May 13, 1930. F. J. SERSEN ET AL 1,758,808

MEANS FOR ACOUSTICAL CORRECTION AND SOUND DEADENING

Filed June 15, 1927

Fig. 1,

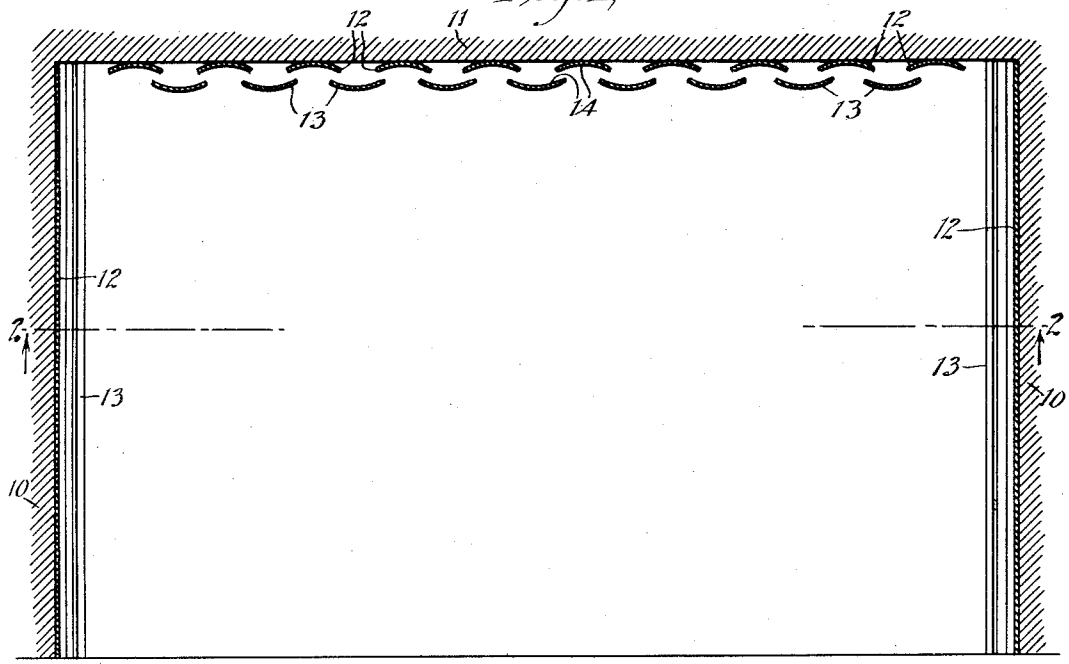


Fig. 2,

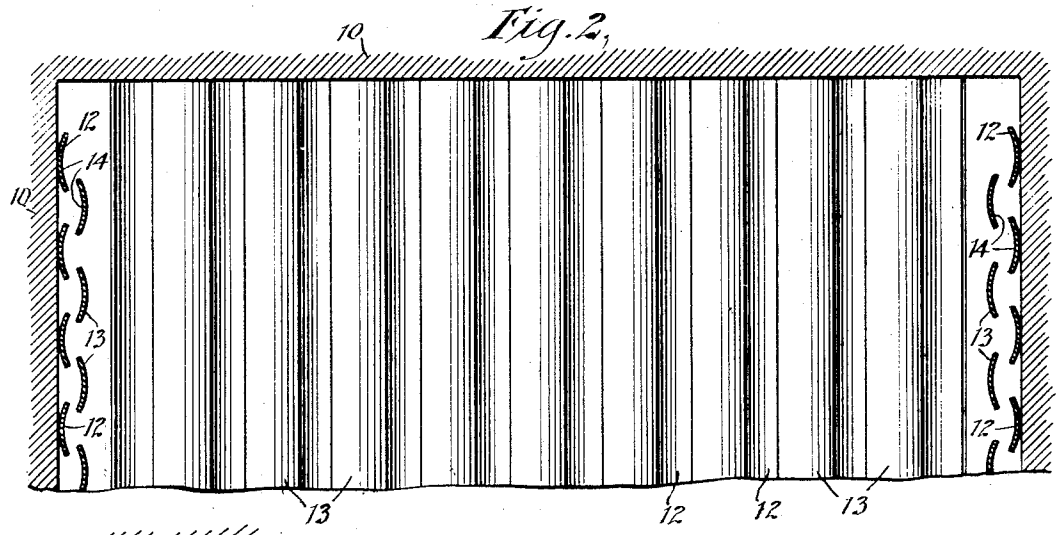


Fig. 4

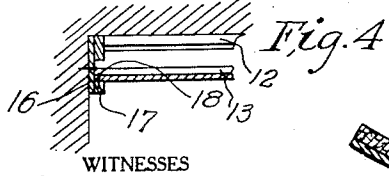
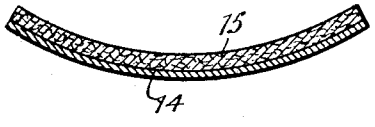


Fig. 3.



WITNESSES

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Patented May 13, 1930 1,758,808

UNITED STATES PATENT OFFICE

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MEANS FOR ACOUSTICAL CORRECTION AND SOUND DEADENING

Application filed June 15, 1927. Serial No. 199,026.

This invention relates to the art of acoustical correction and sound deadening.

The principal object of the invention is the provision of improved means for absorbing sound by causing reverberation or resonance of sound in a manner which eliminates interfering echoes, or which confines sound reflection to a determinate non-interfering limit or area embodied by walled structures or enclosures.

The nature of the invention and its distinguishing features and advantages will appear when the following specification is read in connection with the accompanying drawing, in which—

Figure 1 is a sectional view through an enclosure or room, certain walls and the ceiling of which having means constituting the present invention.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1 and looking in the direction indicated by the arrows.

Fig. 3 is an enlarged sectional view through one of the resonators.

Fig. 4 is a section illustrating the manner in which the resonators are supported.

In accordance with the present invention the means constituting the present invention will be employed in conjunction with, or be applied to, or be embodied by the walls and ceiling defining certain compartments or rooms, halls and the like, or other enclosures. In the illustrated embodiment, there is shown a room or compartment including side walls 10 and ceiling 11. The means of the present invention may be applied to any number or on all of the side walls, and to the ceiling. The said means consists of series of similar elements or resonators, there being a series 12 and a series 13. The series of elements or resonators 12 and 13 are disposed respectively in relatively different planes, and are maintained in this relationship in any suitable manner. The series 12 is arranged immediately adjacent the wall or ceiling as the case may be, whereas, the series 13 is arranged in spaced relationship with respect to the series 12.

Each of the elements or resonators is of such shape cross sectionally as to present an arcuate surface 14. Each of the elements or resonators will have a predetermined potential vibratory responsiveness. The series of elements or resonators 12 and 13 beside being disposed respectively in relatively different planes, are arranged in a staggered relationship with portions of the elements or resonators overlapping each other, and the elements or resonators of one series being arranged reversely from those in the other series, so that the arcuate surfaces 14 will be facing each other. The elements or resonators in each of the series 12 and 13 are spaced from each other.

It will be obvious from the arrangement described that the entrainment of vibrations will pass through the spaces between the elements or resonators of the series 13 and will be reflected by the arcuate surfaces 14 of the elements or resonators of the series 12 to the arcuate surfaces 14 of the series of elements or resonators 13. In this way reverberation is almost entirely confined to the space between the series of elements or resonators 12 and 13, which will substantially eliminate interfering echoes or will substantially prevent such echoes or reverberations from entering the main space of the enclosure or room. This in effect amounts to an acoustical correction in which extraneous or interfering echoes or reverberations are trapped.

It will be understood that the predetermined potential vibratory responsiveness of the elements or resonators 12 and 13 has an effect to absorb sound vibrations to some degree, and that the reflections set up by the arcuate surfaces 14 deadens the sound waves directed against said elements or resonators 12 and 13.

If desired each of the surfaces 14 may have applied thereto absorbent material such as felt or closely analogous material, having a relatively high coefficient of sound absorption. On reference to Fig. 3 it will be apparent that the arcuate surface 14 of one of the resonators has applied thereto felt 15. This absorbent material or felt may be applied to each of the elements or resonators of either series 12 and 13 or both series.

The elements or resonators 12 and 13 may

be supported in any preferred manner, and this may be accomplished by the use of a frame 16 secured to the side wall or ceiling as the case may be, said frame having cradle members 17 on which the opposite ends of each element or resonators respectively rest and to which they are secured as at 18, all of which is shown most clearly in Fig. 4.

We claim:

1. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, of series of spaced elements of predetermined potential vibratory responsiveness, positioned with respect to said wall or ceiling, said series of elements disposed respectively in relatively different planes.

2. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, of series of elements having arcuate surfaces of potential vibratory responsiveness, positioned with respect to said wall or ceiling, said series of elements disposed respectively in relatively different planes.

3. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, of series of spaced elements of predetermined potential vibratory responsiveness positioned with respect to said wall or ceiling, said series of elements disposed respectively in relatively different planes, and said elements arranged in staggered relationship with respect to each other.

4. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, of series of spaced elements of predetermined potential vibratory responsiveness positioned with respect to said wall or ceiling, said series of elements disposed respectively in relatively different planes, and said elements arranged in an overlapping relationship.

5. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, of series of resonators disposed respectively in relatively different planes, and positioned with respect to said wall or ceiling, each of said resonators having an arcuate surface of absorbent material having a relatively high coefficiency of sound absorption.

6. An acoustical correction and sound deadening means, comprising the combination with a chamber wall or ceiling, series of spaced elements of predetermined potential vibratory responsiveness positioned with respect to said wall or ceiling, said series of elements disposed respectively in relatively different planes and reversely arranged with respect to each other.

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