Jan. 8, 1929.

W. D. PACK

1,698,374

SOUND REGENERATING DEVICE

Filed May 1, 1926

Fig. 1

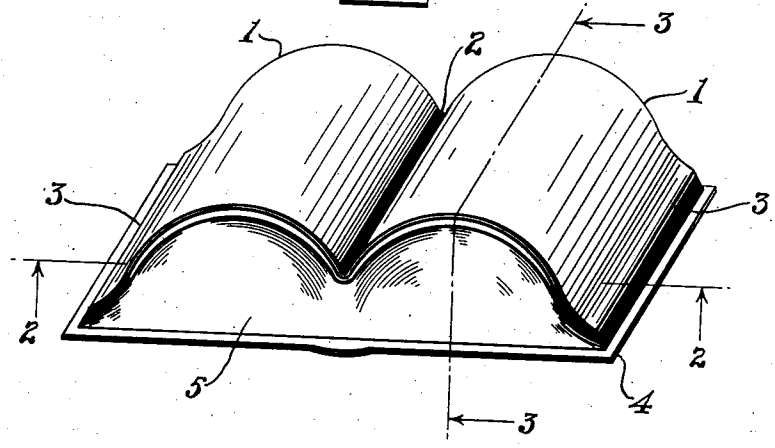


Fig. 2

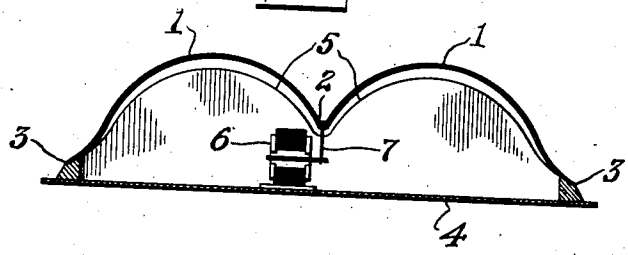
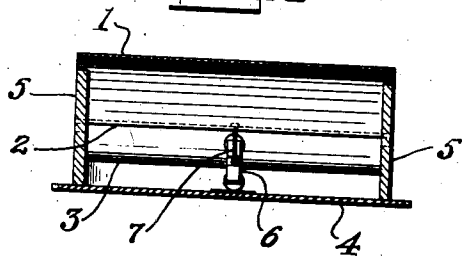


Fig. 3



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UNITED STATES PATENT OFFICE.

WEHRLI D. PACK, OF SALT LAKE CITY, UTAH, ASSIGNOR TO UTAH RADIO PRODUCTS COMPANY, INCORPORATED, A CORPORATION OF UTAH.

SOUND-REGENERATING DEVICE.

Application filed May 1, 1926. Serial No. 106,130.

This invention relates generally to sound regenerating devices adapted for radio reception and more particularly to the loud speaker unit, which utilizes a large diaphragm or membrane held taut or flexed and vibrated by an electrical or mechanical vibrating transmission mechanism.

The invention consists in providing a diaphragm or membrane of novel construction, which is capable of responding to the high frequency vibrations employed in the reproduction of sound, and of imparting these vibrations without change of character and appreciable loss of energy so that a faithful reproduction of the original sound is produced.

One of the objects of the invention is to produce a sound regenerating device which utilizes a folded membrane or diaphragm, folded so as to give stiffness in one direction and utilizing a sound vibrating member attached to the fold of the membrane to impart vibrations thereto, such vibrating unit being either an electric or similar type of device.

A further object of the invention is to produce a sound regenerating device of the character herein described, which, due to its simplicity of construction, affords an exceptionally advantageous commercial article.

A further object of the invention is to regenerate the orignal sound waves or vibrations without the interposition of a restrictive or sound modifying transformer such as a horn or megaphone, and thereby faithfully reproduce the original sound vibrations without distortions.

A further object of the invention is the production of a sound regenerating device in the form of an open book which is simple, compact, inexpensive and attractive in appearance.

Other objects and advantages will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel arrangement and corelation of instrumentalities herein fully described, and illustrated in the accompanying drawings, wherein similar reference characters are used to describe corresponding parts throughout the several views, and then finally pointed out and specifically defined and indicated in the appended claims.

The disclosure made the basis of exemplifying the present inventive concept suggests a practical embodiment thereof, but the invention is not to be restricted to the exact details of this disclosure, and the latter, therefore, is to be underestood from an illustrative, rather than restrictive, standpoint.

The inventive idea involved is capable of receiving a variety of mechanical expressions, one of which, for the purposes of illustration, is shown in the accompanying drawings, in which—

Fig. 1 is a perspective view of a sound regenerating device embodying my invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 looking in the direction of the arrow;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1.

In the drawings 1 represents a membrane or diaphragm constructed of any desirable material which will permit of the proper flexing of the diaphragm, such as compressed fibrous material, hot pressed paper, fibre, cardboard, parchment, fibre-board, paper, sheet metal, aluminum or in fact any material may be used which is of a vibratory nature, and which can be properly held in a flexed position. The membrane or diaphragm utilized is of a large area, and I have discovered that if vibrations occasioned by sound are imparted to the folded edge, which folded edge gives stiffness in one direction and hence the sound vibrations are transmitted from said folded edge outwardly in both directions, exceptionally clear, loud, distortionless and accurate sound reproduction is obtained. In fact I have found that the sound vibrations so reproduced by such sound regenerating device are a faithful and natural reproduction of the original sound vibrations. The membrane or diaphragm is folded at 2 so as to give stiffness in one direction and the edges of the diaphragm may be rigidly or flexibly fastened at 3 to the frame 4.

In the arrangement shown I utilize a membrane or diaphragm 1 which is folded at 2 and maintained in a flexed position by reason thereof; and I have in effect produced a device which has a plurality of membranes

divided by the folded edge. At the folded edge a sound reproducing device 6 is attached, such device being an electromagnetic vibrating unit attached to the membrane at its folded edge by a connecting link 7.

I wish it distinctly understood that while I have shown an electro-magnetically vibrating unit of the balanced armature type, my device is not so limited, and that any vibrating unit, whether electrical or mechanical may be utilized.

The members 5 are illustrated to imitate book ends, and enclose the sound vibrating unit, and also may be utilized as sounding boards to reinforce and amplify the sound vibrations.

In accordance with the provisions of the patent statute, I have described the principle of my invention, together with the device which I now consider to represent a practical embodiment thereof, but I desire it understood that my invention is not confined to the particular form of device herein shown and described, the same being merely illustrative, and that the invention can be carried out in other ways without departing from the spirit of my invention, and, therefore, I claim broadly the right to employ all equivalent instrumentalities coming within the scope of the appended claims, and by means of which the objects of my invention are attained, and the new results accomplished, as herein set forth, as it is obvious that the particular embodiments herein shown and described are only some of many that can be employed to attain these objects and accomplish these results.

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

1. In a device of the character described, a unitary membrane secured at its edges and flexed into the form of a cuspidal arch and a sound vibratory member attached to said membrane at the cusp.

2. In a device of the character described, a base, a unitary membrane secured at its edges to said base and flexed into the form of a cuspidal arch and a sound vibrating member attached to said membrane at the cusp, said membrane and said base forming an enclosure for said sound vibrating member.

3. In a device of the character described, a rectangular base, said base having a pair of opposite substantially perpendicular walls, the upper edges of said walls having the contour of a cuspidal curve, and a rectangular membrane attached to said base at its ends with its edges following the contour of the upper edges of said walls, and means for vibrating said membrane.

4. In a device of the character described, a rectangular base plate, said base plate having a pair of opposite, substantially perpendicular walls, the upper edges of said walls having the contour of a cuspidal curve, a flexed rectangular membrane attached to said base plate at its ends, with its edges following the contour of the upper edges of said walls, and a sound vibrating member mounted upon said base plate and operatively connected to said membrane, said membrane, said walls and said base forming a casing for said sound vibrating member.

5. In a device of the character described, a rectangular base plate having a pair of opposite, substantially perpendicular walls, the upper edges of said walls having the contour of a cuspidal curve, a flexed rectangular membrane attached to said base plate at its ends with its edges following the contour of the upper edges of said walls and creased along a line extending from the cusp of one wall to the cusp of the other wall, and a sound vibrating member attached to said membrane at the creased portion thereof, said membrane, walls and base plate forming an enclosure for said sound vibrating member.

6. In a device of the character described, a rectangular base, a unitary membrane attached to said base at its ends and creased through its center upon a line parallel to said attached ends and flexed into the formation of a double arch of which said creased portion forms the cusp, and a sound vibrating member mounted between said base and said membrane and having a connecting link perpendicular to said base and attached to the creased portion of said membrane.

7. As an article of manufacture, a sound amplifier of a form in imitation of an open book, comprising a rectangular base plate having an outwardly curved central portion simulating the back and cover boards of an open book, a pair of substantially vertical walls having their upper edges in the form of cuspidal curves simulating the top and bottom leaf edge surfaces of an open book, a rectangular membrane attached at its ends to said base plate and with its side edges following the upper edges of said walls and curved to simulate the upper, opposite pages of an open book, and a sound vibrating member concealed under said membrane.

This specification signed this 23rd day of April, 1926.

WEHRLI D. PACK.