I. A. NORTHROP.

SOUND RECORDING AND REPRODUCING MACHINE.

APPLICATION FILED APR. 15, 1914.

1,292,858. Patented Jan. 28, 1919.

Fig. 1.

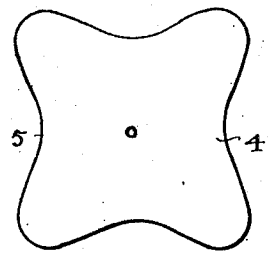
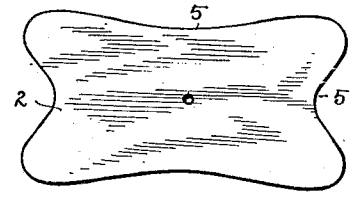


Fig. 2.



WITNESSES

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IRVIN A. NORTHROP, OF LORAIN, OHIO.

SOUND RECORDING AND REPRODUCING MACHINE.

1,292,858. Specification of Letters Patent. Patented Jan. 28, 1919.

Application filed April 15, 1914. Serial No. 831,929.

To all whom it may concern:

Be it known that I, IRVIN A. NORTHROP, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Sound Recording and Reproducing Machines, of which the following is a specification.

My invention relates to improvements in sound recording and reproducing machines, and in devices for transmitting or receiving sounds, and producing musical sounds mechanically or electrically, and the improvement resides more particularly in a diaphragm for such machines and devices, all substantially as herein shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figures 1 and 2 are two plan views of different forms of diaphragms constructed according to my invention.

In general, the sound boxes of machines for transmitting or receiving sounds comprise a round diaphragm of mica, glass or metal clamped near its edge between rubber rings and having a metal stylus-bar secured to the diaphragm center. I have found that the clamping and fastening means used stiffen the central part of the diaphragm at its edge or center and render the sounds more shallow, harsh and unequal the more it is clamped; also that the edge must be restricted from vibration as much as possible without clamping, and the connection should be air tight. I also find that a wood diaphragm gives the best results, and that a diaphragm made thicker near its center will produce a very sweet, but not powerful tone, and if made thicker near its edge it will produce a very powerful tone with very little sweetness, but not in an extreme degree.

Bearing the foregoing requirements in mind, I construct the diaphragm in a particular way to minimize the tendency to respond to certain tones powerfully, and to others feebly, for example as in the diaphragms 4 and 2 shown in Figs. 1 and 2. These diaphragms are particularly distinguished from all other diaphragms known to me in that each possesses wavy or irregularly-curved edges formed according to the law of sines, and while the diaphragms shown have four incurved sides and produce good results, I may make the diaphragms with a different number of incurved sides. Diaphragm 2, Fig. 2, is made of material having relatively unequal strength transversely and longitudinally. For example, the elongated diaphragm preferably is made of wood with the grain running longitudinally, and the outline or peripheral edge 5 of the diaphragm is of irregular curvature and the arc of each circle at the longer sides is of greater radius than the arc of each circle at the shorter sides. The diaphragm 4 shown in Fig. 1 may be made of any material of uniform strength throughout, and the delineation of both forms of diaphragm is only approximate to that of a sine wave. A sine wave periphery is best adapted to break up the sympathetic action which causes such unequal amplitudes in circular diaphragms wherein the radii are all equal.

What I claim is:

1. In a sound recording and reproducing machine, a diaphragm whose periphery has the conformation of a sine-wave.

2. In a sound recording and reproducing machine, a diaphragm made of material of varying strength longitudinally and laterally whose periphery has a wavy conformation, the distance between wave crests being greater where parallel with the lines of greatest strength of said diaphragm.

3. In a sound recording and reproducing machine, a diaphragm of fibrous material strongest along its fibers having a periphery conforming to a sine-wave in which the distance between wave crests is greater where parallel with the fibers.

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

IRVIN A. NORTHROP.

Witnesses:
F. C. HARROLD,
B. C. TAYLOR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."