Sept. 27, 1932. S. ROSENZWEIG 1,880,153

SOUND INSULATING AND VIBRATION DAMPENING STRUCTURAL UNIT

Filed March 19, 1931

Fig. 1.

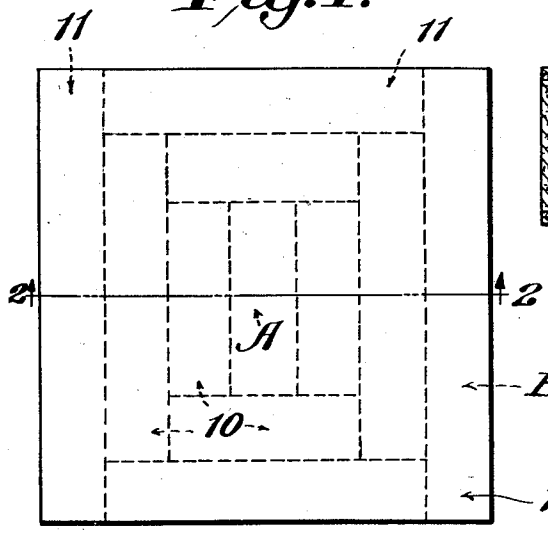



Fig. 4.

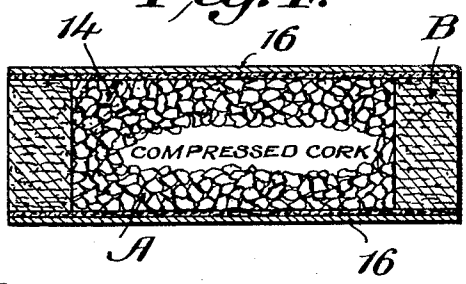



Fig. 5.

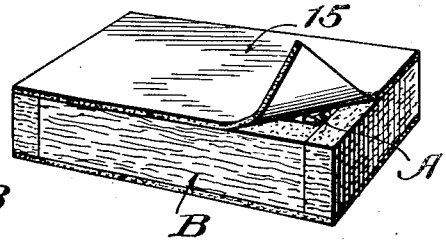



Fig. 2.

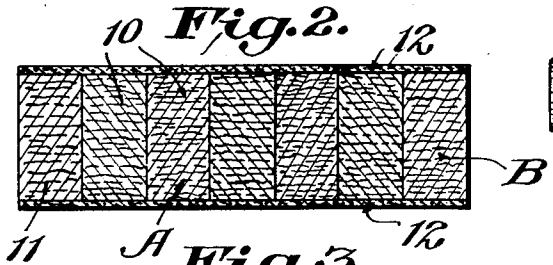
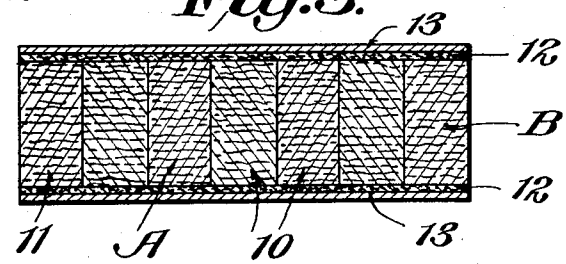



Fig. 3.

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# UNITED STATES PATENT OFFICE

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## SOUND INSULATING AND VIBRATION DAMPENING STRUCTURAL UNIT

Application filed March 19, 1931. Serial No. 523,879.

My present invention relates to structural units for embodiment in the floors, walls and ceilings of buildings and in machine foundations and various other places to localize the effects of sound and vibration and to serve other useful purposes, and has generally in view to provide an insulating and vibration dampening unit of the general character disclosed in my prior Patent Number 1,666,311 of April 17, 1928, and which retains substantially all of the advantages of said prior unit, but which involves certain novel structural features designed primarily to render such units relatively cheap and easy to produce, and to install, to render them capable of readily being cut into sections for facility and economy in installations, and also to render them of exceptional insulating and vibration dampening efficiency.

Insulating and vibration dampening plates or units constructed in accordance with the disclosure of my patent herein referred to are in extensive use and have proven highly efficient. However, since the components or individual parts of such plates or units are bound together by metallic straps or bands it is neither feasible nor practicable to cut said plates or units into sections for the purpose of filling a space of less area than one of the plates or units. Moreover, in covering a surface with units which are provided with binding straps or bands the contact of the bands of adjacent units with one another necessarily results in a space being left between each adjacent pair of units, and in instances where the units are used under a concrete foundation it is necessary to completely cover the units with some sheet waterproofing material such as a heavy layer of tar paper or the like prior to pouring the foundation not only to prevent the concrete when poured from entering the spaces between the units, but to protect the material of the units from direct contact with the moisture laden concrete. Furthermore, the inclusion of metallic binding straps in the units detracts from the insulating and vibration dampening efficiency of the units, especially if the straps of the different units are permitted to contact with one another and with solid parts of a floor, wall or the like in which the units may be embodied, and such units moreover are relatively difficult and expensive to produce.

Accordingly, my present invention has in view to provide a plate for sound insulating vibration dampening and other purposes which not only avoids the foregoing disadvantages but which possesses the advantage heretofore mentioned.

With the foregoing and other purposes in view, which will become more fully apparent as the nature of my invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be heretofore more fully described, illustrated in the accompanying drawing and defined in the appended claims.

In the drawing, wherein like characters of reference denote corresponding parts in the different related views:—

Figure 1 is a plan view of a sound insulating and vibration dampening plate constructed in accordance with my present invention.

Figure 2 is a cross section through the unit taken on the line 2—2 of Figure 1.

Figure 3 is a view similar to Fig. 2 illustrating an alternative construction.

Figure 4 is a view similar to Figs. 2 and 3 illustrating another alternative construction; and

Figure 5 is a perspective view of a unit constructed in accordance with the embodiment of my invention illustrated in Fig. 4.

My present unit is or may be of the same general nature as any of the units illustrated in either of my prior Patents 1,666,311 of April 17, 1928, or 1,685,244 of September 25, 1928, with the exception of the elimination of the metallic binding straps or bands of said prior units and the employment in lieu of said straps or bands of my present novel binding means for the components or individual parts of the units, and my present unit moreover may be produced either in accordance with the general method set forth in my Patent 1,685,244 or in any other suitable manner.

According to the embodiment of my invention illustrated in Figs. 1 and 2, the unit com-

prises a core, designated generally as A, which is composed of a number of blocks, 10 of natural or compressed cork, or material similar to or having the general characteristics of natural or compressed cork, suitably arranged in side to side and side to end or end to end abutting relation to completely fill a frame, designated generally as B, which likewise is composed of blocks 11 of natural or compressed cork or material similar to or housing the general characteristics of natural or compressed cork.

As indicated in Figure 2 the blocks 10 and 11, if formed from natural cork or similar material, preferably are cut so that the grain of the material extends in the direction of the plane of the unit, whereby the unit possesses maximum resiliency transversely and has the greatest tendency to absorb or dampen vibration incident to compressive forces exerted perpendicularly or substantially perpendicularly relative to the plane of the plate, and while the core blocks 10 may be all of the same length and be arranged in side to side relation, nevertheless it is preferred that some of said core blocks extend at right angles to other of said blocks in order to strengthen the unit and at the same time to enhance its insulating and vibration dampening properties.

In producing the unit illustrated in Figures 1 and 2, the frame blocks 11 are disposed in embracing relation to the core blocks 10 and pressure is exerted in any suitable manner against the sides and the ends of the unit to clamp the several blocks 10 and 11 tightly in abutting relation to one another. Then, while the blocks are maintained clamped together, the top and the bottom faces of the unit are coated with a layer 12 of asphaltum, tar or other waterproof, elastic adhesive material of sufficient thickness such that when the same hardens the several blocks 10 and 11 are firmly and positively bound together. The clamping pressure on the blocks is maintained until the asphaltum or the like has thoroughly set, whereupon the clamping pressure is relieved and the unit is ready for use, the asphaltum or equivalent coating material not only serving effectively to hold the blocks together, but serving also as a waterproof covering for the unit, and at the same time, because of its elasticity, accomplishing these purposes without interfering with the elasticity of the unit as a whole. Thus, the necessity of employing metallic bands or straps for the purpose of binding the blocks together is entirely eliminated together with all of the disadvantages inherent to the use of such bands or straps. Moreover, my present units are readily capable of being cut into sections of any desired size and shape, and said units are capable of being arranged in side to side abutting relation, which fact, combined with the waterproofing property of the asphaltum tar or other coating material, renders unnecessary the employment of any additional waterproofing sheet to be placed over the units when the latter are used under a concrete foundation or the like, although it is desirable to employ strips of paper or other material impregnated with asphaltum, tar or the like to cover the seams or joints between adjacent units in such instances to prevent the entrance of any water into said seams or joints.

Although the covering of the units with asphaltum or the like in the manner stated has been found to be entirely satisfactory without employing any auxiliary covering or binding means, nevertheless it may be found desirable in some instances to provide auxiliary means to increase the strength of the units and to assist the asphaltum, tar or the like in rendering the units thoroughly waterproof. In that event, after application of the asphaltum and before the same has been allowed to harden, sheets of asphaltum paper, tar paper or the like may be placed over the asphaltum layers as illustrated in Fig. 3 of the drawing, the said paper sheets being designated as 13 and because of being placed over the layers 12 when the material of said layers is soft, uniting with said material to form in effect single reinforced binding and waterproof coverings for the blocks of the units. Units of this character obviously possess the same advantages as units of the type illustrated in Figs. 1 and 2.

It is not essential that the cores of my present units be formed either of blocks or of cork, as materials other than cork may be employed either in block or in other form. For example, the cores of the units may be composed of one or more slabs or bodies of compressed granulated material possessing sound insulating and vibration dampening properties as indicated at 14 in Figs. 4 and 5 of the drawing, this material in the present instance consisting of compressed cork particles as distinguished from the one-piece blocks which preferably but not necessarily compose the frame element of my unit according to each of the embodiments of the invention.

Obviously my unit as constructed in accordance with the illustration in Figs. 4 and 5 of the drawing may be coated only with asphaltum, tar or the like as in Figs. 1 and 2, and as indicated at 15 in Fig. 5, or with a layer of asphaltum paper, tar paper or the like over either or both of the layers 15 in accordance with the embodiment of the invention illustrated in Fig. 3 and as indicated at 16 in Fig. 4. Moreover, the embodiments of the invention illustrated in Figs. 4 and 5 possess the same advantages as the embodiments of the invention illustrated in Figs. 1 to 3 relative to holding the parts of the unit together and waterproofing the same and rel-

ative to the capability of the unit being cut into sections, it being pointed out in this latter connection that my present invention provides for the utilization of small sections in the construction of the units whereby substantially all waste is avoided.

It is preferable in most instances to avoid the use of any binder such as asphaltum or the like between the abutting faces of the blocks of the units, since in this way the full resiliency and elasticity of the blocks is maintained. However, for some constructions it may be of advantage to interpose a thin binder such as asphaltum or the like between the blocks.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A construction unit of the character described comprising a plurality of sound insulating and vibration dampening members disposed in side to side relation to form a plate, and means for binding said members together comprising a coating of elastic adhesive material disposed over exposed faces of said members.

2. A construction unit of the character described comprising a plurality of sound insulating and vibration dampening members disposed in side to side relation to form a plate, and means for binding said members together comprising a coating of elastic, adhesive waterproofing material disposed over exposed faces of said members.

3. A construction unit of the character described comprising a plurality of sound insulating and vibration dampening members disposed in side to side relation to form a plate, and means for binding said members together comprising a coating of asphaltum disposed over exposed faces of said members.

4. A construction unit of the character described comprising a plurality of sound insulating and vibration dampening members disposed in side to side relation to form a plate, and means for binding said members together comprising a coating of elastic adhesive material disposed over exposed faces of said members and a sheet of fibrous material impregnated with an adhesive waterproofing substance superimposed upon and united with said coating material.

5. A construction unit of the character described comprising a plurality of sound insulating and vibration dampening members disposed in side to side relation to form a plate, and means for binding said members together comprising a coating of elastic adhesive material disposed over exposed faces of said members and a sheet of asphaltum impregnated paper superimposed upon and united with said coating material.

6. A construction unit of the character described comprising a cork frame, a core of sound insulating material disposed within and embraced by said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of said core and said frame.

7. A construction unit of the character described comprising a cork frame composed of cork blocks, a core composed of cork blocks disposed within said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of the blocks of said frame and said core.

8. A construction unit of the character described comprising a cork frame composed of cork blocks, a core composed of cork blocks disposed within said frame, and means for binding said frame and said core together comprising a coating of asphaltum disposed over exposed faces of the blocks of said frame and said core.

9. A construction unit of the character described comprising a cork frame composed of cork blocks, a core composed of cork blocks disposed within said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of the blocks of said frame and said core and a sheet of fibrous material impregnated with a waterproofing substance superimposed upon and united with said coating material.

10. A construction unit of the character described comprising a cork frame composed of cork blocks, a core composed of cork blocks disposed within said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of the blocks of said frame and said core and a sheet of asphaltum impregnated fibrous material superimposed upon and united with said coating material.

11. A construction unit of the character described comprising a cork frame, a core of sound insulating material disposed within and embraced by said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of said core and said frame and a sheet of fibrous material impregnated with a waterproofing substance superimposed upon and united with said coating material.

12. A construction unit of the character described comprising a cork frame, a core of sound insulating material disposed within

and embraced by said frame, and means for binding said frame and said core together comprising a coating of adhesive waterproofing material disposed over exposed faces of said core and said frame and a sheet of asphaltum impregnated fibrous material superimposed upon and united with said coating material.

13. A construction unit of the character described comprising a cork frame, a core of sound insulating material disposed within and embraced by said frame, and means for binding said frame and said core together comprising a coating of asphaltum disposed over exposed faces of said core and said frame, and a sheet of asphaltum impregnated fibrous material superimposed upon and united with said asphaltum coating.

14. A construction unit of the character described comprising a cork frame, a core within said frame composed of compressed granulated cork, and means for binding said core and said frame together comprising a coating of asphaltum disposed over exposed faces of said frame and said core.

15. A construction unit of the character described comprising a cork frame, a core within said frame composed of compressed granulated cork, and means for binding said core and said frame together comprising a coating of asphaltum disposed over exposed faces of said frame and said core and a sheet of asphaltum impregnated fibrous material superimposed upon and united with said asphaltum coating.

In testimony whereof I hereunto affix my signature.

SIEGFRIED ROSENZWEIG.