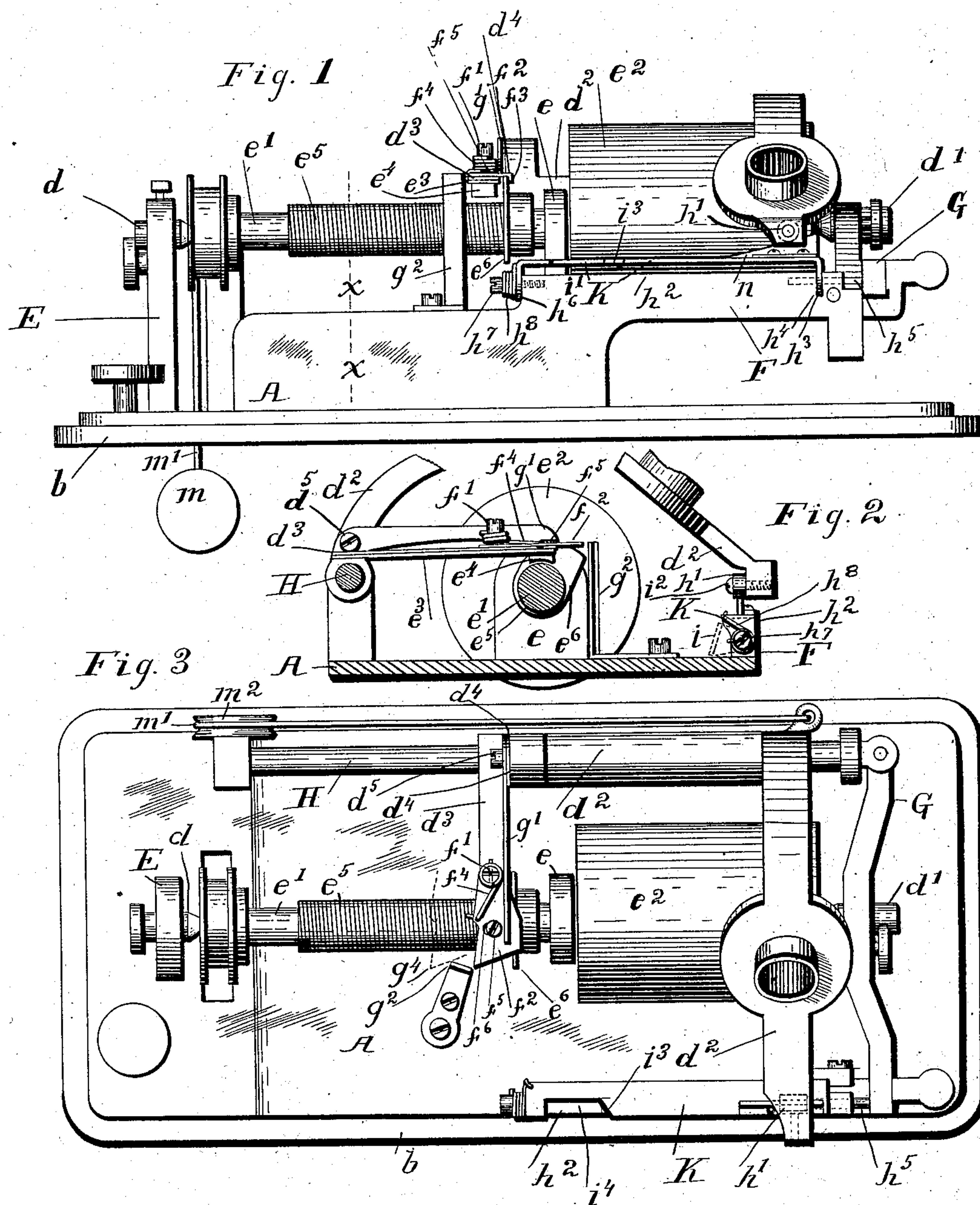


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E. GILMAN.  
REPEATING ACTION FOR PHONOGRAPHS.  
APPLICATION FILED MAY 17, 1902.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWARD GILMAN, OF NEW HAVEN, CONNECTICUT.

## REPEATING-ACTION FOR PHONOGRAPHS.

SPECIFICATION forming part of Letters Patent No. 721,363, dated February 24, 1903.

Application filed May 17, 1902. Serial No. 107,711. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD GILMAN, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Repeating-Actions for Phonographs, of which the following is a full, clear, and exact specification.

My invention relates to an automatic return-carrier and repeating-action for phonographs and analogous devices.

It has for its object to provide mechanism for automatically returning the reproducer to the commencement of the record at the end of its travel, and thus repeating the action of the speaker.

The invention consists in the novel arrangement and combination of a cam upon the driving-shaft for disengaging the sectional operating-nut from the driving-screw, an automatically-projected part upon the reproducer-carriage for intercepting the cam to disengage the nut, and a return track or guide for holding the nut clear of the driving-screw and the speaker clear of the record on the return movement of the reproducer, and in the construction of parts, as hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of a phonograph fitted with my automatic return-carrier and repeating mechanism, showing the operating-nut disengaged from the driving-screw at the end of its travel preparatory to its return. Fig. 2 is a vertical cross-section on the line  $xx$  of Fig. 1. Fig. 3 is a plan view of Fig. 1.

Referring to the drawings, A designates the base-plate of an ordinary phonograph, which is mounted upon the top of the case  $b$  and provided with the fixed standard E, having the center  $d$  and the frame F, to which is hinged the gate G, having the center  $d'$ , which centers, in connection with the intermediate bearing  $e$ , support the driving-shaft  $e'$ , whereon the record  $e^2$  is mounted.

H designates the guide-rod, upon which the reproducer-frame  $d^3$  travels, and to the frame is attached the usual arm  $e^3$ , carrying the section of a nut  $e^4$ , adapted to engage and be driven by the screw-threaded portion  $e^5$  of the driving-shaft. These elements are all old

and well-known and here require no further description, the improvement comprising my invention being as follows:

Upon the driving-shaft  $e'$ , at the end of the feed-screw adjacent the bearing  $e$ , is secured a cam  $e^6$ , adapted to revolve with the shaft and the record  $e^2$ . Above and resting upon the arm  $e^3$  is a similar arm  $d^3$ , having an ear  $d^4$ , by which it is fastened to the frame  $d^2$  by the screw  $d^5$ , inserted therein through said ear. Pivoted to this arm vertically over the shaft by means of a screw  $f'$  is a slide  $f^2$ , having a depending flange  $f^3$  on the edge toward the record. A spring  $f^4$ , wound around the screw  $f'$ , with one end secured through the screw and the other through the slide, normally tends to thrust the slide in the direction toward the record and hold it with its flanged edge projecting somewhat beyond the corresponding edge of the arm  $d^3$ , as shown in the figures. This flanged edge is adapted to be engaged by the cam  $e^6$  to lift the arm  $e^3$  and disengage the sectional nut  $e^4$  from the thread of the driving-shaft, as shown in the figures. A supporting-arm  $g'$ , also secured to the frame  $d^2$  by the screw  $d^5$ , bears at its outer end upon the slide  $f^2$ , and with the screw  $f^5$ , secured in the plate  $d^3$  through the slot  $f^6$  in the slide, receives the strain upon the slide of the cam  $e^6$ .

Mounted upon the base-plate A is a vertical post  $g^2$ , set in such position that it will intercept the pointed end of the slide  $f^2$  just before the latter in its travel reaches the point at which it is to be engaged by the cam  $e^6$ , as indicated by the dotted line  $g^4$  in Fig. 3. The result of such engagement of the slide will be to arrest its motion and cause it to be swung backward from the normal position on its pivot  $f'$  against the tension of its spring  $f^4$ , as the reproducer-frame and the arm  $e^3$  and nut  $e^4$  are meanwhile impelled forward by the driving-screw. The adjustment and proportions of the post and slide are such that the slide in thus swinging backward will soon clear the bar and will then be sprung forward by action of the spring  $f^4$  to normal position, which at that point brings it into the revolving path of the cam  $e^6$ . In this position it will be struck by the cam and lifted to sufficient height to disengage the sectional nut  $e^4$  from the screw-thread  $e^5$ .



The free end of the reproducer-frame  $d^2$  is provided with the usual friction-roll  $h'$ , which in this construction, as in ordinary phonographs, is adapted to track along the horizontal guiding edge  $h^2$  of the base-plate as the reproducer is advanced by the driving-screw; but in connection with my improvements the roll on the return movement of the reproducer is adapted to track upon a suitable removable track or guide K, comprising a flat bar having its ends bent over to the vertical position to form ears, which are hinged to the edge  $h^2$ , as shown, the ear  $h^3$ , near the gate G, being let into a suitable slot  $h^4$  in said edge and pivoted thereto by a pin  $h^5$ , inserted lengthwise in the said edge through the ear, and the ear  $h^6$  being pivoted at the opposite end of the edge  $h^2$  by a screw  $h^7$ . Said screw, like the screw  $f'$ , is provided with an extended head, around which is coiled a spring  $h^8$ , secured at one end through the head and fastened at the other end to the inner edge of the guide K. The spring normally tends to throw and hold the guide up over the edge  $h^2$  in the position to form a track for the roll  $h'$  during the return movement of the recorder, as shown in the figures; but the said track when thrown over inwardly, turning on its axial center, will occupy the position designated by the dotted lines  $i$  in Fig. 2, entirely out of the way of the roll, which will in such case travel upon the regular guiding-track formed by the edge  $h^2$  of the base-plate. The guide K therefore requires to be in the elevated position during the return or non-operative stroke of the reproducer-frame and removed from such position during the feeding or operative stroke. This result is accomplished by means of the following construction: At the end adjacent the ear  $h^6$  a notch or opening  $i'$  is provided in the guide K in the track of the roll  $h'$ , suitable to allow the roll to drop through it to the guiding edge  $h^2$  on the return stroke of the reproducer-frame. As the roll drops through the notch the rounded head  $i^2$  of the screw forming the pivot of the roll will impinge against the guide and crowd it over inwardly to a position from which its continued depression is easily effected by the engagement of the roll with the beveled edge  $i^3$  of the notch in the return movement of the carriage to the position shown by the dotted lines  $i$  in Fig. 2. The resistance of the spring  $h^8$  to the inward movement of the guiding-track serves to cushion the descent of the reproducer-frame  $d^2$  and prevents the speaker from striking with shock upon the record.

The operation of the machine is as follows: Assuming the guide K to be in the depressed position, with the reproducer-frame feeding along by engagement of the sectional nut with the driving-screw, this movement will be continued until the engagement of the slide  $f^2$  with the post  $g^2$  and its subsequent release and engagement by the cam  $e^6$  lifts the nut out of contact with the screw and raises the roll  $h'$  from the guiding edge  $h^2$ . This permits

the track K to spring up to the elevated position, whereby the reproducer-frame is prevented from dropping back to its former position. The return of the carriage may be effected by a spring or gravity, as preferred, a weight  $m$  being employed in the present instance, attached to the reproducer-frame by a line  $m'$  passing over a pulley  $m^2$ , mounted on the base-plate; but in order to assist in overcoming the inertia of the carriage, and thereby avoid undue increase of the weight  $m$ , it is preferable to arrange an inclined plane  $n$  on the track, whereon the roll  $h'$  may track at the inception of its return movement, by which means the weight of the reproducing-frame will materially aid in starting it backward. The inclined plane may be made adjustable on the track, if preferred. On the return of the frame the roll after leaving the incline will run on the track K till it reaches the notch  $i'$ , when it will drop through the same, as hereinafter described, thus reengaging the nut and driving-screw, and the operation will be repeated indefinitely. The depending flange  $f^3$  of the slide  $f^2$  prevents the premature return of the reproducer-frame and insures the slide being retained in contact with the cam until elevated to its highest position.

I claim and desire to secure by Letters Patent—

1. In an automatic return and repeating-action for phonographs the combination with the record-revolving and reproducer-feeding mechanism of means for disengaging the feeding mechanism, and a return-carrier actuated to spring beneath and support the track-bearing of the reproducer-frame on its return stroke, substantially in the manner and for the purpose specified.

2. In an automatic return and repeating-action for phonographs the combination with the record-revolving and reproducer-feeding mechanism of a revolving cam carried by the driving-shaft, a slide mounted upon the reproducer-frame, means for automatically projecting the slide into the path of the cam, and a return-carrier actuated to spring beneath and support the bearing of the reproducer-frame on its return stroke, substantially in the manner and for the purpose specified.

3. In an automatic return and repeating-action for phonographs the combination with the record-revolving and reproducer-feeding mechanism, of a revolving cam carried by the driving-shaft, a spring-pushed slide carried by the reproducer-frame, a stationary stop for retracting the slide by the advance of the reproducer-frame and subsequently liberating it into the path of the cam, and a track for supporting the reproducer-frame on its return movement, substantially in the manner and for the purpose specified.

4. In an automatic return and repeating-action for phonographs the combination with the record-revolving and reproducer-feeding mechanism, of a revolving cam carried by the



driving-shaft, a spring-pushed slide carried by the reproducer-frame, a stationary stop for retracting the slide by the advance of the reproducer-frame, and subsequently liberating it into the path of the cam, a track for supporting the reproducer-frame on its return movement, means for springing the track beneath the bearing of the reproducer-frame as the frame is elevated at the end of its feeding movement, and means for removing the track from the path of the reproducer-bearing by the initial advance of the reproducer-frame in feeding, substantially in the manner and for the purpose specified.

5 5. In a phonograph or analogous mechanism, the combination of the record feed-screw, a cam revolving therewith, the traveling reproducer-frame, an arm carried thereon, a sectional nut carried on said arm engageable with the feed-screw by elevation of the frame, a slide pivoted to said arm, a spring for pressing the slide in the direction of the feeding movement, a stationary stop for intercepting the slide in such advance movement near the end of its travel but permitting its release after a further advance of the frame, whereby the slide is projected into the path of the cam to disengage the feed nut and screw, a track for guiding the reproducer-frame on its return travel, provided with an initial incline for starting the frame by its own gravity, and means for impelling the frame through said return stroke, substantially in the manner and for the purpose specified.

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frame on said return motion substantially in the manner and for the purpose specified.

6. In a phonograph or analogous mechanism, the combination of the record feed-screw, a cam revolving therewith, the traveling reproducer-frame, an arm carried thereon, a sectional nut carried on said arm engageable with the feed-screw by elevation of the frame, a flanged slide pivoted to said arm, a spring for pressing the slide in the direction of the feeding movement, a stationary stop for intercepting the slide in such advance movement near the end of its travel but permitting its release after a further advance of the frame, whereby the slide is projected into the path of the cam to disengage the feed nut and screw, a track for guiding the reproducer-frame on its return travel, provided with an initial incline for starting the frame by its own gravity, and means for impelling the frame through said return stroke, substantially in the manner and for the purpose specified.

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Signed by me at New Haven, Connecticut, this 14th day of May, 1902.

EDWARD GILMAN.

Witnesses:

HELEN C. WHEAT,  
GEORGE L. BARNES.