

J. W. JONES.
SOUND REPRODUCING MACHINE.

No. 605,484.

Patented June 14, 1898.

FIG. 3.

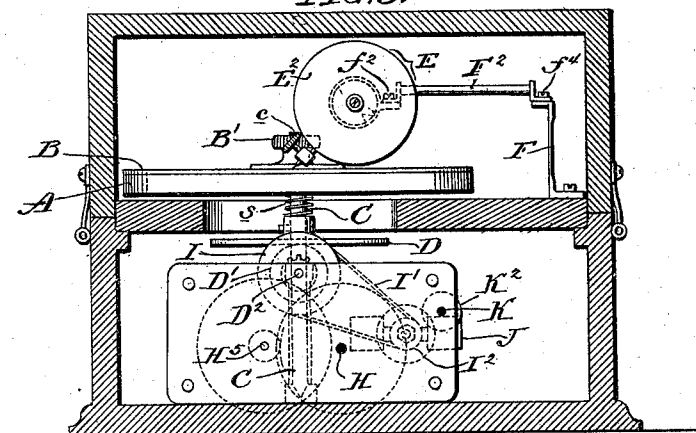


FIG. 5.

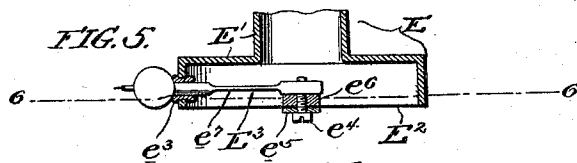


FIG. 4.

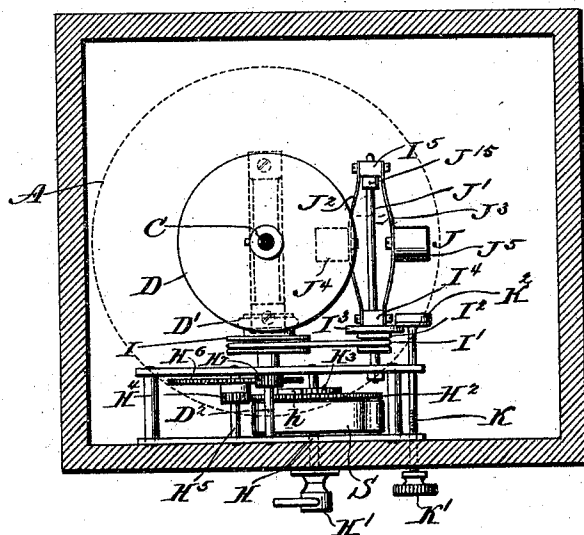
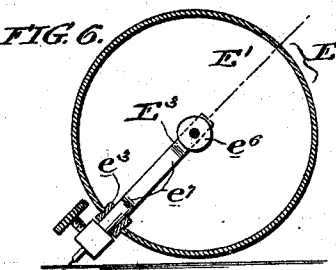


FIG. 6.



WITNESSES:

Witnessed
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INVENTOR

Joseph W. Jones
by his Attorney
David Sullivan

UNITED STATES PATENT OFFICE.

JOSEPH W. JONES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HIMSELF AND JOSEPH A. VINCENT, OF SAME PLACE.

SOUND-REPRODUCING MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,484, dated June 14, 1898.

Application filed May 13, 1897. Serial No. 636,294. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. JONES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sound-Reproducing Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in sound-reproducing machines, more particularly that class known as "gramophones," in which the sound-record employed consists of an irregular groove of even depth formed upon a flat disk, the stylus controlling the diaphragm being fed along by resting in and following the helical groove as the disk is being rotated.

My aim is to construct a simple and inexpensive toy machine which will embody all the quality of tone of a more expensive and elaborate machine and to overcome certain defects which I find to exist in the more expensive forms of gramophones and which are greatly magnified as the size of the instrument is reduced.

The main features embodied in my improvements are, first, the construction and arrangement of the sound-box, diaphragm, and stylus; second, means for guiding the sound-box and stylus and regulating the tension of the stylus-point upon the record; third, means for governing the speed of the motor operating the machine, and, fourth, in the general construction and arrangement of the parts, which will be more fully treated of hereinafter.

Referring to the accompanying drawings, Figure 1 illustrates a plan view of a gramophone embodying my improvements, the top cover of the instrument being removed. Fig. 2 is a side elevation of what is shown in Fig. 1. Fig. 3 is a vertical sectional view taken on the line 3 3 of Fig. 1. Fig. 4 is a horizontal sectional view on the line 4 4 of Fig. 2. Fig. 5 is a horizontal sectional view of the sound-box detached and enlarged, and Fig. 6 is a vertical section of the sound-box on the line 6 6 of Fig. 5.

Referring to the letters of reference marked upon the drawings, A indicates a circular table upon which the record-disk B is placed and firmly held in place by a thumb-screw B', which is threaded to engage a projecting portion c of the vertical shaft C, which supports said table. The table A not only acts as a support for the record-disk B, but is made of sufficient weight and thickness to act as a balance or fly wheel to more readily act in conjunction with the governor to regulate the speed of the machine.

Suitably guided upon the shaft C, below the table A, is a disk D, acted upon by a spring S, said disk being operated upon by a friction-wheel D', mounted upon the shaft D², which is driven by spring means, more fully described hereinafter.

Not the least important feature of my invention is the sound-box E, which comprises the shell or casing E', to which is secured by soldering or brazing the diaphragm E². A lever E³ passes through the rim of the sound-box and is cushioned to prevent the rasping and grating sounds commonly heard in talking-machines, caused by metallic working surfaces coming together in the working portion of the sound-box. To overcome this defect, I surround the lever E³ at its point of fulcrum with a ring or cushion e³ of rubber, which permits of a slight universal movement. The lever E³ is joined at one end to the diaphragm E² by a screw e⁴, which is separated from the diaphragm, and in like manner the diaphragm is separated from the lever E³ by cushions e⁵ and e⁶. I further desire to destroy harsh and grating sounds caused by minute irregularities in the true sound-waves, which I accomplish by reducing the thickness of the bar E³ at a point e⁷, thus allowing the bar to move the reduced portion e⁷, which acts as a spring to take up the delicate movements caused by the irregularities above referred to.

One of the important features of my invention is the means employed to guide the sound-box and stylus across the face of the record-disk, so that the stylus will at all times assume the same relative position in the record-groove, and the sound-box will move in a plane parallel to a horizontal line drawn

across the face of the record-disk. By this arrangement I reduce the tendency of the stylus to leave the groove of the record, which frequently occurs where a short arm is employed, causing the sound-box and stylus to assume a radial position in respect to the point of fulcrum. The tone of the instrument is greatly improved by this means of guiding the sound-box and the life of the record is greatly prolonged.

The sound-box E is connected to the bracket F by the parallel rods F' and F², which are hinged to the sound-box by screws f' and f² and to the bracket F by the screws f³ and f⁴. By the use of these short parallel rods I find that the stylus, which is caused to assume the same plane with respect to the record, imparts with greater force and more accuracy the sound-waves of the record, the great weight of the long arm commonly employed is overcome, and the whole construction is made more compact. The bracket F in addition to acting as a support for parallel rods F' and F² also imparts a spring-tension to the sound-box and stylus and causes the latter to bear with a yielding tension against the record-disk.

As shown in Figs. 1 and 2, the sound is conveyed from the sound-box E by a tube G, which is guided by an opening in the bracket F.

The motor for rotating the table A comprises a winding-shaft H, provided with a key H', a spring S, the inner end of which is secured to said shaft, while the outer end is secured to the framework of the motor. The gear-wheel H² is hung loosely upon the shaft H and is provided with a pawl h, which engages the teeth of a ratchet-wheel H³, which is firmly secured to the shaft H. The gear H² meshes with a pinion H⁴ upon a shaft H⁵, which carries a gear-wheel H⁶, the same meshing with a pinion H⁷ upon the shaft D².

Secured to the shaft D² is a grooved pulley I, provided with an elastic belt I', which imparts motion to a pulley I², controlling the governor.

The governor J consists of a fixed shaft J', secured to the framework of the motor. The pulley I² is united to or has formed therewith a disk I³ and a hub I⁴. The springs J² and J³ of the governor are provided with weights J⁴ and J⁵, which are secured at their ends to the hubs I⁴ and I⁵, which rotate, together with said springs, upon the fixed shaft J', a collar J¹⁵ upon said shaft serving to hold the hub I⁵ in position against the action of said springs.

From the above description it will be readily seen that as the governor rotates the pulley I², disk I³, and hub I⁴ will travel back and forth upon the shaft J' as the speed varies. In order to control the speed of the machine, I provide an adjustment in the form of a threaded rod K, which is provided at one end with a thumb-screw K' for turning and adjusting the same. At the other end of the rod I provide a padded disk K², which may be brought to bear upon the disk I³, and thereby limit

the speed of the machine by frictional contact.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A sound-reproducing machine comprising a rotatable table, a record thereon, spring means for rotating said table, a sound-box provided with a diaphragm and stylus, a bracket secured to the framework of the machine and short parallel rods pivoted to said bracket and to the sound-box, substantially as specified.

2. A sound-reproducing machine comprising a rotatable table, a record-disk detachably secured thereto, spring means for rotating said table, a sound-box provided with a diaphragm, and stylus, the latter having a bar interposed between the diaphragm and sound-box provided with an annular cushion supported by the rim of the sound-box, and cushions at the point where the bar is united to the diaphragm, a bracket connected to the framework of the machine, parallel rods pivoted to said bracket and to a projecting ledge upon the sound-box, substantially as specified.

3. A sound-reproducing machine comprising a rotatable table, a record detachably secured thereto, spring means for rotating said table, a sound-box provided with a diaphragm and stylus operated upon by the record, a flexible bracket secured to the frame of the machine, two parallel rods each of which is pivoted at opposite ends to the sound-box and flexible bracket, a governor upon the operating mechanism and means independent of the action of the governor for regulating the speed of the mechanism.

4. A sound-reproducing machine comprising a rotatable table mounted upon a vertical shaft, a record-disk detachably secured thereto, a driving-disk feathered to said shaft and held in frictional contact with the driving mechanism by a spring, spring mechanism for operating the driving-disk, a sound-box provided with a diaphragm and stylus operated upon by the record and parallel rods pivoted to the sound-box and to a bracket mounted upon the framework of the machine.

5. A sound-reproducing machine comprising a rotatable table, mounted upon a vertical shaft, a record-disk detachably secured thereto, a driving-disk feathered to said shaft and operated upon by a spring, a pulley for rotating said disk mounted upon a horizontal shaft, rotated by spring mechanism, a governor driven by a flexible belt from said shaft, a disk upon one of the movable parts of said governor, an adjusting-screw having upon one end a disk and pad which is capable of being brought into and out of contact with the disk of the governor for regulating the speed of the operating mechanism, a sound-box provided with a diaphragm and stylus, operated upon by the record, and parallel rods for guiding the sound-box, pivoted to the latter

and to a bracket mounted upon the framework of the machine.

6. A sound-box for a sound recording or reproducing machine, consisting of a flexible stylus-lever inclosed within the sound-box
5 and fulcrumed to the wall of the same by an annular ring of elastic material, one end of said stylus being connected to the diaphragm through the medium of a screw and cushion,

and the opposite end being provided with a detachable stylus.

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

JOSEPH W. JONES.

Witnesses:

JAMES E. HEWES,
JOHN R. NOLAN.