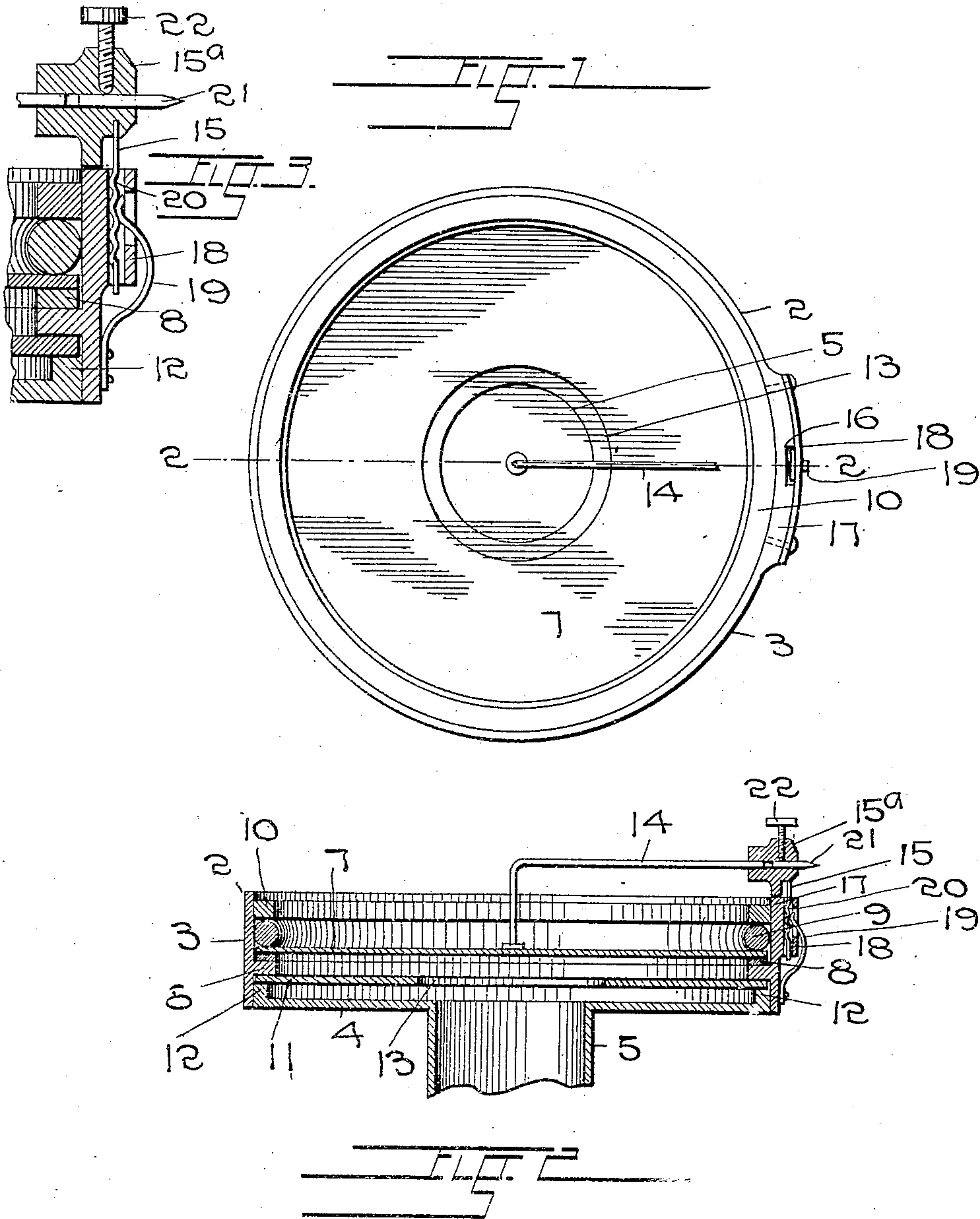


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SOUND BOX.

APPLICATION FILED MAY 20, 1908.

913,153.

Patented Feb. 23, 1909.



WITNESSES:

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GEORGE OSTEN, OF DENVER, COLORADO.

SOUND-BOX.

No. 913,153.

Specification of Letters Patent.

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Application filed May 20, 1908. Serial No. 433,815.

To all whom it may concern:

Be it known that I, GEORGE OSTEN, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Sound-Boxes, of which the following is a specification.

This invention relates to certain new and useful improvements in the sound boxes which form part of the sound-reproducing instruments, commonly known as phonographs and its object is to provide a device of the class named which, by its peculiar construction and the addition of an auxiliary diaphragm, will reproduce sound clearer, more distinct and sonorous than in constructions heretofore known. I attain this object by the mechanism illustrated in the accompanying drawing in the various views of which like parts are similarly designated and in which—

Figure 1— represents a face view of the improved sound box, Fig. 2— a section taken along a line 2—2, Fig. 1, and Fig. 3— an enlarged, fragmentary sectional view of the needle holder and adjacent parts.

In constructing the improved device, I employ a cylindrical box 2 which comprises an annular portion 3 and a plate 4, which, being fitted in one of the ends thereof, is provided with an outwardly extending, central tubular conduit 5, through which the sounds, reproduced by the vibratory movement of the diaphragms, are transmitted to the horn with which it connects. The portion 3 is formed with an interior, annular flange 6 which supports the diaphragm 7 between two rubber packing rings 8 and 9, the outer one of which is engaged by a split ring 10 which, by frictional contact with the internal surface of the member 3 of the box, holds the diaphragm in place. A second diaphragm 11, composed of a suitable metallic substance, is held between the first named diaphragm 7 and the plate 4 and in spaced relation thereto, by engagement with the opposite side of the flange 6 and an inwardly extending peripheral rim 12 on the plate 4. The auxiliary diaphragm 11 has a central opening 13, through which the sound produced by the principal diaphragm 7, which is usually composed of mica, may pass into the orifice of the tubular conduit 5 of the plate 4. The opening 13 is preferably made larger than the therewith axially

aligned orifice of the conduit so that the sounds produced by the diaphragm 7, may pass between the plate 4 and the auxiliary diaphragm 11, to impart a vibratory movement to the latter.

The needle bar 14, one extremity of which engages the outer surface of the diaphragm 7, projects, at its opposite end, into an opening in the head 15^a of the needle holder 15, which extends through a slot formed by a depression 16 in a boss 17 on the annular member 3, and a thereto secured strap 18, and which is adjustably held in place by means of a spring catch 19 which, being secured at one of its extremities upon the peripheral surface of the box, projects through an opening in the strap 18, to engage, with its free extremity, one of a plurality of notches 20 formed in the holder 15. The needle 21 is secured in an opening in the head 15^a, in alinement with the bar 14, by means of a set screw 22.

The advantages derived from the use of the improved sound box will be readily understood by those familiar with the art.

As the needle 21 travels through the groove in the rotating cylinder or disk of the phonograph, the mica diaphragm is set in vibration and the sound waves, produced by this vibratory movement, are propagated to the metallic diaphragm 11 which in consequence, receives a vibratory motion in unison with that of the principal diaphragm and thereby amplifies the undulations which, being augmented by those passing directly through the opening 13 in the diaphragm, into the conduit 5, will cause the sounds emitted from the horn, connected therewith, to be clear, distinct and sonorous. By making the opening 13 larger than the orifice of the conduit, the passage of the waves of vibration into the space between the auxiliary diaphragm 11 and the plate 4, is greatly facilitated. The diaphragm 11, the thickness of which is equal to or less than that of the mica diaphragm, is preferably positioned midway between the latter and the plate 4 at equal distances therefrom, the distances between the members being determined by the nature and thickness of the metallic substance of which the auxiliary diaphragm is composed.

Having thus described my invention what I claim is:—

1.—In a device of the class named, the combination of a sound box open at one of its ends, a sound transmitting conduit connect-

ing with its opposite end, a diaphragm within the box and an auxiliary, flexible, metallic diaphragm interposed between the first named diaphragm and the said conduit, and
5 having an opening opposite to and of greater diameter than the orifice of the latter.

2. In a device of the class named, the combination of a sound-box open at one of its ends, a sound transmitting conduit connected with an opening in its opposite end, a
10 diaphragm within the box and an auxiliary diaphragm interposed between the first named diaphragm and the conduit and having, opposite the said opening, an aperture
15 whose area is not less than that of the said orifice.

3. In a device of the class named, the combination of a sound box open at one of its ends, a sound transmitting conduit connected with a central opening in its opposite
20 end, a diaphragm within the box and an auxiliary flexible, metallic diaphragm interposed between the first named diaphragm and the closed end of the box in proximity to the latter and having a central aperture of
25 greater diameter than the said opening.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE OSTEN.

Witnesses:

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