No. 629,963. Patented Aug. 1, 1899.

P. H. HOLM.

GRAMOPHONE.

(Application filed Aug. 25, 1898.)

(No Model.)

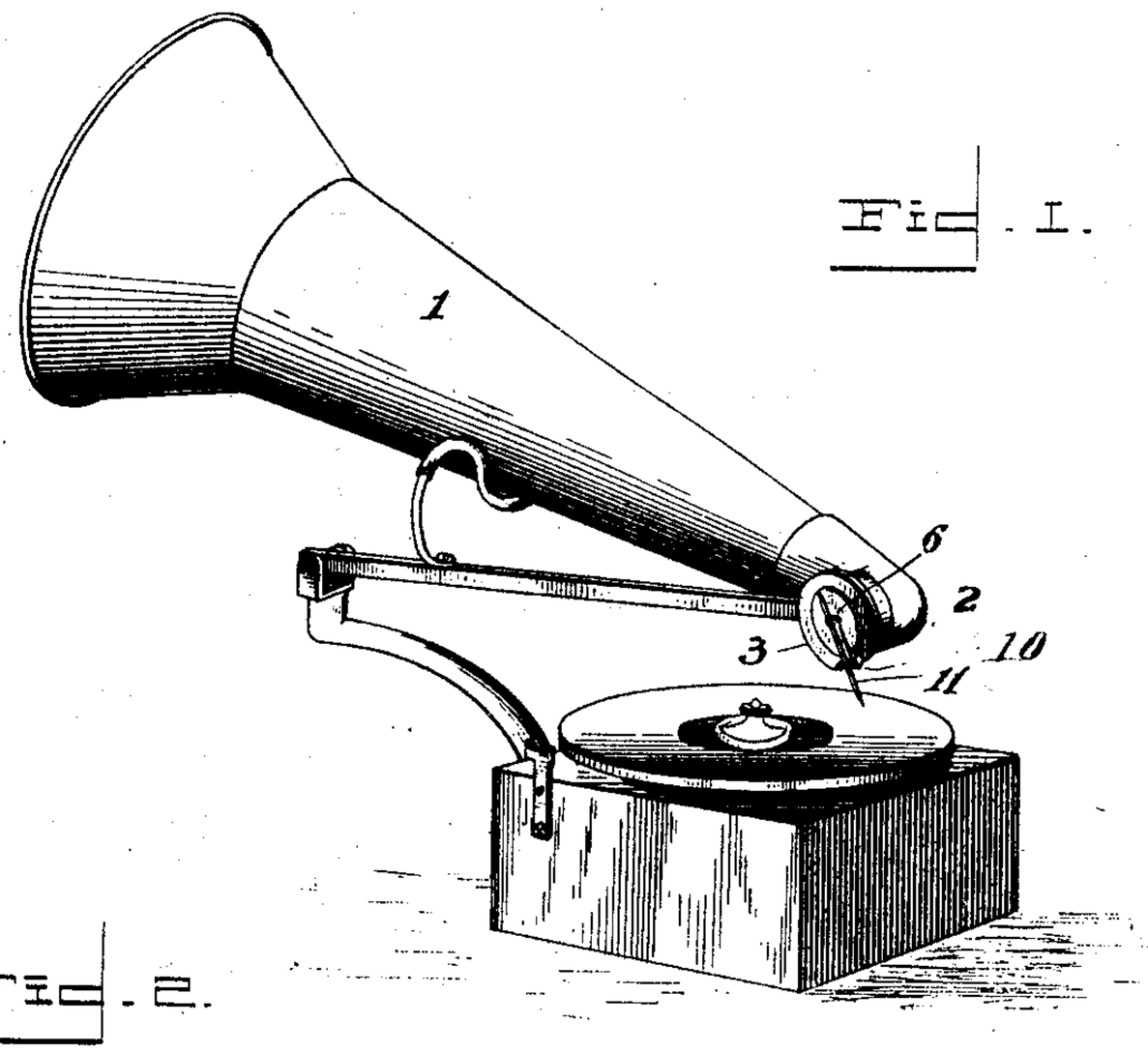


Fig. 1.

Fig. 2.

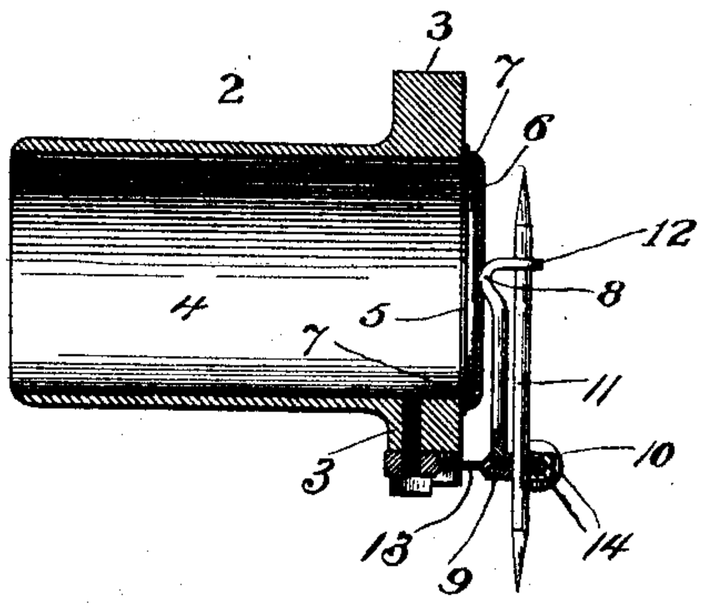
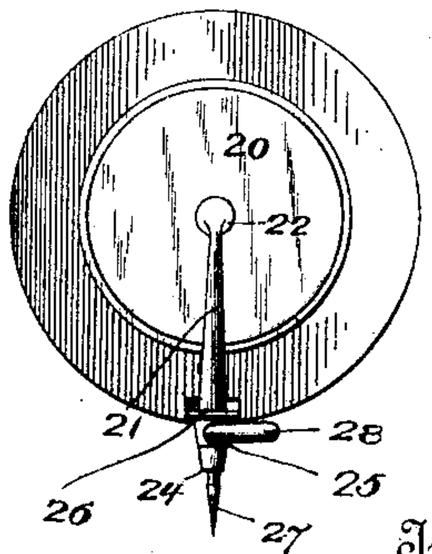


Fig. 3.



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UNITED STATES PATENT OFFICE.

PETER H. HOLM, OF WARREN, MINNESOTA.

GRAMOPHONE.

SPECIFICATION forming part of Letters Patent No. 629,963, dated August 1, 1899.

Application filed August 25, 1898. Serial No. 689,491. (No model.)

To all whom it may concern:

Be it known that I, PETER H. HOLM, a citizen of the United States, residing at Warren, in the county of Marshall and State of Minnesota, have invented certain new and useful Improvements in Gramophones, of which the following is a specification.

This invention relates to gramophones, and particularly to a sound-reproducing diaphragm and means for elastically holding the diaphragm not in or on a sound-box, but on the sound-nipple, thereby making a direct vibration.

The object of the invention is to provide a diaphragm free from or with no direct attachment to the nipple-head of a sounding-tube, said diaphragm having a sharp wedge-shaped inturned bearing peripheral edge forming its only contact-surface.

A further object of the invention is to provide a new and novel means for elastically holding the diaphragm on the nipple-head, such means also constituting the stylus holder or carrier.

The sounds reproduced by the diaphragms heretofore known are accompanied with a disagreeable squeaking, reedy, or buzzing effect, owing to so much of the diaphragm lying on the sound-tube nipple-head. My diaphragm, with its inturned sharp peripheral edge affording the least contact-surface, has been found to entirely prevent such disagreeable and unnatural effects and to reproduce a clearly-vibrated pure tone or sound by direct vibration over the whole area of the sound-tube opening. The direct vibration of the diaphragm is made by having the latter cover the whole area of the opening in the nipple-head, there being no intervening sound-box and said opening being the same size of the nipple.

In the accompanying drawings, forming part of this application, Figure 1 is a perspective view of my invention. Fig. 2 is an enlarged sectional view. Fig. 3 is an elevation of a modified form of the stylus-arm shown in Figs. 1 and 2.

The same reference-numerals denote the same parts throughout the several figures of the drawings.

In lieu of the usual sound-box I provide a headed nipple, which consists of a hollow piece or pipe, having at one end an enlargement or surrounding flange forming a head, over which a diaphragm is operated and over the other end of which a sound-tube is fitted, so that the nipple forms a coupling between the sound-tube and the diaphragm.

The sound-tube 1 is placed on the nipple 2, which has a thick solid flange forming a head 3, an opening 4 direct through the nipple and head, and a rubber or other suitable gasket 5 on the head.

The sound-reproducing diaphragm 6 is composed, preferably, of thin metal, though glass may be used, and has a beveled or wedge-shaped inturned periphery, which forms a sharp or knife-like edge bearing 7, which is the only bearing or contact between the gasket 5 and the diaphragm. The diaphragm is held in a vibratory position over the opening 4 by a stylus-arm 8, secured at one end to the center of the diaphragm, and the other end is secured to or formed integral with a stylus-support 9, which has one end attached to the head 3 and the other end formed into a fork or U-shaped carrier 10 for one end of the stylus 11, the other end of the stylus being carried by the upturned end 12 of the stylus-arm 8. The said two ends of the stylus-support are joined by a spring 13, preferably integral with said ends. A set-screw 14 is operated through one of the arms of the U-shaped carrier to adjust and hold the stylus in any desired position. The stylus is made double-pointed, so that it may be turned end for end should occasion demand. It is obvious that this stylus, either single or double, is for rubber records, either disk or cylindrical, and may be retracted to leave a shorter length of stylus upon the outside of its carrier, so as to louden or strengthen the sound, and when it is desired to reduce the volume or soften the sound the stylus is extended a greater length beyond its carrier.

It will be seen that the stylus-arm is attached directly to the center of the diaphragm and the latter is not attached to the nipple-head, thus permitting a free action of the diaphragm independent of the said head and

vibrated directly from the point of the stylus through the spring and stylus-arm, the bearing-surface of the diaphragm being so slight, yet equal throughout, that a clear pure tone is produced.

Referring to Fig. 3, a stylus 15 for cutting or grooving a wax record, whether in disk or cylindrical form, is shown and has a spring-arm 16 attached to the center of the diaphragm 17 at one end, and the other end is secured to a nipple-head.

In Fig. 3 the diaphragm 20 is the same as that already treated; but the stylus-arm 21 has a downwardly-turned end 22, secured to the center of the diaphragm 20, and the other end is enlarged and hollow and terminates in an open top 24 of the support 25, which has a spring 26, the stylus 27 being adjusted in the hollow end of the arm 21 by a set-screw 28.

It will be observed that the diaphragm is almost equal in diameter to the opening of the sound-tube, so that the full volume of sound will be imparted to the tube by the direct vibration of the diaphragm over the whole area of the tube end.

Having thus described my invention, what I claim is—

1. The combination, with the nipple having a head, of a sound-reproducing diaphragm comprising a disk, the only contact-surface between it and the said head being at the juncture of the inner and outer faces of the disk.

2. A sound-reproducing diaphragm comprising a disk having a beveled or inturned periphery forming a sharp bearing.

3. The combination, with a sound-tube nipple provided with a suitable gasket, of a diaphragm comprising a disk having a sharp edge forming the only contact with the gasket, a stylus-arm secured at one end to the center of the disk, and the stylus-support in which the other end of the said arm terminates.

In witness whereof I hereunto set my hand in the presence of two witnesses.

PETER H. HOLM.

Witnesses:
P. O. DAHLGREN,
P. B. MALBERG.