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Kelsey

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[54] **PRECAST PANELS WITH CORNER-DIVIDER PROJECTIONS**

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Related U.S. Application Data

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[52] **U.S. Cl.** **52/259;** 52/315; 52/316; 52/610; 52/611

[51] **Int. Cl.²**.. **E04F 13/14;** B44F 7/00; B44F 11/06

[58] **Field of Search** 52/602, 284, 316, 259, 52/314, 274, 315, 609–611

[56] **References Cited**

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3,359,696	12/1967	Snaith	52/314
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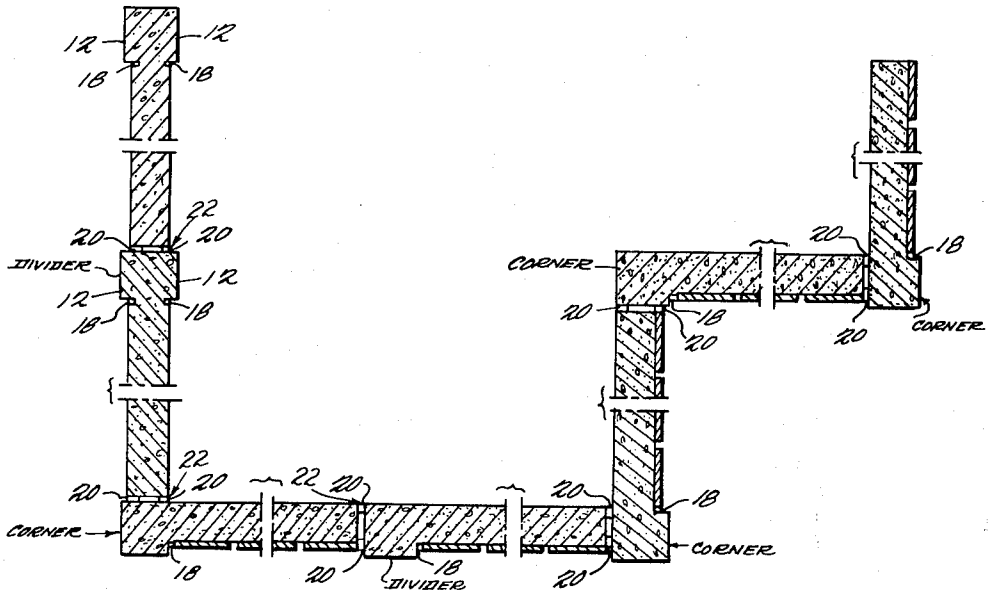
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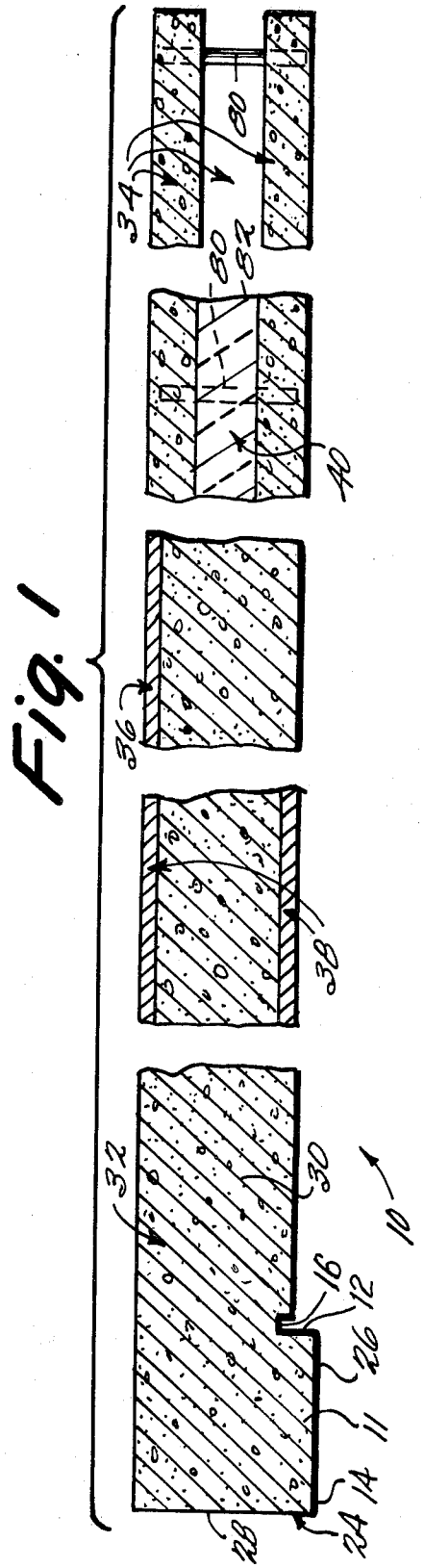
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[57] **ABSTRACT**

There is disclosed a system of joining precast panels having an increased-thickness portion at one end of each panel, bordered by a slot for receiving caulking or the like to replicate the actual caulked joint deposed at the opposite border of the increased thickness portion of each panel. The system preferably provides smooth, unbroken interior walls, even at corners, and may be used to panel lengths up to forty feet or more. The disclosure also discloses means for making the panels, including apparatus for making differently-colored corner-dividers.

8 Claims, 3 Drawing Figures




Fig. 1
34
80
82
40
36
38
32
30
10
16
12
26
11
24
14
28

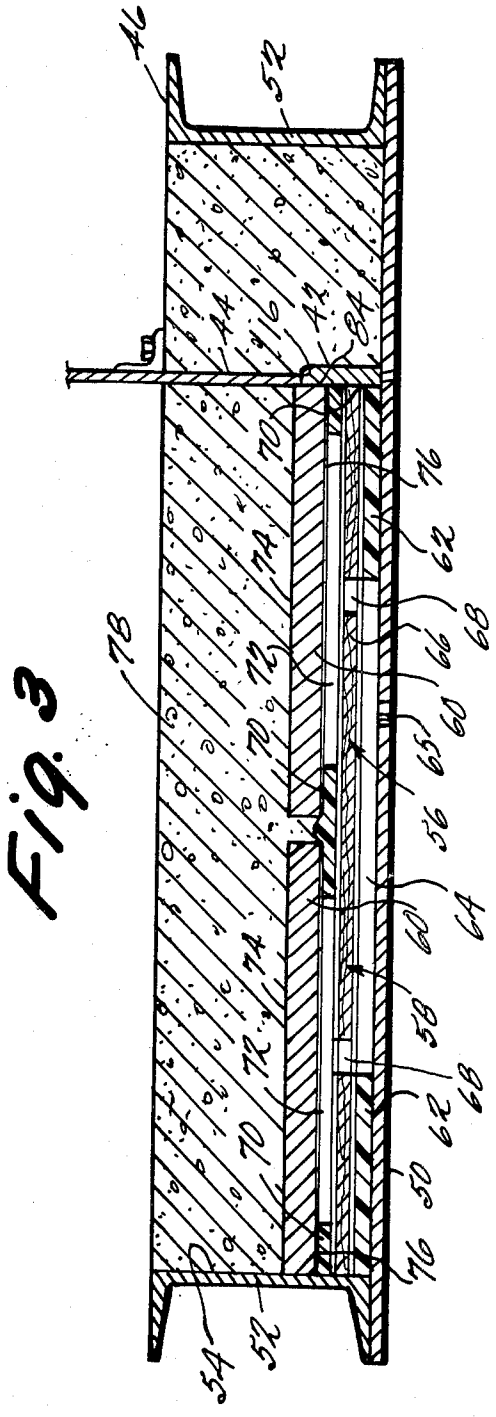
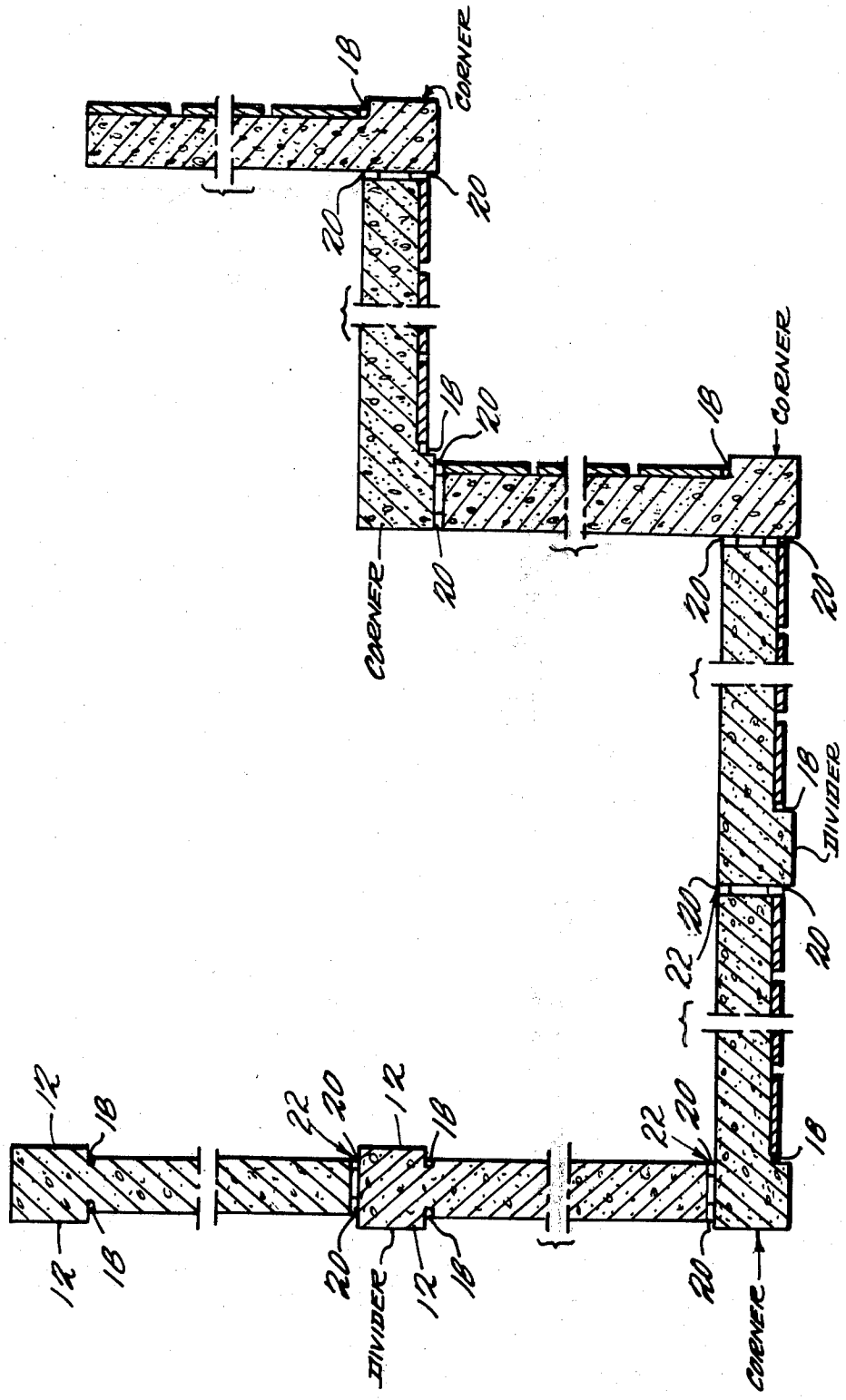

Fig. 3
46
52
44
42
84
70
76
74
62
78
72
66
68
60
65
56
64
58
50
54

Fig. 2


18
CORNER
20
20
18
20
18
CORNER
CORNER
20
20
20
18
DIVIDER
22
20
20
12
18
22
20
12
18
22
20
18
12
18
20
DIVIDER
12
18
20
CORNER

PRECAST PANELS WITH CORNER-DIVIDER PROJECTIONS

This is a division of application Ser. No. **379,313** filed July **16, 1973.**

BACKGROUND OF THE INVENTION

The present inventor has been active for some years in the field of devising ways and means of producing and assembling faced and unfaced precast panels, for instance, those made largely of concrete faced with slabs which are thinner than brick but made of the same material as brick. These have become known as brick slab faced panels. Pertinent among his prior U.S. patents and applications in this field are:

Patent No.	Issue Date	Title
3,694,533	September 26, 1972	Slab-Faced and Headed Panels including Corners or Returns
3,853,976	December 10, 1974	Method and Apparatus for Casting Slab-Faced Panels
3,738,880	November 20, 1973	Method for Making Faced Brick Slabs
3,751,201	August 7, 1973	Method and Apparatus for Casting Slab-Faced Panels
Application No.	Filing Date	Title
49,149	June 23, 1970 (now abandoned)	Bottom-Poured Slab-Faced Panel Casting System
324,302	January 17, 1973 (now abandoned)	Full Cavity Cast Panel

During a search which preceded the preparation of this document, the applicant became knowledgeable of the following prior art:

950,401	Peckham	Feb. 22, 1910
2,102,443	Thorn	Dec. 14, 1937
2,594,928	Horowitz	Apr. 29, 1952
2,270,846	Hines	Jan. 27, 1942
3,352,073	Hipple	Nov. 14, 1967
3,605,353	Marcott	Sept. 20, 1971

These patents, however, neither individually nor collectively suggest the substance of the present invention:

1. Marcott doesn't even offer a "Corner Unit", he has to have two or three separate designs to enclose any given area.
2. Peckham merely discloses corner or window and door projecting units — grooved to take reinforcing steel.
3. Hipples panels apparently all have posts on both ends, projecting posts. When these posts butt each other their projecting exterior is covered with a special metal sheet. When Hipple comes to a corner, his corners just touch each other, a square post element is then fitted in place and then built up projecting corner is covered with a preformed metal slim.
4. Thorn has a system of uniting precast units by bonding them together with bonding material once they are in position, up against a special precast stud, etc. No precast panels with projecting ends are shown or mentioned.
5. Hines has a system wherein precast panels have interior flanges on one end and means of mechanically bolting said panels together. No projecting corners or dividers are shown or mentioned.
6. Horowitz shows projecting corners and dividers but they are special separate units which would, as shown, be extremely difficult to provide a waterproof expansion joint for.

The foregoing is illustrative that the prior art commented on was seeking different ends in different ways with different means than the present inventor.

Load bearing and non load bearing precast concrete panels have for the last 25 years been capturing an ever increasing share of exterior and interior walls of buildings the world over—displacing hand laid bricks, tile, concrete blocks and/or on site formed and poured concrete walls. As could only be expected, numerous systems have been devised to decorate the exposed faces of said pre-cast panels with a wide variety of pleasing to the eye and weather proof materials such as full width brick, thin slab brick, glazed tile, both bathroom and structural, quarry tile, slate, and the like. One of the major reasons why none of the precast panel facing systems in use to date, has taken hold and become popular, is that none have provided a practical attractive corner unit, equivalent for instance to hand laid bricks, where alternate header and stretcher faces are exposed on either side of the corner line or a simple and foolproof way to attractively joint adjacent faced panels to each other — a problem, of course, that does not exist with hand laid bricks, tile and the like.

As disclosed in the present inventor's U.S. Pat. No. 3,694,533, issued Sept. 26, 1972, he has discovered how to face precast corner panels and duplicate any facing pattern that can be executed by hand. Single or double face corners can be economically provided with ease, but unless one extension of the corner unit is less than 8, 10 or 12 foot long, depending on local maximum truck trailer load width restrictions, it cannot be delivered to the job site. Equal short armed corner panels can be made with greater ease, but the vertical jointing lines that are created when adjacent panels are put in place can and are most often objectionable.

Since most states in the U.S. limit semitrailer lengths to 40 feet, that 40 feet has become the general maximum dimension of precast panels that are offered by the precast panel manufacturers here. Buildings have a greater than 40 foot frontages or heights, therefore, have to use more that one panel and the ensuing joints between panels can become a real appearance problem, a problem that simply does not exist when brick, tile and the like are hand laid and can be laid without interruption from corner to corner or bottom to top of any wall exposure regardless of its dimensions and in any pattern.

While most of the precast concrete panels made to date, in this country, have been non-load-bearing and have actually been bolted on to steel structures as exterior facings, mostly limited to duplicate units containing one or more window openings, there is every reason to believe that in the future most precast panels will be load bearing as they generally are today in the Russian Soviet Socialist Republic, in Eastern Europe and in a high percentage of Western Europe. Also, there is every reason to believe that a sizable percentage of individual residential structures of the future will have their exterior walls made of maintenance-free load-bearing, decorated, precast panels.

SUMMARY OF THE INVENTION

There is disclosed a system of joining precast panels having a increased-thickness portion at one end of each panel, bordered by a slot for receiving caulking or the like to replicate the actual caulked joint deposed at the opposite border of the increased thickness portion of each panel. The system preferably provides a smooth, unbroken interior wall, even at corners, and may be used to panel lengths up to 40 feet or more. The disclosure also discloses means for making the panels, including apparatus for making differently-colored corner-dividers.

To meet the present and future need of a simple and economical system to provide attractive corner and junctions for precast panels in general, and especially for such panels when they are faced on one or both sides with decorative materials, the present invention provides a universal projecting corner-divider panel extension. This universal integral extension automatically makes one end or side of every panel that incorporates it, when used with like panels, an individual decorative unit and one which has one end that serves as either a projecting full-wrap-around corner or a full projecting spacer between adjacent precast panels, make "Special corner units" which are more difficult to manufacture, transport and install, unneeded anymore. The problems of mating adjacent decorated panels just don't exist; each panel is a complete unit, having its decorated face framed between eye appealing, projecting plain or decorated dividers.

The principles of the invention will be further hereinafter discussed with reference to the drawings wherein preferred embodiments are shown. The specifics illustrated in the drawings are intended to exemplify, rather than limit, aspects of the invention as defined in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings

FIG. **1** is a transverse, horizontal sectional view through a panel produced in accordance with the present invention;

FIG. **2** is a similar sectional view, on a reduced scale of a building wall constructed using panels produced in accordance with the present invention; and

FIG. **3** is a longitudinal, vertical sectional view of a horizontal casting box for producing one-side-faced panels, as an illustration of the fabrication of types of panels produced in accordance with the present invention.

Unless otherwise indicated, the dimensions given herein are of the preferred embodiments as a means for more rapidly conveying the concepts under consideration. The number of bricks shown in a course exemplifies larger numbers also.

DETAILED DESCRIPTION OF THE MOST PREFERRED EMBODIMENTS

FIG. **1** shows an unfaced precast concrete panel **10** with a 1 inch projecting universal corner or divider **11** incorporated on one end **14.** The ⅜ × ½ inch deep slot **16** next to the projection **12** is to provide a cavity for a duplicate fill **18** (FIG. **2**), to exactly match the color and texture of the actual elastic joint filling **20** (FIG. **2**) that will be used to seal the actual joint **22,** e.g., on the other side **24** of the projection **12,** whether it be a "corner" (legend, FIG. **2**) or "divider" (legend, FIG. **2**) installation. Field and factory joints are rarely matchable in color even when the same formula is used; age makes the difference, like trying to touch-up paint on a used car. When the materials are radically different, plastic vs. a mortar, there is no hope of attaining a completely unobjectionable match.

The relative dimensions of the projection **12,** shown in FIG. **1,** is not invariable, but is believed by the inventor to offer an eye-pleasing wall and it can be made with the present inventor's vacuum Holding And Sealing System U.S. Pat. No. 3,853,976, issued Dec. 10, **1974,** when the panel is to be faced, about which more is written below.

The seven inch projecting front **26** and end **28** width is the thickness of the panel (at **30**), 6 inches in this case, plus the 1 inch projection **12.** This relationship for ease in manufacturing is generally fixed — thickness of the panel plus the projection or projections.

In FIG. **1,** the panel **10** is shown as being solid, e.g., concrete as at **32,** cored (hollow) as at **34,** faced on one side as at **36** or on both sides as at **38,** or including a core of insulating material **40,** as it normally would, alternatives that would not affect the simplicity of design of the universal projecting corner-divider **10.**

One of the possible variations in this application is that when the projection **12** is to be used as a divider, (see legend, FIG. **2**), it is a very easy matter to have the projection **12** poured with a different colored concrete than is the basic panel, i.e., the remainder. The narrow strip **42** (FIG. **3**) that forms the cavity **16** for the matching simulated joint **18** acts as a separator for the two different colors in this situation. When the projection **12** is to be used as a corner (legend, FIG. **2**) the color can still be changed by installing a temporary extension **44** (FIG. **3**) of the "cavity" strip **42** on the casting box **46** as shown in FIG. **3** to separate the different color pour just long enough to accomplish the desired ends.

These options can produce very pleasing and striking effects that are built-in and permanent, not requiring initial decorating or redecorating at rather frequent future intervals.

The panels **10** different configurations are easy to produce with slightly modified versions of the horizontal vacuum sealing and holding system disclosed in my aforementioned application. FIG. **3** shows a preferred panel mold box **46,** set up to make faced or unfaced solid panels or those with a core of insulating material.

There are buildings, warehouses, garages, factories, and the like, where unfaced precast panels would give a more pleasing exterior and interiors if like or similar projections **12** extended from both sides at the same one end of the panel. Such panels faced on one or both sides can also be made using the teachings above. Such panels could easily be made in a comparably modified "book" casting box such as based on the one shown in FIG. **8** of my earlier U.S. Pat. No. 3,853,976 issued Dec. 10, 1974. These panels can in the same way as the one of FIG. **1** incorporate an insulating core. The dual projections **12** on these panels could be cast of a different colored concrete than the main surfaces just as described in relation to the panels of FIG. **1.**

While panels are shown in FIGS. **1–3** to have their maximum dimension horizontally, many installations will have the maximum truckable dimension vertically extending. Warehouse walls, for instance, are rarely less than 18 feet high and are often quite higher. Apart-

ment houses, office buildings, schools, etc. are today being faced with multi-story high vertical precast panels. The universal corner-dividers **10** are believed to have equal utility in uses where their vertical dimension is greater than their length from end-to-end.

The universal corner-dividers **10** offer an especially attractive and most flexible tool to adapt precast concrete panels to home construction. Architects can crenellate house walls to their heart's content and not have to give greatly in price for "extras" to do it, nor have the horrible, clumsy, unfinished "butt corners" now being offered by a minority of pre-casters of full brick panels.

Probably the main reason that factory made precast panels, faced or unfaced, have not even been much more widely used, in this as well as other countries, is that to date, practically every job has been an individual custom creation. Architects have racked their brains to design monuments to themselves. The precasters have not only been faced with increasingly difficult castings to successfully cast, but they have had to start practically from scratch on every job with whole new outlays for very, very, expensive casting boxes, production equipment that is discarded as soon as each building is completed. Not one precaster in our country, to the inventor's knowledge, even offers a simple panel system much less makes regular production runs of same or inventories a reasonable stock. If builders has to wait for an architect to design special brick sizes and shapes for every job or special concrete block sizes and shapes for every job, the cost of both items would become prohibitively expensive, and slow to get delivery on.

The system described herein offers the precasters the first real breakthrough in design that will permit them to most economically produce and inventory for immediate shipment, standardized panels that every architect and builder can utilize, panels that offer low, low installed costs, unlimited life and pleasing to the eye simple elegance. Panels that can be "customized" through the facing materials used and different colored concrete facings, "customizing" that means slight delivery delays but adds very little to the precasters costs can be more widely offered. However, tongues and grooves could be provided on opposite ends of the panels, on the projection fronts **26,** and/or on the top and bottom edges of the panels, were one to wish to, with the teachings provided and referred to herein, without departing at all from the present invention.

The casting box **46** is shown having a flat floor **50** which peripherally mount sidewalls **52,** upstanding from thereupon and arranged with respect to one another to enclose a rectangular space **54.** A divider strip **42** extends up part way through the space **54,** extending between the two (unshown ones) of the sidewalls **52** that form what will be the upper and lower edges of the panels. The strip **42** is closer to one end wall **52** of the casting box than to the other, corresponding to the relative horizontal size of the projected and remaining parts of the face of the panels.

A body (broadly indicated by the numeral **56**) fills the lower portion of the space **54** on the side of the strip **42** where the non-projected, remaining portion of the panel **10** is to be made. In the instance depicted, where the panel to be made is to be faced on one side, the body **56** is shown being constituted by a vacuum plate insert **58,** as described in the inventor's earlier applications and patents listed above, and by the brick slabs **60** shown sealed and seated thereon in a coursing array.

(The vacuum plate insert **58** comprises a lower layer of resilient material **62** such as closed cell sponge rubber, provided with a system of interconnected passageways **64** extending therethrough, and which communicate with an opening **65** through the floor **50** of the casting box **46,** a middle layer of stiffer material like plywood **66,** provided with a set of through passages **68** which communicate with the passageway system **64** and an upper layer of resilient material **70** such as sponge rubber made as a multi-ported mask with openings **72** therethrough each corresponding to where a brick slab **60** is to be centered and seated thereagainst The sandwich **62, 66, 70** (i.e., the insert **58**) may be secured together, e.g., by adhesive or mechanical means. The insert **58** is preferably removable so it may be replaced with a smooth block or other decoratively configured mold insert of similar over-all dimensions may be used instead when the panel being made is not to be a slab-faced one. A grid with a rectangular array of individual cells for receipt of brick slabs may be temporarily installed on top of the insert **58** as described in my aforementioned U.S. Pat. No. 3,853,976, issued Dec. 10, 1974. After the slabs are emplaced, they may be sealed by pushing down on the upwardly facing backsides **74** of the slabs **60,** preferably on all slabs at once using a downward force applying seater mechanism and simultaneously beginning then continuing to draw a vacuum through the system of interconnected passageways **65, 64, 68, 72.** Then the grid may be removed, while vacuum continues to be drawn to seal the front faces **76** that will be exposed once the panel is completed and installed, so that the hardenable panel backing composition **78,** e.g., concrete, that will be filled into the box to complete the panel does not run onto and harden in necessarily slightly uneven areas of the front faces **76.** Pulling the vacuum also serves to bulge the resilient upper layer up somewhat into the open network of jointwork area among and around the perimeter of the brick slabs **60** so that the material **78** filled into the casting box to complete the panel will have a correspondingly concavely recessed, pleasing exterior surface.

During the casting of the backing material **78,** various inclusions, permanent and/or temporary, can be installed in and on the casting box, as described in my own aforementioned prior art, e.g., to provide reinforcing **80,** open spaces, an insulating core **82,** and the like.

Note now that because the vacuum plate insert **58** fits right along side the divider strip **42** and the nearest edges **84** of the adjacent brick slabs do also, and thus, the composite height of the vacuum plate insert and slabs, i.e., of the body **56,** is greater than the height of the strip **42** above the floor **50,** when the vacuum is cut off and the panel **10** is removed from the casting box after the material **78** has sufficiently hardened, the conjunction of the structural relationships just highlighted forms the groove, slot or cavity **16.**

It should now be apparent that the Precast Panels with Corner-Divider Projections as described hereinabove possesses each of the attributes set forth in the specification under the heading "Summary of the Invention" hereinbefore. Because the Precast Panels with Corner-Divider Projections of the invention can be modified to some extent without departing from the principles of the invention as they have been outlined

and explained in this specification, the present invention should be understood as encompassing all such modifications as are within the spirit and scope of the following claims.

What is claimed is:

1. A wall comprising:

two upright panels butted end to end and having a seam of joint fitting caulking material applied between them on at least one exposed side of the wall;

each panel being constituted from panel facing material and hardened panel backing composition and having at least the face thereof corresponding to said one exposed side of the wall provided with an integral piller-like projection of greater thickness than the remainder of the panel, disposed at one end of the panel and set-off from the remainder of said face by a groove running from top to bottom thereof; said groove being at least partly filled with the same joint filling caulking material as said seam.

2. The wall of claim **1,** wherein the joint filling caulking material of said seam and said groove is so similarly constituted and environmentally exposed and said groove is so shaped and filled that said seam is closely simulated by the groove and the caulking material therein.

3. The wall of claim **1,** wherein the two upright panels are aligned in a straight line.

4. The wall of claim **1,** wherein the two upright panels are set at right angles to form a corner with abutment of the remainder of one panel set back from the width dimension of the piller-like projection of the other panel to replicate the extent of this projection on both legs of the 270° side of this corner.

5. The wall of claim **1** wherein the panel facing material presents a substantial visual contrast to the hardened panel backing composition and is provided on said one face of said remainder of the panels, the projection and opposite face of the panels exposing the hardened panel backing composition in view.

6. The wall of claim **5** wherein the panel facing material is constituted by an array of brick slabs partly set into the panel backing composition and having one face of the slabs exposed to view.

7. The wall of claim **5** wherein the panel facing material and the panel backing material are made of concrete of contrasting colors.

8. The wall of claim **1** wherein the projections are wider than said remainder of each panel is thick.

* * * * *