

Nov. 7, 1967

W. K. SMITH, JR., ETAL
BUILDING STRUCTURE HAVING FACING SLABS AND REMOVABLE
SECURING MEANS THEREFOR

3,350,830

Filed May 5, 1965

3 Sheets-Sheet 1

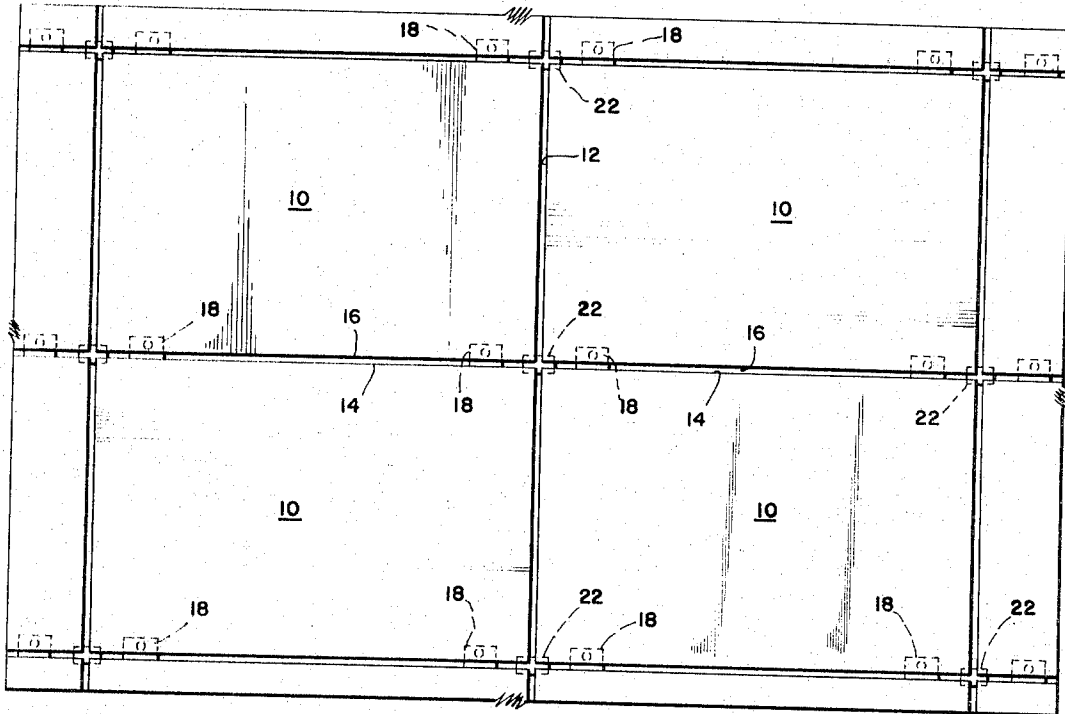


FIG. 1

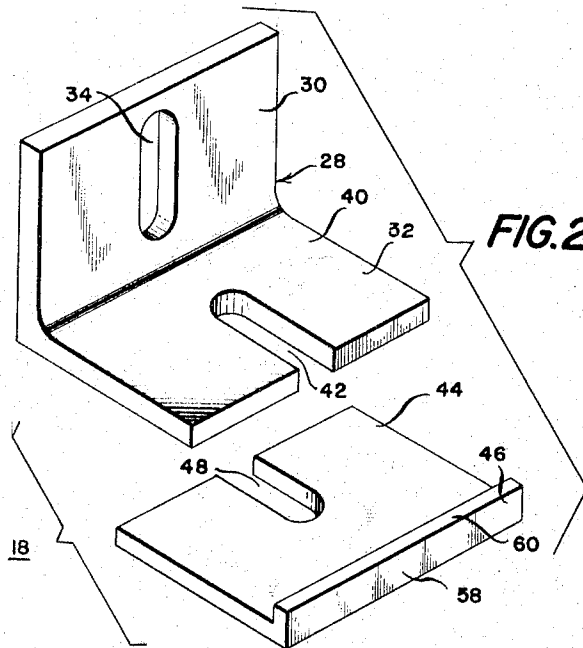


FIG. 2

INVENTORS

WALTER K. SMITH, JR.
CHARLES T. PHILLIPS

BY

Larson and Taylor

ATTORNEYS

Nov. 7, 1967

Filed May 5, 1965

W. K. SMITH, JR., ETAL
BUILDING STRUCTURE HAVING FACING SLABS AND REMOVABLE
SECURING MEANS THEREFOR

3,350,830

3 Sheets-Sheet 3

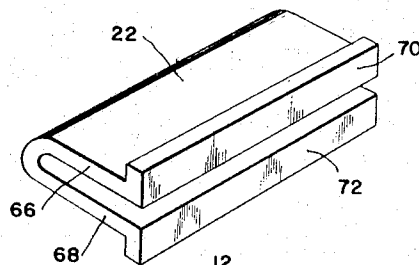


FIG. 5

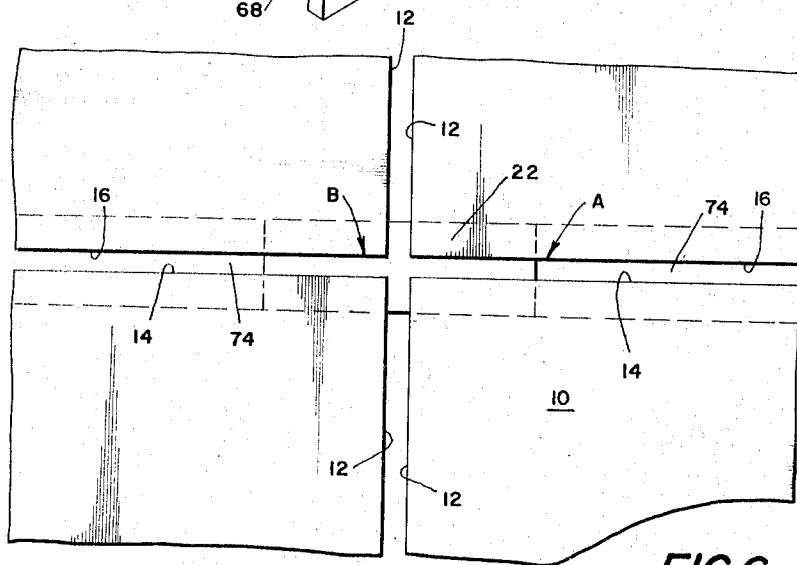


FIG. 6

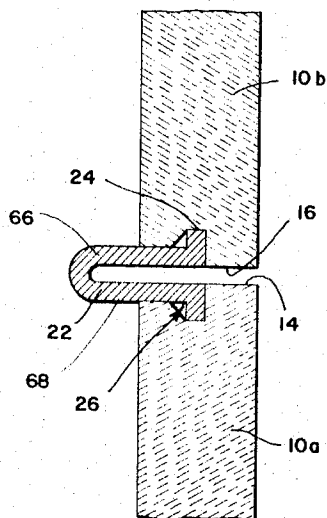


FIG. 7

INVENTORS

WALTER K. SMITH, JR.
CHARLES T. PHILLIPS

BY *Larson and Day*

ATTORNEYS

1

3,350,830

BUILDING STRUCTURE HAVING FACING SLABS AND REMOVABLE SECURING MEANS THEREFOR

Walter K. Smith, Jr., 787 Ocean Shore Blvd., Ormond Beach, Fla. 32074, and Charles T. Phillips, 1347 Continental Drive, Daytona Beach, Fla. 32017
Filed May 5, 1965, Ser. No. 453,272
10 Claims. (Cl. 52-509)

This invention relates to a building structure having facing slabs removably secured thereto, and to the means for effecting such securing. While applicable to many different types of building structures over which facing slabs are to be used, the invention is particularly useful in connection with burial crypts, mausoleums, and the like. These are usually constructed of precast concrete and faced with rectangular slabs of marble, or other stone, which are secured in spaced relation to the building structure proper. Such structures are of course generally known but difficulty has been experienced in providing such structures with a simple, convenient means which will secure the facing slabs in such relationship to the structure and in a manner as will permit ready and accurate assembly, and simple and easy removal and replacement of any individual slab without in any way disturbing the remainder.

It is a principal object of the invention to provide a structure and arrangement which overcomes these difficulties and accomplishes these aims. More explicitly, a principal object is to provide such a structure and arrangement comprised of a few simple parts, which may be easily fabricated, assembled and used; and which secure the facing slabs in position without the use of mortar, grout or the like.

A further object of the invention is to provide such a structure and arrangement in which the mounted and assembled facing slabs present an outer surface which is unbroken, flat and uninterrupted, with no element or part of the securing means protruding.

A still further object is the provision of securing means in such a structure which, through use of a simple tool such as a screw driver, can be manipulated so as to permit the removal from the front, of any one facing slab without disturbing the securing effect of the securing means for the adjacently disposed facing slabs.

The invention has for a further object the provision of securing means, the parts of which may be made of metal capable of being extruded in lengths before cutting to size, thus permitting manufacture in large quantities at a low production cost.

Still a further object resides in providing securing means which during assembly of the structure can be simply and readily adjusted, both in a vertical and horizontal direction, so as to permit accurate positioning and assembling of the facing slabs on the structure, with proper spacing of the slabs to compensate for expansion and contraction of the slabs as will occur under varying weather conditions.

Another object of the invention resides in the provision of a special securing means which, while not attached to the building structure proper, will effectively but removably secure the upper edge of each facing slab to the bottom edge of the adjacent facing slab immediately above it.

These and other objects of the invention will be more apparent from the following detailed description and claims when read in conjunction with the accompanying drawings, in which:

FIGURE 1 is a front elevational view of a building facing embodying the invention;

2

FIGURE 2 is an exploded perspective view of one of the bracket hangers, forming a part of the invention;

FIGURE 3 is a vertical section taken through the structure at the location of one of the bracket hangers;

FIGURE 4 is a top plan view of one of the bracket hangers in operative position;

FIGURE 5 is a perspective view of one of the drive members forming a part of the invention;

FIGURE 6 is a partial front elevational view showing the operative position of a drive member, and

FIGURE 7 is a vertical cross section showing a drive member in operative position.

The invention will now be described in detail as used, for example, in securing square or rectangular facings of marble or the like to a building structure of precast concrete or the like. Since the invention has particular merit in connection with crypts provided with marble facings, such a form will be described as preferred. In such structures the facings are usually disposed in contiguous relationship in horizontal and vertical rows as illustrated in FIGURE 1 in which the facing is comprised of the rectangular marble slabs 10. These usually are about three feet long and two feet wide and about an inch in thickness. Normally the edges of these facing slabs 10 are spaced about an eighth of an inch apart. The ideal arrangement for a crypt is to provide an arrangement for securing the facing slabs in such relationship to each other and spaced slightly from the building structure proper. Moreover, the arrangement should be such that any one facing slab may be individually removed simply to permit entry to the crypt, or to permit repair or replacement of the slab. Still further, in accordance with the invention no part of any of the securing means should extend or protrude from the outer or exposed face of the facing slabs, so that at all times an absolutely smooth outer facing is provided.

The manner in which the invention effects this aim will now be described. The side edges 12 of the facing slabs are flat, but the top edges 14 and bottom edges 16 are such provided with a longitudinal groove extending the full length of the edge. These grooves are shown in the cross-sectional views, FIGS. 3 and 7. Their configuration and purpose will shortly be described in detail. Suffice it to say here that the grooves in each lower edge are formed so to receive the upwardly flanged portions of bracket hangers 18 which bracket hangers, as will be described, are secured to the vertical wall or other building structure surface 20 to which the facings are to be applied.

The upper edge of one facing and the lower edge of the next vertically disposed facing, are slightly spaced when supported by the bracket hangers 18. The opposed grooves in these two facing slabs are adapted to receive specially formed drive members 22 at the corner junction of each four contiguous facing slabs, the arrangement being such that one drive member 22 will, when in fully operative position, engage and secure all four facing slabs 10 at the corner junction. The general location of the facing slabs 10, bracket hangers 18 and drive members 22 is shown in FIG. 1. The drive members 22 are secured in position by their engagement with opposed grooves 24, 26 (FIG. 7) and when in operative position the drive members 22 thus support the upper edge 14 of each facing slab and prevent the slab from moving forwardly from the building structure. Each drive member 22, however, may be moved along in the opposed grooves 24, 26, when desired, to a position where it will still support the upper edge of one of the facing slabs 10 but not the next horizontally adjacent facing slab. When so moved, the upper edge 14 of that facing slab may be swung forwardly from the vertical plane of the remaining facing slabs and may then be lifted up and out

completely to permit repair or replacement, or access to the crypt building structure itself.

The details of the structure and positioning of the bracket hangers 18 will now be described. FIGURE 2 is an exploded perspective view of one of the bracket hangers 18. Each bracket hanger preferably is comprised of a metal L-shaped angle member 28 made up of two separate portions 30 and 32. The portion 30 is an upright backing portion adapted in operation to be secured to the building structure 20. For this purpose the backing portion 30 is provided with a vertically disposed elongated hole 34 adapted to receive a bolt 36 (FIG. 3) which in turn is threadedly secured in a metal insert 38 (FIG. 3) secured in the building structure 20. The slot and bolt arrangement permits vertical adjustment of the position of the bracket hanger 18 and thus of the facing slabs 10. Extending outwardly from the backing portion 30 at right angles thereto is a supporting portion 40 which is provided with a slot 42. The other part of the bracket hanger 18 is a rectangular supporting plate 44 having an upstanding flange 46. The supporting plate 44 is provided with a slot 48 which opposingly corresponds to the slot 42 and is aligned therewith when the supporting plate 44 is secured to the supporting portion 40.

The manner of securing the hanger brackets 18 in place is shown in FIG. 3 which is a cross-sectional view. In this figure a portion of the crypt building structure 20 is provided at predetermined locations with the metal inserts 38 each of which has a threaded bore 50 to receive the bolt 36 which passes through the elongated hole 34 in the upright portion 30 of the bracket hanger 18. The supporting plate 44 is secured to the supporting portion 40 by means of a nut and bolt 52, the bolt passing through the aligned slots 42 and 48. This arrangement permits the position of the supporting plate 44 to be adjusted so that the upstanding flange 46 on the supporting plate 44 will be in proper position to engage in the groove 26 in the lower edge 16 of the facing slab 10 and thus to space the facing slab the proper distance from the building structure 20.

The groove 26 in the lower edge of each facing slab is disposed intermediate the front and rear faces of the facing slab. As seen in FIG. 3 the groove 24 extends upwardly in the facing slab 10 a distance equal to the height of the flange 46 and the groove has a side edge 54 and an upper edge 56 corresponding to one side 58 and top edge 60 of the flange 46. Inwardly from the edge 60 of the groove 26 the facing slab is cut away to provide a bevelled surface 62 and a flat surface 64 which is parallel to the bottom edge of the facing slab and spaced upwardly therefrom a distance equal to the thickness of the supporting plate 44. It will be seen that in operative position the flat surface 64 rests on and is supported by the supporting plate 44 while the flange 46 is engaged in the groove 26 also supporting the facing slab and normally preventing it from lateral movement toward and away from the plane of facing slabs. Preferably the lower edge 16 of each facing slab will be supported by two such bracket hangers 18 as generally shown in FIG. 1.

The drive members 22 and the manner in which they support the upper edges 14 of the facing slabs in vertical position while still permitting simple removal of a facing slab will now be described, reference being had to FIGS. 1, 5 and 7. In FIG. 5, which is a perspective view of one of the drive members 22, it will be noted that the drive member is formed of a flat rectangle of a piece of metal of about one-eighth inch in thickness and bent over upon itself to give it a C-shaped cross section, the free ends 66, 68 of the member being parallel to each other and then extending laterally at right angles to form the flanges 70 and 72. Preferably, the drive member 22 is made of spring metal so that under pressure the flanges will be forced outwardly to forceably engage the opposing grooves 24, 26 in the facing slabs as shown in cross section in FIG. 7. With reference now to FIG. 7 it will be noted that the configuration of the groove 26 in the top

edge 14 of the lower facing 10a is identically complementary to that of the groove 24 in the bottom edge 16 of the upper facing slab 10b shown, one of which grooves having already been described in connection with FIG. 3. With further reference to FIG. 7 it can be seen that the upper and lower surfaces of drive member 22 are in abutting relationship with the edge 16 of upper slab 10b and the edge 14 of lower slab 10a, respectively, at a location between the grooves 24 and 26, respectively, and the left hand edges of the slabs as viewed. As best seen in FIG. 5 and FIG. 7, drive member 22 extends rearwardly from the grooves 24, 26 to a point beyond the rear or left hand face of the slabs 10a, 10b. The length of the member 22 in the direction of the grooves 24, 26 is approximately twice the distance the member 22 projects rearwardly from flanges 70, 72 thereon.

During installation of the facing slabs, one of such metal drive members 22 is inserted in the grooves of the four facing slabs at the corner juncture of all four as illustrated in FIG. 6 and also in FIG. 1. In such position, with its flanges 70 and 72 thrusting into the grooves 24, 26, the drive members 22 securely hold the facing slabs together in position and prevent the top edge 14 of each lower facing slab from moving out of the plane of the facing slabs.

When, for any reason it is necessary to remove one of the facing slabs, that slab may be removed simply by inserting a screw driver or the like in the space 74 between the slabs and push the drive member 22 along in the grooves until it is beyond the edge of the facing slab. Thus, in FIG. 6, if it be desired to remove the lower right facing 10 the tool is inserted in the space 74 at the point of arrow A and the drive member 22 is pushed and moved to the left in the grooves to a point indicated by the arrow B. The drive member 22 at the right upper corner of the facing slab (not shown in FIG. 6, but shown in FIG. 1) is similarly moved along the grooves, but to the right. The upper edge 14 of the facing slab is thus free and unsecured and may be tilted forwardly out of the plane of the facing slabs, pivoting about the edge of the flange 46. (FIG. 3) of the bracket hanger 18. It will be noted that such pivoting is facilitated by the bevel surface 62 adjacent the groove 24 (FIG. 3). The facing may then be lifted out without in any way disturbing the adjacent facing slabs.

It should now be apparent that the bracket hangers 18 and drive members 22 employed permit quick and accurate assembly of the facing slabs. Each bracket hanger is readily adjustable to permit proper positioning both vertically and horizontally during actual assembly of the facing slabs which thus can be properly aligned and spaced in the correct plane. This, on the bracket hangers is accomplished by loosening the bolts and nuts, moving the parts to the desired position, and re-tightening. As to the drive members 22, they simply need be inserted in the opposed grooves 24, 26 and then moved into securing position.

All of these securing parts are of simple design. They may be made of any suitable metal and may be casted, extruded, or otherwise formed to give them the shapes illustrated. In many instances a strong, noncorrodable spring metal is preferred. The shapes lend themselves admirably to extruding in long lengths whereupon they may be cut to appropriate size. Moreover, the parts may be manufactured of sections sufficiently heavy, or having sufficient section modulus to secure to the face of a structure slabs of any reasonable thickness and weight. The use of the invention obviously therefore is not limited to the securing of comparatively thin slabs.

The invention provides an extremely accurate and uniform jointing of the finished facing. No variation in the width of the joint is permitted which is most difficult to accomplish with other systems.

With this invention a true positioning of the slabs is effected so that the faces of all slabs are precisely in the

same plane with each slab corner neither projecting nor being recessed with relation to adjacent corners.

It should be realized, that in addition to the advantages mentioned, this invention avoids the use of springs or the like used in some prior art devices and which are positioned to bear against the rear side of the facing slabs. The invention also avoids the necessity for securing rosettes or other such means disposed the corner juncture of four facing slabs, as is common practice.

The invention is not limited to securing marble facing slabs, but obviously can be employed for securing sheets or slabs of glass, plastic metal, wood or other materials in slab or sheet form, and may be used for surfaces other than walls. Not only does it avoid the necessity for mortar, grout, or the like, but it permits proper spacings between the slabs so as to compensate for expansion and contraction, provide proper drainage, and ventilation.

Various modifications of the parts and their arrangement may be made within the scope of the invention and within the following claims:

We claim:

1. In a building structure having an upright wall and a facing thereon comprised of a plurality of rectangular slabs arranged in adjacent horizontal and vertical rows, upper and lower edges of said slabs having longitudinal grooves extending from end to end, hanger brackets secured to said wall and each having an upstanding flange engaged in the groove in the lower edge of a slab to support the slab in an upright position, and means disposed at the corner juncture of four adjacent slabs positioned to engage in the grooves in all four slabs at said juncture, said means comprising a substantially rigid member of spring metal and of C-shaped cross section, the legs of said member being parallel and greater in length than the distance between a groove and the rear face of a slab, the free ends of the legs of said member having flanges thereon engaged in the opposed grooves of all four of said facing slabs at said corner juncture.

2. A building structure, comprising an upright support, a plurality of rectangular facing slabs disposed in adjoining vertical and horizontal rows, the upper and lower edges of each of said slabs being provided with longitudinal grooves from end to end, a plurality of hanger brackets removably secured to said upright support along parallel horizontal lines spaced from each other a distance substantially equal to the distance between the grooved edges of a slab, said hanger brackets having a supporting portion extending outwardly from said upright support and having an upstanding flange engaged in the groove in the lower edge of a facing slab to support the slab in a vertical position, there being at least two such hanger brackets for each slab so supported, said hanger brackets being positioned inwardly from the side edges of the slab, and a plurality of C-shaped drive members each having outwardly extending flanges on the free ends thereof, one of said drive members being disposed at a corner juncture of four adjoining facing slabs with one of the flanges thereon engaged in the grooves in the lower edges of the two upper horizontally adjacent slabs which meet at said corner juncture, the other of said flanges on said drive member being engaged in the grooves in the upper edges of the two lower horizontally adjacent slabs which meet at said corner juncture.

3. A building structure, comprising an upright support, a plurality of rectangular facing slabs disposed in a rectangular matrix, the upper and lower edges of each of said slabs being provided with longitudinal grooves from end to end, a plurality of hanger brackets removably secured to said upright support along parallel horizontal lines spaced from each other a distance substantially equal to the distance between the grooved edges of a slab, said hanger brackets having a supporting portion extending outwardly from said upright support and having an upstanding flange engaging the groove in the lower edge of a facing slab and supporting the slab in a vertical posi-

tion, there being at least two such hanger brackets for each slab so supported, said hanger brackets being positioned inwardly from the side edges of the slab, and a plurality of C-shaped drive members each having outwardly extending flanges on the free ends thereof, one of said drive members being disposed at the corner juncture of four adjoining facing slabs with one of the flanges thereon engaged in the grooves in the lower edges of the two upper horizontally adjacent slabs which meet at said corner juncture, the other of said flanges on said drive member being engaged in the grooves in the upper edges of the two lower horizontally adjacent slabs which meet at said corner juncture, the closed end of said C-shaped members extending inwardly in the direction of said upright support, and beyond the rear face of the slabs.

4. A building structure, comprising an upright support, a plurality of rectangular facing slabs disposed in adjoining vertical and horizontal rows, the upper and lower edges of each of said slabs being provided with longitudinal grooves from end to end, a plurality of hanger brackets removably secured to said upright support along parallel horizontal lines spaced from each other a distance substantially equal to distance between the grooved edges of a slab, said hanger brackets having a supporting portion extending outwardly from said upright support and having an upstanding flange engaged in the groove in the lower edge of a facing slab and supporting the slab in a vertical position, there being at least two such hanger brackets for each slab so supported and said hanger brackets being positioned inwardly from the side edges of the slab, and a plurality of C-shaped drive members each having outwardly extending flanges on the free ends of said drive members, one of said drive members being disposed at the corner juncture of four adjoining slabs with one of the flanges thereon engaged in the grooves in lower edges of the two upper horizontally adjacent slabs which meet at said corner juncture, the other of said flanges on said drive member being engaged in the grooves in the upper edges of the two lower horizontally adjacent slabs which meet at said corner juncture, the closed end of said C-shaped members extending inwardly in the direction of said upright support, said C-shaped drive members being of spring metal biasing the free ends apart, whereby the flanges more securely engage in the respective grooves in which they are disposed in the slabs when the slabs expand and create greater pressure on said drive member.

5. A building structure, comprising an upright support, a plurality of rectangular facing slabs disposed in adjoining vertical and horizontal rows, the upper and lower edges of each of said slabs being provided with longitudinal grooves from end to end, a plurality of hanger brackets removably secured to said upright support along parallel horizontal lines spaced from each other a distance substantially equal to the distance between the grooved edges of a slab, said hanger brackets having a supporting portion extending outwardly from said upright support and having an upstanding flange engaged in the groove in the lower edge of a facing slab and to support the slab in a vertical position, there being at least two such hanger brackets for each slab so supported and said hanger brackets being positioned inwardly from the side edges of the slab, and a plurality of C-shaped drive members each having parallel legs having outwardly extending flanges on the free ends thereof, one of said drive members being disposed at the corner juncture of four adjoining slabs with one of the flanges thereon engaged in the grooves in lower edges of the two upper horizontally adjacent slabs which meet at said corner juncture, the other of said flanges on said drive member being engaged in the grooves in the upper edges of the two lower horizontally adjacent slabs which meet at said corner juncture, the closed end of said C-shaped members extending inwardly in the direction of said upright support, the area of said grooved edges rearwardly of the grooves

each having a rectangular cut-out equal in thickness to the thickness of a leg of the C-shaped drive member and adapted to receive a leg therein, whereby an unobstructed space is maintained between vertically adjacent facing slabs equal to the space between the legs of said C-shaped drive member.

6. A building structure, comprising an upright support, a plurality of rectangular facing slabs disposed in adjoining vertical and horizontal rows, the upper and lower edges of each of said slabs being provided with longitudinal grooves from end to end, a plurality of hanger brackets removably secured to said upright supporting along parallel horizontal lines spaced from each other a distance substantially equal to the distance between the grooved edges of a slab, said hanger brackets having a supporting portion extending outwardly from said upright support and having an upstanding flange engaged in the groove in the lower edge of a facing slab to support the slab in a vertical position, there being at least two such hanger brackets for each slab so supported and said hanger brackets being positioned inwardly from the side edges of the slab, and a plurality of C-shaped drive members each having parallel legs having outwardly extending flanges on the free ends thereof, one of said drive members being disposed at the corner junction of four adjoining slabs with one of the flanges thereon engaged in the grooves in lower edges of the two upper horizontally adjacent slabs which meet at said corner junction, the other of said flanges on said drive member being engaged in the grooves in the upper edges of the two lower horizontally adjacent slabs which meet at said corner junction, the closed end of said C-shaped members extending inwardly in the direction of said upright support and beyond the rear face of the slabs, said C-shaped drive members being of spring metal biasing the free ends apart, whereby the flanges more securely engage in the respective grooves in which they are disposed in the structure when the slabs expand and create greater pressure on said drive member, said hanger brackets each being comprised of a metal angle portion having a first portion secured to the upright support, an integral portion extending at right angles outwardly therefrom, and a separate support plate, the latter being the portion having said upstanding flange, means for adjustably securing said first portion to the upright support, and means for securing the support plate to said integral portion at selected distances from said first portion, whereby the position of said bracket hangers may be adjusted both vertically and horizontally.

7. A building wall structure comprising an upright wall and facing thereon, said facing comprising vertically disposed slabs having adjoining edges, each of said slabs being provided with longitudinal grooves in two of the opposite edges thereof wherein a pair of opposed grooves is formed when a first edge of one slab is in register with a second opposite edge of another slab, a securing member comprising a substantially rigid element including a pair of legs joined at one end thereof, said member having outwardly extending flanges located at the other end of said legs engaged in the opposed grooves of at least one pair of slabs, said legs of said securing member being in abutting relationship with a portion of the edges of said at least one pair of slabs at a location between said longitudinal groove and the end of said edge whereby proper spacing of the slabs is provided as well as compensation for expansion and contraction.

8. A building wall structure as set forth in claim 7 wherein said rigid element is comprised of spring metal and said flanges are complementary in cross section to the cross section of said grooves.

9. A building wall structure as set forth in claim 7 wherein there is included at least one means secured to said wall having an upstanding flange engaged in a groove in a lower edge of at least one of said slabs to support the slab in an upright position.

10. A building wall structure as set forth in claim 7 wherein said securing member extends rearwardly from the grooves to a point beyond the rear face of the slabs, the length of said member in the direction of the grooves being approximately twice the distance said member projects rearwardly from the flange portion thereof.

References Cited

UNITED STATES PATENTS

2,348,314	5/1944	Spalding	52—509 X
2,363,156	11/1944	Sinner	52—378
2,853,870	9/1958	Sinner	52—378
2,860,504	11/1958	Sinner	52—509 X
2,890,583	6/1959	Grosskortenhaus	52—484 X

FOREIGN PATENTS

567,364 10/1957 Italy.

FRANK L. ABBOTT, *Primary Examiner*.

M. O. WARNECKE, *Assistant Examiner*.