T. A. EDISON.

PHONOGRAPH REPRODUCER.

APPLICATION FILED OCT. 28, 1909.

1,099,346.

Patented June 9, 1914.

Fig. 1

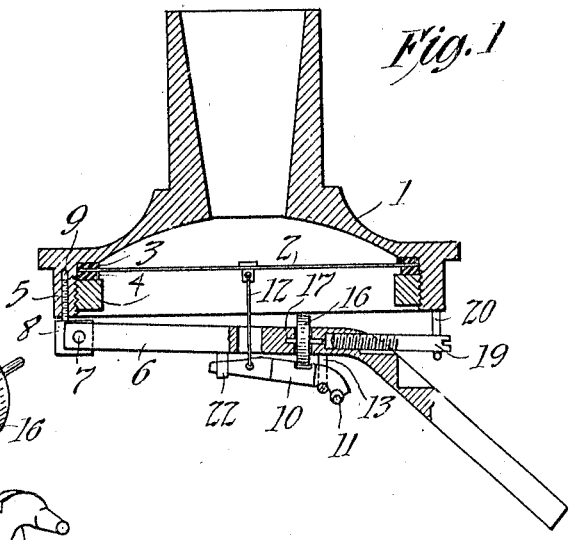


Fig. 3

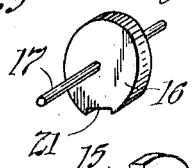


Fig. 4

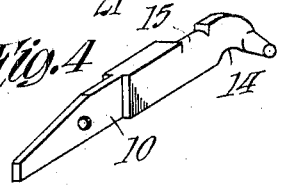
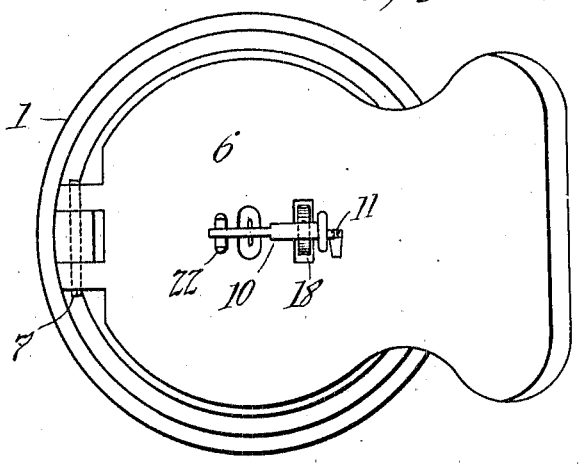


Fig. 2



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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, WEST ORANGE, NEW JERSEY, ASSIGNOR TO NEW JERSEY PATENT COMPANY, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PHONOGRAPH-REPRODUCER.

1,099,346. Specification of Letters Patent. **Patented June 9, 1914.**

Application filed October 28, 1909. Serial No. 525,061.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, county of Essex, and State of New Jersey, have made a certain new and useful Invention in Phonograph-Reproducers, of which the following is a description.

My invention relates to phonograph reproducers, and has for its object the provision of an improved mounting for the stylus lever in order that the same may have great freedom of movement in tracking the grooves of the sound record.

More particularly, the object of my invention is to provide a mounting for the stylus lever whereby the latter may rock in its own vertical plane about a pivot as the stylus tracks the record groove while at the same time the lever may rock in a transverse direction to enable the stylus to follow the contour of the record groove with greater facility. The requirement of great facility of movement of the stylus lever both in a direction parallel to and transverse to the record groove, is particularly important in the case of a record having two hundred threads or a greater number of threads per inch, owing to the thin walls between the record grooves which might be broken down or jumped across by a stylus, the parts moving with which have considerable inertia, and owing to the character of the record grooves generally. Accordingly, I provide a member which bears upon the upper surface of the stylus lever to constitute a fulcrum for the latter, the coöperating surfaces of the pivot member and the lever being so formed as to permit a limited rolling movement between the same in a plane transverse to the stylus lever. Preferably, the stylus lever is formed on its upper side with a convexed surface coöperating with the surface of the pivot member, which latter is preferably mounted for rotation to reduce friction.

Other objects of my invention are the provision of improved details of construction and the combination of parts.

In order that my invention may be more clearly understood, reference is hereby made to the accompanying drawings, illustrating a preferred form thereof, in which—

Figure 1 is a central vertical section through a reproducer equipped with my invention. Fig. 2 is a bottom view thereof, and Figs. 3 and 4 represent in perspective the rotatable pivot member and stylus lever adapted to coact therewith.

Referring to the drawings, the usual sound box 1 is provided with diaphragm 2 which is clamped between gaskets 3, the whole being held in place by ring 4 which is threaded within flange 5 of sound box 1 in the usual manner. Floating weight 6 is pivoted at 7 to block 8 which is supported from flange 5 by pin or screw 9, as is common. Stylus lever 10 carries stylus 11, the lever being connected to diaphragm 2 by link 12, the lever being supported from floating weight 6 when stylus 11 is not in contact with the record by means of stirrup 13 encircling lever 10, lever 10 being provided on its lower surface with a groove 14 for the reception of the stirrup. The upper surface of stylus lever 10 is preferably convexed in a direction transverse to the length or the median plane of the stylus lever as shown at 15. Disk 16, which is supported by pin 17 is mounted in slot 18 in floating weight 6 directly above surface 15 of lever 10. Pin 17 is rotatably mounted in suitable holes in the floating weight on each side of slot 18, so that disk 16 is free to rotate about an axis substantially parallel to the length or longitudinal axis of the lever and in a plane approximately vertical. Floating weight 6 is provided with the usual screw 19, the end of which is supported within stirrup 20 depending from flange 5 of the reproducer to limit the downward movement of the floating weight. Before screwing pin 19 into place, pivot member 16 may be placed in position within its slot 18 and support 17 thereafter pushed through the hole designed for the reception of screw 19 into position to support member 16. Member 16 is preferably provided on its lower surface with notch 21 which affords a plane surface to cooperate with convex surface 15 of lever 10, the shoulders of the notch serving to limit the rotation of the disk 16 and likewise the lateral rocking movement of lever 10, since surface 15 of the lever tends to bind when it comes into contact with either shoulder of notch 21.

The result of the construction above described is that when stylus 11 engages the record, lever 10, after moving out of engage-

ment with the stirrup 13, rocks upon surface 21 as a pivot in a vertical plane as stylus 11 tracks the record groove. Also, lever 10 is free to rock through a limited arc in a plane transverse to its length, the rotatable mounting of member 16 permitting rotation of said member by the lever 10 and thereby reducing friction to a minimum during this movement of the lever. Lever 10 may also oscillate through a limited arc in a plane substantially parallel with diaphragm 2, although during this movement, the rotation of member 16 is not brought into play. The tail of lever 10 rests within a V-shaped stirrup 22 depending from floating weight 6, this stirrup tending to properly center the stylus lever.

It is obvious that, if desired, the curved periphery of member 16 might be used to coöperate with surface 15 of lever 10, leaving out notch 21, or if the periphery of disk 16 was so used, it might be tapered into a V-shape in order to give a more nearly knife edge to act as upper pivot for the vertical oscillation of the lever, or the surface of notch 21 might be so tapered. It is furthermore obvious that, if desired, surface 15 of lever 10 co-acting with plane surface 21 of member 16 might be convexly curved in all directions, instead of merely being curved convexly transverse to the stylus lever as shown. That is, surface 15 instead of being curved as a cylinder, could be curved as a globe, if desired, to facilitate the rocking of the same. However, such a construction is not commercially as practicable as that shown.

Having now described my invention, what I claim and desire to protect by Letters Patent is as follows:

1. In a phonograph reproducer, the combination with a diaphragm and a floating weight, of a stylus lever, a connection between said lever and said diaphragm, and a pivot for said lever supported by said weight, said pivot consisting of a member adapted to be oscillated by said lever about an axis extending longitudinally of said lever, substantially as described.

2. In a phonograph reproducer, the combination of vibratory means, a stylus lever, a stylus carried by said lever, means connecting said lever to said vibratory means, means for supporting said lever when said stylus is not in engagement with a record, said supporting means being inoperative when said stylus is in engagement with a record, and a member contacting said lever and serving as a fulcrum for the latter when the stylus engages a record, said lever having rocking and rolling engagement with said member, substantially as described.

3. In a phonograph reproducer, the combination with the diaphragm and the floating weight, of a stylus lever, a stylus carried thereby, a connection between said lever and diaphragm, and a pivot for said lever secured in said weight, said pivot consisting of a member adapted to be rotated by said lever in a plane crossing the median plane of said lever, and contacting a surface of said lever when the stylus engages a record, substantially as described.

4. In a phonograph reproducer, the combination of a stylus lever, a stylus carried thereby, supporting means, and a member mounted in said supporting means contacting the upper surface of said lever and serving as a fulcrum for the latter when the stylus engages the record, said lever having rocking engagement with said member in its own vertical plane and rolling engagement with said member whereby the latter is movable in a plane transverse to said vertical plane, substantially as described.

5. In a phonograph reproducer, the combination of a stylus lever, a stylus carried thereby, a diaphragm, a connection between said diaphragm and said lever, and a member acting as a fulcrum for said lever and adapted to be oscillated laterally thereby, said lever and member having contacting surfaces one of which is plane and the other convexed, substantially as described.

6. In a phonograph reproducer, the combination of a stylus lever and stylus carried thereby, a diaphragm, a connection between the same and said lever, supporting means, a member rotatably mounted in said means contacting the upper surface of said lever and serving as fulcrum for the latter when the stylus engages a record, said member being adapted to be rotated by said lever, means for supporting said lever when not engaging a record, and means for centering said lever, substantially as described.

7. In a phonograph reproducer, the combination of a stylus lever and stylus carried thereby, a diaphragm, a connection between the same and said lever, supporting means, a member mounted to rotate in said means in a plane transverse to said lever, said member having a surface contacting the upper surface of said lever and serving as fulcrum for the latter when the stylus engages a record, and carrying means for limiting the amount of rotation of said member when in contact with said lever surface, substantially as described.

8. In a phonograph reproducer, the combination of a stylus lever, a stylus carried thereby, a diaphragm, a connection between the same and said lever, supporting means, a member rotatably mounted in said means contacting the upper surface of said lever and serving as a fulcrum for the latter when the stylus engages a record, said means being adapted to be rotated by said lever, and means for supporting said lever when not engaging a record, substantially as described.

9. In a phonograph reproducer, the combination of vibratory means, a stylus lever, a stylus carried by said lever, means connecting said lever to said vibratory means, means for supporting said lever when said stylus is not in engagement with a record, said supporting means being inoperative when said stylus is in engagement with the record, and a member contacting said lever and serving as a fulcrum for the latter when the stylus engages the record, said lever having rocking engagement with said member in a plane passing through the latter and through the longitudinal axis of said lever and having rolling engagement with said member in a direction transverse to said lever, substantially as described.

10. In a phonograph reproducer, the combination of vibratory means, a stylus lever, a stylus carried thereby, means connecting said lever to said vibratory means, and a member contacting the upper surface of said lever and serving as a fulcrum for the latter when the stylus engages a record, said lever having rocking and rolling engagement with said member in planes at an angle to each other and to said diaphragm and oscillatory movement with respect to said member in a direction substantially parallel to said diaphragm, substantially as described.

This specification signed and witnessed this 26th day of October 1909.

THOS. A. EDISON.

Witnesses:
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