May 27, 1941. C. G. FREBORG ET AL 2,243,698

MULTIPLE RECORD PHONOGRAPH

Filed Aug. 26, 1937 6 Sheets-Sheet 1

Fig. 1.

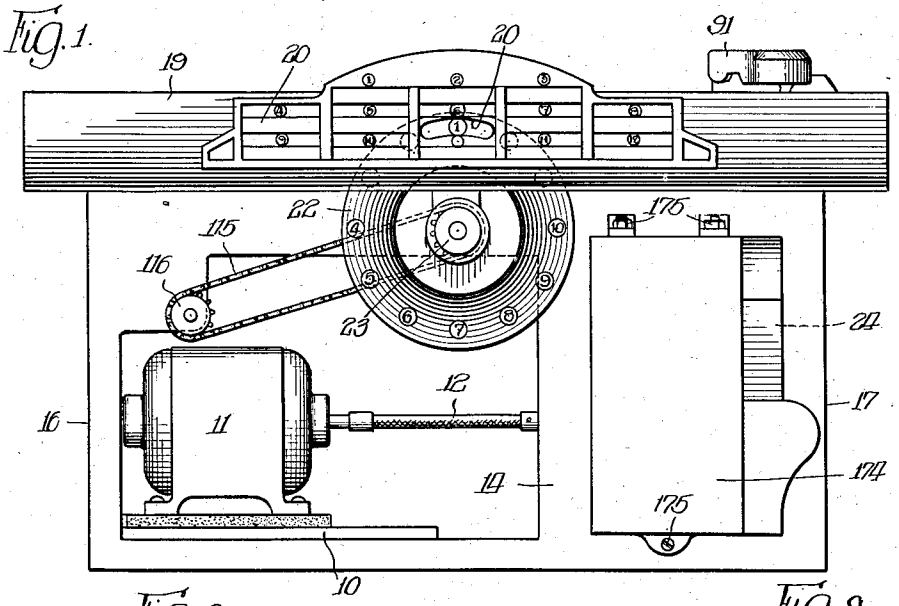


Fig. 8.

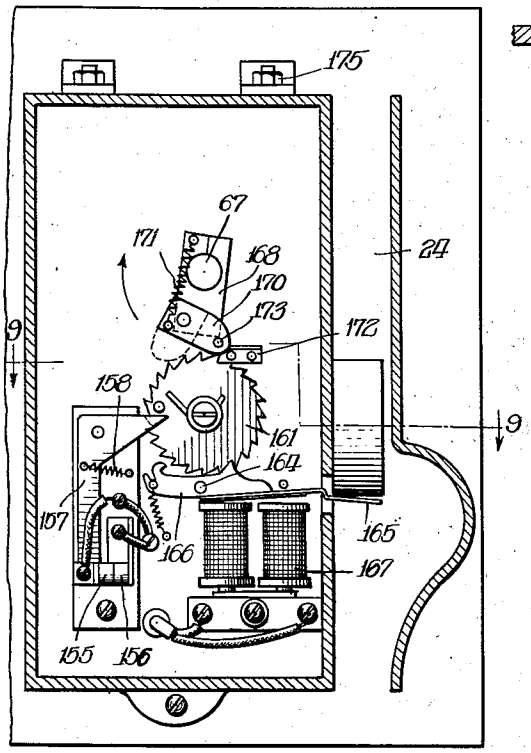


Fig. 9

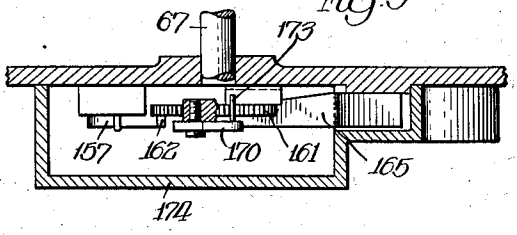
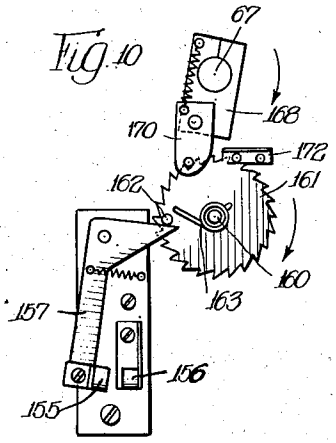


Fig. 10



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Fig. 2.

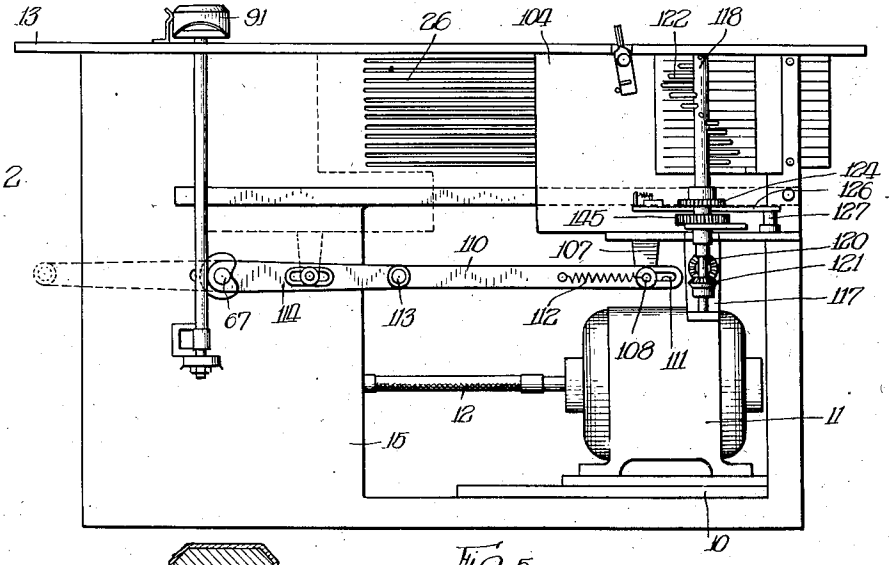
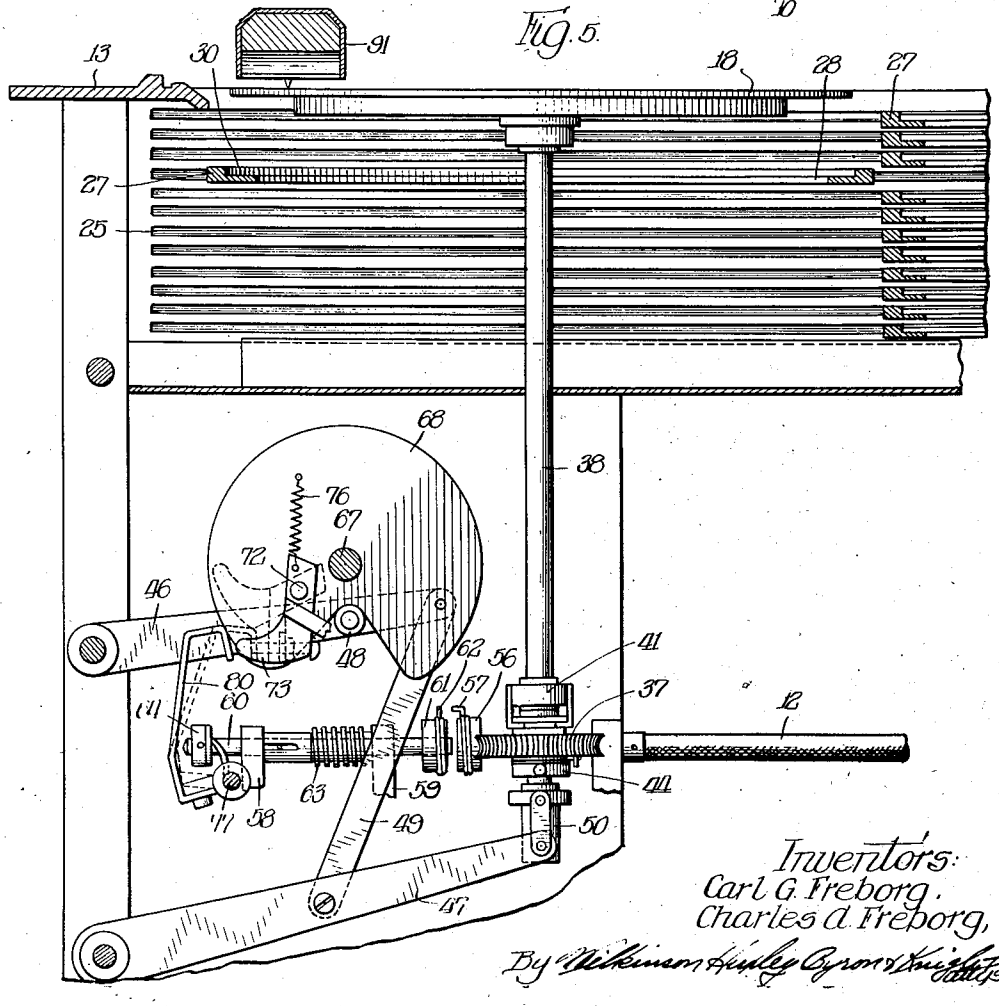


Fig. 5.



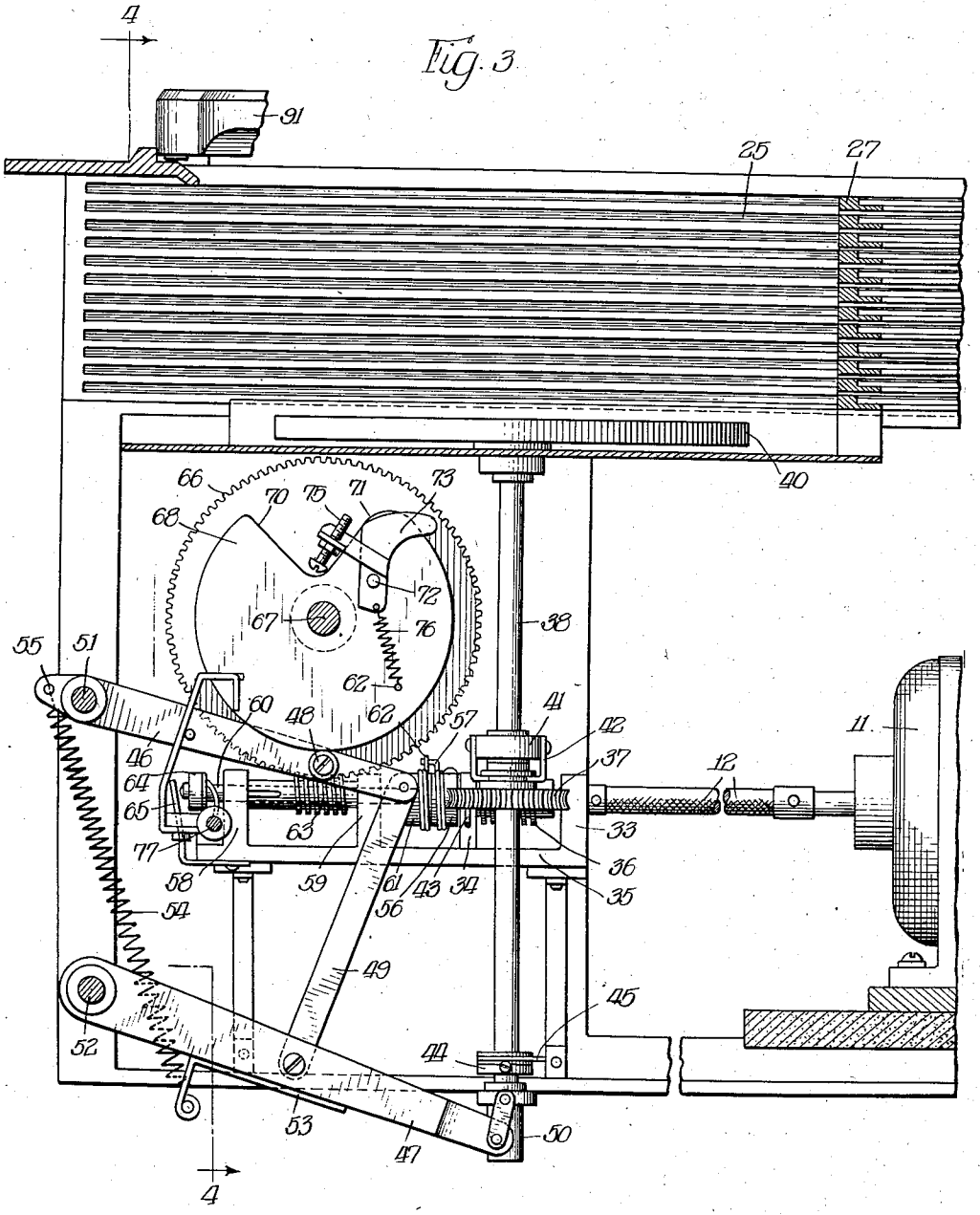
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MULTIPLE RECORD PHONOGRAPH

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Fig. 3



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MULTIPLE RECORD PHONOGRAPH

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Fig. 4

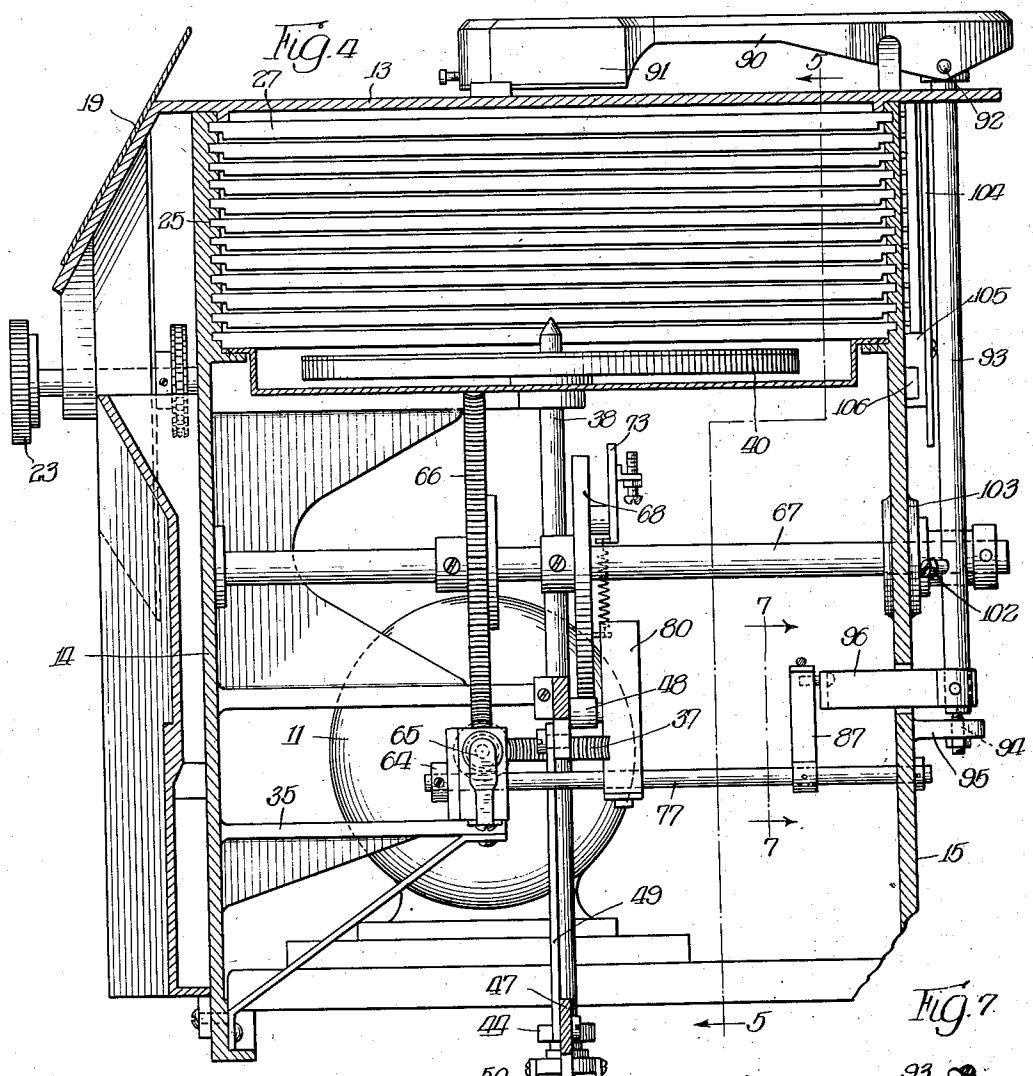


Fig. 7

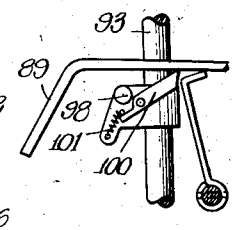
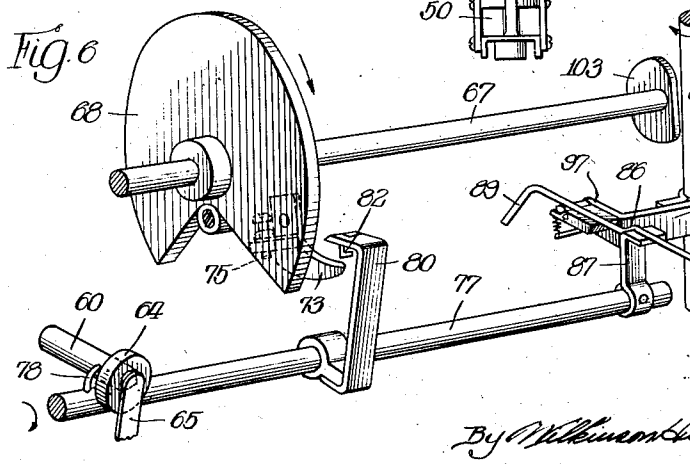


Fig. 6



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Fig. 11.

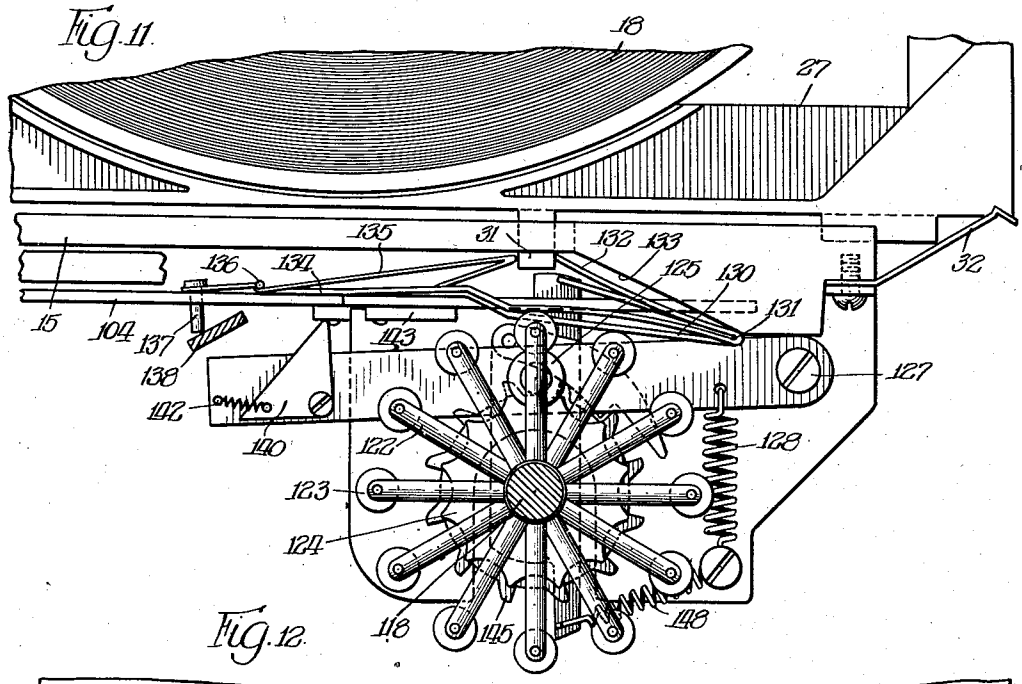


Fig. 12.

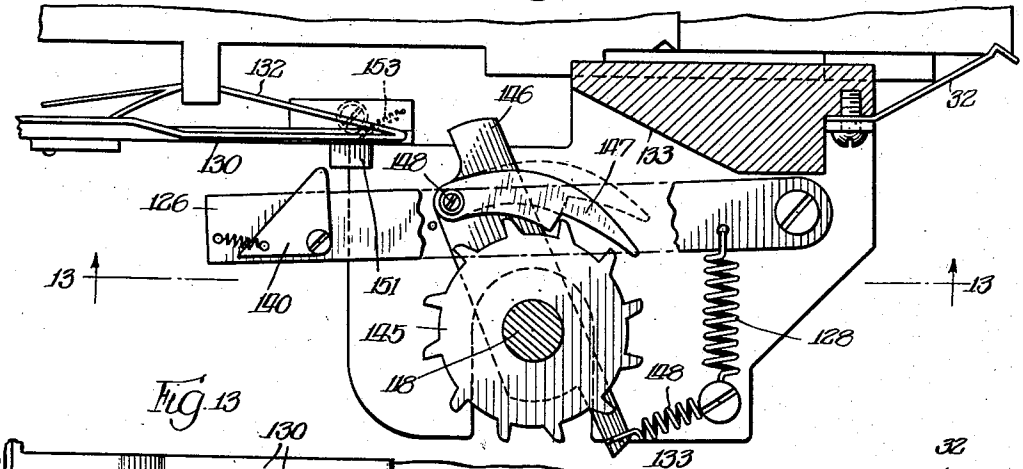
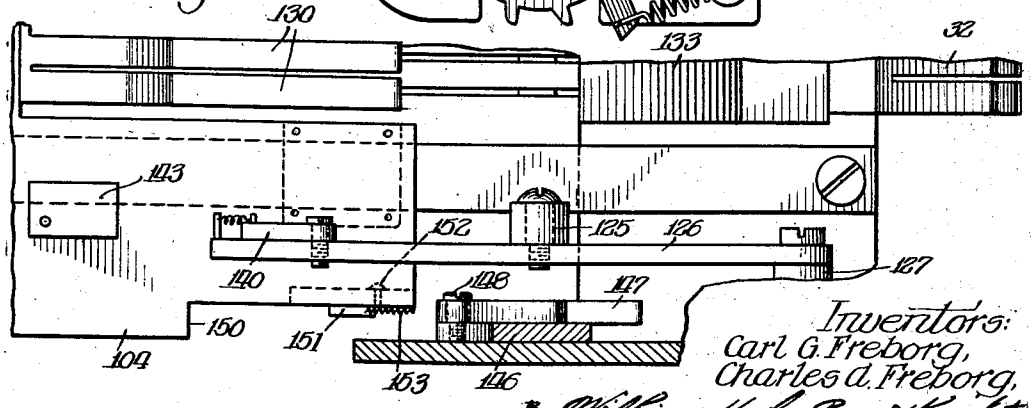


Fig. 13



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MULTIPLE RECORD PHONOGRAPH

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Fig. 14.

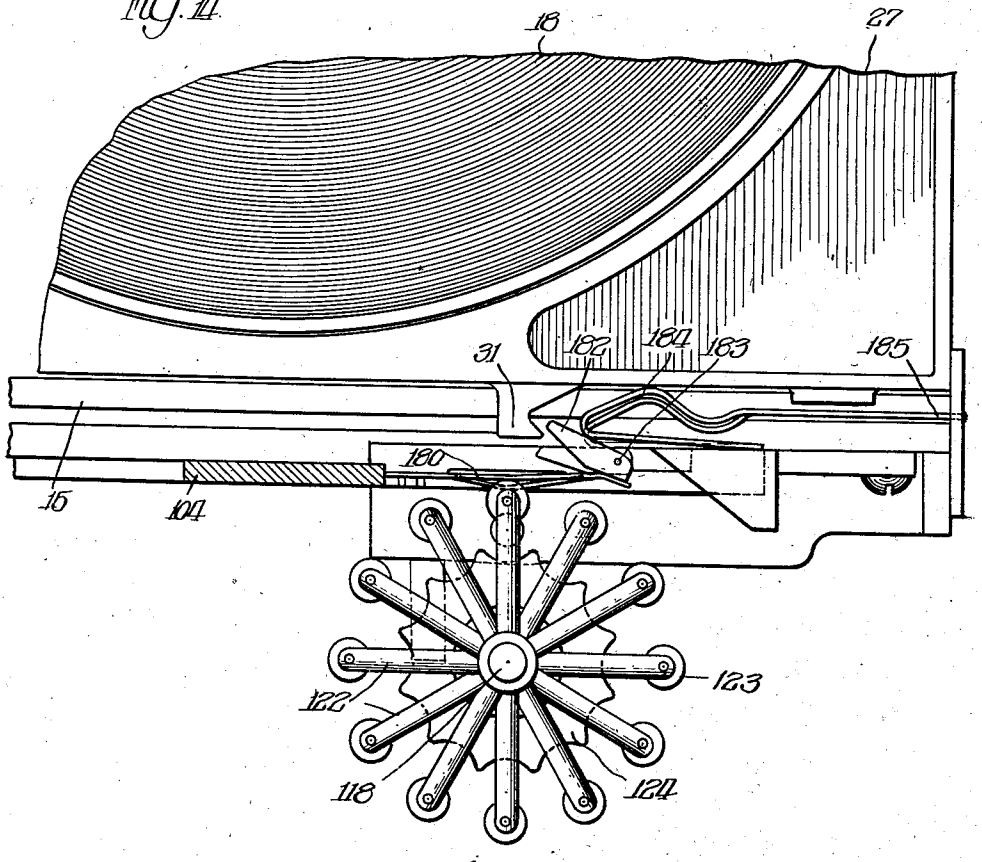
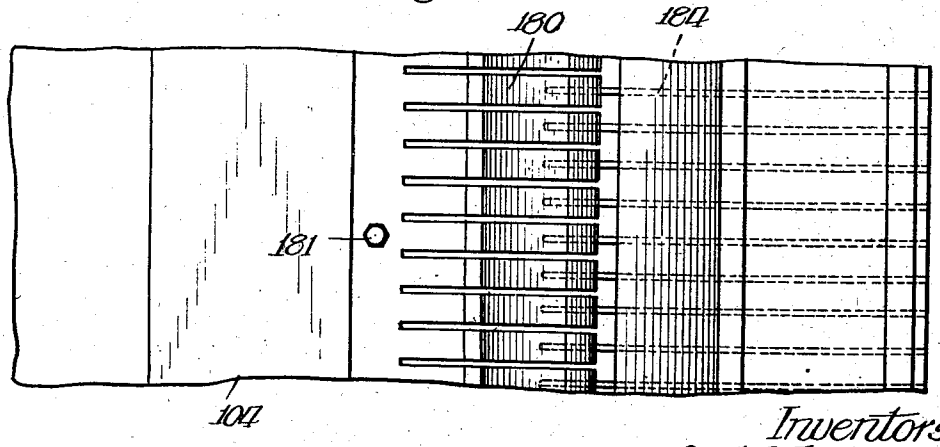


Fig. 15.



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Patented May 27, 1941 2,243,698

UNITED STATES PATENT OFFICE

2,243,698

MULTIPLE RECORD PHONOGRAPH

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Application August 26, 1937, Serial No. 161,010

41 Claims. (Cl. 274—10)

The invention relates to improvements in multiple record phonographs wherein the selected record of a series or group of records will be automatically placed in position on the turntable, played, and returned to the magazine in readiness for another operation.

The invention has for its object to provide mechanism of simple construction and which can be economically manufactured for automatically feeding a selected record to position the same over a turntable; for elevating the turntable in timed relation to the feeding means, and which elevation takes place when the record is in position thereover; for lowering the turntable upon completion of the playing of the record, and finally returning the same to its initial position.

A more specific object is to provide novel means for selecting the records manually and which combines therewith mechanism permitting the selection of a second record immediately after the feeding of the first has begun. Another feature of the invention resides in the combination with the above mechanism of means for automatically selecting the next record in order, provided manual selection of a record has not been made. Thus the device will automatically play each record in its order in the group if continuously operated.

Another object resides in new and improved means for closing the circuit to the electric operating motor by the dropping of a coin in the coin chute and which records the number of coins dropped so that the circuit remains closed until the records played equal in number the coins deposited in the coin chute. A feature in connection with the above resides in improved means for returning the coin actuated member one notch for each record played.

A further object is to provide mechanism for performing a complete operation of the phonograph upon the insertion of a coin in the coin chute and which will raise the turntable by resilient means to yieldingly hold a record in engagement with the sound reproducer.

A further object resides in the provision of an improved coin chute in which the cover for the coin operated mechanism is integral therewith.

A further object is to provide means comprising relatively few parts for automatically and positively returning the tone arm to initial position and which operation will take place after the turntable has been lowered.

A further object is the provision of clutch mechanism and novel throw-out and trip means therefor to control the holding of the turntable in raised position and the lowering of the turntable.

A further object is to provide novel selecting mechanism having means for manually actuating the same to permit selection of any record desired, and which will be positive in operation, combining release means whereby all the carriers may be released therefrom for changing the records.

Another object of the invention is to provide supporting means for the turntable in the form of linkage permitting vertical movement of the turntable and which will be resiliently biased in a direction to cause upward movement of the turntable for locating the record supported thereon into contact with the reproducer and cam actuated for positively returning the turntable to its lowered position. The raising of the turntable through resilient means is effective in preventing the jamming of the mechanism and destruction of the records in the event a carrier supporting a record is located over but out of line with the turntable or several carriers are inadvertently located over the turntable.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the invention, and wherein like reference characters are used to designate like parts—

Figure 1 is a front elevational view of the multiple record phonograph comprising the present invention;

Figure 2 is a rear elevational view of the phonograph of Figure 1 showing in elevation the selector and reciprocating carriage for the record carriers;

Figure 3 is a longitudinal vertical sectional view of the left end of the device of Figure 2 and showing the turntable with associated means for raising, lowering and rotating the same;

Figure 4 is a vertical transverse sectional view taken substantially along line 4—4 of Figure 3, the parts being in the position they assume when inoperative;

Figure 5 is a vertical sectional view taken substantially along line 5—5 of Figure 4 but showing the turntable elevated with a record engaging the sound reproducer ready for playing;

Figure 6 is a fragmentary perspective view of the means for raising and lowering the turntable with the release means for the clutch and the trip therefor shown in combination;

Figure 7 is a detail sectional view taken along line 7—7 of Figure 4;

Figure 8 is a view of the combined coin chute and housing for the electrical starting means with the cover removed showing the parts with the circuit to the motor closed;

Figure 9 is a horizontal sectional view taken substantially on line 9—9 of Figure 8;

Figure 10 is a detail view in front elevation showing the starting means with the circuit to the motor open;

Figure 11 is a fragmentary horizontal view showing the selector for coupling any one of the record carriers to the reciprocating carriage;

Figure 12 is a horizontal sectional view taken through the selector of Figure 11 to show the means for automatically selecting the next record in sequence;

Figure 13 is a front elevational view taken substantially on line 13—13 of Figure 12;

Figure 14 is a fragmentary horizontal view illustrating a modified form of coupling means for coupling the record carriers to the reciprocating carriage; and

Figure 15 is a fragmentary elevational view showing the coupling means of Figure 14.

The framework for housing the mechanism forming the present invention and for journalling the operating shafts included in the same consists of a base 10 supporting an electric motor 11 having the flexible driving shaft 12, a top 13, side walls 14 and 15, the former being located to the front of the device as shown in Figure 1, and end walls 16 and 17. The top 13 is provided with an opening to render visible and permit access of the sound reproducer to the record disc 18 supported on the turntable. Along the front edge of the top a sloping section 19 is formed integral therewith as in Figures 1 and 4, to provide a holder for the indentifying cards 20, each card having a number and listing the title of a record. Section 19 is provided with an arcuate slot 21 to render visible the numerical indicia formed on the rotatable disc 22. By grasping the operating wheel 23 the disc can be manually rotated to actuate the selector mechanism to be presently described, so that any numeral on the disc brought in alignment with the aperture 21 will select the record corresponding thereto. As will be more clearly understood as the description proceeds the record selected is automatically connected with mechanism so that upon the dropping of a suitable coin in the coin chute 24 the record will be withdrawn from its magazine, deposited on the turntable, played and then returned to its position of rest.

The inside surface of each side wall 14 and 15, Figure 4, at the upper portion thereof, is formed to provide a plurality of horizontally disposed grooves 25 for receiving the record holding carriers 27 which are therefore mounted for horizontal reciprocating movement from the right hand end of the frame shown in Figure 2 where the carriers are positioned one over the other for engagement by the selector above mentioned to the left hand end of the frame where the carrier is located over the turntable so that the record disc may be engaged thereby and brought into contact with the sound reproducer as will be understood by reference to Figure 5. Each carriage is provided with an opening 28 centrally thereof and a supporting ledge 30 for supporting a record disc 18 concentric with the opening and which, as shown in Figure 11, has projecting from one side thereof a lug 31, extending through its respective horizontal slot 26 formed in the side wall 15 parallel to and paired with the grooves 25. Also at one corner each carrier is notched to receive the spring clip 32 to aid in holding the carrier in inoperative position, and each carrier properly aligned with the remaining carriers.

The flexible driving shaft 12 is journalled in supports 33 and 34, Figures 3 and 5, formed integral with bracket 35 which forms an integral part of the side wall 14. Fixed to the shaft intermediate the supports is a worm gear 36 meshing with gear 37 having rotation on the standard 38 for supporting the turntable 40. Gear 37 is loosely mounted on the standard and is supported from the bracket 41 by means of the yoke 42, the inwardly turned ends of which fit within a groove formed in the hub portion of the gear. A pin 43 projects from the lower surface of the gear.

Standard 38 is mounted for rotation vertically by bracket 41 and gear 37, as described, and has fixedly secured to its lower end a clutch collar 44 having a few turns of wire thereon to provide the projecting pin 45. When the standard is elevated it will be seen that the same is rotated as pin 43 on the rotating gear 37 contacts with pin 45 fixed to the standard. Supporting means for the standard and turntable is provided by a pair of arms 46 and 47, the former carrying a roller 48 on the outer end thereof and being pivotally connected with arm 47 by link 49. By means of a universal joint 50 the lower end of the standard is connected to the bifurcated end of arm 47. Pivot shafts 51 and 52 support the arms respectively for pivotal movement in a vertical plane to effect raising and lowering of the turntable 40. To the underside of arm 47 is fixed a bracket 53 having secured thereto one end of the coil spring 54, the other end of said spring being fastened at 55 to the outer end of arm 46. The function of the spring 54 is therefore to cause upward movement of the turntable, the leverage ratio of said spring being materially increased by securing the bracket 53 to one end of arm 47 below and removed from the pivot shaft 52.

The end of the flexible shaft 12 projecting beyond support 34 has fixedly secured thereto a clutch collar 56 having several turns of wire thereon to provide the elbow projection 57. Journaled in supports 58 and 59 integral with bracket 35 is a shaft 60 having fixedly secured to the end beyond support 59 the collar 61 from which projects the pin 62, and non-rotatably mounted on the shaft intermediate the supports is a sleeve having a worm gear 63. The sleeve, as clearly shown in Figure 5, is associated with shaft 60 by a pin and slot connection, while the outer end of the shaft is provided with a fixed collar 64. A resilient strip of metal 65 engages the end of the shaft, forcing the same to the right, maintaining the clutch collars in engagement.

With the clutch collars contacting to cause engagement of pins 57 and 62 it will be clear that shaft 60 is driven from the driving shaft 12 and that the worm gear 63 likewise has rotation to cause rotation of the gear wheel 66 meshing therewith. The operating shaft 67 journalled in the side walls 14 and 15 with a portion projecting beyond wall 15 has gear wheel 66 fixedly secured thereto and is therefore driven through rotation of said gear. Also fixed to the shaft in spaced relation to the gear is a cam 68, the periphery of which contacts roller 48 on the arm 46 and is provided with a V-shaped slot having

one side designated by the numeral 70 and the other side by numeral 71. As the roller 48 is in continuous engagement with the periphery of the cam, it will be seen that normally the linkage is held so that the turntable is in lowered position. Upward movement of the linkage and the turntable is permitted when roller 48 rides over the sloping surface 70 of the cam with the turntable reaching its uppermost position when the roller is seated in the vertex of the V-shaped opening, as shown in Figure 5. Downward movement of the linkage and of the turntable against the tension of spring 54 is caused by further movement of the cam bringing the sloping surface 71 in engagement with the roller, whereupon the parts are held in lowered position until rotation of the cam again brings surface 70 over the roller.

Pivotally secured to the gear adjacent the sloping periphery 71 by means of pin 72 is a pawl 73 provided with a projecting arm to which is adjustably secured at its outer end screw 75. The pawl is biased in the direction shown in Figure 3 by the coil spring 76.

The pawl and associated parts above described are part of the throw-out means for the clutch formed by collars 56 and 61 and which when disengaged will disconnect shaft 60 from the flexible driving shaft, whereupon rotation of the operating shaft 67 and the cam 68 will cease. The remaining structure forming the throw-out means includes (Figure 6) the shaft 77 journalled at one end in wall 15 and at its other end by bracket 35 and having projecting therefrom the spaced lugs 78, a lug being located on the respective sides of the shaft 60 and having contact with collar 64 fixedly secured thereto. Also fixed to shaft 77 is the lever 80 provided with a flat upper surface and a depending lip 82. The lever is positioned in alignment with the pawl 73 and is adapted to be engaged by the arcuate end of said pawl as the cam rotates. As the rotation of the operating shaft 67 is counterclockwise the arcuate end of the pawl first seats on the flattened upward end of lever 80. Further rotation of the cam will thus pivot the pawl 72 with the result that the end of screw 75 is brought into contact with the depending lip 82 on the lever. Upon further rotation of the cam and continued pivoting of the pawl the lever 80 is rocked to rotate shaft 77 counterclockwise, Figure 5. As will be seen from this figure, the lugs 78 are thus caused to contact collar 64 to withdraw the clutch collar 61 from contact with collar 56. Separation of the collars disconnects the driving shaft from shaft 60 to stop rotation of the operating shaft and cam as described. This actuation of the clutch is timed so that the operating shaft is disconnected when roller 48 is seated in the vertex of the V-shaped opening in the cam at which point the rotation of the cam the turntable is located in its raised position and is rotated by contact of pin 43 with clutch pin 45.

Means for holding the shaft 77 in position with the clutch collars separated is provided in the form of a holding arm 84 pivoted to stud 85 projecting from side wall 15. The arm is bent at 86 to form a seating portion for engaging with the stud 87 fixed to shaft 77. Spring 88 urges arm 84 downwardly so that immediately as the flat top of stud 87 clears the portion 86 the arm engages therewith to hold the stud and shaft against rotation in a direction to permit contact of the clutch collars. As spring 65 urges the shaft 60 in that direction it is only necessary to trip arm 84 to release engagement with the stud 87 and for this purpose the end is bent downwardly as at 89.

The tone arm 90 positions the sound reproducer 91 over the turntable 40 and has pivotal securement at 92 to the vertical rod 93, the pivot connection permitting limited vertical movement of the sound reproducer but nonrotatably connecting the tone arm with the vertical rod. Horizontal swinging movement of the sound reproducer which takes place during the playing of the record is permitted by rotation of rod 93 mounted in the top wall 13 of the frame and supported at its lower end by the pin 94 secured to the projecting lug 95. The tone arm serves to actuate means for tripping the holding arm 84 to start rotation of operating shaft 67, cam 68 and lowering of the turntable. The same includes a trip arm 96 fixedly secured to the rod and projecting through side wall 15 to the interior of the frame and having a portion 97 bent at right angles therefrom. From this portion projects a stop 98 for limiting the pivotal movement of the finger 100 pivoted to the portion and resiliently urged upwardly by the spring 101. The stop 98 may contact part 89 to trip the holding arm 84 or if arm 96 rotates in the other direction, the finger 100 will operate to trip the holding arm.

For positively returning the tone arm to its initial position after the playing of a record has been completed, the rod 93 is provided with a projecting pin 102 which normally engages the cam 103 fixed to the operating shaft 67 on the outside thereof immediately adjacent wall 15. The cam is provided with the necessary contour to engage pin 102 and rotate rod 93 to cause horizontal swinging of the tone arm, thus locating the reproducer 91 in its initial position. It will be seen from the position of the parts in Figure 6 that the playing of the record has just begun and that the pin 102 is free to move into engagement with the cam 103, whereupon other operations take place to continue the rotation of shaft 67 and lowering of the turntable which will be presently described.

The feeding means for the record carriers 27 consists of a reciprocating carriage 104, Figure 2, having fixed to its inner side a guide block 105 which mounts the carriage for reciprocating movement on the guide 106. Depending from the end of the carriage is a lug 107 having pin 108 connecting with link 110 through the slot 111 formed in the end thereof. The spring 112 maintains the slot to the right of the pin so that the structure provides a lost motion connection between link 110 and the reciprocating carriage 104. Pivotally secured at 113 to link 110 is a crank arm 114 fixed to the projecting end of the operating shaft 67. As the shaft rotates the carriage 104 is caused to reciprocate from its position shown in full lines in Figure 2 to the position shown in dotted lines, where the carrier coupled to the carriage will be located over the turntable 40. The lost motion connection allows continued rotation of the operating shaft 67 after the carriage has been located in position with the carrier over the turntable as described. This is necessary to allow for raising of the turntable since the raising and lowering of the turntable and reciprocation of carriage 104 takes place in timed relation to each other through rotation of the operating shaft.

The invention provides improved means for selecting any record desired and for coupling the carrier supporting said record to the reciprocat-

ing carriage. As has been described, the selection is determined through rotation of the disc 22 which rotates shaft 116, Figure 1, through chain 115. To the rear of the frame supported by bracket 117 integral with the side wall 15 is a selector rod 118 suitably journalled at its upper end and driven from shaft 116 through the meshing pinions 120 and 121 fixed to the shafts respectively. Rod 118 is provided with a plurality of vertically spaced selector pins 122, Figure 11, of equal length but angularly disposed around the axis of the selector rod and having mounted in their outer ends rollers 123. Step rotation of the rod to properly position a pin is taken care of by a star-shaped wheel 124 fixed to the selector rod and having depressions therein corresponding to the number of fingers on the rod, which engage with a roller 125 carried by the lever 126. Stud 127 fixed to an integral bracket projecting from the side wall 15 has lever 126 pivoted thereto to dispose the lever horizontally with roller 125 in engagement with a recess in the star wheel 124. The coil spring 128 resiliently biases the lever to hold the roller seated in its depression on the star wheel and thus rotation of the selector rod takes place only through displacement of the roller against the tension of spring 128.

Fixed to the reciprocating carriage 104 at the upper right hand end thereof, Figure 2, which is cut away for the purpose, is a plurality of resilient strips 130, a strip being provided for each of the fingers 122 and being horizontally disposed with a strip in alignment with each of the fingers. As better shown in Figure 11, the strips are connected at one end by a vertical pin 131 which ends are bent upon themselves to provide the clips 132, adapted to engage the respective lug 31 positioned in alignment therewith. The frame at this point is formed with a sloping surface 133 with which the clips 132 engage. The strips at their opposite ends are secured as at 134 to the carriage 104. Another clip member 135 common to all the carriage lugs has pivotal securement to the plate at 136 with its left end, Figure 11, joined to the stud 137, extending through an opening in the carriage. A pivoted lever 138 is disposed so as to engage with stud 137 depressing the same to cause collapse of the clip 135 from its position as shown in Figure 11 to a flattened position where the lugs 31 will be freed from engagement therewith.

The operation of selecting a record is as follows: Disc 22 is rotated to align the number desired with opening 21, which rotation causes corresponding actuation of the selector rod 118 and the location of a selector finger where the same will contact with a resilient strip to depress the same. This depression of the strip forces the clip 132 of the same inwardly to position the clip back of lug 31, having alignment with the strip. The particular carrier carrying the record desired is thus coupled with the reciprocating carriage and any movement of the carriage carries with it the carrier so engaged. As the carriage begins its movement to the left, Figure 11, it will be seen that the clips ride off the sloping surface 133 and as the tendency of the clips is to spring inwardly, engagement is maintained with the coupled carrier notwithstanding the fact that by this time the strip depressed by the finger 122 has passed beyond the same. Should it be desired at any time to free all of the carriers so that they may be reciprocated in their guides independently of the carriage, lever 138 is rotated to collapse the clip 135, freeing the lugs 31 from the carriers. As the clips 132 of the resilient strips engage one side of the lugs to move the carriers toward the left the clip member 135 engages the other side and functions to return the carriers to their initial position.

In order to prevent rotation of the selector rod immediately after the reciprocating carriage has begun its travel to the left, when such actuation might result in the coupling of more than one carrier to the carriage, the invention provides a pawl 140 pivoted to the lever 126 and urged by spring 142 to direct its pointed end toward the carriage 104. Secured to the carriage is a lug 143 which when aligned with the pawl 140 will prevent pivotal movement of the lever 126 so that rotation of the selector rod as the lug passes the pawl is prevented.

In Figures 14 and 15 a modified selecting mechanism is disclosed comprising the selector rod 118 having a plurality of vertically spaced selector pins 122 carrying at their outer ends rollers 123, as previously described in connection with Figure 11. The selector pins are equal in length but are angularly disposed about the axis of the selector rod. Also fixed to the selector rod 118 is a star-shaped wheel 124 by which the selector pins are properly positioned and held when the carriage 104 is in home position. This results from the operation of the lever 126 carrying a roller 125 adapted to seat within a depression in the star-shaped wheel, as described in connection with the structure of Figures 11, 12 and 13. This modified structure is characterized by spring pressed pawls which have certain features of advantage over the clips 132.

A plurality of resilient strips 180, Figure 15, are fixed to the reciprocating carriage 104 by the screw member 181. Each strip naturally assumes a bow-shape with the bow thereof extending outwardly toward the selector fingers 122. The free end of each resilient strip has engagement with a pawl 182 pivoted at 183 and which forms part of the selecting means carried by the reciprocating carriage 104. Said pawls are provided with a flat outer surface which contacts the resilient strips 180 and thereby tends to normally direct the end of each pawl inwardly toward the frame 15 of the machine. With the pawls directed in this manner they would all engage with a lug 31 formed on their respective record carrier, it being understood that the pawls are located vertically of the carriage in spaced relation so that a pawl is aligned with a particular lug 31. It is therefore necessary to resiliently force said pawls in a direction outwardly so that they will not contact a lug when the carriage is located in its right hand position. This is the function of the resilient members 184 fixedly secured at 185 to the frame of the machine and yieldingly engaging at their other ends the free end of the respective pawl 182. However, the action of the selecting pins 122 counteracts that of the resilient members 184. The particular resilient strip 180 engaged by a pin is forced inwardly, destroying its outwardly bowed shape and rotating its respective pawl so that said pawl is located behind a lug 31 projecting from the record carrier aligned therewith. Accordingly, when said carriage is reciprocated toward the left this record carrier will be connected therewith and will be likewise reciprocated. The reciprocating carriage provides a suitable abutment for engaging the other side of the lugs 31 and which thus functions to return the record

carriers to their initial position upon movement of the carriage to the right.

Automatic selection of a record by the return movement of the reciprocating carriage is made possible through the provision of a ratchet wheel 145 fixed to the selector rod 118 and the rotatable member 146 carrying the latch 147 pivoted thereto at 148. The member rotates on the selector rod with the result that the ratchet wheel and rod is also rotated in a clockwise direction when the latch 147 is in engagement with the ratchet wheel. It is noted that the latch is free to rotate on the member and that any rotation of the ratchet wheel will throw out the latch so that further engagement between the same and the ratchet wheel is impossible unless the latch is first moved inwardly into contact with the wheel. One end of member 146 is resiliently connected through spring 148 to the frame to locate the other end into the path of shoulder 150 provided on the reciprocating carriage. With the parts positioned as shown in Figures 12 and 13, return movement of the carriage will cause contact of shoulder 150 with the member to rotate the same clockwise and as the latch is in contact with the ratchet wheel, rotation of the wheel and selector rod takes place. This rotation is just sufficient to bring the next pin on the rod into contact with its resilient strip 130 to depress said strip and couple its respective carrier with the carriage. Thus the record which has just been played is released and the next record in sequence is automatically coupled.

Should the operator during the playing of a record make his selection it will be seen that the latch 147 will be thrown out into the dotted line position of Figure 12. As the carriage is returned contact between shoulder 150 and the member will still take place but rotation of the member 146 does not rotate the selector rod as the latch has been freed from engagement with the ratchet wheel. To return the latch so that automatic selection may again be accomplished the reciprocating carriage has pivoted to the base thereof a finger 151 held in engagement with pin 152 by the coil spring 153, which is selected to apply a very slight tension on the finger. When the finger contacts with the latch as the carriage is returned, that is, moves to the right, Figure 12, the finger pivots so that no movement of the latch takes place. However, when the reciprocating carriage moves toward the left the finger also contacts with the latch but this time causes displacement of the latch inwardly toward the ratchet wheel as pivotal movement of the finger is prevented by reason of the stop pin 152.

The circuit to the electric motor 10 for energizing the same includes the make and break contacts 155 and 156 respectively, the former being secured to the lower end of the pivoted lever 157 which is resiliently urged in a direction to cause closing of the contacts by the coil spring 158. The contacts are normally held separated but are allowed to engage to close the circuit and energize the motor upon the inserting of a suitable coin in the chute 24 by mechanism which will now be described. Supported for rotation on the stud 160 is a ratchet wheel 161 carrying the pin 162 adapted to engage with the projecting end of lever 157. The stud 160 carries a coil spring 163 having several convolutions, one end of which is fixed to the shaft, while the other end has securement to the wheel to thereby resiliently urge the wheel in a clockwise direction. Pivoted at 164 is a coin actuated member 165 which carries escapement mechanism 166 to permit rotation of the ratchet wheel, one notch for each actuation of the member by the dropping of a coin in chute 24. The member can also be actuated by energization of the electro-magnets 167 so that actuation of the member at a distance from the machine is thus provided for.

Each time a coin is deposited in the chute the member is actuated to allow rotation of the wheel one notch. With the parts as shown in Figure 10 where the contacts are separated and the phonograph is at rest, the depositing of a coin will operate to close the contacts, energizing the motor 10 to start operation of the various mechanism described. Should a second or third coin be dropped during the playing of the first record the wheel will be revolved an additional notch for each coin deposited. The invention provides novel means for returning the ratchet wheel one notch upon the completion of one cycle of operation, and which consists of an arm 168 fixedly secured to the outer projecting end of the operating shaft 67 and carrying the pivoted pawl 170 held in outwardly projecting position by the coil spring 171. Fixedly located adjacent the ratchet wheel to the right side thereof is a plate 172 providing a flat surface for contact with the pin 172 carried at the end of the pawl 170, as shown in Figure 8. Since the operating shaft performs a complete cycle of operations for each revolution the arm 168 is so located on the shaft that just prior to the return of the carriage to its initial position, the pawl 170 will assume a position as shown in Figure 8, wherein the pin 173 engages with plate 172 near the left end of the same. Further rotation of the operating shaft to complete the necessary operations in returning the carriage to its initial position will cause release of the spring energized pawl 170 which immediately rotates on its pivot in a clockwise direction, the pin thereby engaging a notch in the ratchet wheel, causing rotation of said wheel. The rotation is sufficient to return the wheel one notch, which is the same degree of rotation given the wheel by one actuation of member 165. This rotation of the ratchet wheel causes the pin 162 to engage the projecting end of the lever 157, thus separating and holding separate the contacts 155 and 156, respectively. As the circuit to the motor is now open the parts come to rest. The mechanism just described is housed by a cover 174 having formed integral therewith the chute 24 and which is secured to the outside of the wall 14 by securing members 175.

This application is a continuation-in-part of applicants' copending application, Serial No. 683,596 for Multiple record phonograph, filed August 4, 1933.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. A multiple record phonograph comprising a plurality of record holding carriers, horizontal guiding means therefor, a turntable, means for reciprocating the carriers from their position of rest to an operative position over the turntable and return, a selector to couple the selected carrier with the reciprocating means, means for automatically uncoupling the carrier from the reciprocating means upon the return of said car-

rier and for coupling the next carrier in sequence, means for manually actuating the selector, and a member actuated by the manual selection of a carrier prior to the return of a carrier to its position of rest, for rendering said automatic coupling means inoperative.

2. A multiple record phonograph comprising a plurality of record holding carriers, means for guiding said carriers horizontally, a vertically movable turntable having supporting means resiliently urged upwardly, feeding means operative to locate any one of said carriers over the turntable, a sound reproducer located over the turntable, means permitting upward movement of the supporting means to raise the turntable, said means holding the turntable in raised position with the record in engagement with the reproducer, and means positively returning the reproducer to its initial position when playing of the record is completed and said turntable has been lowered.

3. A multiple record phonograph comprising a plurality of record holding carriers, means for guiding said carriers horizontally, a turntable supported for vertical movement by resilient means, feeding means operative to locate any one of said carriers over the turntable, a sound reproducer located over the turntable, means normally holding the turntable in lowered position, said means being operative to effect raising of the turntable by the resilient means, and a lowering of the turntable against the tension of the resilient means.

4. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, feeding means including a reciprocating carriage for locating any one of said carriers over the turntable, and a selector for coupling a selected carrier with the reciprocating carriage, including resilient members on the carriage for engaging a projecting lug on the respective carrier, and means for depressing a resilient member to cause engagement.

5. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, feeding means including a reciprocating carriage for locating any one of said carriers over the turntable, and mechanism for coupling a carrier with the carriage in response to the selection of the operator, said mechanism including depressible means on the carriage for each carrier, and manually actuated means to cause depression of the same selectively.

6. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, means mounting the turntable for rotation, resilient means supporting said mounting means for vertical movement, a reciprocating carriage for locating any one of said carriers over the turntable and for returning the carrier to its initial position, an operating shaft, connections from the shaft to the carriage for reciprocating the same, and means rotated by said shaft for controlling the raising and lowering of the turntable.

7. A multiple record phonograph comprising a plurality of record holding carriers, horizontal guiding means for each carrier, a turntable mounted for rotation, means including a resilient coil spring supporting said mounting for the turntable for bodily movement vertically, a reciprocating carriage for locating any one of said carriers over the turntable and for returning the carrier to its initial position, an operating shaft, connections from the shaft to the carriage for reciprocating the same, and means rotated by said shaft for controlling the raising and lowering of the turntable, the upward vertical movement of the turntable intersecting the horizontal plane of the various carriers and occurring in timed relation to the reciprocation of the carriage.

8. A multiple record phonograph comprising a plurality of record holding carriers, a turntable mounted for rotation and resiliently supported for bodily movement vertically, a sound reproducer located over the turntable, a reciprocating carriage for locating any one of said carriers over the turntable and for returning the same to its initial position, an operating shaft connecting with the reciprocating carriage, and means on the shaft normally holding the turntable lowered but permitting said support therefor to raise the turntable and to yieldingly hold a record in engagement with the reproducer.

9. In a multiple record phonograph, a turntable mounted for rotation and bodily movement vertically, a sound reproducer located over the turntable, an operating shaft, driving means therefor, a clutch connecting the driving means with the shaft, cam means on the shaft connecting with the turntable to effect a raising and lowering of the turntable as the shaft rotates, and throw-out means for the clutch to disconnect the shaft from its driving means, said throwout means being actuated by means on the cam when the turntable reaches its raised position.

10. In a multiple record phonograph, a turntable mounted for rotation and bodily movement vertically, a sound reproducer located over the turntable, an operating shaft, driving means therefor, a clutch connecting the driving means with the shaft, cam means on the shaft connecting with the turntable to effect a raising and lowering of the turntable as the shaft rotates, throwout means for the clutch located on the cam and actuated through rotation of the shaft to disconnect the shaft from its driving means, whereby a record on the turntable is held in engagement with the reproducer, and a trip for holding the clutch in released position, said trip being actuated by movement of the reproducer.

11. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, and means for coupling the carriers with the carriage including a projecting lug on each carrier and resilient members on the carriage.

12. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, and means for coupling the carriers with the carriage including a projecting lug on each carrier and resilient clips on the carriage.

13. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, selecting means for coupling any one of the carriers with the carriage including a projecting lug on each carrier, resilient strips carried by the carriage and having clips for engagement with the lugs, means holding said clips out of contact with the lugs when the carriage is located adjacent the position of rest of the carriers, and a selector for

causing any one of said clips to engage its respective lug and to maintain said engagement until the clips move out of contact with the holding means through reciprocation of the carriage.

14. A multiple record phonograph comprising a plurality of record holding carriers, a plurality of vertically spaced horizontally disposed guides, each carrier being supported and having movement in its individual guides, a turntable mounted for rotation and being supported for vertical movement, resilient means biasing said turntable support in an upward direction to cause upward movement of the turntable, a reciprocating carriage for moving any one of said carriers in its individual guides to a position over the turntable and for returning the carrier to its initial position, and an operating shaft for controlling the raising and lowering of the turntable, said turntable in its upward movement yieldingly engaging the record supported by that carrier located over the turntable and yieldingly presenting the record into contact with the reproducer of the phonograph.

15. A multiple record phonograph comprising a plurality of record holding carriers, a plurality of vertically spaced horizontally disposed guides, each carrier being supported and having movement in its individual guides, a turntable, supporting means for the turntable including a plurality of members connected to form linkage, resilient means connecting with said members to resiliently force the linkage in a direction to cause upward movement of the turntable, a reciprocating carriage for moving any one of said carriers in its individual guides to a position over the turntable and for returning the carrier to its initial position, an operating shaft, connections from the shaft to the carriage for reciprocating the same, and means rotated by said shaft for permitting upward movement of the turntable by the resilient means to take place and for positively returning the turntable to its lowered position.

16. A multiple record phonograph comprising a plurality of record holding carriers, a plurality of vertically spaced horizontally disposed guides, each carrier being supported and having movement in its individual guides, a turntable, supporting means for the turntable, including a plurality of members connected to form linkage, resilient means connecting with said members to resiliently force the linkage in a direction to cause upward movement of the turntable, a reciprocating carriage for moving any one of said carriers in its individual guides to a position over the turntable and for returning the carrier to its initial position, an operating shaft, connections from the shaft to the carriage for reciprocating the same, and a cam rotated by said shaft and operatively engaging the linkage for controlling the raising and lowering of the turntable, said cam permitting raising of the turntable by the resilient means but positively returning the turntable to its lowered position.

17. In a multiple record phonograph, a turntable mounted for rotation and bodily movement vertically, resilient means yieldingly forcing said turntable in a direction to raise the turntable, a sound reproducer located over the turntable, an operating shaft driven from the source of power, a clutch for connecting the shaft with said source of power, cam means rotated by the shaft and operatively associated with the turntable, said cam means permitting upward movement of the turntable by the resilient means and causing positive return of said turntable, throw-out means for the clutch, a trip for holding the clutch in released position, said clutch being actuated by the throw-out means upon rotation of the shaft, whereby the shaft is disconnected from its driving means to hold a record on the turntable in engagement with the reproducer, and means for releasing said trip.

18. In a multiple record phonograph, a turntable mounted for rotation and bodily movement vertically, resilient means yieldingly forcing said turntable in a direction to raise the turntable, a sound reproducer located over the turntable, an operating shaft driven from the source of power, a clutch for connecting the shaft with said source of power, cam means rotated by the shaft and operatively associated with the turntable, said cam means permitting upward movement of the turntable by the resilient means and causing positive return of said turntable, resilient means normally holding the clutch in operative relation to connect the source of power with the shaft, throw-out means for disconnecting the clutch against the tension of said resilient means, said throw-out means being caused to actuate the clutch by rotations of the shaft, whereby said shaft is disconnected from its driving means to hold a record on the turntable in engagement with the reproducer, a trip for automatically holding the clutch in released position, and means releasing said trip to permit the clutch to return to its operative position, said means being actuated by movement of the reproducer.

19. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, and means for coupling the carriers with the carriage including a projecting lug on each carrier and resilient members on the carriage, said resilient members normally lying in a plane where all of said members engage with said projecting lugs, and means holding the members out of said plane when the reciprocating carriage is located adjacent the position of rest of the carriers.

20. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, means for coupling the carriers with the carriage including a projecting lug on each carrier, and resilient members on the carriage, said resilient members normally lying in a plane where all of said members engage with said projecting lugs, means holding the members out of said plane when the reciprocating carriage is located adjacent the position of rest of the carriers, whereby all of said members are disconnected from the carriers when the reciprocating carriage is located adjacent the position of rest of said carriers, and a selector for depressing any one of said members to couple a selected carrier with the reciprocating carriage.

21. In a multiple record phonograph, a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to locate them over the turntable and return, a plurality of resilient members carried by said carriage for coupling the carriers thereto, said members normally lying in a plane where all have engagement with the carriers, holding means for contacting the resilient members when the reciprocating car-

riage is located adjacent the position of rest of the carriers to force the members out of said plane, whereby said members are disconnected from their respective carriers, and a selector for depressing any one of said members to couple a selected carrier with the reciprocating carriage.

22. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to a position over the turntable and return, and means for coupling the carriers with the carriage, said means including a projecting lug on each carrier and resilient members on the carriage, one of said resilient members extending in an opposed direction with respect to the remaining members and engaging the lug of the carriers therebetween.

23. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to a position over the turntable and return, and means for coupling the carriers with the carriage, said means including a lug projecting from the carriers respectively, resilient members on the carriage adapted to engage with one side of said lugs and another member also carried by the carriage for engaging the other side of said lugs, whereby said lugs are confined between the members, and means for releasing said member from engagement with the lugs to permit movement of the carriers in one direction.

24. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to a position over the turntable and return, and means for coupling the carriers with the carriage, said means including a lug projecting from the carriers respectively, a member secured at one end to the carriage and engaging the lugs at its other end, and a plurality of resilient members also carried by said carriage, said resilient members normally lying in a plane where all of said members will engage with its respective carriage lug, means holding the members out of said plane when the reciprocating carriage is located adjacent the position of rest of the carriers, and a selector for depressing a selected resilient member to couple the carrier with the reciprocating carriage.

25. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to a position over the turntable and return, and means for coupling the carriers with the carriage, said means including a projecting lug on the carriers respectively, a single member secured to the carriage for engaging with the lugs of the carriers, and a plurality of resilient members also carried by the carriage for individually engaging with the other side of their respective carrier lug, whereby said lugs are confined between opposed members, said resilient members being effective to cause movement of the carriers from their position of rest to a position over the turntable and said first mentioned member being effective to cause movement of the carriers from their position over the turntable to their position of rest.

26. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, a reciprocating carriage for reciprocating the carriers from their position of rest to a position over the turntable and return, means for coupling the carriers with the carriage, said means including a lug projecting from the carriers respectively, a member having one end secured to the carriage for engaging with the lugs of the carriers, a plurality of resilient members also carried by the carriage and having their free end engaging the other side of the carrier lugs whereby said lugs are confined between opposed members, said resilient members being effective to cause movement of the carriers from their position of rest to a position over the turntable and said first mentioned member being effective to cause movement of the carriers from their position over the turntable to their position of rest, and manual means for releasing said first mentioned member to free the carriers for movement in one direction.

27. A multiple record phonograph comprising a plurality of record holding carriers, guiding means for each individual carrier, a turntable, means for reciprocating the carriers from their position of rest to an operative position over the turntable and return, a selector for coupling the selected carrier with the reciprocating means, means for manually actuating the selector, a ratchet wheel associated with the selector, a rotatable lever also associated with said selector and carrying a pawl for engagement with said ratchet wheel, said lever being rotated by the return of the reciprocating means for the carriers to cause rotation of the ratchet wheel and the selector whereby the returned carrier is automatically uncoupled from the reciprocating means and the next carrier in sequence is coupled thereto, and means actuated by the manual selection of a carrier prior to the return of the reciprocating means to render the pawl inoperative, whereby return of said reciprocating means does not cause rotation of the ratchet wheel.

28. A multiple record phonograph comprising a plurality of record holding carriers, a plurality of vertically spaced horizontally disposed guides, each carrier being supported and having movement in its individual guides, a turntable mounted for rotation and supported for vertical movement, resilient means biasing said turntable support in an upward direction to cause upward movement of the turntable, an operating shaft for controlling the raising and lowering of the turntable, means reciprocating the carriers from a position of rest to an operative position over the turntable and return, said reciprocating means being actuated by said operating shaft whereby vertical movement of the turntable occurs in timed relation to the reciprocation of a carrier, a selector for coupling the selected carrier with the reciprocating means, and means for automatically uncoupling the carrier from the reciprocating means upon the return of said carrier and for coupling the next carrier in sequence.

29. A multiple record phonograph comprising a plurality of record holding carriers, a plurality of vertically spaced horizontally disposed guides, each carrier being supported and having movement in its individual guides, a turntable mounted for rotation and supported for vertical movement, resilient means biasing said turntable support in an upward direction to cause upward movement of the turntable, an operating shaft, cam means rotated by the shaft for permitting upward movement of the turntable by the resilient means and for positively returning the turntable to its lowered position, means recipro-

cating the carriers from a position of rest to an operative position over the turntable and return, said reciprocating means being actuated by said operating shaft whereby vertical movement of the turntable occurs in timed relation to the movement of a carrier, a selector for coupling the selected carrier with the reciprocating means, and means for automatically uncoupling the carrier from the reciprocating means upon the return of said carrier and for coupling the next carrier in sequence.

30. A multiple record phonograph comprising a plurality of record holding carriers, horizontal guide means for each individual carrier, a turntable, means for reciprocating the carriers from their position of rest to an operative position over the turntable and return, means for coupling the carriers with said reciprocating means including lugs projecting from the carriers respectively, and resilient clips on the reciprocating means adapted to engage with said lugs, said clips normally lying in a plane where all of said clips engage with their respective carrier lug, means holding the clips out of said plane when the reciprocating means is located adjacent the position of rest of the carriers, a selector for actuating a selected clip to couple its carrier with the reciprocating means, and means for automatically uncoupling the carrier from the reciprocating means upon the return of said carrier and for coupling the next carrier in sequence.

31. A multiple record phonograph comprising a plurality of record holding carriers, horizontal guide means for each individual carrier, a turntable, means for reciprocating the carriers from their position of rest to an operative position over the turntable and return, means for coupling the carriers with said reciprocating means including lugs projecting from the carriers respectively, and resilient clips on the reciprocating means adapted to engage with said lugs, said clips normally lying in a plane where all of said clips engage with their respective carrier lug, means holding the clips out of said plane when the reciprocating means is located adjacent the position of rest of the carriers, a manually actuated selector for actuating the selected clip to couple its carrier with the reciprocating means, and means for automatically uncoupling the carrier from the reciprocating means upon the return of said carrier and for coupling the next carrier in sequence, said automatic means being rendered inoperative by the manual selection of a carrier prior to the return of the reciprocating means.

32. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, means for moving any one of said carriers to locate the same over the turntable, and mechanism for coupling a selected carrier to said means including a depressible member for each record holding carrier carried by said means, and pivotally mounted pawls also carried by said means, each of said depressible members yieldingly contacting a pawl to resiliently urge the same in a direction to engage a projecting lug on its respective record holding carrier.

33. A multiple record phonograph comprising a plurality of record holding carriers, a turntable, means moving any one of said carriers to locate the same over the turntable, mechanism for coupling a selected carrier to said means including a resilient member for each record holding carrier carried by said means, pivotally mounted pawls also carried by said means, said resilient members each contacting a pawl yieldingly forcing the same in a direction to engage a lug projecting from its respective record carrier, and rotatable mean for depressing a selected resilient member to cause engagement.

34. In a multiple record phonograph, a plurality of record holding carriers, horizontal guiding means for each carrier for supporting and guiding the same throughout its range of movement, a turntable, an operating shaft for effecting the raising and lowering of said turntable, a reciprocating carriage for moving the carriers in their guiding means from a position of rest to an operative position over the turntable and return, a rotatable selector having means for retaining the same in a plurality of indexed positions, (said selector having operation to couple a particular carrier with the reciprocating carriage in each of said indexed positions, and a member on said reciprocating carriage positioned in alignment with said means, said member being adapted to engage said means during initial movement only of said carriage in a direction to locate a carrier over the turntable, whereby as a result of said engagement the selector is locked preventing actuation.

35. In a multiple record phonograph, a plurality of record holding carriers, horizontal guiding means for each of said carriers for supporting and guiding the same throughout their range of movement, a turntable mounted for rotation and for bodily movement vertically, a carriage mounted for reciprocating movement alongside of and parallel to the direction of movement of said carriers for moving the same from a position of rest to an operative position over the turntable and return, an operating shaft, a cam on said shaft for controlling the raising and lowering of the turntable, a crank arm fixed to said shaft, and a connection between said crank arm and said carriage comprising a link, said connection including lost motion means permitting limited rotation of the shaft after said carriage has located a carrier in operative position over the turntable, whereby said carrier may be held at rest in said operative position while said turntable is moved vertically as a result of said limited rotation of the shaft.

36. In a multiple record phonograph, record holding carriers for carrying records to and from a playing position over a turntable, a carriage adapted to have bodily movement for moving the carriers individually to and from said playing position in changing from a played record to a record to be played, means for coupling the carriers to the carriage including a plurality of movable members on the carriage arranged in positions respectively corresponding to the carriers, projecting means on each carrier, said members being movable into and from coupling relation with their respective projecting means whereby a particular member when moved in one direction will have coupling relation with its projecting means and when moved in an opposite direction will be released, and a movable selector adjustable to positions corresponding to the movable members for engaging said members individually and moving them into coupling relation with their respective carrier.

37. In a multiple record phonograph, a stack of independently operable record carriers, a bodily movable carriage for moving said carriers from the stack to a playing position over a turntable and return, a plurality of movable mem-

bers on the carriage corresponding to the carriers and adapted to have coupling relation individually with their respective carrier for moving the carrier into playing position upon bodily movement of the carriage in said direction, and means on the carriage positioned in spaced relation with said movable members and in a direction towards the same so as to oppose the movable members, said means having engagement with a particular carrier upon each return movement of the carriage to thereby return the carriers to their initial position in the stack.

38. In a multiple record phonograph, a stack of record holding carriers each having a projection extending therefrom, a carriage having bodily movement from the stack to a playing position over a turntable and return, coupling members on the carriage respectively corresponding to the carriers for engaging one side of the projection on their individual carrier and for moving said carrier into a playing position upon bodily movement of the carriage in said direction, another member on said carriage common to the projections of all the carriers and positioned in opposed relation to the said coupling members so as to engage the other side of the projections upon return movement of the carriage to thereby return the carriers to initial position in the stack, whereby the projection of each carrier when the same is coupled to the carriage is confined between its respective coupling member and said last mentioned member.

39. In a phonograph for playing records one at a time, a stack of record carriers, a bodily movable carriage for moving said carriers from the stack to a playing position over a turntable and return, means on said carriage including swingable members individual to each carrier for coupling the carriers respectively to the carriage, movable selector means having a plurality of positions corresponding to the record carriers in said stack and effective at different altitudes to engage a swingable member for moving the member into coupling relation with its carrier, and said carriage upon bodily movement thereof being effective to move the coupled carrier.

40. In a phonograph for playing records one at a time, a stack of record carriers, a bodily movable carriage for moving said carriers from the stack to a playing position over a turntable and return, means on said carriage including swingable members individual to each carrier for coupling the carriers respectively to the carriage, a selector having a plurality of positions corresponding to the record carriers in said stack and effective at different altitudes to engage a swingable member for moving the member into coupling relation with its carrier, and said carriage upon bodily movement thereof being effective to move the coupled carrier, said selector including a rotatable shaft having fingers projecting therefrom corresponding to the swingable members and located in relative angular relation and in longitudinally spaced relation.

41. In a multiple record phonograph, record carriers for supporting a plurality of records to be played, means having bodily movement for moving any one of said carriers to a playing position over a turntable, mechanism for coupling a selected carrier to said moving means including a resilient member for each record carrier secured to the said moving means, pivotally mounted pawls also carried by said means and having engagement with the resilient members respectively in a manner whereby each pawl is yieldingly biased in a direction to have coupling relation with its particular record carrier, other yieldable means for each pawl for engaging its pawl when the said movable means is located adjacent the position of rest of the carriers to thereby hold the said pawls out of coupling relation with their particular record carriers, and a movable selector adjustable to positions corresponding to the resilient members for engaging the members individually to thereby move their pawl into coupling relation with its respective carrier.

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