

Jan. 14, 1936.

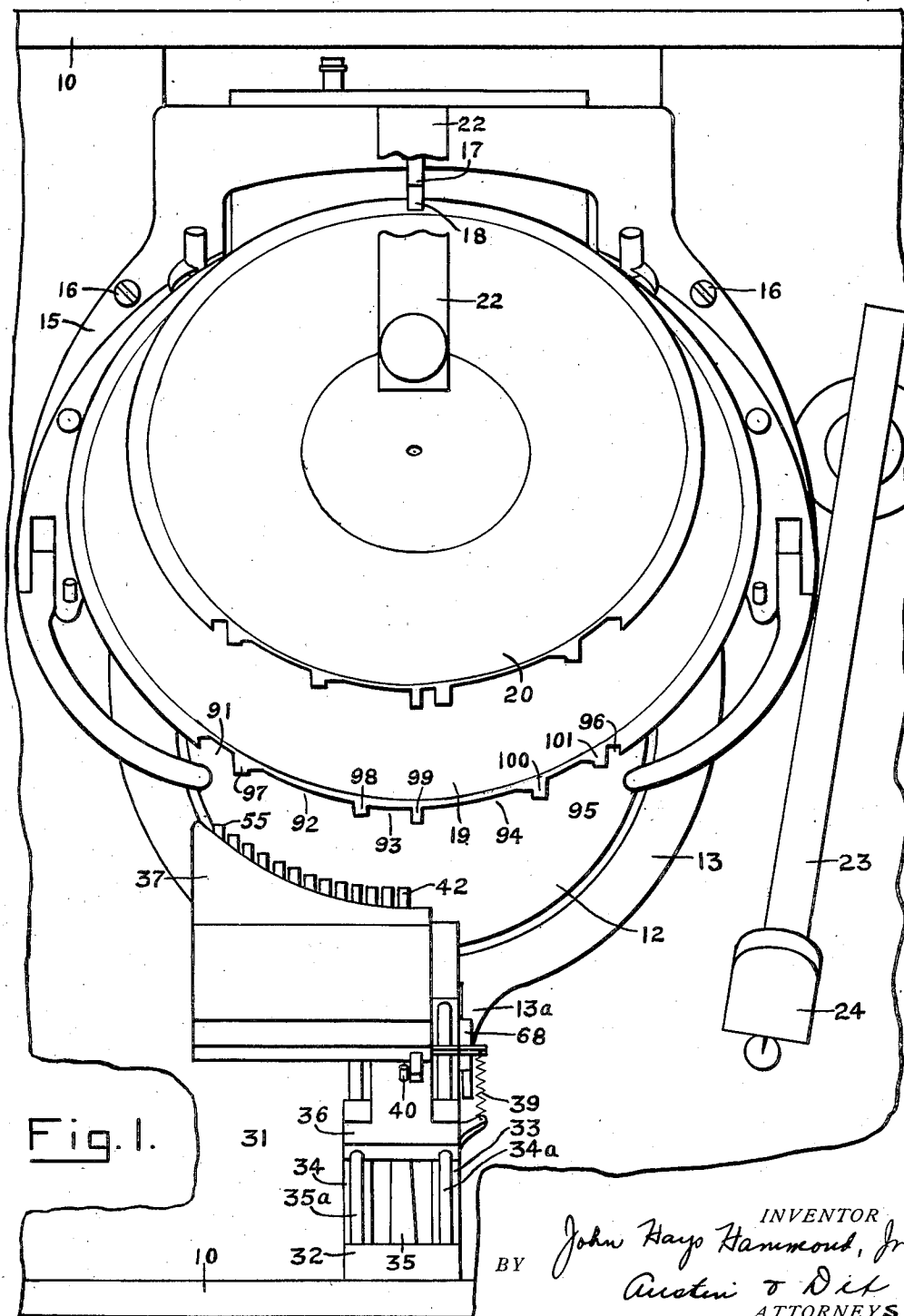
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2,027,427

REPEATING PHONOGRAPH

Filed Aug. 19, 1933

5 Sheets-Sheet 1



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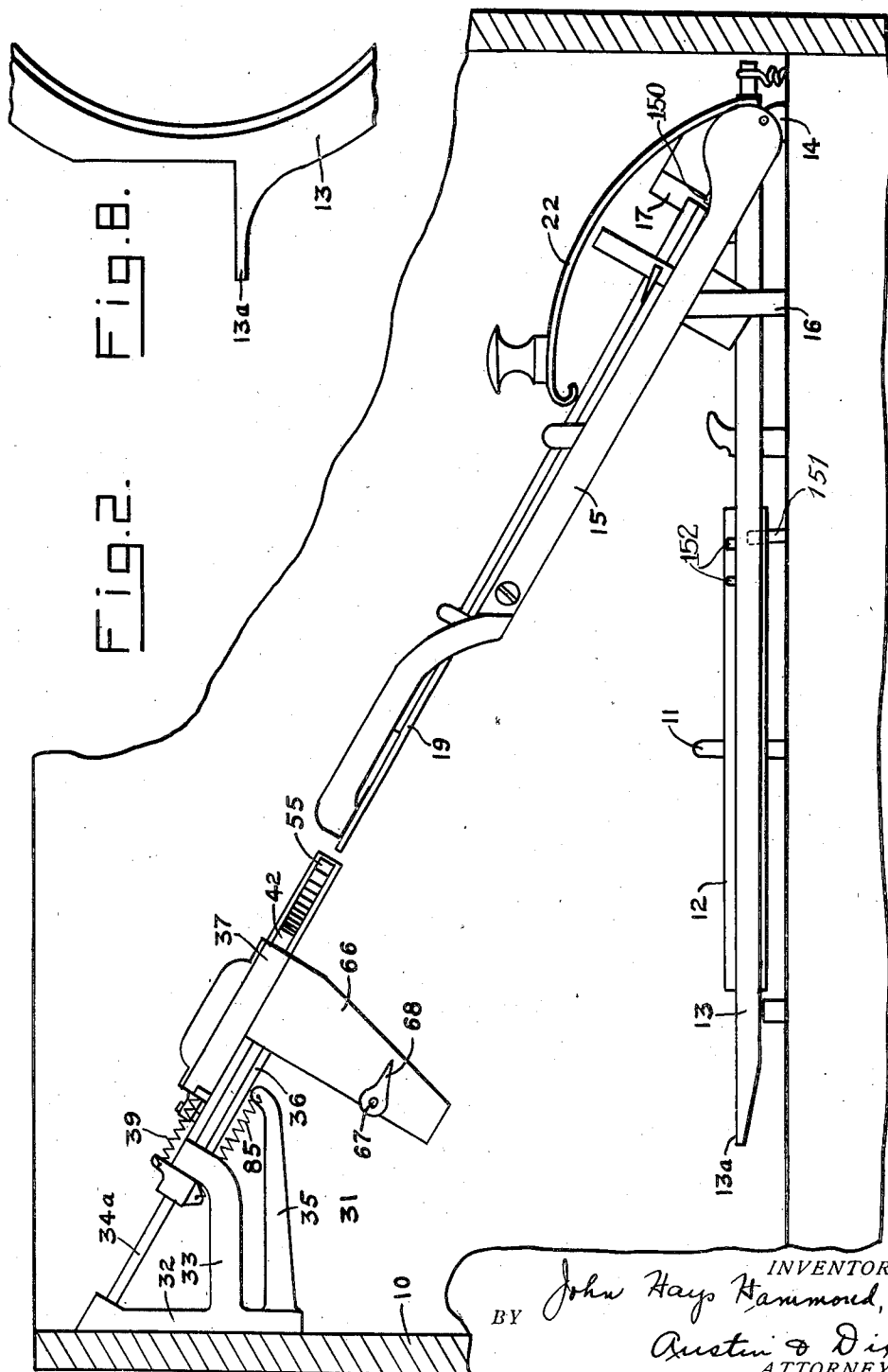
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REPEATING PHONOGRAPH

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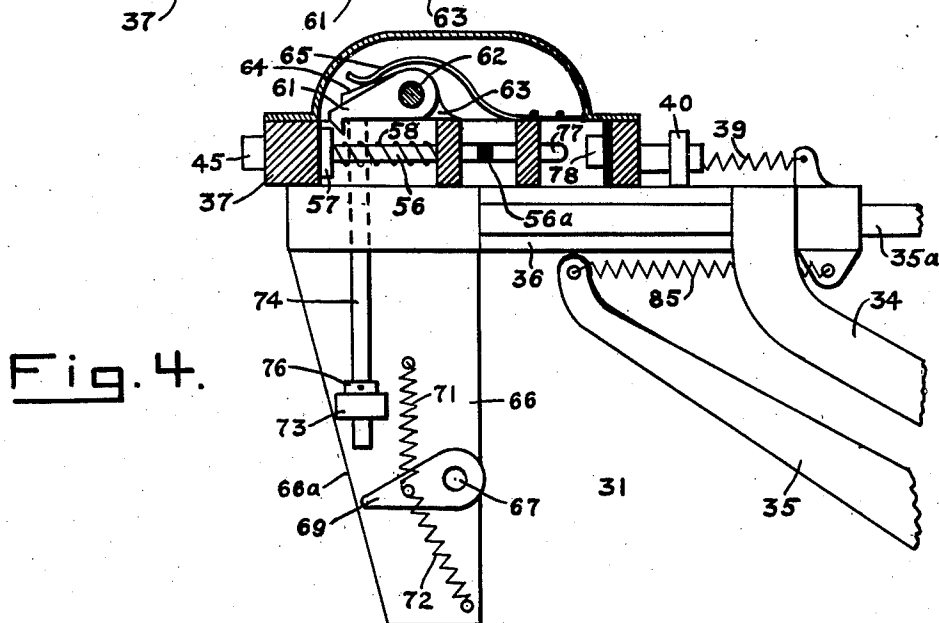
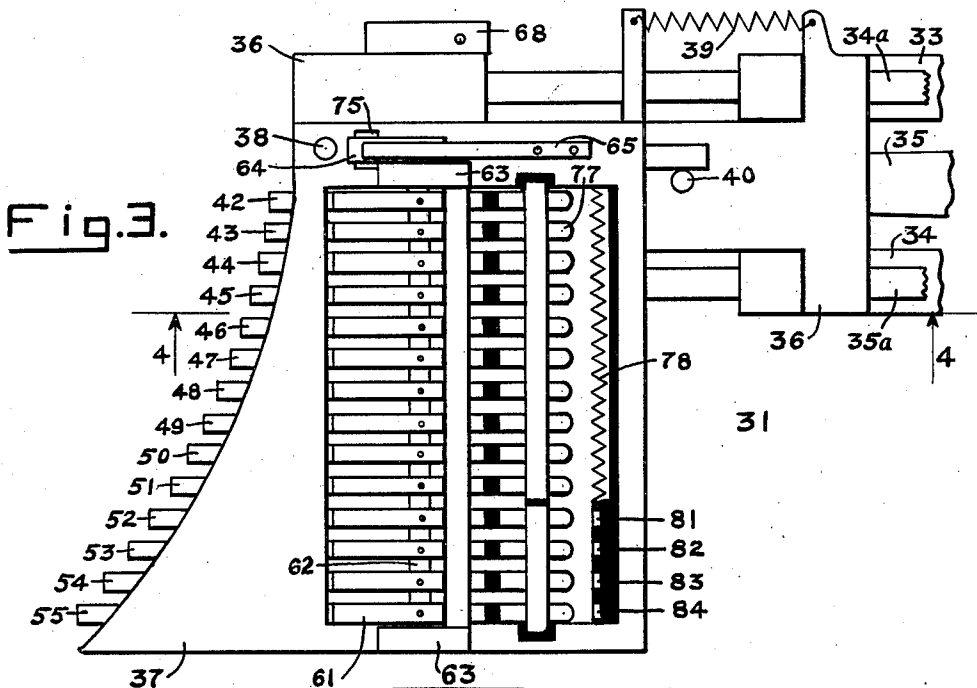
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REPEATING PHONOGRAPH

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5 Sheets-Sheet 3



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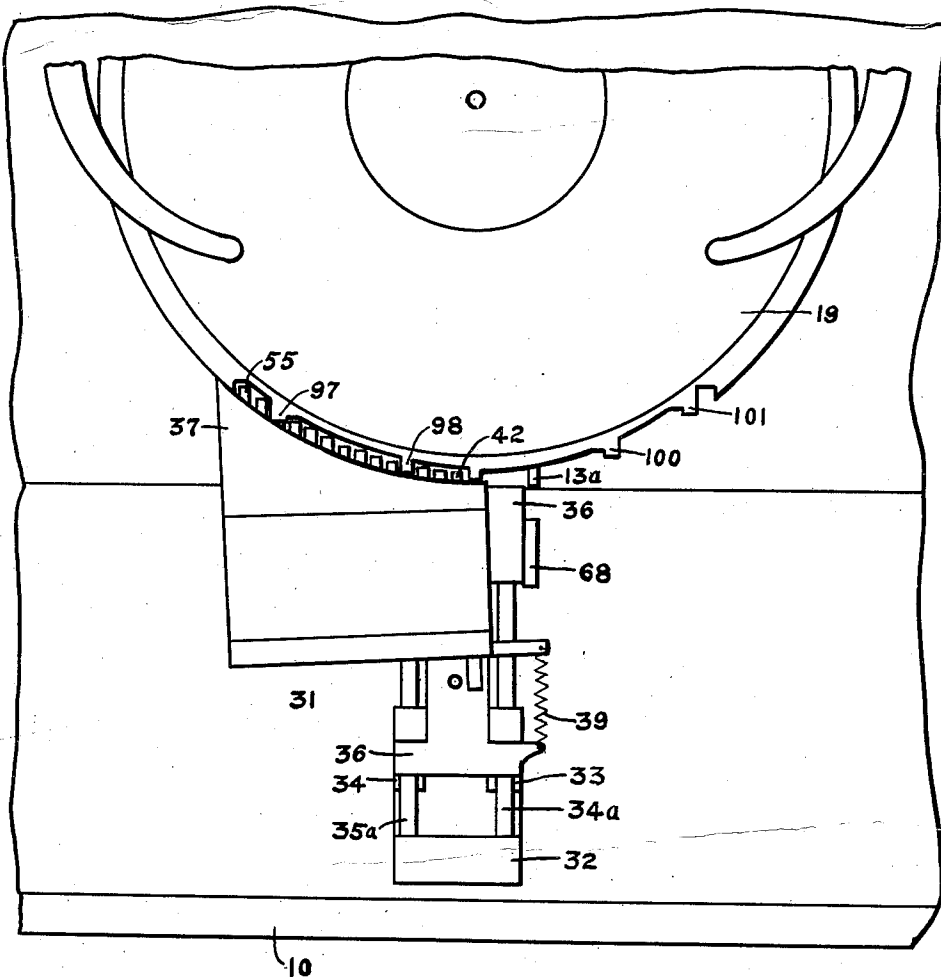
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5 Sheets-Sheet 4

Fig. 5.



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REPEATING PHONOGRAPH

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5 Sheets-Sheet 5

Fig. 6.

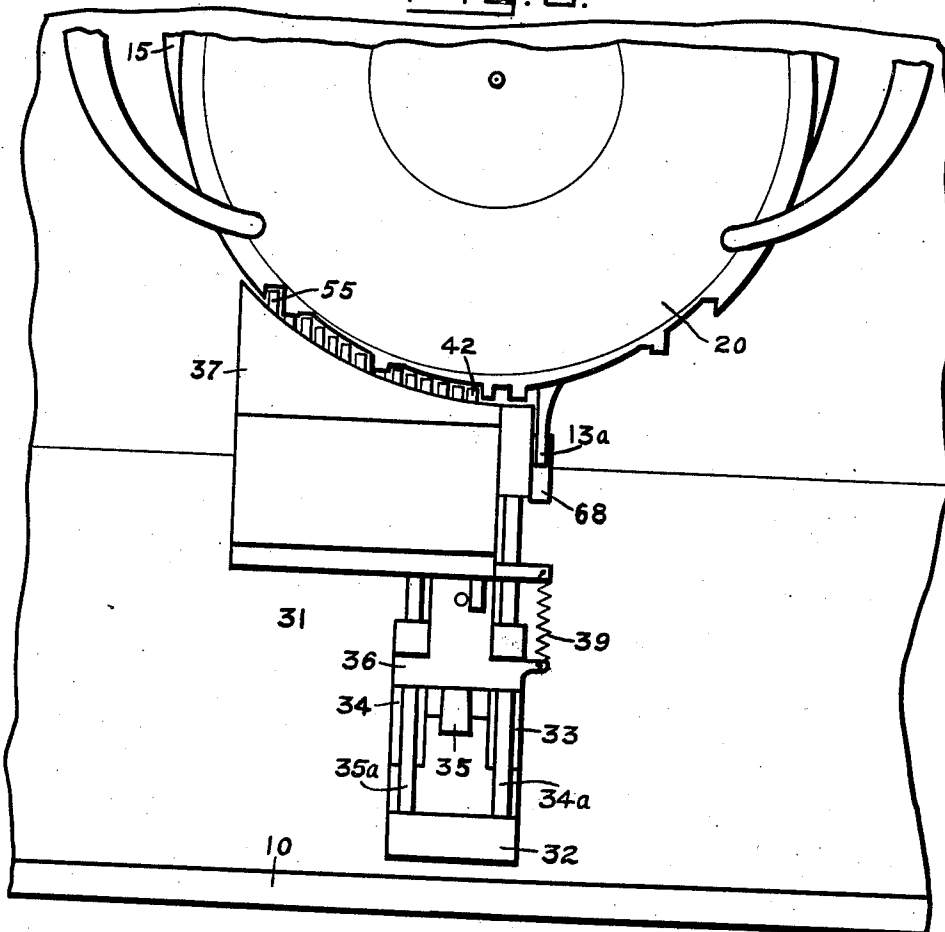
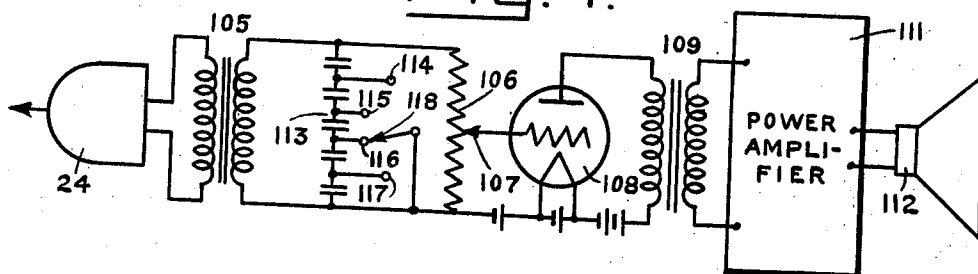


Fig. 7.



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REPEATING PHONOGRAPH

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16 Claims. (Cl. 274-10)

This invention relates to sound reproducing means and more particularly to means for controlling the sound reproduction of devices for automatically reproducing a plurality of musical selections in succession.

The invention relates particularly to means in connection with a repeating phonograph provided with an amplifier, for automatically setting the controls of the amplifier in accordance with the requirements of each record.

The invention provides means for accommodating the system to various sized records.

The invention also provides means for resetting the controls after each record has been played.

The invention further provides means for setting the controls independently for each side of the record.

The invention also consists in certain new and original features of construction and combinations of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, the mode of its operation and the manner of its organization may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Figure 1 is a partial plan view of a repeating phonograph embodying the present invention.

Fig. 2 is a side elevation of the mechanism shown in Figure 1.

Fig. 3 is an enlarged detail view of the automatic setting mechanism.

Fig. 4 is a section taken on line 4-4 of Fig. 3.

Fig. 5 is a partial plan view of a record in operative position with respect to the setting mechanism.

Fig. 6 is a partial plan view similar to Fig. 5 showing a small sized record in the operative position.

Fig. 7 illustrates diagrammatically one form of amplification system which may be used with the present invention and

Fig. 8 is a partial detail view of the lift ring.

Like reference characters denote like parts in the several figures of the drawings.

In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

Referring more particularly to Figs. 1-4, the

invention is shown as applied to a standard type of repeating phonograph mechanism adapted to successively remove disc records from a magazine and to place said discs in playing position. In general, this machine consists of a casing 10 in which is mounted a standard type of phonograph motor (not shown), driving a shaft 11 (Fig. 2) to which is attached a turntable 12. Surrounding the turntable 12 is a lift ring 13, which is pivoted to a bracket 14. A magazine 15 is also mounted on this bracket and is held at a fixed angle by supports 16. A tone arm 23 and pick-up 24 are adapted to cooperate with the record on the turntable 12. Records 19 and 20 which may, for example, be of different sizes, may be held in position in the magazine 15 by a spring 22.

Suitable standard and well known mechanism, not shown, is provided to raise the lift ring 13 into position to receive a record from the magazine and a cam-operated slide 150 is arranged to feed a record from the magazine into the lift ring. The record moves by gravity against centering pins 152 and the lift ring then carries the record to position on the turntable and the pick-up 24 moves into playing position. After the record has been played, but while it is still rotating, plunger rod 151 is moved into engagement with the underside of the record by the phonograph mechanism. The record is tilted by the movement of rod 151 until the center hole of the record is clear of the free end of driving shaft 11. Since turntable 12 is still rotating it acts to carry the tilted record laterally until it slides over the edge of the turntable into a suitably placed record receptacle.

The above described mechanism is of well known commercial form such as is embodied in the automatic "Victrola" and "Electrola" and constitutes no part of the present invention. Hence, it will not be described in detail herein. A complete description of the mechanism and operation of this type of automatic phonograph is given in British Patent No. 338,508 to The Gramophone Company Limited (specification complete accepted November 12, 1930).

In accordance with the present invention, the back of the magazine 15 may be provided with a projection 17, engaging slots 18 cut in the records 19 and 20. The lift ring 13 is provided with a projection 13a for a purpose to be described.

For accomplishing the automatic adjusting of the amplifier controls, a setting mechanism 31 is provided. This mechanism consists of a base 32 provided with three brackets 33, 34 and 35 (Figs. 1-2). Supported by the base 32 and the

brackets 33 and 34 are two rods 34a and 35a. Slidably mounted on these rods is a base plate 36 (Figs. 1-4) to which is pivoted a frame 37 by means of a pin 38. The frame 37 is held in operative position with respect to the base plate 36 by means of a spring 39 and stop 40.

Slidably mounted in the frame 37 are a plurality of fingers 42-55. These fingers are attached to rods 56 which are provided with collars 57. Surrounding the rods 56 are springs 58 which tend to hold the fingers in extended position. Mounted above the rods 56 are a plurality of pawls 61, which are secured to a shaft 62 having bearings in brackets 63, carried by the frame 37. Secured to one end of the shaft 62 is an arm 64 with which a spring 65 cooperates to hold pawls 61 in position to engage collars 57 when said collars are moved into alignment therewith.

The base plate 36 is provided with a downward extension 66 having an inclined face 66a and carrying a rotatable shaft 67. Pinned to one side of this shaft is an arm 68 (Fig. 2), and to the other side a second arm 69 (Fig. 4), which is normally held in a central position by means of two springs 71 and 72. Slidably mounted in the base plate 36 and in a bracket 73, which may be attached to the extension 66, is a rod 74, the upper end of which passes through a slot 75 in the frame 37 (Fig. 3), and engages the under-surface of the arm 64. A collar 76 is pinned to the rod 74 to prevent it from slipping through the bracket 73.

Attached to, but insulated from, the rods 56, as by insulation 56a, are a plurality of contacts 77, which at suitable times are adapted to engage either a resistance 78 or contacts 81-84. The base plate 36 is normally held in the position with respect to rods 34a and 35a shown in Fig. 4 by means of a spring 85, one end of which is attached to this base plate and the other to the end of the bracket 35.

In this invention, the records are provided with suitable notches and projections which cooperate with the fingers 42-55. Thus for example, the record 19 is provided with six notches 91-96 and five projections 97-101, and the record 20 is provided with a similar number of notches and projections.

When the starting switch (not shown) is closed, the turntable 12 is started rotating, the lift ring 13 moves up into engagement with the magazine 15 and at the same time the record 19 is moved out of this magazine by slide 150 until it reaches the position shown in Fig. 5 where it is held by the slide.

While moving into this position, the record encounters the end of the frame 37, thus rotating this frame about the pin 38, through a small angle to cause the fingers 42-55 to register with the periphery of the record. At the same time, the groups of fingers 42-44, 46-52 and 54-55 slip into the notches 93, 92 and 91, respectively, while the projections 98 and 97 engage the fingers 45 and 53, causing them to be moved to the right, as seen in Figs. 3 and 4, sufficiently for the corresponding contacts 77 to engage the resistance 78 and the contact 82, respectively. The corresponding pawls 61 will snap over the collars 57, thus holding these contacts 77 in operating position.

As the record 19, under control of slide 150, continues to move out of the magazine, it will push the frame 37 together with the base 36 along the rods 34a and 35a. After it has reached

the proper position the record 19 will be fed onto lift ring 13 and will be lowered by means of the lift ring onto the turntable 12 by means of the standard phonograph mechanism, and as it does so, the projection 99 of the record 19 will slide along the inclined face 66a of the extension 66 of the base 36, thus gradually allowing this base, together with the frame 37, to be moved back into its original position.

As the lift ring 13 moves down with the record, the projection 13a engages the arm 68, rotating it in a clockwise direction, as seen in Fig. 2, until it slips by this arm which will be returned to its initial position under the action of the springs 71 and 72. As soon as the record 19 is placed on the turn table 12 it will start rotating with this turn table, and the tone arm 23 will be automatically rotated in a clockwise direction as seen in Fig. 1, until the pick up device 24 is placed upon the record in a well known and standard manner.

The energy from the pick-up device 24 may be amplified by any suitable amplifier; such for example, as that shown in Fig. 7. In this amplifier the pick-up device 24 is connected through a transformer 105 to a potentiometer 106. The adjustable contact 107 of this potentiometer is connected in the input circuit of a space discharge amplifier 108, the output of which passes through a transformer 109 to a power amplifier 111, the output circuit of which is connected to a loud speaker 112. Across the potentiometer 106 is a bank of condensers 113, the intermediate points of which are connected to a plurality of contacts 114, 115, 116 and 117. These contacts are engaged by a contact arm 118.

The controls of the amplifier may be adjusted by means of the setting mechanism 31, thus for example, the resistance 78 and the contacts 77, cooperating therewith, may correspond to the potentiometer 106, and the adjustable contact 107 respectively, so that when the contact 77, corresponding to the finger 45, engages the resistance 78, it will permit a certain amount of the energy from the pick-up device 24 to be fed to the amplifier 108. The contacts 81-84 may correspond to the contacts 114-117, and the cooperating contacts 77 to the contact arm 118; thus for example, when the contact 82 is engaged by the cooperating contact 77, this would correspond to the position of the arm 118 on the contact 115, thus causing a predetermined capacity to be placed across the potentiometer 106 for controlling the quality of the sound produced by the loud speaker 112. It is to be understood that suitable connections to the contacts 77, resistance 78 and contacts 81-84 may be made in any convenient manner; also that the amplifying system and the various details thereof are of standard form. Only so much, thereof, has been shown as is necessary to an understanding of the present invention.

When a record is moved into the position shown in Fig. 5, the controls of the amplifier will be set at predetermined positions, depending upon the locations of the projections on the record. If this record is reversed in position for playing on the opposite side, it will be evident that the notches 94, 95, 96 and the projections 100 and 101 will actuate the fingers 42-55. In this case, however, different fingers will be operated, the projection 100 causing the operation of the finger 49, and the projection 101, the operation of the finger 54, thus setting the controls of the amplifier in a proper position for reproducing

that particular record. In this way, the controls of the amplifier will be set for each individual side of the record.

After the record 19 has been played, it will be discarded into the discharge compartment by operation of plunger rod 151, and the lift ring 13 will be moved up in order to take the next record. As it does so, the projection 13a engages the arm 68, rotating it in a counter-clockwise direction as seen in Fig. 2. This causes rotation of the arm 69 in a clockwise direction as seen in Fig. 4, which continues until it engages the end of the rod 74, thus moving this rod upward and causing the arm 64, together with the shaft 62 and pawls 61, to be rotated in a clockwise direction, thus lifting these pawls out of engagement with the collars 57 which, together with the corresponding fingers 45 and 53, and the contacts 77, will be moved to the left as seen in Fig. 4, under the action of the springs 58. It is thus seen that as the lift ring 13 moves up into position for picking up a record, it will automatically reset the setting mechanism 31 so that it is in condition for a new setting by the next record.

The record 20 now be fed out of the magazine into the position shown in Fig. 6. As it does so the fingers of the setting mechanism 31 will fit into the notches in this record. The projections of this record will then cause the corresponding fingers to be moved in, thus setting the controls of the amplifier in a predetermined manner for this particular record. But, in the case of the small record 20, the frame 37 will not be moved from its initial position, as it is so located that the record 20 will just come in contact with this frame without changing its position.

From the foregoing it will be seen that as each record comes into position on the lift ring it will automatically set the controls of the amplifier in accordance with the location of one series of projections on this record, the mechanism automatically taking care of different sized records. When these records are reversed, the amplifier controls will then be set by the other series of projections, so that there will be independent amplifier settings for each side of the record. The projection 17 engages slots 18 in the records to hold the records in proper position with respect to the setting mechanisms.

Although only a few of the various forms in which this invention may be embodied have been shown herein, it is to be understood that the invention is not limited to any specific construction, but may be embodied in various forms without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. In combination, a repeating phonograph adapted to successively reproduce a plurality of records and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph and means controlled by each record and responsive to the positioning of said record for playing, to set said adjusting means in accordance with the requirements of that particular record.

2. In combination, a repeating phonograph adapted to successively reproduce a plurality of records and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph and means controlled by each record

prior to playing thereof, and responsive to the positioning of said record for playing, to set said adjusting means in accordance with the requirements of that particular record.

3. In combination, a repeating phonograph adapted to successively reproduce a plurality of records and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph and means controlled by each record and responsive to the positioning of said record for playing, to set said adjusting means in accordance with the requirements of that particular record and means to restore said adjusting means after the playing of each record.

4. In combination, a repeating phonograph adapted to successively play a plurality of records and having means to successively remove said records from a magazine and place the record in playing position, sound reproducing means adapted to be actuated by the record in playing position, means to adjust the sound reproducing characteristics thereof and means actuated by each record as it is moved from said magazine into playing position, to set said adjusting means in accordance with the requirements of the particular record.

5. In combination, a repeating phonograph adapted to successively play a plurality of records and having means to successively remove said records from a magazine and place the records in playing position, means to adjust the sound reproducing characteristics thereof and setting means to set said adjusting means, said setting means being adapted to be actuated by the periphery of each record as it is moved from said magazine into playing position, to set said adjusting means in accordance with the requirements of the particular record.

6. In combination, a repeating phonograph adapted to successively play a plurality of records and having means to successively remove said records from a magazine and place the record in playing position, sound reproducing means adapted to be actuated by the record in playing position, means to adjust the sound reproducing characteristics thereof and means actuated by each record as it is moved from said magazine into playing position, to set said adjusting means in accordance with the requirements of the particular record and means actuated upon removal of each record from the playing position to restore said adjusting means to condition for resetting by the next successive record.

7. In combination, a set of records having individual control setting means, a repeating phonograph adapted to successively remove said records from a magazine and to place the records in playing position, sound reproducing means adapted to be actuated by the record in playing position, a control means adapted to adjust the sound reproducing characteristics of said sound reproducing means over a range of values, and means operated by the mechanism of said phonograph prior to playing of each record, to bring the individual control setting means of said record into actuating relation with said control means to adjust said reproducing characteristics to the individual value for said record.

8. In combination, a set of record tablets having individual marginal control setting means, a repeating phonograph adapted to successively remove said records from a magazine to place the records in playing position, sound reproducing means adapted to be actuated by the record

in playing position, a control means adapted to adjust the sound reproducing characteristics of said sound reproducing means, and means whereby said control setting means actuates said control means prior to playing of each record.

9. In combination, a set of record tablets having individual peripheral indentations and projections, a repeating phonograph adapted to successively remove said records from a magazine and to place the records in playing position, sound reproducing means adapted to be actuated by the record in playing position, a control means adapted to adjust the sound reproducing characteristics of said sound reproducing means, and means whereby said indentations and projections actuate said control means prior to the playing of each record.

10. In combination, a repeating phonograph adapted to successively remove records from a magazine and to reproduce the same, means to adjust the sound reproducing characteristics of said phonograph, a setting means for said adjusting means comprising a set of fingers adapted to be actuated by the individual records and mounted in the path of movement of said record from said magazine and a yieldable mounting for said setting means whereby said setting means is moved as a unit by the record after the fingers are actuated, whereby to accommodate records of various sizes.

11. In combination, a repeating phonograph adapted to successively remove records from a magazine and to reproduce the same, means to adjust the sound reproducing characteristics of said phonograph, a setting means for said adjusting means comprising a set of fingers adapted to be actuated by the individual records and mounted in the path of movement of said record from said magazine and means to reset said fingers when said record is removed from playing position.

12. In combination, a stack of record tablets, each having marginal projections adapted to engage a setting means, means to align said records with said projections in register with said setting means, certain of said projections corresponding to setting requirements for the selection on one side of said record and others of said projections corresponding to setting requirements of the selection on the other side thereof, a repeating phonograph adapted to successively play records from said stack, means to adjust the sound reproducing characteristics of said phonograph, and setting means adapted to be

actuated by said projections for setting said adjusting means in accordance with the requirements of each record.

13. In combination, a repeating phonograph adapted to successively reproduce a plurality of different sized records and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph, and means controlled by each record and responsive to the positioning of said record for playing, to set said adjusting means in accordance with the size and requirements of that particular record.

14. In combination, a repeating phonograph adapted to successively reproduce a plurality of different sized records and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph, setting means adapted to preset said adjusting means, said setting means being adapted to peripherally engage each record as it is moved into playing position, and means supporting said setting means for pivotal and longitudinal movement, whereby said setting means is adapted to register with the peripheries of records of various sizes.

15. In combination, a repeating phonograph adapted to successively reproduce a plurality of records having separate selections recorded on both sides thereof and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph, and means controlled by each record and responsive to the positioning of said record for playing, to set said adjusting means in accordance with the requirements of that particular selection which is being reproduced.

16. In combination, a repeating phonograph adapted to successively reproduce a plurality of records having separate selections recorded on both sides thereof and having means to successively place the records in playing position, means to adjust the sound reproducing characteristics of said phonograph, setting means adapted to preset said adjusting means, said setting means being adapted to peripherally engage each record as it is moved into playing position, and means positioning each record whereby the portion of its periphery engaging the setting means is determined in accordance with the side of the record to be played.

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