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CONSTRUCTION UNIT

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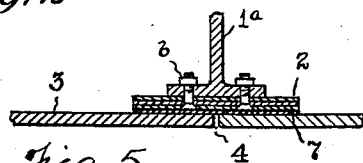
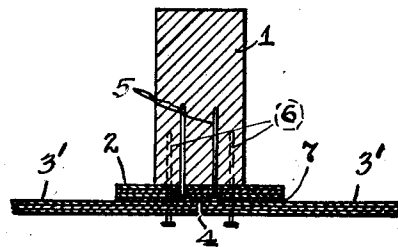
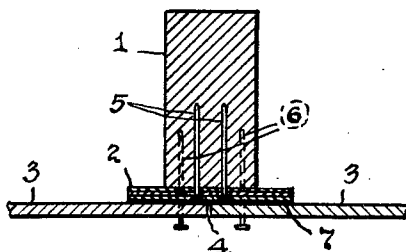
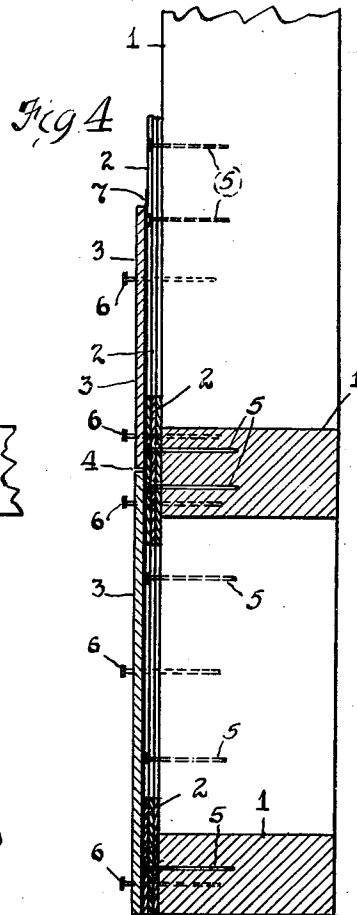
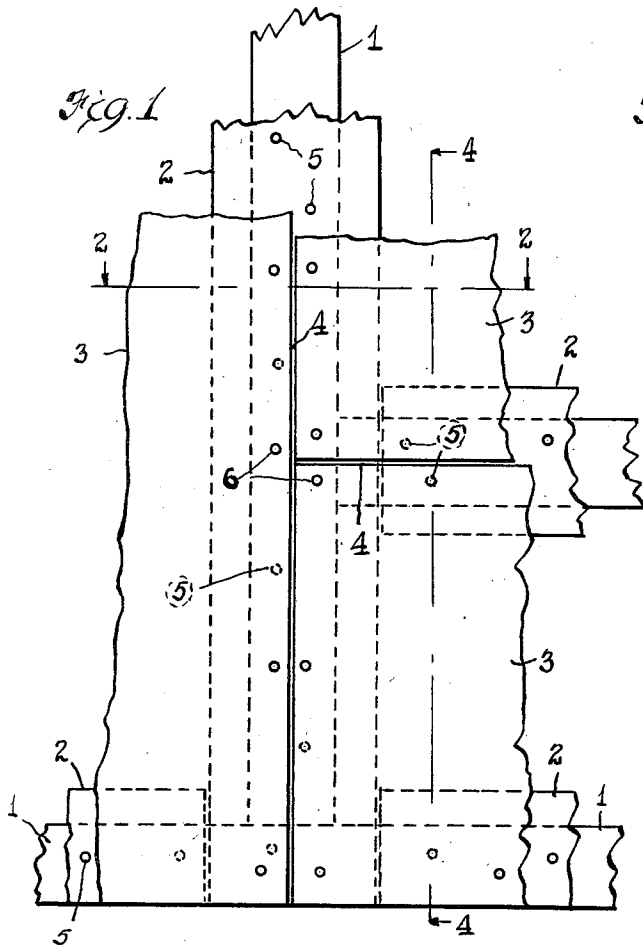


Fig. 2

Fig. 3

Fig. 5.

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CONSTRUCTION UNIT

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11 Claims. (Cl. 20-4)

This invention relates to a construction unit and method of making same and particularly to panel walls, ceilings, etc., constructed with plywood panels, composition board panels, fibre board panels, etc.

An object of the invention is the provision of a construction unit in the form of a wall or a ceiling composed of a number of plywood panels, for example, in which wall or ceiling after decoration no cracks or openings are visible at the joints between the individual panels which are comprised in the construction unit.

A further object of the invention is the provision of exceptional strength in walls and ceilings built with plywood or other panels so that the thickness of the panels may be decreased and the studding made of smaller sizes of lumber than is now the practice and still provide walls and ceilings having greater resistance to strains and shocks which develop in buildings after construction due to settling, atmospheric changes and other natural causes.

Other objects of the invention will in part be obvious and will in part appear hereafter.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing in which:

Figure 1 is an elevational view, partly broken away, of one form of construction unit embodying the invention.

Figure 2 is a horizontal section at line 2-2 of Fig. 1 showing one form of construction unit embodying the invention in which the partition face is of composition board.

Figure 3 is a similar view of a slight modification in which the partition face is of plywood.

Figure 4 is a vertical section on line 4-4 of Fig. 1, and

Figure 5 is a similar view of a modification.

The use of wallboard, such as composition board, fibre board and particularly plywood wallboard, for partitions, ceilings, etc., in buildings has long presented a special problem in the matter of the treatment of the joints between ad-

jacent wallboard panels comprising the face of the partition, ceiling, etc. In many cases the real problem has been avoided by use of battens or strips of wood applied over all the joints giving a frankly paneled interior surface to the wall or ceiling. However there are many and obvious objections to this form of construction such as the uneven surface, difficulty of decorating, limitation of style of wall furnishings, etc. The desire has long been present for a form of construction which would provide wall or ceiling units in which the joints between the individual, adjacent wall board panels were completely and permanently concealed. This desire was all the more accentuated on the part of wallboard manufacturers, and particularly plywood wallboard manufacturers, because all the other cracks so common in plastered construction for example are entirely eliminated by the use of wallboard, and particularly plywood wallboard, as partition material. Thus it is obviously all the more desirable to eliminate the one remaining crack, that is between two adjacent panels.

Because of this real need of the wallboard industry and the building trades a great many suggestions have been made in the attempt to solve this problem. For example a number of joint fillers are on the market, the purpose of which is to fill up the cracks or joints between panel members and to adhere to the adjacent edges. These, however, are only partially successful. If any amount of strain is transmitted to the wall from any cause the joint is of course the weakest section and a crack inevitably occurs. So far it has been impossible to make a joint filler which has sufficient adhesion to the narrow edges of the panel to join the two panels together by a bond as strong as the panels. This method therefore is successful only where strains are almost absent in the wall, or else are very moderate strains.

Another method of joint treatment embodies the use of fabrics or of even special metal sheets which are fastened by adhesives in such a manner as to span the joint. Proposals of this nature are, however, quite expensive, especially in the labor cost of putting them in place since the surface of the panel must be recessed in order to receive a strip of this nature, otherwise the strip will show unless of course a very thick coating of some sort is placed over it. For this reason where smooth finish walls are desirable this form of construction is not possible and in any case it has not been adopted widely because of the expense of using it. Other proposals em-

body various complicated methods of fastening but none of these has proved practical and as a result the problem so far up to the time of my invention may be said to have been practically unsolved.

One reason why the problem is so hard to solve is because the moisture content of the studding, or joists or other framework for example, to which the panels are fastened is generally considerably higher than the moisture content of the panels themselves. As the building is finished the framework generally slowly dries out. Shrinkage strains are thus set up in the structure and are transmitted to the wallboard, in turn cracking the joint. With most types of construction the back side of the partition, especially of outside walls is very likely to be subjected to moisture while the inside is generally subjected to quite dry atmosphere. Leaky roofs, window frames and so on also afford access of moisture so that in general there is very great opportunity for strains to be set up along the joints due to moisture changes or due to uneven moisture conditions.

I have discovered a construction unit and method of making same which solves the aforesaid problem.

Referring more particularly to the drawing, I have shown at 1 a support or "two by four" to which is nailed or glued a strip of plywood 2 desirably with transverse grain which is preferably, but not essentially, slightly wider than the support. The support, whether vertical or horizontal, is for convenience hereinafter concisely designated "studding". When the strip is attached by gluing, light nails 5 are used to hold 2 elements tightly until the glue is set. The partition panels 3 are then erected against the strips 2 on which glue has been spread and are held in place until the glue is set, by nails 6 which may be only partially driven home so as to permit easy removal after the setting of the glue, or may be driven in permanently, the glue line being indicated at 7. The panels may be of homogeneous material, as composition board, fibre board, insulation board, etc., as indicated at 3 in Fig. 2, or of laminated material, as plywood, as indicated at 3' in Fig. 3. Where two panels join on a stud and plywood strip the edges may be tightly butted together whereupon a slight squeeze-out of the glue from the glue line 7 will take place and fill the very slight opening, any excess being sanded off the outer surface. If however it is desired to leave a slight opening between the panels as at 4, it may be filled with a so-called crack or joint filler since no strain is put upon the filler in the joint with this construction unit. All that is required of the joint filler is that it shall have adhesion to the edges of the panels, as all the strains and stresses of the old type of construction are taken up and compensated in my construction unit leaving none to wreck the joint filler. It is preferable that a quick-setting casein glue be used between the plywood strip and the wall panels, but this is not absolutely essential. It is essential that the glue shall be moisture resistant when wet. After the glue is set and the nails 6 withdrawn (if that is desired) the unit is completed and ready for decoration. In case the butt joint was used between the panels the squeezed out glue may be sanded off. If joint filler is used the excess should be sanded down so that the surface is level. It is then generally desirable in the case of plywood to apply a thin coat of oil paint before further decoration is attempted. The panels may then be finished in an

imitation sand finish wall, water paint may be applied which because of the primer coat of oil paint will not affect the top surface of plywood. In the case of insulation boards and some composition boards this is not an essential step in the decoration.

Any support performing the function of studding can be used and plywood strip attached thereto by suitable means, the panels being glued then to the plywood strip. In some cases the plywood strip is nailed or otherwise fastened, but not glued, to the stud or other supporting member. In such cases the slight working of the stud on the nails or other fastenings which attach the plywood strip acts to protect the glued joints uniting the panels to the plywood strips from stresses to which they otherwise would be subjected. Thus a useful function is performed in making panel joints still more secure against cracking. In the illustration, as shown in Fig. 5, a support 1a may be of steel, and the plywood strip 2 may be held thereto by screws or bolts b. The glue line 7 then secures the panels 3 to the plywood strip, as foregoing.

My construction unit provides an interior wall surface which may be decorated in any desired manner with oil paints or water paints or textures, which when complete will show no evidence of the joining of the panels and which will not be marred by cracks appearing at the joints of the panels due to subsequent strains from various causes.

A wall constructed in accordance with my invention has resisted the following tests: Dry plywood panels were secured by means of the hereinabove described means to green studding to which additional moisture had been applied. The joints were filled and sanded down. The wall was permitted to dry until moisture testers indicated uniform moisture conditions throughout the wall. Examination of the joints showed absolutely no hair cracks at any point in any of the joints, even when examined under a magnifying glass. A cut-out section of wall eight feet by eight feet square was then used as a test section. By means of clamps applied diagonally across the corners a heavy pressure was applied sufficient to warp the test section into a concave shape. No cracks appeared at the joints. While the section of wall was still held under this strain a strong mechanical vibration was applied at the rate of 500 vibrations per minute for two hours. No cracks developed in the joints. The strain across the diagonal corners was then released and the vibration was further continued for two hours. No cracks occurred. The face of the section was then subjected to heat while the back of the section and the studs were kept wet by means of wet cloths fastened to the studding and by means of spraying water on the back side of the section. The joints were inspected at frequent intervals during this test and after redrying of the panel and studs and at no time was any crack visible even under a magnifying glass.

In contrast to the results above described a similar section formed in the ordinary way by nailing the wallboard to the studding, then filling the joints with a joint filler, showed very pronounced cracks at the joint immediately when the strain was placed across the diagonal corners.

Experiments were made using strips of composition board in place of the plywood strips 2 in the drawing. Cracks also appeared under test, but not as quickly as in the old method of con-

struction. Where, however, the strips 2 were made of plywood with the face grain running either parallel or at right angles to the grain of the studding no cracks occurred. Obviously nailable and glueable strips of other materials may be substituted for the plywood strip provided they have equivalent strength. For instance strips of dense fiber board or of asbestos board are effective and therefore equivalent.

Other modes of applying the principle of the invention may be employed instead of these herein explained, change being made as regards the details disclosed, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A construction unit comprising wallboard supported by studding by means of a plywood strip glued to both studding and wallboard.

2. A construction unit comprising wallboard supported by studding by means of a plywood strip glued to both studding and wallboard with a water resistant glue.

3. A construction unit comprising wallboard glued to plywood strips interposed between said wallboard and supporting studding.

4. A construction unit comprising plywood wallboard glued to plywood strips interposed between said wallboard and supporting studding.

5. A construction unit comprising plywood wallboard glued with water resistant casein glue

to plywood strips interposed between said plywood wallboard and supporting studding.

6. As a construction unit, a wall covering composed of panels united by glued plywood-reinforced butt-joints spliced on the non-exposed side to form a single reinforced-joint sheet, said sheet being attached to the supports.

7. As a construction unit, a wall covering composed of panels united by glued butt-joints spliced on the non-exposed side to form a single sheet, said sheet being attached to the supports by metallic fastening means.

8. A construction unit comprising wallboard glued to plywood strips interposed between said wallboard and supporting studding, all of the panel joints being located on said strips.

9. As a construction unit a wall support comprising means for a glued joint to hold wallboard, said means including a plywood strip with a stud carrying the same.

10. As a construction unit a wall support comprising means for a glued joint to hold wallboard, said means including a plywood strip with a metal stud carrying the same.

11. As a construction unit a unit wall section comprising panel surfaced walls, the individual panels composing each wall being joined to each other by glue attached plywood strips themselves attached to supporting studding, said sections being adapted for attachment by adhesive means to similar sections to form a continuous wall.

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