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G. HOLST

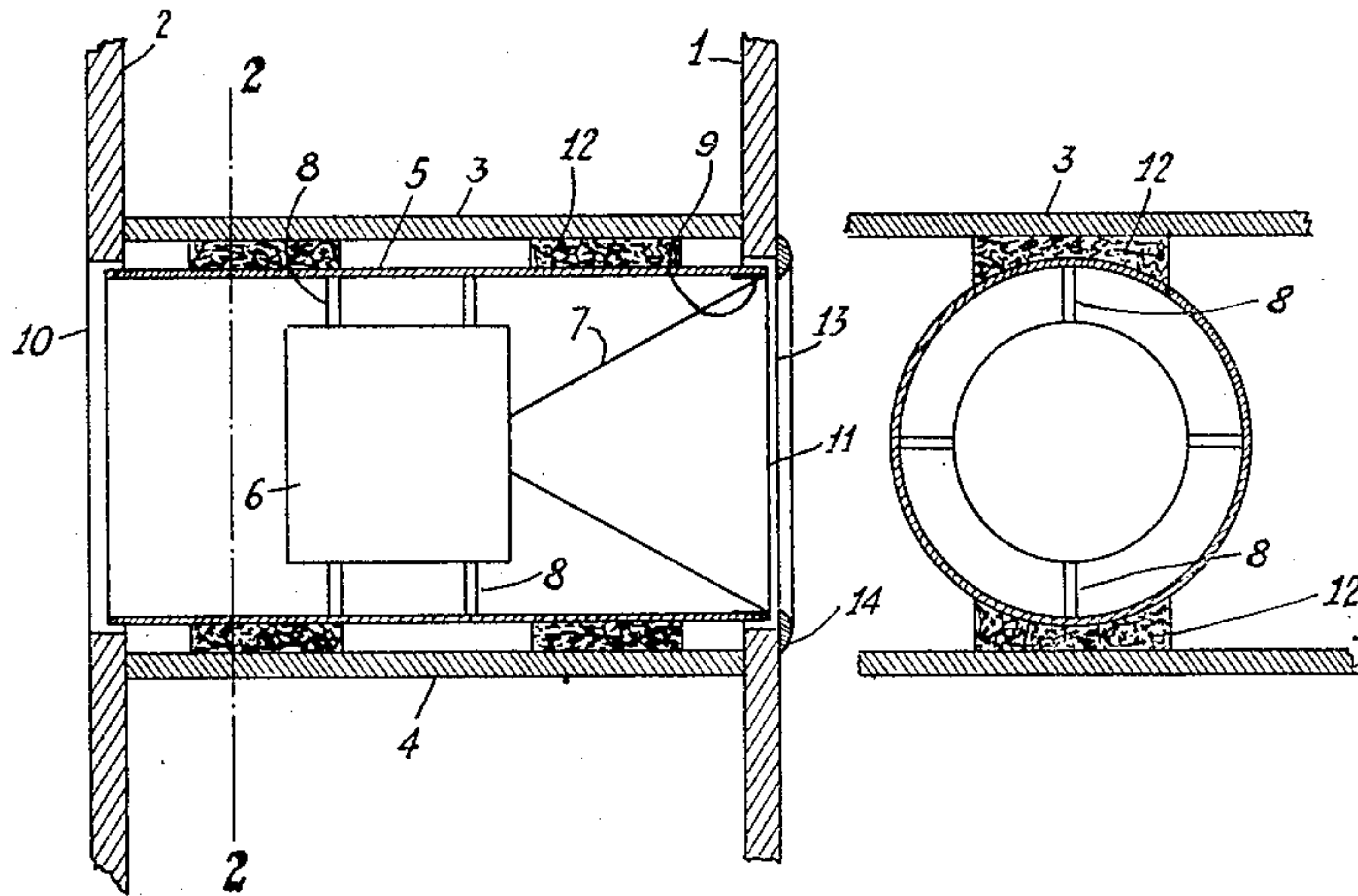
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LOUD SPEAKER

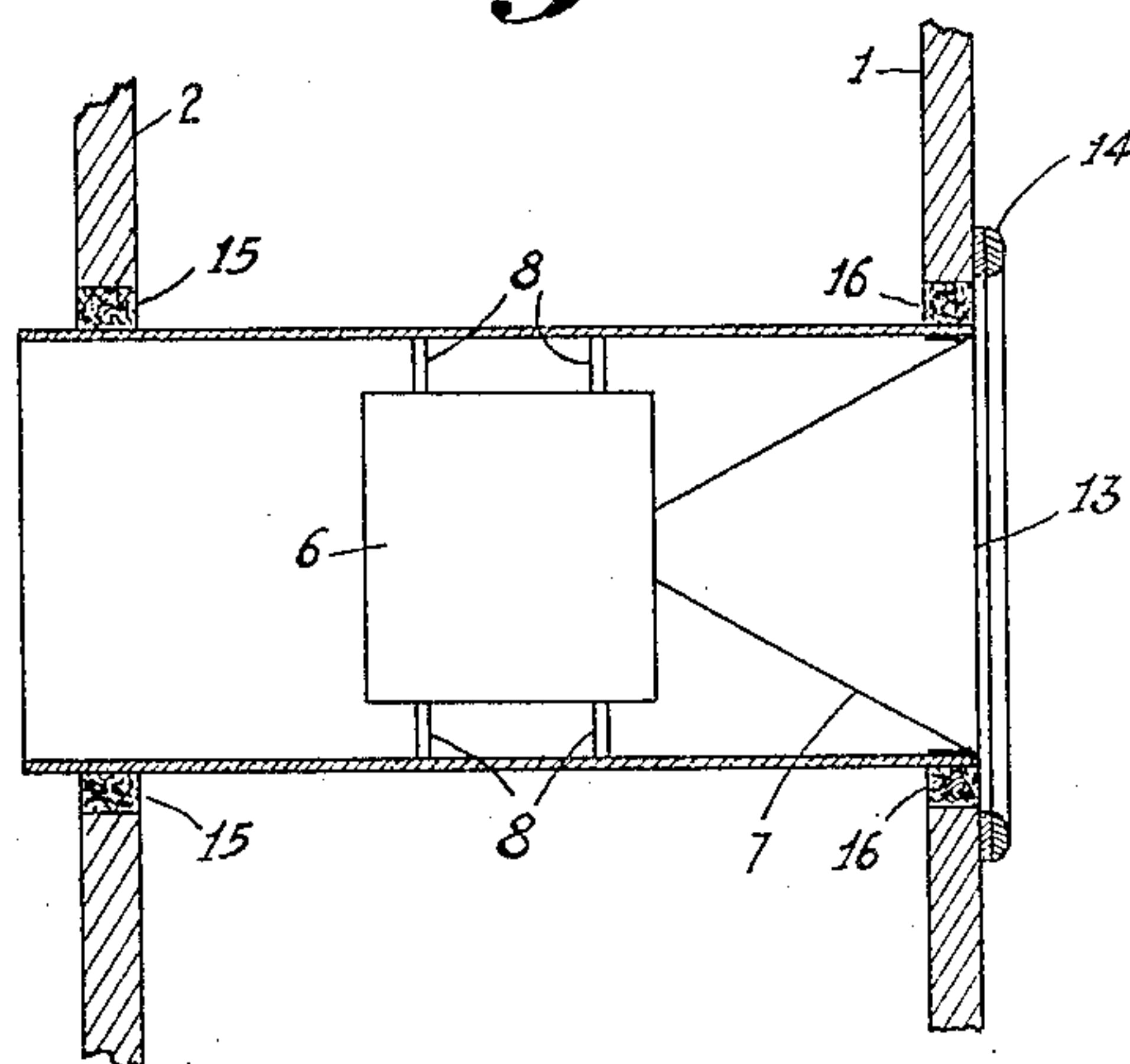
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*Fig. 1*

*Fig. 2*



*Fig. 3*



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## LOUD SPEAKER

Application filed March 28, 1931, Serial No. 525,943, and in the Netherlands August 15, 1930.

This invention relates to a casing having housed in it a loudspeaker provided with an oscillatory member. It is well known that casings of this kind may present interfering resonance phenomena by reason of an excessive transmission of energy from the oscillatory member to the walls and/or partitions of the casing. This difficulty is found to arise when the loudspeaker is fixed to the casing in such a manner that a direct transmission of the energy to the walls may occur. Such is the case, for example, when the entire loudspeaker or only its oscillatory member are secured directly to the walls and/or partitions of the casing.

The invention has for its object to obviate this difficulty. For this purpose the oscillatory member is arranged in a hollow body supported from the casing, passing entirely through it and communicating freely on two sides with the open air. Thus the sound oscillations which, for example, are generated by the rear side of the oscillatory member are permitted freely to spread from the interior of the casing to the exterior without coming into effective contact with the walls of the casing. In practice it has been found that the interfering resonance phenomena can be materially reduced thereby.

This result can be considerably improved by arranging between the outer walls of the hollow body and the supporting walls and/or partitions of the casing material capable of damping the oscillations carried out by the body.

In a preferred embodiment the hollow body is formed by an open cylinder the openings of which are arranged in front of corresponding openings of the casing. In order to render possible an easy mounting the border of the oscillatory member may be secured to the inner circumference of one cylinder opening and accessory magnet system may be fixed simultaneously to the cylinder so that the aggregate comprising the cylinder, the oscillatory member and the magnet system can be mounted in the casing as a single unit.

A handy method of securing the magnet system is possible if the magnet system is also arranged within the cylinder. In this

case it is preferably secured to the inner wall of the cylinder by the spoke-shaped members.

In order to ensure a sufficient damping of the oscillations carried out by the cylinder the damping material should preferably be such that the cylinder is secured to the casing in a slightly resilient manner. Thus for example, the cylinder may be caused to engage rubber pads or be suspended from helical springs. The rubber pads may be mounted equally well on the cylinder wall as on the walls and/or partitions of the casing that support the cylinder.

In order that the invention may be clearly understood and readily carried into effect two embodiments of the invention will be more clearly described by way of example with reference to the accompanying drawing, in which

Figure 1 is a sectional view of a portion of a casing according to the invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a different embodiment of a casing according to the invention.

Referring to Figure 1, 1 and 2 designate the front and rear wall respectively of the casing. Arranged within the space enclosed between these walls and the partitions 3 and 4 is a cylinder 5 open on either side and having arranged within it a loudspeaker provided with a magnet system 6 and an oscillatory member 7 cooperating therewith. The magnet system is secured by means of spokes 8 to the inner wall of the cylinder and the oscillatory member has its border secured by means of a flexible substance 9 to the inner wall of one of the cylinder openings. The latter are arranged within corresponding openings 10 and 11 of the walls 1 and 2 which permits sound oscillations generated by the oscillatory member to be freely spread from the interior of the cylinder to the exterior without coming into effective contact with the walls or partitions of the casing. Resonance phenomena, if any, are thus limited to a minimum. This effect can be further improved by causing the cylinder to be supported by means of, for example, rubber pads 12 arranged between the outer wall of the cylinder and the partitions



3 and 4. These pads are preferably secured to the partitions 3 and 4 by sticking. The cylinder can thus be very simply arranged in the casing as it need only be slipped through the opening 10 of the casing. Adjacent the oscillatory member, the opening 11 of the casing is closed by a piece of decorative texture 13 secured to the wall 1 by a ring 14.

In the embodiment shown in Figure 3, the cylinder is lengthened on one side to such an extent as to protrude at the rear side from the exterior of the casing, which is to be considered as an improvement in connection with resonance phenomena. In addition, the cylinder is supported by means of rubber pads 15 and 16 arranged in the opening of the casing so that the partitions 3 and 4 shown in Figure 1 may be dispensed with. Again this construction permits of the loudspeaker being easily mounted.

What I claim is:

1. A casing having housed in it a loudspeaker provided with an oscillatory member, wherein the oscillatory member is arranged within a hollow body which is supported from the casing, passes entirely through it and communicates freely on two sides with the open air.

2. A casing as claimed in claim 1, wherein the outer walls of the hollow body and the supporting walls of the casing have arranged between them material capable of damping the oscillations carried on by the body.

3. A casing as claimed in claim 1, wherein the hollow body is formed by an open cylinder the openings of which are arranged in front of the corresponding openings of the casing.

4. Acoustical apparatus comprising a casing having wall portions, openings in certain of said wall portions, a structure smaller than said casing and adapted to be contained within said casing, said structure having portions defining openings of substantially the same size as the openings in said casing, said structure being positioned within said casing so that the portions which define the openings therein extend into the openings in said casing, vibration damping material interposed between said structure and said casing, and acoustical apparatus including a vibratile diaphragm mounted within said structure.

5. Acoustical apparatus comprising a casing, openings in said casing, a structure smaller than said casing and adapted to be enclosed thereby, acoustical apparatus including a vibratile diaphragm mounted within said structure, openings in said structure of substantially the same size as the openings in said casing, said structure being positioned within said casing so that the openings in said structure coincide with the openings in said casing and are immediately adjacent thereto whereby sound waves from said dia-

phragm are excluded from the interior of said casing.

6. Acoustical apparatus comprising a cabinet and sound reproducing apparatus, said sound reproducing apparatus consisting of a vibratile diaphragm, driving mechanism for said diaphragm, and a structure encompassing said diaphragm and driving mechanism, a plurality of openings in said cabinet, corresponding openings in said structure, and means for arranging said structure in said cabinet so that sound waves emanating from said diaphragm are directed through said openings without being permitted to enter the interior of said cabinet.

7. An acoustical unit adapted to be inserted in a casing such as a radio cabinet, said unit comprising a vibratile diaphragm, actuating mechanism connected with said diaphragm, and a body surrounding said diaphragm and said mechanism, said body being as long as the linear dimension of said cabinet in the direction in which said body is to extend whereby said body constitutes means for directing sound waves from opposite sides of the diaphragm out of said cabinet.

8. An acoustical device comprising a substantially cylindrical body open at both ends, a vibratile diaphragm mounted across one end of said body, and a casing enclosing said body, the proportions of said body and said casing being such that the ends of said body are positioned substantially in the walls of said casing.

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