

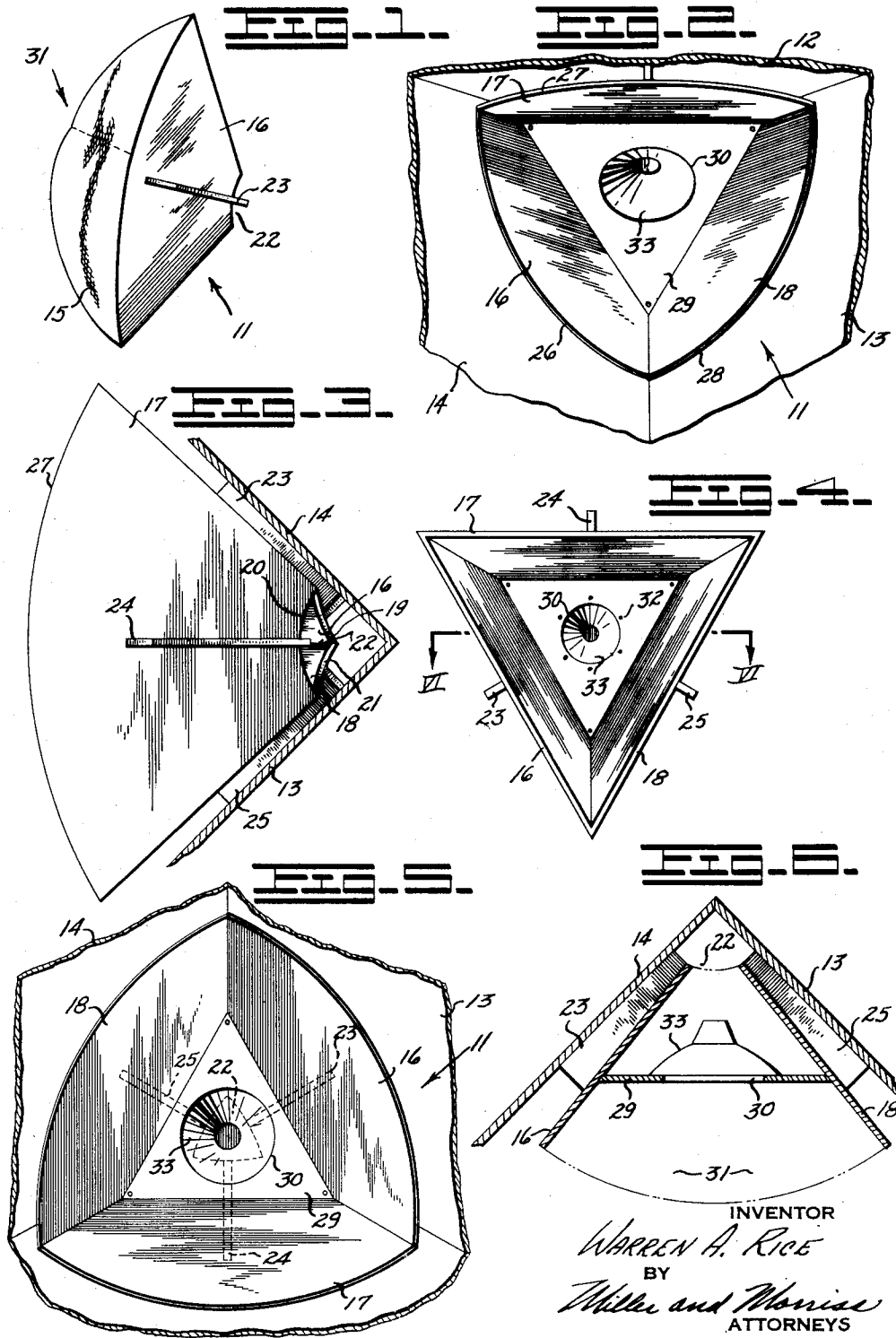
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TRIPLANAL SPEAKER ENCLOSURE

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TRIPLANAL SPEAKER ENCLOSURE

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The present invention relates to speaker enclosures and more particularly to a triplanal hanging speaker enclosure. The invention provides a high efficiency speaker enclosure requiring an absolute minimum in amount of space while providing a high efficiency speaker to air coupling in as inexpensive a manner as possible.

In United States Letters Patent 2,754,926 I disclosed and provided a speaker enclosure of the Corner Horn type having the maximum efficiency of any compact speaker in the low frequency audio range. The present enclosure, while not equaling the low frequency audio efficiency of that structure, does provide, on a pound for pound basis a highly efficient structure particularly adaptable where walls are cluttered and obstructed or where living space is at a premium. As in my United States Letters Patent 2,754,926, the walls of the room are utilized as an effective extension of the enclosure or horn. As in my prior work this enclosure approaches the exponential formula for theoretically perfect low frequency sound reproduction but employs a straight taper flare.

The hanging horn has been known in the art for years but little has been done to analytically improve its function.

It is therefore among the objects of this invention to provide a hanging horn of vastly improved audio efficiency for high fidelity sound reproduction in the low frequency ranges.

Another object is to provide a hanging horn which closely approaches in its audio efficiency horns of great size approximating the theoretical exponential formula.

Another object is to provide a simple inexpensive speaker enclosure structure which utilizes two walls and a ceiling as sound baffles in a position not normally obstructed.

Other objects including economy of material and amenability to plastic casting, for example, will become increasingly apparent to those skilled in the art as the description proceeds.

In the drawing:

Figure 1 is a side perspective view of a hanging speaker enclosure isolated from a room corner to reveal the simplicity of its structure.

Figure 2 is a frontal perspective view of a hanging speaker enclosure in accord with the present invention positioned in the corner of a room proximate to the ceiling of the room.

Figure 3 is a top plan view of the hanging enclosure indicating the relative location of side walls and spacers in respect to speaker location.

Figure 4 is a front view through the speaker axis to reveal the simple interior construction.

Figure 5 is a perspective view of the speaker enclosure of the present invention adjacent the floor and two adjacent converging walls or planes.

Figure 6 is a transverse section through the hanging enclosure taken on line VI—VI of Figure 4.

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General description

In general, the present invention comprises a hanging speaker enclosure for a back loaded speaker. In such structures the audio coupling in the bass or low frequency ranges emanate principally in the sound column set in motion behind the speaker. The flare rate for movement of such a column should closely approximate known exponential formulae. In the earliest horns, where the formula was carried out as far as practicable the enclosure or horn occupied a substantial amount of space in a relatively large theatre. Subsequent folded approximations of the formulae met with varying degrees of success and managed to minimize the space required at some sacrifice of efficiency so that the enclosure would fit into moderate sized dwelling rooms. It was subsequently found that the distortion in such horns reduced their fidelity in the low frequency audio range inasmuch as the sound column was joggled around numerous corners before being finally emitted to the room. The unfolded horn was developed to counteract such distortions but lacked full flare extension because the room walls extended only to ceiling height by carrying the projected exponential column. The present structure utilizes ceiling or floor and wall extension from a corner as planal flare projection assisters. The present structure comprises three substantially identical planal wall pieces and three taper spacers. A triangular mounting board having an opening therethrough for the mounting of a back-loaded speaker at once lends excellent stability to the three wall pieces and is muffled to avoid resonance problems from the speaker. The wedge-like side pieces are curved at their outer faces and have curvilinear truncations at each apex to provide a satisfactory communicating column or throat space between speaker and flare. Thus, a triplanal enclosure is provided and is positioned by tapered spacers to define, when mounted, three right angle merged columns of sound projected simultaneously at selected straight tapered flare rates. As will be seen and appreciated the device of the present invention is extremely simple, compact, and is of light weight.

Specific description

Referring more specifically to the drawing, Figure 2 shows the preferred operative setting of the triplanal horn or speaker enclosure 11 at the juncture of ceiling 12, and intersection of walls 13 and 14. As the description proceeds it will be apparent that the speaker enclosure or horn 11 is also adaptable to the corner juncture between walls 13 and 14 and floor (Figure 5). A frontal drape 15 (Figure 1) covers the flared portion of the horn 11 and may be decorated as desired. In Figure 2 the structure of the horn 11 is best revealed indicating three segment-like planal members 16, 17, and 18 joined at their abutting edges. Substantially adjacent to the apex portion of said segments an arcuate truncation 19, 20 and 21 (in respective corresponding order of numbered segments) provides an opening or throat 22. On the exterior of each of the planal segments 16, 17 and 18 are wedge-like or tapered extensions 23, 24 and 25, each perpendicular to the plane of the members 16, 17 and 18 and joining the planal members 16, 17 and 18 on the approximate bisecting line of said segments running from the approximate apex to the curvilinear mouth edges 26, 27 and 28. As will be seen these extensions form fins or spacers 23, 24 and 25 provide a selected flare as between adjacent planal walls when the horn 11 is in operating position. A triangular mounting board 29, having a center opening 30, therethrough is positioned in the horn 11 between the apex opening or throat 22 and the mouth opening 31 dividing the horn into a forward compartment and a rearward compartment. The mounting board 29 thus forms a plane hav-

ing an opening 30 therethrough which is transverse to the central axis of the enclosure 11. The mounting board 29 is provided with mounting means 32 for a desired speaker 33. The preferred form of speaker is a coaxial back loaded type well known in the art. The speaker 33, as shown, is coaxially positioned in the enclosure 11.

While the description has viewed the construction of the enclosure 11 from the object of describing the discrete parts of the enclosure, it will be readily appreciated that the entire unit is designed for amenability to molding or casting, preferably in plastic material so that the elements become integral except for the mounting panel 29 which may be removed for installation and service of the speaker 33.

A decorative acoustic covering 15 is tastefully secured to cover the mouth opening 31 if desired. Suitable vibration dampening gaskets (not shown) and the like, may be employed in securing the panel 29 to the enclosure 11 and in securing the speaker 33 to the panel 29.

Operation

The operational setting for the speaker enclosure 11 is in the corner of a room adjacent the floor (Figure 5) or preferably hanging adjacent the ceiling (Figure 2). In this manner the two walls and the ceiling or floor become the flare extensions for the sound column emanating from the rear of the speaker 33 through the throat 22. The best sound reproduction from the enclosure described is obtained from the hanging of the enclosure from the room corner adjacent to the ceiling inasmuch as fewer obstacles are encountered in the projection of the sound column. Excellent fidelity in the audible low frequency range (16 to 100 cycles per second) is experienced with adjustment in flare rate being accomplished by varying the taper in the spacers 23, 24, and 25 in their contact with adjacent planal surfaces.

It will be appreciated from the foregoing that a considerable advance in structure is presented herewith if measured in terms of simplicity and overall efficiencies measured against any known horn of the "hanging" type.

Having thus described my invention it will be appreciated that certain modifications within the skill of the art may be made. Such modifications are intended to be included herein if they fall within the scope of the hereinafter appended claims.

I claim:

1. In a speaker enclosure, the combination including: three planal segments joined at their edges to form a triplanal enclosure; a transverse panel dividing said triplanal enclosure into a forward compartment and a rearward compartment and said panel having a central opening therethrough for the mounting of a speaker; and a plurality of adjusting fins extending exteriorly from said planal segments to provide selected spacing between said segments and adjacent planal surfaces.

2. In a speaker enclosure, the combination including: three planal segments of substantially triangular shape joined at their edges to form a triplanal enclosure having an outwardly flaring mouth and a throat opening provided by a truncation occurring short of the apex of said enclosure; a transverse panel intermediate said mouth portion and said throat portion of said enclosure, said panel having an opening therethrough for peripheral mounting of a speaker; and a wedge-like spacer extending from each exterior side of said enclosure spacing said planal segments with regard to adjacent plane surfaces.

3. In a hanging type speaker enclosure, the combination including: a triplanal enclosure having three substantially identical sides defining a flared triangular mouth opening and a smaller triangular throat opening at either end; a panel transversely across the opening through said triplanal enclosure intermediate said mouth and said throat, said

panel having an opening therethrough for the axial attachment of a speaker; and wedge-like spacers selectively extending from said triplanal enclosure spacing each segment of said enclosure from adjacent plane surfaces; and at least three intersecting plane surfaces against which said spacers rest.

4. In a hanging type speaker enclosure for hanging in a corner where at least three plane surfaces meet, the combination including: an open ended triplanal enclosure comprised of three plane segments substantially triangular in configuration and secured to each other at their edges; a panel transversely across the central axis defined by said triplanal enclosure and intermediate the open ends thereof, said panel having an axial opening therethrough for axial accommodation of a back loaded speaker; fin-like projections extending exteriorly from each of the said segments forming spacers establishing a selected flare rate as between planal segments and adjacent plane surfaces.

5. In a speaker enclosure the combination comprising: three identical planal segments joined at their edges to form a substantially triplanal enclosure having an opening through the apex; wedge-like spacers extending outwardly from said segments on a line bisecting said segments; and a triangular speaker mounting board fitted into the mouth of said triplanal enclosure and having a round opening therethrough for the accommodation of a speaker.

6. In a speaker enclosure for mounting in a room at the juncture of ceiling and room corner, the combination comprising: a segment-like ceiling wall; a pair of similar segment-like side walls joined at their edges to form a triplanal enclosure open at its apex; three wedge-like spacers extending outwardly from said wall segments and positioned on a line bisecting said segments; a triangular planal mounting board spaced apart from said open apex and having a circular opening therethrough for the mounting of a speaker.

7. In a speaker enclosure for positioning in the corner defined by three intersecting plane surfaces converging walls, the combination comprising: three segment-like planal walls having the apex of each removed and being joined at their straight edges to form a triplanal enclosure flaring outwardly at a uniform rate; three wedge-like tapered spacers extending outwardly from said walls normal to a line bisecting each of the said walls to space said walls a uniform distance from the ceiling and sidewalls of a room and assure a uniform flare between said enclosure walls and the sidewalls and ceiling of said room; and a triangular planal speaker mounting panel truncating said triplanal enclosure forwardly of said apex in said enclosure and said panel having an opening therethrough for the accommodation of a speaker.

8. In a speaker enclosure for a back loaded speaker, the combination comprising: three planal segments joined at their edges to form a triplanal enclosure; and defining a flared triplanal forward opening and defining an opening at the apex of said triplanal enclosure, a transverse panel dividing said triplanal enclosure into a forward flared opening and a rear compartment, and said panel defining a central opening therethrough for mounting of a speaker; and a fin extending outwardly from each of said segments to provide selected spacing between said planal segments and adjacent planal surfaces.

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