

May 31, 1932.

N. H. HOLLAND
ACOUSTIC DIAPHRAGM
Filed June 12, 1926

1,860,503

Fig. 1

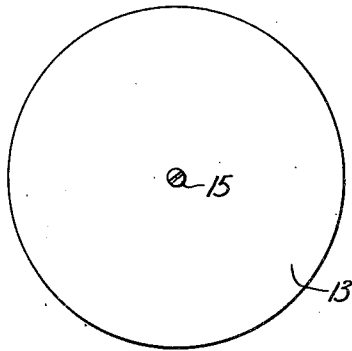


Fig. 2

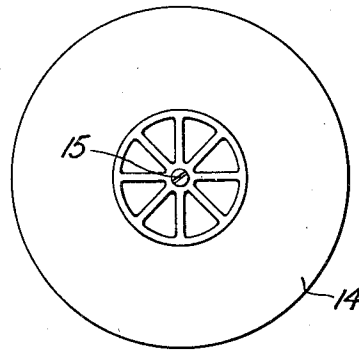
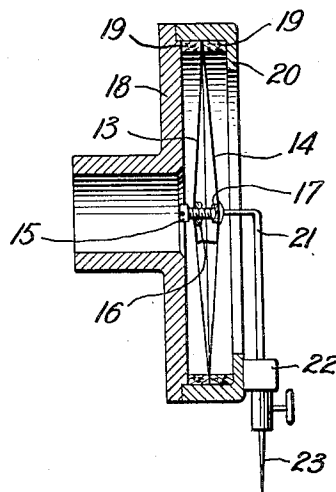


Fig. 3



Inventor:
Newman H. Holland
by J. C. Palmer Att'y.

UNITED STATES PATENT OFFICE

NEWMAN H. HOLLAND, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

ACOUSTIC DIAPHRAGM

Application filed June 12, 1926. Serial No. 115,474.

This invention relates to acoustic diaphragms and more particularly to diaphragms for use in phonographs or loud speakers as sound radiators.

5 An object of this invention is to provide a novel form of diaphragm of small mass and adjustable elastic reactance.

Such a diaphragm is attained, in accordance with the invention in a specific aspect, by constructing it of two sheets of metal foil, the periphery of one sheet being joined to the second sheet either at its periphery (when the sheets are the same size) or at some point between the periphery and the central zone, dependent upon the size of the smaller sheet, and then separating the two sheets at the central zone.

The invention will be better understood from the following description together with the attached drawings, showing a preferred form of the invention in which Fig. 1 is a front view of one form of the diaphragm, Fig. 2 is a front view of a modified form and Fig. 3 shows in partial section the diaphragm of Fig. 1 as applied to a phonograph sound box.

Referring more particularly to Fig. 3, the diaphragm consists of two circular pieces of metal foil 13 and 14 of the same diameter soldered or otherwise joined at the peripheries. The foil may be of copper, aluminum, or any other suitable material.

At the center of the diaphragm is a screw 15 threaded through a nut 16 which is permanently fastened to the foil sheet 13. Cooperating with the screw and forming a seat for the end, is a block 17 permanently fastened to foil sheet 14.

It is apparent that if the periphery of the diaphragm is maintained fixed and the screw 15 is turned, the distance between the foil sheets is varied and hence the tension in the sheets is varied. The variation of tension in the sheets varies the elastic reactance of the diaphragm thereby permitting the elastic reactance to be adjusted as desired with no change in mass.

The structure of the diaphragm may be modified by having one foil sheet of smaller diameter than the other. This causes a re-

duction in mass and still permits a variation in tension of the sheets and hence the elastic reactance of the diaphragm. A still further reduction in mass may be obtained by having the smaller sheet of skeleton construction, as by cutting slots in it, as shown in Fig. 2.

The diaphragm is supported in a sound box 18 by means of rings 19 of rubber or similar resilient material which rings are compressed and held in position by means of cap 20.

The stylus arm 21 is fastened to the center of the diaphragm and is pivotally held at 22. A needle 23 held in the end of the stylus arm cooperates with a phonograph record (not shown) transferring the vibrations from the record to the diaphragm.

What is claimed is:

1. An acoustic diaphragm comprising two circular metallic sheets joined together at the periphery of one of said sheets, one of said sheets being of skeleton construction and screw means associated with said sheets to adjust the tension therein, and to hold the center portions thereof in fixed vibratory relation with respect to each other.

2. An acoustic diaphragm comprising two sheets of metal foil secured together at their peripheries, a screw frictionally engaging the inner center portion of one of said sheets and having a threaded engagement with the other whereby the separation between said sheets may be varied to control the stiffness of said diaphragm.

In witness whereof, I hereunto subscribe my name this 10th day of June, A. D. 1926.

NEWMAN H. HOLLAND.