P. WEBER.

SOUND BOX.

APPLICATION FILED MAR. 8, 1911.

1,197,782.

Patented Sept. 12, 1916.

Fig. 1

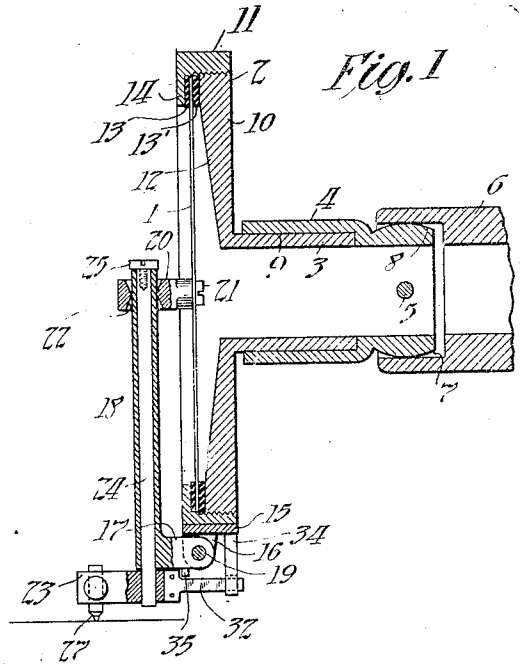


Fig. 2

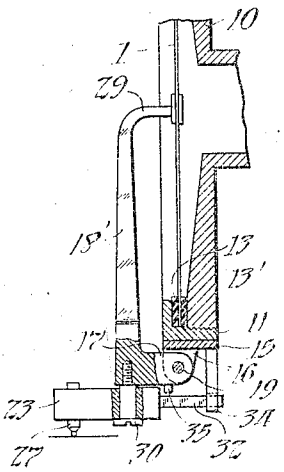


Fig. 3

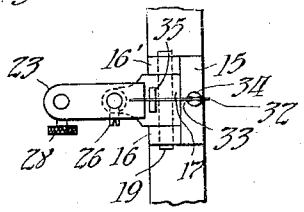
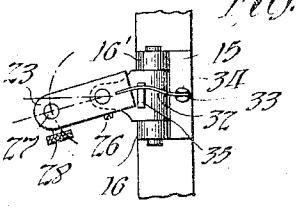


Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

PETER WEBER, OF ORANGE, NEW JERSEY.

SOUND-BOX.

1,197,782. Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed March 8, 1911. Serial No. 613,117.

To all whom it may concern:

Be it known that I, PETER WEBER, a citizen of the United States, and a resident of Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Sound-Boxes, of which the following is a description.

My invention relates to phonograph reproducers, and my object is to provide an improved reproducer wherein the stylus supporting member has great freedom of movement in tracking the grooves of the sound record and wherein a stylus mounting of very small inertia is obtained.

More particularly, the object of my invention is to provide a reproducer which may be mounted on a mechanically fed swinging arm; and which although secured against lateral movement will permit the stylus to follow or track the record groove regardless of its irregularities.

In carrying out my invention, a device is provided which renders it unnecessary to move any parts other than the stylus supporting member itself, when said member is oscillated laterally to the record groove in tracking the same. Furthermore, means are provided by my invention for locating the stylus centrally of the record groove after a deviation from this central position in tracking the groove.

Other objects of my invention are the provision of improved details of construction and combinations of parts hereinafter more fully described and claimed.

In order that my invention may be more clearly understood, reference is hereby made to the accompanying drawings, illustrating a preferred form thereof, and in which:

Figure 1 is a central vertical section of a reproducer embodying my invention, some of the parts being shown in side elevation; Fig. 2 is a view similar to Fig. 1 of a modification; Fig. 3 is a fragmentary bottom plan view of the device illustrated in Fig. 1, the stylus supporting member being shown in its central position; and Fig. 4 is a similar view of the parts shown in Fig. 3, the stylus supporting member being shown deviated from its central position.

In all of the views, corresponding parts are designated by the same reference numerals.

Referring to the drawing, the diaphragm 1 is secured to a body member 2 provided with an annular flange 3 which is securely held within a tubular member 4.

5 represents a pivot whereby the member 4 and the parts secured thereto are connected for vertical movement to the tone arm 6 of the phonograph.

In order to facilitate the movement of the reproducer with respect to the supporting arm and at the same time insure a good connection between these parts, a socket 7 is provided in the end of the arm 6 and the member 4 is provided with a spherical surface 8 engaging the wall of the said socket.

As shown in Fig. 1, the flange 3 is seated in a recess 9 in the member 4, and a sound passage of substantially uniform diameter extends from the flange 3 into the arm 6.

The body 2 comprises a member 10 and an annular member 11 threaded to the periphery of the member 10, the latter being provided with a conical forwardly extending surface 12 adapted to form a tapering sound chamber in the rear of the diaphragm. Two annular gaskets 13, 13′ are placed on opposite faces of the diaphragm at the periphery thereof, and together with the diaphragm are clamped between the member 10 and the flange 14 on the member 11.

Secured to the lower portion of the outer curved surface of the member 11 is a bracket 15 provided with parallel lugs 16, 16′, between which the arm 17 projecting substantially at right angles from the body of the elongated lever 18 is pivotally mounted by means of a pivot 19.

Referring to Fig. 1, 20 represents a projection extending from the center of the diaphragm, and secured thereto by a screw or other suitable fastening means 21. This projection is provided transversely thereof with a vertical opening 22 flaring outwardly from the center to both of its extremities, the long arm of the lever 18 being slidably mounted in the said opening. By the employment of a connection of this type between the lever 18 and the diaphragm, the free backward and forward vibration of the diaphragm is not disturbed by the angularity of the lever 18 with respect thereto. In the form of my invention shown in this figure, the lever 18 is made tubular and the stylus supporting arm 23 is pivotally connected therewith by a shaft 24 rotatably mounted in the opening in said lever and held from downward movement therein by

a set screw 25 secured in the end of said shaft and engaging the top of the said lever. The arm 23 is preferably secured to the shaft 24 by a set screw 26 and carries in its forward end a stylus 27 held in place by a set screw or other fastening means 28. Since the distance from the fulcrum of the lever to the point of connection of the latter with the diaphragm is considerably greater than the distance from the said fulcrum to the stylus, the up and down movement communicated to the stylus by its engagement with the record groove, will be communicated to the diaphragm 1 with increased amplitude; and since the stylus, the arm 23 and the shaft 24 are the only parts moved laterally by the record groove in the reproduction of a record, a stylus mounting having but little inertia and great freedom of movement is obtained.

Referring to Fig. 2, the lever 18′ is provided at its upper end with a rearwardly turned portion 29 secured to the diaphragm 1. In this modification, the arm 23 is pivotally mounted on a set screw or similar support 30 screwed into the lower end of the lever 18′ in alinement with the long arm of the said lever, the head of said set screw engaging the lower surface of said arm. The stylus 27 is secured to the arm 23 as in the form of my invention shown in Fig. 1.

In both of the modifications hereinbefore described, a spring 32 is secured to and extends rearwardly from the stylus supporting arm, the outer end of this spring being slidably engaged between the opposing convex surfaces forming the walls of the notch 33 in the lug 34 which extends downwardly from the bracket 15. Movement of the stylus supporting arm to either side of its normal axial position bends the spring 32, as shown, for example in Fig. 4, so that as soon as the deviating force is removed from the said arm, the latter is returned by the spring to its normal position. A stop 35 on the lower end of the lever 18 (or 18′) is adapted to be engaged by the rear vertical edges of the stylus supporting arm to limit the oscillation of said arm to prevent breaking of the spring 32 or removal of the same from the notch 33.

It is understood that my invention is not limited to the precise device or construction shown, but may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a sound box, the combination of a diaphragm, a support therefor, a lever fulcrumed on said support and connected with the center of said diaphragm, said lever having an opening extending longitudinally therethrough, a shaft mounted in said opening to normally turn freely therein, and a stylus arm secured to said shaft, substantially as described.

2. In a sound box, the combination of a diaphragm, a support therefor, a lever fulcrumed on said support and connected with the center of said diaphragm, said lever having an opening extending longitudinally therethrough, a shaft rotatably mounted in said opening, a stylus arm secured to said shaft, and yielding means for centering said arm, substantially as described.

3. In a sound box, a diaphragm, a support therefor, a projection extending from the center of said diaphragm and provided with a transverse opening flaring from the center to both of its extremities, and a stylus lever fulcrumed on said support, and extending slidably through said opening, substantially as described.

4. In a sound box, the combination of vibratory means, a support therefor, a stylus arm connected with said means and adapted to vibrate the same, said arm being free to oscillate laterally with respect to said vibratory means in a plane substantially at right angles to said means and without imposing stress thereon, yielding means for centering said arm, and a stop to limit the oscillation of said arm, substantially as described.

5. In a sound box, the combination of vertically disposed vibratory means, a support therefor, a lever connected with said vibratory means and pivotally mounted on said support for movement about a horizontal axis to vibrate said means, and a stylus carrying member supported by said lever so as to oscillate laterally with respect thereto about an axis at an angle to the horizontal and in a plane at an angle to said vibratory means without imposing stress thereon and without moving the stylus from operative position, substantially as described.

6. In a sound box, the combination of vibratory means, a support therefor, a stylus arm connected with said means and adapted to vibrate the same, said arm being arranged to oscillate freely in a plane at an angle to said vibratory means without imposing stress thereon and without moving the stylus from operative position, and yielding means for centering said arm, substantially as described.

7. In a sound box, the combination of vibratory means, a support therefor, a lever pivoted on said support and connected with said vibratory means, a stylus arm supported by said lever so as to freely oscillate laterally with respect thereto in a plane at an angle to said vibratory means without imposing stress thereon and without moving the stylus from operative position, and

yielding means for centering said arm, substantially as described.

8. In a sound box, the combination of vibratory means, a support therefor, a lever pivoted on said support and connected with said vibratory means, and a stylus-carrying member supported by said lever for pivotal movement in a plane at an angle to the vibratory means without moving the stylus from operative position, said member having connection with said vibratory means through said lever, substantially as described.

9. In a sound box, the combination of vibratory means, a support therefor, a lever pivoted on said support and connected with said diaphragm, and a stylus carrying member supported by said lever so as to be free to oscillate about an axis at an angle to the axis of the pivot of said lever and in a plane at an angle to said vibratory means without imposing stress thereon and without moving the stylus from operative position, substantially as described.

10. In a sound box, the combination of vibratory means, a support therefor, a lever pivoted on said support and connected with said diaphragm, and a stylus carrying member supported by said lever so as to be free to oscillate in a plane at an angle to said vibratory means without imposing stress thereon, said member having connection with said vibratory means through said lever, substantially as described.

This specification signed and witnessed this 7th day of March, 1911.

PETER WEBER.

Witnesses:

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