May 11, 1937. W. H. HUTTER 2,080,275

SOUND REPRODUCING APPARATUS

Filed Dec. 13, 1935

Fig. 1.

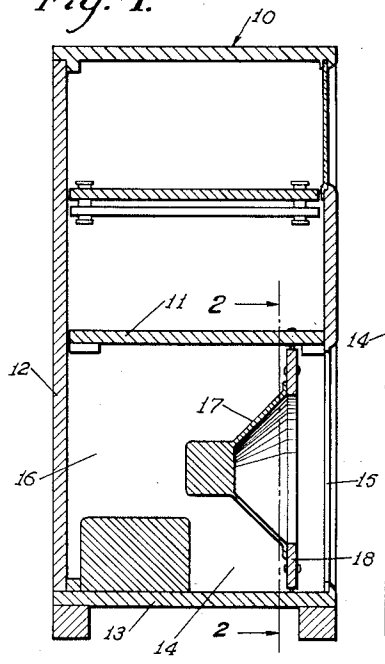


Fig. 2.

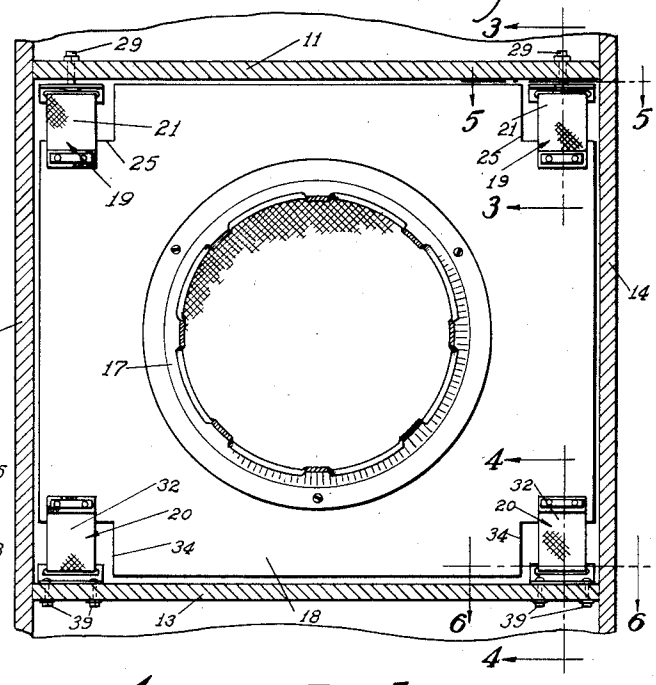


Fig. 3.

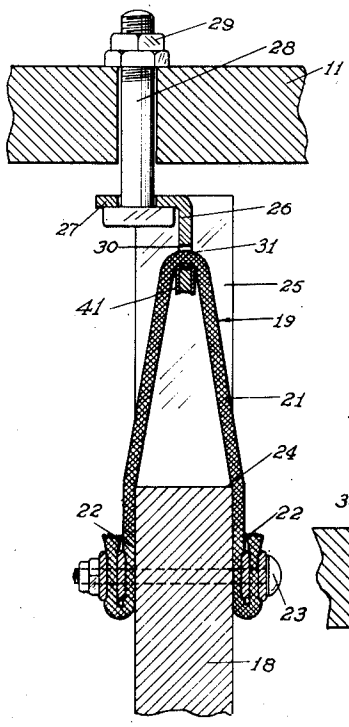


Fig. 4.

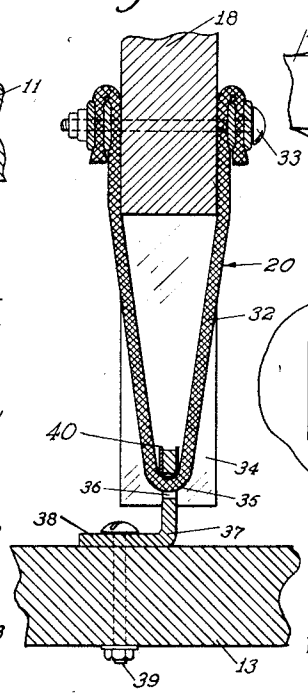


Fig. 5.

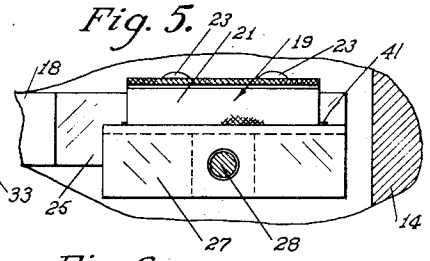
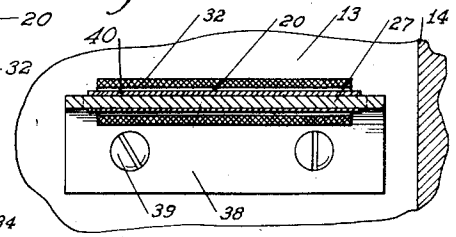


Fig. 6.



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Patented May 11, 1937 2,080,275

UNITED STATES PATENT OFFICE

2,080,275

SOUND REPRODUCING APPARATUS

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Application December 13, 1935, Serial No. 54,211

14 Claims. (Cl. 181—31)

This invention relates to sound reproducing apparatus.

It is an object of this invention to provide an improved sound reproducing apparatus which is relatively simple and inexpensive in construction and efficient in use.

It has been found from experience in the art of sound-reproducing apparatus, particularly automatic phonographs and the like, which embody a speaker and pick up device, that there is a decided tendency for the sounds reproduced by the speaker to be transmitted into and through the body of the cabinet and of the apparatus back to the pick up device in what is known as a cycle of electro-acoustical mechanical vibrations in the apparatus, and which cycle of vibrations seriously interferes with the proper reproduction and transmission of the sound, and the fidelity of the same.

Various attempts have been made to overcome this difficulty and among these have been the use of rubber or resilient mountings for the speaker, that is, using rubber blocks or the like for mounting the speaker in the cabinet. It has been found, however, that the use of rubber or other resilient material for this purpose does not overcome the difficulty referred to above, since rubber, like other non-resilient materials, but only in a lesser degree, transmits the vibrations referred to from the speaker to the cabinet and through the apparatus in a cycle of electro-acoustical-mechanical vibrations which is well understood in the art.

It is therefore an object of the present invention to provide a mounting for the speaker and baffle plate of a sound-reproducing apparatus which will prevent the transmission of the vibrations, by direct contact, above referred to and especially mechanical, from the speaker to the cabinet, and which will also break up the cycle of electro-acoustical-mechanical vibrations above referred to and which, originating usually at the pick up device of the apparatus or by some external agitation, are, in the ordinary forms of sound-reproducing apparatus, and especially phonographs, transmitted through the same.

Another object of the present invention is to provide a novel device for yieldably or flexibly mounting an amplifier, speaker, or other apparatus in the cabinet of a sound-reproducing apparatus, such, for example, as a phonograph, in such a manner that spurious vibrations cannot be directly transmitted from one part of the apparatus to another.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawing showing the preferred form of construction, and in which:

Fig. 1 is a vertical sectional view of the cabinet of a sound-reproducing apparatus showing a preferred form of the present invention associated therewith;

Fig. 2 is an enlarged view on line 2—2 in Fig. 1, partly in section, and partly in elevation, showing a preferred form of the present invention;

Fig. 3 is an enlarged sectional view on line 3—3 in Fig. 2, showing one of the new units for supporting the baffle and speaker in the cabinet;

Fig. 4 is an enlarged sectional view on line 4—4 in Fig. 2 showing another one of the new units for supporting the baffle and speaker in the cabinet;

Fig. 5 is a view on line 5—5 in Fig. 2, partly in section and partly in top plan; and

Fig. 6 is a sectional elevational view on line 6—6 in Fig. 2.

A cabinet of a sound-reproducing apparatus embodying a preferred form of the present invention is shown in the drawing, is therein generally indicated at 10, and is shown as having the form of a phonograph cabinet which includes a horizontal partition 11 and this partition 11 cooperates with the rear wall 12, bottom wall 13, side walls 14, and front wall or grill 15 to provide a compartment 16, and arranged in this compartment 16 is a speaker 17 which is attached to a so-called baffle board or supporting member 18.

The present invention is particularly concerned with the mounting of the reproducer or speaker 17 and baffle 18 in the compartment 16 and, more specifically, in yieldably or flexibly mounting the speaker 17 and baffle 18 in the compartment 16, that is, suspending the same from the partition 11 and the bottom wall 13, respectively, of the compartment 16.

In order to accomplish the foregoing and other objects of the present invention, the baffle 18 is suspended at the top thereof from the top wall 11 of the compartment 16 by means of two supporting units 19, one of the same being shown in detail in Fig. 3, and the baffle 18 is yieldably or flexibly attached to the bottom wall 13 of the compartment 16 by means of two supporting units 20, one of which is shown in detail in Fig. 4.

Each of the supporting units 19 comprises a flexible supporting element or strap 21 which is preferably made of textile fabric, but may be

made of any other suitable fabricated material, and the end portions 22 of each of these flexible members 21 are bent back upon themselves and are attached to the upper end portion 24 of the baffle board or supporting member 18 by means of attaching elements in the form of bolts 23.

Provided in each of the two upper corners of the baffle board 18 is a cut-out portion 25 and projecting into each of these cut-out portions 25 is an arm 26 of a supporting bracket 27, each of these supporting brackets 27 being adjustably mounted upon the top wall 11 of the compartment 16 by means of supporting elements in the form of bolts 28 to which are attached nuts 29.

Provided in the arm 26 of each of the brackets 27 is an opening 30 and the bight portion 31 of each of the flexible supporting elements or straps 21 is extended through the opening 30 in the corresponding bracket 27, (Fig. 3).

The supporting units 20 are similar to the supporting units 19 but the parts thereof are oppositely arranged, that is, each of the units 20 comprises a flexible member or strap 32 and the end portions of each of these straps 32 are bent back upon each other and are attached to the lower end portion of the baffle board 18 by means of attaching elements in the form of bolts 33, the straps 32 being arranged in cut-out portions 34 which are provided at the bottom corners of the baffle 18.

The bight portion 35 of each of the straps 32 is extended through an opening 36 which is formed in an upright arm 37 of a bracket 38, these brackets 38 being attached to the bottom wall 13 of the compartment 16 by means of attaching elements in the form of bolts 39.

When the baffle board 18 and the speaker or amplifier 17 are mounted in the cabinet 10 in the manner shown, and by means of the supporting units 19 and 20, it will be noted that the same are yieldably or flexibly mounted relative to the top and bottom walls 11 and 13 of the compartment 16 by means of the flexible hangers or straps 32, and by reason of this fact the cycle of electro-acoustical-mechanical vibrations, which originates at the pick-up device in the cabinet, is broken up by the flexible hangers or straps 21 and 32 and together with other vibrations is prevented by the same from being transmitted from the amplifier or speaker 17 through the baffle board 18 into the top and bottom walls 11 and 13 of the compartment 16 and thence into the body of the same. At the same time this flexible hanger or strap mounting of the baffle board 18 and speaker 17 permits the baffle board 18 and speaker to vibrate freely upon their flexible hangers or straps 21 and 32, relative to the top and bottom walls 11 and 13 of the cabinet, thereby preventing the vibrations of the speaker 17 and baffle board 18 from being transmitted into the body of the cabinet and thus improving the second-reproductive qualities and fidelity of tone reproduction of the apparatus.

Arranged upon each of the upright extensions 37 of the brackets 38 is a stirrup 40, and each of these members 40 provides rounded edges at the top of the corresponding opening 36 and against which edges the flexible straps 32 will engage when in used as to prevent or minimize wear upon the latter. A similar stirrup 41 is provided on each of the depending arms 26 of the brackets 27.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a sound-reproducing apparatus, the combination of: a cabinet; a speaker in the said cabinet; means for mounting the said speaker in the cabinet including a supporting member of substantially planar form having the said speaker attached thereto; and means including flexible elements extensive substantially in the plane of said planar supporting member for suspending the said supporting member in the said cabinet.

2. In a sound-reproducing apparatus, the combination of: a cabinet, a speaker and a baffle plate secured thereto in the said cabinet; and means including flexible web elements yieldably supporting the said speaker in the said cabinet and being extended from said baffle plate substantially in the plane thereof.

3. In a sound-reproducing apparatus, the combination of: a cabinet; a loud speaker in the said cabinet; means for supporting the said speaker in the said cabinet including a flat supporting member having said speaker mounted thereon; flexible elements supporting the said flat member in the said cabinet; and means for attaching the said flexible elements to the said supporting member and to the walls of said cabinet whereby the said flexible elements are extended from the said flat member substantially in the plane thereof.

4. In a sound-reproducing apparatus, the combination of: a cabinet; a sound means in the said cabinet; means for supporting the said sound means in the cabinet including a baffle board having edge portions and having said sound means mounted thereon; and strap members attached to the said baffle board at the said edge portions thereof; and means including brackets having slots for slidably engaging portions of each of said strap members to the walls of said cabinet inside the same.

5. In a loud speaker device, a cabinet, a loud speaker in the said cabinet, means for supporting the said speaker in the said cabinet including a baffle member having the said speaker mounted thereon, and flexible straps having two end portions attached to said baffle member and being movably connected between their ends to said cabinet.

6. A device for mounting a sound reproducer in the cabinet of a sound-reproducing apparatus, comprising: a baffle member having said reproducer mounted thereon; and flexible means for yieldably suspending the said baffle member in the said cabinet including flexible straps having two end portions attached to a said baffle member, and a bight portion movably attached to said cabinet.

7. A device for mounting a sound reproducer in the cabinet of a sound-reproducing apparatus, comprising: a supporting member adapted to have the said reproducer mounted thereon; means for yieldably suspending the said supporting member in the said cabinet; said means including flexible elements attached to said supporting member; and means for loopingly at-

taching the said flexible elements to the walls of the said cabinet inside the latter.

8. A device for mounting a sound speaker in the cabinet of a sound-reproducing apparatus, comprising: a baffle board having corner portions and having the said speaker mounted thereon; means for yieldably suspending the said baffle board in the cabinet, said means including flexible elements attached to said baffle board at the corners of the latter and co-extensive substantially with the plane of the said baffle board; means for attaching said flexible elements to the walls of the cabinet inside the latter; and means for attaching said flexible elements to said baffle board.

9. A device for mounting a sound reproducer in the cabinet of a sound-reproducing apparatus, comprising: a substantially flat baffle member having the said reproducer mounted thereon; and means including looped flexible strap members for yieldably suspending the said baffle member in the said cabinet, said strap members being extended co-planarly with said baffle member and movably connected to said cabinet at their looped portions.

10. A device for mounting a sound reproducer in the cabinet of a sound-reproducing apparatus, comprising: a baffle member having the said reproducer mounted thereon; means for yieldably suspending the said baffle member in the said cabinet; said means including looped flexible straps attached to said baffle member; and means for slidably attaching the said flexible straps to the walls of the said cabinet inside the latter.

11. In acoustic devices, a sound unit, a baffle member having said unit attached thereto, a support and means for suspending said baffle from said support, said means including straps of material which is a relatively poor vibration transmitter attached to said baffle, and bracket means attached to said support and threadably engaging said straps.

12. In sound apparatus, reproducer mounting means including a baffle board, a reproducer mounted on said baffle board, a support and means for adjustably supporting said baffle board therefrom including flexible elements of a relatively poor sound transmitting material attached to said baffle and extended therefrom in a substantially co-planar direction for attachment to said support, and bracket means slidably engaging said flexible elements, together with attaching means extended from said support and supportably engaging said bracket means, said attaching means being adjustably movable in a direction toward and away from said baffle and in a direction substantially parallel with the plane thereof.

13. An acoustic device comprising a baffle board, a loud speaker attached thereto, a supporting member, and means comprising a plurality of flexible straps supportably extended from said baffle board for attachment to said supporting member in a manner to permit the movement of the baffle board and speaker relative to the supporting member only in a direction normal to the plane of said baffle board.

14. An acoustic device including a support, a sound unit, a substantially flat baffle board mounting said sound unit, flexible members secured to said baffle board and substantially co-extensive therewith, together with means extended from said support and engaging said flexible members to permit movement of said sound unit and baffle board only in a direction in a substantially normal sense to said baffle board.

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