

T. CHALMERS.  
 DIAPHRAGM FOR TALKING MACHINES.  
 APPLICATION FILED MAY 2, 1916

1,298,290.

Patented Mar. 25, 1919.

Fig. 1.

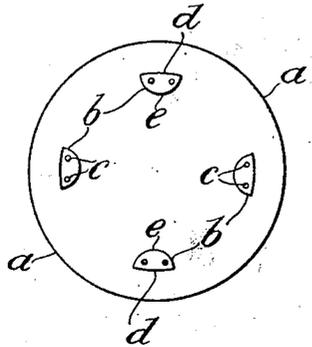


Fig. 2.

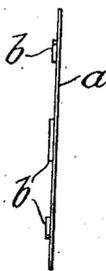


Fig. 3.

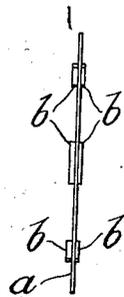


Fig. 4.

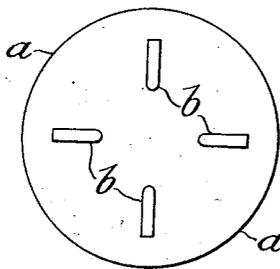


Fig. 5.



Fig. 6.

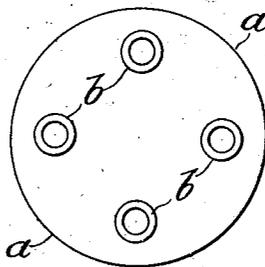


Fig. 7.

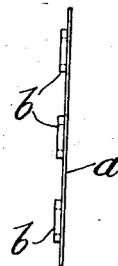


Fig. 8.

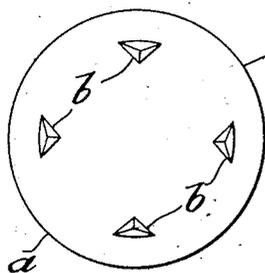


Fig. 9.



Fig. 10.

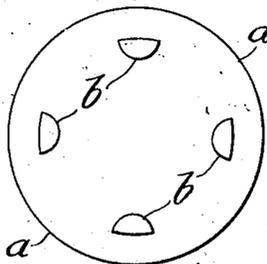


Fig. 11.

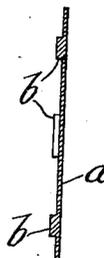
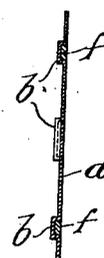


Fig. 12.



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# UNITED STATES PATENT OFFICE.

THOMAS CHALMERS, OF CREWE, ENGLAND.

DIAPHRAGM FOR TALKING-MACHINES.

1,298,290.

Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed May 2, 1916. Serial No. 94,870.

To all whom it may concern:

Be it known that I, THOMAS CHALMERS, a subject of the King of Great Britain and Ireland, and a resident of Crewe, in the county of Chester, England, have invented certain new and useful Improvements in Diaphragms for Talking-Machines and the like, of which the following is a specification.

This invention relates to diaphragms for telephones, transmitters, gramophones and the like and has for its object to provide improved means whereby such diaphragms may be tensioned or tuned to give the most suitable note without interfering with the vibrating area.

The invention resides, essentially, in increasing the thickness of a telephone, transmitter, gramophone or like diaphragm at a plurality of points at a uniform distance from its center. By this means the sound waves or vibrations set up at the center of the diaphragm are encountered or interrupted by the thickened portions and prevented from quickly massing in concentric circles at the periphery of the diaphragm where their value is a minimum and are re-directed or focused back to the center with the result that the waves are intensified and a louder and clearer note is produced.

The thickened portions may be formed on the front or the rear surface of the diaphragm or they may be formed on both the front and rear surfaces.

The thickened portions may be integral with the diaphragm or they may be constituted by separate disks, rings, plates, bars, rods or the like attached to one or both surfaces of the diaphragm. Further, the thickened portions when separate may be of soft iron, tin, brass, lead, solder or other suitable metal, or ebonite, vulcanite, wood, fiber or other appropriate material. They are however, preferably of metal.

In the accompanying drawings Figure 1 is a front view of a diaphragm and Fig. 2 a side view thereof illustrating one embodiment of the invention. Fig. 3 is a side view showing another embodiment. Figs. 4 and 5, 6 and 7, and 8 and 9 are similar views to Figs. 1 and 2 respectively, illustrating further embodiments of the in-

vention. Fig. 10 is a front view and Fig. 11 a section of another embodiment.

Fig. 12 is a section of a still further embodiment.

Referring first to Figs. 1 and 2, according to this embodiment the diaphragm *a* has arranged on and secured to its front face or surface, between its center and outer periphery, a plurality of flat disks *b*. The faces of the disks *b* next the diaphragm *a* are made dead true so that the whole of said faces are in actual contact with the diaphragm. The disks *b* are attached to the diaphragm by screws *c* or any other suitable means. The outer edges *d* of the disks *b* are concentric to the periphery of the diaphragm and their inner edges *e* are convex or rounded as shown.

The disks *b* cause a thickening of the diaphragm *a* at the places where they are located and the effect of these thickenings is, as above stated, to interrupt the vibrations or sound waves produced at the center of the diaphragm and re-direct them to or focus same on the center whereby intensification results and a louder or clearer note is produced.

In Figs. 4 and 5 the thickening disks *b* are in the form of comparatively long and narrow strips or plates arranged radially on the surface of the diaphragm, the outer edges *d* being, as before, concentric to the periphery of the diaphragm and their inner edges *e* convex or rounded.

In Figs. 6 and 7 the thickening disks *b* are of flat ring or annular form while in Figs. 8 and 9 they are of pyramidal construction.

In all the above embodiments the thickenings *b* are separate from the diaphragm and attached thereto by screws *c* or other suitable means as described in reference to Figs. 1 and 2.

In some cases, however, *e. g.* when the diaphragm is of carbon, the thickenings *b* may be integral with the diaphragm as shown in Figs. 10 and 11. Or the thickenings *b* may be formed by indenting the diaphragm and filling in the resulting recesses with suitable material as illustrated in Fig. 12.

The thickenings *b* may be arranged on the rear face or surface of the diaphragm *a* in-

stead of on the front face or surface thereof. Or as shown in Fig. 3, the thickenings may be arranged on both the front and rear faces or surfaces of the diaphragm.

5 In all cases the number, position, size and thickness of the thickened portions will depend on the size and thickness of the diaphragm and will be decided in each case by experiment.

10 When my improved focal diaphragm is employed in telephones, transmitters and the like a considerable saving can be effected in the amount of copper in the line.

What I claim is:—

15 1. A diaphragm comprising a thin disk having portions thereof of greater thickness than said disk proper, and said thickened portions being located between the center and the periphery of said disk.

20 2. A diaphragm comprising a thin disk having portions thereof of greater thickness than the thickness of said disk proper, and said thickened portions being located between the center and periphery of the disk and at uniform distances from the center.

25 3. A diaphragm comprising a thin disk having portions thereof of greater thickness than said disk proper, said portions consti-

tuting isolated areas located between the center and the periphery of the disk and arranged in circular form.

4. A diaphragm comprising a thin disk having indentations formed therein, and a member filling each of said indentations and rigidly secured therein.

5. A diaphragm comprising a thin disk having indentations formed therein, and a member filling each of said indentations rigidly secured to said diaphragm, said indentations being located between the center and periphery of the disk.

6. A diaphragm comprising a thin disk having indentations formed therein, and a member filling each of said indentations rigidly secured to said diaphragm, said indentations being located between the center and periphery of the disk and arranged in circular form.

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

THOMAS CHALMERS.

Witnesses:

EDMUND WARD PATTISON,  
FRANK A. HEYS.