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SPEAKER ASSEMBLY

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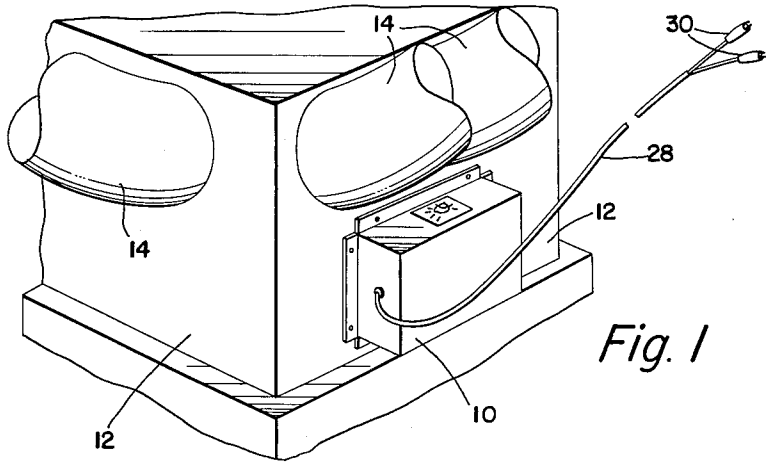


Fig. 1

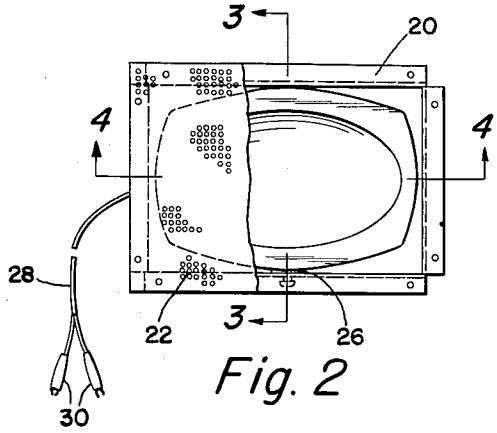


Fig. 2

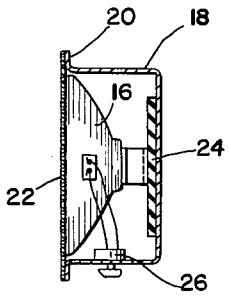


Fig. 3

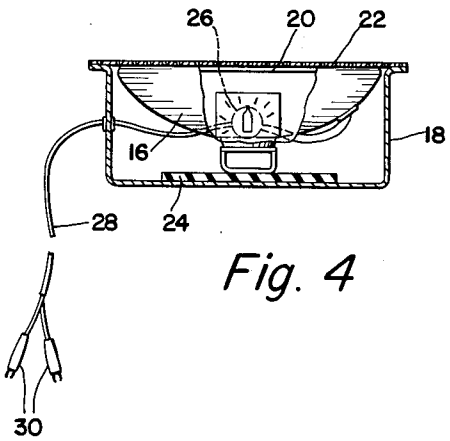


Fig. 4

INVENTOR.
JOHN H. BREISCH
BY
H. E. Whitaker
ATTORNEY

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SPEAKER ASSEMBLY

John H. Breisch, 2103 Arthur Ave., Lakewood 7, Ohio

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This invention relates to music reproduction systems and more particularly to a speaker assembly for attachment to a ventilating system plenum chamber.

One of the primary objects of this invention is to provide a speaker assembly which is adaptable to mounting on the plenum chamber of a ventilating system for transmitting audio signals throughout a building by utilizing the air ducts as sound transmitting media.

The provision of such a sound system produces unusual and highly desirable effects which are audible to the ear of a listener in any of several separated rooms. Further, sound may be transmitted to various parts of a building by use of a single speaker assembly of this type, thus eliminating the necessity for an elaborate and complicated network of transmitting circuits for individual speakers in each of various rooms.

One of the desirable features in reproducing recorded music is to render the sound production non-directional and to produce the effect of sound emanating from several directions at one time. This may be accomplished in an ordinary home installation by attaching the speaker assembly to the ventilating system and utilizing the outlets thereof as the sound source.

Accordingly, it is an object of this invention to provide a speaker assembly which may be connected to conventional radio or amplifier systems and which may be in conjunction with a ventilating system for reproducing the sound in various rooms in a building which are produced by the radio or amplifier.

A still further object of this invention is to provide a speaker assembly having parts which facilitate the incorporation of the sound reproduction system into the ventilating system of the building.

Another important object of the invention is to provide a speaker assembly wherein the speaker mounted in a casing closes approximately eighty percent of the opening of the casing, the remaining twenty percent of the opening functioning as reflex openings to accommodate pressure changes in the casing.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which considered in connection with the accompanying drawings sets forth the preferred embodiment of my invention.

In the drawings:

FIG. 1 is a perspective view showing the speaker assembly which is the preferred embodiment of my invention, installed in a ventilating system;

FIG. 2 is a front view of a speaker assembly;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2; and

FIG. 4 is a sectional view taken along line 4—4 of FIG. 2.

Referring first to FIG. 1, a speaker assembly **10**, which forms the preferred embodiment of my invention, is mounted on a plenum chamber **12** of a ventilating system. The ventilating system is provided with ducts **14** which connect the plenum chamber **12** to various rooms throughout a building. The principle of transmission of sound utilized is the common speaking tube principle which accounts for the transmission of any sound waves produced in the plenum chamber **12** being conducted in practically undiminished intensity to the duct outlet irrespective of the distance from the sound source.

A permanent magnet-type speaker **16** having the usual

voice coil connections is housed within a rectangular box-like casing **18**. The casing **18** has out-turned flanges **20** joined to the marginal edges of the side walls thereof. The casing **18** is preferably made of metal since the temperatures to which the casing **18** may be subjected are high when the plenum chamber **12** is attached to a furnace and is a part of a hot air heating system.

A perforated metallic baffle **22** is affixed to the flanges **20** of the casing **18**, effectively closing the casing for protecting the contents thereof while allowing sounds produced within the casing **18** to be transmitted therefrom.

The speaker **16** is positioned in the casing **18** in confronting relationship to the open side of the casing and the baffle **22** thereby directing the sound produced by the speaker **16** into the plenum chamber. The speaker **16** is held in abutting relationship to the baffle **22** by a resilient pad **24** formed from a material such as sponge rubber, which is disposed between the rearmost portion of the speaker and the rear wall of the casing **18**. The pad **24** functions to apply continuous pressure on the speaker against the baffle **22** and also to absorb the sound waves which are transmitted rearwardly of the speaker.

The casing **18** is generally rectangular and has a size which makes the generally elliptical speaker **16** tangent at the mid-points of the sides of the casing **18**. At each corner of the casing **18**, an opening results between the speaker **16** and the casing **18**. The total area of these open corners is approximately twenty percent of the total area of the open side of the casing **18**. The open corners provide for reflex action to equalize the pressure in the casing behind the speaker cone thus obtaining speaker efficiency and fidelity.

Volume control is accomplished by a rheostat **26** which is connected across the circuit to the voice coil of the speaker **16**. A pair of leads **28** are connected to the rheostat **26** and have alligator clips **30** for quick connection to the voice coil connections on a radio or amplifier which corresponds to the voice coil connections on the speaker **16**. After the connections have been made to the radio and the amplifier to provide the energization for the speaker **16**, the rheostat **26** may be adjusted to balance the relative intensity of the sound produced by the speaker **16** as compared with the sound produced by the speaker in the radio or amplifier.

When the speaker assembly **10** is to be installed on the plenum chamber **12**, an opening is first made in the wall of the plenum chamber **12** corresponding roughly to the inside dimensions of the casing **18** surrounding the speaker **16**. The speaker assembly **10** is fixed to the plenum chamber **12** by using sheet metal screws passing through the flanges **20** and the plenum chamber wall. The clips **30** are then attached to the voice coil connections on a radio or amplifier and the speaker is then operative when the said radio or amplifier is turned on. In order to balance the volume of the output from the radio and the speaker **16**, the rheostat **26** is adjusted until the desired volume balance is obtained.

Having thus described this invention in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications or, or substitutions for, parts of the above specifically described embodiments of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. A speaker assembly adapted to be attached directly

to a ventilating system having an opening therein comprising a casing having an open side, flange means on said casing adjacent to said open side adapted for affixing the speaker assembly to the marginal edges of said opening, a perforate baffle means across said opening and affixed to said flange means, a speaker in said casing disposed for projecting audible signals through said baffle means, and variable resistance means for controlling the energy to said speaker and the volume of the signal produced thereby.

2. A speaker assembly adapted to be attached directly to a ventilating system having an opening therein comprising a casing, flange means on said casing adapted for affixing the speaker assembly to the marginal edges of said opening, a perforate baffle means across said opening and affixed to said flange means, a speaker in said casing disposed for projecting audible signals through said baffle means, a resilent sheet-like body between the said speaker and the rear wall of the casing for holding said speaker against the baffle means, variable resistance means for controlling the energy to said speaker and the volume of the signal produced thereby, and electrical connection means forming a circuit between said speaker, said variable resistance means, and a speaker circuit on a radio or amplifier.

3. A speaker assembly adapted to be attached directly to a ventilating system having an opening therein comprising a casing, flanges on said casing adapted for

affixing the speaker assembly to the marginal edges of said opening, a perforate baffle across said opening and affixed to said flanges, a speaker in said casing disposed for projecting audible signals through said baffle, a resilient sheet-like body between the rearmost portion of said speaker and the rear wall of the casing for holding said speaker against the baffle, variable resistance means for controlling the energy to said speaker and the volume of the signal produced thereby, and electrical connection means forming a circuit between said speaker, said variable resistance means, and a speaker circuit on a radio or amplifier.

4. A speaker assembly adapted to be attached directly to a ventilating system having an opening therein comprising a rectangular casing, flange means on said casing adapted for affixing the speaker assembly to the marginal edges of said opening, a perforate baffle means across said opening and affixed to said flange means, and an oval speaker in said casing confronting said baffle means and disposed for projecting audible signals through said baffle means, said speaker covering eighty percent of the area of said baffle means.

References Cited in the file of this patent

UNITED STATES PATENTS

1,952,514	Selby	Mar. 27, 1934
2,718,931	Boudouris	Sept. 27, 1955