Sept. 4, 1934. R. IRVIN 1,972,563

ACOUSTIC CONSTRUCTION

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Fig. 1

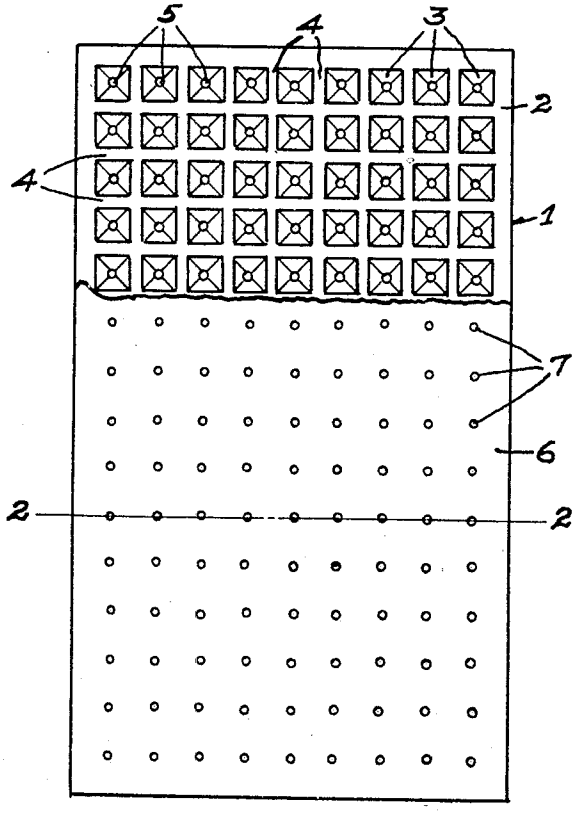
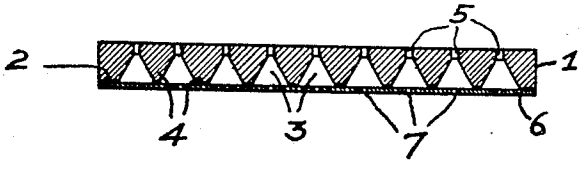


Fig. 2



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ACOUSTIC CONSTRUCTION

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2 Claims. (Cl. 154—44)

My invention relates to improvements in acoustic construction, and important objects thereof are to provide a construction of the character described, which is intended for use on walls and ceilings for improving the acustics of a chamber equipped therewith, by modulating, absorbing, trapping and deadening disturbing sounds, echos and reverberations; which may be readily and quickly installed in buildings already constructed as well as form a component part of a new structure; which embodies a facing of flexible sheet material adherently secured in position and capable of being readily fashioned to conform to any ornamental undulations of the surfaces carrying the same.

Further objects of the invention are to provide a structure of the class stated, which is simple in its construction and arrangement, readily cleaned, durable and efficient in its use, compact, light in weight, and comparatively economical in its manufacture, installation and maintenance.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the construction, combination and arrangement of parts herein specifically described and illustrated in the accompanying drawing, but it is to be understood that the latter is merely illustrative of an embodiment of the invention, and that the actual needs of manufacture and practice may necessitate certain mechanical variations. It is, therefore, not intended to limit the invention to the disclosure thereof herein illustrated, but rather to define such limitations in the claims hereunto appended.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views:

Figure 1 is a front view of an acoustic panel, with a portion of the facing broken away, constructed in accordance with the invention.

Figure 2 is a sectional view on line 2—2, Figure 1.

Referring in detail to the drawing 1 denotes a supporting element comprising a comparatively thin backing board, which may be constructed from any suitable material, preferably composition board and particularly board material embodying gypsum.

The backing board is preferably constructed in the form of rectangular panels in sizes best suited to meet conditions facilitating its manufacture, handling, storage, transportation and installation.

The front of the backing board 1 is formed throughout its area, with a multiplicity of uniformly arranged, very small cavities 3. The latter are regularly spaced from each other providing intersecting walls 4. Each of the cavities 3 is rectangularly-shaped, and the walls thereof converge into an aperture 5 formed in the backing board 1. The provision of the apertures 5 are not primarily essential but preferable.

The backing board 1 is provided with a flexible outer facing 6, which may be constructed from any suitable thin sheet material, preferably sheet aluminum foil. The facing 6 is secured to the backing board front 2 by a suitable adherent agent.

The facing 6 is preferably applied, not unlike ordinary wall paper, to a plurality of backing board panels, which latter have been previously secured in position to a wall or ceiling structure in any suitable manner.

It will here be noted that the conformation of the cavities 3 in the backing board 1 may be widely varied, even in the form of corrugations, without seriously affecting the acoustical efficiency of my improved construction.

However, the preferred rectangular conformation of the cavities 3, in the manner described, provides maximum cavity area and minimum intervening front surface areas of the cavity walls 4. The cavity wall front surface areas are restricted to an extent consistent with providing essential and substantial areas, around each of the cavities 3, and are the contacting surfaces engaged when adherently securing the facing 6 to the front of the backing board 1.

The entire area of the facing 6 is provided with a multiplicity of perforations 7. The latter are very minute and barely discernible, whereby same will not distort or destroy any superficial ornamental design, which may be displayed upon the facing 6.

In the embodiment of the invention disclosed in the drawing, a single facing perforation 7 is provided for each backing board cavity 3. The perforation 7 communicates with and is centrally disposed relatively to its respective cavity 3. While such relative arrangement of the cavities 3 and perforations 7 is ideal for maximum efficiency, the practical method of installing the construction renders the illustrated arrangement infeasible to a great extent. However, the efficiency of my improved acoustical construction is but slightly impaired the arrangement of the facing perforations 7 is varied so that one or more of the facing perforations communicate with each cavity 3, or regardless of whether said perforations are accurately centralized relatively to respective cavities 3.

In the assembly of the facing 6 with the backing board 1, in the manner stated, the portions of the former tensionally covering the cavities 3 in the latter, virtually constitute a multiplicity of vibrator diaphragms, which will vibrate in resonance with the frequency of the ether compression and rarefication of the sound waves. The small facing perforations 7, in conjunction with the cavity apertures 5, allows the air to pass through and around the diaphragms, thereby counteracting the vibratory movements of the latter and thus effectively damping or depressing the sound waves to prevent reverberations, echos, and other disturbing sounds opposed to acoustical excellence.

The present invention provides a most efficient acoustical construction, which entirely eliminates the necessity of the usual expensive and cumbersome sound absorbing fabrications and structures now in common use for acoustical purposes.

What I claim is:

1. An acoustic construction comprising a backing member having its entire front area formed to provide a multiplicity of cavities and intervening cavity walls, and a facing of thin sheet material covering said cavities and being adhesively secured to the front surface areas of the intervening walls of each of said cavities to provide a multiplicity of diaphragms capable of vibrating in resonance with the frequency of the air compression and rarefication of a sound wave, each of said diaphragms formed with a perforation communicating with respective cavities to allow ether to pass through and around said diaphragms to counteract the vibrations of the latter for damping the sound wave.

2. An acoustic construction comprising a backing member provided with a multiplicity of separate cavities extending inwardly from the front surface thereof, a vibratory diaphragm of thin sheet material covering each of said cavities and adhesively secured against the front surface area of the intervening walls of respective cavities, each of said diaphragms being perforated to allow the passage of ether through and around said diaphragms to counteract the vibrations of the latter for damping and depressing the sound wave.

RICHARD IRVIN.