E. H. MOBLEY.

SOUND BOX FOR TALKING MACHINES.

APPLICATION FILED AUG. 17, 1907.

955,894. **Patented Apr. 26, 1910.**

Fig. 1

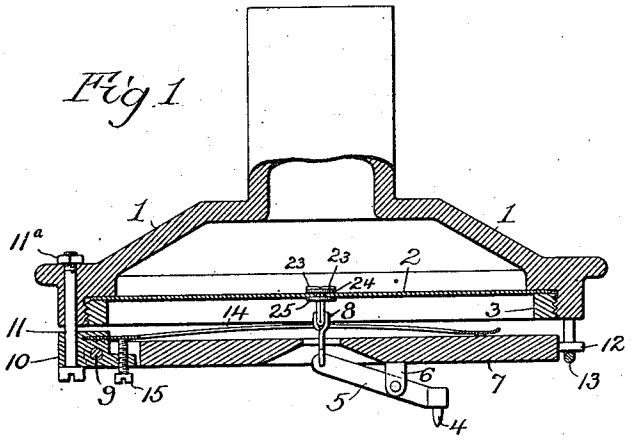


Fig. 4.

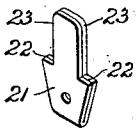


Fig. 3.

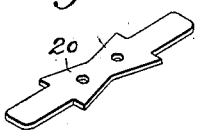


Fig. 2.

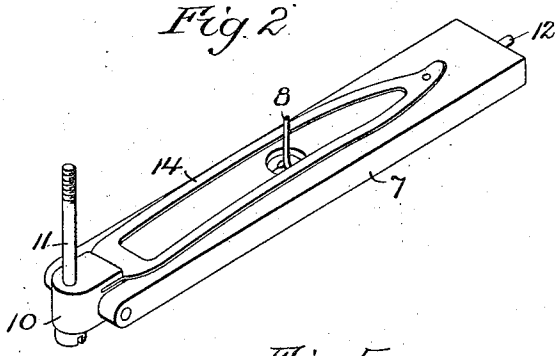
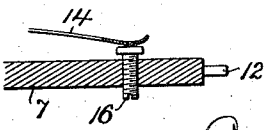


Fig. 5.



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SOUND-BOX FOR TALKING-MACHINES.

955,894. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed August 17, 1907. Serial No. 389,028.

To all whom it may concern:

Be it known that I, EDWIN H. MOBLEY, a citizen of the United States, residing in Hillside, Montgomery county, Pennsylvania, have invented certain Improvements in Sound-Boxes for Talking-Machines, of which the following is a specification.

My invention relates to sound boxes for use in connection with records having grooves of the "hill-and-valley" type, the objects of my invention being to provide for the secure connection of the stylus lever to the diaphragm, and for the proper contact of the stylus with the undulating bottom of the groove without impairing the desired freedom of movement of said stylus and without affecting the purity of the reproduction. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figure 1 is a view partly in side elevation and partly in vertical longitudinal section of a sound box constructed in accordance with my invention; Fig. 2 is a perspective view showing certain elements of said sound box detached therefrom; Fig. 3 is an enlarged perspective view of the blank from which the diaphragm connection is made; Fig. 4 is a perspective view of the same after it has been bent for application to the diaphragm and connecting link, and Fig. 5 is a sectional view illustrating a modification of one of the features of my invention.

1 represents the cup-like casing of the sound box to which the diaphragm 2 may be secured in any desired way, the means adopted in the present instance for effecting this object being a threaded ring 3 which engages a thread formed on the inner wall of the sound box and serves to confine the outer portion of the diaphragm against a suitable shoulder in said box.

The stylus 4 which engages the groove of the record is carried, as usual, by one arm of a stylus lever 5, pivotally mounted upon a bracket 6 which is secured to a weighted arm 7, the other arm of said lever being connected to the diaphragm 2 by means of a link 8 which passes through a central opening in the arm 7.

The arm 7 is hung by means of a pivot pin 9 to a block 10, which is pivotally mounted upon a pin 11, the latter passing through an opening in the sound box casing, and having a threaded upper end for the reception of a nut 11^a which bears upon said casing. The pin 11 is disposed at a right angle to the pivot pin 9, whereby swinging movement of the arm 7 in all directions is permitted within the limits imposed by contact of a projecting pin 12 at the outer end of the arm with a yoke 13 projecting from the face of the sound box, as shown in Fig. 1, freedom of lateral movement being insured owing to the fact that the block 10 can swing upon the pin 11, and the latter can turn in the opening to which it is adapted.

It is advisable in many cases to employ in connection with the arm 7 a spring for pressing upon said arm and imparting an outward thrust thereto. Such a spring is illustrated at 14 in the drawing, one end of the spring being secured, by soldering or otherwise, to the pivoted block 10, and its other end bearing upon the inner face of the arm 7, the spring having a central opening or slot for the passage of the link 8. By this means the spring partakes freely of the lateral movements of the arm 7 and therefore opposes no resistance to such movements or to the movements of the stylus 4 and stylus lever 5, consequently the freedom of movement of the stylus is not restricted in any way by the action of the spring, nor is the purity of the reproduction impaired by any scraping contact of the spring with the lever, as it would be if said spring was mounted upon a fixed member of the sound box casing instead of upon the pivoted and swinging block 10. In so far as the attainment of the desired result is concerned, it is, in a measure, immaterial which end of the spring is the one to be secured, although the construction shown is preferred.

If adjustment of the tension of the spring 14 is desirable, this may be effected either by means of an adjustable screw 15 carried by the block 10, and bearing upon the spring in advance of its point of connection to the block, as shown in Fig. 1, or by means of a screw 16 carried by the arm 7 and constituting the bearing point for the free end of the spring, as shown in Fig. 5.

The link 8 is usually cemented to the diaphragm 2 but this is an unstable and otherwise objectionable means of attachment, in place of which I use a clip consisting of a strip 20 of sheet metal as shown in Fig. 3,

this strip being first bent, as shown in Fig. 4, so as to form a loop 21 with shoulders 22 at the base and projecting wings 23, which after being passed through a central opening in the diaphragm are bent down upon the back of the same, a washer 24 being, by preference, interposed between the diaphragm and the bent wings, and another washer 25 being interposed between the diaphragm and the shoulders 22 at the base of the loop 21, the latter projecting from the face of the diaphragm and being perforated for the reception of the link 8, or otherwise constructed for close fitting connection with said link or with such other connection as may be interposed between the diaphragm and the stylus lever. The clip thus rigidly and securely confined to the central portion of the diaphragm, provides a stable connection which is not impaired by long continued use of the sound box or by changes of temperature or rough handling to which the sound box may be subjected.

I claim:—

1. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a stylus lever connected to the diaphragm, an arm to which said stylus lever is pivoted, a member to which said arm is pivoted, said member having pivotal connection with the casing the axis of which connection is at right angles to the pivot of the arm, and a spring coöperating with the arm and with said pivot member, said spring being secured at one end to one of said parts and imparting outward thrust to the pivoted arm.

2. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a stylus lever connected to the diaphragm, an arm to which said stylus lever is pivoted, a member to which said arm is pivoted, said member having pivotal connection with the casing the axis of which connection is at right angles to the pivot of the arm, and a spring connected to said pivot member and bearing upon the back of the arm so as to impart outward thrust to the latter.

3. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a stylus lever connected to the diaphragm, an arm to which said stylus lever is pivoted, a block to which said arm is pivoted, a pin upon which said block is pivotally mounted, said pin being disposed at right angles to the pivot pin of the arm and being pivotally mounted in the casing, and a spring coöperating with the arm and with the pivot block, said spring being secured to one of said parts and serving to impart outward thrust to the arm.

4. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a stylus lever connected to the diaphragm, an arm to which said stylus lever is pivoted, a block to which said arm is pivoted, a pin upon which said block is pivotally mounted, said pin being disposed at right angles to the pivot pin of the arm and being pivotally mounted in the casing, and a spring secured to said pivot block and bearing upon the back of the arm so as to impart outward thrust thereto.

5. The combination, in a sound box for talking machines, of the casing and its diaphragm, a pin pivotally mounted in said casing and having a block pivotally mounted thereon, an arm pivoted to said block, and a stylus lever pivotally mounted on said arm and acting upon the diaphragm.

6. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a pivoted and swinging block on said casing, an arm pivoted to said block and carrying a stylus lever which acts upon the diaphragm, a spring coöperating with said arm and block and secured to one of said parts, and means for varying the tension of said spring.

7. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a pivoted and swinging block on said casing, an arm pivoted to said block and carrying a stylus lever which acts upon the diaphragm, a spring coöperating with said arm and block and secured to one of said parts, and means carried by the swinging block for varying the tension of said spring.

8. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a pivoted and swinging block mounted upon said casing, an arm pivotally mounted upon said block and carrying a stylus lever which acts upon the diaphragm, a spring secured at one end to said block and bearing at the other end upon the arm, and means for varying the tension of said spring.

9. The combination, in a sound box for talking machines, of the sound box casing and its diaphragm, a pivoted and swinging block mounted upon said casing, an arm pivotally mounted upon said block and carrying a stylus lever which acts upon the diaphragm, a spring secured at one end to said block and bearing at the other end upon the arm, and means carried by the swinging block for varying the tension of said spring.

10. The combination, in a sound box for talking machines, of the sound box casing and its perforated diaphragm, a clip passing through said diaphragm and having, on the outer face thereof, a member with shoulders providing a bearing therefor, and projecting wings bent down on the inner face of the diaphragm, a washer interposed between the diaphragm and said wings, another washer interposed between the diaphragm

and said shoulders, a stylus lever, and a connection between said stylus lever and that portion of the clip which projects beyond the outer face of the diaphragm.

11. The combination, in a sound box for talking machines, of the sound box casing and its perforated diaphragm, a clip consisting of a strip of sheet metal bent to form a shouldered loop with wings passing through the diaphragm and bent down on the back of the same, a washer interposed between the diaphragm and the shouldered portion of the loop, a washer interposed between the diaphragm and the bent wings of the clip, a stylus lever and a connection between said stylus lever and the loop portion of the clip.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

EDWIN H. MOBLEY.

Witnesses:

HAMILTON D. TURNER,

KATE A. BEADLE.