

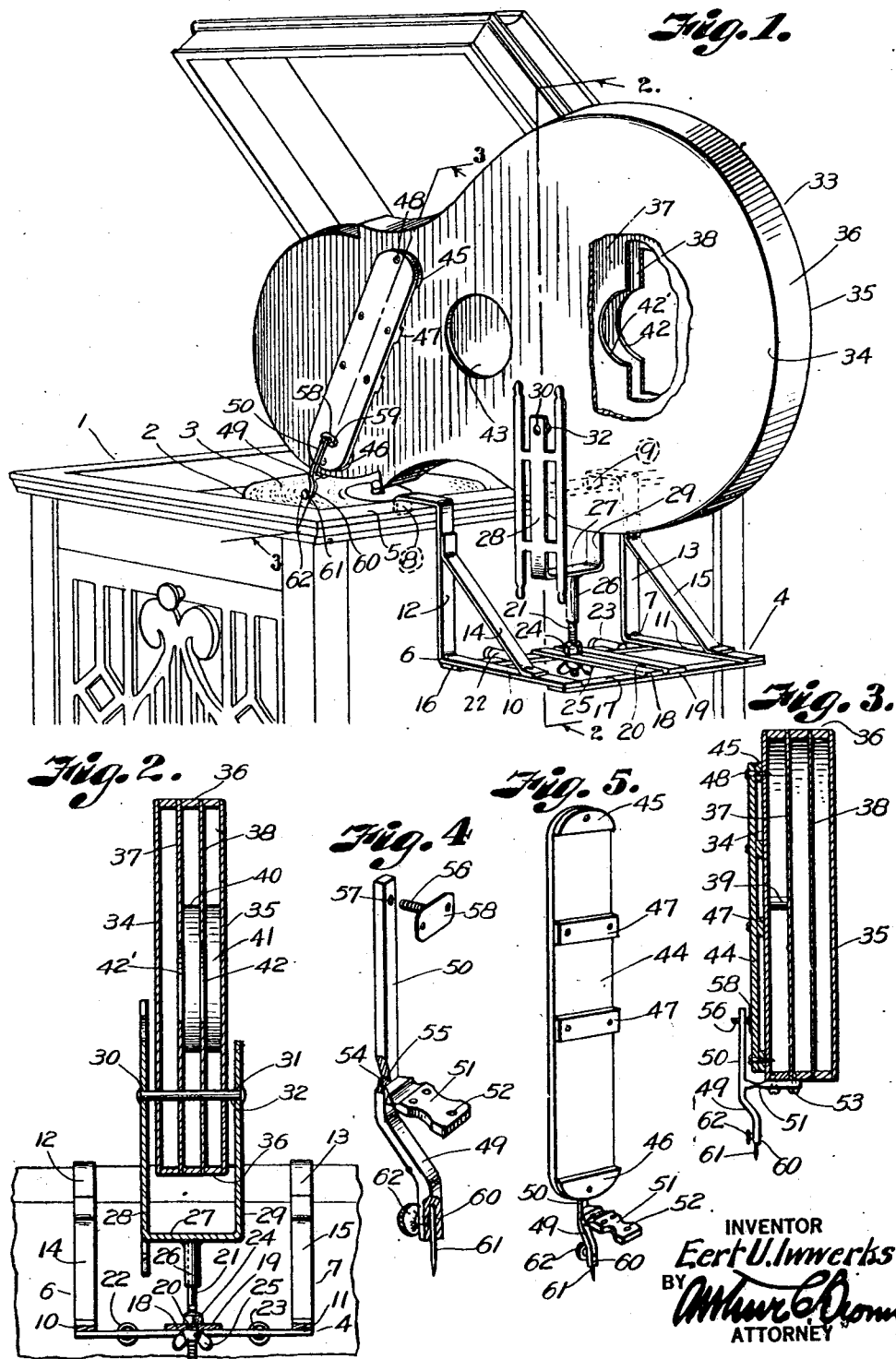
Oct. 18, 1927.

1,646,201

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SOUND REPRODUCING DEVICE

Filed Jan. 25, 1926



UNITED STATES PATENT OFFICE.

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SOUND-REPRODUCING DEVICE.

Application filed January 25, 1926. Serial No. 83,540.

My invention relates to sound reproducing devices and more particularly to a resonator for such devices whereby recorded sounds may be reproduced with the exact tone quality of the natural sounds from which the record was made, the principal object of the invention being to provide a resonator of this type which can be employed as an attachment to existing types of phonographs without materially altering their present construction.

In accomplishing this and other objects of the invention I have provided improved details of construction, the preferred forms of which are illustrated in the accompanying drawings wherein:-

Fig. 1 is a perspective view of a sound-resonating device constructed according to my invention, as it appears when applied to an existing type of phonograph.

Fig. 2 is a vertical sectional view through the resonating body and its support, on the line 2-2, Fig. 1.

Fig. 3 is a vertical sectional view through the resonating body and vibratory bar on the line 3-3, Fig. 1.

Fig. 4 is a detail perspective view of the stylus bar.

Fig. 5 is a detail perspective view of the under side of the vibratory resistance plate.

Referring more in detail to the drawings, 1 designates an ordinary type of phonograph comprising a cabinet containing the usual mechanism for rotating the turntable 2 constituting a support for the ordinary flat, grooved record disk 3.

The resonating device is here shown as supported upon a shelf 4 suspended from the top edge 5 of the cabinet by spaced bracket bars 6 and 7, having their upper ends bent rearwardly and downwardly to provide hooks 8 and 9 for receiving the edge of the cabinet, and having their lower ends bent forwardly to provide horizontal arms 10 and 11 which may be braced from the vertical sections 12 and 13 of the bracket bars by straps 14 and 15, preferably welded to the bars to form a rigid structure.

The shelf 4 includes the horizontal arms 10 and 11 of the bracket bars and front and rear cross bars 16 and 17 which space the

bracket bars apart and carry intermediate longitudinal bars 18 and 19, spaced apart to provide a longitudinal slot 20 for receiving a post 21 on which the resonating device is swingingly mounted.

As in some cabinets a top edge rail projects beyond the side of the cabinet, means must be provided for holding the vertical sections of the bracket bars in vertical alignment, and to accomplish this I have provided the front cross bar 16 with projecting pins 22 and 23 for engaging against the side of the cabinet and spacing the lower ends of the vertical sections of the bracket bars the required distance from the cabinet to retain the bracket bars in vertical alignment and the shelf in horizontal position.

The post 21 comprises a vertical rod projecting through the slot 20 and threaded at its lower end to receive upper and lower nuts 24 and 25 for engaging the corresponding sides of the bars and by which the post may be adjusted through the slot to adjust the resonator as hereinafter described.

Sleeved upon the post 21 is a socket 26, carrying a U-shaped bracket 27 at its upper end, the vertical arms 28 and 29 of which are apertured as at 30 and 31 to receive a horizontal shaft 32 which projects through and forms a support upon which the resonating device may swing vertically to compensate for any unevenness in the thicknesses of the records during operation of the phonograph and upon which the resonating device may be swung back out of position when a record is placed on or removed from the turntable.

The resonating body 33 preferably consists of a hollow body of substantially cello shape, having outer, parallel resonating walls 34 and 35 spaced apart by a peripheral wall 36 and intermediate partitions or sounding boards 37 and 38 adapted for receiving vibrations from the outer walls to increase the volume of the sound. The first partition, 37, is preferably connected to the front wall by a sound post 39 and the other partition, 38, is connected to the partition 37 and to the rear wall 35 by strips 40 and 41, as shown in Figs. 2 and 3.

In order that the sound generated by the

resonating walls may escape from the resonator, the partitions are provided near their rear ends, with aligning openings 42 and 42', and the front wall with a central sound opening 43. Thus it will be seen that the sound produced between the rear wall and the partitions must travel rearwardly of the resonator, around the strips 40 and 41, through the openings 42 and 42' and then forwardly between the front wall 34 and partition 37 to reach the sound opening 43, amplifying the sound because of the tortuous travel of the waves in contact with the resonating walls.

Vibrations are transmitted from the record to the outer wall of the resonator through a vibration transmitting plate 44, comprising a strip of flat material preferably rounded at its ends and of a length to reach substantially across the forward end of the resonating body, the plate being provided on its rear face with end ribs 45 and 46 and one or more intermediate ribs 47 cemented to the face of the resonating wall and secured thereto by screws 48, which extend through the plate and ribs and into the wall of the resonating body so that the plate is in intimate contact with the resonator at points throughout its length to spread the vibrations uniformly through the entire width of the resonator.

The actuating lever 49 comprises a bar 50, preferably rectangular in cross section and provided intermediate its ends with a flexible fulcrum plate 51 having openings 52 therein for receiving screws 53 for affixing the plate to the bottom peripheral wall of the resonating body in line with the vibratory plate. The plate is secured to the lever 49 by a threaded extension 54 carried thereby and received in a threaded opening 55 in the lever. The upper end of the lever extends upwardly and is attached to the vibratory resistance plate by a pin 56 threaded into an opening 57 in the end of the lever, the pin being carried by an anchor plate 58 attached to the vibration transmitting plate by screws 59. The free end of the lever extends downwardly and is provided with a socket 60 for receiving an ordinary phonograph needle 61 which is fixed therein by a thumb screw 62 in the usual manner.

In applying a device, constructed as described, to a phonograph, the brackets are hooked over the top edge of one side of the cabinet, and the post adjusted longitudinally of the slot to bring the needle in proper position upon the record and adjusted for height by manipulating the nut 24. The lower nut 25 is then tightened against the under sides of the bars 18 and 19 to lock the post in position. The resonator may then be swung backwardly upon the shaft 32 and a record applied to the turntable,

after which it is again lowered to bring the needle into contact with the grooves of the record.

Attention is called to the fact that the resonating body is so balanced upon the shaft as to give the proper pressure of the needle upon the record, so that as the needle follows the undulations in the grooves of the record it rocks the lever 49 on its fulcrum 51, vibrating the plate 44, which transmits its vibrations directly to the front resonating wall and through this wall and the sound post by sympathetic vibrations to the other resonating walls, producing the same loud, mellow and natural sounds which were recorded upon the record.

What I claim and desire to secure by Letters Patent is:—

1. In a sound reproducing device, a resonating body having parallel side walls and a plurality of resonating sound boards between the side walls, a vibration-spreading member directly connected to and extending transversely across one of the side walls, and means on the vibration-spreading member for carrying a stylus.

2. In a sound reproducing device, a resonating body, a vibration transmitting plate extending across a face of the resonating body and attached thereto, a fulcrum plate attached to the under side of the resonating body, a pin carried by the fulcrum plate, a stylus bar fixed on the pin, and means for connecting the upper end of the lever to the vibration transmitting plate.

3. In a sound reproducing device, a resonating body having parallel side walls and a plurality of sounding boards between the side walls, separating the resonating body into compartments and having sound openings for the passage of the vibrating air from one compartment to the other sound deflecting means between said sounding boards, a vibration-transmitting member having ribs attached to one of the side walls, a sound post connecting a sounding board and a side wall, and means on the vibratory member for carrying a stylus.

4. In a sound reproducing device, a resonating body having parallel side walls, one of the walls having a sound opening, parallel sounding boards between the side walls separating the resonating body into compartments and having openings staggered from the first named opening to cause the vibrating air to travel along the sound boards in passing from one compartment to the other, a strip having ribs, said ribs being attached to one of the side walls, a sound post connecting a sounding board and a side wall, and means on the strip for carrying a stylus.

5. In a sound reproducing device, a resonating body comprising parallel side walls, one of the walls having a sound opening,

parallel sounding boards between the side walls separating the resonating body into compartments and having openings staggered from the first named opening, strips
5 between the sounding boards and one side wall adjacent to the last named openings for directing the vibrating air toward the periphery of the sound board, a sound post connecting the other wall to the adjacent sounding board, a vibration transmitting member attached to one of the side walls, and means on the vibration transmitting member for carrying a stylus. 10

In testimony whereof I affix my signature.

EERT U. IWWERKS.