The present invention relates to talking machines with automatic record changing device and more particularly to the kind of such talking machines in which a stack of records of different sizes is supported above the turntable on the shoulder of a rod passing through their central aperture, and a push-lever is provided for pushing the most record of the stack toward the supporting shoulder and cause the said record to fall freely into its playing position on the turntable.

It is an object of this invention to provide a simple and efficient rod and push-lever assembly which is adapted to give to the lowestmost record of the stack a lateral releasing displacement which is large enough to secure a large displacement of the feeder for the selection of the record's size and to allow the provision of a single edge support for both small and large sized records.

Further objects and advantages of this invention will appear from the following description of two embodiments given by way of examples and shown in the accompanying drawings.

In the drawings:

Fig. 1 is an elevational view of one form of the invention, record-supporting member being shown partially in vertical section and the records being shown in section;

Fig. 2 is an elevational view of the upper part of the record-supporting member;

Fig. 3 is a cross section on line III—III of Figs. 1 and 2;

Fig. 4 is a cross section on line IV—IV of Figs. 1 and 2;

Fig. 5 is an elevational view with parts in section of a second form of the invention;

Fig. 6 is a similar view of this second form of the invention, in position of rest of the record-changing device;

Fig. 7 is a plan view of the control mechanism of the record changing device thereof;

Fig. 8 is an elevation on enlarged scale of the rod and push-lever assembly thereof; and

Figs. 9, 10 and 11 are cross sections taken on the lines IX—IX, X—X and XI—XI of Fig. 8 respectively.

In the first form of the invention represented in Figs. 1 to 4, the talking machine comprises:

1. A turntable 1 driven uniformly through the full shaft 2 by a motor not shown. This full shaft 2 carrying the turntable 1 is provided at its upper end with a cylindrical recess 4 in which is pivoted the lower end of a cranked rod 13. The inclined portion of the rod 13 is formed with an offset upper end 13' so as to form a shoulder 15 adapted to support the lowermost record 4 of a stack of played records. The cranked rod 13 is held in a fixed position by a movable arm 11.

2. The offset upper end 13' of the cranked rod presents a longitudinal groove which contains a record releasing lever 6 pivoted about a pin 7 and the lower end of which is formed with a nose 8. The nose 8 extends about a thinner portion of the cylindrical periphery of the offset upper end 3' of the rod, and it can move approximately tangentially to the shoulder 5.

A blade spring 9, screwed on the bottom of the groove, tends to hold the record releasing lever 6 into its rest position. The cranked rod 13 is held in a fixed position by a movable arm 11.

A rod 10, arranged for sliding movement in the arm 11 under the action of a mechanism which will be hereinafter described in connection with the second form of the invention, is adapted to put a pressure on the record releasing lever 6 so as to cause the nose 8 to push laterally the lowermost record of the stack by the amount necessary to enable it to get clear of the shoulder 5 and to fall freely by its own weight along the lower portion of the cranked rod 13 into its playing position on the turntable 1, while the remainder of the stack of records is retained by the upper face of the nose 8. The latter then resumes its rest position and the new lowermost record comes to lie on the shoulder 5.

In the second form of the invention shown in Figs. 5 to 11, the talking machine comprises:

1. A turntable 1 driven uniformly through the full shaft 2 by a motor not shown. This full shaft 2 carrying the turntable 1 is provided at its upper end with a cylindrical recess 4 in which is pivoted the lower end of a cranked rod 13. The inclined portion of the rod 13 is formed with an offset upper end 13' so as to form a shoulder 15 adapted to support the lowermost record 4 of a stack of played records. The cranked rod 13 is held in a fixed position by a movable arm 11.

2. The offset upper end 13' of the cranked rod 13 has a circular cross section about an axis 22; the cross section forming the shoulder 15 is also circular about another axis 23; both these axes are parallel, inclined with respect to the axis of the shaft 2 and offset from each other by a distance e.

The middle portion 13'' of the cranked rod has an elliptic cross section and forms an angle with the axes 22, 23. The horizontal distance e between the shoulder 15 and the axis of the shaft 2 has been chosen so that a 30 cm. record pushed clear of the shoulder 5 will perform by falling a lateral displacement large enough to release it also from an edge supporting surface 25 and to
bring it along the trajectory \(X-X'\) onto the turntable \(T\). The edge supporting surface \(26\) is rated in such a way that a 25 cm. record resting on the shoulder \(15\) of the rod has also its edge resting on the rim of this surface \(26\). It is thus seen that moving a single unmounted edge support is provided for both large and small records.

On the outside of the offset upper portion \(13'\) of the cranked rod is pivoted about a pin \(17\) a record releasing lever \(16\) the lower end of which is formed with a nose \(18\) of a thickness at most equal to that of a thinnest record and having a semi-circular outline of a diameter equal to that of the upper portion \(13'\) of the rod. This upper portion \(13'\) of the rod is thinned adjacent the nose \(18\) so that this nose can move approximately tangentially to the shoulder \(15\).

A coil spring \(27\) tends to hold the record releasing lever \(16\) into its rest position in which the nose \(18\) is centered about the axis \(22\).

The extremity of a screw \(28\) screwed in the end portion \(29\) of a link \(30\) slidingly mounted in the arm \(11\) is adapted to put a pressure on the upper end of the record releasing lever \(16\) whereby the latter is rotated in an anticlockwise direction and the nose \(18\) comes to lie coaxial with the axis \(23\) of the shoulder \(15\). The lowermost record \(41\) is thus pushed clear of the shoulder \(15\) and falls by its own weight onto the turntable, the remainder of the stack being held by the upper surface of the nose \(18\). The record releasing lever \(16\) is then removed back to its rest position by the coil spring \(27\) and the new lowermost record comes to lie on the shoulder \(15\). The process then goes on until all the records of the stack have been played.

The link \(30\) which actuates the record releasing lever \(16\) is arranged for sliding movement in the arm \(11\) with which it is slidingly connected by the screws \(31\) and \(32\) guided in the longitudinal slots \(33\) and \(34\). It is held in rest position (Fig. 6) by a coil spring \(35\).

The link \(30\) is actuated by an eccentric comprising a roller \(36\) pivoted about the upper end \(37\) of a shaft \(37\) pivoted in the support \(26\). The roller \(36\) bears on the rim of a circular aperture \(38\) of the link \(30\). The lower end of the shaft \(37\) is connected by a crank \(39\) with the one end of a lever \(40\) the other end of which is pivoted by means of a slot \(45\) about a pin \(41\). The lever \(40\) takes the position \(40^\circ\) (Fig. 7) under the action of a roller \(42\) fixed on the upper face of a gear \(44\) when on rotation of this gear \(44\) about the shaft \(45\) the roller \(42\) comes into contact with a cam surface \(43\) dependent on the lever \(40\). The lever \(40\) resumes then its position of rest under the action of a spring \(47\).

The gear \(44\) is driven by a pinion \(48\) fixed on the shaft \(2\) of the motor through a reversing pinion \(49\) pivoted on a plate \(50\) which in turn is pivoted about a pin \(51\). This plate \(50\) can occupy two distinct positions: the first one in which the pin \(52\) fixed on the plate engages the notch \(53\) of a crank \(54\) pivoted about a pin \(55\) on the plate \(55\); the pinion \(49\) is then held away from the pinion \(48\) and the shaft \(45\) remains at rest.

When the needle of the pick-up (not shown) enters the final groove of a record lying on the turntable \(T\), an automatic stop device (not shown) rotates the crank \(54\) about \(55\) in the anticlockwise direction; the pin \(52\) is then brought clear of the notch \(53\) and the plate \(50\) rotates about the pivot \(51\) under the action of the spring \(57\) in the anticlockwise direction. The pinion \(49\) meshes then with the pinion \(48\) which rotates it together with the gear \(44\), the shaft \(45\) and a cam \(58\) dependent on the shaft \(45\).

This cam \(58\) controls then by means of a device not shown the movements of the pick-up. The pick-up is raised above the record which has been played and is displaced laterally out of the surface face of the turntable. The roller \(42\) then engages the cam \(43\); the lever \(40\) is displaced into \(40^\circ\) and actuates the push-lever \(16\) through the pieces \(25, 30, 36, 38\), thus releasing a new record from the shoulder \(15\). The pick-up is then brought back into playing position and its needle enters the first groove of the new record to be played.

A feeler \(59\) displaced by the fall of a 30 cm. record but situated out of the trajectory of a 25 cm. record determines by means of a mechanism not shown the correct playing position of the pick-up according to the size of the record to be played.

A further roller \(60\) pivoted too on the face of the gear \(44\) engages then the pin \(51\) of the plate \(50\) and displaces the latter about \(55\) at the direct direction until the pinions \(45\) and \(49\) are disengaged from each other; the pin \(52\) enters then the notch \(53\) of the crank \(54\) and the gear \(44\) is stopped.

The construction of the device presents the following advantages:

1. Owing to the large lateral displacement of the record falling along the cranked rod, only a single fixed edge support is needed for both small and large records.

2. The feeler for the determination of the playing position of the pick-up has a larger stroke than the thickness of a 25 cm. record owing to the position of the shoulder \(15\) above the edge supporting surface \(26\) and the inclination of the latter.

3. The record changing mechanism is independent from the size of the record to be played owing to the central record releasing lever.

4. Owing to the central record releasing lever being pivoted in the upper end of the cranked rod and thus controlled from above the driving shaft \(2\) of the motor may be made compact thus more robust than the hollow shafts used in other known constructions with a push-lever controlled from below.

5. The central rod may be more easily removed.

What I claim is:

In a talking machine with automatic record changer adapted for playing a plurality of records in succession and comprising a frame, a rotatable driving shaft, a turntable on said driving shaft, a cranked rod extending upwardly from the center of said turntable and having an offset upper portion of a generally circular cross section forming a shoulder for supporting a stack of records, ords engaged by their central apertures on said offset upper portion, a movable arm hingedly connected with said frame engaging said offset upper portion for holding said cranked rod in a fixed angular position, in combination with said surfaces extending parallelly to the axis on opposite sides of said offset upper portion, a pin extending through said offset upper portion perpendicularly to said flat surfaces, a record releasing lever pivotally mounted at both extremities of said pin so as to partly embrace said offset upper portion and having its lower end formed as a nose in form of a semi-circular ring of a diameter at most equal to the diameter of the central hole of the records, said nose being adapted to engage the edge of the central hole of...
the lowermost record of said stack, a push-rod slidingly mounted in said movable arm, so as to cooperate, when the movable arm is in engagement with said offset upper portion, with said record release lever to push said lowermost record clear of said shoulder while the remainder of said stack is supported by the upper face of said nose, and a spring located inside of said upper portion and intended to bring back said record release lever into its rest position.

LOUIS THÈVENAZ.

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