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RESONATOR DEVICE FOR GRAPHOPHONES.
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1,371,900.

Patented Mar. 15, 1921.

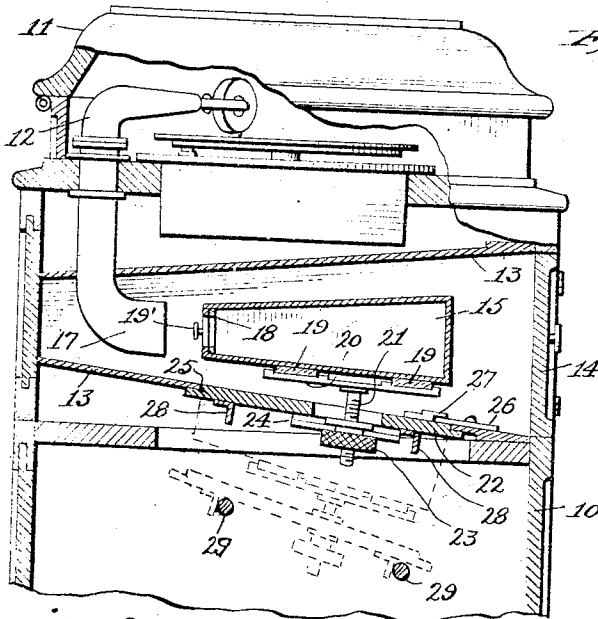


Fig. 1.

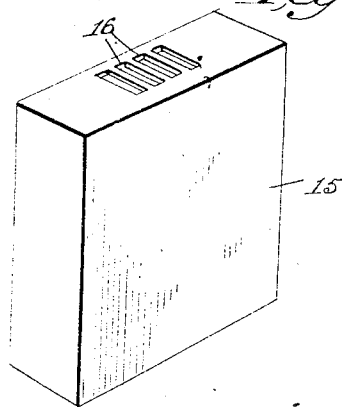


Fig. 6.

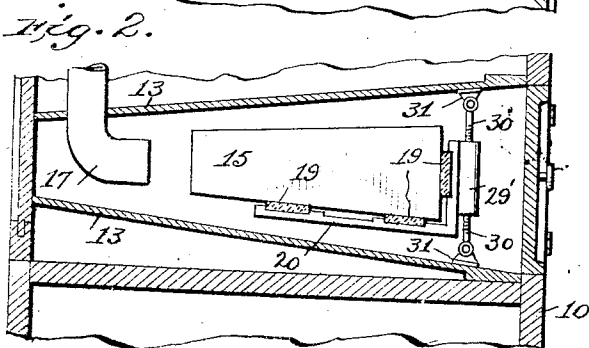


Fig. 2.

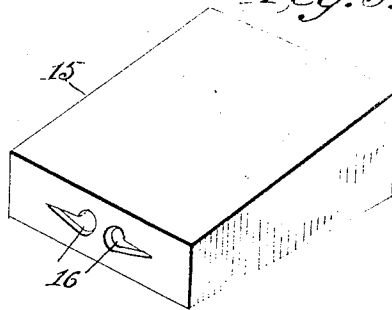


Fig. 5.

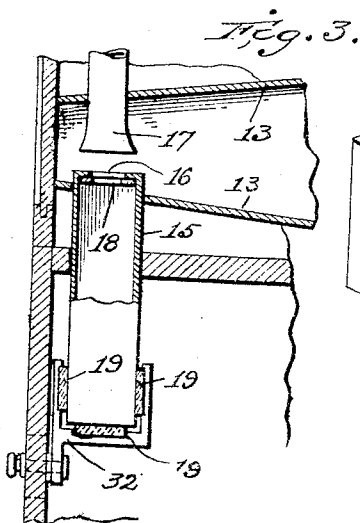


Fig. 3.

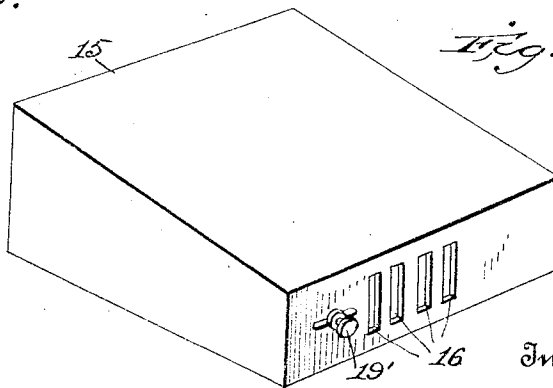


Fig. 4.

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UNITED STATES PATENT OFFICE.

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RESONATOR DEVICE FOR GRAPHOPHONES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JERE JOHNSON, a citizen of the United States, residing at Morgantown, in the county of Monongalia and State of West Virginia, have invented certain new and useful Improvements in Resonator Devices for Graphophones, of which the following is a specification.

This invention relates to improvements in resonator devices for sound reproducing devices, and has for its particular object to provide an attachment for graphophones of the cabinet-type, whereby the sounds reproduced will be more mellow, smoother, and to a greater extent free from foreign sounds than is the case with the sound reproducing machines now made.

Another object is to provide a resonant attachment which can be adjusted relative to the discharge mouth of the tone-arm, whereby more or less sound can be made to enter the resonance chamber.

A further object is to provide a resonant attachment which is constructed with an adjustable support that can be removably fitted into the usual type of cabinet sound amplifying chambers, whereby the device can be sold on the market as a unit and be placed in position within the amplifying horn by an unskilled mechanic.

A still further object is to provide a resonant means for the amplifying horn or chamber, which is adjustable into and out of the same, and so constructed that when it is adjusted to the out position one of its walls forms a portion of the wall of the amplifying chamber.

These and other objects are attained by the means illustrated in the accompanying drawing, in which:—

Figure 1 is a vertical sectional view of a portion of the sound reproducing machine cabinet, showing the improved resonator mounted thereon.

Fig. 2 is a like view to Fig. 1 showing a modified form of support for the resonator.

Fig. 3 is also a like view to Fig. 1 showing another modified form of the device.

Figs. 4, 5 and 6 are detail views showing different constructions of resonance boxes.

Similar reference numerals in all of the figures designate like parts.

Referring to the drawing, 10 designates the casing of an ordinary sound reproducing instrument, 11 the cover thereof, 12 the tone-arm, 13 the walls of the amplifying

chamber, and 14 the doors at the discharge end of the amplifying chamber.

Referring to the Fig. 1 construction, the improved resonant device comprises a box 15 which is formed with an opening or openings 16 in one end only, and is preferably constructed of thin wood, so its walls will vibrate from the sound waves in a similar manner as with a violin case, and is also preferably formed to a tapering shape so that its horizontal walls will lie in a plane parallel to the adjacent walls of the tapered amplifying chamber as now usually constructed thereby forming approximately equal width sound passages around the resonance box.

This box 15 is positioned within the amplifying chamber with its small end adjacent to the discharge end of the tone-arm, said tone-arm in the present instance being formed with an extension 17 which will project the sound waves directly forward toward the discharge end of the amplifying chamber, and said extension 17 being located close to the opening 16 of the resonance box, a greater part of the sounds emitted from the tone-arm extension will enter the resonance chamber. the balance of the sounds will pass around the box to the amplifying chamber outlet. Thus the resonance box is placed in the direct path of the sound waves and consequently they must enter the box, that is, all that the chamber can control, and the amount to enter is regulated by a valve (shown in the drawing as a slide valve) which is provided with a knob 19 for operating it.

The resonance box is made air-tight excepting for the opening 16 in the end thereof, thus the mellowing of the sounds is not produced alone by the material of which the box is formed, but the air in the resonance box or chamber acts as a cushion, and also an absorbent, thus softening the harsh sounds and producing sweet sounds. The harsh and loud sounds penetrate deeper into the cushion of air in the resonance box than do the soft and low tones and are thereby absorbed to a greater extent than the low tones owing to their greater penetration into the air pocket, and nothing but mellow tones are reflected back. The resonance of the material of the box also responds to the vibrations of the sound waves and produces mellow tones.

The resonance box is preferably support-

ed upon plates 19 of any suitable material which act as sound insulators to the balance of the support, and said plates 19 are in turn supported in a bracket 20 which is provided with a depending screw-threaded stem 21 that is adjustably secured to a base 22 by a nut 23 and side guides 24, (only one being shown) whose edges engage an annular groove in the nut. Thus the base 22 is held adjustably spaced from the box 15, so that said box can be adjusted up and down in the amplifying chamber as desired, when the base is secured in position to form a portion of the bottom wall of the amplifying chamber and the resonance box is elevated to a position to receive the sound waves from the tone-arm. When it is desired to use the instrument without the resonance box, said box and base 22 are lowered in any desired manner (to the position shown by dotted lines in Fig. 1 of the drawing) and when in this lowered position the top wall of the resonance box forming a portion of the bottom wall of the amplifying chamber, or in other words, fills the aperture 25 in the bottom wall of the amplifying chamber, and which is also filled by the base 22 when the resonance box is elevated. Any desirable means can be provided for holding the box 16 and base 22 in their different positions. In the present instance is shown a pivoted button 26 engaging under a hook 27 for holding them in the elevated position, and a pair of depending projections 28 which engage cross-rods 29 for supporting the resonance chamber in lowered position. It will be understood that the cabinet will be provided with suitable doors and openings so that access can be had to the movable parts.

In Fig. 2 of the drawing is shown the resonance chamber 15 mounted on an adjustable support which can be removably placed in the usual type of amplifying chambers, so that the resonance means can be used without altering the constructions of the usual cabinet. The support shown in this case is provided with an internally screw-threaded sleeve 29' which has rods 30 engaging the opposite ends thereof, and each of said rods 30 is provided with a foot 31 that is hinged or pivoted to the end of the rod so that the foot will accommodate itself to the walls of the amplifying chamber. The rods 30 can be adjusted inwardly and outwardly from the sleeve to provide a supporting means that can be adjusted to different sizes of amplifying chambers, and the same adjusting means can be used to position the resonance box to and from the end of the tone-arm, as also to adjust it up and down in the amplifying chamber.

In Fig. 3 of the drawings is shown a further modified form of the device, wherein the resonance box is positioned vertically in the cabinet, preferably adjacent to the

rear wall thereof, and its support 32 is also adjustably mounted to locate the resonance box in different positions relative to the end of the tone-arm.

In all of the different forms described, it will be observed that the tone-arm discharges the sound waves directly into the resonance box, in other words, the admission opening of the otherwise air-tight resonance box is always positioned directly in front of the discharge end of the tone-arm and in the direct path of the sound waves emitted from the tone-arm, but spaced therefrom. This positioning is essential to secure correct and perfect operation of the device.

Preferably the resonance box is formed larger at its closed end than at its other end. This shape not only corresponds to the usual shape of amplifying chambers and provides sound passages of approximately equal area around the box, but also provides a greater air-chamber within the box to cushion and absorb the harsh sounds.

Having thus fully described the invention, what is claimed is:—

1. A resonance means for graphophones, comprising a box having an opening in one end only, and an adjustable means for supporting the box in position within the amplifying chamber with its opening in front of the discharge end of the tone-arm and with its walls free from engagement with the walls of the graphophone.
2. A resonance means for graphophones, comprising a box having an opening in one end only, means for adjusting the size of said opening, and an adjustable means for supporting the box in position in front of the discharge end of the tone-arm and with its walls free from engagement with the walls of the graphophone.
3. A resonance means for graphophones, comprising a box having an opening in one end only, and supporting means for positioning said box in front of the discharge end of the tone-arm and with its walls free from engagement with the walls of the graphophone, said supporting means being adjustable to regulate the distance between the discharge end of the tone-arm and the opening in said box.
4. A resonance means for graphophones, comprising a box having an opening in one end only, and supporting means for positioning said box in front of the discharge end of the tone-arm and with its walls free from engagement with the walls of the graphophone, said supporting means being adjustable both horizontally and vertically to regulate the height of the box in the amplifying chamber and also to regulate the distance between the discharge end of the tone-arm and the opening in said box.
5. A resonance means for graphophones,

comprising a box having an opening in one end only, and provided with a supporting base spaced therefrom, and an adjusting means for connecting said base and box together, said base and the top of said box adapted to alternately close an aperture in the bottom wall of the amplifying chamber when the box is elevated and lowered respectively.

6. A resonance means for graphophones,

comprising a box having an opening in one end only and formed with an enlarged closed end, and means for adjustably securing said box in the amplifying chamber with the opening in its small end directly opposite 15 to the discharge end of the tone-arm of the instrument.

In testimony whereof I affix my signature.

JERE JOHNSON.