T. A. EDISON.

PHONOGRAPH REPRODUCER.

APPLICATION FILED JUNE 14, 1908.

1,046,159.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 1.

Fig. 1

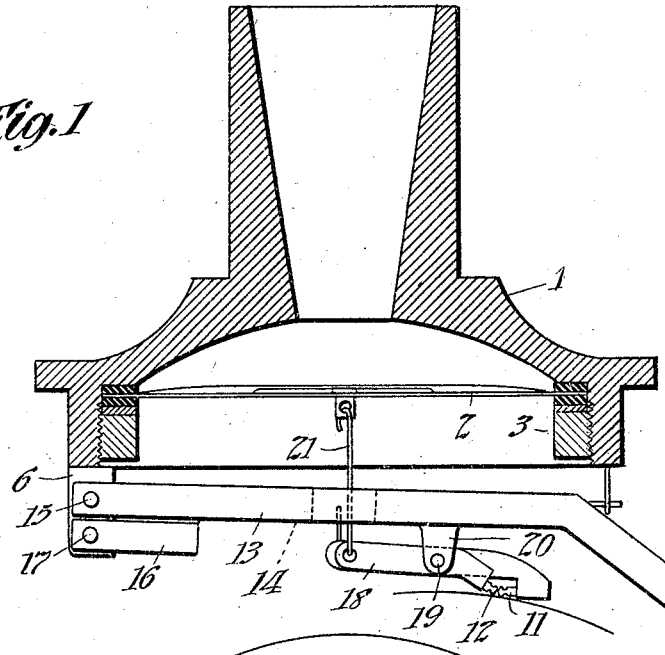
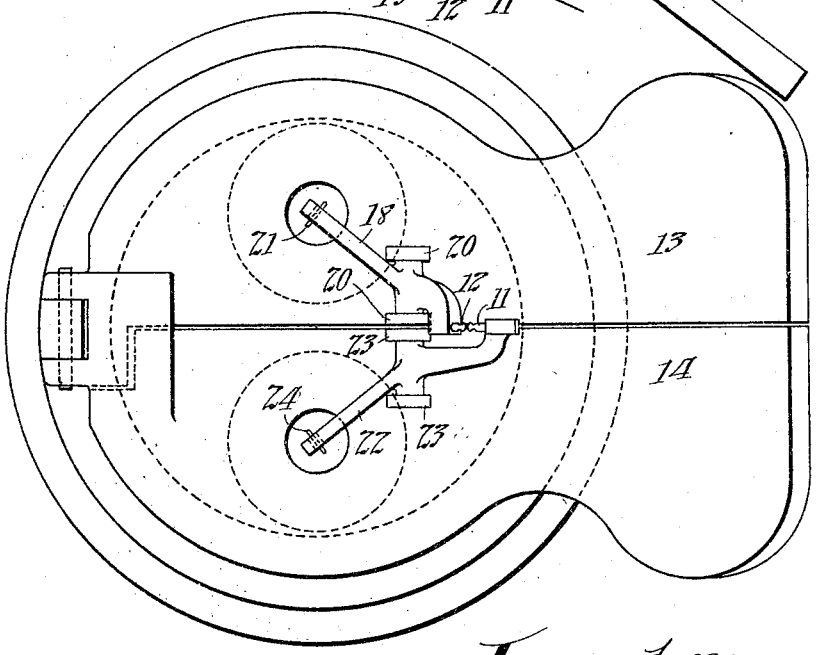


Fig. 2



Witnesses:

Frank D. Lewis

Herbert H. Dyke

Inventor:

Thomas A. Edison

by Frank L. Dyer

Atty.

T. A. EDISON.

PHONOGRAPH REPRODUCER.

APPLICATION FILED JUNE 11, 1908.

1,046,159.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 2.

Fig. 4

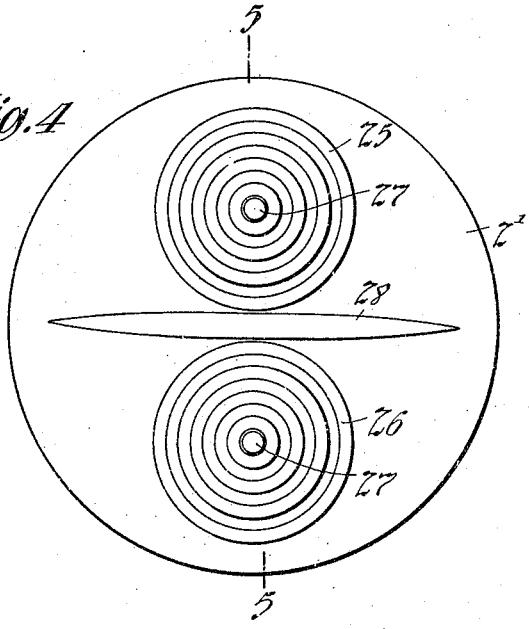


Fig. 5

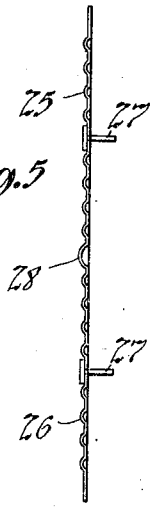
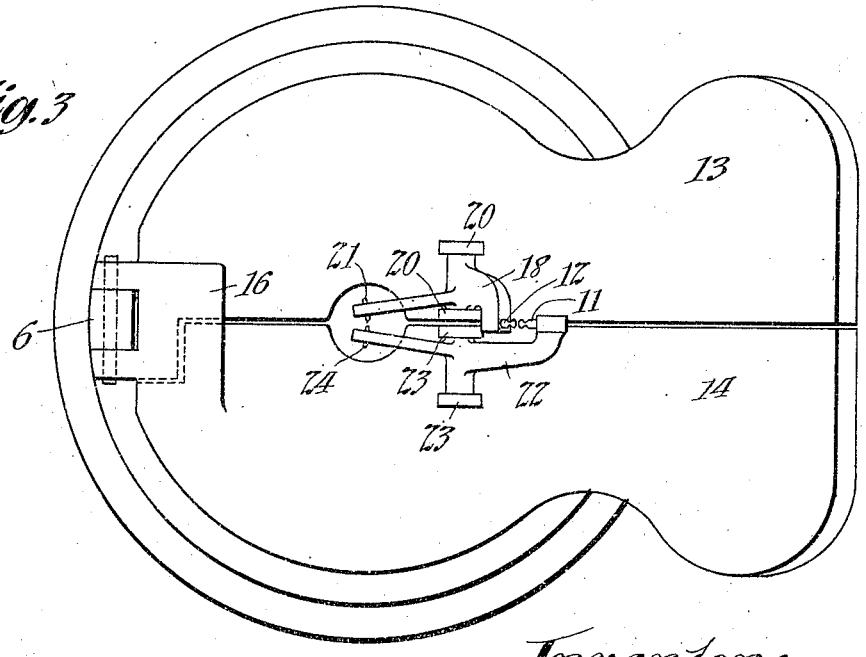


Fig. 3



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Atty.

UNITED STATES PATENT OFFICE.

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

PHONOGRAPH-REPRODUCER.

1,046,159. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed June 11, 1908. Serial No. 437,844.

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, Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Phonograph-Reproducers, of which the following is a description.

My invention relates to reproducers for phonographs, and more particularly to that type which is adapted to operate upon a sound record in the form of a groove having elevations and depressions corresponding graphically to the original sound waves.

The object of my invention is to secure a louder and more perfect reproduction than can be obtained from the ordinary form of reproducer, or to secure a reproduction of equal loudness with less wear upon the record.

With this end in view I employ a pair of reproducer styluses arranged one slightly in advance of the other, with respect to the record groove.

In an application for Letters Patent filed concurrently herewith, I have described and broadly claimed a reproducer constructed on this principle, and have specifically claimed that form in which both styluses are carried by a single lever which is mounted on a single floating weight.

The present invention relates to an improved reproducer in which the two styluses are mounted upon separate stylus levers, which are mounted preferably upon separate floating weights, pivoted so as to have independent movement, and said stylus levers may be connected either to the same point of a single diaphragm or to different parts of a single diaphragm, or they may be connected to separate diaphragms if desired.

In order that the invention may be more fully understood, reference is made to the accompanying drawing of which—

Figure 1 is a side elevation, partly in section, of a reproducer constructed in accordance with my invention, and showing the two stylus levers connected to different parts of a single diaphragm; Fig. 2 is a bottom plan view of the reproducer of Fig. 1; Fig. 3 is a similar view of a reproducer in which the two stylus levers are connected to the center of a single diaphragm; Fig. 4 is a plan view of the diaphragm of Fig. 1, and Fig. 5 is a section on line 5—5 of Fig. 4.

The reproducer shown in Figs. 1 and 2 consists of the sound box body 1 of ordinary form, within which the diaphragm 2 is clamped by a ring 3 in the usual manner. There are a pair of floating weights 13 and 14 respectively, the former of which is pivoted at 15 to the block 6 carried by the body 1, and the weight 14 has a downwardly extending lug 16 which is pivoted at 17 to the said block 6. The weights 13 and 14, as shown, lie side by side in the same general plane and on opposite sides of a plane parallel to the direction of the pivotal movement thereof. The stylus lever 18 is pivoted at 19 to a pair of lugs 20, which depend from the weight 13, and a stylus 12 is secured in a socket formed in the end of the said lever 18, the opposite end of the said lever being connected by the link 21 to the diaphragm 2 at a point eccentric thereto. The stylus lever 22 is pivoted to the lugs 23, which depend from the floating weight 14, the axis of said lever being in the same line as that of the lever 18. One end of the lever 22 is formed with a socket within which is secured the stylus 11, and the other end of the lever 22 is connected by a link 24, with the diaphragm 2 at a point eccentric and opposite to that at which the link 21 is connected. The styluses 11 and 12 may be of any suitable form adapted to track the record groove, those shown being of the button-ball type, as fully set forth and claimed in my Patent Reissue No. 11,857, dated September 25, 1900.

Figs. 4 and 5 show the preferred form of diaphragm, which may be of metal, such as hard copper, or any other suitable material, and is formed with two series of annular corrugations 25 and 26 respectively, eyes 27 being secured at the centers of each of said sets of corrugations, for receiving the ends of the links 21 and 24 respectively. A groove 28 extends diametrically across nearly the entire width of the diaphragm, and divides the same into halves which vibrate practically independently of each other. It is obvious that if desired the links 21 and 24 may be connected to a pair of separate circular diaphragms, correspond-

ing to the annular members 25 and 26, or the diaphragm 2′ may be cut in two along the line of the groove 28 to form separate diaphragms.

The reproducer of Fig. 3 differs from that of Figs. 1 and 2 only in the fact that the levers 18 and 22 are of somewhat different form and the links 21 and 24 are connected to the center of the diaphragm, which may be of any desired form or material.

Having now described my invention, what I claim is:

1. A phonograph reproducer comprising a sound box body provided with a single diaphragm, a pair of floating weights pivoted to the sound box body and lying side by side and on opposite sides of a plane parallel to the direction of the pivotal movement thereof, and a stylus lever and stylus supported by each weight, said levers being connected to said diaphragm and said styluses being adapted to coact with a sound record and supported with their operative surfaces located in substantially the same plane parallel to the grooves of the sound record when the reproducer and record are in operative position and in substantially the same plane tangent to said record, substantially as set forth.

2. A phonograph reproducer comprising a sound box body and a single diaphragm, a pair of styluses, adapted to co-act with a sound record, means supporting said styluses with the operative surfaces of the latter located in substantially the same plane parallel to the grooves of the sound record when the reproducer and record are in operative position, one of said styluses being slightly in advance of the other, and connections from said styluses to widely separated portions of said diaphragm, substantially as set forth.

3. In a phonograph reproducer, the combination of a sound box body provided with a single diaphragm having a plurality of sets of annular corrugations whose centers are at a substantial distance apart, a plurality of independent floating weights pivoted to the sound box body, and a stylus lever and stylus carried by each floating weight, the stylus levers being respectively connected to the diaphragm at the centers of the sets of annular corrugations, substantially as set forth.

4. In a phonograph reproducer, the combination of a sound box body provided with a single diaphragm having a diametric groove dividing the same into sections adapted to vibrate substantially independently of each other, a plurality of independent floating weights pivoted to the sound box body, and a stylus lever and stylus carried by each of the floating weights, the stylus levers being respectively connected to different sections of the diaphragm, substantially as set forth.

5. A phonograph reproducer comprising a body, a pair of floating weights, a stylus lever supported by each weight, and a stylus carried by each lever, said styluses adapted to co-act with a sound record and supported with their operative surfaces located in substantially the same plane parallel to the grooves of the sound record when the reproducer and record are in operative position, one of said styluses being in advance of the other, and both being positioned to co-act with the record at the same time, a single diaphragm, and connections from each stylus lever to said diaphragm, substantially as set forth.

6. A phonograph reproducer diaphragm provided with a plurality of sets of annular corrugations whose centers are at a substantial distance from each other, substantially as set forth.

7. A phonograph reproducer diaphragm provided with a plurality of sets of annular corrugations whose centers are at a substantial distance from each other, and a groove separating said sets of corrugations and extending transversely to a line connecting their centers, substantially as set forth.

8. A phonograph reproducer diaphragm having a diametric groove dividing the same into sections adapted to vibrate substantially independently of each other, substantially as set forth.

This specification signed and witnessed this 8th day of June 1908.

THOS. A. EDISON.

Witnesses:

FRANK L. DYER,

FRANK D. LEWIS.