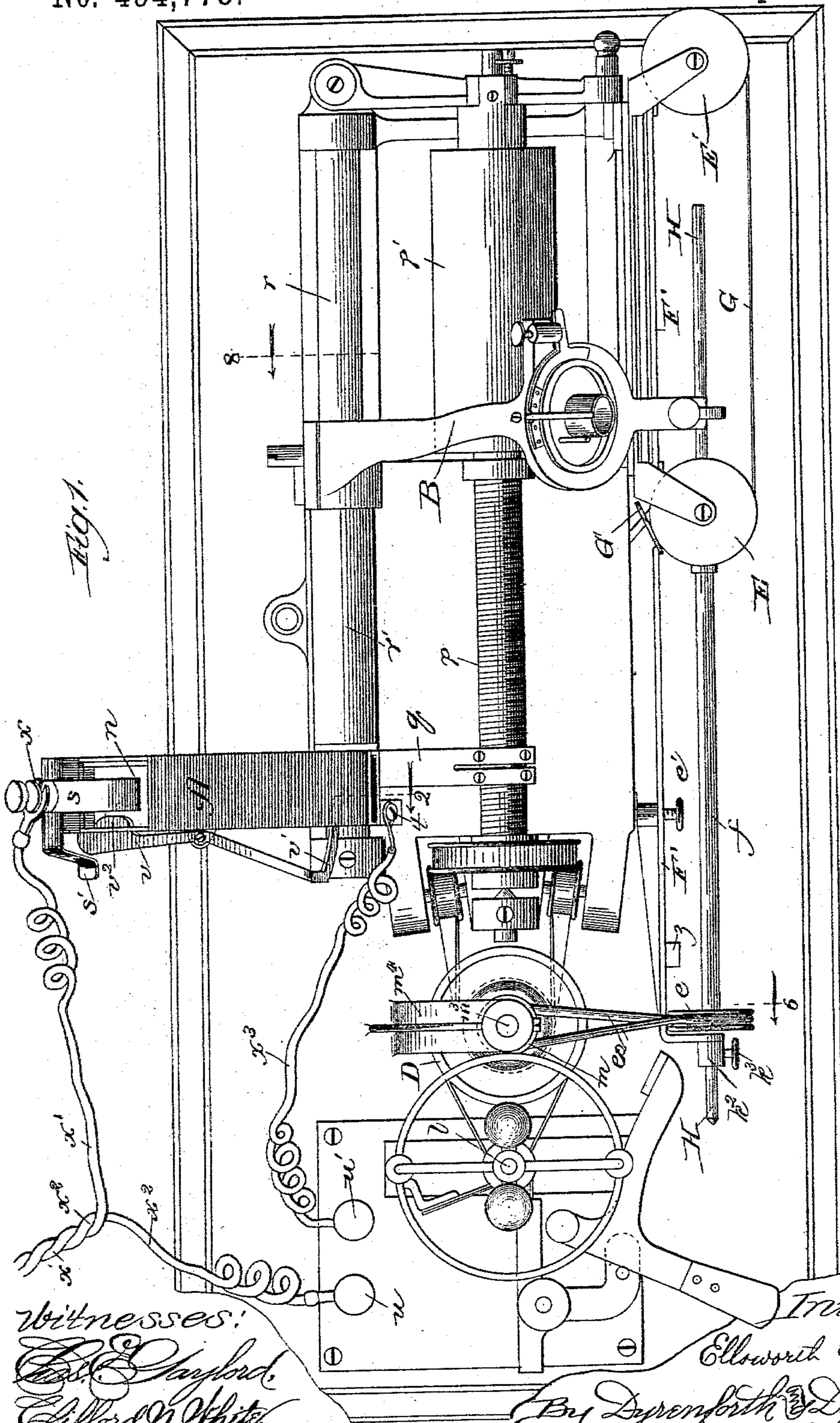


3 Sheets—Sheet 1.

No. 494,778.

Patented Apr. 4, 1893.



Witnesses:

Chas. E. Payson.  
Sifford N. White.

Inventor:

Ellsworth C. Flora

By Durenforth & Durenforth,  
Attys.

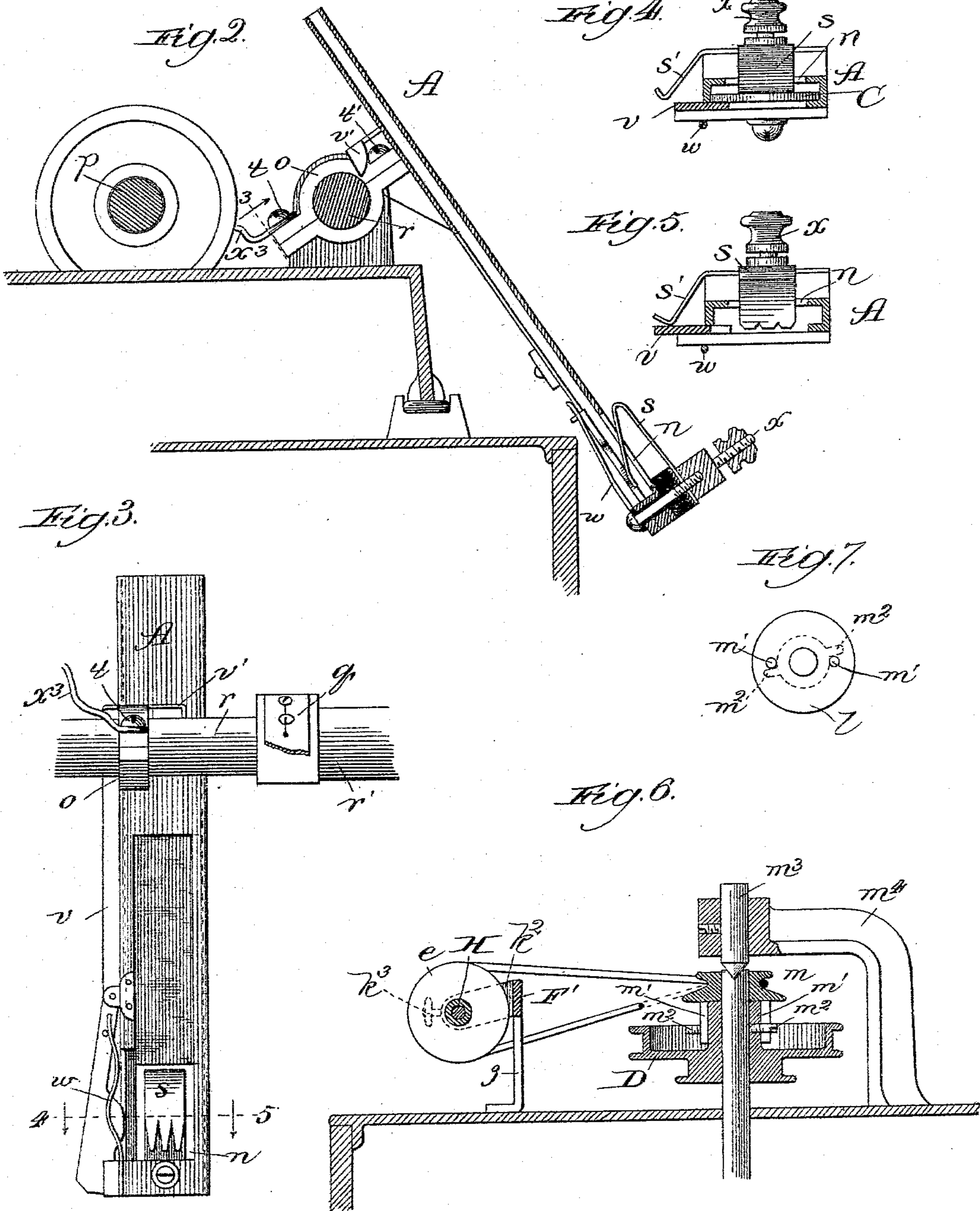
(No Model.)

3 Sheets—Sheet 2.

E. E. FLORA.  
COIN OPERATED PHONOGRAPH.

No. 494,778.

Patented Apr. 4, 1893.



Witnesses:  
Charles E. Chylord,  
Clifford W. White.

Inventor:  
Ellsworth E. Flora,  
By Drenforth & Drenforth,  
Attorneys.

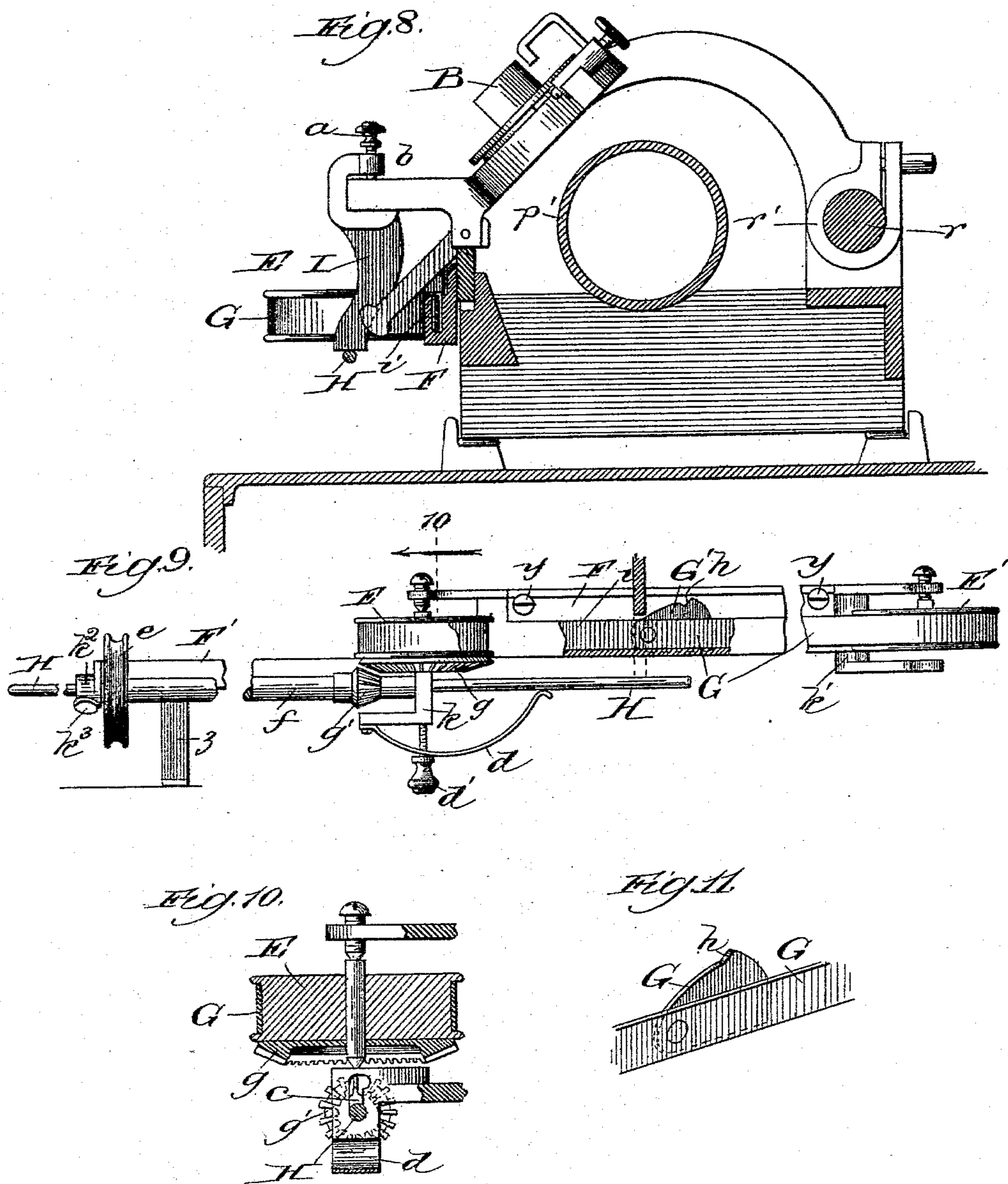
(No Model.)

3 Sheets—Sheet 3.

E. E. FLORA.  
COIN OPERATED PHONOGRAPH.

No. 494,778.

Patented Apr. 4, 1893.



Witnesses:  
C. C. Gaylord,  
Clifford A. White.

Inventor:  
Ellsworth C. Flora  
By *Dyrenforth & Dyrenforth*,  
Attorneys.

# UNITED STATES PATENT OFFICE.

ELLSWORTH E. FLORA, OF CHICAGO, ILLINOIS, ASSIGNOR TO GEORGE B. HOIT.

## COIN-OPERATED PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 494,778, dated April 4, 1893.

Application filed July 31, 1890. Serial No. 360,536. (No model.)

*To all whom it may concern:*

Be it known that I, ELLSWORTH E. FLORA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Coin-Operated Phonographs, of which the following is a specification.

My invention relates to an improvement in the class of attachments for use upon the phonograph to cause it, by the insertion of a coin or token, (intended to represent the price for the privilege of using the instrument,) into a coin-chute, in turn to close the circuit, and thus induce operation of the phonograph, then release the coin, and, finally, effect the return of the carriage to its initial position.

My improvement, while it relates, generally, to the entire coin-actuated mechanism, relates especially to the device for effecting, automatically, the return to its initial position of the phonograph-carriage; my main object being, in that connection, to provide a simply constructed, readily and reliably operating, and durable returning apparatus.

Further objects are to afford generally improved means for producing the automatic operation of a phonograph by the insertion of a coin or circuit-closing token into a slot.

In the accompanying drawings—Figure 1 is a plan view of a phonograph provided with my improvement; Fig. 2, a section taken at the line 2 of Fig. 1, viewed in the direction of the arrow, and showing the construction of the coin-chute and circuit controlling mechanism thereon; Fig. 3, a section taken at the line 3 of Fig. 2 and viewed in the direction of the arrow. Figs. 4 and 5 are sections taken, respectively, on the line 4—5 in Fig. 3, the former showing the parts of the chute in their relative positions with a coin inserted, and the latter showing their subsequent relative positions. Fig. 6 is a section taken on the line 6 of Fig. 1 and viewed in the direction of the arrow; Fig. 7, a bottom plan view of a detail; Fig. 8, a section taken at the line 8 of Fig. 1 and viewed in the direction of the arrow; Fig. 9, a view in broken front elevation of the automatic returning mechanism; Fig. 10, a section taken at the line 10 of Fig. 9, viewed in the direction of the arrow and enlarged; and Fig. 11, a perspective view of a broken

portion of the endless band of the returning mechanism supporting the dog.

A is the metallic coin-chute supported, preferably as shown, on the shaft *r* of a phonograph, which shaft carries the phonograph-carriage involving the sliding sleeve *r'* surrounding the shaft *r* and carrying the stylus-device B and the finger *q*, which engages at its free end with the thread on the screw-shaft *p* carrying the cylinder *p'*.

To support the chute A, I provide, to extend from its rear side, a split collar, *o*, the parts of which are secured together around the shaft *r*, by screws *t* and *t'*, (the latter fastening the chute and collar together) whereby it may be readily loosened to permit the chute to be adjusted on the shaft nearer to or farther from the end thereof, toward which the carriage travels in the operation of the phonograph, depending on the extent of travel desired for the carriage.

Near the lower end of the upper side of the chute, which should be open along a portion of its under side to permit the inserted coin to drop out when released in the manner hereinafter described, is an opening, *n*, into which projects a flat metal spring, *s*, extending from the lower end of the chute, from which it is insulated, being secured in place by a binding-post, *x*. Another spring, *s'*, projects laterally at a right-angle to the spring *s*, being secured by the same means that fasten the last-named spring and bent over the side of the chute beyond which it projects, as shown. A metal lever, *v*, fulcrumed between its extremities to the side of the chute A at which the spring *s'* projects, extends at one end into contact with the spring *s'*, being controlled, to tend normally to make such contact, by a spring, *w*. The opposite upper end of the lever *v* is provided with a finger, *v'*, bent to extend, under the chute, parallel with the shaft *r* into the path of the sleeve *r'*.

The circuit runs as follows: By the wires *x'*, from the battery (not shown) respectively to the binding-post *x* on the chute, and the terminal *u* of the phonograph-motor (not disclosed); the opposite terminal being connected by a wire, *x''*, with the screw on the collar *o*. Thus, as will be seen, if contact be produced between the lever *v* and spring *s'*, or

the spring  $s$  be electrically connected with the chute A, the circuit will be closed, thereby setting the motor in operation, and, through the medium of the gearing illustrated, driving the screw-shaft  $p$ , the rotation of which produces the travel of the carriage in the usual and well-known manner in phonographs.

When the carriage is in its normal initial position, as represented in Fig. 1, the end of the sleeve  $r'$  on the shaft  $r$ , nearest the collar  $o$ , bears against the finger  $v'$  of the lever  $v$ , thereby forcing the lower, contact-end, of the latter inward, and maintaining it out of contact with the spring  $s'$  until the sleeve  $r'$  is moved to advance on its route and permit the spring  $w$ , by thus freeing it, to operate to force the lower end of the lever into contact with the spring  $s'$ . Therefore, the carriage being, normally, in the initial position referred to, obviously the circuit is normally open, owing to the separation of the spring  $s'$  and lever  $v$ , and of the spring  $s$  at its free end, from the chute A.

By inserting a coin, C, (Fig. 4) into the chute A, it slides down the latter until it makes contact with the springs  $s$ , thereby producing electrical connection between that spring and the chute, being prevented from falling out of the open under side of the chute by the normally inward projecting laterally enlarged end  $v^2$  of the lever  $v$ ; so that when the coin is inserted, it closes the circuit and operates the phonograph. When the sleeve  $r'$ , in the operation of the instrument, has moved away, on the route of the carriage, sufficiently far to remove its end from the finger  $v'$  of the lever  $v$ , thus freeing the latter, the spring  $w$ , controlling it, is permitted to act to force the lower end  $v^2$  outward, thereby depriving the coin of its support and allowing it to drop out (into a suitable receptacle, not shown). While this dropping out of the coin breaks the electrical connection between the chute A and spring  $s$ , it does not open the circuit; since before that connection is broken, another is made between the lever  $v$  and spring  $s'$ , which latter continues the operation of the instrument until the carriage is returned to its initial position, wherein it effects opening of the circuit and thus stoppage of the motor, by the bearing of the sleeve  $r'$  against the finger  $v'$ .

The gear-mechanism referred to between the motor and screw-shaft  $p$  may be of the well-known or any suitable construction, though inasmuch as it is desirable that the coin-operating attachment constituting the subject of my improvement, shall be applicable to the instrument without in any, at least appreciable, manner, disfiguring it, I prefer to construct, accordingly, the connection between the pulley  $m$ , from which to drive my automatically operating returning mechanism, hereinafter described, and the pulley device D, through the medium of which

the governor-shaft  $l$  is geared to the screw-shaft  $p$ . To that end, I make use of the stops  $m^2$ , in the form of screws (Figs. 6 and 7) which are commonly inserted transversely into opposite sides of the hub extending upward from the pulley D, and provide on opposite sides of the pulley  $m$ , pins,  $m'$ , to extend vertically downward from opposite sides of the center of the pulley, being far enough apart to embrace the said hub between them, thus permitting the pulley  $m$  to be adjusted by placing it on the hub, causing the pins  $m'$  to embrace the latter, and turning it until stopped by contact of the pins with the stops  $m^2$ . The tapering bearing  $m^3$ , supported in the bracket  $m^4$ , engages the upper side of the pulley  $m$ .

The returning-mechanism for the carriage, hereinbefore referred to, involves the following construction: E and E' are two guide-pulleys, supported in suitable bearings,  $k$  and  $k'$ , extending from opposite ends of a lever, F, which should be provided, longitudinally, with a guide-slot,  $i$ . This bar may be supported on the instrument in any desired or suitable manner, as by forming the cross-head of a bracket to be secured to the base of the instrument. As shown, (Fig. 9) I fasten the bar F, by screws,  $y$ , to the frame of the instrument supporting the shafts  $p$  and  $r$ . An endless band, G, is supported around the peripheries of the horizontally disposed pulleys E and E', and carries, rigidly secured to it, a dog, G', having its upper edge inclined downward from a backward-inclined stop,  $h$ . The under side of the pulley E is provided with a beveled gear-wheel,  $g$ , to be engaged by a beveled pinion,  $g'$ , on a sleeve,  $f$ , surrounding a portion of the length of a rod, H, loosely supported, in the manner hereinafter described, in the bearing  $k$ , through which it passes, and toward its opposite end, in a bearing,  $k^2$ , having a set-screw,  $k^3$ , on a bar, F', forming an extension of the bar F, to which it is secured, and propped by a leg,  $z$ . I also provide, in the bar F', a horizontally disposed set-screw,  $e'$ , (Fig. 1) to bear against the frame of the machine and serve for springing the bar outward and inward, with reference to the frame, to adjust it and thereby tighten or loosen the belt  $e^2$ , connecting the pulley  $m$  with a vertically disposed pulley  $e$  on the adjacent end of the sleeve  $f$ , thereby to rotate the latter on its supporting-rod H and thus drive the beveled pinion  $g'$ . The pinion  $g'$  tends normally to engage with the gear  $g$  by a spring,  $d$ , extending from the bearing  $k$  against the under side of the adjacent portion of the longitudinally adjustable rod H, the spring being adjustable to bear with greater or less pressure against the rod, by a set-screw,  $d'$  (Fig. 9). The meshing of the pinion  $g'$  and gear  $g$  is prevented, however, during the travel of the phonograph-carriage from its initial position, by a tongue, I, on the stylus-device B resting upon the rod H and thus bearing down upon it, thereby springing it toward its free end to

maintain the two gears out of mesh, the opening *c* (Fig. 10) in the bearing *k'* for the passage of the rod, being elongated to permit this transverse movement of the rod *H*. When, in the travel of the carriage, it passes beyond the end of the rod *H*, the latter is free to be raised by its controlling spring *d*, thereby producing engagement of the pinion *g'* with the gear-wheel *g*. The tongue *I* should be separably connected with the end *b* of the stylus-device *B*, being secured in position by a set-screw, *a*, in order that in respect thereto also, the original instrument need not be altered in the application of my improvement.

The entire operation of the device is as follows: On inserting a coin *C* into the chute *A*, it produces, in the manner already described, electrical connection between the springs and chute, and, by the consequent closing of the circuit, actuates the motor to drive the screw-shaft *p* and thus produce the travel of the carriage in the common manner. While the carriage is moving forward, it maintains the pinion *g'* out of mesh with the gear *g* by the bearing of its tongue *I* against the rod *H*, so that although the pinion rotates constantly while the circuit remains closed, (since the pulley *m* geared to the pulley *e* on the sleeve *f* carrying the pinion must rotate, being secured to the pulley *D*) it performs no work until the tongue *I* clears the rod *H*. The extent of the portion of the rod *H* upon which the tongue bears may be increased or diminished, by sliding it in the proper direction, to increase or diminish the extent of forward travel of the carriage. In moving, the sleeve *r'* is withdrawn from its bearing effect against the finger *v'* of the lever *v*, thereby permitting the spring *v<sup>2</sup>* to act to remove the lower end of the lever to the contact-spring *s'*, and, by thus removing the support from the coin, permitting it to drop out of the opening in the back of the chute *A*, but, as already explained, without opening the circuit. When the tongue *I* has passed the end of the rod *H*, the spring *d* raises the latter, producing engagement of the pinion *g'* with the gear-wheel *g*, rotating it and, through it, the pulley *E*. This causes the endless band *G* to travel, whereby the dog *G'* is eventually brought against the tongue *I* and raises it to turn the stylus-device *B*, and through it the sleeve *r'*, back on the shaft *r*, and thus also raise the finger *q* out of engagement with the thread on the shaft *p*, freeing the carriage to enable it to be returned without obstruction. The return is produced by the continued travel of the band *G*, causing the dog *G'*, at its stop *h*, to push the carriage at the tongue *I* along ahead of the dog, until the sleeve *r* strikes the collar *o*, which stops the carriage, the dog clearing the tongue by passing under it, which it does without material obstruction therefrom, owing to the inclination of the stop *h*. As the sleeve *r* reaches the end of its return-route, it bears against the finger *v'* and thereby breaks the contact between the lever *v*

and spring *s'*, thus opening the circuit, stopping the motion of the driving-mechanism, and placing the parts into their relative positions illustrated, in which they are adapted to be again actuated by an inserted coin.

Obviously my improved circuit-controlling mechanism may be used with a phonograph independently of my particular, or any, carriage-returning mechanism; and my automatically operating returning mechanism may be employed with advantage on the phonograph with any circuit-closing device, whether coin-operated or not.

The broad principle involved in my improvement is that of employing an endless carrier to operate, when the carriage reaches a predetermined point, to return it. Hence I do not wish to be understood as limiting my invention to the exact means shown and described for producing automatically the return of the carriage, as these may be variously changed without thereby departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a phonograph and its motor, a coin-chute, *A*, in circuit with the motor and supporting two contacts, the one closing the circuit by an inserted coin, and the other closing the circuit on the escape of the coin from the chute, substantially as described.

2. In combination with a phonograph and its motor, a coin-chute, *A*, in circuit with the motor, and supporting a contact, *s*, closing the circuit by the insertion of a coin, and a contact, *s'*, and a lever, *v*, normally controlled by the phonograph-carriage to support the coin in the chute and released by the advance-movement of the carriage to engage with the contact *s'*, and free the coin, substantially as described.

3. In combination with a phonograph and its motor, a coin-chute, *A*, in circuit with the motor, and having an opening for the escape of the inserted coin and supporting a contact, *s*, in the path for the coin, and a contact, *s'*, and a spring-controlled lever, *v*, extending at one side of its fulcrum into the path of the phonograph-carriage, and at the opposite side thereof into proximity with the contact *s'* and said opening in the chute, substantially as described.

4. In combination with a phonograph and its motor, a chute, *A*, adjustably supported, in circuit with the motor, on the shaft *r*, and supporting contact-mechanism for closing the circuit by a coin inserted into the chute, substantially as described.

5. In combination with a phonograph and its motor, a coin-chute, *A*, in circuit with the motor and having an opening for the escape of the inserted coin and adjustably supported on the shaft *r*, a spring-contact, *s*, in the path for the coin, a spring-contact, *s'*, a spring-controlled lever, *v*, tending, under the influence of its controlling-spring, to engage, at one

end, the contact  $s'$ , and extending at its opposite end into the path of the phonograph carriage, and normally maintained by the carriage out of engagement with the contact  $s'$  and in position to support the coin in the chute, substantially as described.

6. In combination with a phonograph and its carriage, an endless carrier,  $G$ , engaging means upon the endless carrier and phonograph-carriage, driving-mechanism for the endless carrier actuated from a motor and normally out of gear with the endless carrier, and mechanism, substantially as described, for throwing the driving-mechanism into gear at a predetermined point in the progressive movement of the carriage to actuate the endless carrier to return the carriage, substantially as set forth.

7. In combination with a phonograph, an endless carrier,  $G$ , provided with a dog,  $G'$ , extending therefrom to engage with the phonograph-carriage, and provided with a stop  $h$  from which the upper edge inclines downward, driving-mechanism for the endless carrier actuated from a motor and normally out of gear with the endless carrier, and mechanism, substantially as described, for throwing the driving-mechanism into gear at a predetermined point in the progressive movement of the carriage to actuate the endless carrier to return the carriage, substantially as set forth.

8. In combination with a phonograph, an endless band,  $G$ , on horizontally disposed pulleys  $E$  and  $E'$ , a dog,  $G'$ , on the band, a tongue,  $I$ , on the phonograph carriage, extending into the path of the dog, a gear-wheel,  $g$ , on the pulley  $E$ , a spring controlled rod,  $H$ , supported in bearings and surrounded by a sleeve,  $f$ , carrying a pulley,  $e$ , at which it is geared with the driving-mechanism, and a pinion,  $g'$ , normally maintained out of gear with the wheel  $g$  by the tongue  $I$  bearing down on the rod  $H$  against its spring the whole being constructed and arranged to operate substantially as described.

9. In combination with a phonograph, an endless band,  $G$ , on pulleys,  $E$  and  $E'$ , supported on bearings,  $k$  and  $k'$ , extending from a bar,  $F$ , having a longitudinal guide-slot,  $i$ , for the endless band, a dog,  $G'$ , on the band, a tongue,  $I$ , on the phonograph-carriage extending into the path of the dog, a gear-wheel,  $g$ , on the pulley  $E$ , a bar,  $F'$ , forming an extension of the bar  $F$  and provided with a bearing,  $k^2$ , a spring-controlled rod,  $H$ , supported and longitudinally adjustable in the bearings  $k^2$  and  $k$ , and surrounded by a sleeve,  $f$ , carrying a pulley,  $e$ , at which it is geared with the driving-mechanism, and a pinion,  $g'$ , normally maintained out of gear with the wheel  $g$  by the tongue  $I$  bearing down on the rod  $H$ , the whole being constructed and arranged to operate substantially as described.

10. In combination with a phonograph and its motor, a coin-chute,  $A$ , in circuit with the motor and having an opening for the escape of the inserted coin and supporting a contact,  $s$ , in the path for the coin and a contact,  $s'$ , and a spring-controlled lever,  $v$ , extending at one side of its fulcrum into the path of the phonograph-carriage and at the opposite side thereof into proximity with the contacts  $s'$  and said opening in the chute, an endless band,  $G$ , on horizontally disposed pulleys,  $E$  and  $E'$ , a dog,  $G'$ , on the band, a tongue,  $I$ , on the phonograph-carriage, extending into the path of the dog, a gear-wheel,  $g$ , on the pulley  $E$ , a spring-controlled rod,  $H'$ , supported in bearings and surrounded by a sleeve,  $f$ , carrying a pulley,  $e$ , at which it is geared with the driving-mechanism, and a pinion,  $g'$ , normally maintained out of gear with the wheel  $g$  by the tongue  $I$  bearing down on the rod  $H$ , the whole being constructed and arranged to operate substantially as described.

ELLSWORTH E. FLORA.

In presence of—

J. W. DYRENFORTH,  
M. J. FROST.