June 23, 1931. F. M. DIETZ 1,811,385

ACOUSTICAL BOARD

Filed Sept. 7, 1929

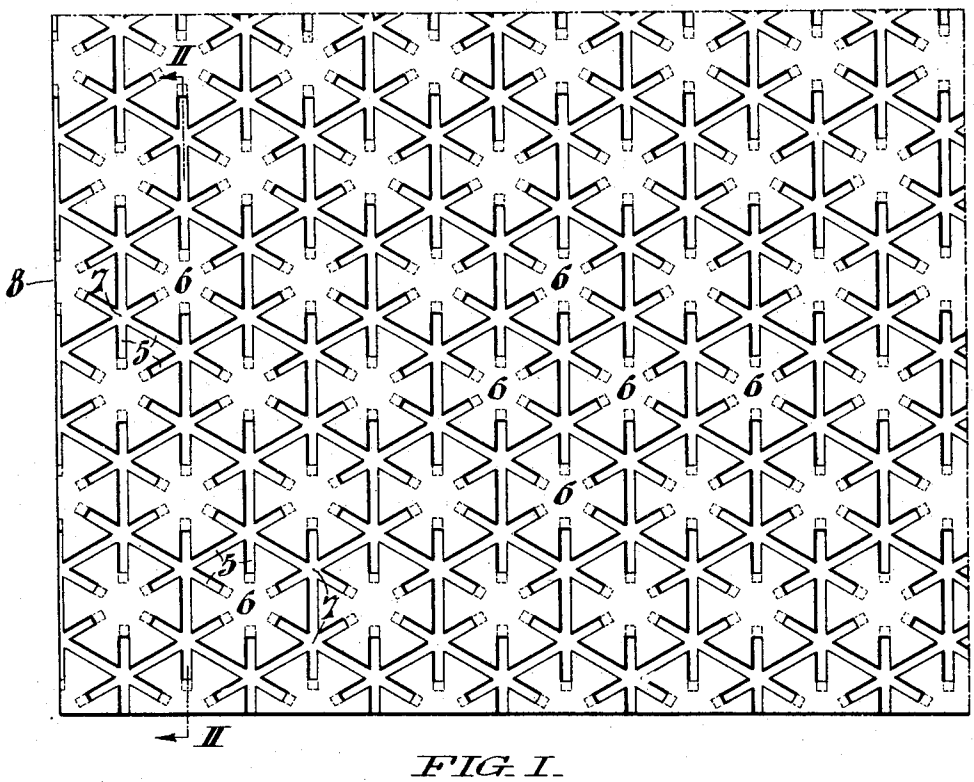


FIG. I.

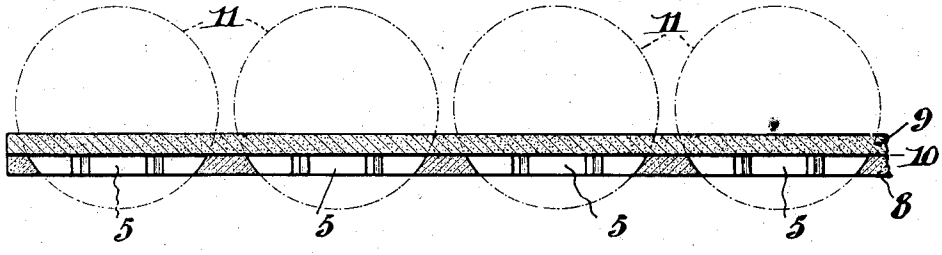
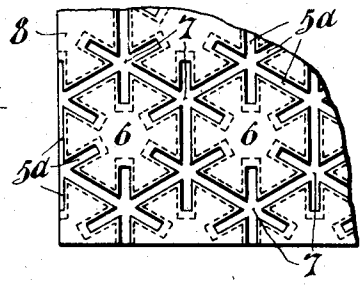


FIG. II.

FIG. III.



INVENTOR
Franklin M. Dietz,
BY Fraser & Paul
ATTORNEYS.

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UNITED STATES PATENT OFFICE

FRANKLIN M. DIETZ, OF HUTCHINSON'S MILLS, HAMILTON TOWNSHIP, MERCER COUNTY, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOHNS-MANVILLE CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

ACOUSTICAL BOARD

Application filed September 7, 1929. Serial No. 390,967.

The present invention relates to acoustical board and the like. This board is useful for the walls and ceilings of auditoriums and other places or rooms where satisfactory audition is important. Such board may also be found a desirable surfacing on account of thermo-insulative or æsthetic considerations, even in cases where audition is unimportant. Amongst the advantages of my board are a high degree of effectiveness in the prevention of secondary sound phenomena, particularly echoes or reverberations of sound that interfere with satisfactory audition; an æsthetically pleasing appearance; and comparative simplicity and cheapness of manufacture.

For the purposes of my invention, the board is made with a broken surface, having a multiplicity of recesses, grooves or channels forming a recurrent pattern. Either such a surface absorbs the incident primary atmospheric waves; or it mutilates the wave front in reflection, so that the reflected waves are inaudible; or it suppresses or mitigates the secondary sound phenomena in some other way.

In the drawings, Fig. I is a plan view of a sheet of acoustical board embodying my invention.

Fig. II shows a section through the sheet, taken as indicated by the line II—II in Fig. I; and,

Fig. III is a view similar to Fig. I illustrating a modification.

As shown in Fig. I, the grooves or channels 5 in the board form a recurrent pattern, consisting of a multiplicity of units 6, preferably polygonal in shape. In the present instance, each major recurrent unit or element of the pattern is an individually complete regular polygon: i. e., the character of regularity does not (in this example of the invention) depend on any area being regarded as part of more than one unit 6. And not only are the channels or grooves 5 which form the pattern all of the same length, making them simpler and less expensive to cut, but those bounding each major unit 6 of the pattern are prolonged so as to extend into one or more adjacent major units 6,—a feature which facilitates manufacture by allowing long individual cuts without sacrificing the total extent of channelling, or entailing the disadvantage of large unbroken areas.

As shown, the major unit 6 of the pattern is a hexagon, and the channels 5 bounding each such hexagon are prolonged so as to extend into the corners 7 of each adjacent hexagon 6, toward its center. Accordingly, three of the channels 5 intersect and cross each other at each corner 7,—making a channel pattern consisting of a multitude of six-pointed stars with alternate points of each star connected to the points of adjacent stars: i. e., each cut 5 is common to two of the six-pointed stars.

The hexagonal pattern gives a very pleasing visual effect combined with excellent acoustical properties.

It will be understood that while I prefer a pattern whose major polygonal units or elements are completely severed, yet the invention is not in its broader aspects limited to such completely severed units.

As shown in Fig. II, the board is of laminated construction, consisting of two thicknesses 8, 9 secured together by glue, cement 10 or other means. Openings to form the grooves or channels 5 are cut in the sheet 8, and the sheet 9 serves as a backing to close the bottoms of the openings and support the separate polygons 6 in proper relative positions. The dot and dash lines indicate rotary cutters or saws 11 that may be used to form the openings 5 in the sheet 8 before it—or the pieces 6 into which it is cut—are secured to the backing 9. With grooves 5 of substantially the same length, a plurality of openings may be cut simultaneously with a gang of saws 11 all of the same diameter. As shown, the cuts at 5 are preferably made from what afterward becomes the back side of the sheet 8, so that the ends of the cuts 5 are undercut, as they appear from the front of the finished board. The undercutting augments the sound-deadening effect, since the sound wave reflected from the bottom of a recess 5 will strike the overhanging wall at its end and be reflected back to the bottom again.

Fig. III illustrates a board similar to that

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of Fig. I, but having the sides of its grooves 5*a* undercut, as well as their ends.

Having thus described my invention, I claim:

1. Acoustical board having its surface broken by a multiplicity of channels forming a recurrent pattern of polygonal units, the channels bounding each unit being prolonged into adjacent units.

2. Acoustical board having its surface broken by a multiplicity of channels of substantially the same length forming a pattern of hexagonal units, the channels bounding each unit being prolonged into the corners of adjacent units.

3. Acoustical board having its surface broken by a multiplicity of channels forming a recurrent pattern of hexagonal units, the channels bounding each unit being prolonged both ways into the corners of adjacent units.

4. Acoustical board having its surface broken by recesses presenting undercut walls.

5. Acoustical board having its surface broken by channels having overhanging end walls.

6. Acoustical board comprising a sheet with slots therein defining a recurrent pattern, the slots bounding each unit of the pattern being prolonged into adjacent units, and a backing sheet to which the aforesaid sheet is attached affording a bottom for the slots and thus forming channels in the surface of the board.

In testimony whereof, I have hereunto signed my name at Trenton, New Jersey, this 29th day of August, 1929.

FRANKLIN M. DIETZ.

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