M. VIGNALI.

GRAMOPHONE.

APPLICATION FILED FEB. 4, 1914.

1,198,977.

Patented Sept. 19, 1916.

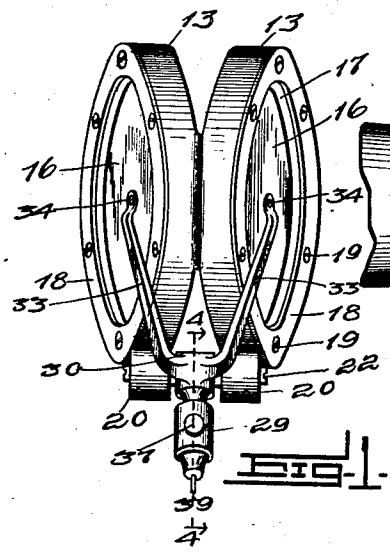

Fig. 1.

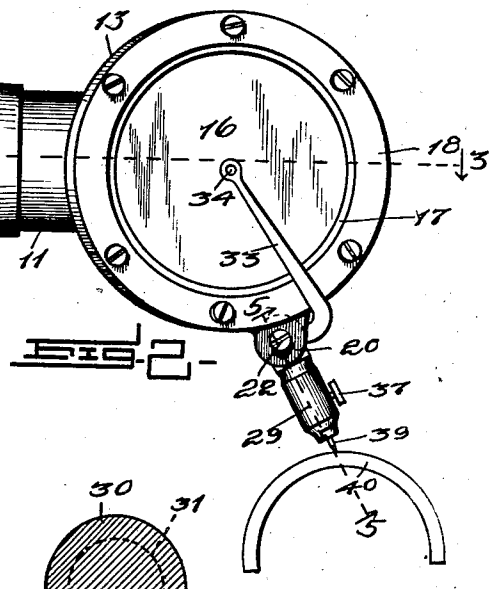

Fig. 2.

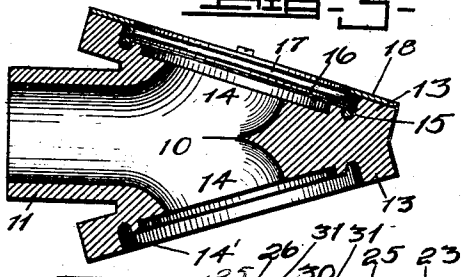

Fig. 3.

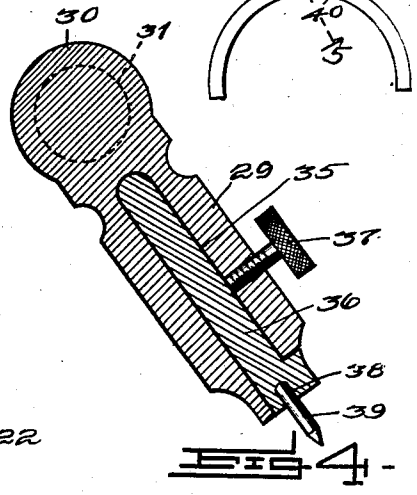

Fig. 4.

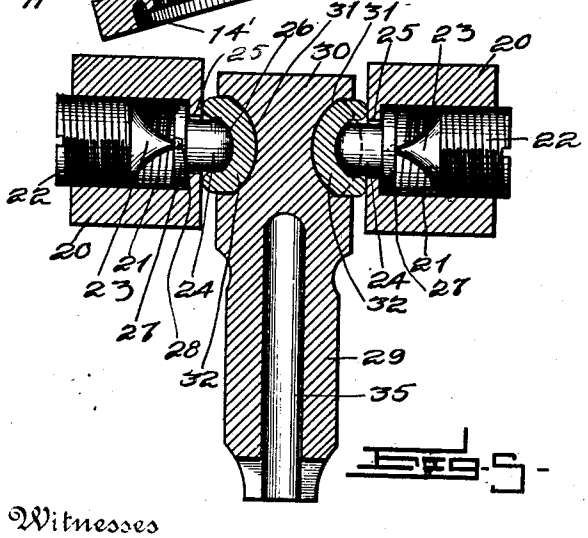

Fig. 5.

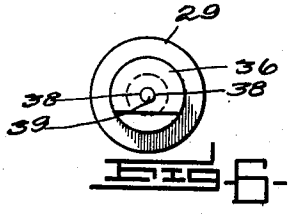

Fig. 6.

Witnesses

M. Lyles

B. W. Hilburne

Inventor

Marcelo Vignali,

By C. L. Parker

Attorney

UNITED STATES PATENT OFFICE.

MARCELO VIGNALI, OF MONTEVIDEO, URUGUAY.

GRAMOPHONE.

1,198,977. Specification of Letters Patent. Patented Sept. 19, 1916.

Application filed February 4, 1914. Serial No. 816,573.

To all whom it may concern:

Be it known that I, MARCELO VIGNALI, a citizen of the Republic of Uruguay, residing at Montevideo, in Uruguay, have invented certain new and useful Improvements in Gramophones, of which the following is a specification.

My invention relates to apparatus for recording or reproducing sounds and has particular reference to improvements in a sound box included therein, and embodying a plurality of diaphragms arranged in a novel manner and connected with a single needle-carrying lever.

An important object of the invention is to provide means of the above mentioned character, which will record and reproduce sounds, vocal, musical or the like, in a clear and full manner.

A further object of the invention is to provide means of the above mentioned character, which is light, strong, durable, simple in construction, and convenient in use.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side elevation of apparatus embodying my invention, the same being shown in the operative position, Fig. 2 is a rear end elevation thereof, Fig. 3 is a horizontal sectional view taken on line 3—3 of Fig. 2, Fig. 4 is a longitudinal sectional view taken on line 4—4 of Fig. 1, Fig. 5 is a similar view taken on line 5—5 of Fig. 2, parts being omitted, and, Fig. 6 is an end view of the needles and associated elements.

My apparatus, which may constitute either a recorder or reproducer, comprises a shell or sound box 10, which is preferably cast or formed of aluminum, owing to the strength and lightness of such material. Extending forwardly from the shell or sound box 10 is a reduced tube or neck 11, adapted for connection with a horn 12, as is customary. Formed upon the opposite sides of the shell or sound box 10 are preferably vertically arranged rings or open frames 13, which are disposed at an acute angle with relation to each other. The shell or sound box 10 has its opening or bore forked at one end thereof, forming oppositely extending passages 14, which lead into the openings of the rings or frames 13, as shown. The rings or open frames 13 are provided with annular grooves 14′, receiving packing rings 15, preferably formed of rubber or some other highly elastic material. Mounted within the rings or frames 13 and engaging the packing rings 15, are flexible diaphragms or membranes 16, which may be formed of any suitable material, while I have found that satisfactory results are obtainable by forming them of ivory or gold. These flexible diaphragms or membranes are held in place by packing rings 17, preferably formed of rubber, and engaging the edges of the diaphragm, as shown. These packing rings are in turn held in place by detachable rings 18, preferably formed of aluminum. The rings 18 are connected with the rings or open frames 13 by means of screws 19 or the like, as shown.

As more clearly shown in Figs. 1 and 2, the rings or open frames 13 are provided upon their lower portions with depending spaced lugs or ears 20, shown in detail in Fig. 5. These lugs or ears 20 are provided with main axially extending screw-threaded openings 21, receiving externally screw-threaded adjusting elements or screws 22. Each of the screws 22 is provided at its inner end with a tapered or conical portion 23, decreasing in diameter outwardly, as shown. The numeral 24 designates pivot studs or elements, passing through openings 25 formed through the ends of the lugs or ears 20. The outer ends of the studs or elements 24 are curved or rounded, as shown at 26, while the inner ends thereof are provided with enlarged heads 27, which are adapted to be moved longitudinally within the screw-threaded openings 21, but having no screw-threaded engagement therewith. Each head 27 is provided centrally thereof with an opening or recess 28, receiving the reduced outer end of the tapered extension 23.

The numeral 29 designates a vibratory lever, provided at one end with a head 30, having curved recesses or chambers 31 formed upon the opposite faces thereof. These recesses or chambers contain pads or packing 32, preferably formed of rubber or some other highly elastic material. The pivot studs 24 extend into the recesses 31 and engage therein, with the elastic pads 32. It is thus seen that the vibratory lever 29 is pivotally connected between and with the

lugs or ears 20, to swing in substantially vertical planes, the amount of friction that the pivotal connection of this lever will offer upon the swinging of the same, being regulated by the adjustment of the screws 22.

As more clearly shown in Figs. 1 and 2, the numeral 33 designates vertically inclined arms arranged at an acute angle, and diverging upwardly. These arms are rigidly connected with the head 30 of the lever 29 and are preferably cast integral therewith. The arms 33 are relatively rigid, being preferably formed of aluminum, of which the lever 29 is also preferably formed. It is thus seen that the arms 33 and lever 29 are adapted to swing or vibrate in substantially vertical planes. The upper ends of the arms 33 are arranged outwardly of and adjacent the vibratory diaphragm or membranes 16, and are pivotally connected therewith, as shown at 34.

As more clearly shown in Figs. 4 and 5, the vibratory lever 29 is provided with a longitudinally extending opening or recess 35, for receiving a removable rod or element 36, adapted to be clamped therein by a binding post 37 or the like. The element 36 is provided at its lower end with an opening 38, receiving needle 39, which may be constructed of any suitable material, while I have found that highly satisfactory results are obtainable by making it of sapphire. The needle may be held in the opening 38 by frictional engagement or by any other suitable means.

The numeral 40 designates a cylinder record, operating in engagement with the needle or needles 39. My apparatus may be just as well employed in connection with a disk record, the record 40 being simply shown, in connection with the apparatus, for the purpose of illustration.

In the use of the apparatus as a reproducer, it is obvious that as the record 40 which may be of the Berliner type with horizontally undulating sound grooves rotates in slidable engagement with the needle 39, such needle will be vibrated, to impart an oscillatory vibratory movement to the lever 29 and arms 33, which movement causes the diaphragms or membranes 16 to properly vibrate, to reproduce the sound.

When the apparatus is used as a recorder, the operation is reversed, the diaphragms being primarily vibrated, causing the lever 29 and arms 33 to partake of an oscillatory vibratory movement, whereby the needles 39 will be vibrated while having slidable contact with the revolving record cylinder, to cut the sound grooves therein.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having described my invention, I claim:

In apparatus of the character described, a sound box, a plurality of flexible diaphragms connected therewith in spaced relation, a swinging needle-carrying member arranged near the sounding box and provided as its turning point with oppositely arranged recesses, highly elastic pads disposed within the recesses to permit of perceptible lateral vibration of the member, internally screw-threaded tubular ears connected with the sounding box, pivot studs rotatably mounted within the ears and extending outwardly therefrom to engage the highly elastic pads, screw-threaded adjusting elements arranged within the screw-threaded tubular ears with their inner ends engaging the pivot studs, and arms connected with the needle-carrying member and with the flexible diaphragms.

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

MARCELO VIGNALI.

Witnesses:

LEOPOLDO ASPESI,

JOSE AGUSTIN PIANAVIA.