Aug. 9, 1927. 1,638,424

H. W. WEBB

SOUND RECORDING DEVICE

Filed April 11, 1923 2 Sheets-Sheet 1

Fig. 1.

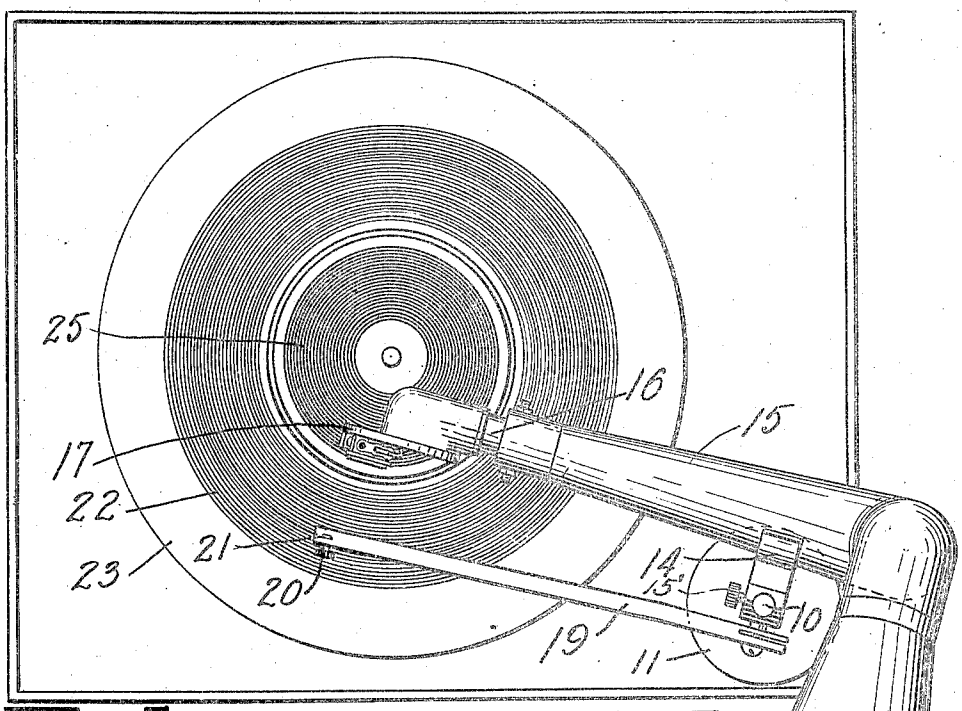


Fig. 7.

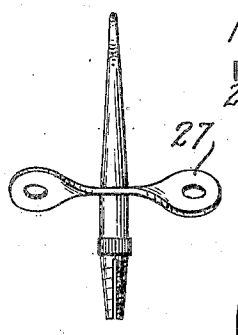
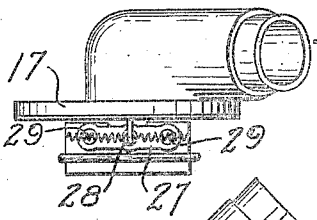
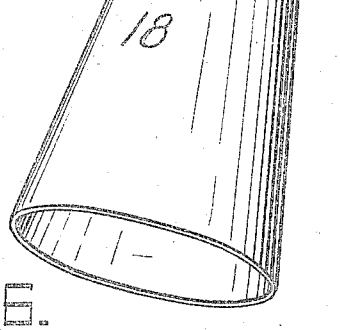


Fig. 5.





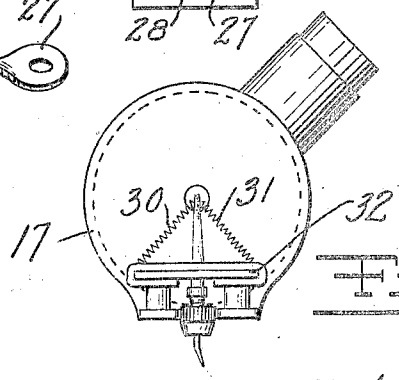


Fig. 6.

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Fig. 2.

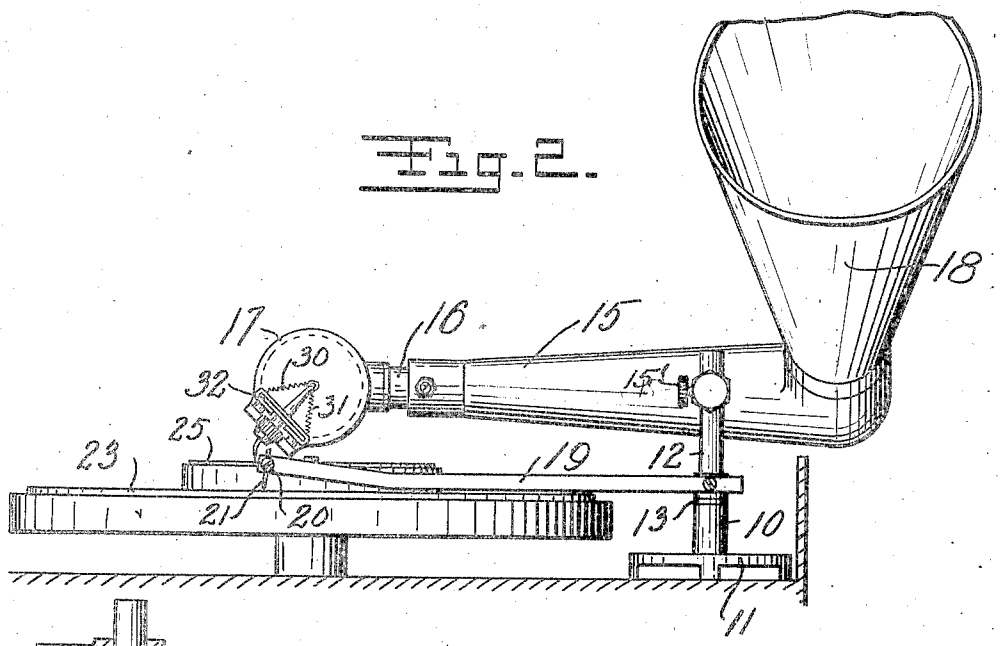


Fig. 4.

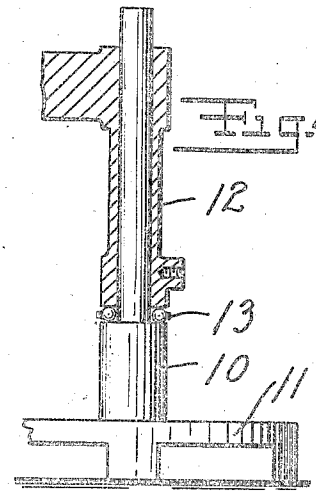


Fig. 3.

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Patented Aug. 9, 1927. 1,638,424

UNITED STATES PATENT OFFICE.

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SOUND-RECORDING DEVICE.

Application filed April 11, 1923. Serial No. 631,265.

This invention relates generally to the construction of sound recording machines and particularly to devices of this general nature which are adapted for home or individual use in the production of talking machine records.

The invention includes a vertical post mounted on a base adapted to be set on the floor of the turntable chamber of any phonograph, the post being provided with a tubular arm terminating in a sound box carrying a cutting stylus and a guiding arm carrying a stylus adapted to follow the tracking groove of a directing groove zone. The other end of the tubular arm terminates in a receiving horn whose weight is so related to the other end of the arm as to produce a desirable balance and distribution of the weight of the parts carried on opposite sides of the post and prevent an undue application of pressure on the cutting stylus as well as to produce a condition of stable equilibrium in the supporting post.

A feature of the invention resides in the mounting of the stylus arm in such manner that it is maintained in a constant state of spring tension exerted in different directions and by means of which the sensitiveness of the stylus to impulses imparted to the sound box diaphragm attains a desirably advantageous operating efficiency.

Another feature of the invention resides in the mounting of the guiding arm in such relation to the tubular arm that there is no vibratable connection therebetween so that the guiding arm and the sound box carrying arm perform their functions without any interference from each other.

Other features of the invention will be hereinafter referred to.

In the drawing, in which a preferred form of the invention has been selected for illustration,

Figure 1 is a plan view of a preferred embodiment of the invention.

Figure 2 is a view in side elevation of the device shown in Figure 1.

Figure 3 is a view similar to Figure 2 taken from the left of Figure 2.

Figure 4 is a sectional view on an enlarged scale of a detail of construction employed in the device.

Figure 5 is a plan view of a sound box and recording stylus.

Figure 6 is a view in side elevation of the device shown in Figure 5.

Figure 7 is a detail view of the stylus holder and spring.

Referring to the drawings for a more detailed description of the invention, at 10 is shown a post extending upwardly from a base member 11 and having a reduced section throughout its upper part to receive a sleeve 12 which is adapted to turn on the reduced post section and rests on a ball bearing structure 13. The sleeve 12 supports a bracket 14 which may be adjusted vertically along the sleeve through the use of the thumb set screw 15'. The bracket 14 is attached to the side of a tapering tubular sound conveying member 15 which is attached at one end through a hinge coupling 16 with a sound box 17 equipped with a recording stylus. The other and larger end of the tubular arm 15 terminates in a sound receiving horn 18 and it will be seen that the attachment of the supporting bracket 14 to a point of the tubular arm intermediate the horn 18 and the sound box 17 produces a balanced relation of the weight supported by the vertical post so that the sound box 17 does not cause the stylus to bear with undue pressure on the wax or other material in which the sound record is being formed.

In addition to the sound-box-supporting tubular arm 15 the sleeve 12 also supports a rigid arm 19 which extends in a direction parallel to the axis of the tubular arm 15 and is provided with a recess and screw 20 for holding a stylus 21 formed of wood or like material. The arm 19 is hinged to be swung vertically about its point of connection with the sleeve 12 and its function is to cooperate with a spiral groove 22 on a disk 23 whose spiral groove guides the arm 19 and the arm 15 and sound box 17. It will be seen that the spaced apart connection of the tubular arm and the guiding arm to the supporting sleeve 12 insures the performance of the respective functions of the tubular arm and the guiding arm without interference through mechanical vibrations, with each other.

The vertical adjustment of the tubular arm 15 along the vertical sleeve 12 provides for the holding of the smaller end of the tubular arm at an elevation such that the sound box 17, through its hinged connection 16 with the tubular arm, will bear with merely its own weight on the wax in which the recording stylus is operating. This provision for a minimum weight pressing on

the recording stylus greatly facilitates the product of a true record of the various tonal values and overcomes distorted rendition of the recorded sounds.

In the operation of the device a guiding disk 23 is placed on the turntable of a phonograph and a wax or other blank 25 of a suitable size for a relatively small size record is also placed on the turntable in concentric relation thereto. The guiding arm 19 is then swung to a position in which the stylus carried thereby will move radially inward toward the center of the guiding by disk the guiding impulse of the groove. At the same time the cutting stylus will produce a corresponding path of movement on the wax blank and produce a sound record groove from which a master record can be made for the production of grooved record disks in a known manner.

In order to provide a high degree of sensitiveness in the recording stylus suitable spring members are employed in connection with the stylus for producing and maintaining a considerable spring tension therein. A flat leaf spring 27 is twisted between its ends—see Fig. 7—in reverse directions with relation to its longitudinal axis and as the stylus passes through an opening 28 in the spring and is engaged by the edges of the opening, it will be seen that a tensioning action is produced therein where the warped ends of the spring are clamped in flat condition by means of the screws 29. Supplemental springs 30 and 31 of the retractile helical type extend between the upper end of the stylus and the spaced apart points on the stylus support 32. The springs 30 and 31 exert different degrees of tension and are accordingly responsive to different vibration forces so that the stylus is made correspondingly sensitive to the different forces.

It will be seen that the generally parallel arrangement of the guiding arm 19 with relation to the tubular arm 15 which is achieved by the mounting of the respective arms on opposite sides of the sleeve 12, produces a tracking relation of the guiding arm stylus in relation to the recording stylus carried by the tubular arm. The result is that each stylus moves inwardly toward the center of the disks substantially along the same arc of curvature with the attendant production of a record groove having a path duplicating that of the tracking or guiding groove.

Not only is the tubular arm 15 capable of adjustment along the sleeve 12, and the sound box 17 capable of vertical swinging movement about the hinged connection at 16 with the tubular arm, but the tracker or guiding arm 19 is capable of vertical swinging movement about its point of connection with the sleeve 12.

What I claim is:—

1. In a sound recording device, a base member adapted to be placed in removable position adjacent the turntable of a phonograph, a vertical post carried by said base member, a tubular sound receiving arm pivotally supported at a point between its ends on said post, a sound box and a recording stylus carried by said tubular arm, the weight of the parts supported by said post being equally distributed on opposite sides thereof and a guiding arm pivotally supported by said post for vertical movement and connected thereto at a point spaced from the point of connection of the tubular arm to the post, whereby vibrations of the tubular arm will not be transmitted to the guiding arm.

2. In a sound recording device, a base member adapted to be placed in removable position adjacent the turntable of a phonograph, a vertical post carried by the base member, a sleeve journaled on said post, a tubular sound receiving arm mounted on said sleeve at a point substantially at the center of gravity of the arm, a sound box mounted on one end of the tubular arm, a recording stylus carried by the sound box, and a guiding tracker arm extending from said sleeve in a direction substantially parallel to the axis of the tubular arm, the point of attachment of the tracker arm being spaced from the point of attachment of the tubular arm with said sleeve.

3. In a sound recording device, a base member adapted to be placed in removable position adjacent the turntable of a phonograph, a vertical post carried by the base member, a sleeve journaled on said post, a tubular sound receiving arm mounted in a vertically adjustable position, on one side of said sleeve, said arm being mounted substantially at its center of gravity, a sound box hinged for vertical swinging movement in one end of the tubular arm in position to cooperate with a record blank of relatively small size, a guide arm pivotally attached for vertical movement to the other side of the sleeve, and a stylus carried by said guide arm for cooperation with a guiding disk having a greater diameter than the record blank, said stylus and the sound box stylus being spaced substantially the same distance from the post.

HARTWELL W. WEBB.