R. T. BELL.

SOUND BOX FOR SOUND REPRODUCING MACHINES.

APPLICATION FILED MAR. 15, 1919.

1,322,997. Patented Nov. 25, 1919.

Fig. 1

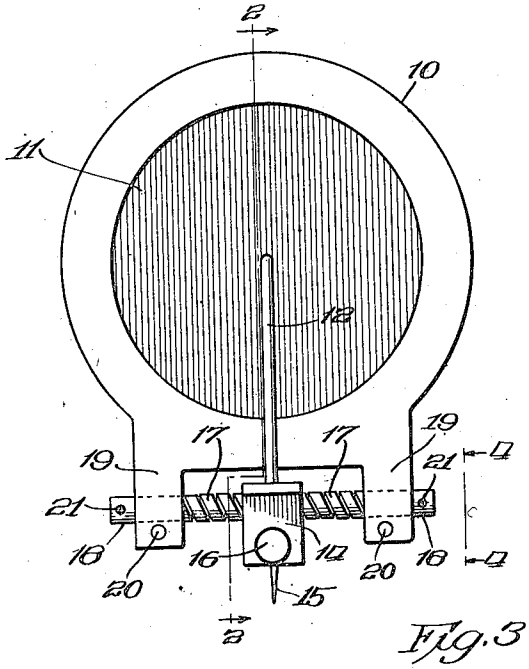



Fig. 2

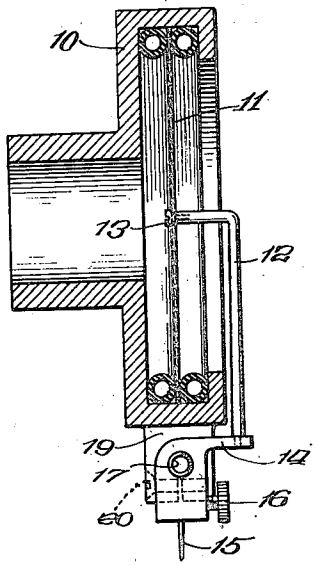



Fig. 3

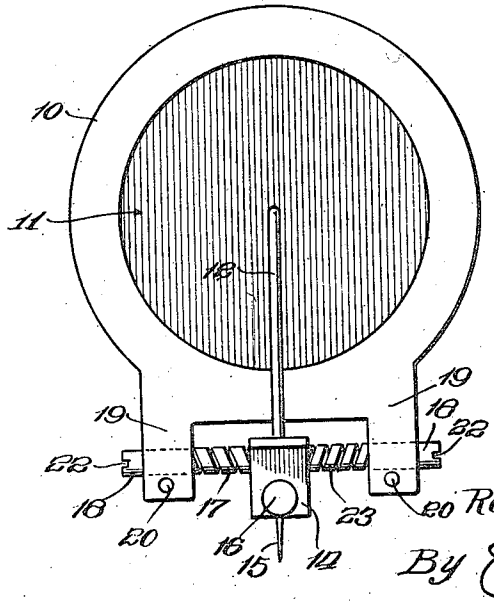
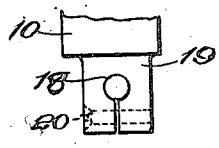



Fig. 4

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# UNITED STATES PATENT OFFICE.

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## SOUND-BOX FOR SOUND-REPRODUCING MACHINES.

1,322,997. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed March 15, 1919. Serial No. 282,834.

*To all whom it may concern:*

Be it known that I, RAYMOND T. BELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sound-Boxes for Sound-Reproducing Machines, of which the following is a specification.

This invention relates to improvements in sound box for sound reproducing machines and one of the objects of the invention is to improve and simplify the construction thereof, eliminate friction and overcome excessive vibration of the parts, and at the same time improve the flexibility of the diaphragm.

A further object is to provide an improved construction whereby a very sensitive adjustment of the diaphragm may be obtained and the tonal qualities of the sound box will be improved.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed and shown in the accompanying drawing illustrating this invention and in which—

Figure 1 is a front elevation of an improved sound box of this character constructed in accordance with the principles of this invention.

Fig. 2 is a vertical sectional view as taken on line 2—2, Fig. 1.

Fig. 3 is a view similar to Fig. 1 of a modified form of the invention.

Fig. 4 is a detail view in elevation taken on line 4—4, Fig. 1.

Referring more particularly to the drawing the numeral 10 designates generally the casing of the sound box, 11 the diaphragm and 12 the stylus bar, all of the ordinary and well known construction.

The stylus bar 12 is connected with the diaphragm at 13 in the usual or in any desired manner while its other end is connected with the support 14 in any suitable manner. The support 14 is provided with the usual opening for receiving the stylus or needle 15, and the usual clamping screw 16 is provided for holding the stylus removably in position.

The support 14 is held in position by means of an elastic connection between the support and the casing of the sound box 10. In the form of this invention shown in Fig. 1 the elastic support is here shown as embodying a coiled element to which the support is rigidly attached to form elastic projections 17 which extend laterally from opposite sides of the support 14, and the extremities 18 of these projections are shaped to form bearing portions adapted to be seated in spaced bearings 19 and between which bearings the stylus bar 12 and support 14 are arranged. The bearings 19 are preferably split as shown more clearly in Fig. 4 so that the portions 18 of the elastic support will pass into the split portions of the respective bearings and will be frictionally held or gripped by forcing the split portions of the bearings together. This may be accomplished by providing a screw 20 adapted to draw the portions of the bearings together. The bearings 19 may be spaced apart for any desired distance, according to the length of the elastic element 17 that it is desired to employ and the extremities 18 of the element project beyond the bearings 19 so that ready access may be had thereto, and also to permit of a torsional adjustment of the elastic element when desired. This adjustment may be accomplished by loosening the screw 20 and either twisting the element 17 on its longitudinal axis and which axis on either one or both sides of the support 14 is arranged transverse to the longitudinal axis of the stylus bar 12 or the element 17 may be expanded by separating the ends 18 to draw out the coils of the element or the ends 18 may be forced together to compress or force the coils together. When the desired adjustment of the elastic element is obtained, the screw 20 may be tightened to cause the bearing elements to grip the element 17 and thereby maintain the adjustment. This adjustment of the element may be imparted thereto in any desired or suitable manner. In the form of the invention shown in Fig. 1 the portion 18 of the element which projects beyond the bearing is provided with an opening 21 into which a suitable implement may be inserted, while in the form of the invention shown in Fig. 3 the extremity 18 of the element which projects beyond the bearing 19 is provided with a groove or slot 22 into which a screw-driver or other implement may be inserted when it is desired to vary

the tension of the element 17 by twisting the same. Obviously any other means may be provided for obtaining this torsional adjustment.

In the form of the invention shown in Fig. 1 the convolutions of the elastic element 17 on both sides of the support 14 extend in the same general direction, whereas with the form of the invention shown in Fig. 3 the elastic element is constructed of two separate parts each secured by one end to the support 14 and the convolutions 17 of one of the parts on one side of the support 14 extends in one direction while the convolutions 23 of the other part on the other side of the support 14 extend in the opposite direction.

With this improved construction it will be seen that the flexible element constitutes a yielding support for the stylus bar 12 and also serves as the pivot for the bar, and by imparting an adjustment to the elastic element it will be manifest that a very sensitive adjustment of the diaphragm may be obtained which will improve the flexibility of the diaphragm.

At the same time the present construction eliminates friction and reduces to a minimum the chatter of the parts and also overcomes excessive vibration. Obviously the elastic member may be given a different degree of adjustment on the opposite sides of the support 14, if desired or necessary, or may be given the same degree of adjustment and when such adjustment is obtained it will be maintained by forcing the portions of the bearing into clamping relation with respect to the element.

While in the present form of the invention the elastic member is illustrated as being a coiled elastic member, it is obvious that any other elastic element adapted for torsional adjustment may be employed with equal efficiency and instead of providing an element of this character the convolutions of which are constructed of coils substantially flat, it is to be understood that the coils or convolutions may be of any desired form or configuration in cross-section.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts without departing from the spirit of this invention.

What is claimed as new is:—

1. A sound box for sound reproducing machines embodying a stylus bar, a normally coiled elastic element connected with the stylus bar and extending laterally therefrom, and means connected with the sound box and with which means the elastic element has connection for yieldingly supporting the stylus bar.

2. A sound box for sound reproducing machines embodying a stylus bar, a coiled elastic element connected with the stylus bar and extending laterally therefrom for yieldingly supporting the stylus bar, and means connected with the sound box and with which means the elastic element is releasably connected whereby the tension of the said element may be varied.

3. A sound box for sound reproducing machines embodying a stylus bar, a coiled elastic element interposed between the stylus bar and to the sound box for yieldingly supporting the stylus bar, and means connected with the sound box and in which means the said element is releasably mounted whereby the stress of the said element may be varied and for maintaining such variation.

4. A sound box for sound reproducing machines embodying a stylus bar, an elastic element interposed between the stylus bar and the sound box, said element being adapted for torsional adjustment on an axis transverse to the longitudinal axis of the stylus bar and also for adjustment lengthwise of the said longitudinal axis.

5. A sound box for sound reproducing machines embodying a stylus bar, a coiled elastic element interposed between the stylus bar and the sound box, said element being adapted for torsional adjustment and for adjustment lengthwise thereof to expand or compress the coils, and provisions for maintaining such adjustment.

6. A sound box for sound reproducing machines embodying a stylus bar, a normally coiled element connected with the bar and forming a pivot for the bar, the axis of the pivot being transverse to the longitudinal axis of the bar, said element being adapted for a plurality of different adjustments to vary the tension thereof, and provisions for maintaining such adjustment.

7. A sound box for sound reproducing machines embodying a stylus bar, oppositely extending coiled elastic projections connected with the bar, and spaced bearings with which the elastic projections are respectively connected to form a pivot for the stylus bar, said projections being adapted for torsional adjustment on an axis transverse to the longitudinal axis of the stylus and also for adjustment in directions lengthwise of the longitudinal axis of the said projections to compress or expand the coils of the projections.

In testimony whereof I have signed my name to this specification, on this 13th day of March, A. D. 1919.

RAYMOND T. BELL.