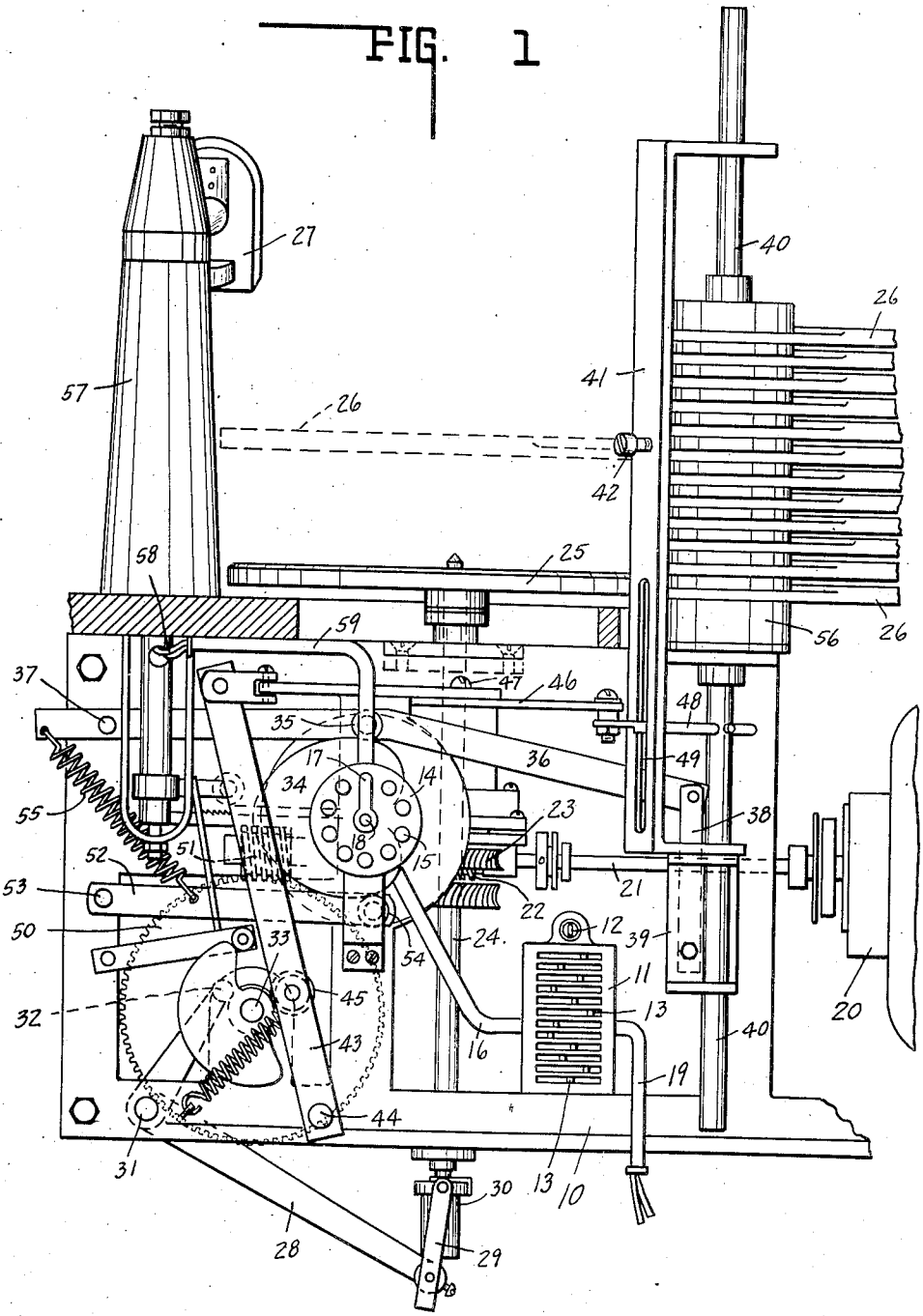
Nov. 19, 1940. P. U. LANNERD 2,221,977

VOLUME CONTROL FOR PHONOGRAPHS

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FIG. 1



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VOLUME CONTROL FOR PHONOGRAPHS

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FIG. 2

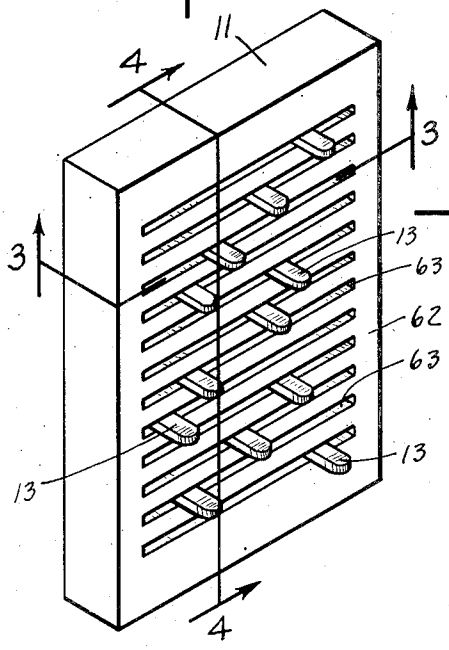


FIG. 4

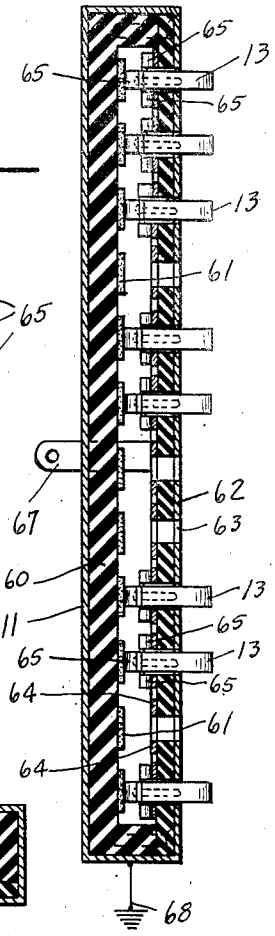


FIG. 5

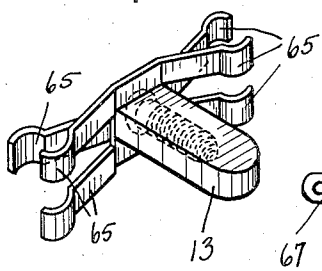


FIG. 3

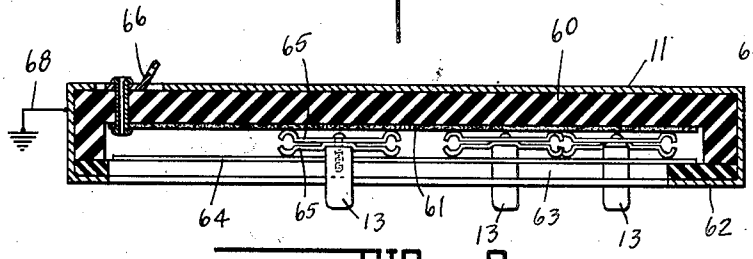
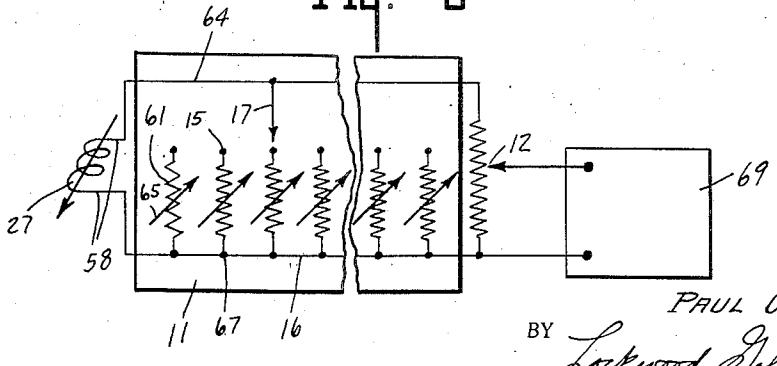


FIG. 6



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Patented Nov. 19, 1940 2,221,977

UNITED STATES PATENT OFFICE

2,221,977

VOLUME CONTROL FOR PHONOGRAPHS

Paul U. Lannerd, North Tonawanda, N. Y., assignor to The Rudolph Wurlitzer Company, Cincinnati, Ohio, a corporation

Application June 19, 1939, Serial No. 279,846

17 Claims. (Cl. 179—100.4)

This invention relates to a pre-set volume control, particularly applicable to automatic record changing electric phonographs. It is well known that phonograph records vary considerably in their volume of sound reproduction so that assuming that the instrument is equipped with the usual volume control, which is set to the desired volume of sound for one record to be played, the following records may reproduce a volume of sound which is loud, on the one hand, or too soft on the other hand. It is, therefore, desirable to have a pre-set automatic control which will change the degree of amplification by the instrument in accordance with the particular record played. By means of this invention it is possible to pre-set the volume of amplification and sound reproduction for each record, whereby all records will produce the desired sound volume.

This is accomplished by providing a volume control board on the machine having a series of rheostats, one for each record, with means associated therewith for manually adjusting the position thereof to effect the desired volume of sound, together with a suitable connection with the automatic record changing mechanism to throw the pre-set volume control for the particular record into the circuit when that record is played and switch the circuit to another pre-set volume control when the next record is played.

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

Fig. 1 is an elevation illustrating one application of the invention to an automatic phonograph. Fig. 2 is a perspective view of the pre-set volume control box. Fig. 3 is a section taken on the line 3—3 of Fig. 2. Fig. 4 is a section taken on the line 4—4 of Fig. 2. Fig. 5 is a perspective view of one of the adjustable contact members. Fig. 6 is a wiring diagram showing one type of installation.

In the drawings there is illustrated one application of the invention wherein it is applied to the character of automatic record changing device more specifically shown and described in Letters Patent No. 2,002,236, issued May 21, 1935, upon an application of Russell I. Wilcox.

In Fig. 1 there is shown a rear elevation of a portion of the above-mentioned record changer having a frame 10 upon which is mounted a volume control box 11 hereinafter more specifically described. Said box 11 supports a master manually adjustable volume control 12, together with a series of auxiliary manually adjustable volume controls 13. Each of the volume controls 13 is individually connected in circuit with the amplifier and a control switch plate 14 having a series of contacts 15, one for each record. Said contacts are connected by individual wires through the cable 16 with their respective volume controls 13. A circuit is closed through a selected contact 15 by the contact arm 17 mounted for rotation upon the shaft 18 to be selectively positioned in accordance with the particular record selected for playing. The several volume controls are connected by the cable 19 with the amplifier and loud speaker.

By means of this arrangement, upon selection of a record through rotation of shaft 18 a corresponding pre-set volume control member 13 is placed in the circuit from the reproducer to the speaker and amplifier. This occurs in respect to each individual record of pre-determined volume of sound amplification.

In the record changer device as described in the above-mentioned Letters Patent, a portion of which is shown in Fig. 1, there is provided a driving motor 20 which drives a shaft 21 having a worm 22 meshing with a worm gear 23 slidably keyed upon the turntable shaft 24. Said shaft drives the turntable 25 and causes it to move upwardly so as to pass through the selected record tray indicated at 26, until the record is brought into engagement with the needle depending from the reproducer 27.

The elevation of the turntable is accomplished by a bell crank lever 28 having one end connected by a link 29 to an end thrust bearing 30 in which the lower end of the shaft 24 is seated and supported. The bell crank lever 28 is pivoted to the frame 10 at 31 and is provided with a pin 32 on its opposite end adapted to be actuated by a cam driven by the cam shaft 33 for causing the raising and lowering of the turntable in timed relation to the swinging of the selected record and the tray 26 from an inoperative position to a position over the turntable, as shown in dotted lines.

A record, together with its supporting tray 26, is selected by rotation of the shaft 18 through suitable manually or electrically actuated selecting mechanism, shaft 18 rotating a heart-shaped cam 34 to a predetermined position applicable to the particular record and tray. Engaged by the cam there is a roller 35 on a lever 36 which is pivoted to the frame 10 at 37. The free end of the lever is pivoted to a link 38 connected with an elevating bracket 39 slidably mounted on a vertical rod 40 mounted for rotation upon the frame 10. The elevated bracket 39 carries a selector bar 41 which is pivotally and slidably

mounted upon the rod 40 to move relative to the series of record trays 26. The selection of the record is accomplished by causing the heart-shaped cam 34 to position the bar 41 so that a screw 42 therein is brought into alignment with the projection of the selected record tray 26.

To swing the tray thereby selected in the position over the turntable there is provided an arm 43 pivoted to the frame 10 at 44. Said arm has an intermediate roller 45 engageable by a cam on the cam shaft 33. The upper or free end of the arm 43 has a universal connection with a link 46 which is adjustable longitudinally by a screw 47. The other end of the link 46 is pivoted to an arm 48 extending through a longitudinal slot 49 in the bar 41 and rigidly secured to the rod 40. Thus, through actuation of the shaft 33 in timed relation with the other cams thereon, the arm 43 causes the bar 41 to swing about the rod 40 and carry with it the selected record tray engaged by the screw 42. This movement is such that the selected record tray is caused to swing from its inoperative magazine position to the desired position over and concentrically with the turntable.

The cam shaft 33 is driven during the record changing action through a suitable clutch by a gear 50, which gear is continuously driven by a worm 51 on the drive shaft 21. There is also provided a counterbalance arm 52 pivoted to the frame at 53 and having a roller 54 engaging the heart-shaped cam 34 at the opposite side thereof from the roller 35 on the arm 36, counterbalancing pressure being applied through the medium of a spring 55.

The record trays are supported by a barrel 56 mounted upon the frame 10 and through which the rod 40 extends, the rod 40 being rotatable with respect thereto and serving as a pivotal connection for the individual record trays. The reproducer is supported by the usual tone arm suitably mounted upon a standard 57 for swinging movement over the record when raised by the turntable to playing position, said standard also serving as a conduit for the wires 58 extending through cable 59 to the amplifier and reproducer through the selected contacts 15 and volume control members carried by the box 11.

The box 11, shown in Figs. 2, 3 and 4, embodies an insulating lining 60 having strips of carbon coated sheet material 61 for providing a suitable resistance. The cover of the box 62 is formed with a plurality of horizontally-extending slots 63 through which the manually adjustable members 13 in the form of projections may be moved from one end of the slot to the other. Embedded transversely of the inner surface of the lid and spaced therefrom by suitable insulating material, there is a series of brass conducting strips 64, said strips being positioned one above and one below each of the slots 63. Each of the pre-selected volume control members 13 has secured on the inner end thereof, within the box, a series of spring contact members 65. One of said members is positioned to have both ends slidably contact the carbon strips 61 while oppositely-disposed ends slidably engage the brass contact strips 64 above and below the slots.

The carbon resistance strips 61 are individually connected through their respective contact members 66 with corresponding contacts 15 through the needle 16. The brass strips 64 are connected in parallel with a common connection 67. The box is covered with a thin metal sheet which is grounded at 68.

The circuit is illustrated in Fig. 6, wherein there is shown the amplifier 69, the master volume control 12 and the individual record volume controls comprising the resistance strips 61 and manually adjustable sliding contacts 65. The reproducer is indicated at 27 and the circuit wires 58 are indicated leading from the reproducer to the rotating contact arm 17 of the record changing device adapted to engage a selected one of the contacts 15 thereon, depending upon the record to be played. The common terminal for the contact strips 64 is indicated at 67, all of which is shown housed within the box 11.

In operation, the operator adjusts the master volume control 12 to give approximately the desired volume of sound reproduced by the phonograph. As each record is played, he further adjusts the volume of sound emanating from that particular record by adjusting the corresponding volume control 13. This is accomplished by sliding the contacts 65 to a position for increasing or decreasing the length of the resistance strip 61 through which the current may pass from the terminal 66 to the contact member 65. Having once adjusted the volume control for that particular record, a pre-determined sound volume will result whenever that record is played. The same applies to each of the records. As above described, this results through the switching of the circuit between the reproducer and the amplifier to one of the volume controls through movement of the contact arm 17 which is positioned by the heart-shaped cam 34 acting to move the record selecting bar 41 to an elevation in alignment with the corresponding record.

The invention claimed is:

1. The combination with a phonograph for playing a plurality of phonograph records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, means controlled by said device for connecting each control with its corresponding record when played, and means for manually adjusting each of said controls to establish a predetermined sound volume for each of said records.

2. The combination with a phonograph for playing a plurality of phonograph records including an automatic record changing device and sound reproducing and amplifying means, of a master volume control therefor common to all records played, a series of individual auxiliary volume controls in series with said master control and associated with each of said records respectively, means controlled by said device for connecting each auxiliary control with its corresponding record when played, and means for manually adjusting each of said controls to establish a predetermined sound volume for each record when played.

3. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, a plurality of circuits connecting the sound reproducing and amplifying means, each of said circuits passing through one of said volume controls, a control switch mechanically connected to said device for selectively closing one of said circuits when said device is actuated to move the record associated with said control into playing position, and means for mechanically adjusting each of said controls

to establish a predetermined sound volume therefor.

4. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, said device having a movable member positioned in accordance with the record to be played, of a series of manually adjustable volume control members for individually controlling the sound volume of one of said records, and means actuated by the movable member of the record changing device for making effective the volume control member associated with the corresponding record to be played.

5. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproduction and amplifying means, of a series of manually adjustable volume control members for individually controlling the sound volume of each record when played, means on said device automatically movable to a position in accordance with a particular record to be played and means interconnecting said movable member and volume control members to selectively place one of said volume control members in effect according to the record moved by said record changing device into playing position.

6. The combination with a phonograph for playing a plurality of records including an automatic record-changing device and sound reproducing and amplifying means, said device having a movable member positioned in accordance with the record to be played, of a switch provided with a plurality of electric contacts individually engageable by said member when positioned for the playing of a particular record, and a series of manually adjustable volume members each electrically connected with one of said contact members in series with the sound reproducing and amplifying means for individually controlling the sound volume of each record.

7. The combination with a phonograph for playing a plurality of phonograph records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, means on said device for closing a circuit from the reproducing to the amplifying means through one of said controls actuated upon the movement to present a predetermined record to playing position, and means for individually adjusting said controls for individually controlling the sound volume of each record.

8. A volume control device for an automatic record changing phonograph comprising a housing containing a series of resistance units corresponding in number to the records to be played by said phonograph, means for selectively closing the amplifier circuit of the phonograph through the resistance unit corresponding with the record being played, and manually operable means for varying the resistance of each of said units to control the sound volume of the particular record associated therewith.

9. A volume control device for an automatic record changing phonograph having a series of adjustable resistance units individually connected in circuit with the phonograph reproducer and amplifier, each unit comprising a resistance strip individually connected in the circuit and a corresponding oppositely disposed current conducing strip, a control member in sliding control with said strips and slidable therebetween to vary the effective length of the resistance strip, and means associated with said control member for manually sliding it between said strips for varying the sound volume of the record associated therewith.

10. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of volume control resistances, means for manually pre-setting said volume control resistances with respect to each record to be reproduced, and electrically controlled means actuated by said record changing device for rendering effective the pre-setting of said volume control resistances with respect to the record to be played.

11. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, and electrically controlled means actuated by said record changing device for rendering effective one of said individual volume controls in accordance with the record to be played.

12. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, and an electric switch selectively operable by said record changing device for automatically connecting said reproducer and amplifier means with one of said volume controls in accordance with the record to be played.

13. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, an electric circuit between said reproducing and amplifying means, and an electric switch actuated by said record changing device for connecting into said circuit one of said volume controls in accordance with the record to be played.

14. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, electrically controlled means actuated by said record changing device for rendering effective one of said individual volume controls in accordance with the record to be played, and means for manually adjusting each of said volume controls independently to establish a predetermined sound volume for its associated records.

15. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a volume control variable resistance, an electric circuit between said reproducing and amplifying means, means for manually and variably pre-setting said volume control resistance with respect to each record to be reproduced, and an electric switch actuated by said record changing device for connecting into said circuit said pre-set volume control resistance in accordance with the record to be played.

16. The combination with a phonograph for playing a plurality of records including an automatic record changing device and sound reproducing and amplifying means, of a series of individual volume controls associated with each of said records respectively, an electric circuit between said reproducing and amplifying means, an electric switch actuated by said record changing device for connecting into said circuit one of said volume controls in accordance with the record to be played, and means for manually adjusting each of said volume controls to establish a predetermined sound volume for its associated record.

17. The combination with a phonograph for playing a plurality of records, including an automatic record changing device having a manually controlled record selecting mechanism, and a sound reproducing and amplifying circuit therefor, of a series of individual volume controls associated with each of said records respectively, manual adjustments for varying the resistance in each of said controls independently of each other, and a switch mechanism actuated by said record selecting mechanism for interposing in said reproducing and amplifying circuit the volume control associated with the record selected.

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