

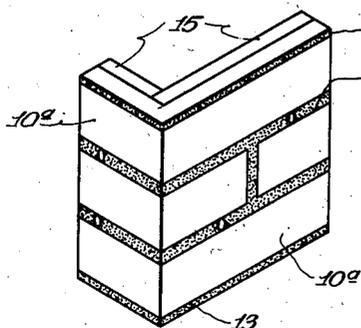
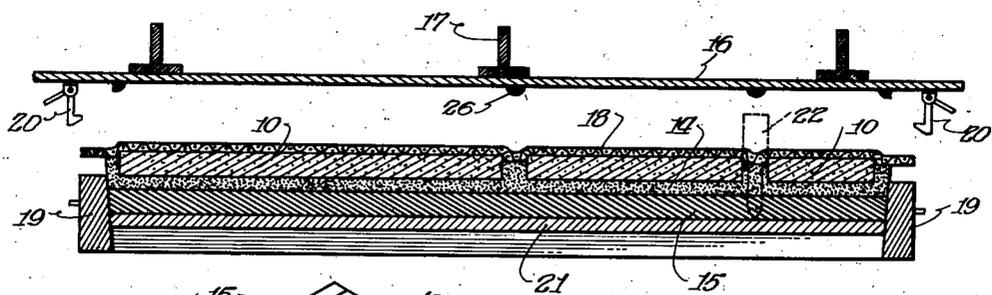
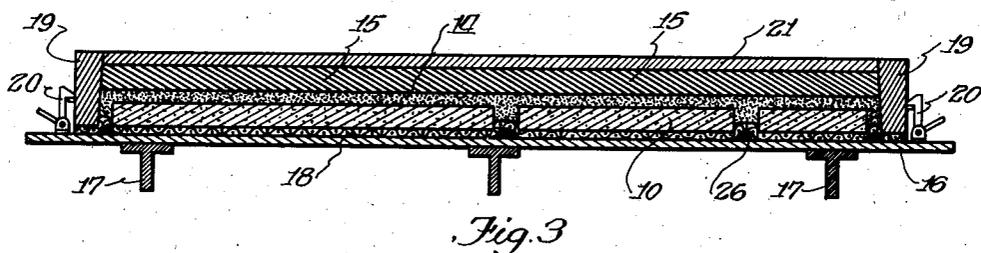
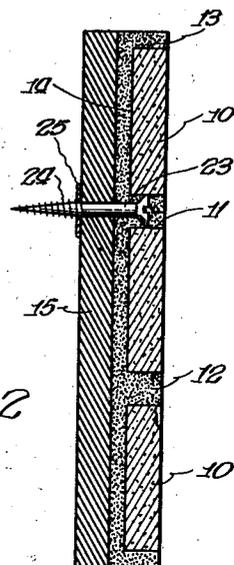
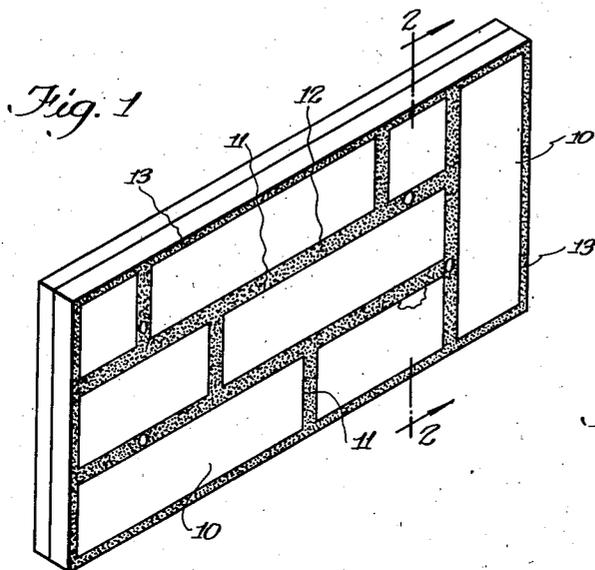
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METHOD OF MAKING BUILDING PANELS

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METHOD OF MAKING BUILDING PANELS

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7 Claims. (Cl. 18—59)

My invention relates to building panels having veneer-like facing members of such materials as stone, brick and the like, the joints between which comprise a suitable cementitious material, and more particularly to the method of making such panels.

Buildings having an exterior finish of brick or stone have long been considered more pleasing in appearance and more durable and satisfactory in use than buildings having other types of exterior construction. However, the brick and stone have been laid individually by hand and the building of a wall having a veneer of such materials necessarily proceeds slowly and is costly. The insulating values of brick and stone are negligible. Moreover, the thickness of such a veneer, usually four inches or more, adds greatly to the weight of the building and requires correspondingly heavy foundations to carry the increase in load. Some attempts have been made to provide building panels having thin brick-like facing members set in mortar, but such substitutes have been unsatisfactory for various reasons. It has been difficult to transport or ship the panels without breakage. The panels have been hard to handle or install on the job. The appearance of the finished wall comprising the panels has not been uniform or satisfactory. The insulating value of the panels has been quite low.

It is an object of my invention to provide an improved and practical building panel of the type mentioned which will be inexpensive to produce, light in weight, easily transported without likelihood of being broken or damaged in transit, easy and quick to install on the job, have well defined mortar joints between the facing members and therefore present a highly pleasing appearance in the finished wall, and which will offer substantial hindrance to the passage of heat and cold.

My invention contemplates the use of facing members of brick, stone, tile and the like, only about one-half inch or less in thickness, and it is an object of my invention to bond by the use of a suitable cementitious material such facing members to each other and to a body of lightweight insulating material, preferably of a fibrous character.

In the manufacture of panels of this type, no satisfactory method has been found heretofore which will permit the use of a cementitious material in the joints between the facing members. It has not been possible to confine the slurry of cementitious material to the joint spaces. In-

variably some of the wet mortar has always escaped and become smeared over the exterior surfaces of the facing members thus presenting an unsightly appearance. This condition is very pronounced when the exterior surfaces of the facing members are rough as is the case when chips of stone or brick material of a rough texture are used. A further object of my invention is to provide an improved and easily practiced method of making my novel and improved panels by which the flow of wet cementitious joint filling material will be controlled and will be confined closely to the boundaries of the spaces between the edges of the facing members.

The invention consists in the novel constructions and arrangements to be hereinafter described and claimed for carrying out the above stated objects and such other objects as will appear from the following specification, and it consists further in the improved method of making building panels to be hereinafter described and claimed.

The invention is illustrated in certain preferred embodiments in the accompanying drawing, wherein:

Fig. 1 is a perspective view of a building panel embodying the principles of my invention;

Fig. 2 is a transverse sectional view on an enlarged scale taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view of suitable mold apparatus in panel forming position by which my improved method of making my improved panel may be practiced;

Fig. 4 is a sectional view of the mold apparatus in inverted position with certain of the parts separated from the remaining parts; and

Fig. 5 is a perspective view of a panel embodying the principles of my invention suitable for use at the corners of a building.

Like characters of reference designate like parts in the several views.

The panels illustrated in the drawing comprise a plurality of facing members 10 which may be of any suitable material such as stone, brick, tile and the like. The facing members may be of any desired thickness, those illustrated in the drawing being approximately one-half inch. The facing members are uniformly spaced edgewise with respect to each other at 11 to provide spaces for the joint filling material which is shown in said spaces at 12. The joint filling material also surrounds the outer edges of the facing members a distance of about one-fourth inch as shown in the drawing at 13. Preferably the cementitious material is spread

in a continuous layer 14 over the rear surfaces of the facing members. The mortar or cementitious material may be of any suitable composition. I have had satisfactory results by the use of ingredients in kind and quantity as follows: quick-setting Portland cement, 1 part,—a finely granulated light-weight aggregate such as furnace slag, 3 parts,—powdered glue, waterproof after setting, one-eighth part,—and sufficient water to make a slurry of a thick, creamy consistency. Coloring matter of any desired shade may be added to the mix. Such a mortar flows readily into the spaces between and around the facing members, is easily spread over the backs of the facing members, sets quickly and provides weather-tight joints between the edges of the facing members. A body of insulating material 15 is preferably applied over the layer 14 of cementitious material while the latter is in a wet or plastic state, the cementitious material serving effectively to bond the facing members to each other and to the backing member 15. The member 15 may be of any desired thickness and of any suitable material such as a precast body of cellular gypsum or cellular cement, but I prefer to use a material of a fibrous nature such as Celotex, pressed wood pulp or the like.

I have found that my improved panels may be manufactured economically by the use of a mold apparatus such as that illustrated in Figs. 3 and 4. In preparing to make the panels, I use a flat supporting surface which may be in the form of a sheet of metal 16 welded to and supported by a plurality of T-irons 17. The member 16 is positioned as shown in Fig. 3 with the T-irons resting on a table, bench or other suitable support. A cushioning member 18 is spread over the sheet 16. A rectangular frame comprising mold members 19 are placed on edge on the marginal portions of the cushioning member 18 as shown in Fig. 3, the mold members 19 preferably being locked to the support 16 by spring-pressed fastening members 20 pivotally carried by the plate 16. Within the area defined by the mold members 19 the facing members 10 are positioned with their exterior or front surfaces in contact with the cushioning means 18. The facing members 10 are preferably spaced edgewise uniformly apart about one-half inch and have their outer edges spaced about one-fourth inch from the inner faces of the mold members 19. The wet cementitious material is then poured in place into the spaces between the adjacent edges of the facing members and in the spaces between the outer edges of the facing members and the mold members onto the cushioning means 18 which forms the bottoms of said spaces. The cementitious material is spread by screeding or trowelling it into a layer 14 over the rear surfaces of the facing members 10. The body of insulating material 15 is then applied and pressed down into firm contact with the layer 14 of the wet cementitious material. A pallet 21 of plywood or the like is preferably placed over the insulating material as shown in Fig. 3. The mold apparatus and the panel formed as described within it are then turned upsidedown into the position shown in Fig. 4, the pallet 21 being placed on any suitable elevated support (not shown). As soon as the joint material has set sufficiently to hold its shape the fastening members 20 are operated to release the mold members from the plate 16. The inner sides of the mold members 19 are preferably inclined slightly as shown in the draw-

ing so that they will separate freely from the outer edges of the panel when the fastening members 20 are released. The plate 16 is lifted clear of the panel underneath and the cushioning member 18 is stripped from the facing members 10 and the joint material between and around the members. By means of a suitable punch 22 shown in dotted lines in Fig. 4, openings 23 for the reception of fastening members such as screws 24 may be easily formed in the self-sustaining but plastic joint material and the fibrous insulating material therebelow. The panel is permitted to harden and dry on the pallet 21 after which it is ready for use.

When the parts are arranged as shown in Fig. 3, the lower edges of the mold members 19 and the lower or exterior surfaces of the facing members 10 seat themselves well within the cushioning member 18. I have had highly satisfactory results by the use of cushioning means in sheet-like form of fabrics such as Turkish towels, linen towels and pieces of cotton flannel. Such fabrics are substantially impervious to cementitious material when in an unset or pourable condition. When the cushioning means comprises terry cloth of which Turkish towels are commonly made, the mold members and the facing members bear down into the nap to such an extent that the spaces between adjacent edges of the facing members and between the outer edges of the facing members and the mold members are well defined, with the result that the wet cementitious material is not permitted to escape from said spaces but is controlled in and confined to the boundaries of such spaces even when the exterior surfaces of the facing members are quite rough or uneven. Fabrics of the type mentioned are moisture-absorbent with the result that those portions of the wet cementitious material which make contact with the cushioning means set very rapidly which further aids in confining the joint material to the spaces provided therefor. By the practice of my improved method, the joint material does not get out of control and it does not get onto the exterior surfaces of the facing members 10 to smear or otherwise detract from the appearance of the panels.

The corner panel shown in Fig. 5 is formed substantially in the same manner as the straight panels heretofore described by the use of facing members 10a of angle shape. The long web of the corner panel is first made in a mold of appropriate size and then the short web of the panel is placed in a mold of a size to fit it and that web is completed.

Panels made in accordance with my invention are light in weight, a panel 8" wide, 16" long and 1¼" thick weighing but little more than a single brick of the usual dimensions. The panels, therefore, are easy to handle. When the backing of insulation material is of a fibrous nature the panels may be stacked on top of each other, the insulating material serving to cushion the hard facing members of one panel from those on another. The panels may be easily installed against the sheathing of a wall by inserting the screws 24 into the openings therefor and driving them into the sheathing. The work of installation proceeds rapidly as a panel of the size mentioned covers approximately the same area as would be covered by the use of six or seven bricks of ordinary size. Preferably a patch 25 of material in the form of a suitable mastic is applied to the back of the in-

sulating body 15 around the screw openings to provide a seal against moisture. The mastic may also be applied to the edges of the panels to provide a weatherproof seal between adjacent panels. The panels may be made in one-half, one-fourth or other smaller sizes to permit them to be fitted around door and window openings, or they may be cut or sawed to size on the job to fit around such openings. A wall of panels made in accordance with my invention presents a pleasing effect. The width of the joints between the outer edges of the facing members of one panel and the outer edges of the adjacent facing members of the adjacent panels are approximately equal to the width of the joints between adjacent facing members of any one panel, thereby enhancing the uniform appearance of the finished wall. The heads of the screws 24 are preferably covered by a patch of the joint material so that in the finished wall the fastening screws do not appear.

If desired, the joint of my improved panels may be of the raked, curved or V-type. If a joint of that type is desired, I attach strips 26 of the desired cross section to the supporting plate 16. The strips 26 are preferably made of metal and may be secured to the supporting plate 16 by spot-welding or the use of rivets. In Fig. 3 I have shown strips 26 of a cross section suitable for making joints having their outer surfaces curved. The cushioning means 18 in such case is positioned over the strips 26 with the result that the raised portions of the cushioning means forms the bottoms of the respective spaces in which the joint material is poured.

While I have illustrated in detail and have specifically described certain preferred constructions, it is to be understood that such has been done merely for the purpose of illustrating the principles of the invention. I do not intend, therefore, to limit my invention to the details of construction shown and described, except only in so far as certain of the appended claims are specifically so limited, as it will be obvious that modifications may be made without departing from the principles of the invention.

I claim:

1. In the herein described method of making a building panel having veneer-like facing members separated edgewise by joint material confined closely to the adjacent edges of the members, those steps which comprise placing on a flat support a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, positioning the facing members with their exterior or front faces downward on said cushioning means and spaced edgewise from each other, pouring a cementitious material into the edge spaces between said facing members and onto those portions of the cushioning means forming the bottoms of said spaces, and after the cementitious material has hardened sufficiently to retain its shape and while the facing members are in a common plane stripping said sheet from the panel thus formed, whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

2. In the herein described method of making a building panel having veneer-like facing members separated edgewise by joint material confined closely to the adjacent edges of the members, those steps which comprise placing on a

flat support a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, positioning the facing members with their exterior or front faces downward on said cushioning means and spaced edgewise from each other, pouring and spreading a cementitious material into the edge spaces between said facing members and onto those portions of the cushioning means forming the bottoms of said spaces and over the rear surfaces of the facing members, applying a body of backing material to said cementitious material while the latter is in a bondable condition, and after the cementitious material has hardened sufficiently to retain its shape and while the facing members are in a common plane stripping said sheet from the panel thus formed whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

3. In the herein described method of making a building panel having veneer-like facing members separated edgewise by joint material confined closely to the adjacent edges of the members, those steps which comprise placing on a flat support a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, positioning the facing members with their exterior or front faces downward on said cushioning means and spaced edgewise substantially uniformly from each other, surrounding the facing members with mold members spaced from the respective adjacent edges of the facing members a distance approximately one-half the width of the spaces between the facing members, pouring a cementitious material into the edge spaces between said facing members and the edge spaces between said mold members and said facing members and onto those portions of the cushioning means forming the bottoms of said spaces, and after the cementitious material has hardened sufficiently to retain its shape and while the facing members are in a common plane stripping said sheet from the panel thus formed whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

4. In the herein described method of making a building panel having veneer-like facing members separated edgewise by joint material confined closely to the adjacent edges of the members, those steps which comprise placing on a flat support a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, positioning the facing members with their exterior or front faces downward on said cushioning means and spaced edgewise substantially uniformly from each other, surrounding the facing members with mold members spaced from the respective adjacent edges of the facing members a distance approximately one-half the width of the spaces between the facing members, pouring and spreading a cementitious material into the edge spaces between said facing members and the edge spaces between said mold members and said facing members and onto those portions of the cushioning means forming the bottoms of said spaces and over the rear surfaces of the facing members, applying a backing sheet to said cementitious material while the latter is in a bondable condi-

tion, and after the cementitious material has hardened sufficiently to retain its shape and while the facing members are in a common plane stripping said cushioning sheet from the panel thus formed whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

5. In the herein described method of making a building panel having veneer-like facing members separated edgewise by joint material confined closely to the adjacent edges of the members, those steps which comprise placing on a flat support a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, placing on said cushioning means side and end mold members on edge to provide a confined area, positioning the facing members in said confined area with their exterior or front faces downward on said cushioning means and spaced edgewise from each other and from said mold members, pouring and spreading a cementitious material into the edge spaces between said facing members and the edge spaces between said mold members and said facing members and onto those portions of the cushioning means forming the bottoms of said spaces and over the rear surfaces of the facing members, applying a backing sheet to said cementitious material while the latter is in a bondable condition, turning upsidedown the panel thus formed and its supporting parts, removing the mold members and the support, and then stripping the cushioning means from said facing members and the cementitious material therearound while the facing members are in a common plane, whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

6. In the herein described method of making a building panel having veneer-like facing members separated edgewise by material providing joints of the rake, curved or V-type, those steps which comprise providing on a flat support strips which in cross section are like the recessed portion of the type of joint desired, placing over the support and said strips a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, arranging fac-

ing members with their exterior or front faces downward on said cushioning means of sizes corresponding to the respective areas between the raised portions formed by said strips, pouring a cementitious material into the edge spaces between said facing members and onto those portions of the cushioning means raised by said strips and forming the bottoms of said spaces, and after the cementitious material has hardened sufficiently to retain its shape and while the facing members are in a common plane stripping said sheet from the panel thus formed, whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

7. In the herein described method of making a building panel having veneer-like facing members separated edgewise by material providing joints of the rake, curved or V-type, those steps which comprise providing on a flat support strips which in cross section are like the recessed portions of the type of joint desired, placing over the support and said strips a sheet of cushioning means substantially yieldable under the facing members and substantially impervious to a pourable cementitious material, providing on said cushioning means side and end mold members on edge to provide a confined area, arranging facing members with their exterior or front faces downward on said cushioning means of sizes corresponding to the respective areas between the raised portions formed by said strips, pouring and spreading a cementitious material into the edge spaces between said facing members and onto those portions of the cushioning means raised by said strips and forming the bottoms of said spaces and over the rear surfaces of the facing members, applying a backing material to said cementitious material while the latter is in a bondable condition, turning upsidedown the panel thus formed and its supporting parts, removing the mold members and the support, and then stripping the cushioning means from said facing members and the cementitious material therebetween while the facing members are in a common plane, whereby the pourable cementitious material is prevented from getting onto the front faces of the veneer-like members of the panel.

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