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CONE LOUD SPEAKER

Filed June 30, 1925

Fig. 3.

Fig. 2.

Fig. 1

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CONE LOUD-SPEAKER.

Application filed June 30, 1925. Serial No. 40,661.

This invention relates to loud speaking telephone receivers, and more particularly, to loud speaking telephone receivers of the cone type.

The chief advantage of the cone loud speaker over the horn type of loud speaker is that the former provides a large diaphragm, which produces greater efficiency for the lower frequencies than is the case with the horn type unless the horn is made so large that it would be inconvenient for ordinary residence use.

One type of cone loud speaker has the shape of a symmetrical circular or right cone. A serious objection to this type is that the receiver has natural periods of vibration in the operating range of 50 to 5,000 cycles. This objection has been overcome in some cases by giving the loud speaker an asymmetrical construction—the so-called elliptical cone, in which the various segments of the cone have different natural frequencies, and the instrument is free from resonant effects. The asymmetrical cone, however, is objectionable on two grounds, first, that it is bulky and not pleasing in appearance, and second, that the load on the driving mechanism is unbalanced.

In an application filed of even date herewith and numbered 40,660, applicant describes and claims a symmetrical cone loud speaker in which the first objectionable feature is eliminated.

The object of this invention is the production of a symmetrical cone loud speaker in which the load on the driving mechanism is balanced—and the resonant effects avoided.

The invention will be understood when the following description of one desirable form of receiver embodying the invention is read with reference to the accompanying drawing. Fig. 1 shows the cone in elevation and indicates the structure of the walls; Figs. 2 and 3 are sectional views taken on the lines 2—2 and 3—3, respectively, of Fig. 1 in the directions indicated by the arrows, and serve to show more clearly than does Fig. 1 the varying thickness of segments of the cone.

With reference to the details of the drawing, the cone is circular, and in order to avoid the undesirable resonant effects of the ordinary circular cone, parts of the cone wall, specifically portions 1 and 2, are constructed with continuously varying thickness. The darker shading in Fig. 1 of the drawing represents the greater thickness, while in Fig. 3 the thickness is exaggerated and the continuous variation clearly shown. In order that the load on the driving mechanism may be balanced, the portions to be so constructed, 1 and 2, are, as shown, two opposite portions.

The continuously varying thickness may be obtained in any suitable way. With the ordinary use of paper for the construction of the receiver, the pulp of which the paper is made may be properly moulded to produce the varying thickness, or the variation may be obtained by pasting or otherwise attaching sheets of very thin paper of different areas to the cone wall. The variation of thickness obtained by the latter method is a sufficiently close approximation to a truly continuous variation. Viewed somewhat differently, this continuously varying thickness may be described as a continuously varying "loading" of two symmetrically disposed segments of the cone.

What is claimed is:

1. A cone loud speaking receiver having opposite portions of similarly varying thickness, the balance of the receiver being of unvarying thickness.

2. A cone loud speaking receiver having opposite portions of continuously and similarly varying thickness, the greatest thicknesses being at the base of the cone, the balance of the receiver being of unvarying thickness.

3. A cone loud speaking receiver in which two symmetrically disposed portions have varying loading and the balance of the receiver has unvarying loading.

4. A cone loud speaking receiver in which two symmetrically disposed portions have continuously varying mass per unit area, the balance of the receiver having unvarying mass per unit area.

In testimony whereof, I have signed my name to this specification this 29th day of June, 1925.

ROBERT W. MORRIS.