

1,061,211.

Patented May 6, 1913.

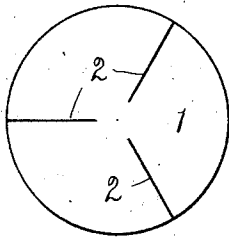


FIG. 1.

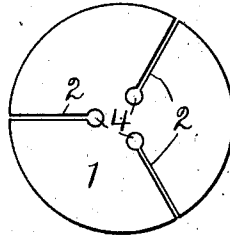


FIG. 2.

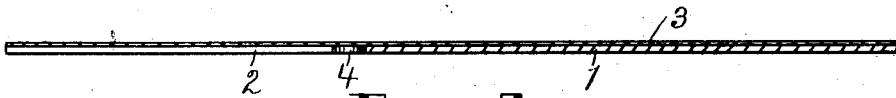


FIG. 3.

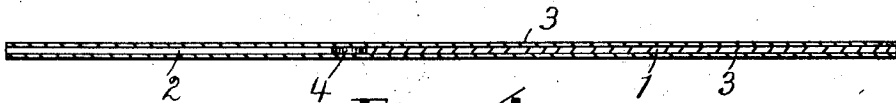


FIG. 4.

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ACOUSTIC DIAPHRAGM.

1,061,211.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed August 1, 1911. Serial No. 641,753.

To all whom it may concern:

Be it known that I, WILLIAM W. YOUNG, a citizen of the United States of America, residing at Agawam, in the county of Hampden and State of Massachusetts, have invented a new and useful Acoustic Diaphragm, of which the following is a specification.

My invention relates to improvements in diaphragms having acoustic properties which are designed especially for the sound-boxes of talking machines, and consists essentially of what may be termed a base member slit radially and covered with a permanently fixed integument on one or both sides, all as hereinafter set forth.

The object of my invention is to produce a comparatively inexpensive diaphragm which is inherently durable retains its acoustic properties without deterioration for an indefinite length of time, and possesses such properties in so highly a developed state as to make the diaphragm superior for talking machine purposes.

A further object is to construct the base member of the diaphragm in such a way that the necessary amount of vibration is provided for without unduly weakening said diaphragm or taking from it the degree of stability which is also required in order to obtain the best results.

Other objects will appear in the course of the following description.

I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a base member which may be employed in my diaphragm; Fig. 2, a similar view of a slightly modified form of base member; Fig. 3, an enlarged central cross-section through a complete diaphragm which embodies my invention in a practical form, and, Fig. 4, a similar cross-section through a diaphragm having integuments on both sides.

Similar figures refer to similar parts throughout the several views.

Diaphragms for the sound-boxes of talking machines are made in the form of disks, for the reason that better results are obtained from round sound producing members of this type, hence my diaphragm is made round or disk-like.

The diaphragm comprises a base member

1 having one or more radial slits 2 therein, and a covering or integument 3 on one side of such base member, or two integuments one on each side of said member, such integument or integuments being permanently affixed to the base member by means of suitable adhesive and hardening material, as lacquer, varnish, shellac, and the like.

For the base member 1 I provide a disk of thin material which is resonant and resilient and possesses the other necessary characteristics or qualities for reproducing sound to the best advantage, such as aluminum for metal or a fine grade of cardboard for fiber, although I do not restrict myself to these materials inasmuch as the range of available materials for such base member is quite wide, but merely mention them as examples of two of the best materials for my purpose.

In Figs. 1 and 2, three slits 2 are shown, but, while that number is most practical for some diaphragms, for others less than three or even more will be found advantageous, and when only a single slit is present in a diaphragmal base member the desired effect may be produced. Each slit 2 radiates from the vicinity of the center of the base member 1 outward through the edge of such member, and when there are three slits they are preferably spaced uniformly. The slits may be made without removing any of the material between the contiguous edges of each, as represented in Fig. 1, but I prefer to cut out a narrow strip of material so as to separate the edges of each slit, as represented in Fig. 2, because freer vibratory action is thus permitted the base member. I also prefer to enlarge the inner end of each slit 2, as shown in Figs. 2, 3 and 4 where such enlargements or perforations appear at 4, since by so doing the vibratory action of the base member and consequently of the diaphragm as a whole is still further increased, and this without impairing the stability of said diaphragm.

For each integument 3 a thin fabric is employed, the same being much thinner than the base member 1. In order to serve as a good absorbent medium for the adhesive material, as is desired, the fabric for the integument 3 may be a paper of fairly loose texture. The integument becomes saturated with the lacquer or other adhesive material

used, when it with such material is applied to the base member, and thus is filled with the adhesive material when the latter hardens, besides being securely affixed to said base member. In this way the integument is closely and permanently united with the base member and enters so intimately into the structure of the diaphragm as to form with said member and the hardened adhesive material a disk or diaphragm which possesses ample strength and great power to sustain and endure the multiplicity of vibrations to which such a device is subjected.

Ordinarily an integument 3 on one side only of the base member 1 is all that is necessary to cover the slits 2, with their enlargements 4 when present, and bind together or connect the slitted parts, as shown in Fig. 3, but two integuments 3 may be employed, as is sometimes desirable, as shown in Fig. 4. Whether one or both of the integuments be incorporated in the diaphragm, the office is the same in each case, such office being to transform, with the aid of the adhesive material, the slitted base member into a serviceable diaphragm, which possesses all of the desired qualifications, by closing or covering the slits 2 and connecting the parts separated by such slits without interfering unduly with the flexibility of said base member, but rather converting a flabbiness which the slitted member may have alone into the kind of flexibility or resiliency required, and at the same time lending itself in other ways, such as those hereinbefore pointed out, to aid in the perfection of the diaphragm. The filled and hardened integument, united as it is with the slitted member, connects and blends, as it were, the resonant vibrations produced by and given off from said member.

A diaphragm constructed in the manner herein shown and described is capable of

producing most excellent and satisfactory results in volume and quality of tone.

It is obvious that modifications, in addition to those made special note of in this specification, may be made without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, an acoustic diaphragm comprising a base member slit from a point outside of the center thereof to and through the edge of said member, and an integument affixed to said member over the slitted portions of the same.

2. As a new article of manufacture, an acoustic diaphragm comprising a base member perforated outside of the center thereof and having a slit extending from such perforation to and through the edge of said member, and an integument affixed to said member over the perforated and slitted portions of the same.

3. As a new article of manufacture, an acoustic diaphragm comprising a base member slit from a point outside of the center thereof to and through the edge of said member, an integument adapted to cover one side of said member, and a hardening adhesive material capable of uniting said integument with said member and of entering intimately and permanently into the texture of said integument.

4. As a new article of manufacture, an acoustic diaphragm comprising a base member having a plurality of perforations therein adjacent to the center thereof, and also having a plurality of slits extending from said perforations to and through the edge of said member, and an integument covering one side of and united with said member.

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Witnesses:

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