

Aug. 14, 1923.

C. J. MECHLING

1,465,239

SOUND BOX

Filed March 19, 1917

Fig. 1.

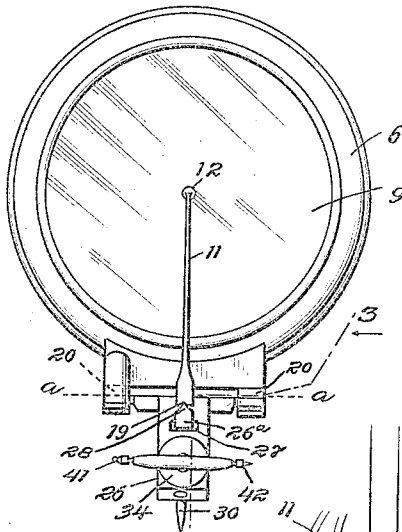


Fig. 2.

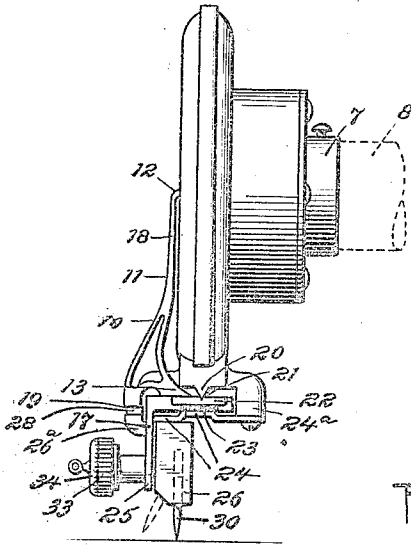
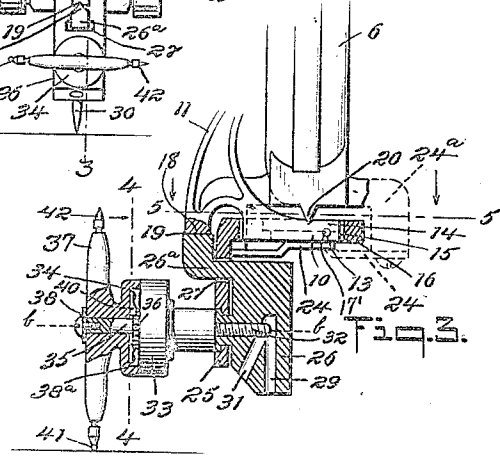
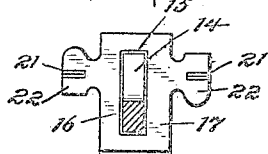
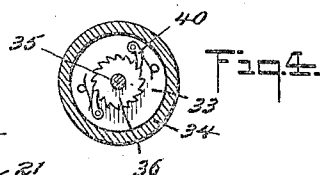


Fig. 5.



WITNESS

Charles J. Mechling

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UNITED STATES PATENT OFFICE.

CHARLES J. MECHLING, OF NEW YORK, N. Y.

SOUND BOX.

Application filed March 19, 1917. Serial No. 155,660.

To all whom it may concern:

Be it known that I, CHARLES J. MECHLING, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Sound Boxes, of which the following is a specification.

My invention relates to reproducing devices or sound boxes for disk sound records, and one of the objects of my invention is to provide a sound box, capable of use on all machines and with the two kinds of records, now in general use.

It is understood that with the commercial types of machines now in general use it is necessary to mount the sound box with its diaphragm extending in an upright plane, either disposed tangent to the curvature of the grooves on the record disks or disposed across the line of the grooves or in another type of machine with the diaphragm disposed in a substantially horizontal plane, that is parallel to the plane of the record disk.

It is also known that there are in general use, two types of record disks. One the hill and dale type, which consists of a series of vertical indentations or impressions formed on the face of the disk, which when travelling against the sound box stylus or needle produce vibration of the stylus in a vertical plane or in the plane of the vertical axis of the stylus or needle and the horizontal or laterally cut grooves, which consists of a series of horizontal indentations or impressions formed on the face of the disk, which when travelling against the sound box stylus or needle produce vibration of the stylus in a direction parallel to the surface of the sound record disk.

My invention contemplates the providing of a single sound box, which may be mounted in certain positions, depending upon the character of the machine to which it is attached and to provide this sound box with a plurality of styluses or needles, so arranged that the proper playing instrument may be brought into operative engagement with the records to most effectively play the particular record on the machine equipped with this form of sound box.

It is a further object of the invention to provide an attachment designed to take the place of the usual binding screw with one form of sound box now known and to pro-

vide this attachment with a plurality of styluses arranged to be brought into playing position to play a disk different from the type of disks used usually on a machine designed to play disks of one particular character.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

Referring to the accompanying drawings:

Figure 1 is a view in elevation of a preferred embodiment of my invention;

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

Figure 3 is an enlarged view in side elevation of the sound box casing and showing the lower portion thereof in vertical section, taken on the line 3—3 of Figure 1;

Figures 4 and 5 are transverse sectional views of details taken on the lines 4—4 and 5—5 of Figure 3.

In the following description and in the claims, parts will be identified by specific names for convenience of expression but they are intended to be as generic in their application to similar parts as the art will permit.

In the drawings there is shown a sound box for playing sound record discs, including a casing 6 of conventional form provided with a tone arm attachment 7 and arranged to be positioned on a tone arm 8 disposed so as to dispose the diaphragm 9 in a vertical plane preferably at right angles to the horizontal plane of the sound-record disc, which is mounted to be rotated beneath said sound box.

For the purpose of this disclosure it may be assumed that the tone arm 8 is part of a phonograph either of the type in which the sound box diaphragm has heretofore been disposed to extend transverse of the direction of movement of the grooves in the record disc, such as a Pathé machine, or it may be considered that the tone arm 8 is part of a phonograph of the type in which the sound box diaphragm heretofore has been disposed tangent to the grooves and facing outwardly, such as a Victor or Columbia

machine, or with the diaphragm facing downwardly parallel to the plane of the disc. An L-shaped stylus lever 10 includes an upstanding leg 11 which extends radially across the face of the diaphragm and has its free upper end 12 fixed to the center of the diaphragm, as is usual with devices of this character. A foot portion 13 of this L-shaped curve laps the edge of the sound box casing and has its free toe end 14 fitted within a socket 15 in the horizontal portion 16 of an L-shaped rocking frame 17.

The toe portion 14 is rectangular in plane and is pivoted to the rocking frame by oppositely disposed pivot pins 17', so as to possess relative movement about an axis *a-a* positioned below and adjacent the plane containing the diaphragm.

The heel portion 18 of the lever is offset forwardly from the plane of the diaphragm, as shown in Figures 2 and 3 and is provided on its under side with a V-shaped or half-round groove 19 extending at right angles to the plane of the diaphragm.

The underside of the casing is provided on opposite sides of the lever toe end 14 with a pair of knife edges 20, paralleling the plane of the diaphragm, designed to fit in slots 21 in the upper side of the rocking frame portion 16. These knife edges and coacting slots locate the pivotal line for the rocking frame in its movement relative to the casing which line is parallel to and closely adjacent to the pivotal line of the lever relative to the rocking frame. This upper side has horizontal extensions 22 projecting laterally from diagonally opposite corners and providing seats for resilient washers 23. The rocking frame is maintained in position engaging the knife edges by keepers 24 removably affixed to lugs 24^a projecting from the casing and engaging said washers to hold the frame lightly in engagement with the knife edges.

The rocking frame includes a depending plate 25 extending below the stylus lever between the heel portion and pivoted toe portion. A socket or stylus block 26 is pivotally mounted on the rear of the plate 25 for rotary movement about a horizontal axis *b-b*. The upper portion of the block is provided with an extension 26^a which projects forwardly through the arched slot 27 in the upper portion of the plate 25. The extension is provided with an inverted V-shaped ridge 28 disposed within the groove 19 in the heel portion of the stylus lever. In its normal position the parts are so set that the ridge 28 bears lightly on the stylus bar to spring the diaphragm.

The block is provided with a vertically disposed needle socket 29 adapted to contain a playing stylus or needle 30, when playing a "hill and dale" record such as a record on a Victor machine. The block is

also provided with a downwardly and outwardly inclined needle socket 31 opening into the socket 29 at the line *b-b* and forming an angle of about 50° with the length of the socket 29. This inclined socket may contain a playing needle (as shown in dotted lines Fig. 2) when playing a transverse record, such as a Victor record, on a phonograph in which the diaphragm usually faces outwardly such as a Pathé machine. The needles when in either sockets are held in place by a set screw 32 which may be of the conventional form, and provided with a milled head 33.

In place of the usual set screw a substitute attachment 34 is provided to permit the playing of a "hill and dale" record with a ball point or an Edison record with a sharp stone point.

The attachment includes the usual set screw 32 and milled head 33 and an outwardly projecting shaft 35 to which is fixed a one way ratchet 36 adjacent the outer face of the head. A carrier 37 is slidable on the shaft and removably held in place by the cap screw 38. The carrier includes a cap 38^a rotatably mounted on the head 33 to enclose the ratchet. A plurality of spring pressed pawls 40 are pivoted to the cap and engage the ratchet to form a one way pawl and ratchet connection between the carrier and the head. The ratchet teeth are so disposed that the travel of the playing disk holds the carrier against rotation in reverse direction. A round ball point 41 is mounted at the end of one of the arms and a sharp point 42 is mounted at the end of the other arm.

In operation, it will be understood that the sound box is mounted in position on any type of machine now on the market and if there is a transversely cut grooved record on the machine, such as a Victor or Columbia record, the needle is inserted in either the socket 29 or 31 depending upon whether the diaphragm is facing sidewise, as on a Victor or Columbia machine or whether the diaphragm is facing outwardly as on a Pathé machine. It will be understood that when playing such a record the vibrations are transmitted vertically through the socket block; through the heel portion of the stylus lever thus rocking this lever on its axis *a-a* to cause a vibration of the diaphragm in the direction of its axis and perpendicular to its plane. Should the sound box be mounted upon a machine requiring the offset type of stylus the ball 41 is brought into operative position to play a record, such as the Pathé record and the pointed end 42 is brought into operative engagement when playing a hill and dale record.

Where the needle is used in the inclined slot it is obvious that the laterally cut grooves of the record played thereby will

cause the stylus block to oscillate about its axis $b-b$ thus causing the knife end of the extension to wipe back and forth past the grooved heel portion of the stylus lever; thus tending to raise and lower the leg of the lever and again produce the usual vibratory movement in the diaphragm.

When the offset type of stylus is used with the "hill and dale" records, there will be caused, a rocking of the rocking frame about its axis $a-a$. This will result in a vertical rocking movement of the extension from the stylus block, causing this extension to bear with varied pressure upon the heel of the stylus, here again causing a vibratory movement of the diaphragm.

It is apparent that by means of a device of this character, one type of sound box may be provided designed for use universally on any of the phonograph machines now in general use and designed, by means of a proper manipulation of the stylus or needle in use, to play either of the two types of sound discs now known.

It is obvious that the attachment with the ball sharp points may be regarded as a separate article of manufacture and may be substituted in place of the usual binding screw for holding the needle styluses for most types of sound boxes now in general use.

While I have shown and described, and have pointed out in the annexed claims, certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, I claim:—

1. A sound box including a casing provided with a diaphragm, a stylus lever having an end affixed to said diaphragm and fulcrumed for movement about an axis parallel to the plane of the diaphragm, a stylus block, means for fulcruming the same to the casing, said stylus block having a freedom of movement about an axis extending perpendicular to the plane containing the other axis, and said block adapted to bear on the stylus lever to actuate the diaphragm by the vibratory movement of the block.

2. A sound box including a casing provided with a diaphragm, an inverted L-shaped frame having a horizontally extending flange mounted for rocking movement about an axis fixed relative to the casing and parallel to the plane of the diaphragm, said frame provided with means for carrying a stylus, and a stylus lever fulcrumed to the rocking frame having an end affixed to the diaphragm and adapted to be engaged by

said stylus carrying means for actuating the diaphragm.

3. A sound box including a casing provided with a diaphragm, a frame mounted for rocking movement about an axis parallel to the plane of the diaphragm, said frame provided with means for carrying a stylus, said means pivoted to the rocking frame for movement about an axis perpendicular to the plane of the diaphragm, and a stylus lever fulcrumed to the rocking frame, having an end affixed to the diaphragm and having a bearing portion adapted to be engaged by said pivoted means, and said stylus lever and said pivoted means being otherwise disconnected from each other at the bearing portion.

4. A sound box including a casing provided with a diaphragm, a lever having an end affixed to the diaphragm and fulcrumed for movement about an axis parallel to the plane of the diaphragm and a stylus block pivotally mounted for movement about an axis at right angles to the first named axis, said block being normally in light bearing engagement with the lever and adapted to be moved bodily into operative engagement with the lever to vibrate the diaphragm.

5. A sound box provided with a diaphragm provided with a stylus lever, a stylus block adapted to carry a playing stylus, and a connection between said block and diaphragm, said connection including means for transmitting vibrations perpendicular to the plane of the diaphragm and a pivotal connection between said last named means and the stylus lever.

6. A sound box including a casing provided with a diaphragm, an L-shaped stylus lever having a leg portion thereof extending radially across the face of the diaphragm and with one end thereof affixed to the diaphragm, a rocking frame mounted on the casing for movement about an axis parallel to the diaphragm, a toe portion of said lever pivoted to said rocking frame, and a stylus block carried by said rocking frame and provided with an extension engaging a heel portion of said lever.

7. A sound box including a casing provided with a diaphragm, an L-shaped stylus lever having a leg portion thereof extending radially across the face of the diaphragm and with one end thereof affixed to the diaphragm, a rocking frame mounted on the casing for movement about an axis parallel to the diaphragm, a toe portion of said lever pivoted to said rocking frame, and a stylus block carried by said rocking frame and provided with an extension engaging a heel portion of said lever, the interengaging portions of the heel and extension being in the form of a knife edge engaging in a slot.

8. A sound box including a casing provided with a diaphragm, an L-shaped stylus

lever having a leg portion thereof extending radially across the face of the diaphragm and with one end thereof affixed to the diaphragm, a rocking frame mounted on the casing for movement about an axis parallel to the diaphragm, a toe portion of said lever pivoted to said rocking frame, and a stylus block pivoted to said rocking frame and provided with an extension engaging a heel portion of said lever, the interengaging portions of the heel and extension being in the form of a knife edge engaging in a slot.

9. A sound box including a diaphragm and actuating mechanism therefore, said mechanism including a rocking frame, a stylus block pivotally connected to said frame and provided with means for carrying a playing stylus and a stylus lever pivoted to said frame, affixed to the diaphragm and in direct bearing engagement with the stylus block.

10. A sound box including a casing provided with a diaphragm, a rocking frame pivoted to said casing, a stylus lever fixed to the diaphragm and pivoted to the rocking frame, and a stylus block provided with means for carrying a playing stylus, said block being pivoted to the frame and provided with means for engaging the stylus lever intermediate its connection with the diaphragm and its pivotal connection with the rocking frame thereby to actuate the diaphragm.

11. A sound box including a diaphragm and a stylus block mounted for rocking movement about an axis perpendicular to the plane of the diaphragm, said block pro-

vided with a pair of sockets, one of said sockets extending parallel to the plane of the diaphragm and the other socket extending at an angle to said plane, and means for securing a stylus in either of said sockets.

12. A sound box including a diaphragm, a stylus block mounted for rocking movement about two axes, one of which is at an angle to the plane of the diaphragm, a direct hearing connection between the block and diaphragm and an attachment adapted to engage in said block, said attachment including a head provided with a playing stylus.

13. In a phonograph reproducer, a diaphragm, an arm for imparting vibration thereto, said arm being provided with a socket for a reproducer point, a member carrying a reproducer point, and an element separate from said member and serving both for securing said member on said arm and for clamping a reproducer point in said socket.

14. In a phonograph reproducer, a diaphragm, an arm for imparting vibration thereto and provided with a socket for a reproducer point, a screw for clamping a reproducer point in said socket, and a member having a plurality of reproducer points secured thereto and held on said arm by said screw.

Signed at New York city in the county of New York and State of New York this fifth day of March, A. D., 1917.

CHARLES J. MECHLING.