(No Model.) 3 Sheets—Sheet 1.

G. E. TEWKSBURY.

COIN OPERATED MECHANISM FOR PHONOGRAPHS.

No. 523,556. Patented July 24, 1894.

Fig. 1.

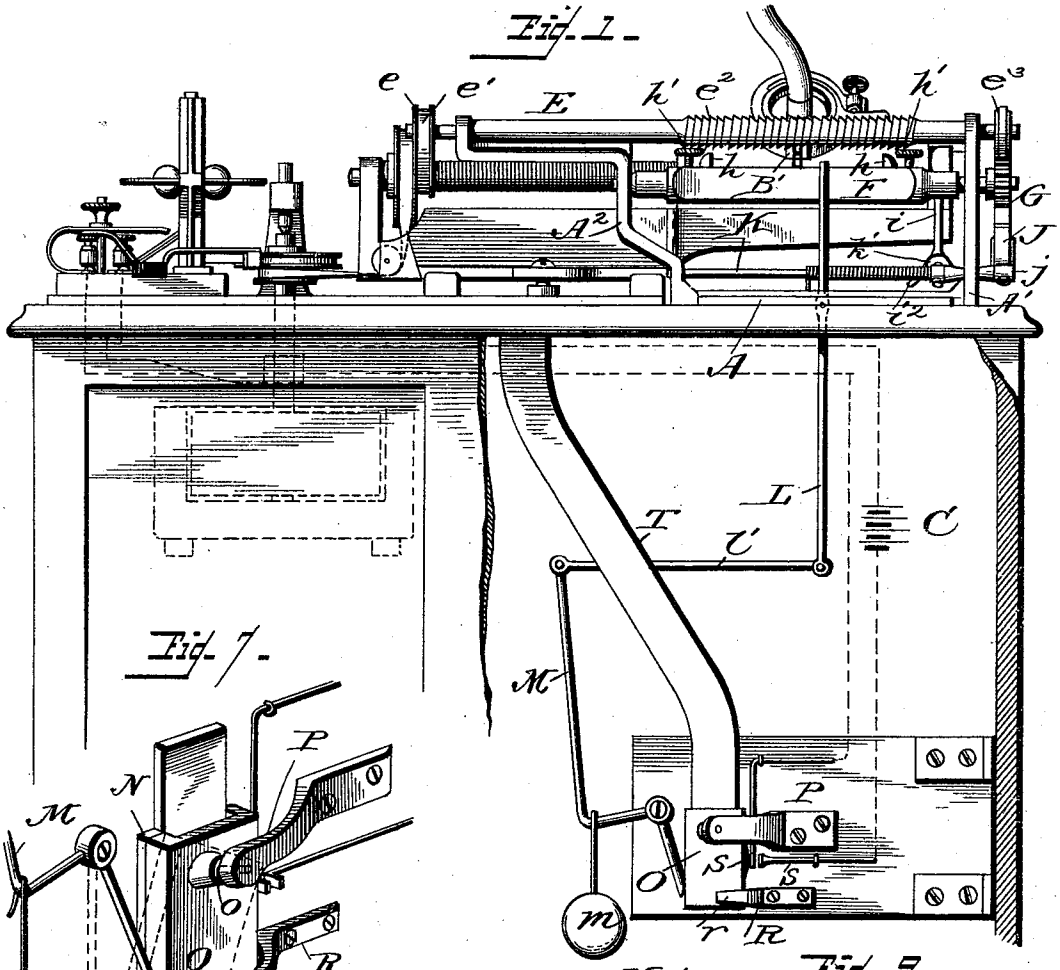
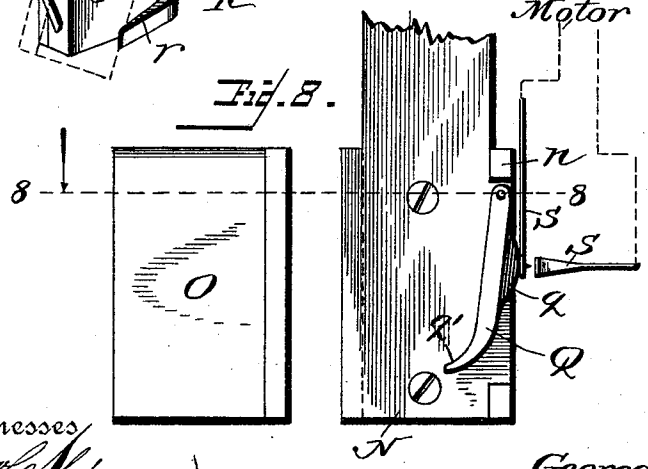


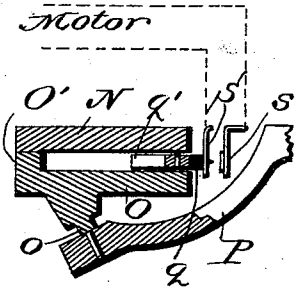
Fig. 7.

Fig. 8.



Motor

Fig. 9.



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G. E. TEWKSBURY.

COIN OPERATED MECHANISM FOR PHONOGRAPHS.

No. 523,556. Patented July 24, 1894.

Fig. 2.

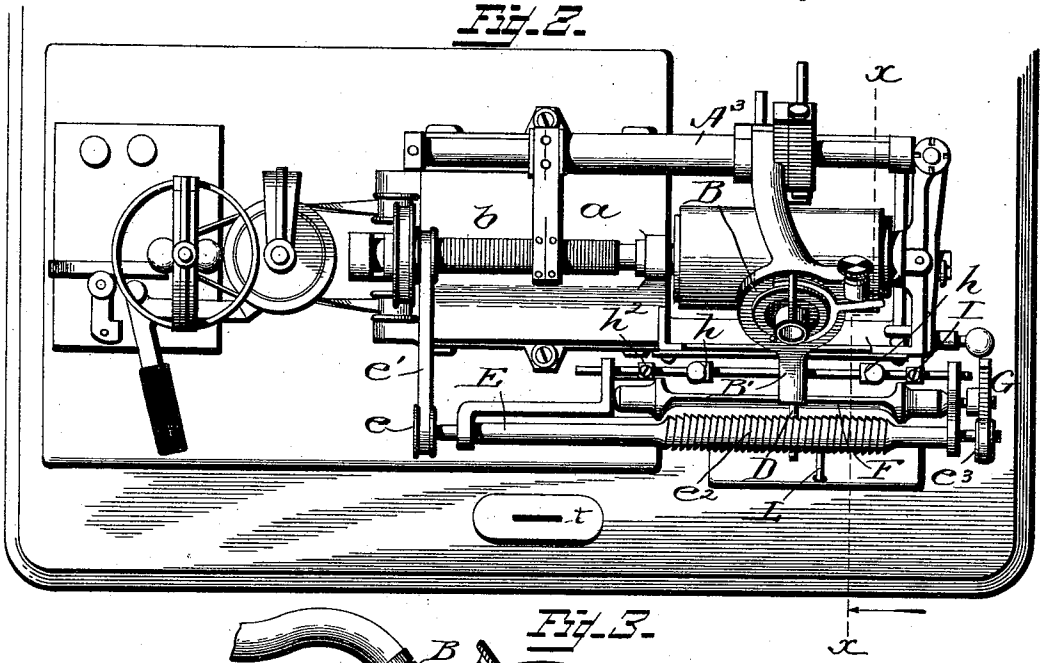


Fig. 3.

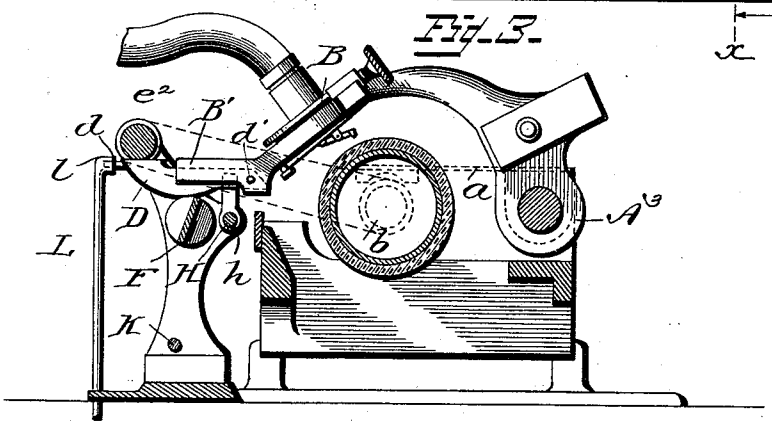
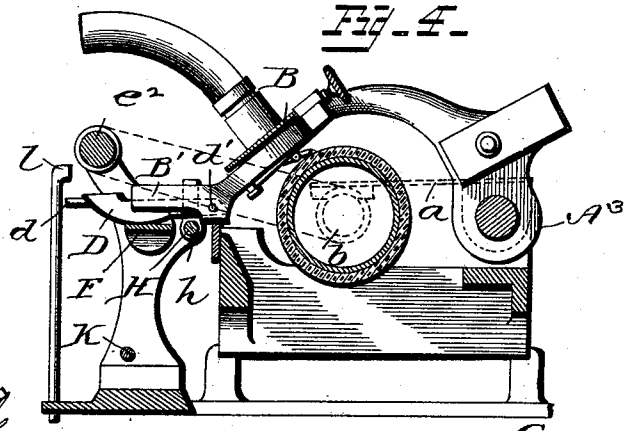


Fig. 4.



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G. E. TEWKSBURY.

COIN OPERATED MECHANISM FOR PHONOGRAPHS.

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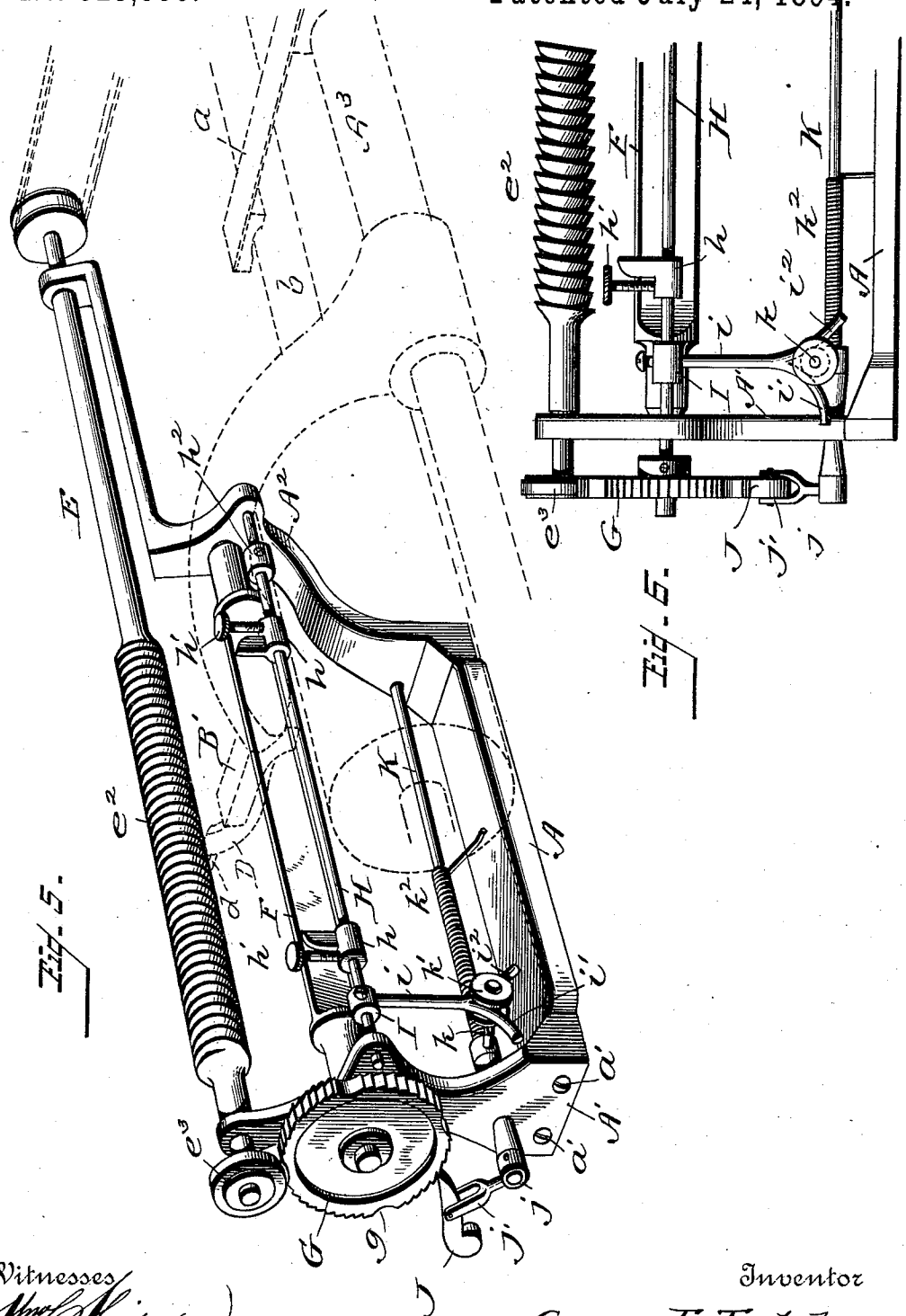


Fig. 5.

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE E. TEWKSBURY, OF TOPEKA, KANSAS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES PHONOGRAPH COMPANY, OF NEW JERSEY.

COIN-OPERATED MECHANISM FOR PHONOGRAPHS.

SPECIFICATION forming part of Letters Patent No. 523,556, dated July 24, 1894.

Application filed November 30, 1892. Serial No. 453,576. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. TEWKSBURY, a citizen of the United States, residing at Topeka, in the county of Shawnee, State of Kansas, have invented certain new and useful Improvements in Coin-Operated Mechanism for Phonographs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to coin operated mechanism for phonographs; and has for its object to start the phonograph by dropping a nickel in a slot, permitting the diaphragm to traverse the length of the wax cylinder or any such part thereof as may be desired, and afterward to automatically stop the same, leaving the phonograph in such a position that another nickel similarly applied will repeat the operation, doing all of this without interfering with or retarding the mechanism of the phonograph or impairing the quality of its reproduction.

The improvement consists of the novel features and the peculiar construction and combination of the parts which will be hereinafter more fully described and claimed and which are shown in the accompanying drawings, in which—

Figure 1 is a front view of a phonograph of ordinary construction showing my invention applied, parts of the cabinet being broken away, showing the coin chute and the coin actuated mechanism, which for convenience is placed below the table on which the phonograph is placed, and the connections between the said mechanism and the diaphragm controlling mechanism. Fig. 2 is a top plan view of a phonograph and the invention applied thereto. Fig. 3 is a section on the line X—X of Fig. 2 looking in the direction of the arrow, showing the diaphragm-controlling mechanism in gear. Fig. 4 is a section similar to Fig. 3, showing the diaphragm-controlling mechanism out of gear and the phonograph feed mechanism in gear. Fig. 5 is a perspective view of the diaphragm controlling mechanism on a larger scale. Fig. 6 is a rear view of one end of the diaphragm controlling mechanism. Fig. 7 is a perspective view of the coin actuated mechanism for making and breaking the circuit to start and stop the phonograph. Fig. 8 is an inside view of the pivoted cap detached and the back plate of the coin actuated mechanism, respectively, showing the terminals of the circuit. Fig. 9 is a horizontal section of the coin-actuated mechanism on the line 8 8 of Fig. 8.

The phonograph is of ordinary construction and is operated by an electric motor shown by dotted lines in Fig. 1 in the usual manner and which receives a current from any convenient source, as the battery C. The sleeve A^3 having the diaphragm B at one end and the spring arm *a* at the other end carrying the twin nut which operates with the feed shaft *b* to carry the diaphragm over the record, is of well known construction and arrangement and is referred to because more intimately related to the invention and mechanically operated by the diaphragm controlling mechanism.

The frame is composed of the plate A and the standards A′ and A^2, the standard A′ being preferably detachable and held to the plate A by fastenings as the screws *a′ a′*, being pierced at proper points to form bearings for and support the working parts of the diaphragm controlling mechanism.

B′ is the front end of the diaphragm supporting arm of the phonograph proper which is provided with a slot on the under side to receive the feed lever D and brace the same laterally.

E is the main shaft of the mechanism, and is provided with a pulley *e* around which passes one end of a belt *e′*, the other end passing around a pulley on the feed shaft *b* of the phonograph. This shaft is also provided with a left handed screw thread e^2 and friction pulley e^3. This friction pulley e^3 may be constructed of rubber or other elastic or yielding substance, or may be a rubber ring sprung over a grooved pulley, and is firmly secured on shaft E to revolve therewith. The shaft E is always in motion when the phonograph is running.

F is a cam roller, or flat bar, so constructed as always to balance on its journals which are supported in the standards A′ and A² of the main frame of the structure. When this cam roller or flat bar is in the position shown in Fig. 3 of the drawings, the lever D attached to the arm B′ rests on the straight edge thereof, completely disengaging the diaphragm from the feed shaft *b* during the travel of the diaphragm to a starting point for reproducing the record. To this cam roller or flat bar F is attached a toothed wheel G having mutilations *g* to permit the friction roller e^3 to rotate freely during the travel of the diaphragm to the starting point for reproducing the record and to a normal position after the record has been reproduced. The mutilations, four in number preferably, conform to the shape of the cam roller as shown, and are formed by cutting out a sufficient number of the ratchet teeth to permit the continuous turning of the friction pulley e^3 without revolving the cam roller or flat bar F. This cam roller or flat bar F is so constructed that in operation it raises and lowers the phonograph diaphragm by means of the lever D hereinafter more particularly described attached to the arm B′ heretofore referred to, thereby starting and stopping the reproduction of the sound, without jar or interference with the reproducing adjustment of the phonograph.

H is a rod that is adapted both to slide and rock in the standards A′ and A² of the frame of the machine as shown, to which are attached two movable stops *h h* held in the required position by thumb screws *h′ h′* for the purpose of limiting the travel of the phonograph diaphragm, and thereby providing the means of securing an accurate beginning and ending of the phonographic record. Attached to the rod H near one end is the collar h^2, held in place by a binding screw, or other device, and serves to limit the movement of the rod in one direction. The collar I near the other end of the rod H is held thereon by a binding screw and is provided with a fork which consists of a rod *i* with forked ends *i′* and i^2 which operate the pawl J carried by the rock shaft K through intermediate mechanism hereinafter described, by depressing the arm *k*, projected from the said rock shaft K by means of the reciprocal motion of said rod H. The anti-friction roller *k′* on the arm *k* enters the angle formed by the diverging ends *i′* and i^2, and is depressed as the fork is moved either to the right or the left.

K is a rock shaft mounted in the standards A′ and A² and is yieldingly held in a normal position by a spiral spring k^2 which is mounted thereon. One end of the spring k^2 is secured to the rock shaft and the other end is extended, and rests on the base or plate A. The purpose of the spring k^2 is to hold the pulley *k′* in operative relation to the fork.

The collar *j* attached to rock shaft K by a binding screw, is provided with the arm *j′* which carries the pawl J. This pawl J by its forward motion at the proper time caused by the depression of the arm *k* rocking the shaft K moves the mutilated gear forward until it is engaged by the friction roller e^3 which roller being in motion moves the mutilated gear wheel to the next mutilation at which point the friction roller becoming disengaged the cam roller or flat bar F ceases to revolve, having during its partial revolution raised or lowered the phonograph diaphragm from or to the phonograph record and engaged or disengaged the arm *a* with or from the feed screw *b* on the phonograph and at the same time effected an engagement or disengagement of the lever D with or from the screw thread on the shaft E.

D is a feed lever placed in the slot provided in the under side of arm B′ and pivotally connected therewith by the pivot *d′*. This lever is made with a projecting end in the rear of pivot *d′* to prevent its dropping more than enough to disengage itself from the screw thread e^2 when arm B′ of the phonograph diaphragm is raised independently of the mechanism, as is necessary to be done when the record cylinders are moved or replaced, thus avoiding the danger of damage to the said cylinders. Also, this lever is so made as to have ample play, being set loosely in the said slot of arm B′ so as to prevent binding or locking at the moment of engagement with the left hand screw thread e^2 of shaft E or during its travel while being actuated by said shaft E.

The under side of the front end of the lever D inclines upward, to permit the cam roller or flat bar F to turn at the proper time without raising the lever D or any portion of the weight of the diaphragm or of the phonograph, until the friction pulley e^3 has engaged the mutilated spur gear G. This lever D is also provided with a projecting point *d* at the front, which in the return movement of the lever D presses against the bent end *l* of lever L (it having passed under said bent end without contact during the forward travel of the phonograph arm carrying the lever D) releasing the nickel or coin below and breaking the electrical circuit which actuates the phonograph thus completing one operation after the operating parts have been returned to the place of beginning.

L is a trip lever mounted on a fulcrum between its ends, which has positive connection with the base A and has a projecting arm or bend *l* at the upper end, against which the projecting point *d* of the feed lever D, as above described, presses in passing on its return motion, while the cam roller or flat bar has its widest diameter vertical as shown in Fig. 3, but which hook is not disturbed during the forward or right hand motion of the feed lever D, while the widest diameter of the cam roller or flat bar is in the position shown in Fig. 4 with lever D resting on the flattened side. At the lower end lever L is

connected with the lever M by the link *l'* forming an adjustable yet sensitive connection with the coin actuated mechanism, and thus perfectly controlling the entire nickel or coin operated action and hence the opening and closing of the electric circuit. These or equivalent connections are essential because it admits of the coin actuated mechanism being located at any convenient point above or below, or at either side, if a cabinet be used for setting up the machine, without in any manner affecting the reliability of the entire device, phonograph included. The connection by link *l'* through modification of the link motion, makes this possible.

N is the sustaining base of the coin operated action and may be attached to the cabinet or table, by bracket, bolt, or angle iron, as most convenient from either end or side. This base with the cap or front wall O forms the coin chute or the termination of the same. The cap or front wall O is held in place by pin or journal *o* projected from its side near the upper left hand corner, at an outward and forward angle of perhaps twenty-two degrees, said pin or journal having a shoulder and working freely in a bearing provided in the bracket arm P, when the pressure of lever M is withdrawn or applied to the edge of the said cap or wall O.

By reason of the angle and eccentric location of the pin or journal *o* the front wall or cap O instantly moves forward and laterally or vice versa when the pressure on lever M is withdrawn or applied, instantly discharging the coin or other substance that may have been directed into the coin chute, when the pressure of lever M is withdrawn. One edge of the base has an inner flange or projection which is cut away between its ends as shown to provide for the reception and the operation of the lever Q.

P is the rigid arm or bracket used as described in foregoing paragraph, held in place by screws or other fastening and supports cap O by the pin *o* working in a bearing provided therein at a corresponding angle to that of said pin *o*. The end of the bracket containing the bearing is so curved outward, or might be filed on its inner edge to the same angle, as to reduce friction to a minimum on the shoulder of the pin *o*.

R is a guide fastened to the base N and so constructed as to permit the forward and lateral motion of the front wall O of the chute and guide the said wall or cap on its return to the position shown in Fig. 1 for which the angle *r* is appropriately made. This apparently simple guide is an indispensable part of the mechanism.

M is a lever constructed as shown and adapted to press against the edge of the cap or front wall O to hold the said cap in the position shown in Fig. 1 and in full lines in Fig. 7 of the drawings or return it to such position when by the trip action of the mechanism it has permitted the said cap to swing open and discharge the coin. The lever is held in an operative position by the weight *m* which is attached to the horizontal member of the said lever M.

S S are two terminals of the wires leading from an electric battery C or other electrical source, and are made of copper or other metal of proper electrical conductivity. Both terminals have broad flattened ends which when the machine is not charged with a coin do not touch. One terminal is rigidly fastened; the other terminal is constructed to form a spring which is driven and held against the rigid terminal when the coin is received in the chute, thus closing the electrical circuit and conveying the power to the electrical motor of the phonograph. The position of the terminals is maintained until the coin is discharged by the action of trip lever L hereinbefore described, when the terminals separate and break the electrical circuit.

Q is a lever pivoted at its upper end to the base N and is provided on its outer face with insulating material *q* which is in engagement with the movable terminal. The lower end of the lever curves in at *q'* to further retain the coin in the chute. The operation of the coin in connection with this lever Q is as follows: The coin enters through a tube or other suitable guide T at the receiving slot *t*. The weight *m* attached to lever M holds the cap in a normal position and the return edge or portion *o'* being on the edge opposite the return portion *n* on the base N forms a perpendicular wall for the coin chute. The lever Q by the action of the spring terminal S and by reason of the location of the pivot hangs at an incline to the perpendicular and forms with the perpendicular wall *o'* a slightly converging chute. The coin by its weight and particularly by the force acquired in its passage through the tube or guide T crowds the lever Q outward against the spring terminal with sufficient force to form a perfect electrical contact, which is maintained by the continuous wedging action of the coin until it has become firmly locked between the curved end *q'* and the perpendicular wall. The distance between the perpendicular wall *o'* and the curved end *q'* is such that a penny or other coin smaller than a nickel passes completely through the chute without crowding the lever to point of contact.

The release of the coin and the consequent stoppage of the mechanism by means of the levers L and M, have been explained in other paragraphs.

The difficulty with many slot attachments, of getting an electrical contact that is reliable enough to operate the phonograph at all times during the entire reproduction of the record with sufficient steadiness not to affect the said reproduction is here obviated, because I do not depend alone on the weight of the coin but not generally reliable thereafter. I obtain a positive contact in the way described, using not only the coin but taking and hold-

ing the power of its blow on the wires through the weighted lever M, during the entire reproduction of the record thus practically making a complete binding post when each nickel or other coin of proper denomination goes in.

The great objection to coin operated mechanisms for phonographs generally is that they do not raise and lower the diaphragm of the phonograph without some concussion. By means of the cam roller or flat bar I do this more gently than the hand can raise or lower it. This is essential to the successful use of the phonograph.

I do not take any power off the small one hundred thread feed screw *b* of the phonograph, the action of the pawl J being on a balanced wheel and cam roller as described that carries no weight until after the friction gear e^3, has engaged mutilated gear G by the action of shaft E which gets its power from the phonograph in the manner hereinbefore set forth.

The trip lever L is so located from right to left that the machine has several seconds of time for the governor of the phonograph to steady its speed before the mechanism lets down the diaphragm on the record and hence the first reproduction of the phonograph is as perfect as the last.

The instant and accurate adjustment to the length of the phonographic record by the stops *h h* is an important element of the invention in that it adapts the mechanism to records of varying lengths.

During the forward travel of the phonograph, which is the period of reproduction, the phonograph is as completely and perfectly detached from and independent of the diaphragm controlling mechanism as if there were no such attachment, and hence can be neither retarded, impeded, nor affected by it.

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

1. The combination, with a phonograph and the mechanism which actuates it, of an interposed shaft driven from said mechanism, a shifting clutch mechanism actuated from the carriage and a carriage lifting device controlled by said clutch mechanism, substantially as described.

2. The combination with a phonograph, its motor, and a circuit in which the motor lies, of a circuit breaker, connected with the phonograph-carriage, and mechanism for raising the diaphragm, and reversing the carriage, said raising and reversing mechanism being actuated from the main shaft of the instrument, substantially as specified.

3. In a coin operated mechanism for phonograph the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record, of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a cam roller, a mutilated gear on the cam roller, a friction roller on the said screw threaded shaft, a sliding rod constructed to be operated by the diaphragm, a rock shaft actuated by means of the said sliding rod, a pawl carried by the rock shaft and adapted to give an initial movement to the said mutilated gear, a coin chute, electrical terminals actuated by the passage of the coin through the said chute, to complete the circuit, and electrical circuit, and an electric motor included in the said circuit, substantially as and for the purpose described.

4. In a coin operated mechanism for phonograph the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record, of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a cam roller, a mutilated gear on the cam roller, a friction roller on the said screw threaded shaft, a sliding rod constructed to be operated by the diaphragm, adjustable stops on the sliding rod, a rock shaft actuated by means of the said sliding rod, a pawl carried by the rock shaft and adapted to give an initial movement to the said mutilated gear, a coin chute, electrical terminals actuated by the passage of the coin through the said chute to complete the circuit and electrical circuit, and an electric motor included in the said circuit, substantially as and for the purpose described.

5. In coin operated mechanism for phonograph the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a cam roller, a mutilated gear on the cam roller, a friction roller on the said screw threaded shaft, a sliding rod constructed to be operated by the diaphragm, a rock shaft having an arm projected therefrom, a fork connected with the sliding rod and adapted to engage with the said arm a pawl carried by the rock shaft and adapted to give an initial movement to the said mutilated gear, a coin chute, 1, electrical terminals actuated by the passage of the coin through the said chute to complete the circuit, and electrical circuit, and an electric motor included in the said circuit, substantially as and for the purpose described.

6. In a coin operated mechanism for phonographs the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record, of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a lever pivotally connected with the diaphragm arm, a cam roller, mechanism for operating the cam roller to disconnect the diaphragm from the phonograph feeding mechanism and effect connection between it and

the said screw threaded shaft, a coin chute, electrical terminals actuated by the passage of the coin through the said chute to complete the circuit, and electrical circuit, and an electrical motor included in the said circuit, substantially as and for the purpose described.

7. In coin operated mechanism for phonograph the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record, of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a lever D pivotally connected with the diaphragm arm and having a point, a coin actuated mechanism, a trip lever having a portion projected within the path of the point of the said lever D and constructed to release the coin, a cam roller, mechanism for operating the cam roller to disconnect the diaphragm from the phonograph feeding mechanism and effect connection between it and the said screw threaded shaft, a coin chute, and terminals actuated by the passage of the coin through the said chute to complete the circuit, and electrical circuit, and an electric motor included in the said circuit, substantially as and for the purpose described.

8. In coin operated mechanism for phonograph the combination with the diaphragm and feeding mechanism for carrying the diaphragm over the record, of a screw threaded shaft operated from the phonograph and adapted to move the diaphragm over the record to a starting point and to a normal position, a lever D pivotally connected with the diaphragm arm and having a point, a coin actuated mechanism, a trip lever having a portion projected within the path of the point of the said lever D and constructed to release the coin and terminals to close the circuit when the coin is dropped in and automatically separate after the coin is released, and electrical circuit, and an electric motor included in the said circuit, substantially as described.

9. In coin actuated mechanism the combination with the base N, of the cap O pivotally connected with the base by a pivot arranged obliquely thereto, said cap adapted to swing outwardly and laterally and forming with the base the coin chute, substantially as described.

10. In coin operated mechanism the combination with the base, and the cap pivotally connected with the base by a pivot arranged obliquely thereto, said cap adapted to swing outwardly and laterally, of the pivoted lever Q having the curved end q', substantially as and for the purpose described.

11. In coin operated mechanism the combination with the base and the cap pivotally connected with the base by a pivot arranged obliquely thereto, said cap adapted to swing outwardly and laterally, of the guide R having the inclined portion r, substantially as and for the purpose described.

12. In coin operated mechanism the combination with the base N, and the cap O pivotally connected with the base by a pivot arranged obliquely thereto, said cap adapted to swing outwardly and laterally of the weighted lever M constructed to hold the cap in operative relation with the base, substantially as set forth.

13. In coin operated mechanism the combination with the base N, and cap O pivotally connected with the base, and adapted to swing outwardly and laterally, of the pivoted lever Q having the curved end q', and the weighted lever M constructed to hold the said cap in operative relation with the said base, substantially as described.

14. In coin operated mechanism for phonographs the combination of the diaphragm feeding mechanism for carrying the diaphragm over the record, a screw threaded shaft operated from the phonograph a lever D having pivotal connection with the diaphragm arm, and having a point, d, a cam roller for effecting engagement and disengagement of the lever D with the said screw threaded shaft and gearing and ungearing the diaphragm feeding mechanism, a friction pulley on the screw threaded shaft, a mutilated gear on the cam roller to be actuated by the said friction pulley, the sliding rod H, adjustable stops on the said rod, the spring actuated rock shaft having arm k, a fork secured to rod H and adapted to depress arm k, and rock the shaft K, the pawl J carried by the rock shaft and adapted to impart an initial movement to the said mutilated gear, trip lever having end l extended within the path of the point d, the weighted lever M connected with the trip lever L, the coin chute having the cap O adapted to swing outwardly and laterally, the lever Q having a curved end q', and the terminals S S, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. TEWKSBURY.

Witnesses:
SIMON S. OTT,
E. STAUFFENBERG.