

Feb. 12, 1924.

1,483,366

J. MAZER

SOUND ABSORBING METHOD AND MATERIAL

Original Filed June 27, 1918

FIG. 1

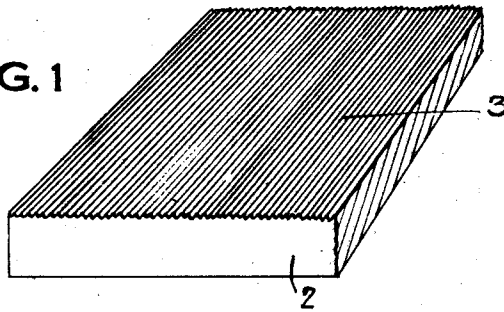


FIG. 2

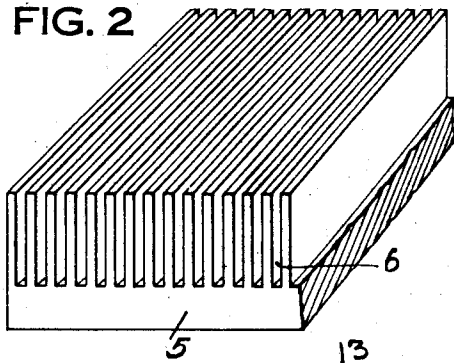


FIG. 3

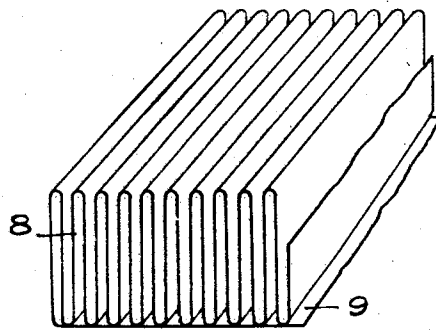


FIG. 4

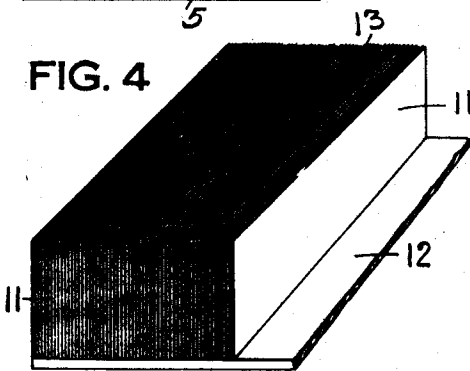


FIG. 5

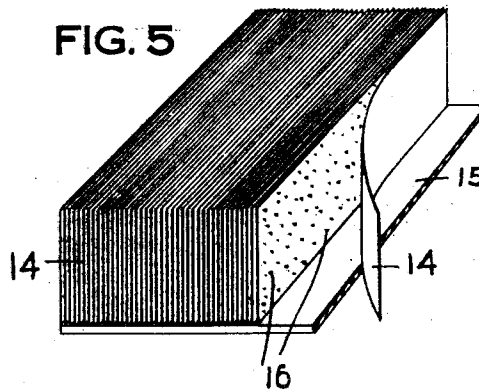


FIG. 6

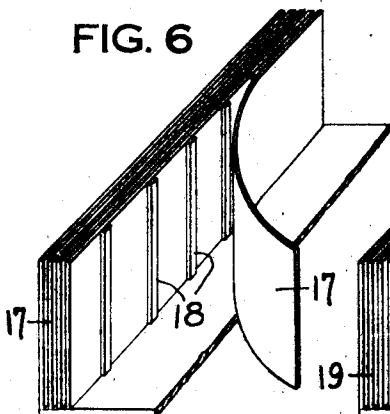
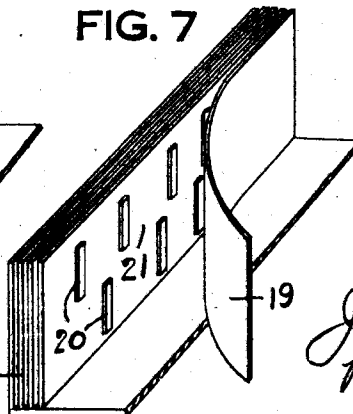


FIG. 7



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UNITED STATES PATENT OFFICE.

JACOB MAZER, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-ABSORBING METHOD AND MATERIAL.

Continuation of application Serial No. 242,272, filed June 27, 1918. This application filed October 9, 1922.
Serial No. 593,353.

To all whom it may concern:

Be it known that I, JACOB MAZER, a citizen of the United States, and resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Sound-Absorbing Methods and Material; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the art of correcting the acoustics of rooms, auditoriums and other enclosures, and its object is to provide a novel and effective method and means for modifying the boundary surfaces of such enclosures to produce definite and predetermined sound modification.

In my application for Letters Patent filed June 27, 1918, Serial No. 242,272, I have described and claimed an improvement in the sound-modifying art consisting in providing the surface of an enclosure with apertures communicating freely with the auditorium or other enclosure, and so disposed as to their size, number and arrangement as to give a definite and predetermined sound-absorbing capacity per unit area of the exposed surface. In my said prior application I have described some of the many different ways in which such sound-absorbing apertures may be formed.

My present application is a continuation of this prior application and relates specifically to the use, for sound-modifying purposes, of apertures in the nature of grooves penetrating one or more of the exposed surfaces of the enclosure to be treated. Such grooves may be formed by scoring or otherwise forming indented lines in a wall or ceiling coated with plaster or other material capable of such treatment. Or, the grooves may be made by building up a composite material, for example, by laying together strips of thin material and securing the assembled strips to a suitable backing. When such composite material is applied to a wall or ceiling the edges of the strips or other elements form the boundary surface of that portion of the enclosure and present spaces or grooves between them of greater or less width, according to the character of the material used. The spaces between the laminations of such composite material may be varied by placing separating elements between them, and such separating

elements may be of various forms, some of which will be described below.

The grooves formed in these various ways need not all be parallel with each other, but may run in different directions in accordance with any design that may be desired, while still maintaining the definite and predetermined sound-absorbing value that is characteristic of my system of sound-control as set forth in this application and in my prior application mentioned above.

In the accompanying drawing Fig. 1 is a perspective view showing the embodiment of my invention in which a previously erected wall or ceiling is scored to present a grooved surface; Fig. 2 is a perspective view showing a modification in which kerfs or slots are employed; Fig. 3 is a perspective view of a portion of a sound-modifying body composed of corrugated sheet material; and Figs. 4 to 7, inclusive, are fragmentary perspective views showing various methods of producing grooved surfaces through the use of superposed laminations.

In Fig. 1 the numeral 2 indicates a fragment of a wall, ceiling or floor of an enclosure having its exposed surface provided with a multitude of closely adjacent grooves 3. Such grooves may readily be made after the plaster, or other like material, has been placed in position and before it has completely hardened. It will be understood that these grooves may be arranged in various different ways to produce a variety of decorative effects, and that the grooves may be of different widths and depths and may be spaced from each other either regularly or irregularly, the only requirement being that the grooves be sufficiently numerous to have a substantial sound-modifying effect, and that the grooved surface shall have definite and predetermined sound absorbing capacity per unit of its area.

In Fig. 2 is shown a modification in which a block 5 of plaster or the like is kerfed or slotted, as at 6, to form longitudinal grooves. When such blocks are used to produce walls or ceilings with the grooves exposed, they produce a similar effect as to the absorption of sound as the grooved surface shown in Fig. 1.

Fig. 3 shows another modification of my invention in which the sound-absorbing material consists of units or blocks of corrugated sheet material, such as paper, fiber-

board or the like, which is bent into convolutions 8, thus presenting at the outer surface grooves or passages similar to the grooves 3 and 6 of Figs. 1 and 2. This corrugated material may be secured to a backing sheet 9 by which the material is held together as a unitary structure. By dipping such material in a solution of silicate of soda or other stiffening medium, a rigid and effective sound-modifying material is very cheaply made.

Fig. 4 shows the simplest method of carrying my invention into effect by the use of superposed laminations, the edges of which form the normally exposed surface of the material. As shown in this figure, strips 11 of paper, fiber-board, cloth, felt or the like may be laid together and secured to a backing member 12 by means of cement or otherwise. The edges 13 of these strips will necessarily present spaces or grooves between them of greater or less width. If the strips are made of smooth material and are closely compacted together, the spaces or grooves between them will be of small or even microscopic width, but will have substantial sound-modifying power. By employing strips of rougher material the effective spaces or grooves between the strips may be increased, as desired. The exposed edges 13 may present a flat even surface, as shown in Fig. 4, or may be more or less irregular and rough, according to the desired appearance and sound absorbing capacity.

Fig. 5 differs from Fig. 4 in that the laminations 14 secured, as in Fig. 4, to a backing sheet 15, are separated by means of particles 16 of felt fiber, sand or other suitable finely-divided material which produces effective spaces between the laminations of controllable width. The particles 16 may themselves be of high sound-absorbing power, thus providing an additional means for regulating the absorption of sound.

In Fig. 6 the strips or layers 17 may be positively spaced apart in a uniform manner by means of spacing strips 18, thereby forming sound-absorbing apertures between the strips.

Fig. 7 shows a modification similar to that of Fig. 6 with the difference that the laminations 19 are spaced apart by strips or blocks 20 which do not extend fully across the width of the strips 19, and which may be staggered in position, as illustrated, to form more or less irregular openings for the absorption of sound. In this case it will be noted that the openings extending inward from the edges of the adjacent strips 19 will communicate with cross openings, such, for example as 21, between the ends of the short spacers 20, and consequently the openings extending inwardly from the exposed sur-

face of the material may also communicate one with the other.

It will be understood that the foregoing examples are described merely to illustrate the many ways in which my invention may be employed, without limiting my invention to the constructions herein shown. In particular, it will be noted that the grooves which I employ may be either uniform or non-uniform in width and depth, and may be regular or irregular as to their spacing and distribution on the exposed surface of the material, and that such exposed surface may be either rough or even and may be produced after the surface has been placed in position or may be made in the form of blocks or sheets of predetermined sound-absorbing power, ready to be placed in position without any alteration. My invention includes all of these modifications, and such others as fall within the scope of the appended claims.

I claim as my invention:

1. The method of modifying the acoustics of a room, auditorium or other space that comprises providing such a space with a boundary surface having grooves communicating with said space, the said grooves having definite and predetermined sound-absorbing capacity per unit area of the exposed surface.

2. Sound-modifying material having grooves communicating with a normally exposed surface of said material, said grooves being sufficiently numerous to have substantial sound-modifying effect, and said surface having definite and predetermined sound-absorbing capacity per unit area of said surface.

3. Material for forming an exposed surface of a room enclosure, the said material having a normally exposed surface provided with sound-absorbing openings formed by the edges of laminations arranged side by side.

4. Material for forming an exposed surface of a room enclosure, the said material having a normally exposed surface provided with sound-absorbing openings formed by the edges of laminations arranged side by side, and a backing member secured to said laminations.

5. Material for forming an exposed surface of a room enclosure, the said material having a normally exposed surface provided with sound-absorbing openings formed by the edges of laminations arranged side by side, a backing member secured to said laminations, and means for spacing said laminations from one another.

6. Material for forming an exposed surface of a room enclosure, the said material having a normally exposed surface provided with sound-absorbing openings

formed by the edges of laminations arranged side by side, a backing member secured to said laminations, and means for spacing said laminations from one another, said spacing means consisting of bodies which individually have high sound-absorbing power.

7. Material for forming an exposed surface of a room enclosure, said material comprising a backing member and laminations of stiffened fibrous material arranged side by side and secured to said backing member.

8. A room enclosure having an exposed sound-absorbing wall composed of material having an exposed surface formed by the edges of laminations arranged side by side. 15

9. A room enclosure having an exposed wall bounded by sound-absorbing material comprising a backing member and laminations of thin material arranged side by side and secured to said backing member. 20

In testimony whereof I, the said JACOB MAZER, have hereunto set my hand.

JACOB MAZER.