April 23, 1968 A. D. GOETTL 3,379,276

SPEAKER INSTALLATION MEANS

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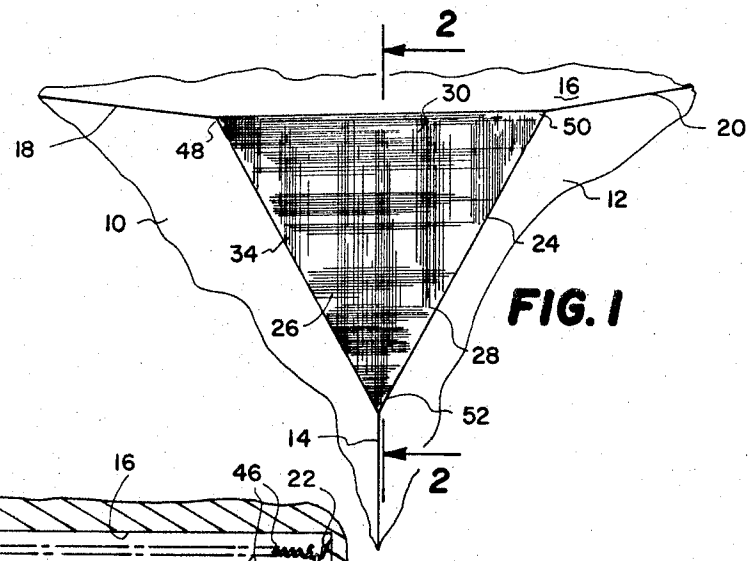


FIG. 1

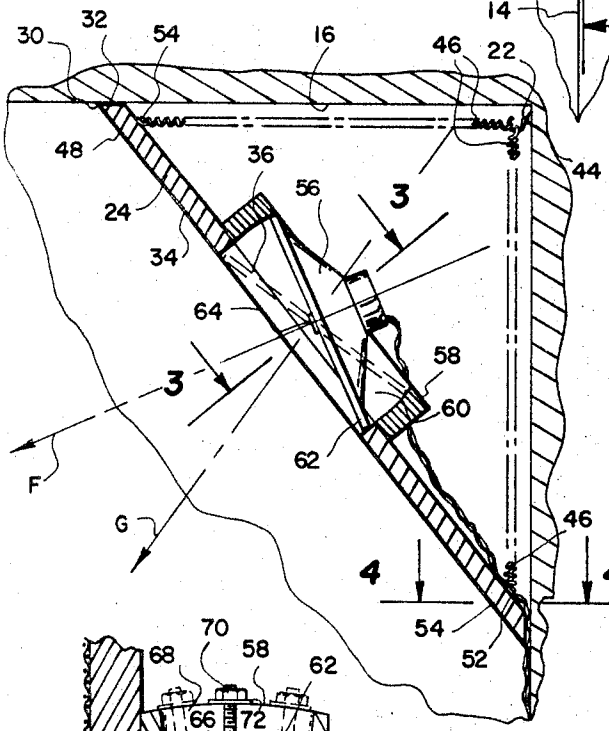


FIG. 2

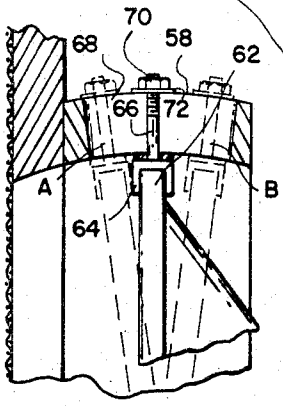


FIG. 3

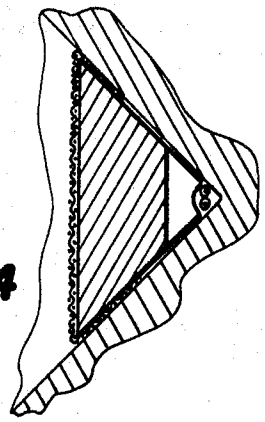


FIG. 4

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FIG.5

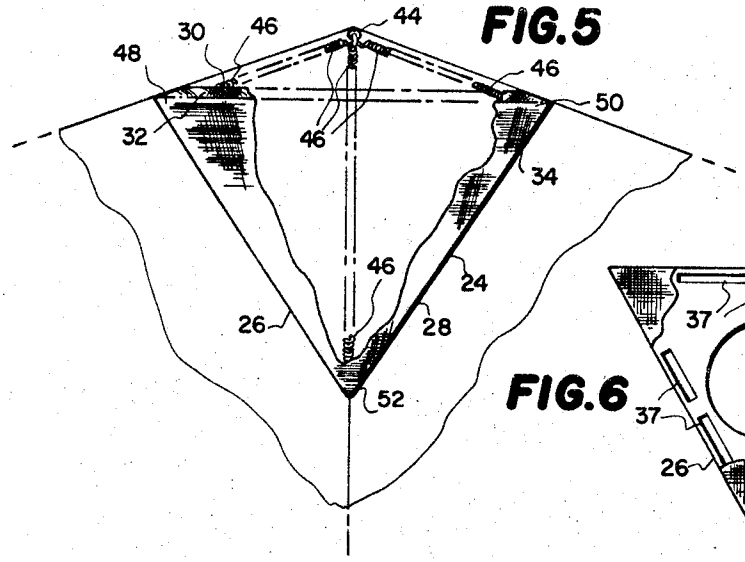


FIG.6

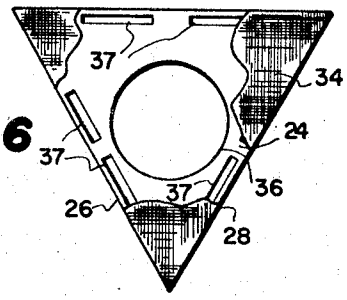


FIG.7

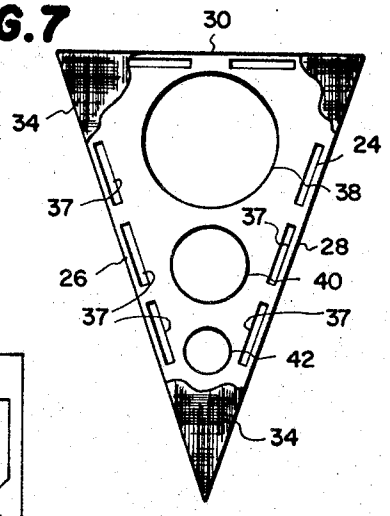
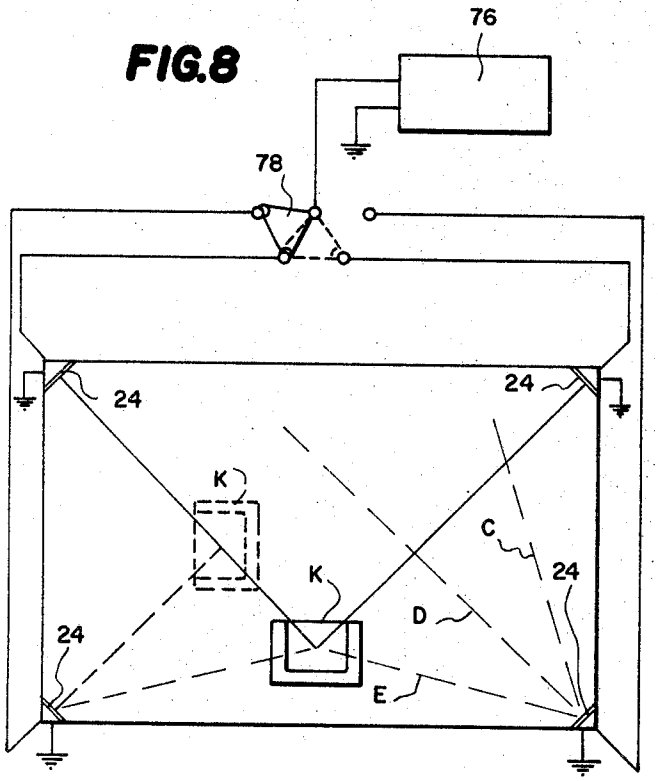


FIG.8



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United States Patent Office 3,379,276
Patented Apr. 23, 1968

3,379,276

SPEAKER INSTALLATION MEANS

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Filed Dec. 2, 1966, Ser. No. 598,671
10 Claims. (Cl. 181—31)

ABSTRACT OF THE DISCLOSURE

A speaker installation means having a triangular frame disposed to close a corner recess of a building room, ceiling and wall structure, and wherein resilient coil springs hold the speaker frame secured to a fixture in the corner recess, and wherein gimbal bolts and slotted mounts are disposed adjustably to hold said speaker for angular axial adjustment throughout two axes with relation to the speaker frame.

This invention relates to a speaker installation means, and more particularly, to a speaker installation means which is adapted to support speakers in a corner recess at the juncture between walls and ceiling structures of a room.

Speakers are generally located in cabinets of various types, and some of them are located in walls, and directed toward grills which are flush and in a common plane with walls of a room.

Various speaker installations have been employed to take advantage of the acoustics of a room in relation to speakers installed therein.

Accordingly, it is an object of the present invention to provide a novel means for installing speakers in the corner recesses of rooms at the intersections of the walls with the ceiling structure thereof, and to provide for optimum acoustical, and directional emission of sound speakers so installed.

Another object of the invention is to provide a novel speaker installation means comprising a speaker supporting frame held in a corner recess by resilient means, which permits installation of the speaker supporting frame on a fixture hidden in the corner recess so as to permit the peripheral edges of a triangular-shaped frame closely to confom with the walls and ceiling outwardly of the corner recess.

Another object of the invention is to provide a novel speaker installation means employing a speaker supporting frame resiliently held in a corner recess of a room, and means in connection with the frame to permit axial adjustment of the speaker about a plurality of axes so that directional, as well as acoustical performance of the speaker may be attained with respect to various locations in the room, and with relation to horizontal, as well as vertical dispositions of areas in the room.

Another object of the invention is to provide a very simple speaker installation means comprising a speaker supporting frame resiliently held in the corner of a room by means connected to a fixture in the corner recess; said means being resilient so as to permit the connection thereof to the fixture, while the frame is deflected away from the corner far enough, such that the resilient means may be manually secured to the fixture preliminary to the release of the frame such that the resilient means will pull the frame into intimate contact with the intersecting walls and ceiling of a respective room, and to thereby abridge the corner recess.

Further objects and advantages of the present invention may be apparent from the following specification, appended claims, and accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view of a pair of walls, and a ceiling of a room, and showing a speaker installation means bridging the corner recess at the intersection of the walls, and the ceiling of the room;

FIG. 2 is an enlarged fragmentary sectional view taken from the line 2—2 of FIG. 1, the plane of the section being vertical;

FIG. 3 is an enlarged fragmentary sectional view taken from the line 3—3 of FIG. 2, showing means for adjusting the axial direction of the speaker carried by the speaker frame of the invention;

FIG. 4 is an enlarged fragmentary plan sectional view taken from the line 4—4 of FIG. 2;

FIG. 5 is a perspective view of the structure shown in FIG. 1, with the ceiling structure omitted from the illustration, and showing the speaker frame of the invention held resiliently by resilient means to a fixture in the corner recess of the room;

FIG. 6 is a front view of a speaker frame, according to the present invention, and showing the fabric cover thereof broken away and illustrating a circular opening adjacent to which a speaker may be installed;

FIG. 7 is a view similar to FIG. 6, but showing a plurality of superimposed openings for the installation of several speakers of different size, wherein the largest speaker may be installed directly above the next lower adjacent speakers, which are relatively smaller and

FIG. 8 is a diagrammatic view of several speakers, according to the present invention, installed in a room, shown in plan, and illustrating various directions of axial adjustment of the speakers for attaining directional, as well as acoustical efficiency from the speakers installed, in accordance with the present invention, and further illustrating an amplifier and switch circuitry for controlling operation of the speakers.

As shown in FIG. 1 of the drawings, a speaker frame, in accordance with the present invention, is installed in a corner of a room, wherein walls **10** and **12** are substantially vertical, and intersect at a vertical juncture **14**. These walls also intersect a ceiling **16**, the walls **10** intersecting the ceiling on a horizontal plane at **18**, while the wall **12** intersects the ceiling on a horizontal plane at **20**. Thus, a corner recess **22**, as shown in FIG. 2, is abridged by a speaker frame **24** of the invention. This speaker frame **24** is generally triangular in shape, having edges **26**, **28** and **30** which are disposed adjacent the walls **10** and **12**, and the ceiling **16**, respectively. These edges are beveled, as indicated at **32** in FIG. 2 of the drawings, so that the edges closely conform with the respective wall or ceiling structure, and the frontal portion of the frame **24** is covered with a covering preferably of a fabric-like material, designed **34**. The frame **24** may be of a solid structure, such as plywood, or the like, and as shown in FIGS. 6 and 7, may be provided with a single opening **36** adjacent to which a speaker may be installed or may be provided with a plurality of superimposed openings **38**, **40** and **42**, so as to permit the installation of a large speaker adjacent the opening **38**, a relatively smaller speaker adjacent the opening **40** and another speaker adjacent the opening **42**, which is relatively smaller than the speaker to be installed adjacent the opening **40**. In this instance, the edges **26** and **28** are substantially longer than the edge **30**. Thus, the edges **26** and **28** adjacent the walls **10** and **12** being longer than the edge **30**, provides an acute triangle, whereas the frame **24**, shown in FIG. 6, may be an equilateral triangle. The fabric-like covering **34** covers the frontal portions of the frame **24**, and the openings **36**, **38**, **40** and **42**, as the case may be.

In the wall and ceiling corner recess **22**, a fixture **44** is installed. This fixture may be hook-shaped similar to a cup hook, or the like, and secured thereto are resilient elements **46** which extend generally to the corners **48**,

50 and 52 of the frame 24. Opposite ends of the resilient members 46 are secured to fixtures 54 extending from the back of the frame 24. These fixtures hold opposite ends of the resilient means 46 from those attached to the hook 44, and the resilient means 46 are preferably coil springs, or the like. These springs are sufficiently resilient to permit the upper edge 30 of the frame 24 to be deflected away from the ceiling a sufficient distance to permit a person's hand and arm to be inserted into the recess 22 so as to connect the resilient means 46 to the hook 44. It will also be understood, that a man's hand or arm may be so inserted past the edges 26 or 28, while the frame is pulled out, and when all of the resilient means, such as the springs 46 are connected to the hook 44, the frame 24 is released to permit it to be drawn resiliently into a position to abridge the corner recess 22, and such that the edges 26, 28 and 30 are in closely adjacent relation to the respective walls 10 and 12, and ceiling 16.

As shown in FIGS. 2 and 3 of the drawings, means is provided for adjustably supporting a speaker 56 rearwardly of the fabric-like cover 34, and in relation to the opening 36, such as shown in FIG. 6 of the drawings. A mounting block 58 is secured to the back of the frame 24 in surrounding relation with the opening 36, and this mounting block may have a central opening 60 in which the perimeter 62 of the speaker 56 is movably positioned. The peripheral rim or perimeter 62, as shown in FIG. 3 of the drawings, is held by a pair of clamp members 64 having a pair of opposed gimbal bolts 66 extending through a pair of opposed slots 68 in the block 58. The bolts 66 are disposed approximately 180° apart in connection with the perimeter of the speaker. These slots 68 extending through the side wall of the block 58 are elongated sufficiently to permit adjustment of the speaker about one axis, which is angularly disposed to the axes of the gimbal bolts 66, and the speaker is also pivotally mounted about the axis of the bolts 66, since the bolts 66 and clamp 64 may be rotated about the axis of the bolts 66 preliminary to the tightening of nuts 70 on the bolts to clamp them in certain position in the slots 68. The bolt nuts 70 bear on washers 72 which abridge the slot portions 68, and thus the speaker 56 may be clamped in various angularly adjusted positions about two axes, one concentric of the bolts 66, and the other concentrically or substantially concentrically of the speaker by reason of movement of the bolts through an arcuate path in the slots 68 to various broken line positions A and B or locations intermediate these positions, as indicated by solid lines in FIG. 3 of the drawings.

With reference to FIG. 8 of the drawings, it will be seen that axial direction of the speaker 56 may be in accordance with lines generally designated C, D and E in horizontal directions, or in elevated directions, as indicated by lines F and G, in FIG. 2 of the drawings.

Accordingly, axial disposition of the speakers may be adjusted in relation to the disposition of a desk, shown in FIG. 8, or any other furniture or fixtures, as desired.

An amplifier or other power source for a plurality of speakers is designated 76, and is electrically coupled selectively through a switch 78 to the speakers in connection with several speaker frames 24, as hereinbefore described. Each speaker frame is installed in the corner of a room, as indicated in FIG. 1 of the drawings, to abridge a corner recess formed by the intersection of two substantially vertical walls with a ceiling structure, which may be and is generally horizontal.

It will be obvious to those skilled in the art that various modifications of the present invention may be resorted to in a manner limited only by a just interpretation of the following claims.

I claim:

1. In a speaker installation means, the combination of:

a room wall and ceiling structure comprising an overhead ceiling structure, and two substantially vertical wall structures all intersecting to form a corner recess; a fixture in said corner recess; resilient means secured to said fixture; and a triangular speaker frame connected to said resilient means, and having edges adjacent said walls, and ceiling, and abridging said corner recess; said resilient means in a tension condition and tending to hold said speaker frame against said walls, and ceiling.

2. The invention, as defined in claim 1, wherein: a speaker is supported by said speaker frame.

3. The invention, as defined in claim 2, wherein: a mount is carried by said speaker frame, and supporting said speaker movably relative to said speaker frame.

4. The invention, as defined in claim 3, wherein: said mount structure is provided with means permitting movement of said speaker relative to said frame about two axes angularly disposed to each other, said last mentioned means comprising a pair of opposed gimbal bolts connected to said speaker substantially 180° apart about the perimeter thereof; and slotted means connected to said frame in which said gimbal bolts are individually adjustably mounted, and movable in directions toward and away from said frame; said gimbal bolts pivotally adjustable about their longitudinal axes in said slotted means; and means for fixing said bolts relative to said slotted means.

5. The invention, as defined in claim 1, wherein: said frame is provided with a frontal portion covered with fabric-like material, and a speaker located behind said material.

6. The invention, as defined in claim 1, wherein: a plurality of speakers are supported on said speaker frame.

7. The invention, as defined in claim 6, wherein: said speakers are of varying diameter, the larger diameter speakers being superimposed above the relatively smaller speakers.

8. The invention, as defined in claim 7, wherein: said edges of said triangular frame which are adjacent said walls are longer than said edge which is adjacent said ceiling.

9. The invention, as defined in claim 1, wherein: said edges are beveled, and closely conforming with said walls and said ceiling.

10. The invention, as defined in claim 1, wherein: said speaker frame is provided with three corners; and wherein said resilient means comprises three coil springs coupled to said frame adjacent said three corners; and said fixture is adapted to be secured to said room wall and ceiling structure in said corner recess; said fixture removably connected to said springs, said springs being under tensions and capable of sufficient extension to permit said frame to be pulled away from said wall or ceiling structure far enough, such that a person's hand may be inserted between the frame and the wall or ceiling structure to connect or disconnect said springs relative to said fixture.

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