

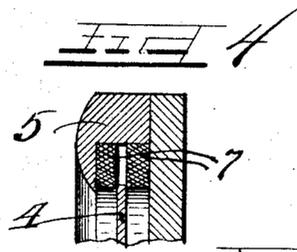
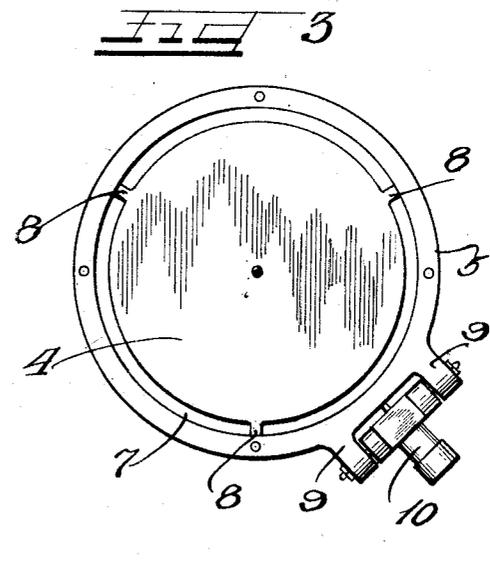
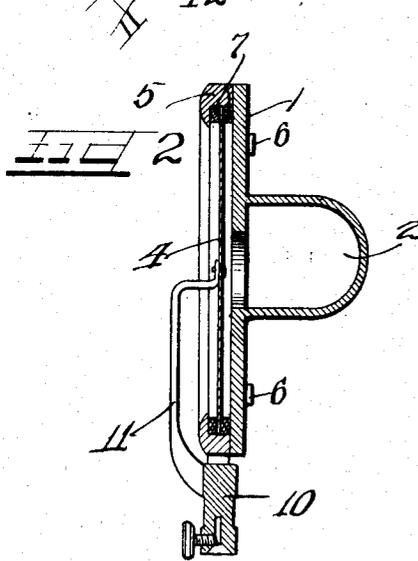
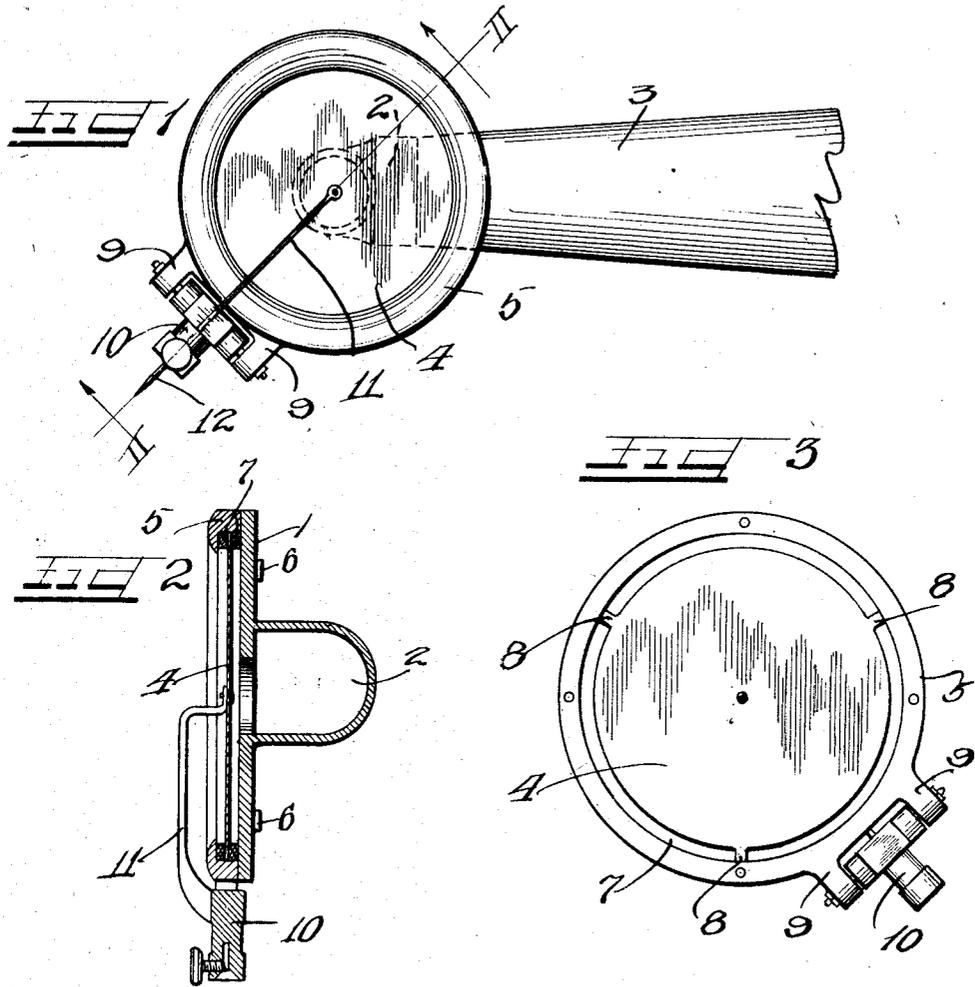
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DIAPHRAGM AND MOUNTING THEREFOR

Filed April 21, 1926



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DIAPHRAGM AND MOUNTING THEREFOR.

Application filed April 21, 1926. Serial No. 103,428.

This invention relates to a diaphragm and mounting therefor and particularly to a diaphragm structure which is adapted to be used in connection with phonograph reproducers, radio loud speakers and similar instruments in the reproduction and amplification of audible sound waves.

An important object of this invention resides in the provision of a diaphragm the entire surface of which is vibratable in such a manner as to effectively reproduce sounds throughout the audible range with a maximum of efficiency.

It is a further important object of this invention to provide a reproducing instrument of the kind described which is strong and durable, which does not easily get out of adjustment, and which may be economically manufactured.

Other and further important objects of this invention will be apparent from the disclosures in the specification and accompanying drawings.

The invention (in a preferred form) is illustrated on the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevation of the phonograph reproducer provided with the diaphragm and mounting embodying the principles of this invention.

Figure 2 is a section on the line II—II of Figure 1.

Figure 3 is a plan view of the reproducer unit with the back plate removed.

Figure 4 is an enlarged fragmentary detail sectional view illustrating the method of supporting the diaphragm.

As shown on the drawings:

The reference numeral 1 indicates an annular plate which forms the base of the reproducer and which may be provided with an integral sound outlet portion 2 communicating with a tone arm 3 of usual construction. The diaphragm of this invention comprises a disk 4 which may be made of any suitable material but which I have found gives particularly good results when constructed of a magnesium alloy. Said diaphragm 4 is held in position relative to the plate 1 by means of a flanged clamping ring 5 which is secured to said plate 1 by screws 6 and which serves to position two cushion supporting members 7 which are constructed

of rubber composition or other suitable resilient cushioning material and which engage only the extreme edge of the major portion of the diaphragm as will be evident from Figure 4.

In order to facilitate assembly of the diaphragm within the clamping ring 5 and to properly center the same, said diaphragm is provided with three integral radial prongs 8 which are relatively narrow so that they only comprise a very small percentage of the periphery of the diaphragm. By mounting the diaphragm as just described wherein only the extreme edge thereof engages the cushion supporting means, it is possible to readily vibrate the entire surface of the diaphragm including the extreme edge thereof without undue resistance or damping and thus accurate reproduction of the entire audible range of sounds from the lowest note to the highest notes is attained. The cushioning means as will be evident also serve to seal the space between the edge of the diaphragm and the casing and thus vibrations transmitted to the diaphragm are effectively reproduced without loss.

In the construction shown wherein the diaphragm and mounting of this invention is employed in connection with a phonograph reproducer, the ring 5 is provided with integral bosses 9 in which a stylus bar 10 is pivotally mounted, one end of said stylus bar carrying a reproducer arm 11 secured to the center of the diaphragm 4 and the other end being provided to removably carry a usual phonograph needle or other suitable stylus 12. Thus vibrations of said stylus 12 are transmitted through the arm 11 to the diaphragm where they are faithfully reproduced.

By the construction of this invention it is possible to employ a diaphragm of considerable thickness since the edge thereof for all practical purposes is unrestrained and allowed to vibrate to faithfully reproduce notes or sounds low in the scale. I have found it preferable to so mount the diaphragm relative to the cushioning means 7 as to only engage the extreme edge thereof, and within certain limits, this engagement of the cushioning means with the surface of the diaphragm should be as little as possible, for example, certain experiments which I have made indicate that the engagement of the

cushioning means over the surface of the diaphragm should not be for a distance of more than three times the thickness of the diaphragm and preferably much less.

5 While I have shown and described the diaphragm of this invention for use in connection with a phonograph reproducer, it will be apparent that it might be used without modification in similar sound reproducing instruments such as radio loud speakers wherein
10 the diaphragm mounting would be the same as shown, with standard means attached thereto to effect the vibrations.

15 I am aware that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not intend limiting the patent granted, otherwise than necessitated by the prior art.

I claim as my invention:

20 In a device of the class described, an annular casing having an internal flange, a ring of resilient material on the flange, diaphragm positioning means, a diaphragm positioned on
25 said ring so that only the extreme edge of the diaphragm for a major portion of the periphery thereof engages said ring, said diaphragm positioning means comprising narrow radial prongs at widely spaced intervals on
30 the periphery of said diaphragm to engage said ring and said casing, and thereby to suitably position said diaphragm and to substantially prevent lateral displacement of said diaphragm in said casing.

35 In testimony whereof I have hereunto subscribed my name.

EDWARD TOMAN.