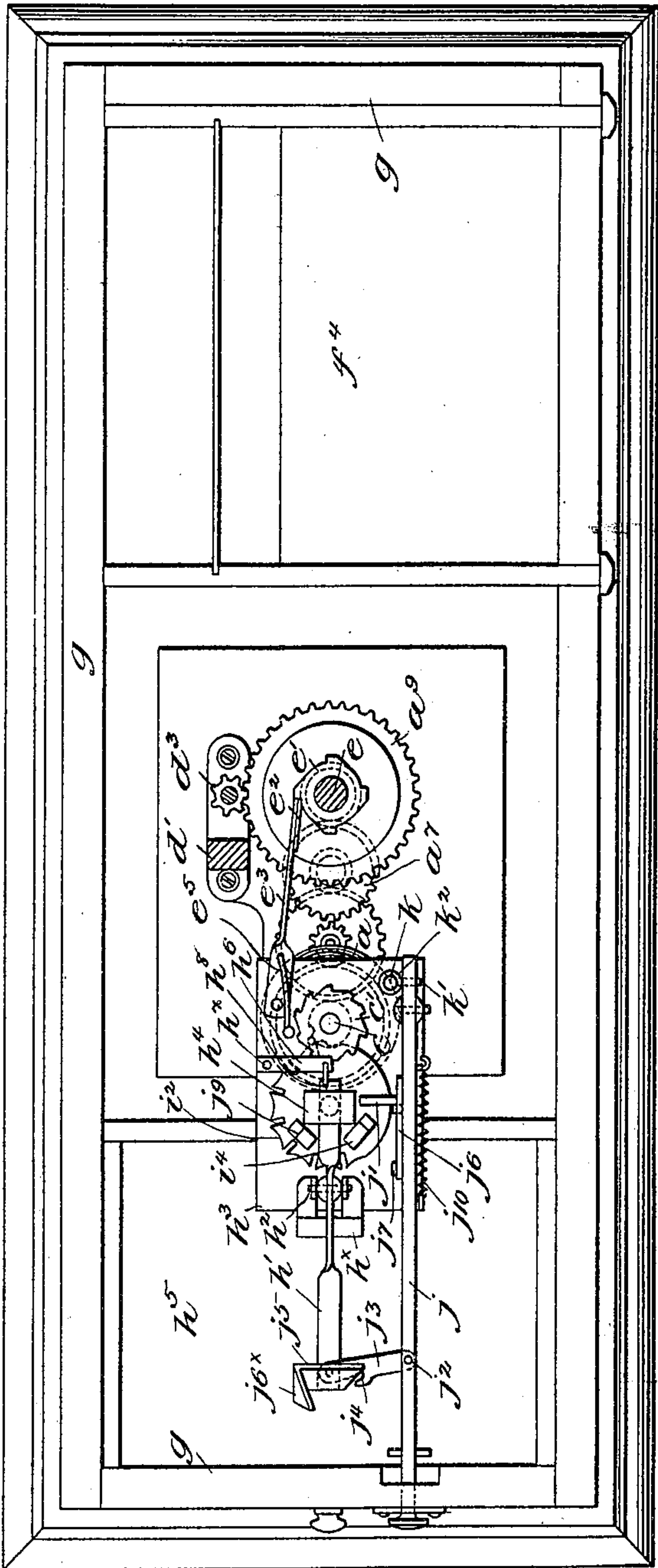
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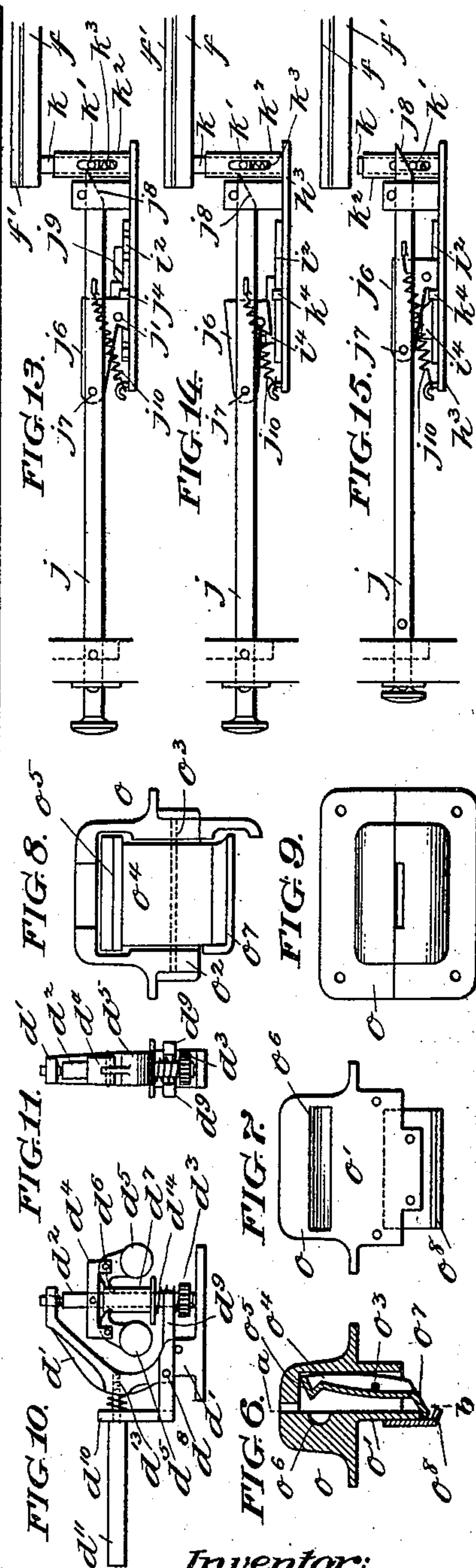
(No Model.)

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FIG. 5.



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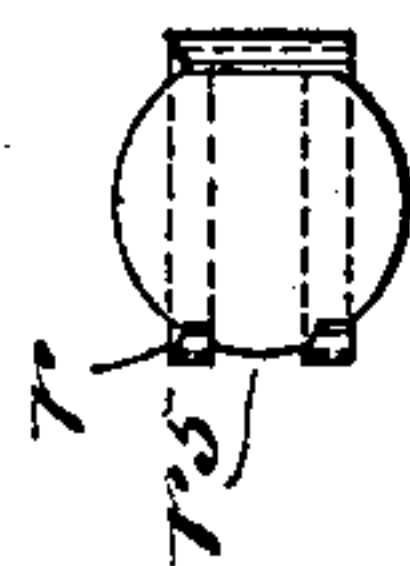
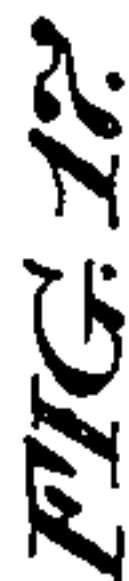
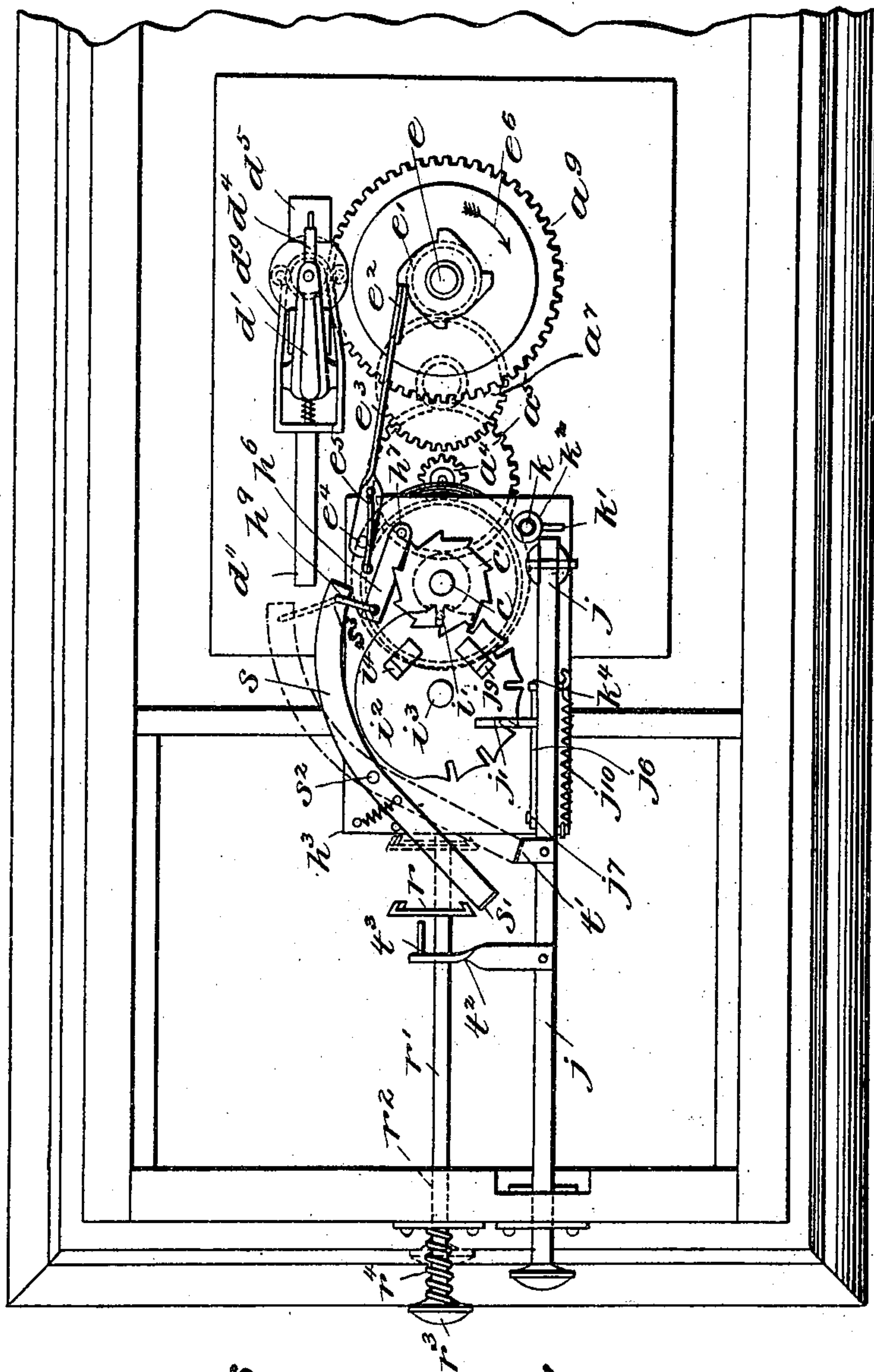
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(No Model.)

4 Sheets—Sheet 4.



Witnesses:
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Inventor:
Belford G. Royal
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UNITED STATES PATENT OFFICE.

BELFORD GRANT ROYAL, OF LONDON, ENGLAND, ASSIGNOR TO THE
GRAMOPHONE COMPANY, LIMITED, OF SAME PLACE.

COIN-FREED APPARATUS FOR GRAMOPHONES.

SPECIFICATION forming part of Letters Patent No. 670,062, dated March 19, 1901.

Application filed November 13, 1899. Serial No. 736,753. (No model.)

To all whom it may concern:

Be it known that I, BELFORD GRANT ROYAL, engineer, a citizen of the United States, residing at 31 Maiden Lane, Covent Garden, London, in the county of Middlesex, England, have invented certain new and useful Improvements in and Relating to Coin-Freed Apparatus for Controlling the Use of Gramophones or the Like, (for which applications have been made in Great Britain, dated April 14, 1899, No. 7,856; in Germany, dated June 12, 1899; in Austria, dated June 20, 1899; in Hungary, dated June 22, 1899, and in Russia, dated June 5/17, 1899,) of which the following is a specification.

My invention relates to certain improvements in coin-freed apparatus for controlling the use of gramophones and other sound-reproducing machines.

The principal object of my invention is to provide an apparatus so constructed as to enable gramophones or the like to be put in operation for a certain time subject to the deposit of a suitable coin, and for this purpose I inclose the motor mechanism of the gramophone in a locked case, together with the mechanism for controlling the operation of the motor mechanism and a receiving mechanism for the deposited coin.

A still further object of my invention is to provide mechanism for preventing the record from rotating until the winding of the motor has been completed, thus preventing the record from being scratched or otherwise mutilated.

Further objects of my invention are to provide mechanism for preventing the winding of the motor until the proper coin has been deposited in the coin-receiving slot; also, to provide a construction of coin-operated lever which cannot be worked or operated by inserting wires or other instruments in the coin-slot, thus preventing the machine from being fraudulently operated, and also in providing means for preventing a repetition of the operation of the apparatus by the deposit of only one coin.

My invention is distinguished from other coin-freed mechanism of this character in that the selections and manipulation of the records and parts for the reproduction of the

sounds are left accessible to the public or the payer, while only the operating and driving mechanisms are locked against general access—that is to say, the person desiring the use of the gramophone after duly depositing the necessary coin and winding up the motor mechanism is not debarred from selecting and manipulating any record of his choice and its cooperating sound-producing parts which are exposed to view.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference are used to indicate similar parts, Figure 1 is an elevation, partly in section, of an apparatus embodying my invention, so much of a gramophone being shown as will serve to explain my invention in its connection therewith. Fig. 2 is a sectional elevation of the forward end of my machine, showing the position the coin-operating mechanism assumes when the said machine is tilted. Fig. 3 is a vertical sectional view illustrating the controlling mechanism with the parts above the record removed and the remaining parts in the position they assume as soon as a coin has been properly lodged in the holder and by its weight tilted the operating-lever. Fig. 4 is a plan view of Fig. 3 with the upper casing removed. Fig. 5 is a similar view to Fig. 4, but showing the parts in the position they assume as soon as the coin is released from the holder. Fig. 6 is a vertical sectional view through the device for guarding the coin-entry against the entry of a wire to manipulate the coin-operating lever. Fig. 7 is a view taken on the line *a b* of Fig. 6 looking toward the left. Fig. 8 is a view taken on the same line looking toward the right. Fig. 9 is a plan view of the coin-entry device. Fig. 10 is a side elevation of the governor used for regulating the speed of the motor. Fig. 11 is a front view of the same. Fig. 12 is a plan view showing a modified form of the coin-freed parts for use in cases where the coins used are too small or light in weight to operate the mechanism. Figs. 13, 14, and 15 are detail views in elevation of the slide, its lock, and the brake, illustrating the different positions these parts assume during the operation of the machine. Fig. 16 is a face view of a claw coin-holder

used in the form of machine illustrated in Fig. 12, and Fig. 17 is a similar view showing a coin in position in said holder.

The coin-freed controlling mechanism is in my present invention brought into combination with the gramophone apparatus through the vertical spindle and record supports thereof, the usual gramophone parts above such support being left, as already stated, exposed.

The gramophone-motor here shown is a usual type of spring driving mechanism for the purpose and consists of a spring a , connected at its outer end to the casing a' and at its inner end to the winding-spindle c , said spindle being rotatable for winding by means of a removable key b . Said spring rests on a plate a^2 to keep it in place, mounted on the axis c . Also affixed on this spindle c is the first wheel a^3 , the teeth of which wheel engage those of the second wheel a^4 , and so on, successively, the motive power of the spring is conveyed through gear-wheels a^5 , a^6 , and a^7 to the gear-wheel a^8 , affixed on the spindle e of the "record" turn-table to which motion has to be imparted. a^9 is another gear-wheel also mounted on spindle e and engaged by the teeth of a gear-wheel d^3 of the governor mechanism provided to control the speed of such rotations, as will be described.

The governor d , referring to Figs. 10 and 11, consists of a framing d' , supporting in bearings above and below the spindle d^2 , on which is affixed the gear-wheel d^3 , which engages the gear-wheel a^9 on spindle e . On the spindle d^2 is affixed the cross-arm d^4 , which carries pins or axes for the weighted arms d^5 , the inner ends of which engage in slots d^6 in a flanged barrel d^7 , applied on spindle d^2 and held in position thereon by said arms d^5 and other arms d^9 , centered on pins d^8 , mounted in the framing d' . The arms d^9 are joined into one at the back and formed into an upturned elbow-piece d^{10} in a hole, in the upper end of which is mounted a shouldered stem d^{11} , the small end thereof being passed through said hole through a coiled spring d^{12} and by its screw-threaded end d^{13} being engaged adjustably in a correspondingly-threaded hole in the framing d' , so that the distance apart of the arm d^{10} and the framing about the stem d^{11} may be varied, and thereby the amount of frictional pressure exerted on the under side of the flange of the barrel d^7 by the ends of the arms d^9 . The operation of this governor d is as follows: If the speed of the spindle e exceeds that to which the device is adjusted, the arms d^5 by the excessive rotary motion communicated as described fly outwardly under the centrifugal force, and their opposite ends exert a pressure on the barrel d^7 sufficient to overcome the spring d^{12} , interposed between the flange of the barrel and the wheel d^3 , bringing that flange into frictional contact with the arms d^9 and impeding the revolutions thereof.

In order to prevent any improper operation of the winding apparatus to the spring-mo-

tor by rotating the turn-table directly by hand in the opposite direction to that in which it is driven for use with the gramophone parts, I mount on the spindle e a ratchet-wheel e' , and engaging therewith is an appropriately-formed end e^2 , properly padded to avoid any discordant noise, of an arm e^3 , centered at e^4 to the plate h^3 , and this arm e^3 is kept to its work on the ratchet-wheel e' by a slight spring e^5 , connected to the plate h^3 and to said arm. By this device the spindle e can only be turned in the direction of the arrow e^6 . Any rotation of the table is by the construction of the parts harmless in the said direction, even when effected by hand.

f is the record turn-table mounted removably on the spindle e , but so as to rotate therewith.

f' indicates the record bedded frictionally on the support f , and f^3 indicates the stylus engaging the record and the other usual parts of the gramophone for conveying the vibrations and sounds produced to the horn, partially seen at f^2 resting on usual supports.

f^4 indicates a series of cells for records formed in the casing g , inclosing the controlling coin-freed mechanism. In this casing g is the coin-slot h , leading to the coin-holder. This entrance to the coin-holder is protected against the insertion of a wire or strip in order to fraudulently operate the lever h' , (to be described,) so as to free the winding mechanism, by a cover o and within the cover by a trapping device, which is shown separately by Figs. 6, 7, 8, and 9, said cover being secured to the casing, as by screws, and is provided with a coin-slit of size to admit of a coin of the proper size. The cover o upon the casing over the entry h is, as shown, formed in two parts for convenience of access to the interior thereof. The sides o^2 of the part o are pierced to form supports for the ends of the cross-spindle o^3 , which carries on it the bent plate o^4 , between which and plate o' each coin has to pass, the coin first passing in between the jaw o^5 and the opening in the side of the plate o' at o^6 and then tilting said plate o^4 inward at top until it enters the hole o^6 , the coin in falling pressing out the end o^7 from the lower recess o^8 of plate o' until the coin is free and falls into the holder below. Any wire directly it presses the end o^7 becomes trapped by the upper end of o^4 . The normal position of the plate o^4 is shown in sectional view in Fig. 3 of the drawings, the slot o^{10} being closed by the inclined jaw o^5 . As soon as the coin is inserted in the slot o^{10} the lower edge of same comes in contact with the inclined face of the jaw o^5 and tilts the plate o^4 , thus causing it to assume a position such as shown in Fig. 6 of the drawings, which closes the lower end of the slot-opening by reason of the inclined end o^7 coming in contact with the recess o^8 . The coin will then drop and in striking against the end o^7 tilts the plate o^4 and returns it to normal position and at the same time allows the coin

to drop into the holder, as before described. From this construction, as described, it will be seen that manipulation of the coin-lever h' by means of a wire or other elongated instrument for the purpose of fraudulently operating the machine is prevented by reason of the trap formed by the tilting lever o^4 . This construction also prevents a second coin from being inserted in the receiving device until after the first coin has been dropped to the coin-holder j^5 .

Below the coin-entry h is a holder into which the coin drops and is temporarily held until it has by its weight performed its function of releasing the locking means, which prevents the winding mechanism from being operated. This locking device is constructed as follows: The "holder" is mounted on a lever-arm h' , hinged to the support h^2 , mounted on plate h^3 , mounted on the spring-case a' and forming part of the framing. At its opposite end this lever h' is weighted at h^4 , so that on the coin falling into the reservoir, here shown as a drawer h^5 , the lever may be replaced in its locking position. The plate h^3 has also affixed in it a stem h^7 , which forms an axis for an oscillating pawl h^6 , which engages normally with the teeth of the ratchet-wheel c' , mounted on the upper end of the spindle c , above the bearing thereof in the plate h^3 , and prevents said spindle c from being turned by the handle b . As soon, however, as the lever h' is tilted and its weighted end is raised the pawl h^6 is drawn free of the teeth of wheel c' by the loop h^8 on the lever h' sliding up the staple-shaped connection h^9 , connected to said pawl, and drawing it away.

To prevent the lever h' from being tilted or moved relatively to the pawl h^6 , so as to free the winding apparatus in absence of a coin by tilting the entire apparatus, as partly shown in Fig. 2, a weighted swing cranked arm h^x is mounted on the hinge-pin h^2 . This arm h^x as the apparatus is inclined, as indicated in Fig. 2, swings to the front, bringing the crank under the lever h' and preventing it from sinking relatively to the line of plate h^3 .

The ratchet-wheel c' is formed with or connected to another wheel or disk i below, having recesses and a pin i' , forming a tooth, adapted to engage the teeth of the star-wheel i^2 , mounted on the axis i^3 , the wheel i performing one complete revolution to each operation on the wheel i^2 . The notches provided on the periphery of the wheel i^2 are cut in about one half of said periphery, the other half being smooth and concentric to the axis of the wheel, as illustrated in Figs. 4, 5, and 12 of the drawings. The circumference of the wheel between each of the notches is curved on a radius equal to that of the disk i , and the said notches are so distanced as to admit of the engagement of the pin i' on each complete revolution of the disk i . This construction prevents the spring a from being wound too tight, because after the pin i' has engaged the last notch in the wheel i^2 it will

come in contact with the smooth periphery of said wheel and prevent the further revolution of the winding-shaft. During the operation of the machine and the unwinding of the motor-spring the wheel i^2 and disk i revolve in the opposite direction, and in this case the star-wheel limits the unwinding of the spring, and thus prevents said spring from becoming too loose, which would render it liable to be disengaged or unhooked from its fastenings. The winding mechanism of the arbor c having been freed from its lock by the coin and coin-lever, the winding up of the spring-motor having been completed, and the star-wheel i^2 having been fully rotated, such rotation will have brought one of two projections fixed thereon—viz., i^4 —with its inclined side foremost under the pin j' , projecting from the side of a latch j^6 , mounted on a hinge-pin j^7 , affixed in the side of the slide j . By the passage of this incline i^4 under the pin j' it lifts it, and thereby the latch j^6 , freeing the inner end thereof from its abutment against the stop k^4 on the plate h^3 , permitting said slide-bar j to be pushed inwardly against the pulling strain of the spring j^{10} , connected at opposite ends to the said slide and to the plate h^3 , so as normally to force out said slide-bar. This pushing inward of the slide-bar j presses its inclined end j^8 upon the pin k' , projecting from the brake-plunger k , which slides in the tube k^2 and is kept normally pressed up against the revolving disk f by the coiled spring k^3 , located in the said tube below the plunger k , causing the pin k' to release the plunger k from its frictional contact with the disk f and permit its revolution and the consequent operation of the gramophone to be effected. This inward movement of the slide j by a pin j^2 shifts one end of an arm j^3 , on which is formed a hook or claw j^4 , said arm j^3 , claw j^4 , and an arm or flat plate j^5 , with its hooked end j^{6x} , forming the coin-holder referred to when they are in the relative positions represented by Fig 4; but as soon as the slide j displaces arm j^3 its claw j^4 by its grip on the coin pulls it away from the parts j^5 and j^{6x} , even should it be smeared with adhesive matter, and the coin drops free into the drawer below. The pin j^2 extends below the push-bar j and is curved slightly, as indicated in Fig. 1 of the drawings, the radius of this curve being equal to the distance between the pivotal point of the lever h' and that of the arm j^3 , so as to permit the said lever h' to descend under the action of the coin. A stop-pin j^{11} is provided through the end of the curved pin j^2 to limit the downward movement of the lever h' and to prevent the disengagement of the arm j^3 from said pin j^2 . As soon as the spindle c has run its full number of revolutions and the wheelwork has resumed its original position, bringing the star-wheel also back to its starting position, the other projection j^9 , provided on the face of the wheel i^2 , mounted thereon, is pressed with its inclined surface under the pin j' . That pin again lifts

the latch j^6 and releases its outer end, (see Fig. 15,) which during the time the inclined end j^3 was engaged with the spring brake-plunger k was engaged with the stop k^4 already referred to, and as soon as this latch j^6 is free from the stop k^4 it flies back to the position shown in Fig. 4 and releases the brake k , allowing it to resume its frictional pressure on the disk f , preventing revolution. The effect of this retention of the slide-bar j by the latch and stop and the holding back of the brake-plunger is to permit the record to complete its revolutions with the disk f and then automatically by the release of the latch and the springing back of the slide-bar j to reset the parts for another coin-freed operation.

Referring to Fig. 12, which shows a modification in the parts for holding and discharging the coin used as the operative link in the train of mechanism adapted for use where the weight of the coin is too small to be efficient as a motive power to tilt the lever h' of the previously-described arrangement. Herein the said articulated holder $j^3 j^4 j^5 j^6$ is replaced by a claw-holder r , mounted on the end of a slide-rod r' , having its bearing in a hole r^2 in the casing g and being provided with a handle r^3 , a spring r^4 causing said rod r' to be constantly tending to project from the casing, as shown. Any pressing in of the slide-rod r' without a coin in holder r will be inoperative; but as soon as a coin is in position in said holder r the coin when pressed toward the end s' of the lever s comes in contact therewith and turns it on its center-pin s^2 , bringing said hooked end s' into engagement with the hooked projection t' on the slide j , (which is in other respects a counterpart of the slide j of Figs. 1, 4, 5, 13, 14, and 15.) The end s' is turned up at right angles to the lever s , and the projection t' has its inner end bent downwardly, but inclined, so as to be engaged by the turned-up end s' , with a wedge effect, so as to hold said lever in engagement with the projection t' until released in the manner hereinafter described. This engagement is just sufficient to hold the end s' of lever s in that position during the winding operation on the spindle c , as already detailed. This movement of lever s draws the opposite end s^3 thereof outward, and by reason of its connection to the pawl h^6 by the staple-shaped connection h^9 , affixed to said pawl, (substantially as shown in Fig. 3,) that pawl h^6 is drawn free of the teeth of the ratchet-wheel c' , and the winding can be effected. As soon as the winding has been completed the slide-bar is pushed in, with the result that the hook parts s' and t' are removed from engagement, lever s , under the influence of spring r^4 , flies back to the position indicated by the full lines, and the arm t^2 , carrying the pin t^3 , moves to the right and meeting the coin in the holder r pushes it out therefrom, causing it to fall into the reservoir—the drawer h^5 —below. The inclined end j^3 performs the same functions in connec-

tion with the brake k and is retained by latch parts, as seen in Figs. 13, 14, and 15 and already described, so that repetition is unnecessary. The form of the holder r in front elevation is shown by detail views, Figs. 16 and 17, with the absent and present coin, respectively, also the slot r^5 , into which the arm s is entered idly when no coin is present to cause engagement.

Access to the interior of the case may be obtained by removing the upper portion g' of the casing g .

From the foregoing description it will be seen that I have provided a machine which is comparatively simple in its construction and positive in its operations and so constructed that it is almost an impossibility to "beat" or defraud the same by fraudulent manipulation.

While I have described the simplest form of mechanism for carrying out my invention, it will of course be understood that various changes in the construction and arrangement of parts might be effected without departing from the spirit and scope of the said invention. Hence I do not desire to be limited to the exact details as shown and described.

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

1. In a coin-controlled talking-machine, the combination with the winding-shaft of its motor, of a ratchet-wheel secured to the upper portion of said shaft, a pivoted pawl adapted to engage the said ratchet, a lever pivoted to the motor-frame adapted to be operated by the weight of the coin, a staple having one arm connected to the pawl, and its other arm loosely connected to the pivoted lever whereby upon the tilting of the forward end of said lever the pawl is withdrawn from engagement with its ratchet, and upon the return of said lever to normal position, the pawl is thrown into engagement with its ratchet.

2. In a coin-controlled talking-machine, the combination with the motor-winding mechanism, of mechanism for holding the same locked, a pivoted lever having a coin receiving and holding device at one end, connections between the other end of said lever and the locking mechanism whereby upon the tilting of said lever by the action of the coin said winding mechanism is released, and a weighted crank-arm pivoted at the fulcrum-point of the coin-lever for the purpose, substantially as described.

3. In a coin-controlled talking-machine, the combination with the motor, of mechanism for preventing the winding of said motor until after the coin has been deposited, means for locking the record turn-table against rotation, and mechanism for releasing such locking mechanism upon the completion of the winding of the motor, substantially as described.

4. In a coin-controlled talking-machine, the combination with the motor mechanism, of

means for preventing the winding of said motor until after the coin is deposited, a spring-brake adapted to bear against the record-table, and lock it against rotation, a push-bar for operating the spring-brake, and means for locking said push-bar against operation until after the motor has been wound up.

5. In a coin-controlled talking-machine, the combination with the motor, means for preventing the winding of said motor until after the coin is deposited, a spring-brake adapted to bear against the record-table and lock it against rotation, a push-bar for operating the said brake, a locking device for preventing the operation of the push-bar until after the motor has been wound, and means for automatically unlocking said push-bar simultaneously with the completion of the winding for the purpose described.

6. In a coin-controlled talking-machine, the combination with the motor mechanism, of means for preventing the winding of said motor until after the coin is deposited, a braking device adapted to bear against, and lock the record-table against rotation, a push-lever for operating the brake device, a locking device for preventing the operation of the push-bar until after the motor is wound, means for automatically unlocking said push-bar immediately upon the completion of the winding of the motor, mechanism for holding the push-bar in contact with the record-table brake, and means for automatically releasing said push-bar and returning the same to normal position, as the motor runs down.

7. In a coin-controlled talking-machine, the combination with the motor mechanism, of a pivoted lever adapted to be operated by the weight of a coin, mechanism connected with said lever for locking and releasing the winding-shaft, a single-tooth wheel secured on said winding-shaft, a star-wheel journaled on the motor-frame having its teeth cut on a portion of its periphery and adapted to be engaged by the single-tooth wheel and limit the winding and unwinding of the motor, substantially as described.

8. In a coin-controlled talking-machine, the combination with the motor mechanism of a pivoted lever adapted to be operated by the weight of a coin, mechanism connected with said lever for locking and unlocking the winding-shaft, a single-tooth wheel secured on said winding-shaft, a star-wheel journaled on the motor-frame adapted to be engaged by the single-tooth wheel, a push-bar for releasing the record turn-table, and mechanism actuated by the star-wheel for releasing the push-lever upon the completion of the winding of the motor, substantially as described.

9. In a coin-controlled talking-machine, the combination with the motor mechanism, of a pivoted lever adapted to be operated by the weight of a coin, mechanism connected with said lever for locking and unlocking the winding-shaft of the motor, a single-tooth wheel

secured on the winding-shaft, a star-wheel journaled on the motor-frame adapted to engage the said single-tooth wheel, an inclined lug formed on the upper surface of said star-wheel, a push-bar for releasing the record-table, a locking device for said push-bar, a pin projecting laterally from said locking device adapted to be engaged and raised by the inclined lug on the star-wheel, at the time of completion of the winding of the motor, substantially as described.

10. The combination with the pivoted coin-lever having mechanism for releasing the winding-shaft of the motor, of a push-lever for releasing the record-table locked against movement until after the coin has been deposited and the motor wound up, a coin-holding device secured to the forward end of the pivoted lever, an arm pivoted to the push-rod and to the coin-holder, and a finger formed on said arm adapted to bear against the coin and help hold it in the holder and to displace it when the push-rod is operated, substantially as described.

11. The combination with a gramophone, of a pivoted lever operated by the weight of the coin for unlocking the winding-shaft of the motor, a ratchet secured on the turn-table spindle, and a pawl secured on the frame of the motor adapted to engage the teeth of said ratchet and prevent the turn-table from being turned in a backward direction to wind up the motor.

12. The combination with the pivoted coin-lever having mechanism for releasing the winding-shaft of the motor, a plunger adapted to bear against the underside of the turn-table and lock the same until after the coin has been deposited and the motor wound up, a push-rod adapted to operate said plunger to release the turn-table, and mechanism actuated by the winding of the motor for locking the push-rod, substantially as described.

13. A coin-receiver comprising an outer casing, having a channel in its central portion, a slot of a size sufficient to admit a coin provided in the top of said casing, a tongue located in the channel pivotally mounted in the side walls of the casing, a flange formed on the lower end of said channel adapted to close the lower end of the slot when the tongue is in normal position, a jaw formed on the upper edge of the tongue adapted to close the upper end of the slot when the tongue has been tilted by the weight of the coin, and a groove formed in the front wall of the channel into which the jaw of the tongue rests when the said tongue is in an inclined position, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

BELFORD GRANT ROYAL.

Witnesses:

ALFRED GEORGE BROOKES,
FREDC. HARUS.