

April 1, 1941.

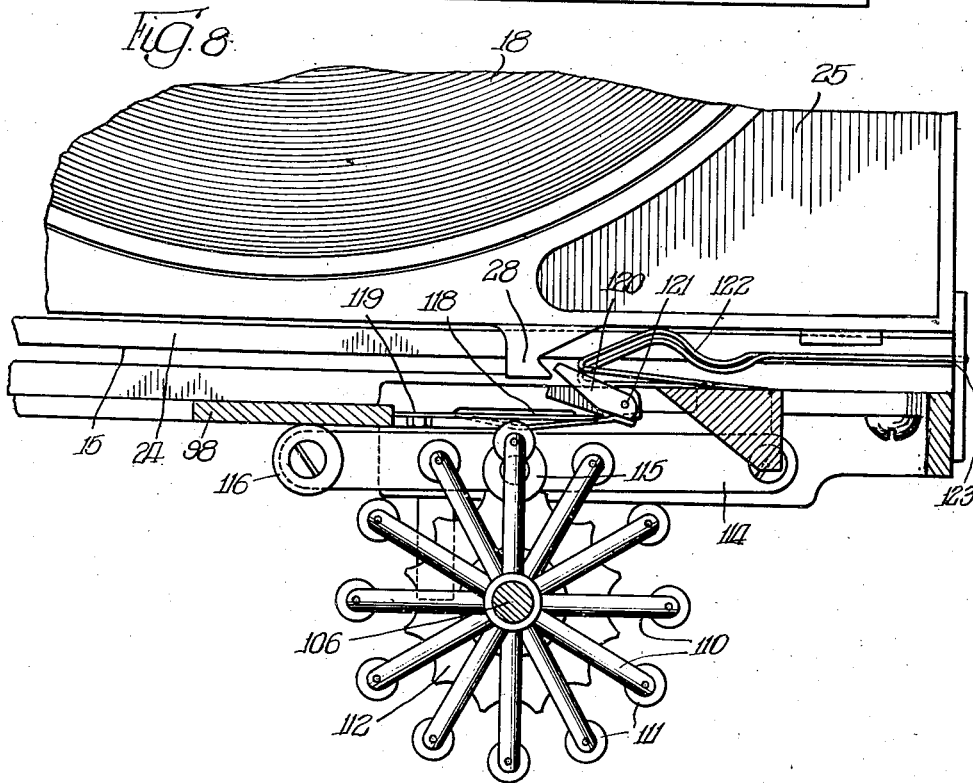
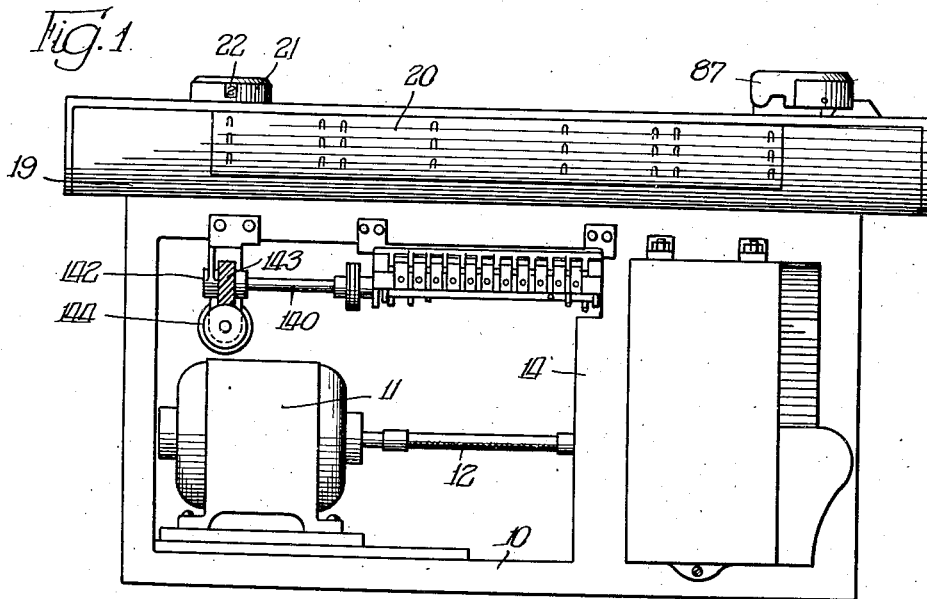
C. G. FREBORG

2,237,139

MULTIPLE RECORD PHONOGRAPH

Filed July 3, 1940

7 Sheets-Sheet 1



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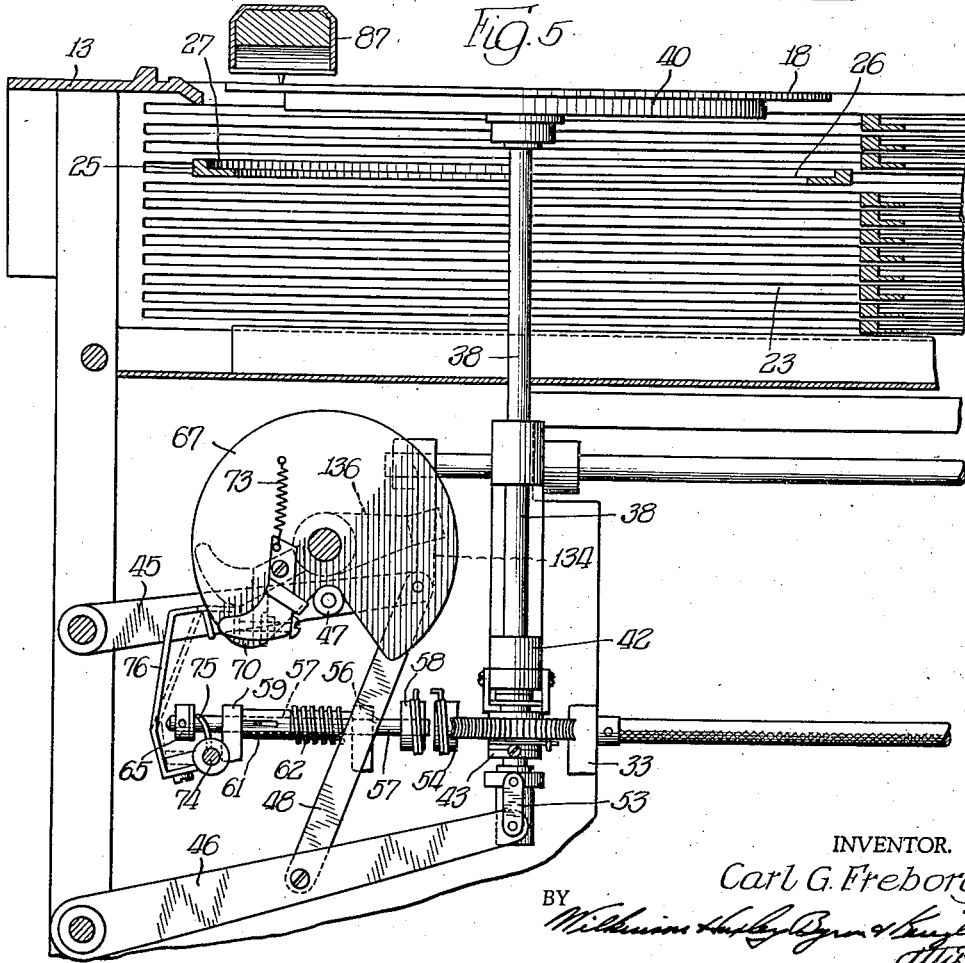
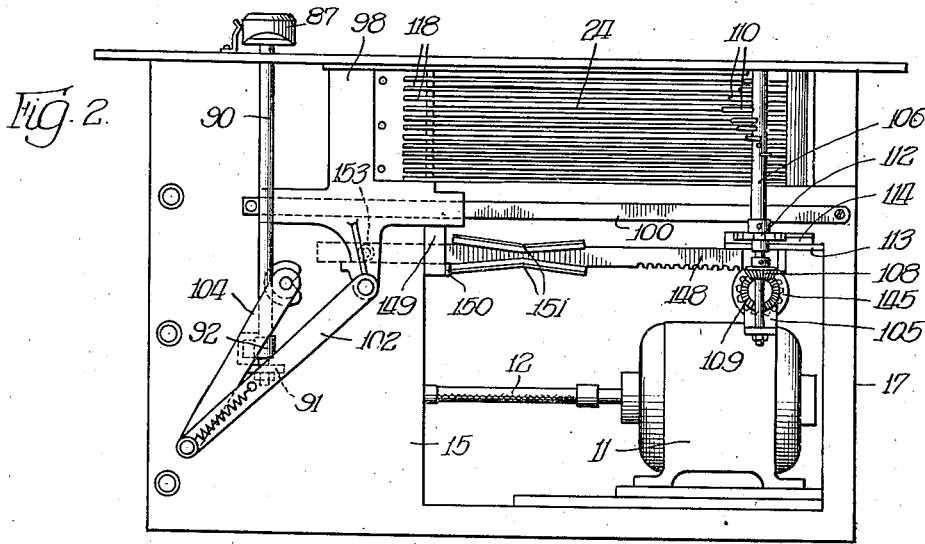
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MULTIPLE RECORD PHONOGRAPH

Filed July 3, 1940

7 Sheets-Sheet 2



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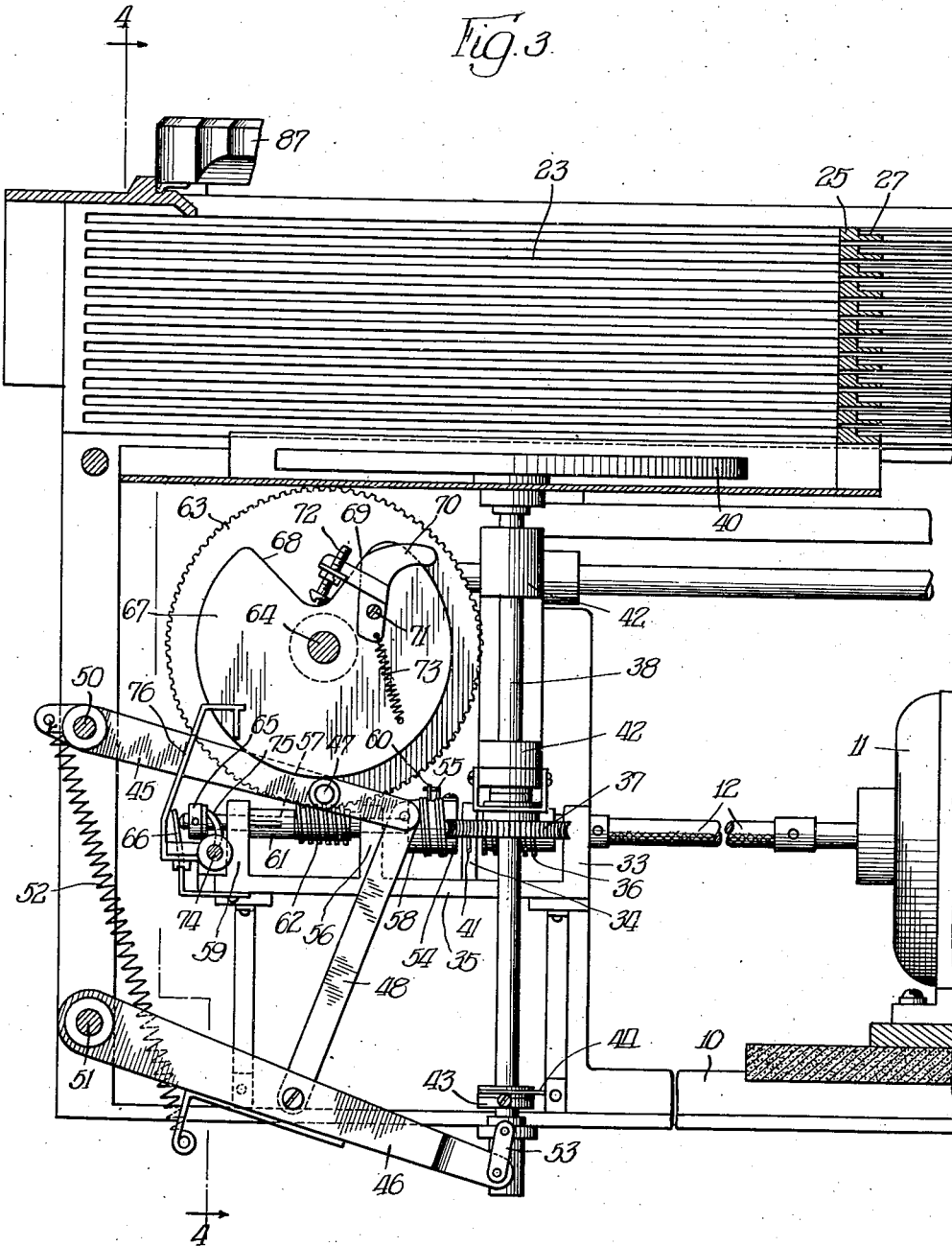
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MULTIPLE RECORD PHONOGRAPH

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7 Sheets-Sheet 3



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MULTIPLE RECORD PHONOGRAPH

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Fig. 4

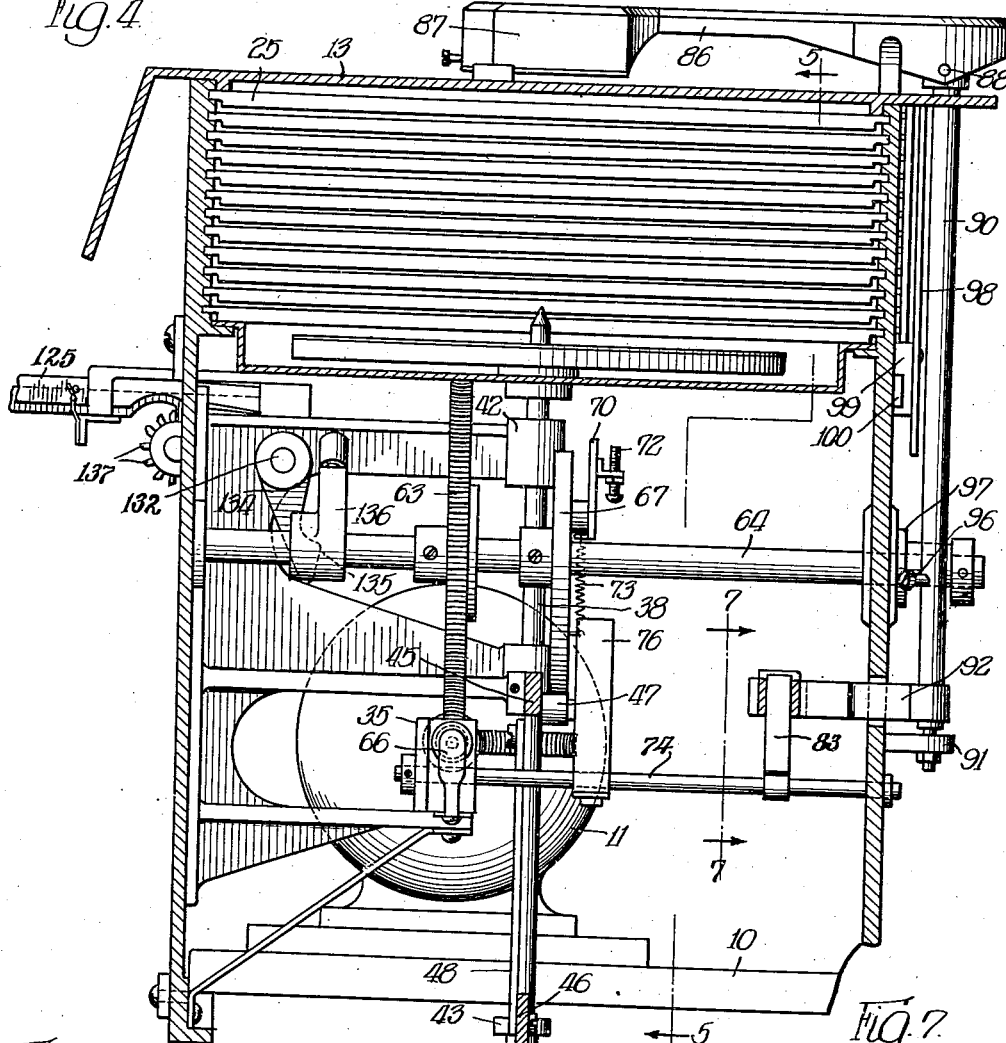


Fig. 6

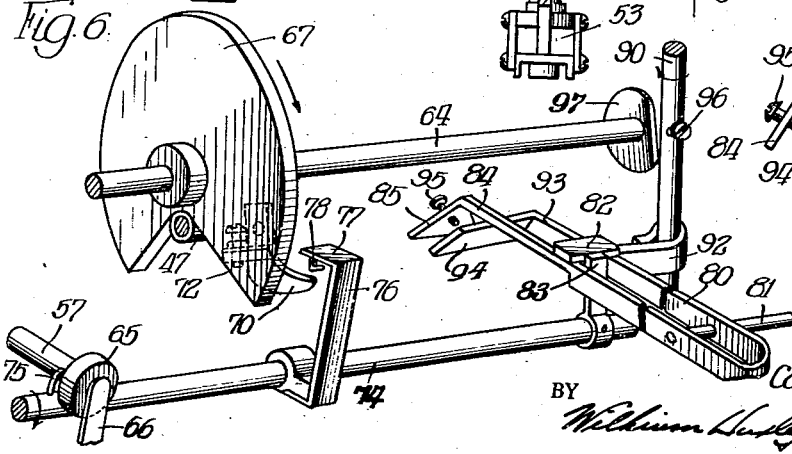
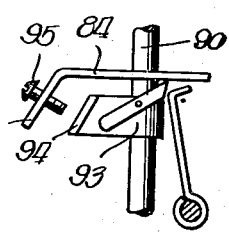


Fig. 7



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MULTIPLE RECORD PHONOGRAPH

Filed July 3, 1940

7 Sheets—Sheet 5

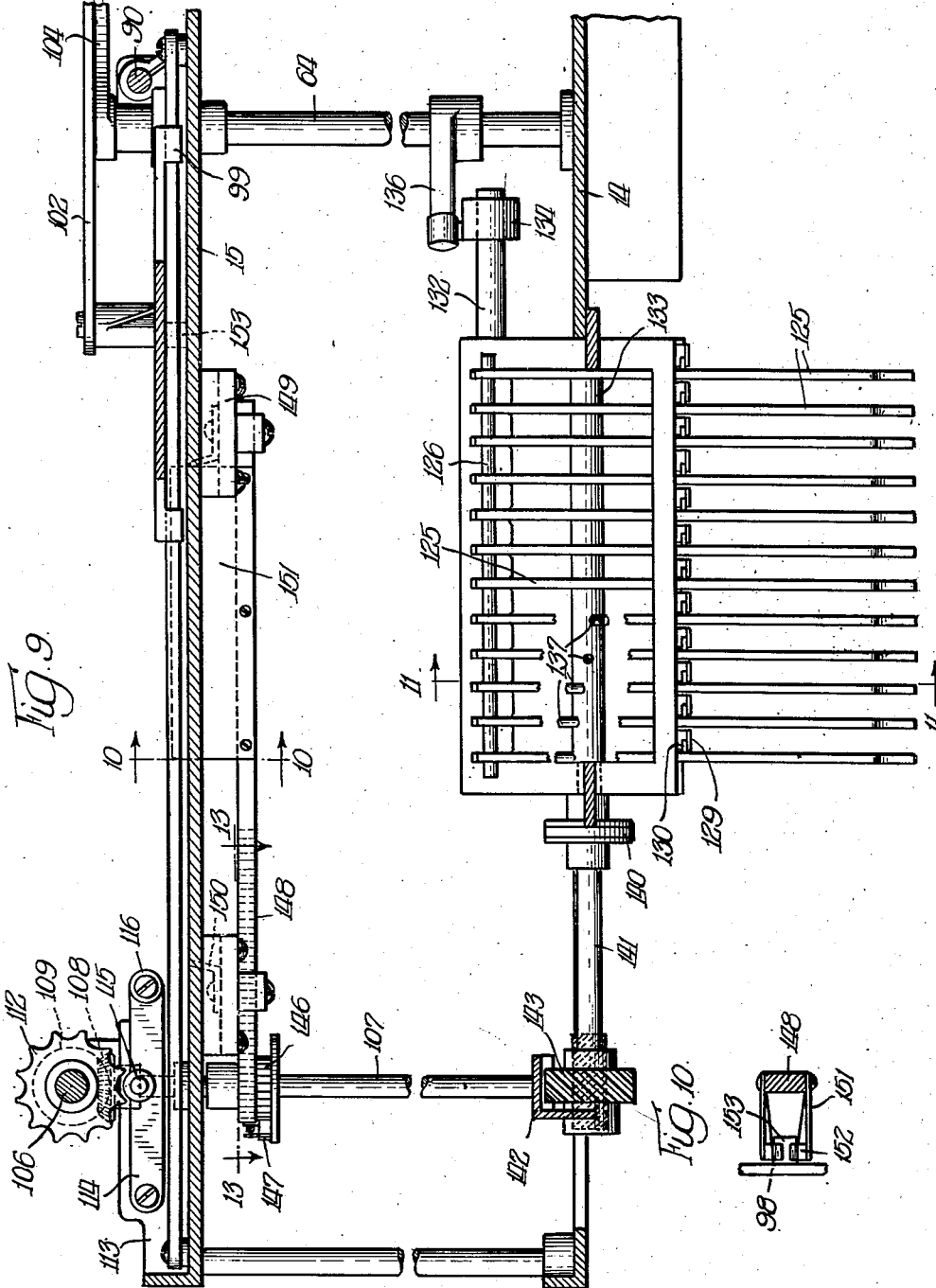


Fig. 9.

Fig. 10.

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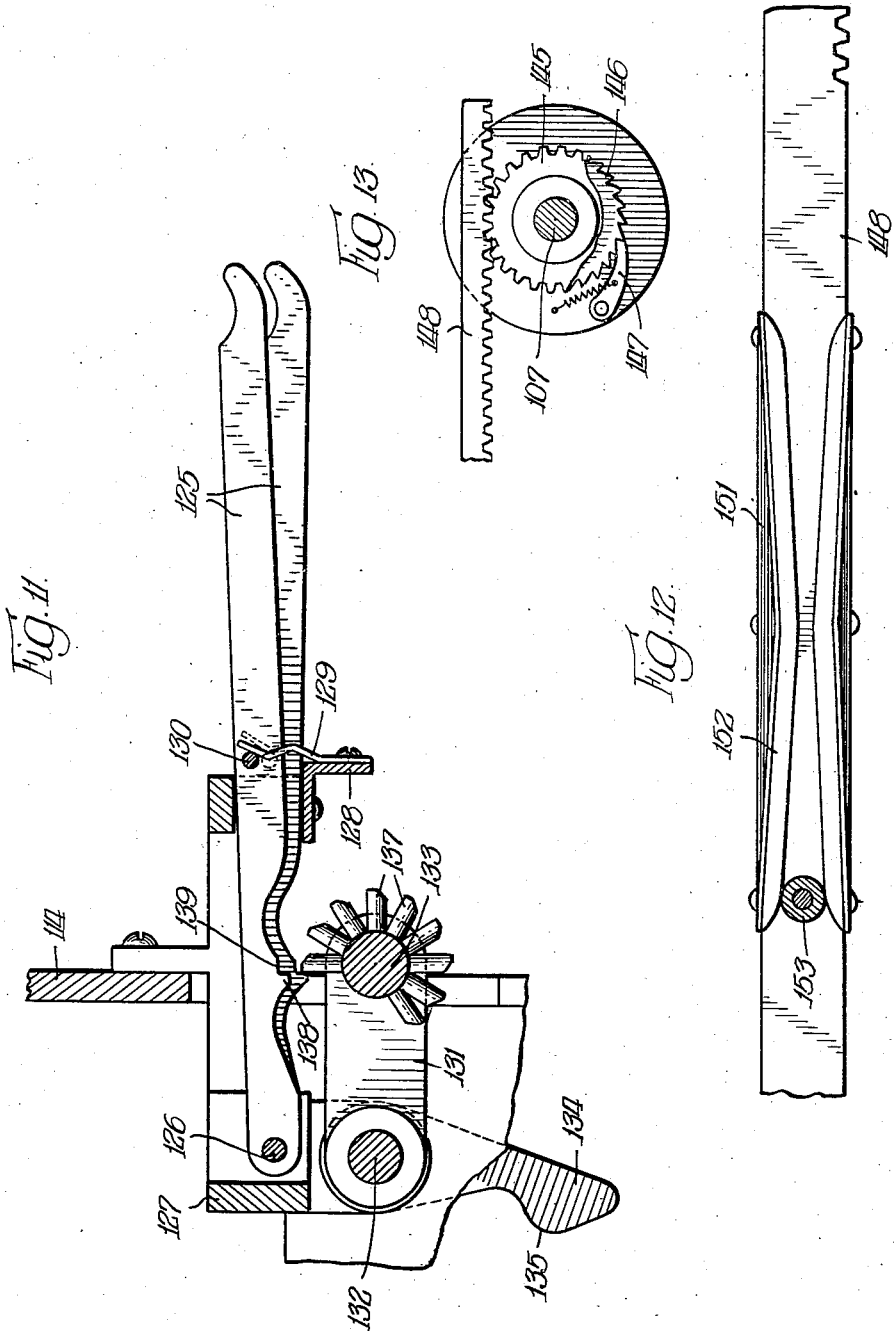
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MULTIPLE RECORD PHONOGRAPH

Filed July 3, 1940

7 Sheets-Sheet 6



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MULTIPLE RECORD PHONOGRAPH

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7 Sheets-Sheet 7

Fig. 14

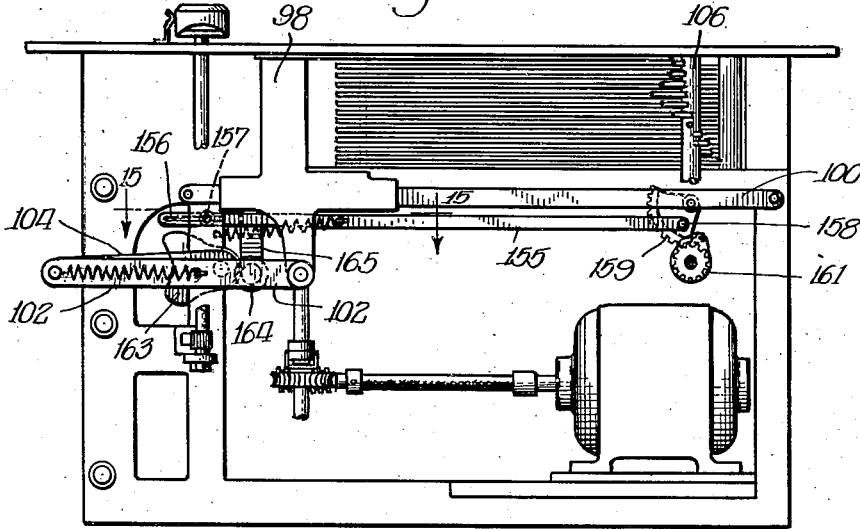


Fig. 15

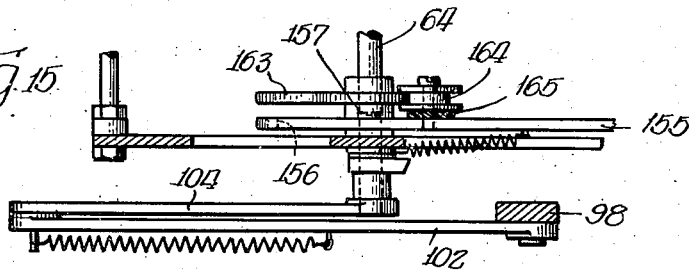
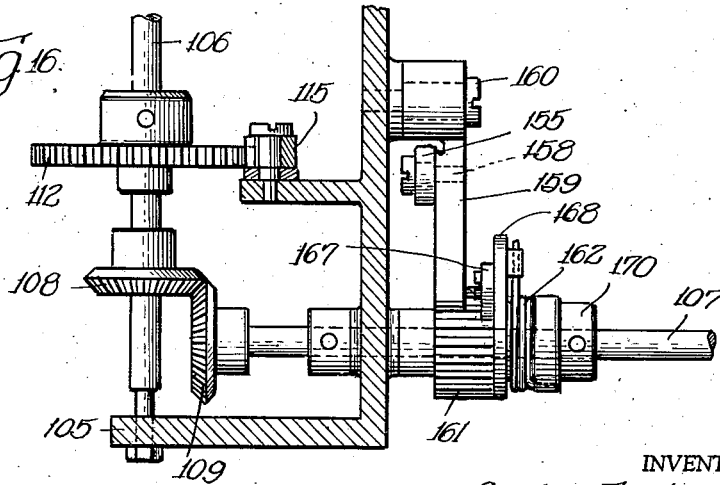


Fig. 16



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UNITED STATES PATENT OFFICE

2,237,139

MULTIPLE RECORD PHONOGRAPH

Carl G. Freborg, Chicago, Ill.

Application July 3, 1940, Serial No. 343,721

10 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 over the turntable, played, and then returned to the magazine in readiness for another operation.

The type of machine above described is disclosed in the co-pending application of Carl G. Freborg and Charles A. Freborg, Serial No. 161,010, filed August 26, 1937. Said machine is characterized by horizontal guides, each supporting a record holding carrier and by mechanism for automatically reciprocating the selected carrier to a position over the turntable, which is thereupon elevated in timed relation with the reciprocating means and then lowered following the completion of the playing of the record. A cycle in the operation of said mechanism is completed by the return of the record carrier to its initial position.

The selecting mechanism in the phonograph disclosed in the above identified application was limited in that only one record could be selected in advance. It is an object of the present invention to provide improved means for predetermining the order of playing of the records in a multiple record phonograph such as described. With the present invention a plurality of records can be selected in advance and once the machine is started the selected records will be played without further attention from the operator. Also the selection may be made before or during operation of the machine. However, if the selecting mechanism is not set the records will be played in their proper sequence.

A more specific object of the present invention resides in the provision of selecting mechanism which will be automatic in operation, requiring only an initial setting to predetermine the playing of the records desired and which will have particular application to the multiple record phonograph disclosed in the application above identified.

Another object of the invention is to provide selecting mechanism in the form of a plurality of displaceable levers corresponding to the records to be played and which control a movable selector adjustable to different altitudes for selecting a particular record carrier from a group of record carriers in stacked relation at one end of the machine.

Another object resides in the provision of selecting mechanism including a movable shaft having spirally disposed pins thereon and selecting levers for controlling the extent of move-

ment of the shaft which in turn controls the movement of a selector, and wherein the selecting mechanism will be cleared by bodily movement of the shaft to return to initial position a particular displaced lever.

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 device and wherein like reference characters are used to designate like parts—

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

Figure 2 is a rear elevational view of the phonograph of Figure 1 showing 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 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 located in an inoperative position;

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 cam means for raising and lowering the turntable with the release mechanism for the clutch and trip therefor shown in combination;

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

Figure 8 is a fragmentary horizontal view showing the selector for coupling the desired record carrier to the reciprocating carriage;

Figure 9 is a horizontal sectional view illustrating the improved selector mechanism of the invention;

Figure 10 is a vertical sectional view taken substantially along line 10—10 of Figure 9 and showing the means by which the reciprocating carriage is caused to actuate the selecting mechanism;

Figure 11 is a vertical sectional view taken substantially along line 11—11 of Figure 9 illustrating the selecting levers and associated mechanism,

Figure 12 is a front elevational view showing the resilient member by means of which the se-

lecting mechanism is actuated by reciprocating movement of the carriage;

Figure 13 is a detail sectional view showing the pawl and ratchet on the selector driving shaft;

Figure 14 is an elevational view of the phonograph showing a modified structure by which the main operating shaft is caused to actuate the selecting mechanism;

Figure 15 is a detail sectional view taken substantially along line 15—15 of Figure 14; and

Figure 16 is a sectional view showing the ratchet and clutch mechanism of the modified arrangement.

The framework for housing the multiple record phonograph selected for the purposes of illustrating the present invention 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, Figure 5, to 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 shown in Figures 1 and 4, to provide a holder 20 for identifying cards, each card having a number and listing the title of a record. The cylindrical cap 21 houses a ring member to which is applied indicia 22 rendered visible by reason of an opening formed in said cap. The ring carrying the indicia is suitably rotated by the selector to be presently described in detail and best shown in Figure 8. This structure is provided so that the number of the record being played will be visible to the operator.

The inside surface of each side wall 14 and 15, at the upper end thereof, Figure 4, is formed to provide a plurality of horizontally disposed grooves 23 for receiving the record holding carriers 25 which are thereby mounted for horizontal reciprocating movement from the right hand end of the frame, Figure 2, where the carriers are positioned in stacked relation for engagement by the selector to the left hand end of the frame, where the carrier will be located over the turntable so that the record disc may be engaged thereby and brought into contact with the sound reproducer, as best illustrated by reference to Figure 5. Each carrier is provided with an opening 26 and a supporting ledge 27 for supporting a record disc 18 and is also provided with a lug 28, Figure 8, extending through its respective horizontal slot 24 formed in the side wall 15 parallel to and paired with the grooves 23.

The flexible driving shaft 12 is journaled in supports 33 and 34, Figures 3 and 5, integral with the bracket 35 which is an integral part of the side wall 14. Fixed to the shaft 12 adjacent support 33 is a worm gear 36 having meshing engagement with gear 37, rotatable on the standard 38 which supports the turntable 40. A pin 41 projects from the lower surface of said gear 37. Standard 38 is supported for rotation by means of brackets 42, the lower bracket also supporting gear 37. Said standard has fixedly secured to its lower end a clutch collar 43 having a few turns of wire thereon to provide the projecting pin 44. Bodily movement vertically is imparted to said standard 38 by arms 45 and 46, the former carrying a roller 47 and being pivotally connected with arm 46 by the link 48. The arms are pivoted respectively at 50 and 51 and are yieldingly biased in an upward direction by the coil spring 52. The bifurcated end of the arm 46, by means

of a universal joint 53, has connection with the lower end of the standard 38 and therefore it will be understood that movement of the arms 45 and 46 will be transmitted to cause vertical movement of standard 38 to raise and lower the turntable. The function of the spring 52 is to yieldingly bias the turntable in an upward direction, the leverage ratio of the spring being materially increased by the manner in which the spring is secured to its respective shafts.

The flexible shaft 12 ends a short distance beyond gear 36, to which end is secured a clutch collar 54 having a few turns of wire thereon to provide an elbow projection 55. Journaled in supports 59 and 56 is a shaft 57 having fixedly secured to the end beyond support 56 the collar 58 from which projects the pin 60 adapted to engage the elbow connection 55 and thus operatively connect the flexible shaft 12 and shaft 57. Shaft 57 between supports 59 and 56 carries a sleeve 61 to which is nonrotatably secured a worm gear 62 having meshing engagement with a relatively large gear 63 fixed to the operating shaft 64. The sleeve, as clearly shown in Figures 3 and 5, is associated with shaft 57 by a pin and slot connection. The outer end of shaft 57 is provided with a fixed collar 65. Said end of the shaft has engagement with a resilient strip of metal 66 which forces said shaft to the right, maintaining the clutch collars in engagement, which thereby operatively connects the flexible drive shaft 12 with shaft 57 to cause rotation of the operating shaft 64.

The operating shaft is journaled in the side walls 14 and 15 of the machine and in addition to gear 63 there is secured to said shaft a cam 67 having spaced relation with respect to the gear and which has contact with roller 47 on arm 45. The cam is provided with a V-shaped slot providing a surface designated by numeral 68 and a second surface angular with respect thereto, designated by numeral 69. Said slot permits upward movement of the linkage and thus upward movement of the turntable to position a record in contact with the reproducer. Downward movement of the linkage and thus the turntable takes place against the tension of spring 52 and is caused by further movement of the cam, bringing the sloping surface 69 into engagement with the roller.

The pawl 70, pivotally secured to the cam at 71 and carrying the screw 72, is resiliently held in proper position by the coil spring 73. The pawl and associated parts are part of the throwout means for the clutch formed by collars 54 and 58 and which throwout means additionally includes the shaft 74, Figure 6, journaled at one end in wall 15 and at its other end by bracket 35. Shaft 74 carries spaced lugs 75, located on the opposite sides of shaft 57, and adapted to have contact with collar 65. Also fixed to said shaft is a lever 76 provided with a flat upper surface 77 and a depending lip 78. The lever is positioned in alignment with pawl 70 and is engaged by the arcuate end of said pawl as the cam rotates, which rotation is counterclockwise. Thus the arcuate end of the pawl first seats on the upward end of lever 76 but further rotation of the cam will cause the pawl to pivot with the result that the end of the screw 72 is brought into contact with the depending lip 78, causing movement of the lever 76 and rotation of shaft 74 counterclockwise, Figure 5. As will be seen from this figure the lugs 75 contact collar 65 to separate the clutch collars, thereby disconnecting

the flexible driving shaft 12 from shaft 57. Rotation of the operating shaft and cam 67 is thereby stopped but it will be clear from Figure 5 that when this actuation of the clutch takes place the roller 47 is seated in the vertex of the V opening in the cam and thus the turntable is elevated to its uppermost position, where the same will contact the reproducer. As upward movement of the shaft 38, and thus the turntable, takes place the pin 41, rotated by cam 37, will contact the projecting pin 44 to thus cause rotation of the shaft and turntable.

Means for holding the shaft 74 in position with the clutch disconnected is provided in the form of a holding yoke 80 pivoted to the stud shaft 81 projecting from the side wall 15. The yoke carries the cross piece 82 for engaging the arm 83 fixed to shaft 74. The weight of the yoke tends to urge the same downwardly onto a support (not shown) so that the yoke will locate the cross piece 82 into contact with the arm 83 to hold the arm and shaft against rotation in a direction to permit engagement of the clutch rollers. As spring 66 urges the shaft 57 in that direction it is only necessary to trip yoke 80 to release shaft 74 and for this purpose yoke 80 is extended forwardly by part 84, having a bent downwardly directed end 85.

The tone arm 86 of the sound reproducer 87 has pivotal securement at 88 to the vertical rod 98. Horizontal swinging movement of the sound reproducer, which takes place during the playing of the record, is permitted by rotation of rod 98, journaled in the top wall 13 of the frame and supported at its lower end by bracket 91. The tone arm has fixed thereto a trip arm 92 which projects through the side wall 15 to the interior of the frame and is provided with a portion 93 bent at right angles therefrom. From said portion, Figure 7, projects an end part 94 for camming the yoke 80 through engagement with the screw 95 threaded in part 85 of said yoke. Upward movement of the yoke 80 will release arm 93 and allow shaft 74 to rotate in a direction to effect connection of the clutch comprising collars 54 and 58, whereupon rotation of the operating shaft 64 will take place to lower the turntable. For positively returning the tone arm to its initial position after playing of a record has been completed the rod 98 is provided with a projecting pin 96 which normally engages cam 97, fixed to the operating shaft 64 on the outside immediately adjacent wall 15. The cam is provided with the necessary contour to allow the tone arm to have swinging movement during the playing of the record but which will cam the pin 96 while the turntable is being lowered to rotate rod 98 and thus locate the reproducer in its initial position.

The feeding means for the record carriers consists of a reciprocating carriage 98, Figure 2, having fixed to its inner surface a guide block 99 which mounts the carriage for reciprocating movement on the guide rod 100. Depending from the end of the carriage is a lug 101 having a pin connecting with the link 102. Pivotaly secured to the other end of link 102 at 103 and in a manner to provide a lost motion connection is the crank arm 104 fixed to the projecting end of the operating shaft 64. As the shaft rotates the carriage 98 is caused to reciprocate from its position shown in full lines in Figure 2, to a right hand position adjacent a selector, in which position a record carrier will be coupled to the carriage which will presently locate the same over the turntable.

The invention provides improved means for selecting a number of records in advance, which will automatically and in the sequence determined by the setting of the selecting mechanism, couple the proper record carrier to the carriage, which will thereupon be reciprocated as described and returned to initial position following the playing of the record. To the rear of the frame, Figure 2, supported by bracket 105, is a selector rod 106, suitably journaled by said bracket and at its upper end by the stop 13 of the frame and having connection with the ring member carrying indicia 22, as shown in Figure 1. The selector rod 106 is driven from shaft 107, Figure 9, by means of the meshing bevel gears 108 and 109, respectively. The selector shaft is provided with a plurality of vertically spaced selector fingers 110, Figure 8, of equal length but displaced angularly on the selector rod and having mounted in their outer end a roller 111. The spoke-formation of the fingers conforms to a star-shaped wheel 112 fixed to the selector rod and having depressions therein corresponding to the number of fingers on the selector rod. Pivoted to bracket 113 is a lever 114 carrying a roller 115 adapted to seat within the particular depression in the star-shaped wheel 112 aligned therewith. The end of lever 114 carries another roller 118 which is cammed by the reciprocating carriage 98, forcing the roller 115 to seat within a depression in the star-shaped wheel. In this manner the selector rod is locked in the position desired and the rod is held locked as long as the carriage remains in its right hand end position. Each position of the selector corresponds to a particular record carrier, which carriers are in stacked relation at this end of the machine, and accordingly, the selector locates a selector finger at a different altitude for the various adjusted positions thereof.

Fixed to the reciprocating carriage 98, the said carriage being cut away for the purpose, is a plurality of resilient strips 118, each strip being fixedly secured to the carriage at 119 and naturally assuming a bowed shape with the bow thereof extending outwardly toward the selector fingers 110. The free end of each resilient strip has engagement with a pawl 120 pivoted at 121 and which forms part of the selecting means carried by the reciprocating carriage 98. Said pawls are provided with a flat outer surface which contacts the resilient strips 118 and which 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 have a tendency to engage with the lugs 28 formed on the record carriers, it being understood that the pawls are located vertically of the reciprocating carriage in spaced relation so that a pawl is aligned with a particular lug 28. It is therefore necessary to resiliently force said pawls in a direction outwardly so that they will not contact a lug 28 when the reciprocating carriage is located in its right hand position. This is the function of the resilient members 122 fixedly secured at 123 to the frame of the machine and yieldingly engaging at their other ends the free end of their respective pawls 120. The action of the selecting fingers 110 counteracts that of the resilient members 122. The particular resilient strip 118 engaged by a finger 110 is forced inwardly, changing its outwardly bowed shape and rotating its respective pawl 120 so that said pawl is located behind a lug 28 projecting from the record carrier aligned therewith and accordingly when said reciprocating carriage is moved in a

direction toward the left, this 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 28 and which thus functions to return the record carriers to their initial position upon movement of said reciprocating carriage to the right.

Selection of the desired record is effected by the selecting levers 125, Figure 11, which are pivotally secured at their inner ends by pivot rod 126 journaled in the rectangular frame 127. Said frame is suitably secured to and supported by the front wall 14 of the machine and in order to hold the selecting levers 125 in either of their up or down positions the frame has suitably secured to the undersurface of its front wall a flange member 128 which carries spring clips 129 adapted to contact a pin 130 secured to its respective selecting lever. The shape of each clip 129 is designed so that the selecting lever will be held in an up position, that is, an inoperative position, or a down position, where said lever will be operative to cause selection of the particular record carrier corresponding thereto. The size of the machine is determined by the number of record carriers which determines the number of fingers 110 on the selector rod and the number of selecting levers 125.

Located below the selecting levers and supported from frame 127 is a movable frame consisting of spaced members 131 fixed at one end to the pivot shaft 132 which supports said spaced frame members from frame 127. Said movable frame journals at the other end of members 131 a shaft 133. As shown in Figure 9, the pivot shaft 132 extends toward the operating shaft 64 and has fixedly secured to said end a depending arm 134 having a bulbous cam portion 135. The operating shaft carries a cam lever 136, the end of which is adapted to contact the bulbous portion 135 of the depending arm 134 to rock the pivot shaft 132, thereby producing bodily movement of shaft 133, which movement takes place in a vertical plane. Projecting from said shaft 133 are a plurality of pins 137, said pins being disposed so that a pin is in alignment with a selecting lever 125, and being angularly displaced so that for any setting of the shaft 133 only one pin is located in alignment with its selecting lever. Each selecting lever is provided with a depending lip 138 and with a shoulder portion 139 adjacent thereto which are adapted to have association with the pin 137 in alignment therewith.

The shaft 133 has connection by means of the flexible joint 140 with shaft 141 journaled in bracket 142, Figure 1, and carrying worm gear 143. The flexible joint permits bodily movement of the shaft 133, which occurs once for each rotation of the operating shaft 64, and at the same time insures that said shaft will have rotation along with shaft 141. Meshing with gear 143 is a gear 144 fixed to shaft 107 which, as previously described, operatively connects with the selector rod 106. The driving gear 145, Figure 13, is free to rotate on shaft 107. Formed integral with said gear is a ratchet 146 but fixed to shaft 107 is a disc carrying a pawl 147 and which has contact with the teeth of said ratchet. The driving gear has meshing engagement with a rack 148 supported for reciprocating movement in the depending members 149, which carry stops 150, limiting the reciprocating movement of said rack.

As a result of the pawl and ratchet connection between the driving gear 145 and shaft 107, the

shaft 107 is rotated only upon reciprocating movement of rack 148 in a direction toward the left, Figure 9, to rotate the gear counter-clockwise. Movement of the rack caused by the carriage 98 is operative, therefore, when the carriage is being returned to its home position, in which position the release of one record carrier and the coupling of another record carrier is effected. When the rack 148 reciprocates in a direction toward the left, Figure 2, no movement of shaft 107 takes place, the gear 145 merely revolving on the shaft, since the pawl 147 when the gear is rotated in this direction, merely slips over the teeth of the ratchet 147.

Fixed to rack 148, as best shown in Figure 12, are a pair of resilient members 151, having secured to the inner surface of their outer end a flange 152 providing a roller contacting surface. Since one of the members 151 is secured to the top side of rack 148 and the other member is secured to the bottom side, a space is provided between the inwardly directed flanges 152 which progressively decreases in width from each end toward the center. The carriage 98 carries a roller 153 aligned with the flanges 152 and which is adapted to pass through the space between said flanges. However, the resistance provided by the resilient members 151 to the passage therethrough of the rollers 153 is sufficient to cause movement of said rack 148 to the full extent permitted by stops 150. When the maximum movement of rack 148 in a direction toward the right, Figure 2, occurs, the selector rod 106 will be rotated thirteen-twelfths revolutions. It will be observed that the selector rod is provided with twelve fingers 110 and therefore one-twelfth of a revolution of said selector rod will locate a different finger into contact with a different resilient strip 118. Each finger will couple with the reciprocating carriage its respective record carrier. In the event none of the selecting levers 125 has been depressed, it will be understood that rack 148 will reciprocate its full distance between stops 150 as a result of the homeward movement of carriage 98, and therefore the selector rod will rotate thirteen-twelfths revolutions and each time will accordingly select a different record, which selection will take place in sequence.

The setting of any of the levers 125 functions to destroy the natural sequence in which the records will be played and instead the records are played according to which of the levers 125 are depressed. The shaft 107 rotates shaft 133 in addition to rotating the selector rod 106 as described. The shaft 133 is also rotated thirteen-twelfths revolutions as a result of maximum reciprocation of rack 148. When a lever 125 is depressed its respective lip 138 is projected into the path of a pin 137 and accordingly rotation of shaft 133 and the selector rod 106 will be limited, depending on the particular lever depressed. A definite relationship of course exists between pins 137 and the selector fingers 110 and a particular record carrier will be selected corresponding to the depressed lever 125. In other words, each effective position of the selector rod corresponds to one of the projections 137 on the shaft 133 and when a lever is displaced the shaft is arrested and said selector rod is also arrested in corresponding position.

In Figures 14, 15 and 16 a modified arrangement of structure is shown by which the main operating shaft is caused to actuate the selecting mechanism. The rack 148 is replaced in this modified arrangement with the connecting rod

155 having a slot 156 at one end and which is accordingly held to the frame of the phonograph by the pin 157 which permits reciprocating movement of said rod within the limits of the slot. At the other end the connecting rod is pivotally connected at 158 to a segment gear 159 fastened to the frame by the pivot screw 160 so as to have oscillating movement. The segment gear has meshing engagement with pinion 161 on shaft 107 and which is free to rotate on said shaft to the extent permitted by the friction clutch 162. The connecting rod 155 is oscillated by a selector operating cam 163 fixed to the main operating shaft 64. Said cam is in engagement with a feed roller 164 carried by a depending member 165 and which is suitably secured at its upper end to the connecting rod 155. The coil spring 166 maintains the connecting rod in a position toward the left, Figure 14, whereupon the connecting rod is moved against the tension of said spring in a direction toward the right to oscillate the segment gear 159 when the feed roller 164 is actuated by the selector operating cam 163.

As previously explained, oscillating movement of the segment gear 159 will rotate the pinion 161 but by reason of the pawl 167 rotation is imparted to shaft 107 only during the period of movement of the carriage 98 in a direction toward the right, Figure 14. In this respect the modified arrangement is similar to the rack and pinion previously described and shown in Figures 9 and 13. The pawl 167 which has contact with the teeth of pinion 161 is carried by the disc 168 which has connection with shaft 107 through the friction clutch 162 and the collar 170 fixedly secured to said shaft. Accordingly, when the segment gear oscillates in one direction the pinion is rotated and if the direction of rotation is against the pawl 167 movement is correspondingly imparted through the friction clutch 162 to the shaft 107. The return oscillating movement of segment gear 159 will rotate the pinion in a reverse direction and in this case the pawl will slip over the teeth on said pinion and no movement will be imparted to shaft 107.

The friction clutch is provided for the reason that the segment gear will have full movement upon each actuation thereof, whereas, shaft 107 will have partial movement in most instances, due to the fact that a projecting pin 137 will be brought into contact with a displaced lever 125. Even though movement of shaft 107 and movement of the selector rod 106 is accordingly arrested, the segment gear and connecting rod will be permitted to move the full distance to which these parts are actuated by the selector operating cam 163.

After the depressed lever has accomplished its selecting function which may be before or following the playing of the selected record, it is necessary to clear the selecting mechanism insofar as that one lever is concerned so that upon return movement of the carriage 98 movement of rack 148 will rotate the selector rod to select the next record. Therefore rotation of shaft 64 to lower the turntable is utilized to bring the cam lever 136 into contact with the bulbous portion 135 on arm 134 to produce rocking of shaft 133. The pin 137 in contact with the depending lip 138 of the depressed lever and in alignment with the shoulder portion 139 will be moved in an upward direction by the rocking of shaft 133 to thus return the depressed lever to its inoperative, or up position. The operations above described will be re-

peated for each cycle of the machine, each depressed selecting lever being returned after it has accomplished its selecting function. If the selecting mechanism has been entirely cleared and the machine is again operated, the records will be played in order, unless the operator in advance or during playing of a record registers his selection by depressing the selecting levers 125.

The present machine may be operated through coin controlled mechanism such as disclosed in the copending application of Carl G. Freborg and Charles A. Freborg previously identified. When the coin is dropped into the machine the circuit to the motor 11 is closed and said motor through the flexible drive shaft 12 and intermediate connecting means will cause rotation of the operating shaft 64. Said shaft controls the reciprocating movement of the carriage 98 and also the raising and lowering of the turntable 40. Assuming that the carriage 98 was in its position of rest, as shown in Figure 2, when the coin was dropped into the machine, rotation of shaft 64 will cause movement of the carriage toward the right and actuation of the selector to couple a particular record carrier to said carriage. Movement of the carriage then takes place toward the left until the record carrier is located over the turntable, whereupon the cam 67, by reason of the V-shaped slot therein will allow upward movement of the turntable to locate the record into contact with the sound reproducer 87. Rotation of the operating shaft 64 is now discontinued as the clutch is automatically thrown out and held in disconnected relation by the yoke 80. When the sound reproducer 87 reaches the center of the record and the playing of the same is completed the trip arm 92 will have been rotated sufficiently to release yoke 80 and allow connection of the clutch members to again rotate the operating shaft 64. The turntable is thus lowered, whereupon the operation ceases and the record carrier and carriage remain in their position of rest as in Figure 2.

When again actuated movement of the carriage is in that direction to produce movement of the rack 148 and rotation of the selector rod 106 and shaft 133 of the selecting mechanism. In the event the selecting mechanism has not been set the rack will have maximum movement and the records will be selected in rotation. However, setting of the selecting mechanism by depressing any one of the levers 125 will function to limit rotation of the selector rod and the record selected will correspond to the lever depressed. The shaft 133 having the pins 137 projecting radially therefrom performs a dual function. First of all, rotation of this shaft is limited by the particular lever depressed which will determine the extent of rotation of the selector rod so that the record corresponding thereto is selected by one of the fingers 110 through contact with its resilient strip 118. Secondly, shaft 133 has bodily movement in a vertical plane which occurs immediately before the record to be played is picked up by the turntable in order to clear the selecting mechanism insofar as the selecting lever is concerned corresponding to the record being played. By forcing said lever into its up position the return motion of the carriage 98 will revolve the shaft 133 until rotation thereof is limited, this time by contact of a pin 137 with the next depressed lever, whereupon the record carrier corresponding thereto will be subsequently coupled to the carriage.

The present selecting mechanism makes it possible to select one or a plurality of records in ad-

vance or said selection may be made during the playing of a record. The mechanism is extremely simple in construction, embodying relatively few parts, and therefore does not readily get out of order. Also the mechanism has particular application to the type of phonograph disclosed where- in the record carriers are reciprocated from their position of rest to a position over the turntable and lowered, since the reciprocating movement of the carriage is utilized to rotate the selector rod, the extent of rotation of which is governed by the selecting levers.

This application is a continuation-in-part of my copending application, Serial No. 161,906, filed September 1, 1937 and entitled Multiple record phonograph.

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. In an automatic phonograph, in combination, means for supporting a plurality of records to be played, means for moving any single record into playing position, a movable member having a plurality of positions corresponding to said records and controlling in each position said last named means to cause it to move the corresponding record, means for moving said member through a plurality of its positions, a shaft member connected for simultaneous movement with said movable member, projections on said shaft member corresponding to said records located in relative angular relation and in longitudinally spaced relation, a manually displaceable selecting member corresponding to each projection and adapted to cooperate with its respective projection on said shaft member, said selecting members when displaced being adapted to engage their corresponding projections and to locate the shaft and the movable member in corresponding position, and means for thereafter moving said shaft member to control the return of the engaging displaced member to initial position.

2. In an automatic phonograph, in combination, means for supporting in stacked relation a plurality of records to be played, means for moving any of said records into playing position, a movable member having a plurality of positions effective at different altitudes corresponding to said records and controlling in each position said last mentioned means to cause it to move the corresponding record, means for moving said member through a plurality of its positions, a shaft member having projections corresponding to said records located in spaced relation and in relative angular relation, means operatively connecting said movable member and shaft member whereby each effective position of the movable member corresponds to an effective position of one of the projections on the shaft member, a plurality of manually displaceable selecting members corresponding to said projections and adapted, when displaced, to arrest the shaft by locating a stop in the path of its particular projection, said movable member being also arrested in a corresponding position which renders said movable member effective at a definite altitude, and means effective after said arrestment for moving said shaft member and thereby controlling the return of the arresting displaced member to initial position.

3. In an automatic phonograph, the combination with a plurality of movable record holding carriers, of transfer means having coupling members for coupling the carriers thereto and operating to move a coupled carrier to and from a playing position, movable selector means for selectively actuating the coupling members one at a time to couple the respective carriers to said transfer means, a reciprocable member having movement with the transfer means and operative during return movement only of each record carrier to move the selector, a shaft member operatively connected with the selector means and having angularly spaced stop pins longitudinally thereof, and a plurality of movable selecting levers aligned with said stop pins respectively and having operative and inoperative position with respect thereto, said movable levers being disposed in a plane substantially parallel with the axis of the shaft member and each lever when operatively positioned locating an abutment in the path of its stop pin to limit rotation of said shaft member and thus movement of said selector means, whereby the selector means controls the playing of the records according to the selections as indicated by the operatively positioned levers.

4. In an automatic phonograph, the combination with a plurality of movable record holding carriers, a carriage having coupling members for coupling the carriers thereto and operating to move a coupled carrier to and from a playing position, rotatable selector means for selectively actuating the coupling members one at a time to couple the respective carriers to said carriage, an operating shaft for said carriage, means actuated by the shaft for rotating said selector means during return movement only of each record carrier, a shaft member operatively connected with the selector means, stop pins spirally disposed about the axis of said shaft member, and a plurality of pivotal selecting levers aligned with the stop pins respectively and having an operative and inoperative position with respect thereto, said pivotal levers being disposed in a plane substantially parallel with the axis of the shaft member and each lever when operatively positioned locating an abutment in the path of its stop pin to limit rotation of said shaft member and thus the selector, whereby the selector means controls the playing of the records according to the selections as indicated by the operatively positioned levers.

5. In an automatic phonograph, in combination, means for supporting a plurality of records to be played, means effective to control the playing of each individual record including a movable selector member having a plurality of positions, each position corresponding to a certain record to be played, means for moving said selector member through said plurality of positions, a shaft member having projections corresponding to said records located in spaced relation and in relative angular relation, a plurality of individual displaceable selecting members in associated relation with the projections respectively and adapted when displaced to locate the selector member in a corresponding one of its positions, and means for moving said shaft member after said locating to effect return of the locating selecting member to initial position.

6. In an automatic phonograph, in combination, means for supporting a plurality of records to be played, means effective to control the playing of each individual record including a mov-

able selector member having a plurality of positions, each position corresponding to a certain record to be played, means for moving said selector member through said plurality of positions, a shaft member operatively connected with said selector member, a plurality of stop pins spirally disposed about the axis of said shaft member, and pivotal selecting levers aligned with the stop pins respectively and having an operative and inoperative position with respect thereto, each lever when operatively positioned locating an abutment in the path of its stop pin to limit rotation of said shaft member and thus movement of said selector member, whereby the selector member will cause the records to be played according to the selections as indicated by the operatively positioned levers, supporting means for the shaft member permitting limited bodily movement thereof, and cam means for effecting bodily movement of said shaft member to return the operatively positioned lever corresponding to the record selected to its initial position.

7. In an automatic phonograph, the combination with a rotatable selector for selectively coupling record carriers to transfer means for movement to and from a playing position, of mechanism for predetermining the playing of a plurality of records including a shaft member operatively connected with said selector, spirally disposed stop pins on said shaft member, and a plurality of selecting levers aligned with the stop pins respectively and having an operative and inoperative position with respect thereto, each lever indicating a selection when operatively positioned and locating an abutment in the path of its stop pin, a reciprocable member for rotating the selector and thus the shaft member, means connecting said reciprocable member therewith including pawl and ratchet mechanism operating to impart rotation during movement of the reciprocable member in one direction only, and a friction coupling permitting the reciprocable member to move its full distance in said direction even after the selector is stopped by reason of a stop pin on the shaft member engaging an operatively positioned lever.

8. In an automatic phonograph, the combination with a plurality of movable record holding carriers, of a carriage having coupling members for coupling the carriers thereto and operating to move a coupled carrier to and from a playing position, an operating shaft for the carriage, a rotatable selector for selectively actuating the coupling members one at a time to couple the respective carriers to said carriage, mechanism for predetermining the playing of a plurality of records including a shaft member operatively connected with the selector, spirally disposed stop pins on the shaft member, and a plurality

of horizontally disposed selecting levers aligned with the stop pins respectively and having an operative and inoperative position with respect thereto, each lever indicating a selection when operatively positioned and locating an abutment in the path of its stop pin, a reciprocable member actuated by said operating shaft and connecting with the selector for rotating the selector and thus the shaft member, and a friction coupling in the connections from the reciprocable member to the selector for permitting the member to move its full extent even after the selector is stopped by reason of a stop pin on the shaft member engaging an operatively positioned lever.

9. In an automatic phonograph, in combination, means for supporting a plurality of records to be played, means effective to control the playing of each individual record including a movable selector having a plurality of positions, each position corresponding to a certain record to be played, a shaft member operatively connected with the movable selector and having rotation with the movement of said selector, a plurality of angularly spaced stop pins on the shaft member in longitudinally spaced relation, and selecting levers aligned with the stop pins respectively and having an operative and inoperative position with respect thereto, each lever indicating a selection when operatively positioned and locating an abutment in the path of its stop pin to limit rotation of the shaft member and which determines the extent of movement of the selector, and drive means for moving said selector through said plurality of positions during a portion of each cycle in the operations of the phonograph, said drive means including a friction coupling permitting the drive means to continue in operation after the selector is stopped by reason of a stop pin on the shaft member engaging an operatively positioned lever.

10. In an automatic phonograph, in combination, means for supporting a plurality of records in stacked relation, means for moving a definite record, selector means for rendering said moving means effective at various heights to control the record to be moved, a shaft including a plurality of projections located in spaced relation and in relative angular relation, a plurality of manually displaceable members adapted to be moved manually into cooperative relation with an individual projection to effect the arrestment of the shaft in a corresponding position, means operatively connecting said shaft to said selector means whereby the corresponding record is selected by said arrestment, and means for moving said shaft after its arrestment to effect return of the arresting displaceable member to initial position.

CARL G. FREBORG.