Aug. 21, 1934. E. E. COLLISON ET AL 1,970,691

RECORD CHANGING MECHANISM

Filed Dec. 8, 1930 2 Sheets-Sheet 1

FIG. 1

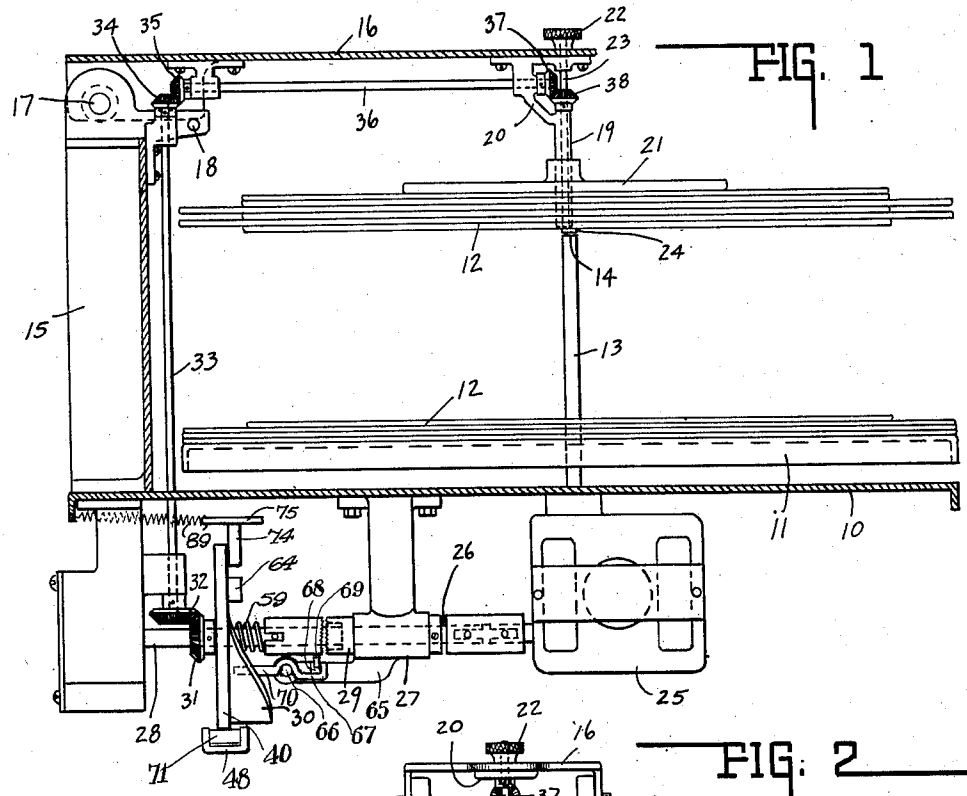


FIG. 2

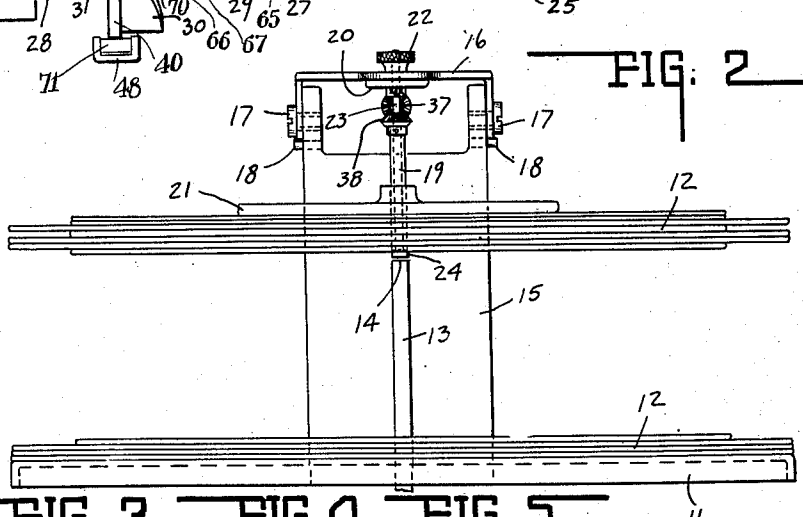
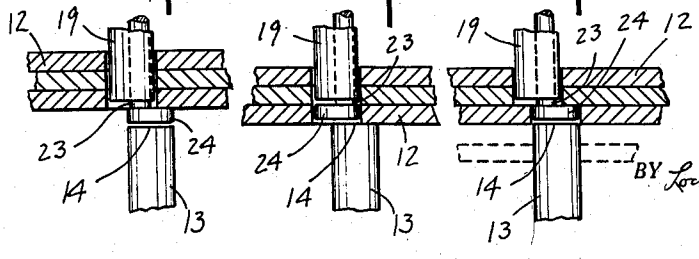


FIG. 3 FIG. 4 FIG. 5



INVENTORS.
EDWARD E. COLLISON,
ERNEST DEGENHART.
BY Lockwood Lockwood Goldsmith & Galt.
ATTORNEYS.

Aug. 21, 1934. E. E. COLLISON ET AL 1,970,691

RECORD CHANGING MECHANISM

Filed Dec. 8, 1930 2 Sheets-Sheet 2

FIG. 6

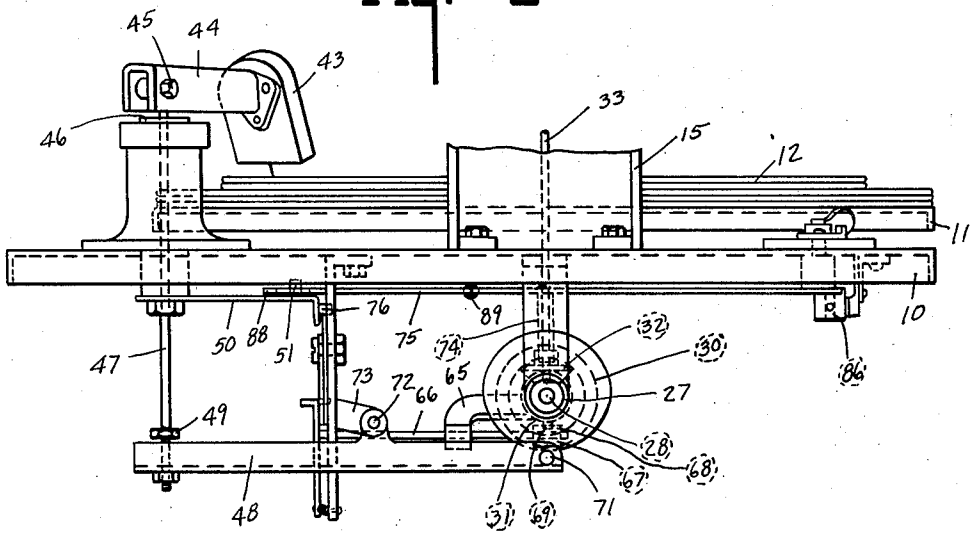
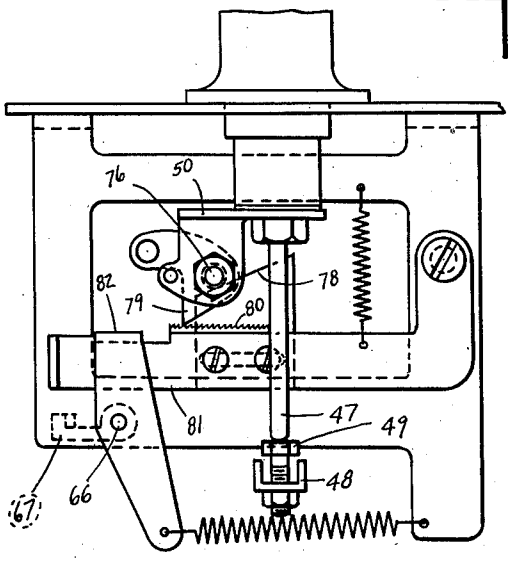


FIG. 7



INVENTORS.
EDWARD E. COLLISON.
ERNEST DEGENHART.

BY
Lockwood Lockwood Goldsmith & Galt.
ATTORNEYS.

Patented Aug. 21, 1934 1,970,691

UNITED STATES PATENT OFFICE

1,970,691

RECORD CHANGING MECHANISM

Edward E. Collison and Ernest Degenhart, Fort Wayne, Ind., assignors to The Capehart Corporation, Fort Wayne, Ind.

Application December 8, 1930, Serial No. 500,862

10 Claims. (Cl. 274—10)

This invention relates to an automatic phonograph and more particularly to a specific record changing mechanism therefor.

The object of this invention is to provide a simple and economic positive means for releasing and dropping records from a record support or magazine onto a turntable to be played, whereby records of different diameters may be used in the same group.

It will be noted that in the above mentioned applications only twelve-inch records may be employed together, or ten-inch records, it requiring a manual adjustment to alter the support for the records so as to receive a group of ten-inch records or a group of twelve-inch records. As distinguished therefrom, the record support disclosed herein will support and release either ten or twelve-inch records in the same group and without manual adjustment.

The full nature of the invention will be more clearly understood from the accompanying drawings and the following description and claims:

Fig. 1 is a side elevation of the record changing mechanism showing a plurality of records of varying size mounted thereon and a group of records of varying size supported by the turntable. Fig. 2 is a front elevation thereof. Fig. 3 is an enlarged section of the record supporting mechanism showing a record supported thereon. Fig. 4 is the same as Fig. 3 showing the lower record in position released from the support and supported upon the centering pin. Fig. 5 is the same as Fig. 3 showing the lowermost record in released position. Fig. 6 is a rear elevation of the control portion of the mechanism. Fig. 7 is a rear elevation of the tone arm control.

In the drawings there is shown a record changing mechanism comprising a supporting base 10 having a turntable 11 for receiving a plurality of records 12. Said turntable is provided with an upwardly extending centering pin 13 having a flat upper end 14 only slightly less than the diameter of the central hole in the records.

Mounted upon the base 10, there is a supporting standard 15 with the bracket 16 pivotally mounted thereon at 17 so as to swing upwardly and rearwardly. Said bracket is supported in its lowered position upon the pins 18 mounted upon the supporting standard 15.

Extending downwardly from the forward end of the bracket 16, there is a sleeve 19 supported by the bracket 20 upon which a suitable weight 21 is slidably mounted. Extending axially through said sleeve so as to rotate therein, and terminating above the bracket 16 in the knob 22, there is a pin 23 having an eccentric head 24 on the lower end thereof. The records 12 are adapted to be mounted over the head 24 and on the sleeve 19 when the bracket is swung rearwardly to vertical position about the pivotal mounting 17. After the records are placed thereon and the bracket is lowered to the position shown in Figs. 1 and 2, the lowermost record being concentric with the sleeve 19 is supported upon the eccentric head 24 and held thereby in spaced relation to the turntable.

Suspended beneath the base 10, there is a driving motor 25 which rotates the turntable and also drives the shaft 26 mounted in the bearing 27. Periodically hereinafter described, upon completion of the playing of a record, the shaft 26 is thrown into driving engagement with the shaft 28 through the medium of the clutch 29, whereupon the cam 30 is rotated. Mounted upon the cam 30, there is a bevelled gear 31 meshing with the bevelled gear 32 which drives the upright shaft 33 which, in turn, drives the bevelled gear 34 meshing with the bevelled gear 35, which drives the horizontal shaft 36 supported by and immediately below the bracket 16. The shaft 36 is provided with the bevelled gear 37 which meshes with the bevelled gear 38 keyed to the pin 23.

As shown in Figs. 3, 4 and 5, when the pin 23 is in the position shown in Fig. 3, the lowermost record 12 is supported thereby. Upon rotating the pin 23 through the motor and shafts above described so as to bring the head 24 to the position shown in Fig. 4 wherein it is concentric with the sleeve 19, the lowermost record is released and permitted to drop onto the upper end of the centering pin 13 where it is supported thereby and, in turn, supports the superimposed records.

When the head 24 completes one rotation, it returns to its original position as shown in Fig. 5 wherein it is eccentric as to the sleeve 19, and concentric with the centering pin. This movement shifts the lowermost record laterally so that the central opening thereof is concentric with the centering pin, whereupon it is released to drop downwardly over the centering pin while the superimposed records are held in supported position by the head 24.

From the above cycle of operations, it will be noted that upon one revolution of the pin 23 and head 24, the lowermost record will be released to drop over the centering pin while the superimposed records will remain supported above the sleeve 19. The weight 21 acts to balance the records and hold them steady, forcing the lowermost record downwardly onto the top of the centering

pin when the head reaches its concentric position.

As illustrated in Fig. 6, the reproducer 43 is rigidly mounted upon the arm 44 which, in turn, is pivotally mounted at 45 on a swivel support 46. Extending through the swivel support and connected with the tone arm there is a control rod 47. Said rod is elevated by the lever 48 and adjustable contact 49. Rigidly secured to the rod, there is an arm 50 with an upwardly extending pin 51 thereon in position to be actuated for swinging the tone arm laterally by the mechanism hereinafter described.

The spring 59 normally maintains the clutch in operative engagement under spring tension, whereby the motor 25 will drive the cam 40 through the shaft 26 and the clutch 29. However, in the manner hereafter described, the clutch will be disengaged against the tension of the spring 59 so that the cam will be inoperative during the reproduction of a record.

In addition to the peripheral cam surface and the lateral extending cam surface 30 on the cam 40, there is a cam surface 64. The bearing bracket 65 extends from the shaft bearing support for rotatably supporting the rod 66, on which the latch 67 is secured, having a cam face 68 adapted to be engaged by the pin 69 protruding from the movable member of the clutch 29. Said latch has an extension 70 thereon in position to be engaged by the cam surface 64 on the cam 40 for causing the latch 67 to engage the pin 69.

In operation, when the rod 66 is turned clockwise, the latch 67 will release the pin 69 so that the spring 59 will force the movable clutch member into engagement with the companion member, thereby revolving the cam 40. When the cam surface 64 makes one complete revolution, it will engage the extension 70, turning the rod in the reverse direction so as to raise the latch 67 in position to cause the pin 69 to ride upon the cam surface 68 of said latch, compressing the spring 59 and disengaging the clutch members, whereby the cam 40 will come to rest.

The periphery of the cam 40 engages the roller 71 on the arm 48, said arm being pivoted at 72 to a supporting bracket 73. This movement will raise the rod 47, elevating the tone arm so as to disengage the reproducer from the record. The cam surface 30 on the cam 40 will thereupon engage the depending pin 74 extending downwardly from the arm 75 which engages the pin 51 on the arm 50 for swinging the tone arm laterally away from the record.

When the record reaches the end of the playing groove, the arm 50 will have caused the pin 76 to ride up the cam surface 78 (Fig. 7), or will cause the pawl 79 to oscillate in engagement with the ratchet toothed plate 80 for forcing the arm 81 downwardly to release the trip lever 82 which is keyed to the shaft 66, thus operating to throw the clutch into engagement for driving the record changing mechanism above described.

Upon the tripping of the lever 82 and the clutch being thrown into engagement, the cam face 30 will engage the pin 74 projecting from the lever 75. The lever 75 is pivoted at 86, and the opposite end thereof is provided with a head 88 in which the pin 51 rides. The spring 89 normally maintains the lever against the cam so that when the cam forces the lever against the tension of the spring, it will carry the pin 51 to such position that the reproducer will be moved beyond the periphery of the record. But upon being released by the cam, the spring 89 will move the lever in the opposite direction, carrying the pin 51 back to position to bring the reproducer into engagement with the beginning of the record.

Upon the reproducer reaching the end of the record, the pin 76 will ride up the cam surface 78, or the pawl 79 will engage the ratchet teeth 80, forcing the lever 81 downwardly to release the latch 82 and turn the rod 66 which will cause the latch 67 to disengage the pin 69, allowing the spring 59 to bring the clutch members into engagement. Thus, the cam 40 will be set in motion, the first action of the cam 40 will be to depress the lever 48, elevating the rod 47 to raise the reproducer from the record. Thereupon, the cam surface 30 will engage the pin 74 to swing the lever 75 to a position for causing the tone arm to swing outwardly beyond the periphery of the record. The rotation of the gear 31, and consequently the pin 23 will turn the head 24 to the positions shown in Figs. 4 and 5 so as to drop the record over the upper end of the centering pin onto the turntable into playing position.

The lever 75 being released by the cam surface 30, will be drawn back by the spring 89 so that the head 88 in engagement with the pin 51 will swing the tone arm back to a predetermined position for engagement with the beginning of the newly dropped record and the above described operation will be repeated.

The invention claimed is:

1. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, and means for moving said pin and head to periodically bring said head into a concentric position with respect to said sleeve for releasing a record therefrom.

2. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a sleeve extending downwardly to a point adjacent to but spaced from the upper end of the centering pin and axially eccentric with respect thereto upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, and means for moving said pin and head to periodically bring said head into eccentric position with respect to said centering pin and concentric position in respect to said sleeve to release a record therefrom and return said head to concentric position with respect to said pin to permit the record to drop thereover.

3. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, means for moving said pin and head to periodically bring said head into a concentric position with respect to said sleeve for releasing a record therefrom, and a weight slidably mounted on said sleeve for exerting a downward steadying pressure on said records.

4. A record changing mechanism for an automatic phonograph having a turntable for receiv-

ing a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, means for moving said pin and head to periodically bring said head into a concentric position with respect to said sleeve for releasing a record therefrom, and means for exerting a downward steadying pressure on said records.

5. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, and manual means for moving said pin and said head to periodically bring said head into concentric position to said sleeve for releasing a record therefrom.

6. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, and automatic means for moving said pin and head to periodically bring said head into a concentric position with respect to said sleeve for releasing a record therefrom upon completion of the playing of a record on said turntable.

7. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin, a downwardly extending sleeve upon which a group of records are mounted, a movable pin mounted in said sleeve, a head on the lower end of said pin normally eccentric to said sleeve for supporting the records thereon, automatic means for moving said pin and head to periodically bring said head into a concentric position with respect to said sleeve for releasing a record therefrom upon completion of the playing of a record on said turntable, and manual means for moving said pin to release a record at will independently of said automatic means.

8. A record changing mechanism for an automatic phonograph having a turntable for receiving a record in playing position, including an upwardly extending centering pin having a circular flat upper end for receiving a record thereon, a downwardly extending member for supporting a group of records immediately above said centering pin, and means for releasing the lowermost record from said group onto said centering pin to be temporarily supported thereby when said member is in one position, and for thereafter shifting said record to position for dropping over the upper end of said centering pin onto said turntable when in another position.

9. In combination, an automatic phonograph comprising a turntable having a shaft, a magazine positioned above said turntable shaft comprising a spindle offset with respect to the turntable shaft and upon which a plurality of records may be threaded, said records being supported upon the top of said turntable shaft, and means carried by said spindle for bringing the lowermost record in said magazine into coaxial relationship with said turntable shaft and supporting the remaining records in the magazine.

10. In combination, an automatic phonograph comprising a turntable having a shaft, a magazine positioned above said turntable shaft comprising a spindle offset with respect to the turntable shaft and upon which a plurality of records may be threaded, said records being supported upon the top of said turntable shaft, a button relatively smaller in diameter than an aperture in a record and of a thickness substantially equal to the thickness of a record movably carried at the end of said spindle, means for coaxially positioning said button with respect to said turntable shaft whereby said records upon said spindle are supported by said button and the record threaded upon said button is disposed coaxially with respect to the turntable shaft.

EDWARD E. COLLISON.
ERNEST DEGENHART.