

J. C. ENGLISH.
SOUND BOX FOR TALKING MACHINES.
APPLICATION FILED MAY 16, 1906.

940,795.

Patented Nov. 23, 1909.

Fig. 1.

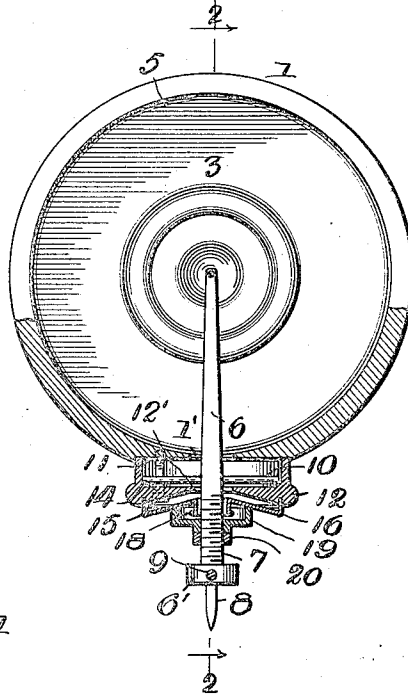


Fig. 3.

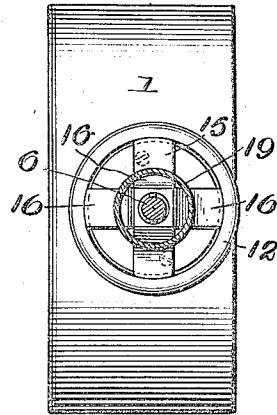


Fig. 2.

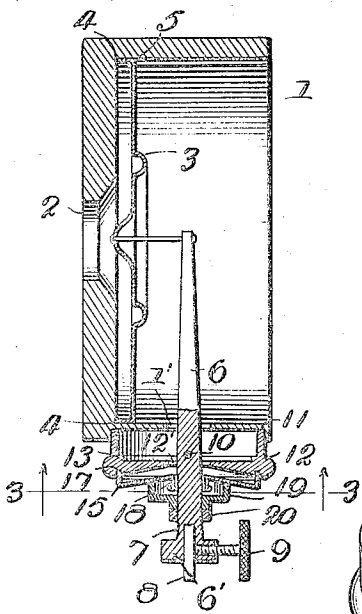


Fig. 4.

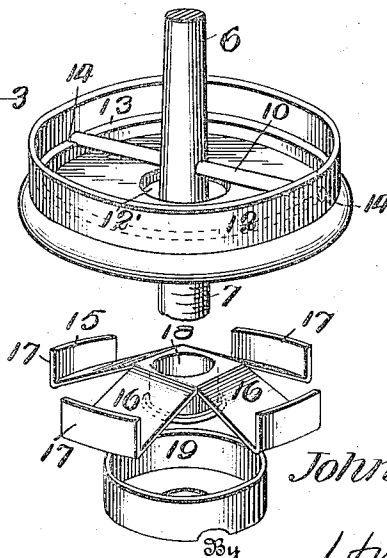
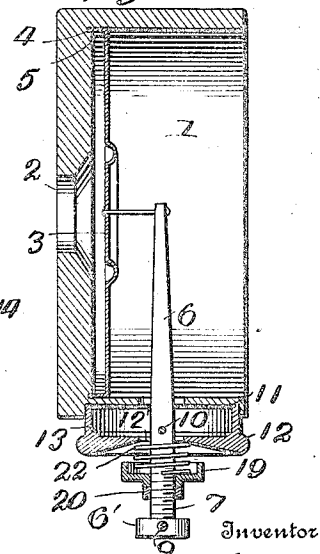


Fig. 5.



Witnesses
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SOUND-BOX FOR TALKING-MACHINES.

940,795.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed May 16, 1906. Serial No. 317,055.

To all whom it may concern:

Be it known that I, JOHN C. ENGLISH, a citizen of the United States, and resident of the city of Camden, county of Camden, State of New Jersey, have invented certain new and useful Improvements in Sound-Boxes for Talking-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in sound boxes, and the objects of my invention are, to provide an improved mounting for a stylus bar, in which an adjustable tension is exerted upon the bar to restrain the oscillation thereof; and to provide other improvements as will appear hereinafter.

In the drawing: Figure 1 is an elevation of my sound box, showing a part of the casing and stylus bar mounting mechanism in section; Fig. 2 is a sectional elevation thereof taken on lines 2—2 of Fig. 1; Fig. 3 is a bottom plan view of the sound box, showing a transverse section of the stylus bar mounting taken on line 3—3 of Fig. 2; Fig. 4 shows perspective views of several parts of the stylus bar mounting detached; and Fig. 5 is a sectional elevation of the sound box, showing a modified form of the stylus bar mounting.

The sound box casing 1 may be of the usual open end construction, having an orifice 2 in the rear end thereof, to which the sound tube may be connected. The diaphragm 3 may be of any well known type, but I prefer to employ one in which the peripheral portions are turned at right angles to the face of the diaphragm to form a cylindrical flange 4. The outer surface of the said flange is cemented or otherwise fastened to the inner wall of the sound box casing, so that the vibrations or fluctuations of the diaphragm will take place only within the peripheral edge 5, and the diaphragm is so mounted that it is tightly held within the wall of the sound box casing and has no moving contact surface. By reason of this construction, it will be observed that it is very easy to make a large number of sound boxes substantially identical in construction, at least to assemble the sound boxes so that the rear diaphragm is always at a predetermined distance from the rear wall of the

case, that is to say, from the wall which has a sound conveying opening 2 therein. The flange 4 enables the workman to do this without any special care and at the same time, the flange presents a simple means for attaching the diaphragm to the casing.

Attached to the diaphragm and passing through an orifice 1' in the side of the casing is a stylus bar 6, the outer end of which is screw threaded at 7, the purpose of which screw threads will be hereinafter set forth. The lower end of the stylus bar 6 is enlarged as at 6' and is provided with a suitable socket within which the needle 8 is secured by a set screw 9, or by any other suitable means. Passing through the stylus bar and rigidly fastened to the same is the trunnion or axial pin 10. In the outer side of the sound box casing and around the orifice through which the stylus bar passes is a cylindrical recess 11, within which the cylindrical cap 12 is located. The cap 12 is of a box-like construction, having an orifice 12' in its outer side, through which the stylus bar passes, and which is large enough to permit the necessary amplitude of vibration of the said bar. On the interior of said cap is an annular seat 13, having diametrical opposite grooves 14, in which rest the ends of the trunnion or axial pin 10. This seat 13 does not necessarily extend entirely around the interior of the cap 12, as it is merely for the purpose of presenting surfaces in which the diametrical oppositely arranged grooves 14 may be located. The axial pin 10 is held within the grooves 14 by means of the spring 15. The spring may be formed of a circular blank stamped out to form the radially extending blades 16, the outer ends of which are turned inwardly as shown at 17. The central portion of the spring is apertured and drawn outwardly into a cylindrical collar 18, which surrounds the stylus bar, but is large enough to permit the necessary amplitude of vibration of the same. The turned edges 17 of the spring are located in depressions in the outer end of the cap, to prevent rotary movement of the spring. The spring is so constructed that the central portion has a tendency to spring outwardly; that is, when the said central portion is pressed inwardly toward the seat, it offers a yielding resistance. Located loosely around the stylus bar is the head 19, which is adapt-

ed to be moved inwardly against the spring by the nut 20. Thus, when the head is forced inwardly by means of the nut, the spring 15 resists said inward movement of the same, which resistance causes the stylus bar and its axial pin to be drawn outwardly, thus exerting a yielding pressure on the bearing grooves 14.

The construction illustrated in Fig. 5 is the same as that of the remaining figures with the exception that a coil compression spring 22 surrounds the stylus bar and has a normal tendency to pull the same, with the axial pin 10 outwardly from the sound box, and exerts pressure on the grooves 14 in the same manner as the spring 16 in the other figures. It may be readily seen that by virtue of this peculiar mounting of the stylus bar the latter vibrates upon yielding bearings, the yielding pressure being exerted in a plane which passes through both the axis of the trunnion pin and that of the stylus bar. The inwardly depressed outer face of the cap 12 enables the pressure of the spring on the stylus bar to be brought near to its axis of oscillation and renders the stylus bar free to respond to the vibrations impressed upon it while at the same time, the trunnions 10 are firmly held against their bearings in the cap 12. It is obvious that the outer end of the stylus beyond the nut 20 may have a downwardly projecting elbow therein, as it is sometimes required when the stylus extends over the edge of the sound box casing instead of projecting through the orifice in the same. Further, it is not essential that the pressure against the bearings should be exerted in a plane passing through the longitudinal axis of the stylus, as the construction may be so modified as to have the pressure exerted in a plane transverse thereto.

Other changes in the details and arrangement of the various parts may be made without departing from the spirit and scope of my invention, as pointed out in the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States, is:—

1. In a sound reproducer, the combination with the diaphragm of a stylus bar mounted to oscillate upon a pivotal bearing, compressed spring for tensioning said bearing, the axis of said spring being substantially in a plane of the axis of oscillation of said bar and substantially coincident with the longitudinal axis of the stylus bar at its bearing.

2. In a sound reproducer, the combination with the diaphragm of a stylus bar mounted to oscillate upon pivotal bearings and a compressed spring for tensioning said bearings, the longitudinal axis of said spring being substantially coincident with the longitudinal axis of said bar, the said bar having a

projection against which one end of the spring bears to hold the pivots upon their bearings.

3. In a sound box for talking machines, a stylus bar, trunnions mounted on said sound box upon which said stylus bar oscillates, a spring surrounding said stylus bar close to said trunnions and exerting a yielding pressure between said trunnions and said sound box tending to force said bar outwardly from said box.

4. In a sound box for talking machines, a stylus bar, trunnions bearing against said sound box and upon which said stylus bar oscillates, a spring comprising a collar surrounding said stylus bar, radial arms engaging said sound box, and means to exert a tension on said spring in the direction of the longitudinal axis of said stylus bar.

5. In a sound box for talking machines, a stylus bar, trunnions bearing against said sound box and upon which said stylus bar oscillates, a spring comprising a collar surrounding said stylus bar, radial arms engaging said sound box, and means also mounted on said stylus bar to exert a tension on said spring in the direction of the longitudinal axis of said stylus bar.

6. In a sound recording and reproducing device, a sound box casing; a stylus bar extending through an orifice in the side of said casing, a hollow cylindrical cap having bearing surfaces therein and upon which the said stylus bar is adapted to oscillate upon a transverse axis, a head attached to said stylus beyond said cap and a compression spring arranged between said cap and said head to hold the cap against the side of the casing and the stylus bar upon its bearing surfaces.

7. In a sound recording and reproducing device, a sound box casing having an aperture in the side thereof, a circular cap having bearing seats therein covering said orifice, the said circular cap having an aperture substantially in alinement with the aperture in the casing, a stylus bar extending through said apertures and having a transverse axial bearing, a head upon said stylus bar beyond said cap and a compression spring arranged between said head and said cap whereby the latter is held in engagement with the casing, and the axial bearing of the stylus is held under tension.

8. In a sound recording and reproducing device, the combination with a sound box casing of a stylus bar, a cap having an orifice therein engaging the outer wall of said casing, bearing surfaces within said cap, means for mounting said stylus bar upon said bearing surfaces, the said stylus bar extending through said orifice in the cap and having a head mounted thereon outside the same, and a compression spring arranged between said cap and said head to hold

the cap in engagement with said casing and to hold the mounting means in engagement with the bearing surfaces.

9. In a sound box, a stylus bar, a mounting therefor restraining said bar to oscillate in a single plane, and a compressed spring surrounding the said bar to hold the same upon the said mounting.

10. In a sound box, a stylus bar, a mounting therefor restraining said bar to oscillate in a single plane, and a compressed spring for tensioning said bar upon its mounting, the longitudinal axis of said spring being normally substantially coincident with the longitudinal axis of the said bar at the mounting.

11. In a sound box, a stylus bar, a mounting therefor, and a spring collar surrounding said stylus bar and having radial arms engaging the said sound box to hold the said stylus bar upon its mounting.

12. In a sound box, a stylus bar, a mounting therefor, and a spring collar surrounding said stylus bar and having radial arms engaging in grooves and provided therefor in the said sound box to hold the said stylus bar upon its mounting.

13. In a sound box, a stylus bar, a mounting therefor, a spring collar surrounding said stylus bar, and a head threaded upon said stylus bar and engaging said spring collar to compress the same to hold the said stylus bar upon its mounting.

14. In a sound box, a stylus bar, a mounting therefor, and a compressed spring surrounding the said bar to hold the same upon the said mounting, said bar being held in a fixed position longitudinally.

15. In a sound box, a stylus bar, a mount-

ing therefor, and a compressed spring for tensioning said bar upon its mounting, the longitudinal axis of said spring being normally substantially coincident with the longitudinal axis of the said bar at the mounting, said bar being held in a fixed position longitudinally.

16. In a sound reproducer, a stylus bar mounted to oscillate on a fixed axis, and a compressed spring surrounding said bar for exerting pressure normally in a plane of said axis of oscillation, to tension said bar.

17. In a sound box, the combination with the casing, of a stylus bar mounted thereon, and means exerting pressure on said stylus bar tending to force said bar longitudinally away from said sound box casing.

18. In a sound box, the combination with the casing, of a stylus bar, trunnions on said bar, bearings for said trunnions, and means exerting pressure on said stylus bar to hold said trunnions in said bearings and tending to force said bar longitudinally away from said sound box casing.

19. In a sound box, the combination with the casing, having a sound conveying opening in the one wall thereof, of a diaphragm having means integral therewith engaging said wall, to determine the position of said diaphragm with respect to said wall and to retain the said diaphragm in position in said casing.

In witness whereof, I have hereunto set my hand this 15th day of May, A. D. 1906.

JOHN C. ENGLISH.

Witnesses:

CORA A. WITMER,
ALEXANDER PARK.