June 27, 1944. F. J. OFFEN 2,352,560

RECORD DISCHARGE MECHANISM

Filed Aug. 4, 1942 2 Sheets-Sheet 1

Fig. 1

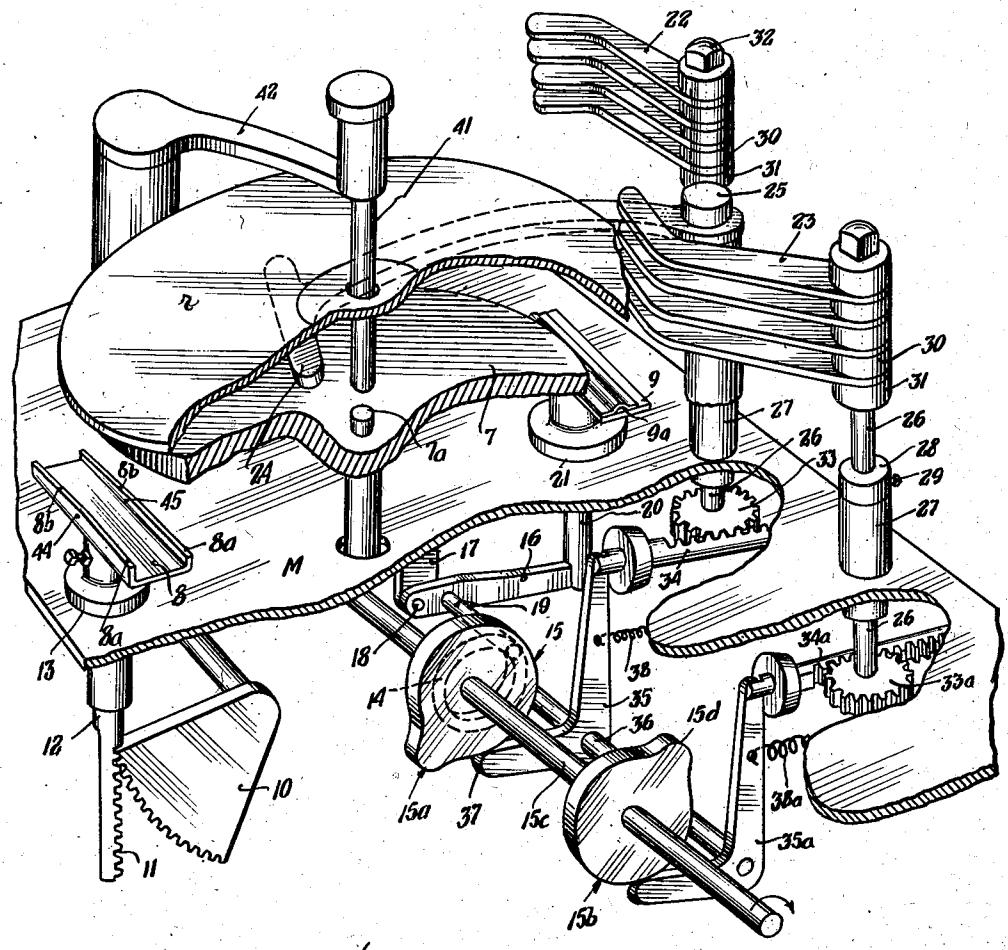
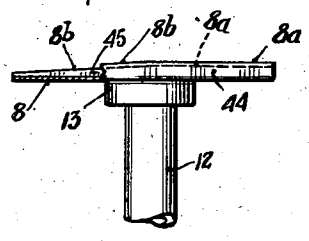


Fig. 4



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RECORD DISCHARGE MECHANISM

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FIG. 2

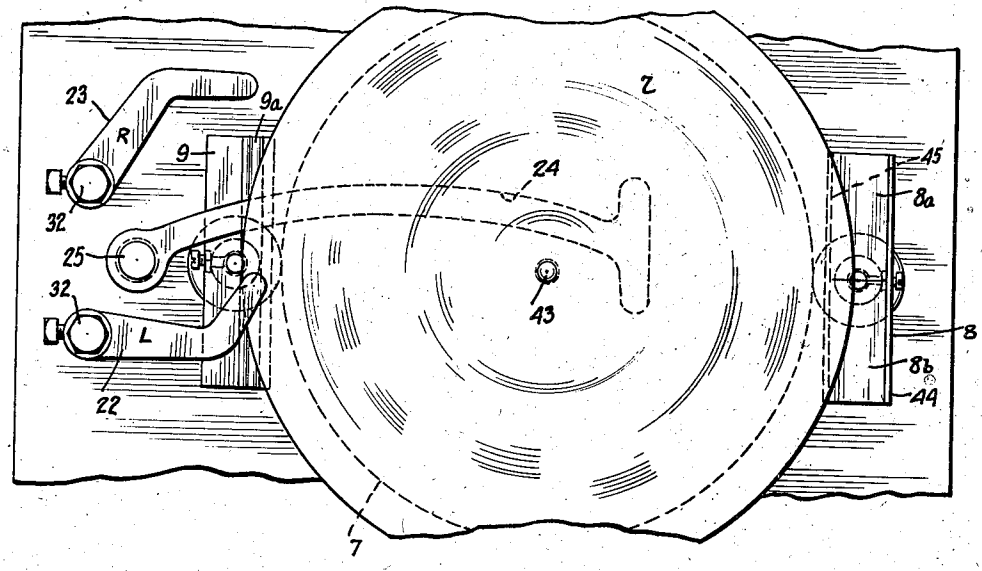
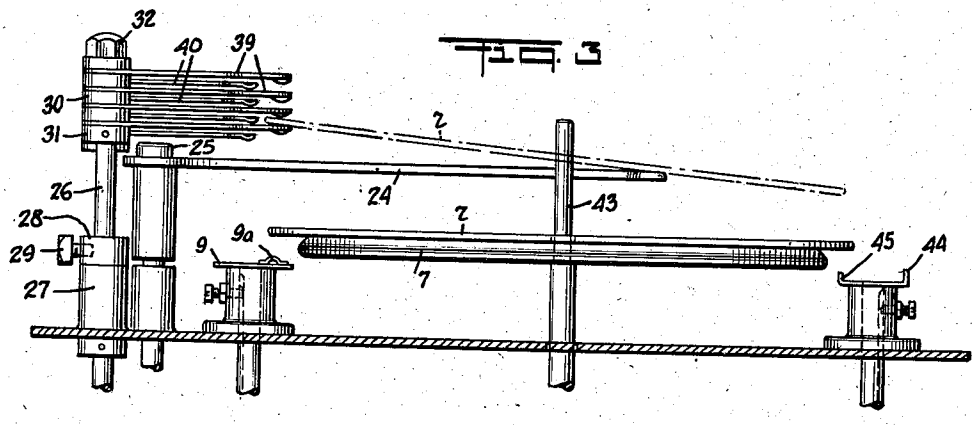


FIG. 3



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2,352,560

RECORD DISCHARGE MECHANISM

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Application August 4, 1942, Serial No. 453,593

9 Claims. (Cl. 274—10)

This invention relates to mechanisms for effecting the automatic delivery of disc records, one at a time, from a storage position to the turntable of a gramophone or similar sound-reproducing machine, such as is shown and described in my co-pending application, Serial No. 392,200, filed May 13, 1941 for "Magazine phonographs," issued as Patent No. 2,297,014, dated September 29, 1942, of which this application is a continuation in part.

In my aforesaid application, I have described a record delivery mechanism comprising a series of vertically spaced vanes located in juxtaposition to the periphery of the records, for individual engagement with the undersurface of the marginal portions thereof, which are adapted to coact with other and relatively spaced supporting means for retaining the records in stacked condition above the turntable, for delivery thereto in response to the lateral displacement of the respective vanes, in sequence, for the delivery of the lowermost record to the turntable, the remaining records of the stack being lowered to pre-delivery position by the conjoint vertical displacement of the vanes in engagement therewith.

The principal object of the present invention is to provide an automatic record delivery mechanism of a type which may meet such requirements as may negative the use of the independently displaceable vane mechanism of my said co-pending application, the present invention contemplating the utilization of two sets of conjointly laterally displaceable vanes alternately functioning to engage the stacked records to lower the stack to a pre-delivery position and to effect the release of the lowermost record for disposition upon the turntable.

A further object of this invention is to provide a mechanism comprising two sets of alternately operating vanes, functioning as aforesaid, in conjunction with other record supporting and delivery means, such, for example, as described in my said co-pending application, which will be capable of supporting and delivering records of different diameters, intermixed in any arrangement in the stack or pile.

Briefly, the present invention consists of mechanism for automatically delivering disc records, one at a time, from the bottom of a stack of records of different or like sizes or diameters, supported above the turntable of a gramophone or similar machine, which comprises a plurality of sets of vanes alternately engageable with the records of the stack, each vane functioning as an individual record-support in engagement with the undersurface of a record adjacent its edge, vertically movable oppositely located supports spaced outwardly of the periphery of the turntable, which, when raised, receive each record as it is released, to lower it onto the turntable, and a swinging arm serving, in conjunction with one of the sets of alternately laterally displaceable vanes, to support the stack of records to be delivered, the whole being cooperatively associated with actuating mechanism becoming effective automatically to release each record in the lowermost position in turn. The release of the lowermost record is accomplished in a series of correlated movements of the sets of vanes, the vertically movable supports and the swingable arm, in which the stacked records supported by one set of vanes and one of said supports are engaged by the other set of vanes in a concurrent lateral displacement of the first set of vanes from record-engaging position, the records of the stack with the exception of the lowermost one thereof, being re-engaged by the first set of vanes, in a synchronized displacement of the second set from record-engaging position, with the other of said vertically movable supports rising beneath and engaging with the vane-released record, the swinging arm moving into position beneath the lowermost record of the stack to support the load thereof, during the transfer of the record carried by the two supports to the turntable.

Other objects and advantages flowing from the practicing of my invention will become manifest as the description of the preferred embodiments thereof shown in the accompanying drawings proceeds, it being understood that my invention may take other forms within the spirit and scope of this disclosure.

In the drawings:

Figure 1 is a view in perspective, partly broken away, showing a record delivery mechanism of a preferred form, conforming to my invention, and the manner in which it may be applied to a gramophone.

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a side elevation of the construction of the preceding figures, illustrative of a slightly modified arrangement of record-engaging vanes, and

Figure 4 is a front elevation of the record elevator of Figure 1 which cooperates with the vanes in supporting the lowermost vane-engaged record in its transfer to the turntable.

Referring now to the drawings in detail, in

which like characters of reference are employed to designate similar parts in the several views, the records, generally indicated at *r*, which may be of mixed sizes of diameters are alternately supported above the turntable 7 by two sets of vanes located on opposite sides of the center line of a record, each set being laterally movable in alternation with the other set, into and out of engagement with the stack or pile of records, the movement of the two sets of vanes being so synchronized that the lowermost record of the stack is released for transfer to the turntable and the remaining records in the stack simultaneously lowered or moved downwardly to locate the bottom one thereof, in position for subsequent release, the records, of course, being released one at a time in appropriately timed relation.

The records are released, one at a time, as stated, onto a pair of vertically movable supports 8 and 9, located diametrically opposite, in outwardly spaced relation to the periphery of the said turntable 7, the support 8 being adapted to cooperate with the two sets of vanes in supporting the stack of records in the manner hereinafter explained. For this reason, the support 8 rises to a higher level than the opposite vertically movable support 9 and since, in the transfer of a record to the turntable, the two supports complete their downward movement in unison, the lowering of the support 8 will commence first, the downward movement thereof continuing until it reaches the level of the support 9, when both move in unison as pointed out. Therefore, the two supports are independently actuated, the raising and lowering of the support 8 being effected by a toothed quadrant 10 which is in engagement with a rack 11 formed on the lower portion of the rod 12 which carries said support 8 and is mounted for vertical reciprocation in the bearing 13 on the motor-board *m*.

The raising and lowering of the support 9 is effected by a cam groove 14, formed in one face of the cam 15, rigid with the shaft 15c, through the medium of a rocking lever 16 which is pivotally mounted on a bracket 17, as at 18, dependent from the underside of said motor-board, the lever carrying a cam follower 19 which traverses said cam groove. The opposite end of this lever 16 is connected to the lower end of the rod 20 carrying the support 9 and vertically reciprocable in the bearing 21 on said motor-board *m*. During the rotation of the cam 15, the lever 16 is rocked about its pivot to raise and lower the support 9, the movement of this cam being synchronized with the movement of the aforesaid quadrant 10, in order that the two supports may operate in unison during a part of their like directional movement.

In the form of the invention shown in Figures 1, 2 and 4, the vanes in each set, which are indicated by the reference numerals 22 and 23, are relatively spaced to permit the opposing edge of a record to enter therebetween and to allow the engaged records to incline downwardly to abut upon the opposite vertically movable support 8, the lowermost record, normally, being in engagement with the lowermost of the vanes 22 and said support 8. Preferably, the upper face of said support 8 is conformed to provide a horizontal record-engaging surface as at 8*a* and a relatively inclined record-engaging surface as at 8*b*, the records, as the load is transferred to the vanes 23 in the step by step lowering thereof, inclining laterally in the direction of the support surface 8*b*, with the lowermost record of the stack in alined engagement therewith, as hereinafter will become evident, while, when the records are engaged by the vanes 22 of the opposite set, the records will be supported in a level position, with the lowermost one of the stack bearing upon the horizontal surface 8*a* of said support, the vanes of the respective sets being in the same horizontal plane and equidistantly spaced, as is clearly shown in Figure 1 of the drawings.

For the purposes of this description, the set of vanes 22, whereby the records are disposed in a level position, in association with the horizontal surface 8*a* of the support 8, will be termed the "left-hand" set, while the other set of vanes 23, by means of which the records are supported in inclined association with the surface 8*b* of said support, will be referred to as the "right-hand" set.

Now, assuming that the records are supported by the left-hand set of vanes 22 and the cooperating surface 8*a* of the support 8, the inward movement of the right-hand set of vanes 23 will cause the same to engage beneath the corresponding records, i. e., the lowest vane will engage under the bottom record and so on throughout the series. The left-hand vanes 22 then move outwardly and clear of the records, the records tilting in the direction of the inclined surface of the support 8*b*, on which the bottom record abuts, or in other words, to the left. The left-hand vanes now move inwardly again and owing to the inclination of the records, the lowest vane of the set will engage beneath the second lowest record, thus leaving the lowermost record supported only by the lowest vane of the right-hand set 23. In the succeeding outward movement of the right-hand set of vanes 23, the record is released from the lowest vane thereof to drop on to the vertically movable support 9 in juxtaposition to the vanes in readiness for lowering to the turntable, while the remaining records, engaged by the left-hand set of vanes, assume a level attitude. These operations, of course, are repeated in the same sequence, until all of the records in the stack have been released.

As each released record becomes solely supported by the oppositely positioned vertically movable supports 8 and 9, these supports become operative to lower the record into position upon the turntable 7, by the functioning of their actuating mechanism, as heretofore described.

As the lowering of the supports 8 and 9 in the transfer of a record to the turntable would otherwise leave the vane-engaged stack of records unsupported, I provide a swinging arm 24 which is movable into and out of position beneath the stack of records, the arm moving inwardly beneath the stack immediately following the tilting of the lowermost record from the bottom thereof, so that the load of the remaining records is taken by said arm, as the vertically movable supports function as the sole supporting means for the released record, while the outward movement of said arm occurs immediately the weight of the records in engagement with the vanes is supported thereby and the cooperating support 8, as the latter is returned to its zenith position. The arm 24 is mounted on a vertical shaft 25 and may be operated by any suitable means from the motor driven mechanism of the machine.

Each set of vanes 22 and 23, is fixed to a vertical column 26 mounted for rotative movement in a suitable bearing 27, each column carrying a collar 28 adjustable longitudinally thereof and

lockable thereto by a set screw 29, for adjusting the vanes to the height desired, relatively to the turntable of the machine. In the present showing, the vanes are interposed between appropriate spacers 30 and a hub 31 keyed or pinned to the column and locked in frictional engagement therewith by the nut 32 in threaded engagement with the upper end of the column 26, to provide a substantially unitary structure and insuring conjoint movement of the vanes and their supporting columns.

Any suitable actuating mechanism for producing the requisite alternating movements of the two sets of vanes in appropriately timed relation to the cooperating record supporting media, may be employed. For example, the column 26 which supports the vanes 22 for conjoint rotative movement may be provided with a pinion 33, keyed thereto, in engagement with a rack 34 pivotally connected to one end of a bell-crank lever 35, rockably mounted on a shaft 36 and carrying a cam follower 37, interposed in the path of rotation of the aforementioned cam 15, for engagement by the effective surface 15a on the periphery thereof, to rock said lever on its fulcrum and actuate the rack in one direction to rotate the vanes 22 out of record-engaging position, the reverse directional movement of said lever, under the influence of the spring 38 connected thereto and to an oppositely located fixed support, serving to return the vanes to record-engaging position, or vice versa, as may be deemed desirable in designing the mechanism. The alternate operation of the vanes 23 is likewise effected through the medium of the rack 34a in mesh with the pinion 33a rigid with the column 26 on which the vanes 23 are fixed, the rack 34a having a pivotal connection with the bell-crank lever 35a rockably mounted on the aforesaid shaft 36, one end of said lever being disposed in the path of rotation of the cam 15b for engagement by the effective surface 15d thereof, to rock said lever 35a and actuate the rack 34a in engagement with the pinion 33a to impart rotative movement to said vanes 23 in opposition to the spring 38a. Obviously, the lever 35a is rocked in the reverse direction under the influence of the spring 38a as the cam surface 15b becomes non-effective relative to said lever, resulting in the opposite rotative movement of the vanes 23, the spring 38a being connected to the lever 35a and a suitable fixed support in the manner of the spring 38 of the actuating means for vanes 22. As will be noted, from Figure 1, the cam 15b, similarly to the cam 15, is rigid with the shaft 15c so that during the revolution of the shaft 15c both cams revolve, the alternate positive or cam actuation of the respective sets of vanes being obtained by the diametrically opposite disposition of the effective surface 15d of the cam 15b relative to the corresponding surfaces 15a of the cam 15, the shaft 15c being driven from the motor of the phonograph (not shown) or other medium, in any appropriate arrangement of mechanism.

In the modified vane construction of Figure 3, the vanes 39 of one set are fixed at such height, relatively to the vanes 40 of the second set, that the former are displaced vertically in relation to the said vanes 40, a distance equivalent to half the space between the vanes of each set, while the co-supporting surface of the vertically movable support 8 is horizontal. With this arrangement, the records, at all times, are maintained in level disposition, but owing to the difference in height between the opposed vanes, the records will be lowered a distance equal to half the vane spacing in each outward movement of the lower set of vanes. Therefore, it will be obvious that with this vane arrangement, they may be mounted on separate and independent columns 26, as shown, or the two sets may be constructed as a unit and mounted upon a common or single column. As in the construction of Figures 1 and 2, the alternate movements of the vanes are repeated until all of the records have in turn been released.

To maintain the records in peripheral registration while in superimposed position in the stack or pile and during the release of the lowermost record, a pin or rod 41 is provided. This pin or rod may be dependent from a suitable support 42 overhanging the turntable, as shown in Figure 1, in alinement with the locating pin 7a on the latter, the length of said rod being such as to provide for the accommodation of all of the records of the stack and to permit it to function in accurately guiding the released record into position upon the supports whereby it is transferred to the turntable. Preferably, the pin is loosely fitted in the overhanging support 42 so that it may be readily raised by hand, to facilitate locating the records in stack formation in engagement with the vanes whereby they are initially supported in conjunction with the cooperating raised vertically movable support 8. In lieu of the guide pin 41, the center pin of the turntable, in certain reproducing machines, may be of a length to enter the center apertures of the records engaged with the vanes to retain them in assembled position and guide the lowermost as it is released in its movement to position in association with the turntable, as shown at 43 in Figure 3.

In both embodiments illustrated, provision is made for the operation of my record discharge mechanism with 10" records or 12" records, with all of the records in a stack being of the same diameter or of different diameters, the records being released to the turntable by the alternate actuation of the two sets of vanes 22 and 23, as described in conjunction with the cooperating support afforded by the elevator 8, which, as set forth in Figures 1 and 2, embodies surfaces 8a and 8b for alternately maintaining the record in process of being discharged in a level position or parallel to the turntable and inclined at an angle thereto, for its transfer to the turntable, as it is released by the lowermost vane of the right hand set 23 to be supported by the oppositely located elevators 8 and 9 and lowered to the turntable; and, in Figure 3, the respective vanes 39 and 40 are at different levels and the elevator 8 is horizontal throughout the length of its record-engaging surface, as heretofore indicated.

To provide for the support of the record in process of discharge, whether it is of the larger or smaller diameter, the elevator 8, as herein shown, embodies two laterally spaced upstanding flanges 44 and 45, the inner flange 45 being located for engagement by a ten inch record just inwardly of its periphery, while the outer flange 44 is engageable by a twelve inch record in a similar manner. Each of these flanges, as heretofore pointed out and as shown in the drawings, especially in Figure 4, embodies a straight surface 8a to cooperate with the lowermost of the vanes 22 to support the record abutting thereon parallel to the turntable and an inclined surface 8b which cooperates with the lowest of the vanes 23 for tiltingly supporting the record engaged therewith, in the manner heretofore described, the outer flange 44 being higher than the inner flange 45, so that a twelve inch record abutting on either

of its surfaces, 8a, 8b, in Figures 1 and 2, or 8, in Figure 3, will clear the corresponding surface of the inner flange. Manifestly, in Figures 1 and 2, the mode of operation is the same whether the record being discharged is of the smaller or larger diameter, the record when finally released to the two elevators 8 and 9 shifting from its tilted engagement with the surface 8b of the elevator 8 to a position parallel to the turntable, as it is engaged from beneath by the elevator 9, the entire supporting surface of which is parallel to the straight surface 8a of the opposite elevator.

Although in the drawings a raised portion 9a is shown as being provided on the supports 9, such portion which may be of some soft material serves no other purpose than that of a fulcrum to facilitate the turning movement of the record as the support 8 is being moved relatively to the support 9.

Mechanism according to the present invention may be used either alone, in which case it will be necessary to impart a secondary and outward movement to the vertically movable supports to enable the same to rise clear of the records on the turntable, or in connection with record changing and reversing mechanism. For example, it is particularly applicable for use in conjunction with record changing mechanism of the kind described in Patent Number 2,188,769 involving a swinging arm which operates to engage each delivered record by its central hole, remove the same from the turntable, reverse it, return it again for playing the reverse side and finally again remove it, when played for rejection.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their margins, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the margin of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes.

2. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes.

3. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes, and means horizontally movable between the tilted lowermost record and the remaining records to supportingly engage from beneath said remaining records marginally supported by said second set of vanes, and means for lowering the vertically movable support to permit the tilted lowermost record marginally supported thereon to drop by gravity towards the turntable.

4. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes, a horizontally oscillatable arm mounted outwardly of the periphery of the turntable and movable between the tilted lowermost record and the remaining records to supportingly engage said remaining records marginally supported by said second set of vanes from beneath at a zone

adjacent said vertically movable support, and means for lowering the vertically movable support to permit the lowermost record marginally supported thereon to drop by gravity towards the turntable.

5. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes, a horizontally oscillatable arm mounted outwardly of the periphery of the turntable and movable between the tilted lowermost record and the remaining records to supportingly engage said remaining records marginally supported by said second set of vanes from beneath at a zone adjacent said vertically movable support, and means for lowering the vertically movable support to permit the lowermost record marginally supported thereon to drop by gravity towards the turntable, and means for sequentially reversing the movement of, respectively, the vertically movable support, the horizontally movable arm, the oscillated and non-oscillated set of vanes, to their original positions for completing the record-supporting and delivering cycle.

6. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, the respective vanes and the horizontal and inclined surfaces of the vertically movable support being so located that the sets of vanes in their alternating engagement with the records cooperate with the respective surfaces of the vertically movable support diagonally opposite therefrom, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes.

7. Mechanism for supporting and delivering disc records of different diameters in succession to the turntable of a phonograph comprising two laterally spaced sets of vanes oscillatably mounted outward of the periphery of the turntable for engaging the records in alternation, the vanes of each set being vertically spaced for extending beneath and supporting a plurality of records at their marginal zones, a vertically movable support located outwardly of the periphery of the turntable opposite said sets of vanes and having horizontal and inclined surfaces for supporting at the diametrically opposite marginal zone of the lowermost record all the records supported by one or the other of the sets of vanes at a horizontal or inclined plane, the sets of vanes, on the one hand, and the horizontal and inclined surfaces of the vertically movable support, on the other, being so located that the records at any one time are supported by the most distant of any two thereof, means for alternately oscillating said two sets of vanes into and out of record-supporting position to transfer the support of the records from one set of vanes and the horizontal surface of the vertically movable support to the other set of vanes and the inclined surface of the vertically movable support, whereby the lowermost record is tilted below the level of the lowermost vane of the first set of vanes.

8. Mechanism for supporting and releasing disc records in succession to the turntable of a phonograph comprising two sets of elements; one set including a first series of vertically spaced vanes for individually supporting a plurality of records at their marginal zones and a second series of correspondingly functioning vertically spaced vanes mounted non-radially of the turntable from said first series, means movably mounting said two series of vanes for alternating supporting engagement with the records, said second set including a vertically movable elevator for supporting the stack of records in association with either set of vanes at the substantially radially opposite marginal zone of the lowermost record, one said set of elements having upper and lower surfaces spaced non-radially of the records, whereby the marginal edges of the records, when supported on said lower surface of said one set of elements, will be below the planes of the correspondingly spaced vanes of the second series to thereby cause the records to be lowered by one position when the second series of vanes is moved into engagement with the records and the lowermost record to be released from engagement with the lowermost vane of the first series.

9. Mechanism for supporting and releasing disc records in succession to the turntable of a phonograph comprising two sets of elements; one set including a first series of vertically spaced vanes for individually supporting a plurality of records at their marginal zones and a second series of correspondingly functioning vertically spaced vanes mounted non-radially of the turntable from said first series, means movably mounting said two series of vanes for alternating suporting engagement with the records, said second set including a vertically movable elevator for supporting the stack of records at the substantially radially opposite marginal zone of the lowermost record in alternation with said first and second series of vanes and a horizontally

movable oscillatably mounted arm for supporting said stack of records in association with either set of vanes, but in alternation with said elevator, one said set of elements having upper and lower surfaces spaced non-radially of the records whereby the marginal edges of the records, when supported on the lower surface of said one set of elements, will be below the planes of the correspondingly spaced vanes of the second series to thereby cause the records to be lowered by one position when the first series of vanes is moved out of and the second series of vanes is moved into engagement with the records.

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