

S. KERSHAW.

REPEATING ATTACHMENT FOR TALKING MACHINES.

APPLICATION FILED JAN. 31, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

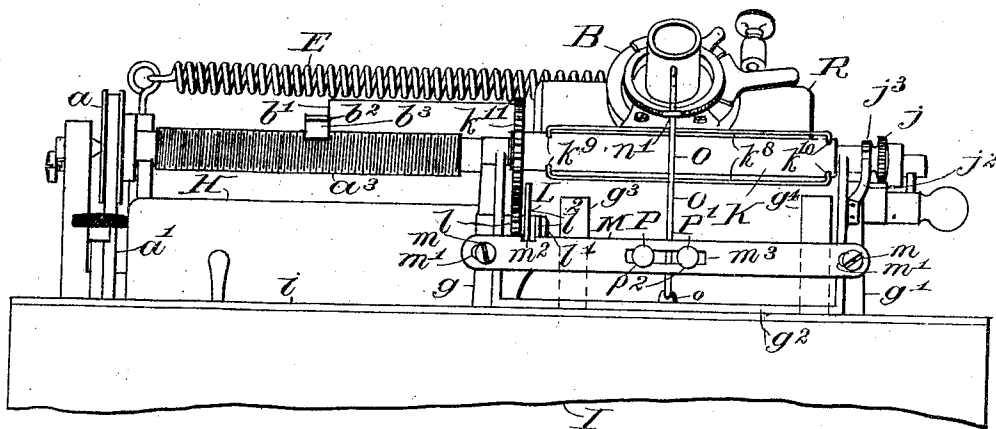


Fig. 2.

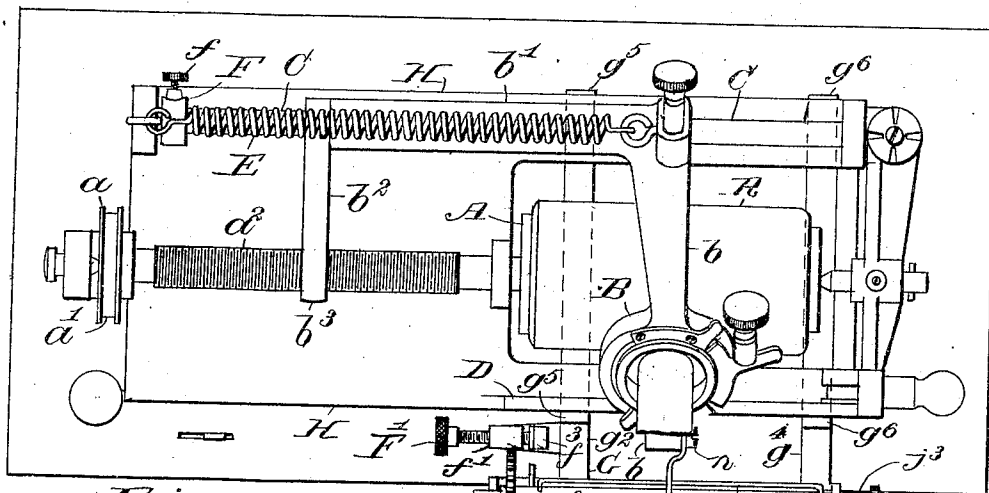
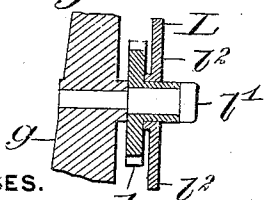


Fig. 3.



WITNESSES.

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REPEATING ATTACHMENT FOR TALKING-MACHINES.

No. 805,076.

Specification of Letters Patent.

Patented Nov. 21, 1905.

Application filed January 31, 1905. Serial No. 243,556.

To all whom it may concern:

Be it known that I, SAMUEL KERSHAW, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Repeating Attachments for Talking-Machines, of which the following is a specification.

This invention relates to repeating attachments for talking-machines, such as phonographs and graphophones.

The object of this invention is to return the speaker or reproducer instantly to the starting-point of the record after each reproduction of the record until the motive power is exhausted or until the motor is stopped by the usual means in order to give a continuous reproduction of a musical record to accompany dancing, marching, or other rhythmical movements of the body or limbs.

The improvement herein described allows the beginning and ending of the reproduction to be made at any desired points on the record, so that, if desired, the usual "announcement" at the beginning of the record may be omitted in the repetition, or any desired part of the record may be used alone.

Other devices which return the reproducer to the starting-point are coin-controlled and do not repeat the record until another coin is placed in the coin-slot or else occupy too much time in making such return to allow of their being used for any purpose that requires a practically continuous performance. Such devices are usually a part of the machine and built into the same frame with the other parts, the whole constituting a special machine capable of no other use.

The attachment herein described is easily separable from the talking-machine and does not prevent the ordinary uses of the latter.

In the accompanying drawings, on two sheets, Figures 1 and 2 are respectively a front elevation and a plan of a phonograph with my improved attachment applied thereto; Fig. 3, a vertical transverse section on the line 3 3 in Fig. 7 of a part of the attachment-frame, the escapement, and the pinion rotary therewith; Fig. 4, a left-end elevation of the phonograph and my attachment; Fig. 5, a front elevation of said attachment; Fig. 6, a vertical section on the line 6 6 in Fig. 5 of the spring-winding spindle, showing a right-end elevation of the other parts of the attach-

ment; Fig. 7, a vertical section on the line 7 7 in Fig. 5 from front to rear of said attachment; Fig. 8, a left-end elevation of the upper part of the phonograph and of the attachment, showing the reproducing-arm of the phonograph raised by the lifter; Fig. 9, the lifter, partly in central longitudinal section, showing in plan the spindle, spring, and gear fast on the lifter; Fig. 10, a longitudinal vertical section on the line 10 10 in Fig. 11 of a part of the frame of the attachment, showing in rear elevation parts of the sliding bar and lever of the escapement; Fig. 11, a vertical transverse section of a part of the attachment-frame on the line 11 11 in Fig. 5, showing parts of the escapement; Fig. 12, a vertical section on the line 12 12 in Fig. 9 of the barrel and spindle and a left-end elevation of the lifter-spring.

The phonograph is represented as having a mandrel A, provided with a fast pulley a , adapted to be connected by a belt a' to any suitable motor. The mandrel supports a record R and has a screw a^2 , the revolution of which causes a diaphragm or reproducer B to travel lengthwise of said record, said reproducer being secured to the reproducer-arm b of a tubular carrier b' , which slides on a guide-rod C and has another arm b^2 , the free end of which supports a nut b^3 , which rests upon the screw a^2 when the phonograph is in operation, the front or free end of the reproducer-arm being then supported by a straight edge D, which is parallel with the axis of the mandrel A and with the guide-rod C. The above-named parts are of the usual construction and operation.

To return the diaphragm or reproducer to the starting-point, the front end of the reproducer-arm is lifted and pushed to the left in Figs. 1 and 2, the raising of said arm raising the nut b^3 out of engagement with the screw a^2 and then replaced upon the straight edge D, causing said nut to reengage said screw.

To return the diaphragm to the starting-point, I use a spring E or equivalent device, the same being represented as a spiral spring connecting the carrier b' with a part of the phonograph-frame at the left of said carrier, so that said spring is stretched by the feed movement of the carrier and draws said carrier back in a second or less time, when the reproducer-arm is raised and supported, as hereinafter described.

It is important that the carrier should return to the exact point desired in order that the reproducing-point of the diaphragm may engage exactly the beginning of the record or the beginning of the part to be repeated. I use a stop, which may be a collar F, surrounding the guide-rod C and held at any desired point by a radial set-screw f , which turns in said collar against said rod, as shown in Figs. 1 and 2; but I prefer to use an arm or post f' , supported on the frame G of the attachment, Fig. 2, in which post turns a horizontal screw F', the point of which carries a buffer f^3 , of felt, leather, rubber, or similar material, against which the reproducer-arm b may strike in the return movement of the carrier b' , the last-named device being more easily and accurately adjustable and being removable with said attachment-frame. The frame G of the attachment consists of two posts g g' , connected by a suitable base g^2 . When the attachment is in use, it may be secured to the base H or frame of the phonograph in any convenient manner. In Figs. 1, 2, 4, and 8 the frame G is represented as provided with arms g^3 g^4 , each of which extends to the back of the base H and has two upward projections g^5 g^6 , arranged at a suitable distance apart to receive between them said base H, so that the weight of the phonograph will hold the attachment steadily in place on the table i or top of the motor-case I. A horizontal spindle J is journaled in the posts g g' and may be turned by grasping and turning a milled head j secured thereto.

The lifter, which raises the reproducer at the end of the reproduction and disengages the nut from the screw, comprises a barrel or hollow cylinder K, rotary on the spindle J, a helical spring k , arranged in said barrel and having one end secured to said barrel at k' , and having at the other end a hook k^2 , which engages a projection j' on the side of the spindle J. The spindle J, Figs. 9 and 12, passes through central holes k^3 k^4 in heads k^5 k^6 of the barrel K, the head k^6 nearest the head j having a radial slot k^7 to allow the projection j' to pass through said head k^6 and engage the hook k^2 . When the spindle is turned to wind up the spring k , said spindle is prevented from turning in the opposite direction by a spring-retaining pawl j^2 on the post g' , which engages a ratchet-wheel j^3 , fast on said spindle. The barrel K is long enough to fill the space between the posts g g' without binding. The barrel K is provided with a plurality (four are shown) of rests k^8 , arranged at equal angular intervals from each other, each having a straight edge or surface, on which an extension N (hereinafter described) of the reproducer-arm b may slide to the starting-point when said arm is raised. These rests are represented as each formed of a single wire, the body of which is parallel with the axis of said cylinder, the end portions of said wire being

bent at right angles at k^9 k^{10} and driven radially into the heads k^5 k^6 of the barrel K. A gear k^{11} is fast on the barrel K, concentrically therewith, and engages a pinion l , which turns on a horizontal stud l' , secured to the post g . Rotary with the pinion l is a spider L, having as many arms l^2 as there are rests k^8 on said barrel, said arms l^2 being of an even number and the opposite arms lying in the same plane with each other, but in a different plane from the next arms, or, at least, the free ends of successive arms lie in two different planes, the alternate free ends in the same plane. The unwinding of the spring k tends to turn the cylinder K, gear k^{11} , pinion l , and spider L in the directions indicated by adjacent arrows.

A bar M is arranged to slide on studs or screws m , which pass through slots m' in said bar into the posts g g' , the length of said slots limiting the movement of said bar. Said bar M is provided with a notch m^2 on its upper edge of a width and depth sufficient to allow the free end of one of said arms l^2 to pass freely through said notch, and the sliding of said bar in one direction brings said notch into position to allow the arms l^2 of one plane to pass down through it; but immediately after one of said arms passes through said notch the next-following arm being in another plane strikes the top of said bar outside of said notch and prevents the further rotation of said spider and of the pinion, gear k^{11} , and barrel K. When said bar M is pushed in the other direction, the arm resting on said bar passes down through said notch and the following arm strikes on the top of said bar. As represented, the pinion l has half as many teeth as the gear k^{11} , so that every time one of the four arms l^2 passes through the notch m^2 the barrel makes one-eighth of a revolution. The bar M and the spider L thus form an escapement.

To the reproducer-arm b I attach an extension N by any convenient means, as by the cap-screw n , Fig. 2, said extension consisting of a rod or wire having at its front end a loop n' , and a lever O, pivoted at o on the base g of the frame G, extends up through said loop n' and is swung alternately in one and the other direction by the operative and return movements of the reproducer. The lever O swings between two studs P P', which are adjustable in the horizontal slot m^3 of the escapement-bar M, each stud consisting, Fig. 11, of a pin p , arranged in said slot and having a flange p' between its ends and a nut p^2 , also provided with a flange p^3 , so that when the nut is turned on the threaded front end portion of said pin the bar M is pinched between the two flanges and the pin is prevented from moving on said bar. The part of the pin p within the slot m^3 is preferably rectangular and fills said slot vertically to prevent said pin from turning in said slot. The extension N is bent downward between its ends

to form a horizontal bearing n^2 upon a rest k^8 of the barrel K when said rest is in a vertical position, Fig. 8, and at the ends of the bearing n^2 are inclines $n^3 n^4$ to insure the lifting and lowering of said extension without jar by the rests.

When the studs P P' are properly adjusted and the moving diaphragm has reached the end of the record, the lever O strikes the stud P' and moves the escapement-bar to the right, allowing one arm of the spider or scape-wheel L to pass through the notch m^2 , and the barrel turns enough to bring a rest k^8 vertically under the extension N, raising the reproducer-arm b and lifting the nut b^3 out of the screw a^2 , whereupon the spring E instantly draws the reproducer-carrier back to the starting-point, and at the same time the lever O, striking the stud P, throws the bar M to the left and allows another eighth of a revolution of the barrel, letting the reproducer-arm b fall and said nut b^3 again to engage said screw a^2 .

I claim as my invention—

1. The combination of a barrel having rests or parallel straight edges arranged at equal angular distances from each other, means of turning said barrel on its axis, a scape-wheel driven by said barrel and adapted to permit at each operation of said wheel the turning of said barrel an angular distance measuring one-half of the angular distance between adjacent rests, a release or escape piece, connecting means arranged to be moved by the operative movement of the reproducer-arm of a talking-machine, to release said wheel and to effect the movement of said barrel and the raising of said arm, with said arm and means for producing said operative movement thereof.

2. The combination of a barrel having rests or parallel straight edges arranged at equal angular distances from each other, means of turning said barrel on its axis, a scape-wheel driven by said barrel and adapted to permit at each operation of said wheel the turning of said barrel an angular distance measuring one-half of the angular distance between adjacent rests, a release or escape piece, connecting means arranged to be moved by the return movement of the reproducer-arm of a talking-

machine, to release said wheel and to permit the movement of said barrel and the lowering of said arm, with said arm and means for producing said return movement thereof.

3. The combination of a barrel having rests or parallel straight edges arranged at equal angular distances from each other, means of turning said barrel on its axis, a scape-wheel driven by said barrel and adapted to permit at each operation of said wheel the turning of said barrel an angular distance measuring one-half of the angular distance between adjacent rests, a release or escape piece, a lever arranged to be moved by the operative movement of the reproducer-arm of a talking-machine, to release said wheel and to effect the movement of said barrel and the raising of said arm.

4. The combination of a barrel having rests or parallel straight edges arranged at equal angular distances from each other, means of turning said barrel on its axis, a scape-wheel driven by said barrel and adapted to permit at each operation of said wheel the turning of said barrel an angular distance measuring one-half of the angular distance between adjacent rests, a release or escape piece, a lever arranged to be moved by the return movement of the reproducer-arm of a talking-machine, to release said wheel and to permit the movement of said barrel and the lowering of said arm.

5. The combination of a barrel provided with projecting straight edges parallel with the axis of said barrel and at equal angular intervals from each other, means of rotating said barrel, a scape-wheel, an escapement-piece, connecting means between said escapement-piece and the reproducer-arm of a talking-machine and adjusting devices whereby a movement of said arm a predetermined distance in either direction will release said escapement.

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

SAMUEL KERSHAW.

Witnesses:

ALBERT M. MOORE,
LUDGER A. NICOL.