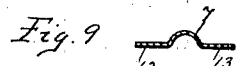
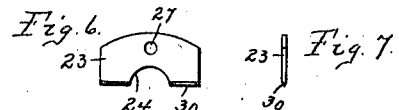
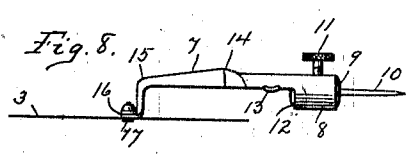
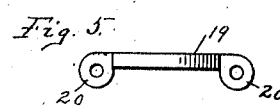
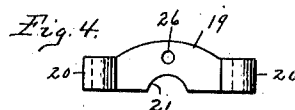
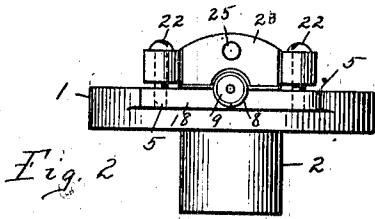
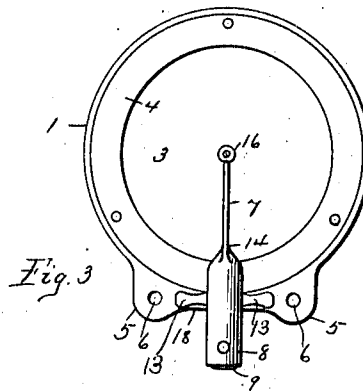
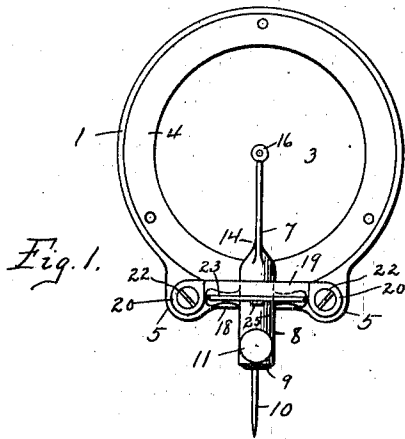


P. CATUCCI.
GRAMOPHONE SOUND BOX.
APPLICATION FILED NOV. 26, 1912.

1,059,346.

Patented Apr. 22, 1913.



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UNITED STATES PATENT OFFICE.

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GRAMOPHONE SOUND-BOX.

1,059,346

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed November 26, 1912. Serial No. 733,585.

To all whom it may concern:

Be it known that I, PLINY CATUCCI, a citizen of the United States, residing in the city of Newark, county of Essex, and State of New Jersey, have invented a new and useful Improvement in Gramophone Sound-Boxes, of which the following is a specification.

The object of my invention is to provide an improved construction in and relating to the sound boxes for talking machines.

The main essential parts of a sound box are the diaphragm and the stylus lever. The diaphragm must be so held in place that it will readily respond to the oscillation of the stylus; it must also have some restraining means to prevent any excessive movements or oscillations beyond those transmitted by the stylus through the stylus lever.

The stylus lever with its stylus must be mounted in such a manner as to respond to the following requirements: It must absolutely be free to respond to the micro-oscillations due to the sound waves; 2nd, its axis of oscillation must be absolutely rigid and resist any movement tending to displace it from the plane occupied when at rest; 3rd, and finally the stylus lever must be restrained and controlled in its rotation upon the fixed axis.

The superior musical rendition and the distinctness and clearness of enunciation of my present sound box confirm the correctness of the above reasoning.

The essential parts of my invention are most elementary; a one-piece stylus lever retaining the removable stylus, which is under pressure between one flat surface and the keen edge of a blade. The keen edge of the blade with its plane transverse to that of the stylus lever offers a rocker like resistance in the transverse direction; but permits the free oscillation of the stylus lever, which is sensitive to most minute oscillations. The portion of metal of the stylus lever which extends on each side of the pressure exerting edge, acts as a restraining member, and eliminates all costly, cumbersome, adjustable springs which can only be properly adjusted by persons well versed in the art of manufacturing sound boxes. This restraining action is of great importance. Without it (in the high soprano notes) the stylus, impinging on one abrupt wave of the sound grooves, would impart to the stylus

bar a sharp movement that would carry the diaphragm end of the bar beyond its intended limit of amplitude; the next wave would have to overcome the momentum of the stylus and would repeat the excessive movement in the opposite direction. This behavior of the stylus lever produces discordant chattering; on the other hand, if the mounting of the lever is too rigid, the lever will not be sensitive to the micro-oscillations and the volume of the sound will be greatly reduced. It is, therefore, of great importance to mount the bar on an almost mathematical axis, to achieve great sensitiveness; but it is also essential to provide restraining-controlling means that work in conjunction with its free movement. Figure 1, is a front view of a sound box showing my improvement. Fig. 2, is a side view showing the improvement in elevation. Fig. 3, is a view similar to Fig. 1, but with the fastening bar removed. Fig. 4, is a front elevation and Fig. 5, is a plan view of the fastening bar. Fig. 6, is a front elevation and Fig. 7, is an end elevation of the equalizing bar. Fig. 8, is a side elevation of the stylus lever. Fig. 9, is a cross section of the stylus lever through its supporting arms.

Similar reference numerals refer to like parts throughout the specification and drawings.

The sound box body 1, is of the usual type, having the second conveying thimble 2, at its rear; the diaphragm 3, is secured in position in the body 1, by means of the ring 4. From one side of the body 1, project the two lugs 5, 5, which are provided with the screw threaded apertures 6, 6. The stylus lever 7, is made from thin sheet metal, pressed to the form illustrated, with the tubular end 8, provided with the stylus needle socket 9, to receive the needle 10, the latter being held in position by means of the small thumbscrew 11. The tubular body of the lever is cut away at 12, so as to leave a semi-tubular shell, as shown in Figs. 8 and 9, with the thin lateral arms 13, 13, extending at right angles to the length of the lever. These arms are slightly cambered as shown in Fig. 8, so that they serve in the nature of rockers, about which the lever may slightly oscillate under the vibrations of the diaphragm 3. The semi tubular portion of the lever 7, is pinched together from the point 14, to the end, and bent at substantially a right angle

at 15, and provided at its extremity with a foot 16 by which it is secured in any convenient or desired manner to the center of the diaphragm 3, as by the rivet 17. When
 5 in position the arms 13, 13, rest upon the flat face of the bridge of metal 18, extending between the two lugs 5, 5, and in substantial alinement with the two apertures 6, 6.

The fastening bar 19, is of the general shape shown in Figs. 4, and 5, and is provided with the offset apertured lugs 20, 20. It is slightly arched as shown with the semi-circular notch 21, cut in its lower edge, so that when in the position shown in Fig. 2
 15 it will span the semitubular part of the stylus lever 7, without contact therewith. Screws 22, 22, pass through the apertured ends of the bar 19, and into the apertures 6, 6, and thus hold the fastening bar 19 in place.

The equalizing bar 23, is made from a thin strip of hardened steel of the general shape shown in Figs. 6 and 7. Its lower edge is sharpened to a knife edge as shown at 30,
 25 and notched as at 24 to span the stylus lever 7, without contact therewith. The equalizing bar is pivotally secured to the fastening lever 19, by means of the pin 25, which passes through the apertures 26, and 27 respectively in the bar 19, and in the bar 23.

When the parts are assembled as shown in Figs. 1 and 2, with the screws 22, 22, securing the fastening bar 19 in place, the knife edges 30, of the equalizing bar 23, bear
 35 upon the concave side of the rocker arms 13, 13, and press them firmly upon the flat bridge 18. Inasmuch as the equalizing bar 23, is centrally pivoted upon the bar 19, this pressure is equal upon the two arms 13, 13,
 40 notwithstanding inequality of pressure upon the ends of the bar 19, due to the screws 22, 22.

By the structure of my improvement I am able to firmly clamp the stylus lever to the sound box body, in such a manner as to
 45 permit said stylus to vibrate freely in a plane perpendicular to the diaphragm, and yet avoid any tendency of the parts to rattle, or come loose. The structure is neat and simple, and presents no manufacturing difficulties which so often are present in devices
 50 of this nature.

I claim:

1. In a sound box, the combination of a
 55 box body, a diaphragm secured in said body, a stylus lever centrally secured to said diaphragm, a pair of cambered arms extending laterally from said stylus lever, a fastening bar adjustably secured to said box body, an
 60 equalizing bar centrally pivoted upon said fastening bar with one edge of said equalizing bar bearing upon the concave faces of said cambered arms.

2. In a sound box, the combination of a
 65 box body and a stylus lever, means for se-

curing said lever to said box body comprising a pair of cambered arms extending laterally from said lever and bearing upon the face of said body, a fastening bar spanning
 70 said lever and adjustably secured to said body, an equalizing bar spanning said lever and centrally pivoted upon said fastening bar, said equalizing bar having knife edges which bear with equalized pressure upon the cambered arms of said stylus lever.

3. In a sound box, the combination of a box body having a pair of lugs extending laterally therefrom, a bridge extending between and connecting said lugs, a stylus lever having a laterally extending cambered arm
 80 upon each side thereof and resting upon said bridge, an equalizing bar spanning said lever, and having a pair of knife edges which bear upon said cambered arms, and means for pivotally and adjustably supporting
 85 said equalizing bar from said lugs.

4. In a sound box, the combination of a box body, and a stylus lever, cambered arms upon said lever, means for securing said
 90 stylus lever to said box body comprising an equalizing bar having knife edges which bear upon and press said cambered arms firmly against said box body, and means for pivotally supporting said equalizing bar
 95 upon said box body.

5. In a sound box, the combination of a box body having laterally extending lugs and a connecting bridge thereon, a stylus lever having laterally extending arms thereon, means for securing said lever to said
 100 body comprising an equalizing bar pivotally and adjustably secured to said lugs, said equalizing bar being provided with knife edges which bear upon and press said stylus arms firmly upon said bridge.

6. In a sound box, the combination of a box body having a lateral projection thereon, a stylus lever having lateral arms thereon, a fastening bar, an equalizing bar pivotally secured to said fastening bar, and
 110 means for adjustably securing said fastening bar to said lateral projection, to cause said equalizing bar to press said lateral arms firmly upon said projection.

7. In a sound box, the combination of a box body having a lateral projection thereon, a stylus lever having elastic cambered rocker arms projecting laterally therefrom, and means for firmly pressing said rocker
 115 arms upon said lateral projection.

8. In a sound box, the combination of a box body having a lateral projection thereon, a stylus lever having lateral elastic supporting arms, bearing upon said projection, equalizing means for firmly pressing said
 120 arms with equal pressure upon said projection.

9. In a sound box, a box body, a stylus lever, means for securing said stylus lever to said box body, comprising a fastening
 125

bar, adjustably secured to a part of said box body, an equalizing bar centrally pivoted upon said fastening bar, knife edges upon said equalizing bar which bear upon and press parts of said stylus lever firmly upon a part of said box body.

10. Means for securing a stylus lever to a sound box body, comprising a fastening bar having apertured ends and an equalizing bar centrally pivoted upon said fastening bar, and adapted to bear upon and firmly press a part of said stylus lever upon a part of said sound box.

11. Means for securing a stylus lever to a gramophone sound box, comprising a fastening bar having offset apertured ends, an equalizing bar pivoted at its center to the middle of said fastening bar, and knife edges upon said equalizing bar in alinement with the apertures in the ends of said fastening bar.

12. In a sound box, the combination with

a box body having laterally projecting lugs provided with screw threaded apertures, a bridge connecting said lugs, a stylus lever having cambered rocker arms projecting laterally therefrom in alinement with said apertures and resting upon said bridge, a fastening bar having offset apertured ends, an equalizing bar pivoted at its center to the middle of said fastening bar, and having knife edges thereon in alinement with the apertures in the ends of said fastening bar, and screws passing through said apertured ends and into the screw threaded apertures of said projecting lugs of the box body, to press said knife edges upon said cambered arms, and thereby yieldingly pivot said stylus lever upon said bridge.

PLINY CATUCCI.

In presence of—

NORMAN E. ZUSI,
LOUIS M. SANDERS.