No. 831,546. PATENTED SEPT. 25, 1906.

L. F. DOUGLASS.

SOUND BOX FOR TALKING MACHINES.

APPLICATION FILED APR. 20, 1905.

Fig. 1.

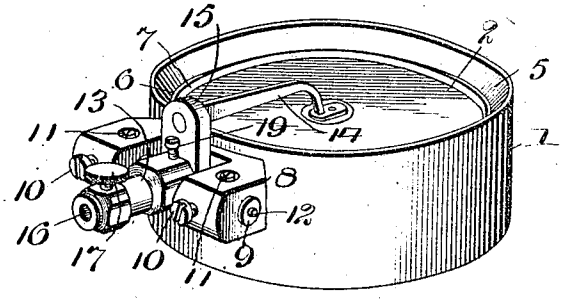


Fig. 2.

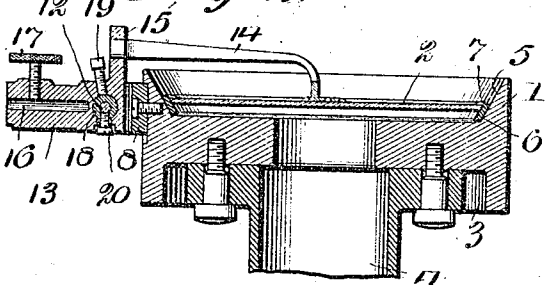


Fig. 3.

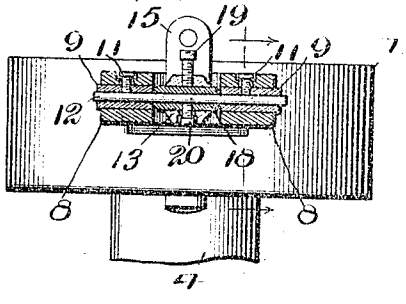
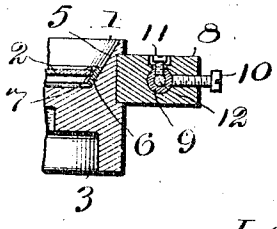


Fig. 4.



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SOUND-BOX FOR TALKING-MACHINES.

No. 831,546. Specification of Letters Patent. Patented Sept. 25, 1906.

Application filed April 20, 1905. Serial No. 256,590.

To all whom it may concern:

Be it known that I, LEON F. DOUGLASS, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Sound-Boxes for Talking-Machines, of which the following is a full, clear, and complete disclosure.

The object of my invention is to produce a sound-box for a talking-machine in which the stylus-bar is more delicately, perfectly, and efficiently mounted than heretofore and also whereby the position and tension of the stylus-bar may be quickly and easily adjusted.

The further object of my invention is also to provide, in combination with the features above referred to, means for delicately mounting the diaphragm of the sound-box, so that the same may be vibrated with the most delicate and minute vibrations of the stylus-bar.

Heretofore in sound-boxes in which the stylus-bar has been mounted upon a torsional device for giving a tension thereto or for holding said stylus-bar in position the torsional device or spring has been attached rigidly to the casing of the sound-box and to the stylus-bar—that is to say, no means have been provided for the axial adjustment of the stylus-bar so that its pressure or tension in relation to the diaphragm may be varied. Furthermore, heretofore when the diaphragm has been mounted between a pair of gaskets which contact with the marginal portions of the diaphragm said diaphragm is more or less confined by the surfaces of the gaskets and its free vibration to some extent hindered. This feature when taken in connection with the lack of adjustability of the torsional mounting for the stylus-bar is a disadvantage which reduces the efficiency and quality of the reproduction by the sound-box.

Briefly, my invention comprises the embodiment in a sound-box of an improved torsional mounting and also a mounting which may be easily adjusted by means of suitable clamping or holding devices both in relation to the stylus-bar or in relation to the bearings for the torsional device.

My invention also comprises the combination, with the above features, of a diaphragm which is mounted so as to vibrate freely in response to the most minute and delicate vibrations of the stylus-bar.

For a full, clear, and exact description of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 is a perspective view of my improved sound-box; Fig. 2, a transverse sectional view thereof, taken substantially on a line passing longitudinally through the center of the stylus-bar. Fig. 3 is a side elevation thereof, showing the device for torsionally mounting the stylus-bar in cross-section; and Fig. 4 is a view taken substantially upon the line 4 4, Fig. 3, showing a portion of the casing of the sound-box.

Referring to the drawings, the numeral 1 indicates the usual cylindrical casing or ring in which the diaphragm 2 is mounted, said ring being provided with a transverse partition or back 3, to which is attached the sound-conducting tube 4 in any suitable or well-known manner. Within the ring 1 is provided a tapering or conical surface 5, upon which is placed a corresponding gasket 6, of rubber or other suitable elastic material. The diaphragm 2 is retained in position with its extreme outer edge resting against the inner surface of the gasket 6, said means for retaining the diaphragm in position consisting of any well-known expedient, such as wax or other cement 7, springs, or even the pressure of the stylus-bar of itself against the diaphragm.

As means for mounting the stylus-bar I provide the following parts: Attached to one portion of the periphery of the ring 1 is a U-shaped block 8, the arms of which are provided with apertures in alinement, within which are placed bushings of steel or other suitable material, as indicated at 9. These bushings 9 are adapted to be retained in position within the holes in the block 8 by means of suitable set-screws, as indicated at 10. The bushings 9 are provided with holes through which pass the small screws 11, which are adapted to contact with the torsional pin, wire, or spring 12, upon which the stylus-bar is carried, suitable openings being provided in the block 8 to allow free passage of the screws 11.

The stylus-bar consists of two main parts, a portion 13 of which is adapted to receive the stylus-needle and the portion 14 of which

connects with the first-named portion and is also operatively connected with the diaphragm 2. The portion 13 is preferably made in the form of an L-shaped block, to one arm 15 of which is attached the portion 14, the other arm of which is preferably cylindrical and provided with a stylus-socket 16 and thumb-screw 17. Adjacent the apex of the angle of the L-shaped portion 13 of the stylus-bar is provided a transverse hole, within which is placed a bushing 18, similar to the bushings 9 previously referred to. The set-screw 19 is provided for holding the bushing 18 in position within the section 13. The bushing 18 is also provided with a screw-threaded hole, through which passes the screw 20, a suitable opening being made in the section 13 to allow free passage of the screw 20. This screw 20 is adapted to engage and hold the torsional wire or spring 18 firmly in position in relation to the stylus-bar and the bushings 18.

When the parts above described are assembled, the same will be substantially in the positions indicated in Fig. 3—that is, the bushings 9 and 18 will be securely held within their respective openings by screws 10 and 19, while the torsional spring or wire 12 will be held securely within said bushings by screws 20 and 11.

By virtue of the above-described construction the stylus-bar may be adjusted both rotatably and longitudinally on the wire spring 12, and, further, the said spring may be adjusted both rotatably and longitudinally with reference to its clamping-screws. When the proper adjustment is obtained, the wire spring will be clamped to resist torsional movement by the screws 11 11; but the intermediate portion upon which the stylus-bar is mounted will cause the vibrations of the latter to be very sensitive. The wire spring 12 during its torsional movement, caused by the vibrations of the stylus-bar, has a tendency to flex away from the line of its axis; but this tendency is resisted by having bushings incasing the same throughout its entire length.

It is not necessary that I should utilize a diaphragm mounted in the manner above described, as my efficient mounting of the stylus-bar can be adapted to any vibrating diaphragm; neither do I wish to limit myself to the exact details of construction herein set forth, as I may utilize any of the well-known equivalents thereof, provided the same are within the scope of my invention as pointed out in the appended claims.

Having thus described my invention, what I claim, and desire to protect by Letters Patent of the United States, is—

1. In a sound-box, a stylus-bar, a torsional spring passing therethrough and adjustably retained in connection therewith, and means for supporting the outer ends of said torsional spring.

2. In a sound-box, a stylus-bar, a torsional spring, which is rotatably adjustable in relation to said stylus-bar and bearings for said torsional spring within which said torsional spring is also rotatably adjustable.

3. In a sound-box, a stylus-bar, an axle passing through said stylus-bar, fixed bearings for said axle, and bushings interposed between said axle and said stylus-bar and said bearings.

4. In a sound-box, a stylus-bar, a torsional spring passing through said stylus-bar, fixed bearings for said spring and bushings interposed between said torsional spring and said stylus-bar and bearings.

5. In a sound-box, a stylus-bar, a torsional spring passing through said stylus-bar, fixed bearings for said spring and bushings interposed between said stylus-bar and spring and between said bearings and said spring and inclosing said spring for its entire length.

6. In a sound-box, a stylus-bar, an axle passing through said stylus-bar, fixed bearings for said axle, and bushings interposed between said stylus-bar and axle, and between said bearings and said axle and inclosing said axle for its entire length.

7. In a sound-box, a stylus-bar, an axle passing through said stylus-bar, a bushing interposed between said stylus-bar and axle, fixed bearings for said axle, bushings interposed between said bearings and axle, and means for clamping said bushings to said axle and means for clamping said bushings within said bearings and within said stylus-bar.

8. In a sound-box, the combination with the stylus-bar, of a cylindrical torsional spring, said spring being rotatably adjustable for varying the tension of said stylus-bar, and a diaphragm coöperating with said stylus-bar and mounted by its peripheral edge only.

9. In a sound-box, the combination with a stylus-bar, of a cylindrical torsional spring passing therethrough, bearings for said spring, bushings interposed between said spring and bearings, and bushings interposed between said spring and stylus-bar, means for holding said bushings rigidly in position, means for holding said torsional spring adjustably in position within said bushings, and a diaphragm coöperating with said stylus-bar and mounted by its peripheral edge only.

10. In a sound-box, the combination with the stylus-bar, of a cylindrical torsional spring, said spring being rotatably adjustable for varying the tension of said stylus-bar and a diaphragm coöperating with said stylus-bar.

11. In a sound-box, the combination with a stylus-bar, of a cylindrical torsional spring passing therethrough, bearings for said spring, bushings interposed between said

spring and bearings, and a bushing interposed between said spring and stylus-bar, means for holding said bushings rigidly in position, means for holding said torsional spring adjustably in position within said bushings, and a diaphragm coöperating with said stylus-bar.

12. In a sound-box, the combination with a stylus-bar of a rotatably-adjustable torsional spring connected therewith, and a diaphragm coöperating with said stylus-bar.

13. In a sound-box, a stylus-bar, a torsional spring passing therethrough, and rotatably and longitudinally adjustable therein, and means arranged on each side of the stylus-bar for resisting the torsion of said spring.

14. In a sound-box, a stylus-bar, a torsional spring on which said stylus-bar is mounted, and means arranged on each side of the stylus-bar for resisting the torsion of said spring.

15. In a sound-box, a stylus-bar, a torsional spring passing therethrough and rotatably and longitudinally adjustable therein, and means arranged on each side of the stylus-bar for supporting said spring.

16. In a sound-box, a stylus-bar, a torsional spring passing therethrough, the said stylus-bar being rotatably and longitudinally adjustable on said spring, and means located on each side of the stylus-bar for supporting said spring.

17. In a sound-box, a stylus-bar, a torsional spring passing therethrough and rotatably and longitudinally adjustable therein, means arranged on each side of the stylus-bar to support said spring, and means for rotatably and longitudinally adjusting the same.

18. In a sound-box, a stylus-bar, a torsional spring passing therethrough and longitudinally adjustable therein, and means arranged on each side of the stylus-bar for resisting the torsion of said spring.

19. In a sound-box, a stylus-bar, a torsional spring passing therethrough and longitudinally adjustable therein, and means arranged on each side of the stylus-bar for supporting said spring.

20. In a sound-box, a stylus-bar, a torsional spring passing therethrough, the said stylus-bar being longitudinally adjustable on said spring, and means located on each side of the stylus-bar for supporting said spring.

21. In a sound-box, a stylus-bar, a torsional spring passing therethrough and longitudinally adjustable therein, means arranged on each side of the stylus-bar to support said spring, and means for longitudinally adjusting the same.

22. In a sound-box, a stylus-bar, a torsional spring upon which said stylus-bar is mounted, and means for maintaining the axis of said spring in a straight line during its torsional movement.

23. In a sound-box, a stylus-bar, a torsional spring upon which said stylus-bar is mounted, and means for preventing the spring from bending or flexing out of its alinement during its torsional movement.

24. In a sound-box, a stylus-bar, a torsional spring upon which said stylus-bar is mounted, means arranged on each side of said stylus-bar for resisting the torsion of said spring and means for maintaining the torsional portion of said spring in straight alinement.

25. In a sound-box, a torsional spring, a stylus-bar mounted thereon, and means for incasing the said spring throughout its entire length.

26. In a sound-box, a wire spring having a stylus-bar mounted thereon, and a U-shaped block containing alined apertures in its arms, in which the extremities of said wire are supported.

27. In a sound-box, a torsional spring, a stylus-bar rotatably mounted thereon, supporting-arms having alined apertures therein, bushings within said apertures, and means arranged within the bushings for resisting the torsion of said spring.

28. In a sound-box, a torsional spring, supporting-arms having alined apertures therein, a stylus-bar arranged between said arms and having an aperture alined with those of the supporting-arms and a bushing within each aperture, the said spring being supported within said bushings, the said bushings being in contact with each other to incase the said spring throughout its entire length.

In witness whereof I have hereunto set my hand this 29th day of March, A. D. 1905.

LEON F. DOUGLASS.

Witnesses:
OLIVER JONES,
ALEXANDER PARK.