

Dec. 6, 1949

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2,490,387

AUTOMATIC RECORD CHANGER

Filed March 9, 1944

5 Sheets-Sheet 1

Fig. 1

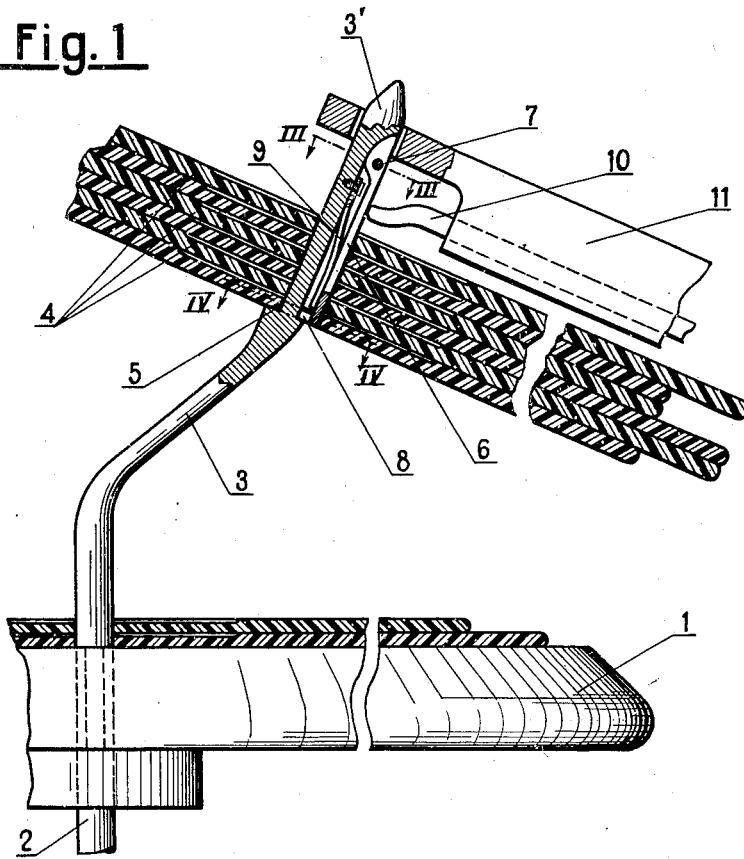


Fig. 2

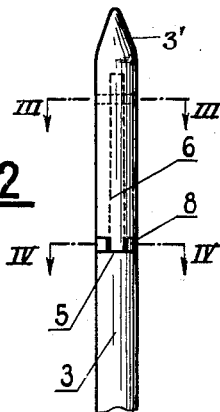


Fig. 3

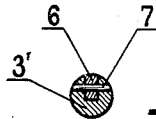
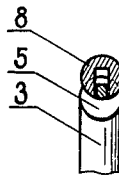


Fig. 4



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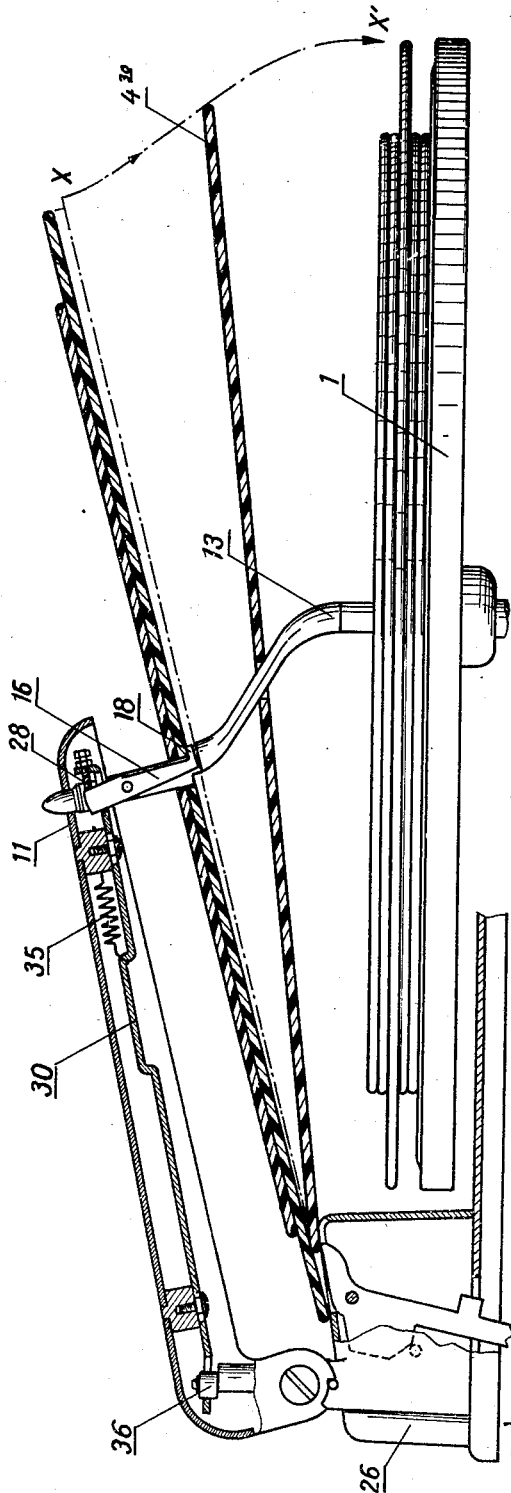


Fig. 5

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5 Sheets-Sheet 4

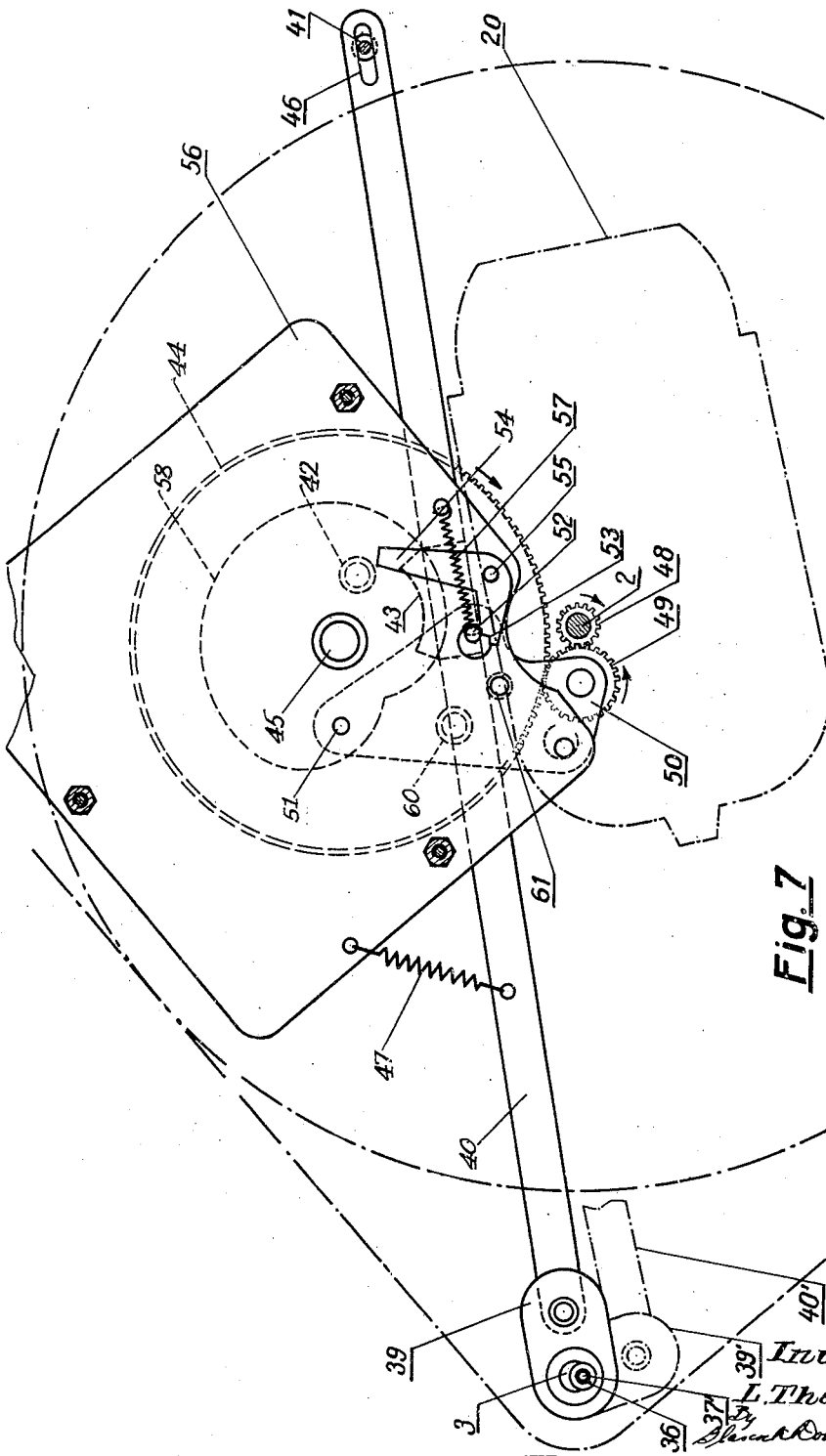


Fig. 7

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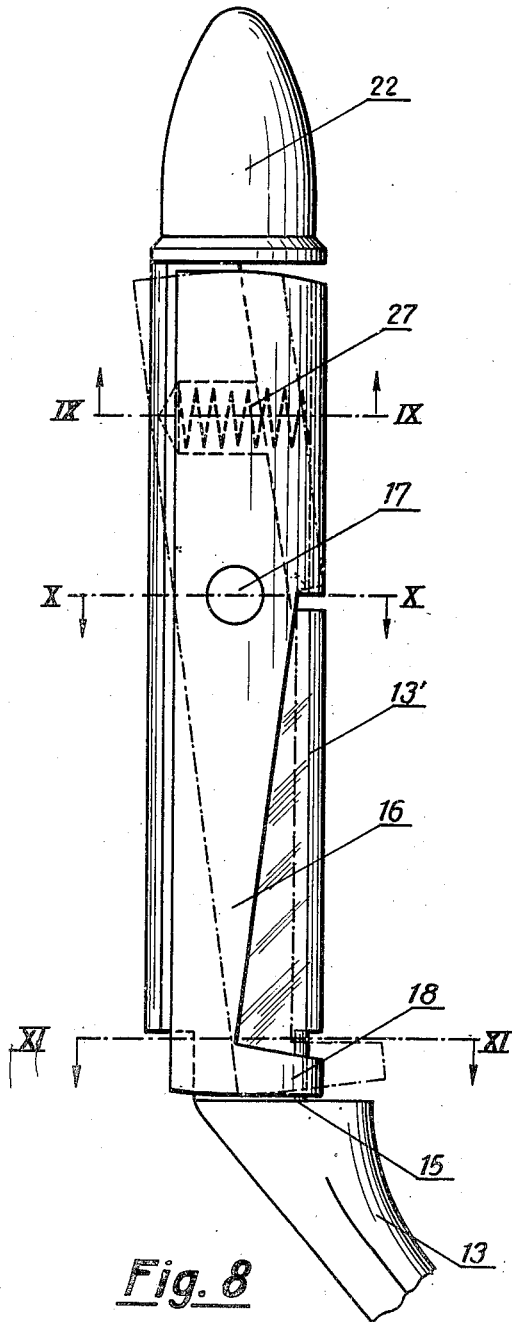


Fig. 8

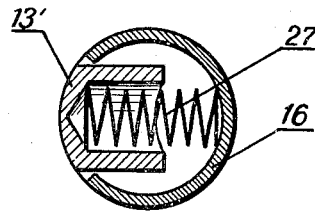


Fig. 9

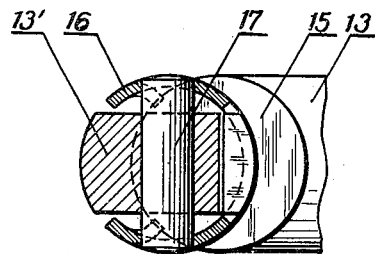


Fig. 10

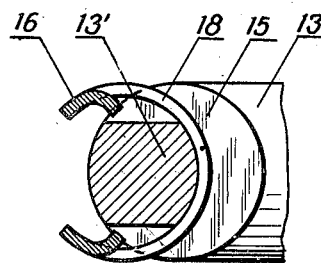


Fig. 11

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UNITED STATES PATENT OFFICE

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AUTOMATIC RECORD CHANGER

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In Switzerland August 24, 1943

1 Claim. (Cl. 274—10)

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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 lowermost record of the stack clear of 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 lowermost record of the stack a lateral releasing displacement which is large enough to secure a large displacement of the feeler 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 a turntable 1, driven uniformly by a mechanism not shown. The shaft 2 supporting the turntable carries a cranked rod 3 the inclined portion of which is formed with an off-set upper end 3' so as to form a shoulder 5 adapted to support a stack of unplayed records 4 which are engaged by their

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central aperture on the offset upper end 3' of the cranked rod 3.

The offset upper end 3' 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 3 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 3 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 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 21 in which is pivoted the lower end of a cranked rod 13. The inclined portion of the rod 13 is formed with an off-set upper end 13' so as to form a shoulder 15 adapted to support the lowermost record 4¹ of a stack 4 of unplayed records. The cranked rod 13 is held in a fixed position by a movable arm 11.

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 those 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 d 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 26 and to

bring it along the trajectory X—X' onto the turntable 1. 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 merely a single unmovable 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 4' 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 cut in 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 46 about a pin 41. The lever 40 takes the position 40' (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 56; the pinion 49 is then held away from the pinion 48 and thus 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 1, 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 of the turntable. The roller 42 then engages the cam 43; the lever 40 is displaced into 40' and actuates the push-lever 16 through the pieces 39, 38, 36, 30, 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 61 of the plate 50 and displaces the latter about 51 in the clockwise direction until the pinions 48 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 according to the invention 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 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, two flat surfaces extending parallelly to the axis and 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

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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.

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