

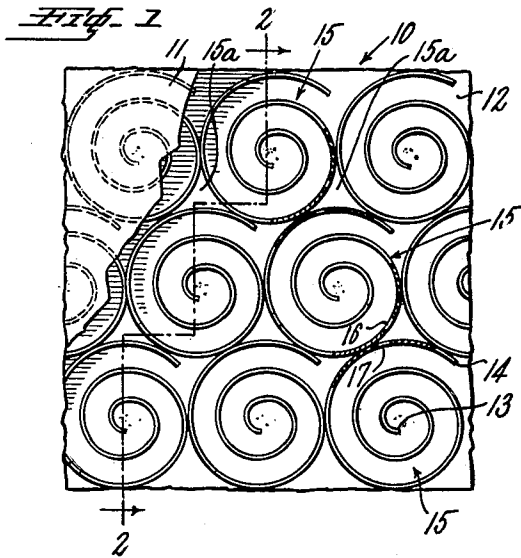
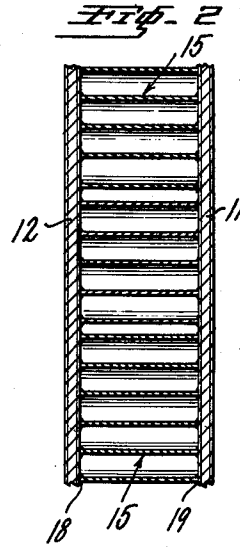
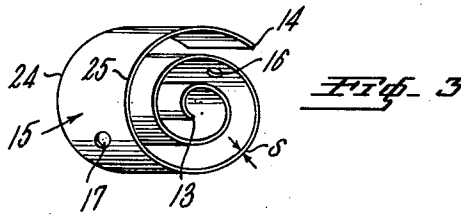
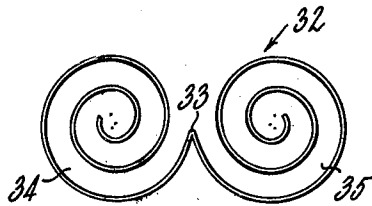
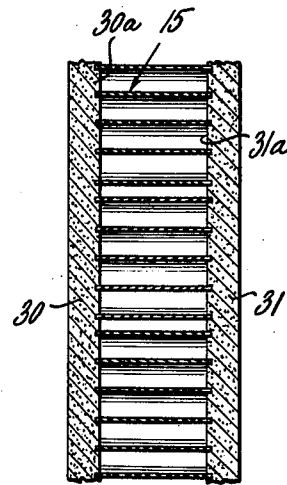
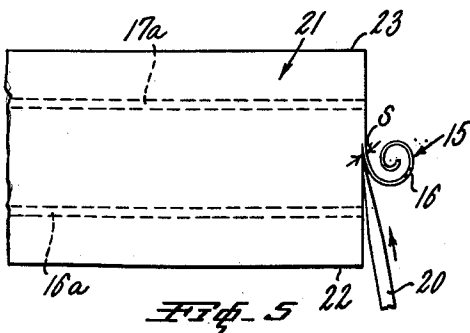
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HOLLOW PANEL DOOR STRUCTURE

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HOLLOW PANEL DOOR STRUCTURE

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7 Claims. (Cl. 154-45.9)

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The present invention relates to doors or similar structures, such as walls, panels, partitions, frames, etc.

It is one of the objects of the invention to provide means attributing to panel, door and like plate structures insulating properties and great carrying capacity.

It is another object of the invention to provide means affording very economical manufacture of inexpensive and light-weight walls, panel and like structures of relatively thin plate materials (wood, fibre, plaster of Paris, etc.) and to interpose within the space between opposite plates forming the walls, panels and the like members of predetermined shape which bring about resistance to bending or other mechanical forces to which the assembled panel structure may be subjected.

Still another object of the invention is to provide means permitting air circulation within spaces and between said interposed members of the panel structure to thereby effectively reduce to a minimum the time required for drying the panel assembly during manufacturing stages thereof.

Still another object of the invention is to provide means making possible the employment of thin-walled, perforated and spiral-shaped members for insulating and bracing cover plates arranged in sandwich-like fashion for any building or structural purposes.

Yet another object of the invention resides in the provision of means for equidistantly spacing and uniformly supporting oppositely disposed plates, to thereby obtain strong, durable and compact structural panel-like elements, which may be readily connected together by suitable binders at abutting ends or which may be cut to any desired size and form.

A still further object of the invention is to provide means permitting the production of spirally-shaped members of substantially equal extent and with walls of substantially equal height, whereby said members may be speedily placed in contact with each other and in edgewise relation between opposite plates, whose walls may be relatively thin, since the same are evenly and uniformly supported by said members.

These and other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawing which discloses, by way of example, the principle of the invention and preferred modes which have been contemplated for applying said principle.

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In the drawing:

Fig. 1 is a top plan view of a structural element made in accordance with the invention, parts being broken away to show the interior of said element.

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1.

Fig. 3 is a perspective view of one of the spiral members employed in accordance with the invention.

Fig. 4 is a view similar to that of Fig. 2 in modified form.

Fig. 5 shows diagrammatically the obtainment of a spiral member, as seen in Fig. 3.

Fig. 6 is a top plan view of a spiral member in modified form and preferably made from metal.

Referring now more particularly to the drawing, there is shown in Fig. 1 a structural element 10, such as a panel of a door or the like having the front plate 11 and the rear plate 12. Front plate and rear plate are preferably coextensive with each other and spaced from each other by spiral-shaped members 15 having the inner end 13 and the outer end 14. It will be observed that the distance between the wall parts forming the spiral-shaped members is substantially equal throughout. As a consequence of this shape of the members 15 the advantage is achieved that the plates 11 and 12 may be made relatively thin since the plates are uniformly and evenly supported throughout their lengths by said members.

It may be further seen from Fig. 3 that each spiral-shaped member has one or more, say, two openings 16, 17 which permit circulation of air through the sandwich-shaped structure 10 when the members 15 are placed in contact with each other and rest between front and rear plates 11, 12. As can be seen from Fig. 2, the inner faces of front and rear plates 11, 12 are provided with respective layers 18, 19 of a suitable adhesive material, such as glue containing casein, or other suitable binder capable of attaching plates 11, 12 to each other through the medium of said prearranged and preshaped interposed members 15, providing reduced spaces therebetween designated by numerals 15a. The aforementioned openings 16 and 17 effectively contribute to air circulation within the structure and spaces 15a so that the time for drying such panel structure may be reduced to a minimum.

From Fig. 5 it will be seen that the spiral member 15 may be, for example, obtained by slicing by means of a knife 20 a suitable board 21, made of wood, metal and the like, from edge 22 in the

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direction of edge 23. The width from edge 22 to 23 determines the extent of the spiral member 15, whereas the height from edge 24 to 25 corresponds to the thickness of the board 21.

It is preferred to select a wall thickness S of the spiral-shaped turnings or members 15 of about 2 mm. or even less, preferably varying between 0.9 to 0.5 mm., depending on the board material.

In order to obtain the aforementioned perforations 16 and 17, it is proposed to provide two bores 16a, 17a in a direction transverse to the movement of the slicing knife 20.

Fig. 4 shows front and side walls 30 and 31, preferably made of plaster of Paris between which the spiral members or turnings 15 are interposed, the latter engaging the respective inner surfaces 30a, 31a of the walls 30, 31 while the same are still in a somewhat formable state. Thus, the spiral-shaped members 15 project into the inner surfaces 30a, 31a and are firmly held therein after the walls 30 and 31 have been subjected to a drying operation or allowed to set.

It is well understood that any other formable material may be used for this purpose instead of plaster of Paris, such as resinous material or compositions containing resin, cement etc.

It is further to be noted that members 15, as shown in Fig. 3, may be made instead of wood, of metal and may assume instead of a shape shown in Fig. 3 a form seen in Fig. 6. Spiral-shaped member 32 of Fig. 6 is preferably obtained by slicing a metal plate by means of two knives which are guided in angular relation to each other and meet at the apex of the angle at which the inwardly projecting part 33 of the double or twin spirals 34, 35 is obtained.

It is to be understood that the spiral-shaped member 32 may be obtained in any other way, such as by bending a metallic band over a die or by means of a jig.

It is preferred that the height of the wall 24—25 of each member 15 be greater than the thickness of the plate 11 or 30.

It has been found in practice that the employment of relatively thin-walled, spiral-shaped members results in a very sturdy, light-weight plate or panel structure which may be used for building or similar purposes and withstands considerable bending and other mechanical forces to which the panel structure may be subjected.

It is well apparent that the structure 10 may be cut to shape in any desired manner through front and rear walls 11, 12 as well as through adjacently positioned spiral members 15 without weakening such structure and that like structures may be readily connected to each other in end to end relation by any suitable binders.

Having described several embodiments of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A structural element in the form of a hollow panel, comprising two plates facing each other in a spaced relationship, spiral-shaped members each having a plurality of complete spiral turns, said members being arranged between said plates in edgewise relationship to and

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in touch with the inner faces of said plates and in contact with each other so as to space said plates from each other, the individual spiral turns of each of said members being spaced from each other by a free space having a width which is a multiple of the wall thickness of said turns, and binding means securing said inner faces to the edges of said members.

2. A structural element according to claim 1 wherein said spiral turns are substantially equidistantly spaced from each other.

3. A structural element according to claim 1 wherein at least a number of said turns are perforated to permit air circulation through said spiral-shaped members.

4. A structural element in the form of a panel comprising two spaced apart plates facing each other, spiral-shaped members each having a plurality of complete spiral turns, said members being in contact with each other and with the inner faces of said plates so as to space said plates from each other, the individual spiral turns of each of said spiral members being spaced from each other by a free space having a width which is a multiple of the wall thickness of said turns, said spiral-shaped members being set into said inner faces.

5. A wall structure of the character described comprising two plate elements made of relatively thin material and having inner surfaces, and a plurality of spiral-shaped members in contact with each other, the height of the walls of said members being substantially equal but being greater than the thickness of each of said plate elements, said members having a plurality of complete spiral turns positioned in edgewise relation to said inner surfaces of said plate elements, the individual spiral turns of each of said spiral members being spaced from each other by a free space having a width which is a multiple of the wall thickness of said turns, and means associating said members at their edges with said plate elements to form a structure of relatively high carrying capacity.

6. A wall structure according to claim 5 wherein the spiral turns of each of said spiral-shaped members are substantially equidistantly disposed to each other.

7. A wall structure according to claim 5 wherein each spiral-shaped member is composed of double spirals in juxtaposition.

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