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H. J. ROUND

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TELEPHONE AND THE LIKE

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Fig. 1

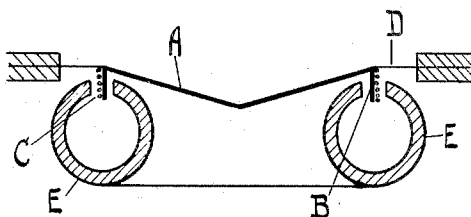


Fig. 2

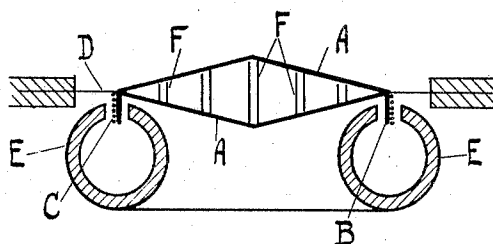


Fig. 3

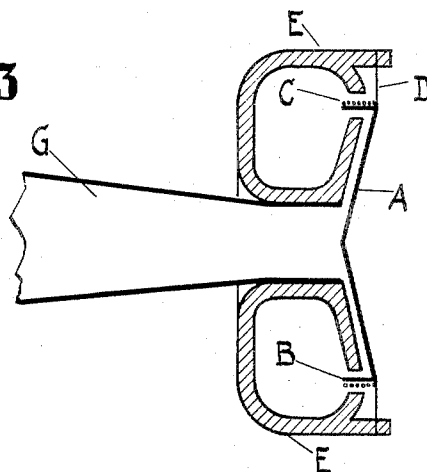
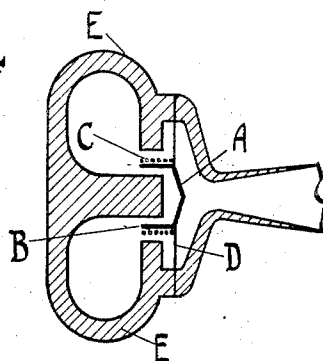


Fig. 4



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TELEPHONE AND THE LIKE.

Application filed November 11, 1924, Serial No. 749,118, and in Great Britain November 29, 1923.

This invention relates to telephones and the like and its primary object is to provide an improved loud speaker.

According to this invention I secure to the edge of a stiff diaphragm a coil which is immersed in a magnetic field so that when speech currents or the like pass through the coil it is moved and consequently the diaphragm is also moved.

Preferably the diaphragm is provided with a cylindrical flange on which the coil is mounted and this flange extends into the annular air gap of a magnet constructed in the form of a torus and containing within it a magnetizing winding.

The invention is illustrated by the accompanying drawing, in which the four figures are sections through four different modifications.

In Figure 1 A is a stiff diaphragm around the edge of which is a cylindrical flange B on which is mounted a coil C. The diaphragm is supported by a thin rubber ring D in such a position that the coil C is suspended in the annular air gap of a magnet E in the form of a torus, containing within it a magnetizing winding not shown.

It will be understood that when speech or like currents are passed through the coil, the diaphragm will be moved as a whole and will produce sound waves, and that when sound waves fall upon the diaphragm they will move it and therefore corresponding currents will be produced in the coil.

Figure 2 shows a similar arrangement, but the diaphragm consists of a double cone having stiff ribs F inside it.

In Figure 3 the magnet is so modified in shape that it can support a horn G across the entrance of which the diaphragm extends.

Figure 4 shows an arrangement in which the horn is mounted on the same side of the magnet as is the diaphragm, this arrangement being suitable for smaller diaphragms than is that of Figure 3.

The diaphragm is preferably formed of some such material as ebonite, celluloid or paper treated with a phenol condensation product, and may be given any natural period by means of the rubber support. In some cases, however, in place of supporting the diaphragm by a rubber ring as shown, I may support it by radial wires covered

wholly or partly with some sealing material such as rubber or oiled silk. Or again, a thin flexible metal ring can be employed to support the diaphragm.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a loud speaker a diaphragm having truss members, and an operating coil attached at its edge.

2. In a loud speaker a diaphragm having truss members, and an operating coil attached at its periphery, the coil being affected by a constant magnetic field.

3. A loud speaker comprising a supporting member, flexible supporting means attached thereto, a vibratile diaphragm attached to the free edge of the supporting means, said diaphragm being conical and relatively large whereby the use of a horn is avoided, a perpendicular flange attached to the junction of the diaphragm and the supporting means, and an operating coil associated with the flange.

4. A loud speaker comprising a supporting member, flexible supporting means attached thereto, a vibratile conical diaphragm attached to the free edge of the supporting means, a perpendicular flange attached to the junction of the diaphragm and the supporting means, an operating coil associated with the flange, and means for producing a continuous flow of flux at right angles to the direction of the winding, said diaphragm being conical and relatively large whereby the use of a horn is avoided.

5. In a loud speaker a double cone diaphragm, strut members associated with the diaphragm, and flexible supporting means at the periphery of the diaphragm mounted in an opening of a mounting member.

6. In combination, a magnetic field having an air gap in a circular form, a conducting winding supported in the air gap by means of a flexible mounting, and a double cone diaphragm attached at its periphery to the winding, the whole being supported by means of a mounting member.

7. In a loud speaker a diaphragm having two cone type elements associated together by means of braces, a supporting member, supporting means comprising a flexible strip

attached at one edge to the diaphragm and at the other edge to said supporting member, and operating means attached to the diaphragm at the junction between the flexible supporting means and the diaphragm.

8. A piston type diaphragm composed of two cone type elements joined together at the periphery and braced against each other by means of strut members, a supporting member, a flexible supporting member mounted in said supporting member, and an operating flange connected to said elements at the junction of the flexible supporting member, said flange being immersed in a magnetic field.

9. A loud speaker comprising a supporting member, a conical shaped diaphragm, resilient supporting means between the edge

of said diaphragm and said supporting member and a driving means connected to said diaphragm around its edge, said diaphragm being relatively large and having its outer envelope in unrestricted communication with the surrounding medium whereby the use of a horn is avoided.

10. A loud speaker according to claim 9, in which the resilient supporting means consists of an annular membranous member which prevents unrestricted communication between the two sides of the diaphragm.

11. A loud speaker according to claim 9, in which the driving means consists of an annular coil located in a strong magnetic field.

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