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W. H. MARTIN

CONE LOUD SPEAKER DIAPHRAGM

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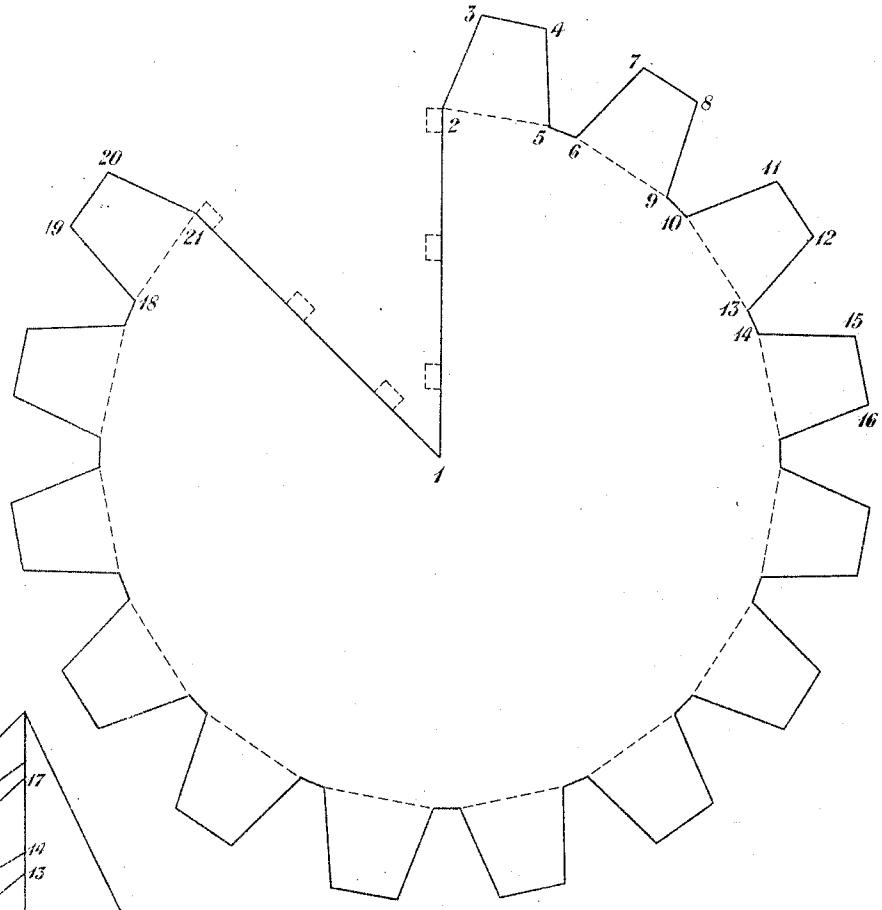


Fig. 1

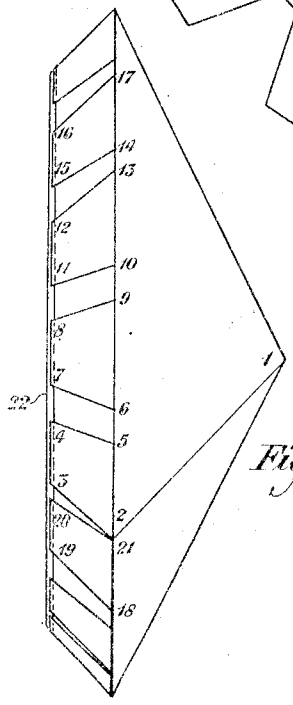


Fig. 2

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CONE LOUD-SPEAKER DIAPHRAGM.

Application filed February 21, 1925. Serial No. 10,928.

This invention relates to diaphragms for loud speaking telephone receivers, and more particularly to conical diaphragms for such receivers.

It is an established practice in the art to construct loud speaking receiver diaphragms with a conical scetion and a frustoconical section which co-operates with the conical section in reproducing the sound vibrations. Heretofore, such a diaphragm has been formed of two or more pieces of paper or other light, elastic material, joined together by suitable means. This construction necessarily involves considerable cost and labor.

It is the object of applicant's invention to provide an efficient conical loud speaker diaphragm formed from a single piece of material.

The invention will be clearly understood from the following detailed description of one desirable embodiment thereof, when the description is read with reference to the accompanying drawing. Figure 1 of the drawing shows the single piece of material before it is formed into the cone and cone frustrum, and Fig. 2 shows in side elevation the diaphragm after formation. Like numerals of reference in the two figures of the drawing mark corresponding points on the piece of material.

With reference to the details of the drawing, the single piece of paper or other light, elastic material is cut to the shape shown in Fig. 1, 1—2—3—4—5—6—7—8—9—10—11—12—13—14—15—16—17 and 18—19—20—21. The points 2, 5, 6, 9, 10, 13, 14, 17, and 18, and 21 are all equidistant from the point 1, and the dotted (Fig. 1) straight lines 2—5, 6—9, 10—13, 14—17, and 18—21, and the solid straight lines 5—6, 9—10, 13—14, etc., are chords of a circle whose center is 1, the chords 2—5, 6—9, etc., being longer than the chords 5—6, 9—10, etc. The chords 2—5, 6—9, 10—13, 14—17, and 18—21 form the bases of sections 2—3—4—5, 6—7—8—9, 10—11—12—13, 14—15—16—17, and 18—19—20—21, respectively, these sections being, approximately, at least, in the form of trapezia. The edges 2—3, 5—4, 6—7, 9—8, etc., are not radial lines with center 1, but are cut back somewhat in the form of gear-teeth edges.

When the piece of material shown in Fig. 1 is to be formed into the diaphragm shown in Fig. 2, the material is folded along the lines 2—5, 6—9, 10—13, 14—17, and 18—21, and the edges 1—2 and 1—21 are brought together and secured by suitable means, such as the tabs indicated in Fig. 1. The flaps 2—3—4—5, 6—7—8—9, 10—11—12—13, 14—15—16—17, and 18—19—20—21 are fastened along the lines 3—4, 7—8, 11—12, 15—16, and 19—20 to a suitable support, such as a ring, indicated at 22 in Fig. 2. It is thus seen that the main section 1—2—5—6—9—10—13—14—17 and 18—21 of the material forms the conical portion of the diaphragm, and the flaps, when bent back along the dotted lines of Fig. 1, jointly form the frustro-conical portion of the diaphragm.

The straight lines 2—5, 6—9, etc., permit the ready folding of the flaps even though the material be somewhat stiff. The flaps of Fig. 1 should preferably be cut back far enough so that, when the flaps are bent into position to form the divided cone frustrum, the points 4 and 7, 8 and 11, 12 and 15, etc., will be apart. This separation keeps the edges 4—5 and 6—7, 8—9 and 10—11, etc., from striking each other during the operation of the diaphragm and so avoids the rattling sound which would result from such striking.

As will be clearly seen from the above description and Fig. 1 of the drawing, the main section of the material, being polygonal and not circular, does not form a true cone. As the number of flaps is increased, the surface of the main portion of the diaphragm becomes more nearly a conical surface.

The diaphragm has been described in connection with a loud speaking receiver, but it is to be understood that the invention is applicable to many other devices, for instance, phonograph reproducers or recorders. Furthermore, applicant does not limit his invention to the above description, but claims that invention as follows:

What is claimed is:

1. A loud speaking telephone receiver diaphragm comprising a substantially conical portion and a divided frusto-conical portion, said two portions being integrally formed.

2. A loud speaking telephone receiver diaphragm comprising a main section in substantially conical form and a plurality of smaller sections jointly forming a divided

frusto-conical portion, said main section and said smaller sections being integrally formed.

3. A loud speaking telephone receiver diaphragm comprising a substantially conical main portion and a plurality of smaller portions, said smaller portions being designed to form a divided cone frustrum and being integrally formed with said substantially conical portion.

4. A loud speaking telephone receiver diaphragm comprising a first portion polygonal at its periphery and gradually merging into conical form towards its apex and a divided frusto-conical second portion, said two portions being formed from a single piece of material, said piece of material comprising a main polygonal section forming the first portion and a plurality of smaller sections forming the second portion, the bases of said smaller sections being chords of the circle whose center forms the apex of said first portion.

5. A loud speaking telephone receiver diaphragm comprising a first portion polygonal at its periphery and gradually merging into conical form towards its apex and a divided frusto-conical second portion the diaphragm being formed from a single piece of material, said piece of material comprising a main polygonal section whose sides are chords of a common center, said main section forming the first portion, and a plurality of smaller sections each in the form of a trapezium having as its base one side of said polygonal section, said smaller sections forming the second portion.

6. A loud speaking telephone receiver diaphragm comprising a first portion polygonal at its periphery and gradually merging into conical form towards its apex and a divided frusto-conical second portion the diaphragm being formed from a single piece of material, said piece of material comprising a main polygonal section having alternate longer and shorter sides which are chords of a common center, said main section forming the first portion, and a plurality of smaller sections each in the form of a trapezium having as its base a longer side of said polygonal section, said smaller sections forming the second portion.

In testimony whereof, I have signed my name to this specification this 18th day of February, 1925.

WILLIAM H. MARTIN.