A. HAUG.

TALKING MACHINE.

APPLICATION FILED MAY 21, 1918.

1,281,565. Patented Oct. 15, 1918.

Fig. 1.

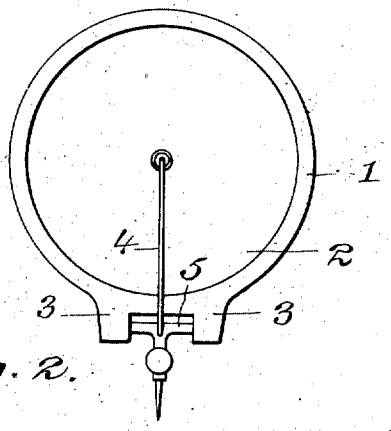


Fig. 2.

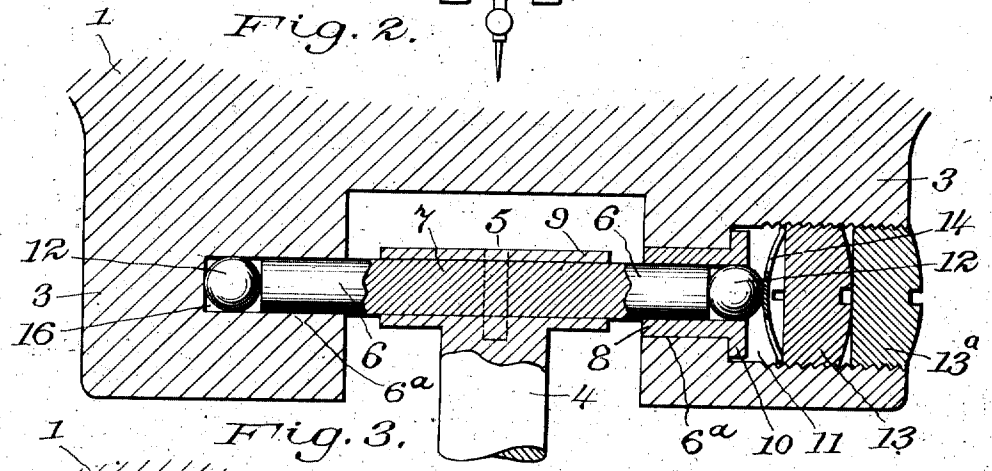


Fig. 3.

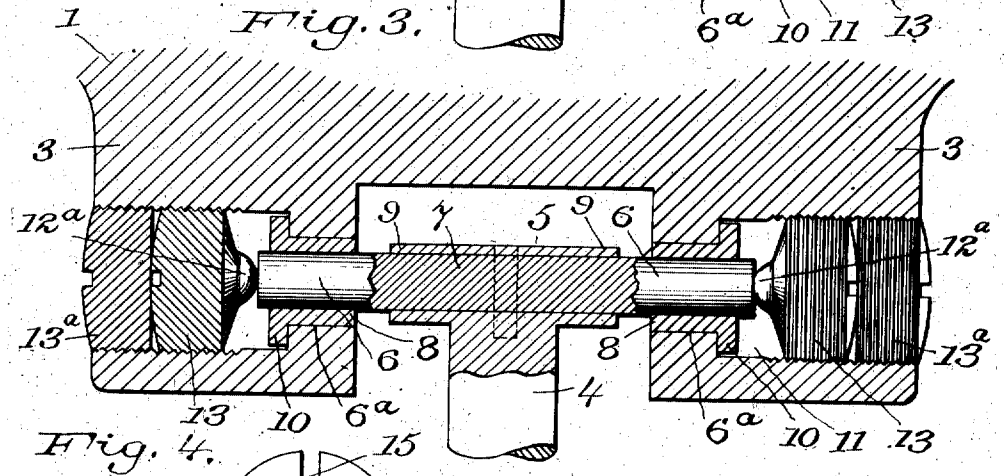
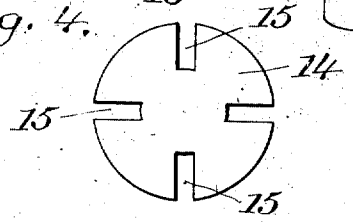


Fig. 4.



Inventor

Andrew Haug

By his Attorney

Walter H. Pumphrey.

UNITED STATES PATENT OFFICE.

ANDREW HAUG, OF NEW YORK, N. Y.

TALKING-MACHINE.

1,281,565. Specification of Letters Patent. Patented Oct. 15, 1918.

Application filed May 21, 1917. Serial No. 235,906.

To all whom it may concern:

Be it known that I, ANDREW HAUG, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Talking-Machines, of which the following is a specification.

My invention relates generally to talking machines and has particular reference to the construction of sound-boxes for use in connection with such machines.

The primary object of the invention is to obtain better tone quality of the reproduced sound by constructing the sound-box in a manner to give it freer action and greater sensitiveness, thereby rendering it more fully responsive, particularly to the finer vibrations of the record, which are ordinarily damped out and lost in the use of sound-boxes now on the market, as a result of frictional resistance and pressure on the moving parts thereof.

I have found by experiment and test that greatly improved results are obtained in tone quality, when the diaphragm and stylus arm of the sound-box are operatively connected in such relation that normally or when the sound-box is not in use, no pull or pressure is exerted by the stylus arm on the diaphragm and the latter, excepting its usual circumferential mounting, is entirely free of tension.

A second important feature of the invention consists in mounting the stylus arm so that it will be firmly held against lost motion or rattling and at the same time, free to vibrate with the least possible amount of friction.

In connection with the peculiar mounting of the stylus arm, an additional and even more important feature of the invention consists in the provision of means for varying the pressure between the pivotal centers on which the stylus arm turns, to "tune" the sound-box. That is to say, by increasing the pressure, the pitch of the box is raised and on reducing the pressure, the pitch is lowered. The important resulting advantages will be apparent.

A clearer understanding of the above and other novel features of the invention may be had from the following detailed description:

In the accompanying drawings, I have illustrated several constructions suitable for carrying my invention into effect. I wish it understood, however, that I do not limit myself to the exact forms shown in the drawings, as various changes may be made therein without departing from the spirit and scope of the invention.

In these drawings:

Figure 1 is a face view of the sound-box.

Fig. 2 is a sectional view taken horizontally through the pivotal centers on which the stylus arm vibrates.

Fig. 3 is a similar view of a slightly modified form, and

Fig. 4 is a detail view of the spring disk shown in Fig. 2.

Referring now to the drawings, 1 represents the casing of the sound-box and 2 the diaphragm mounted therein in any suitable or well-known manner, preferably by being yieldingly held circumferentially between rubber gaskets, (not shown), as is commonly done in the art.

Projecting outward in parallel relation from the casing 1, there are two lugs 3, 3, in which the stylus arm 4 is trunnioned, as indicated at 5.

The trunnions are formed by the oppositely projecting ends 6, 6, of a hardened steel pin 7, which is driven transversely through or otherwise made fast to the stylus arm to form, in effect, an integral part of it.

Bearings 6^a, 6^a, for the trunnions are provided by boring out the lugs 3, 3, as shown. Either or both of these bearings may have a removable bushing 8, fitted therein to facilitate assembling, it being necessary, in placing the stylus arm in position between the lugs, to first insert one trunnion and the adjoining boss 9 of the arm in the bore of one lug before the bushing is placed therein, in order to enter the other trunnion in the opposite bearing. The arm is then centered and the bushing or bushings inserted.

Only one bearing is usually bushed, this being found sufficient to enable the stylus arm to be readily mounted in the bearings.

The bushing is provided with an integral terminal flange 10, which rests against the annular end wall of a counter-bored portion 11 of the lug, as shown.

Coöperating with the flat or plane surface presented by the ends of the trunnions, there are hardened steel balls or their equivalents, indicated at 12, which come to a bear-

ing axially of the trunnions and exactly in the line of centers about which the stylus arm vibrates.

By means of one or more fine threaded screws 13, in the outer tapped portions of the bore of the lugs, I am enabled to force the balls inward and thereby exert the necessary pressure on the arm to tension it as required for the purpose of tuning the sound-box.

It is important to note that by reason of the peculiar manner in which such pressure is applied, that is to say, axially of the vibrating center of the arm, there will be no appreciable resulting friction tending to limit or check the free vibrating movement of the arm. Having overcome the retarding effect of friction in the manner stated, it will be seen that there are practically no limits to the pressure that may be applied to tension the arm, and that therefore the tuning of the sound-box to give best results is reduced to the simple adjustment of the pressure screws to vary the tension of the stylus arm.

When the sound-box is not subjected to changes in temperature, the form of the device shown in Fig. 3 will ordinarily operate satisfactorily, once the sound-box is tuned. In this construction, it will be observed that the pressure-regulating screws are rounded at the ends, as indicated at 12^a, approximating a portion of a sphere and that such rounded portions bear directly against the trunnions of the stylus arm, thus serving, when properly adjusted, to maintain the arm under the required tension. Under marked changes in temperature, as will be obvious, the expansion and contraction of the metal is often sufficient to destroy the adjustment and so vary the pressure and tension of the stylus arm as to require a frequent re-tuning of the box.

In order to adapt the sound-box for general use regardless of changes in temperature, the form shown in Figure 2 may be employed, in which a tension disk 14, is interposed in the line of applied pressure and by its resilience serves to compensate for any and all expansion and contraction of the metallic members.

The tension disk 14 is preferably given a concaved form and is split radially to about one-third of its diameter at a number of points about its circumference, as indicated at 15. As shown, it is interposed between the pressure screw 13 and the adjoining ball-bearing 12, the convex side of the disk coacting directly with the ball. In this construction only one pressure-regulating screw 13 is employed and is secured, as adjusted, by a locking-screw 13^a, the opposite trunnion and ball being fitted in a socket 16 formed in the other lug of the sound-box casing.

As the many important advantages of the invention will be apparent from the foregoing description, it will not be necessary to specifically mention or further elaborate the same.

Having, therefore, described my invention, I claim:—

1. In a sound box, a stylus arm having bearing extensions on each side thereof, bearing lugs receiving and holding the bearing extensions for pivotal movement, coöperating ball bearings applied to opposite sides of the bearing extensions of the arm and axially thereof in the line of centers about which the arm vibrates, and controllable means exerting pressure on the balls to vary the tension of the arm.

2. In a sound box, a stylus arm having bearing extensions on each side thereof, bearing lugs receiving and holding the bearing extensions for pivotal movement, coöperating ball bearings applied to opposite sides of the bearing extensions of the arm and axially thereof in the line of centers about which the arm vibrates, and adjustable means exerting yielding pressure on the balls to vary the tension of the arm.

3. In a sound box, a stylus arm having bearing extensions on each side thereof, bearing lugs receiving and holding the bearing extensions for pivotal movement, a diaphragm normally free of tension and operatively connected with the arm, coöperating ball bearings applied to opposite sides of the bearing extensions of the arm and axially thereof in the line of centers about which the arm vibrates, and controllable means exerting pressure on the balls to vary the tension of the arm.

4. In a sound box, a stylus arm having bearing extensions on each side thereof, bearing lugs receiving and holding the bearing extensions for pivotal movement, coöperating ball bearings applied to opposite sides of the bearing extensions of the arm and axially thereof in the line of centers about which the arm vibrates, a spring exerting pressure on the balls to tension the arm, and means controlling the pressure of the spring.

5. A sound box, comprising a casing provided with bearing lugs, a stylus arm having bearing extensions on each side thereof, said bearing extensions being held by said lugs and serving as a pivot about which the arm vibrates, a diaphragm mounted in the sound box casing, said diaphragm being free of tension at its center and operatively connected with the stylus arm, and tuning means for the sound box consisting of ball-bearings applied to opposite sides of the bearing extensions and axially thereof in the line of centers about which the arm vibrates, and coöperating means exerting requisite pressure on the balls to tension the stylus arm.

6. A sound box comprising a casing provided with integral lugs, a diaphragm mounted in the casing, a stylus arm having

extensions on each side thereof and being operatively connected but normally exerting no pressure on the diaphragm, the said lugs of the casing being adapted to receive and hold the said bearing extensions for pivotal movement of the arm, and tuning means for the sound box consisting of ball bearings applied axially to the plane surfaces formed by the opposite ends of the bearing extensions and pressure regulating means coöperating with the balls to vary the tension of the stylus arm.

7. In a sound box, a stylus arm having plane parallel surfaces formed by the opposite sides thereof, coöperating bearings presenting rounded surfaces, each approximating a portion of a sphere to the plane surfaces of the arm, and adjustable means cooperating with the bearings to exert pressure on the arm to vary the tension thereof, such pressure being applied axially in the line of centers about which the arm vibrates.

ANDREW HAUG.

Witnesses:
J. M. McLachlen,
Joseph F. Bellak.