

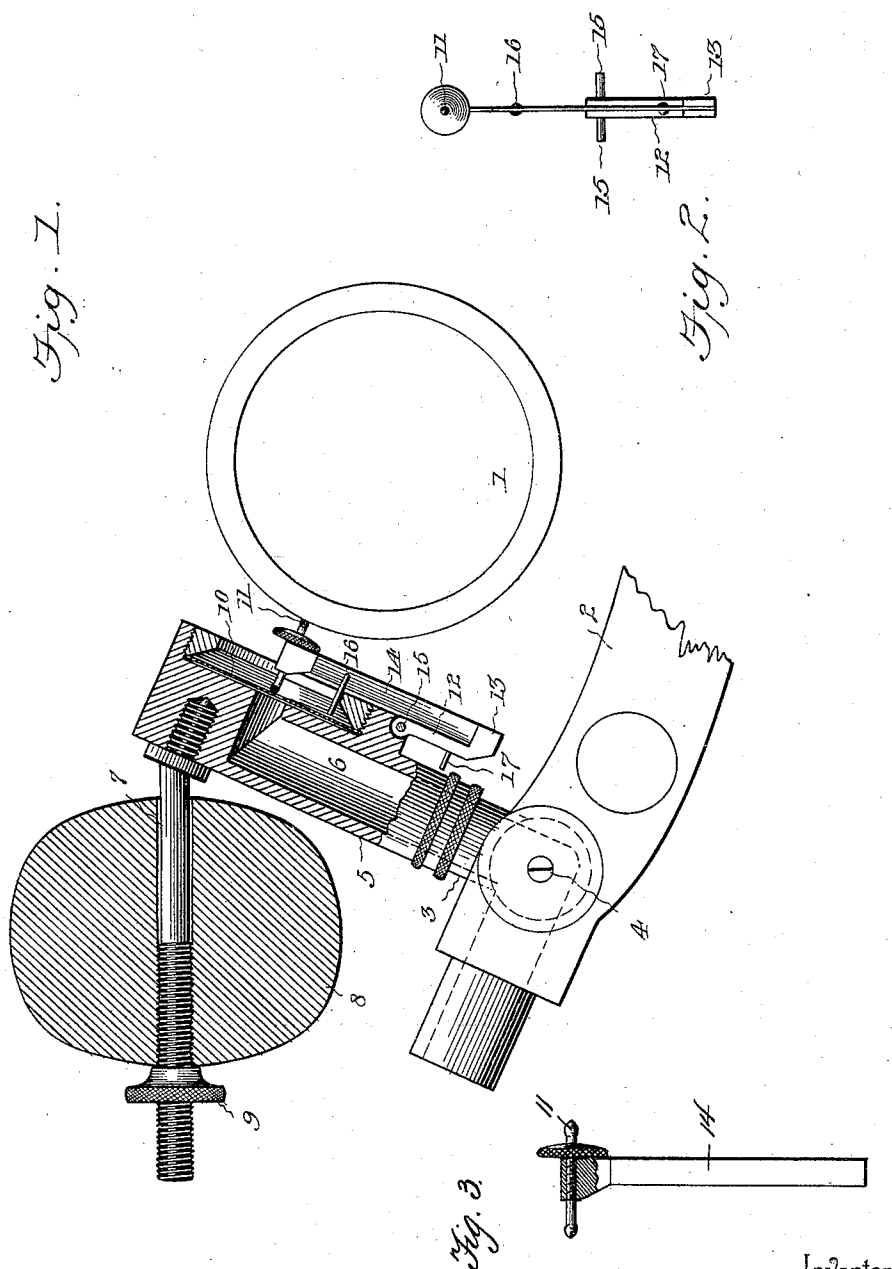
No. 644,981.

Patented Mar. 6, 1900.

W. HART.
GRAPHOPHONE REPRODUCER.

(Application filed Nov. 22, 1897.)

(No Model.)



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Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM HART, OF KIRKSVILLE, MISSOURI.

GRAPHOPHONE-REPRODUCER.

SPECIFICATION forming part of Letters Patent No. 644,981, dated March 6, 1900.

Application filed November 22, 1897. Serial No. 659,434. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HART, a citizen of the United States, residing at Kirksville, in the county of Adair and State of Missouri, have invented a new and useful Graphophone-Reproducer, of which the following is a specification.

This invention relates to means for reproducing sound from a record obtained in any of the known ways, and is applicable to graphophones or like machines in which the reproducer embodies a diaphragm and a stylus, the latter following the record and causing vibrations in the diaphragm similar to those resulting in the record, whereby the sound-waves are such as to reproduce the original.

The object of this invention is to secure volume and distinctness and to enable the pitch to be varied according as the horn or tubes are to be used; also, to obviate lost motion between the stylus-bearing arm, the reproducer and its support, and to enable the stylus to adapt itself to the record without necessitating a loose or pivotal joint between the reproducer, and its support which is the chief source of trouble in not securing satisfactory results in this class of machines.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a detail view showing the invention in operative relation. Fig. 2 is a front view of the arm bearing the stylus. Fig. 3 is a detail view showing the screw-thread connection between the stylus and its carrying-arm.

Corresponding and like parts are referred to in the following description and indicated in the several views of the drawings by the same reference characters.

The record-cylinder 1 is supported in the usual manner peculiar to the style of machine to which it is applied, and these mountings are not shown, because they form no part of

the present invention and vary with the different makes of machines. The bracket or support 2 has an elbow-shaped tube 3, pivoted thereto at 4 in the ordinary way, and the reproducer 5 is applied to one arm or member of the tube 3 by means of a slip or other joint, and the horn or ear tube is fitted to the opposite end of the tube 3 in the usual manner.

The reproducer has a passage 6, which registers with the member of the tube 3 to which it is fitted, and is counterbalanced, a rod 7 being applied to its upper end and extending away from the cylinder 1 and threaded to receive a weight 8, which latter is adjustable on the rod, so as to establish nearly an equilibrium between the weight and the reproducer, whereby the latter is free to respond to the vibrations of the stylus to cause the diaphragm to vibrate in consonance with the stylus, so as to produce well-defined sound-waves, which will result in a clear and distinct sound corresponding as nearly as possible with the original as can be reproduced by mechanical appliances. A binding-screw 9 is applied to the threaded end of the rod 7 to secure the weight 8 in an adjusted position when the reproducer is equiposed. The diaphragm 10 is secured to the frame of the reproducer in any of the usual ways, so as to vibrate freely, and its central portion comes directly opposite the deflected end of the passage 6, whereby the confined air may receive the full benefit of the maximum vibrations of the diaphragm and reproduce the sound in a clear, distinct, and audible manner.

The arm bearing the stylus 11 is composed of two parts, a pivoted member 12, having its lower end formed with a lateral extension 13, and a spring member 14, having a head at its upper end, which is internally threaded to receive the stylus 11, which latter is exteriorly threaded and is provided at its ends with the usual points to bear against the record and diaphragm, respectively. The member 12 has journals 15 at its upper end, which obtain a bearing in the reproducer-frame, thereby admitting of the stylus moving rapidly between the diaphragm and record, which is essential to the operativeness of the machine. The parts are disposed so that the stylus comes directly opposite the center of the diaphragm.

The spring member 14 is thin and comparatively wide and is placed with its greatest width in the direction of the stylus, thereby preventing any movement of the part 14 in a plane at right angles to the diaphragm and record independent of the movement of the vibration of the arm upon its journals 15 and with the stylus 11.

A pin 16 is rigidly attached to the member 14 and is located a short distance from the stylus 11, so as to engage with the diaphragm near its edge when the stylus 11 has been unscrewed, so as to withdraw it from engagement with the diaphragm. This construction provides for moderating the sound, so as to prevent a person standing near the machine from hearing the reproduction without the use of an ear-tube, which is of advantage when the privilege of listening to the machine must be paid for. A second pin 17 is applied to the pivoted member 12 and constitutes a stop to engage with the frame of the reproducer and prevent the arm bearing the stylus from falling away from the reproducer too far when the latter is raised and slid back to the head to pass over another record.

As previously explained, the arm 14 is adapted to yield laterally or in a plane parallel with a diaphragm and record, thereby enabling the stylus to adapt itself to the groove of the recording-cylinder when lowering the reproducer into an operative position. This construction obviates the provision of a loose joint between the reproducer and its support, which has been found objectionable because of the lost motion generally existing in a pivotal joint of this character.

The weight 8 may be conveniently disposed and by preference is placed above the bearing of the reproducer, although it may be located below the bearing or in any relation so long as it serves to counterbalance the reproducer, so that the stylus will bear lightly upon the record and the diaphragm engage lightly with the stylus.

Having thus described the invention, what is claimed as new is—

1. In a graphophone, the combination of a record and a reproducer comprising a diaphragm, of a resilient stylus-carrying arm having a pivotal connection at one end with the reproducer-frame to permit of its oscilla-

tion in a direction toward and away from the diaphragm, the resiliency of said stylus-carrying arm also permitting a movement, independent of its pivotal motion, transversely of the faces of the diaphragm and record, and a stylus adjustably mounted in said arm and adapted for adjustment with respect thereto in a direction toward and away from the record, substantially as described.

2. In a graphophone, the combination of a record and a reproducer comprising a diaphragm adapted to vibrate at right angles to the face of the record, of a flat stylus-carrying spring-arm having a pivotal connection at one end to a fixed point of attachment on the reproducer-frame to permit the stylus to freely vibrate in a direction toward and away from the diaphragm, said flat spring-arm being arranged edgewise with reference to the faces of the diaphragm and record to prevent independent movement thereof in the direction of vibration of the stylus and permitting the same to move transversely of the faces of the diaphragm and the record, and a stylus adjustably mounted in said arm and adapted for adjustment with respect thereto in a direction toward and away from the record, substantially as set forth.

3. In a graphophone, the combination with the reproducer, of a pivoted arm bearing a stylus and a pin which are relatively adjustable, whereby either the stylus or pin may be caused to engage with the diaphragm, substantially as described.

4. In a graphophone, the combination with the reproducer, of a pivoted arm, a stylus having adjustable connection with the pivoted arm to engage centrally with the diaphragm, and a pin attached to the said pivoted arm and adapted to engage with the diaphragm at a point remote from its center upon moving the stylus outward or away from the diaphragm, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM HART.

Witnesses:

MYRON A. MILLER,
J. W. HELME.