

M. KEEN.
SOUND BOX FOR TALKING MACHINES.
APPLICATION FILED JULY 9, 1909.

940,161.

Patented Nov. 16, 1909.

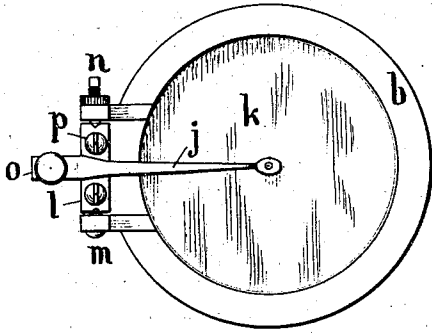


Fig. 1

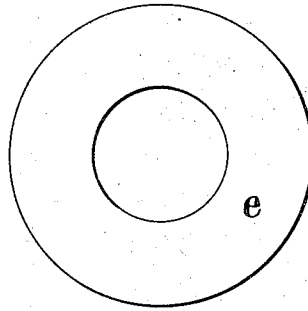


Fig. 5

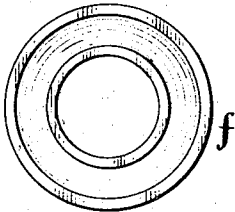


Fig. 4

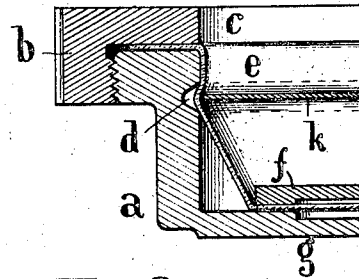


Fig. 3

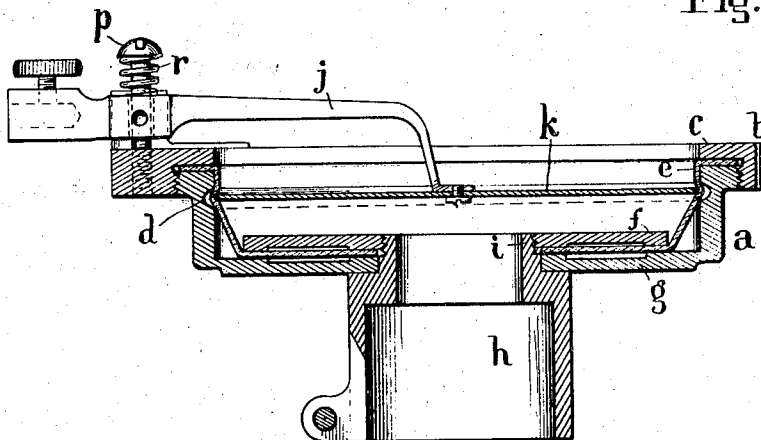


Fig. 2

WITNESSES
P. M. Kelly.
E. G. Farley.

INVENTOR
Morris Keen
BY *J. M. [Signature]*
ATTORNEY

UNITED STATES PATENT OFFICE.

MORRIS KEEN, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-BOX FOR TALKING-MACHINES.

940,161.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed July 9, 1909. Serial No. 506,664.

To all whom it may concern:

Be it known that I, MORRIS KEEN, a citizen of the United States, and a resident of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Sound-Boxes for Talking-Machines, of which the following is a specification.

My invention has reference to sound boxes for talking machines and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

The object of my invention is to provide a construction of sound box in which the diaphragm is yieldingly supported in the box so that it has capacity for vibration adjacent to its perimeter as well as at its center and to otherwise construct the sound box as a whole that it will be inexpensive to construct, sensitive in action and easily and quickly repaired.

My invention consists of certain features of construction which are fully described hereinafter and more particularly defined in the claims.

The invention will be better understood by reference to the drawings, in which:

Figure 1 is an elevation of a sound box embodying my invention; Fig. 2 is a cross sectional view of the same; Fig. 3 is an enlarged cross section of a portion of the same; Fig. 4 is a plan view of the clamping annular plate; and Fig. 5 is a plan view of the yielding lining before being applied to the box.

a is the body of the box and is made circular with an annular back *g*. The open end of this box *a* is screw-threaded upon the outside and upon which is serewed a cap *b*, the inner annular flange *c* of which coöperates with the annular rim of the box to clamp a yielding lining *e*. The yielding lining *e* may be of rubber, felt or other textile or elastic material and having an annular shape indicated in Fig. 5 before being applied within the box. When applied in position within the box, the outer perimeter of this lining is first clamped between the flange *c* and the rim of the body *a*. A washer or annular ring *f* is then placed over the middle part of the lining and pressed downward into the box with its central aperture in line with the aperture in the middle of the back *g* of the box. A rear tubular

part *h* having the screw-threaded shank *i* is then placed in position at the back of the box with the tubular screw-threaded end *i* extending through the aperture thereof and screwed into the aperture in the washer or annular ring *f*. By turning the tubular part *h* upon the sound box body the clamping washer or ring *f* is drawn toward the back *g* until it tightly clamps the yielding lining *e*, as indicated in Figs. 2 and 3. The lining will then be stretched from the clamping cap *b* down to the clamping washer or ring *f* and forms a conical lining to the body. A diaphragm *k* of metal or other suitable material, having a diameter slightly less than the inner diameter of the body *a*, is pressed downward into the yielding lining *e* and is held in position parallel to the back of the box and the washer or clamping ring *f* thereof.

To give to the diaphragm a desirable yielding support about its perimeter, I provide a deep and wide annular groove *d* on the inner face of the body *a* and immediately in line with the diaphragm so that the yielding lining is stretched over the edge of the diaphragm and is supported by the body *a* on each side of the annular groove *d*. As the yielding lining is free to move in all directions adjacent to the perimeter of the diaphragm it will be understood that in vibrating the diaphragm, not only will the center be vibrated, but the perimeter of the diaphragm will also have more or less free vibration in a direction at a right angle to the plane of the diaphragm. The diaphragm is, in effect, a floating diaphragm free to be moved bodily by the stylus bar. The yielding lining *e* is supported tightly against the inner face of the body between the annular groove *d* and the flange *c* of the clamping cap *b* and from the groove downward it is preferably clear of the inner wall of the body. By examining Fig. 3, it will be seen that the diaphragm is normally held in a yielding manner by the flexible lining and while no great strain is put upon the diaphragm to interfere with its movement in any direction, there is no possibility of escape of air around the perimeter of the diaphragm.

j is a stylus bar and has one end secured to the center of the diaphragm *k* and the other end provided with a clamp *o* for receiving and holding the stylus or needle point. The stylus bar *j* is pivoted to the cap

b at m and n so that it is free to oscillate upon an axis arranged parallel to the plane of the diaphragm. To provide room for the adjustment springs, I prefer to form the stylus bar cross shaped, as indicated in Fig. 1. The cross piece l of the stylus bar is provided with large holes through which the adjusting screws p extend and said screws are screwed into the cap b , as clearly indicated in Figs. 1 and 2. Between the heads of the screw and the cross piece l of the stylus bar, I provide coil springs r which press upon the stylus bar structure to hold it in a normally intermediate position and with provisions for adjustment to make it more or less sensitive to being oscillated and by which to regulate the degree of vibration permitted to the diaphragm.

Other ways of supporting the stylus bar may be employed in place of that shown, as my improved manner of holding the diaphragm may be employed with any mechanism for supporting the stylus bar which will permit freedom of vibration of the diaphragm.

While I prefer in practice, to employ rubber for the lining c , as I have found this best suited for the purpose; I may nevertheless employ felt, flannel or other textile material having yielding properties, if so desired.

Other means of holding the clamping washer f may be employed in lieu of those shown; and in general, while I prefer the construction illustrated, I do not restrict myself to the minor details thereof, as these may be modified without departing from the spirit of the invention.

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

1. In a sound box, a body part having a circular interior provided with an annularly grooved wall, combined with a yielding lining secured to the body at its front part and extending inwardly over the annular groove and secured adjacent to the back of the body, a diaphragm yieldingly supported by the yielding lining adjacent to and in the plane of the annular groove, and a stylus bar having a connection with the diaphragm.

2. In a sound box, a body part having a circular interior provided with an annularly grooved wall, combined with a yielding lining secured to the body at its front part and extending inwardly over the annular groove and secured adjacent to the back of the body by a clamping ring within the body for clamping the middle part of the yielding lining adjacent to the back of the body, means to hold the clamping ring in position upon the back, a diaphragm yieldingly supported by the yielding lining adjacent to and in the plane of the annular groove, and a stylus bar having a connection with the diaphragm.

3. In a sound box, a body part having a circular interior provided with an annularly grooved wall, combined with a yielding lining secured to the body at its front part and extending inwardly over the annular groove and secured adjacent to the back of the body by a clamping ring within the body for clamping the middle part of the yielding lining adjacent to the back of the body, means to hold the clamping ring in position upon the back consisting of a tubular part resting against the back and having a screw-threaded end extending through the back and engaging the clamping ring, a diaphragm yieldingly supported by the yielding lining adjacent to and in the plane of the annular groove, and a stylus bar having a connection with the diaphragm.

4. In a sound box, a body part having a circular interior provided with an annularly grooved wall, combined with a yielding lining secured to the body at its front part and extending inwardly over the annular groove and secured adjacent to the back of the body, a diaphragm yieldingly supported by the yielding lining adjacent to and in the plane of the annular groove, a stylus bar having a connection with the diaphragm, and means for yieldingly supporting the stylus bar normally in an intermediate position for holding the diaphragm in line with the annular groove in the body.

5. In a sound box, the combination of a circular body having its inner wall provided with a deep annular groove, a clamping cap adapted to the outer rim of the body, an annular lining of yielding material clamped between the rim of the body and the cap, means within the body for clamping the inner part of the yielding lining at a point within the body, a diaphragm within the body and engaging the yielding lining in the plane of the deep annular groove, and a stylus bar connected with the diaphragm.

6. In a sound box, the combination of a circular body having its inner wall provided with a deep annular groove, a clamping cap adapted to the outer rim of the body, an annular lining of yielding material clamped between the rim of the body and the cap, means within the body for clamping the inner part of the yielding lining at a point within the body consisting of an annular clamping plate, a screw-threaded tubular part extending through the back of the body and engaging the annular clamping plate, a diaphragm within the body and engaging the yielding lining in the plane of the deep annular groove, and a stylus bar connected with the diaphragm.

7. In a sound box, the combination of a metallic box having a circular interior, a lining of yielding material forming a circular yielding wall within the box unsupported in a plane between its outer and inner edges,

a diaphragm having its perimeter pressed into contact with the yielding lining at a place corresponding to the plane thereof which is unsupported whereby the diaphragm is yieldingly supported by the lining, and a stylus bar having a connection with the body for vibrating the diaphragm.

In testimony of which invention, I hereunto set my hand.

MORRIS KEEN.

Witnesses:

R. M. HUNTER,
R. M. KELLY.