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H. FISCHER

1,514,511

SOUND TRANSMITTING AND RECEIVING DIAPHRAGM

Filed July 15 , 1922

Fig. 1.

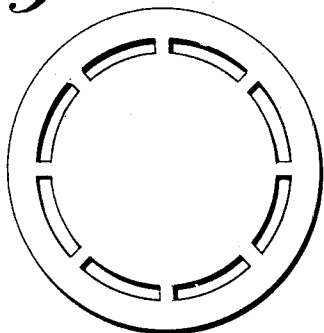


Fig. 2.

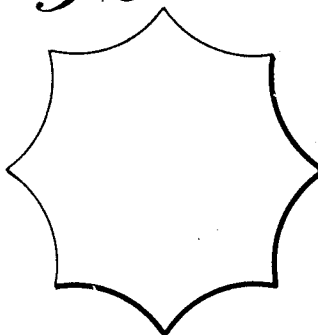


Fig. 3.

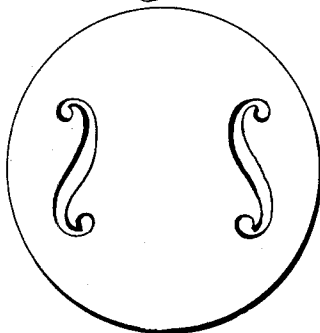


Fig. 4.

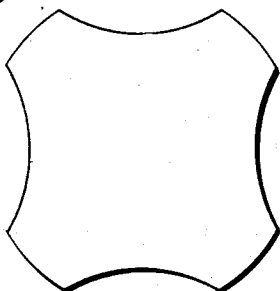


Fig. 5.

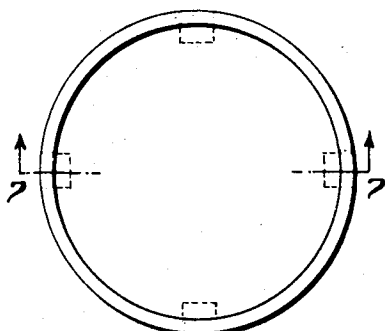
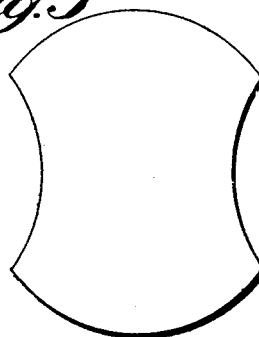


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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SOUND TRANSMITTING AND RECEIVING DIAPHRAGM.

Application filed July 15, 1922. Serial No. 575,246.

To all whom it may concern:

Be it known that I, HERMANN FISCHER, a subject of Russia, residing in New York, county and State of New York, have invented certain new and useful Improvements in Sound Transmitting and Receiving Diaphragms, of which the following is a specification.

This invention relates to an improvement in sound diaphragms for the transmission, reception, reproduction and amplification of sound produced by the human voice, or other sound producing means, and whether the transmission, reception, and reproduction is by telephone, radiophone, gramophone or otherwise.

I have discovered that a very marked increase in the tonal value and volume of sound transmitted and reproduced is achieved by so forming or supporting the diaphragms that they have "edge" vibration. This may be accomplished by modifying the form of the diaphragm from the usual solid disk or by modifying the usual annular clamping ring support.

The invention will be understood by reference to the accompanying drawing, in which:—

Fig. 1 represents a diaphragm provided with a series of marginal segmental slots.

Fig. 2 represents a diaphragm in which a plurality of uniform segmental portions have been removed from the margin.

Fig. 3 represents a diaphragm formed with two centrally disposed curvilinear slots.

Figs. 4 and 5 are modifications of Fig. 2.

Figs. 6 and 7 illustrate a circular diaphragm supported at four marginal points, the remaining marginal edge being free.

Unlike the usual sound receiving or transmitting diaphragm, my diaphragm utilizes sound waves on both of its sides, its outside edge or the edges of intermediate apertures being permitted to freely vibrate; and my diaphragm does not have the damping and sound-distortional effect of a diaphragm clamped by annular rings, and of unbroken periphery or centre.

I have illustrated in the drawings several of many possible forms of my diaphragm.

Referring to Fig 1, the diaphragm therein shown is formed with the circularly arranged segmental slots 1 separated by webs 2 which connect the centre 3 to the rim 3^x 55 which may be secured between the usual clamping rings of a telephone transmitter or receiver or other instrument. In this form the edges of the slots are free for vibration, and the amplitude of vibration is greatly increased over the usual form of diaphragm. In Figs. 2, 4 and 5, I achieve the same result by removing segmental portions from the margin of the disk, so that the latter is provided with spaced edges 4, 65 free for vibration. In the diaphragm shown in Fig. 3, the annular margin is left intact, and curvilinear slots 5 are formed, the opposite edges of which are free for vibration. In Figs. 6 and 7 I achieve the same result by 70 making my diaphragm of less diameter than the diameter of the supporting member 6 in which it is clamped, and by clamping the diaphragm between spaced series of opposed supports 7, 7^x, so that the intermediate sections of diaphragm rim are free for vibration. 75

It will be understood that the free edges of the disk, whether peripheral or intermediate, may be of any suitable form, but 80 preferably free from angles or sharp angles. The material of which my diaphragm is composed may be of any usual or suitable material, and the diaphragm may be circular or of any other form. In certain cases 85 it may be found desirable to employ a diaphragm of variable thickness, so as to place the vibration of greatest intensity at certain definite points. I have shown such a diaphragm in Fig. 7, the greater thickness 90 being on the centre, so as to intensify the marginal edge vibration.

Having described my invention, what I claim and desire to secure by Letters Patent is:— 95

A sound diaphragm comprising a member having a substantially flat surface, supporting means for clamping said diaphragm at a plurality of points of support spaced about the periphery thereof, all within the 100 same circular line, said surface having substantially segmentally shaped portions cut

away between said points of support, the edges of said diaphragm being curved inwardly from said points, whereby said edges operate to freely vibrate between said points
5 of support when said diaphragm is placed in a state of vibration.

In testimony whereof, I have signed my

name to this specification in the presence of two subscribing witnesses.

HERMANN FISCHER.

Witnesses:

W. LEE HELMS,
JOSEPH I. ZEMSBY.