No. 749,360. PATENTED JAN. 12, 1904.

G. K. CHENEY.

SOUND BOX FOR SOUND RECORDING AND REPRODUCING MACHINES.

APPLICATION FILED APR. 16, 1902.

NO MODEL.

Fig. 1.

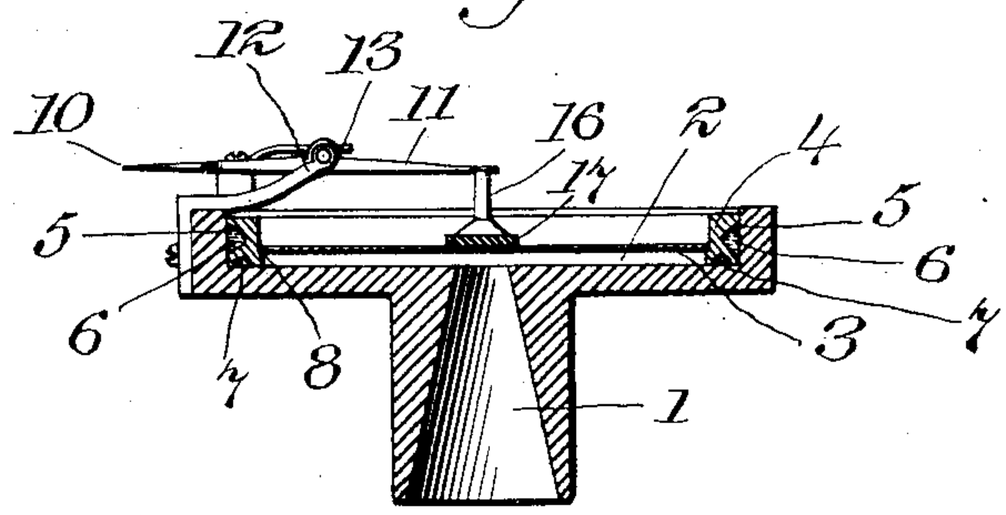


Fig. 2.

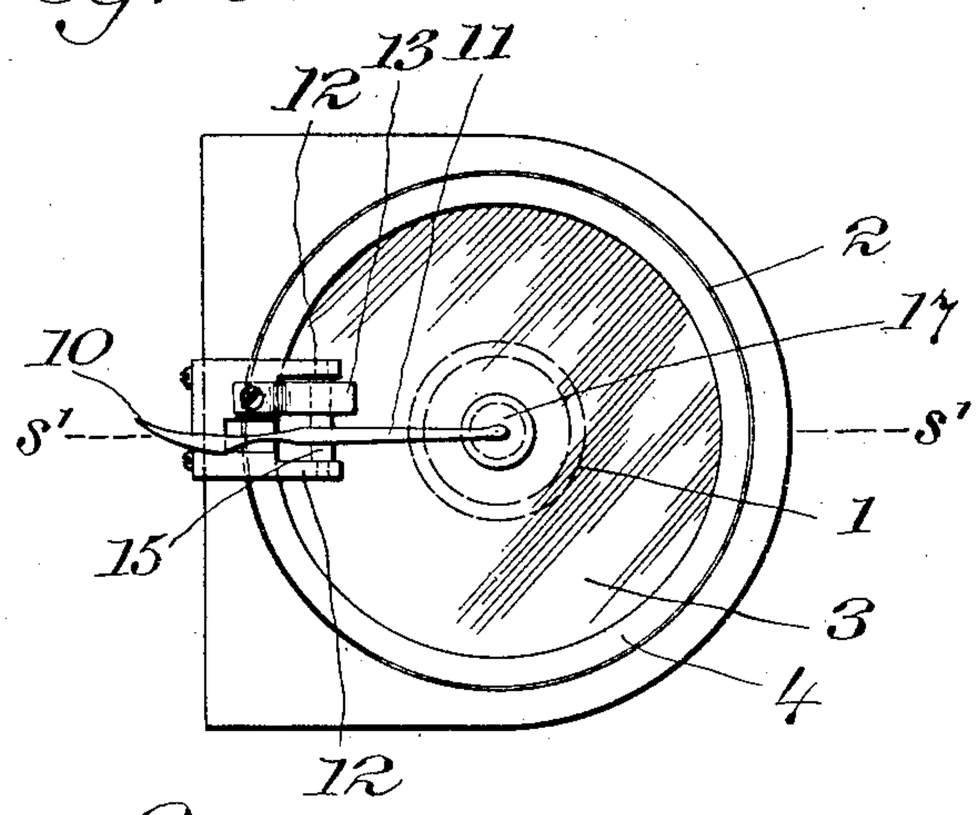


Fig. 3.

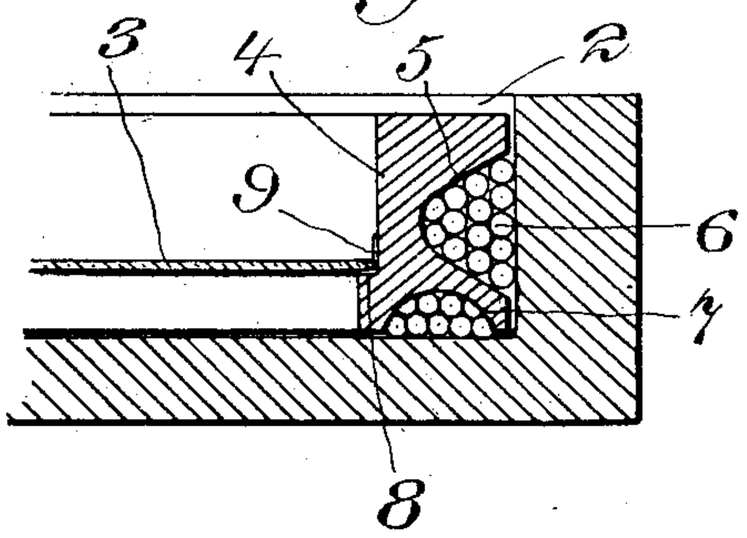
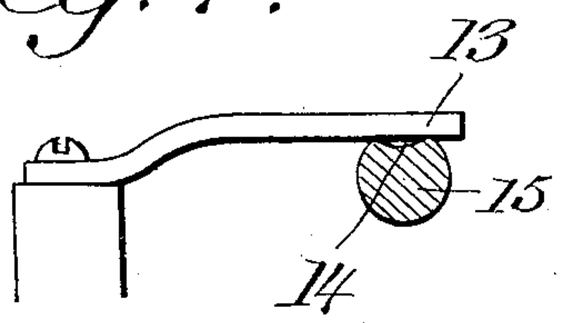


Fig. 4.



WITNESSES:

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No. 749,360. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

GEORGE K. CHENEY, OF NEW YORK, N. Y., ASSIGNOR TO UNIVERSAL TALKING MACHINE MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

SOUND-BOX FOR SOUND RECORDING AND REPRODUCING MACHINES.

SPECIFICATION forming part of Letters Patent No. 749,360, dated January 12, 1904.

Application filed April 16, 1902. Serial No. 103,154. (No model.)

To all whom it may concern:

Be it known that I, GEORGE K. CHENEY, a citizen of the United States of America, and a resident of the city of New York, county of New York, State of New York, have invented certain new and useful Improvements in Sound-Boxes for Sound Recording and Reproducing Machines, of which the following is a specification.

My invention relates to sound recording and reproducing machines, and more specifically to certain improvements in the construction of the sound-box employed therein.

One embodiment of the invention is illustrated in the accompanying sheet of drawings, throughout the several views of which like reference-numerals indicate corresponding parts.

In the drawings, Figure 1 is a sectional view taken on the line $s' s'$ of Fig. 2, the stylus and its support being shown in elevation. Fig. 2 is a plan view thereof. Fig. 3 is an enlarged detail sectional view showing the manner of mounting the diaphragm in the sound-box casing, and Fig. 4 is an enlarged detail view of the centering-spring for the stylus-arm.

Referring to the drawings, the sound-box casing is represented as provided in the usual manner with a tubular extension 1 for connection with the horn and a circular chamber 2 for the diaphragm. Within this chamber the diaphragm 3 is mounted in a floating ring 4. The outside diameter of this ring is a trifle less than the diameter of the chamber to provide sufficient clearance to permit a free up-and-down movement of the ring. In order to center the ring and provide an antifriction and noiseless bearing, it is grooved peripherally, as shown at 5, and the groove filled with a heavy liquid—such as oil, glycerin, mercury, or the like—which, as indicated in Fig. 3, serves in a sense as a ball-bearing and holds the ring away from or out of contact with the annular wall of the diaphragm-chamber. If desired, a second groove 7 may be formed on the bottom of the ring and filled with liquid to support it clear of the bottom of the chamber. Within this floating ring an annular shoulder 8 is formed to provide a seat for the diaphragm. The shoulder is made very slight, so that the diaphragm has only the smallest possible marginal bearing thereon. I preferably secure the diaphragm elastically upon its seat by a coating of wax 9, the diaphragm being placed thereon while the wax is soft and adhesively secured as it hardens.

The recording point or stylus 10, forming a continuation of the stylus-arm 11, is trunnioned in bracketed bearings 12 12 and is free to vibrate under the yielding resistance of a plate-spring 13, which, as shown in Fig. 4, engages a flattened or concaved portion 14 of the needle-arm shaft 15, and thereby serves to maintain the arm in a central position. The stylus-arm may be connected with the diaphragm in any suitable or well-known manner—as, for example, by means of the post 16—and there is preferably interposed between the diaphragm and the arm or post a disk of elastic material 17, such as rubber or the like.

While the sound-box, as above described, is particularly adapted for use in recording, it may be readily converted into a reproducing instrument by substituting for the recording-point shown an ordinary needle or stylus, with means for readily removing and renewing the same. In either recording or reproducing sound the diaphragm is free to vibrate throughout its entire area by reason of its being elastically connected to its seat through the interposed layer or coating of wax, and the full force and effect of the sound-waves is thereby secured. In addition to its ordinary vibratory action the diaphragm may move bodily with its floating-ring support and thereby avoid buckling by more readily adapting itself to coöperate with the needle-arm in receiving and transmitting vibrations. The rubber disk interposed between the stylus-arm and the diaphragm in yielding to the outward vibrations affords greater amplitude of movement of the diaphragm and thereby improves the tone by increasing its clearness and volume.

The operation, &c., will be readily understood from the foregoing description.

I do not wish to limit myself to the exact construction and arrangement of parts herein shown and described, as various changes might be made without departing from the spirit and scope of my invention. For example, other forms of floating diaphragm might be employed and the diaphragm might be differently mounted. The bracketed bearings for the stylus-arm and the form of centering-spring might be changed, &c.; but all such modifications I consider obvious and immaterial variations of form and not of substance and still within the meaning of my invention.

Having therefore described my invention, I claim—

1. The combination of a sound-box, a diaphragm, a floating support in which the diaphragm is adhesively secured, said support being freely movable in and confined by the walls of the sound-box and an operatively-connected stylus.

2. The combination of the sound-box, a floating ring therein, provided with an annular seat, a diaphragm, an interposed elastic material adhesively securing the diaphragm upon the annular seat and a coöperating stylus.

3. The combination of the sound-box, a floating ring therein, provided with an annular seat, a diaphragm, an interposed elastic material adhesively securing the diaphragm upon the annular seat, the stylus elastically connected with the diaphragm, bearings in which the stylus is mounted to vibrate freely, and a retractile spring for the stylus.

4. The combination of the sound-box, a floating ring therein, provided with an annular seat, a diaphragm, an interposed elastic material adhesively securing the diaphragm upon the annular seat, a coöperating stylus trunnioned in bracketed bearings to vibrate freely, and a spring engaging a flattened portion of one of the trunnions.

Signed at New York city, New York, this 15th day of April, 1902.

GEORGE K. CHENEY.

Witnesses:

W. H. PUMPHREY,

L. E. PEARSON.