Jan. 24, 1967 S. H. ZACHAR 3,299,599

CONSTRUCTION UNITS

Original Filed April 30, 1962 2 Sheets-Sheet 1

Fig. 1.

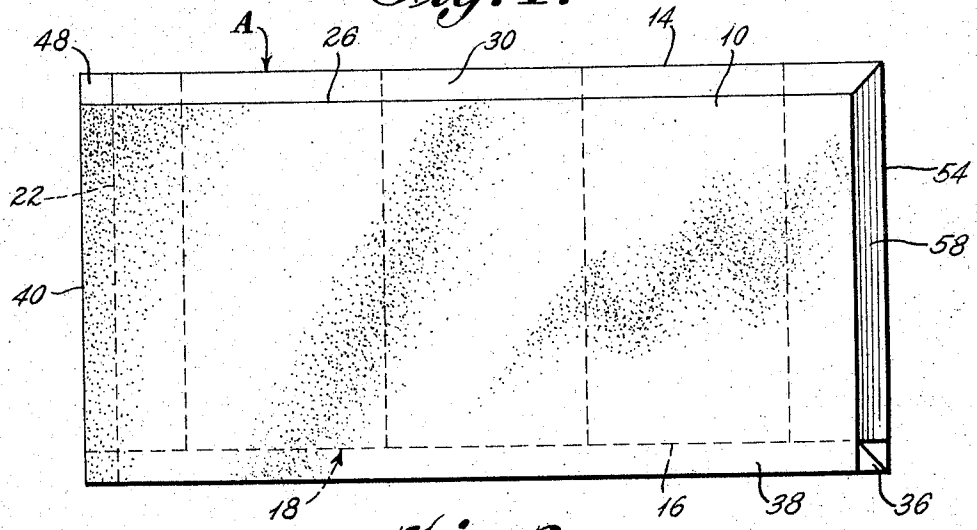
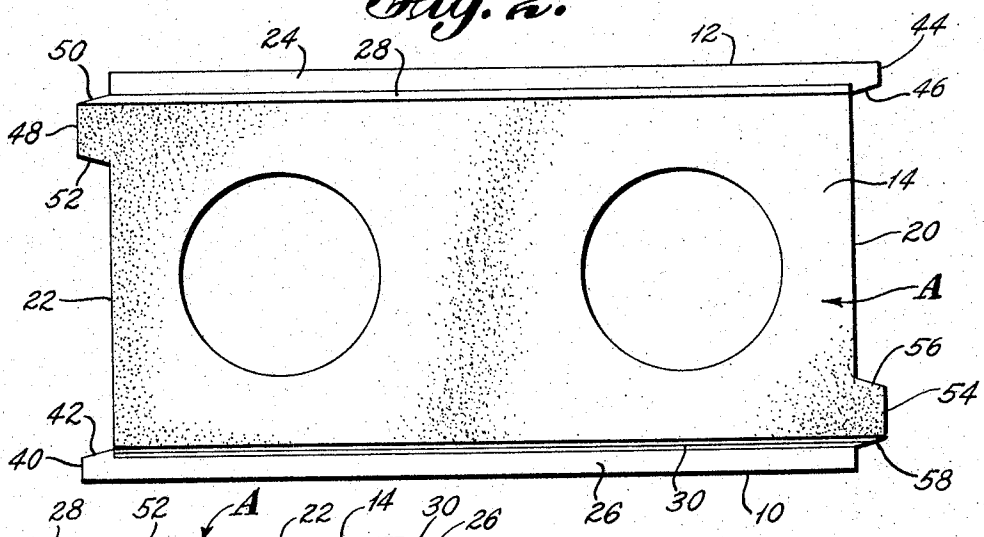


Fig. 2.



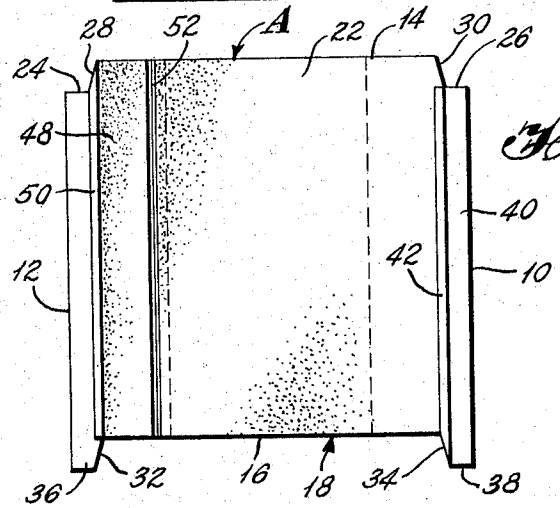


Fig. 3.

INVENTOR

Stefan H. Zachar

BY Stevens, Davis, Miller & Mosher

ATTORNEYS

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CONSTRUCTION UNITS

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Fig. 4.

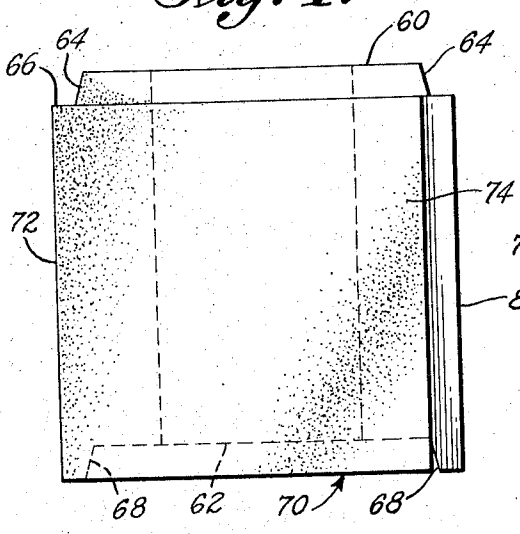


Fig. 5.

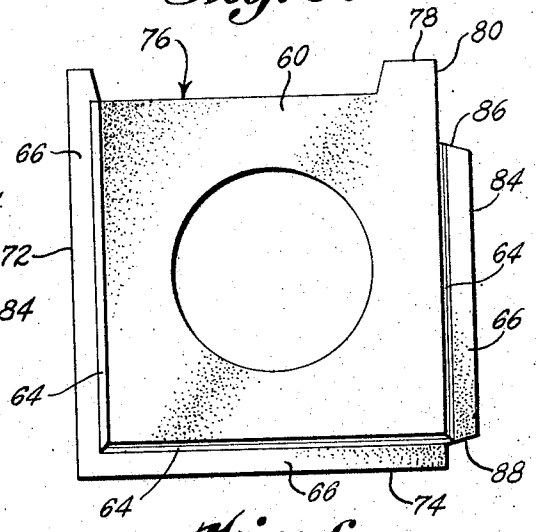
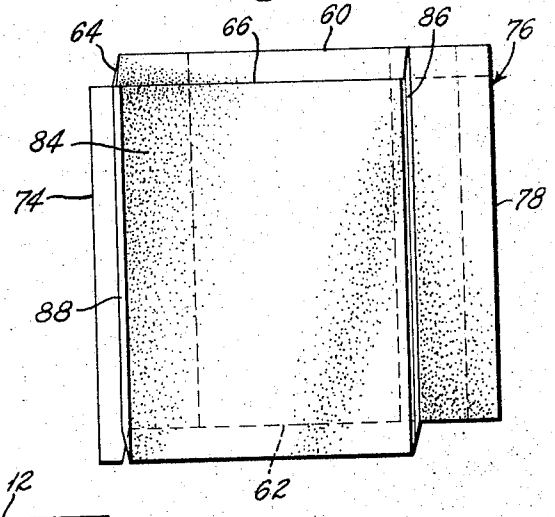


Fig. 6.



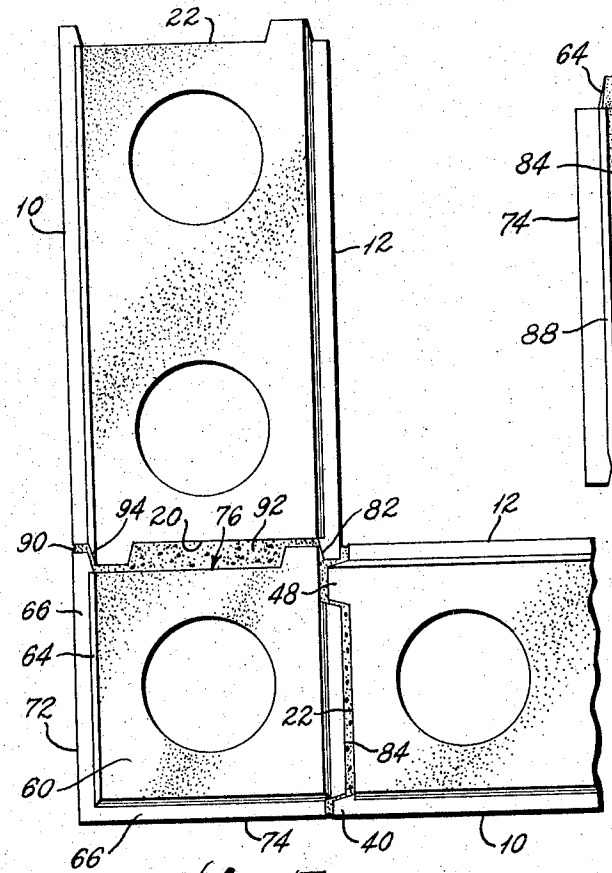


Fig. 7.

INVENTOR

Stefan H. Zachar

BY Stevens, Davis, Miller & Mosher

ATTORNEYS

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CONSTRUCTION UNITS

Stefan H. Zachar, 924 Lincoln Road,
Miami Beach, Fla. 33139

Continuation of application Ser. No. 191,125, Apr. 30, 1962. This application Mar. 11, 1966, Ser. No. 540,786
1 Claim. (Cl. 52—595)

This application is a continuation of my prior application Serial No. 191,125, filed April 30, 1962, now abandoned.

This invention relates to construction units such as are customarily formed of concrete, coral, cinders, brick and the like. The invention is especially concerned with blocks of the type usually employed in the construction of walls of buildings, both interior and exterior, retaining or divider structures whether of mortared construction or dry-wall type.

At present, there is a large number of types of construction units known to the art which have been reported to be improvements over the well-known strictly rectangular, i.e., uncontoured, form; however, very few units other than the rectangular block form are in wide usage. A number of reasons may be suggested explaining the limited acceptance of blocks which have been modified for the purpose of effecting one or more improvements over the rectangular form. One of the principal reasons is to be found in the resistance of the molding industry to any change in form. Over the past years, the molding industry has invested an enormous amount of capital in highly standardized molding equipment and, very understandably, this industry is most reluctant to introduce to the market a block which cannot be molded in existing equipment. Moreover, the molding industry looks for a high degree of improvement offering real probability of a large demand for the modified product before it is willing to go to the expense of even minor equipment modification and the necessary marketing effort involving advertising and selling to the construction industry. The construction industry presents a problem in that the type of construction unit most readily accepted must be one which is attractive to union labor. Largely because of these obstacles, construction units which might otherwise have been adopted have been rejected for many years.

Additionally, presently available construction units not only fail to provide a high degree of improvement over the widely employed strictly rectangular block form, but in many instances disadvantages are introduced which render them completely unacceptable. One of the important considerations in the design of construction units is their acceptability to union workmen from the standpoint of the ease of handling and positioning with respect to each other. Many contoured blocks heretofore suggested have afforded only one possibility for block positioning in the course of their use. This has required that the workman inspect the blocks and face them in a particular relative manner before they are set into position for mortaring. Accordingly, unless particular units are carefully pre-stacked for the workman, much delay and frustration is encountered by workmen, a fact which is an exceedingly important consideration; moreover, pre-stacking involves the same positioning problem. Also, contoured units heretofore suggested occasioned a considerable economic loss due to the fracturing and breaking of contoured edges and surfaces, thus, requiring the rejection of a large number of units in the course of a particular building operation. Of course, some unit loss from fracturing and breaking can hardly be avoided; however, any means of reducing such loss obviously is a further important consideration.

With respect to the presently widely accepted uncontoured rectangular unit or block, there exists important disadvantages. In the first place, they offer none of the advantages afforded by the units which are of the interlocking type, as a result of which they are not especially suitable for use in dry-wall type of construction and, in mortared type of construction, they suffer from the disadvantage of permitting entry of water along poorly mortared joints resulting in dampness within the inner wall and cracking along the mortar joints due to freezing water. In order to rectify this undesirable condition, it has been customary and perhaps necessary, to apply stucco to the wall surfaces. Even stuccoing, however, does not completely solve the problem unless the surface is carefully applied and no openings left permitting the entry of water. Water entering at any point to the interior of the wall structure often freezes not only causing separation of the units along the mortar line, but also the stucco itself is damaged by cracking. It should be mentioned that this same disadvantage prevails in the known contoured type of unit.

It is an object of this invention to overcome the foregoing described disadvantages and at the same time provide a construction unit which will be acceptable to the molding industry as well as the workman of the construction industry.

A further object of the invention is to provide a construction unit which may be employed either in dry-wall or mortared type of construction and one which will make possible reduction in cost particularly of building structures by eliminating the necessity for stuccoing.

A further object of the invention is to provide a construction unit which will effectively prevent entrance of water to the interior of structures.

These and other objects of the invention will become apparent from the description thereof hereinafter presented.

The construction unit or block of this invention may be described generally as a contoured block type unit, contoured surfaces appearing at the ends and top and bottom of the block. The blocks of the invention are reversible in a horizontal direction, the end surfaces being contoured complementary of each other on opposite sides of a vertical plane passing downwardly through the center line of the unit in order that the units will properly mate or interfit as they are laid up in courses; also, in order that the blocks may interfit vertically as well as horizontally, the top and bottom of each block are contoured; however, the contouring of the top and bottom is irrespective of the center line of the block and is such as to provide a bottom surface shaped to mate or interfit with a complementary surface on the top side of adjoining lower blocks. Stated in another fashion, the tops of blocks interfit with the bottoms of blocks above.

In use, the blocks preferably are stacked with their top sides uppermost which automatically assures that regardless of which face of the block is presented, adjoining blocks will always mate without the necessity for turning to particular positions.

Contouring of the construction units of this invention is such as to afford a high degree of rigidity of structures especially where mortar is not employed. By reason of the interfitting nature of the units on all surfaces where they join, each unit resists movement in all directions.

Additionally, the particular type of contouring provided by this invention has been found to render the blocks highly resistant to the entrance of water, the contouring having the effect of returning the water to the outside of the wall even though it might penetrate along joints initially. Since the contoured end surfaces are complementary as described above, regardless of which face, that

is the outer or inner face, is presented, the units mate properly, and turn water equally well.

The contoured surfaces as discussed immediately above may more specifically be described as having the configuration of tongue and groove as the blocks are related to each other. As specifically described in this specification, i.e., the particular form adopted for illustrating the invention includes a broad upper plateau surface which may be described as an elongated tongue. On the opposite undersurface is a groove formed to receive the tongue from an adjacent top surface of blocks in a lower course. On opposite sides of the plateau surface adjacent the edges of the block are grooves extending lengthwise and horizontally.

Diagonally opposite vertical edges are similarly formed with a groove running the height of the unit, the vertical grooves connecting at their upper ends with the horizontal grooves. The remaining diagonally opposite vertical edges are provided with tongue-like portions having a configuration complementary to the just described vertical grooves. Thus, it will be understood that each end face presents a grooved portion on one edge and a tongue-like portion on the other edge. The grooves may be described generally as L-shaped; however, the inner surface of each groove is formed to slope inwardly at a small angle to facilitate positioning of units with respect to each other and also to provide a greater volume between mating surfaces for the reception of mortar. In practice, mortar is placed adjacent the sloping side of the groove so that when the blocks are brought together, mortar is pressed and moved along the inner sloping surface as well as along the outwardly extending surface of the groove. By reason of the fact that the inner sloping walls adjoin at their ends, i.e., the horizontal and the vertical grooves join to form a continuing channel about two edges of the blocks, and because blocks with which a single one mates are formed similarly with grooves having surfaces in a similar relative plane, water is effectively prevented from entering the interior of the blocks and is returned to the outside thereof. In the present invention, this is an important advance over blocks previously known. Moreover, because of the presence of mortar along both surfaces of the grooves, water which might otherwise be driven to the interior beyond the sloping sides of the groove is prevented from doing so.

Referring to the drawings illustrating a specific form of the invention:

FIGURE 1 is a view in side elevation of a construction block formed according to the present invention;

FIGURE 2 is a top plan view of the block of FIGURE 1;

FIGURE 3 is an end view of the block of FIGURE 1;

FIGURE 4 is a view in side elevation of an outside of a corner block constructed according to this invention;

FIGURE 5 is a top plan view of the block of FIGURE 4;

FIGURE 6 is a view in side elevation of the block of FIGURE 4 showing an inside surface thereof.

FIGURE 7 is a top plan view of an assembly of blocks showing the relationship when associated in the forming of a wall or the like.

In the form of the invention shown in the drawings, the block may be described as having an outside **10** and inside **12**, the inside not being visible in FIGURE 1, but being identical with outside **10** as to all surface characteristics, a top surface **14** lying in a plane spaced above the top edge of the side walls, a bottom surface **16**, the said bottom surface lying in a plane above the lower edges of the sides of the block thereby forming a channel noted by numeral **18**. The block also has end walls **20** and **22**, both of which end walls lie within the extremities of the block when considered as a unit.

As will be observed upon considering FIGURE 2 of the drawings, the top wall **14** may be regarded as a flat plateau between side walls **10** and **12**, having lateral

dimensions less than the overall width of the construction block, as a result of which, there are provided two horizontal ledges or shelves **24** and **26**, forming a channel extending the length of the sides **10** and **12** adjacent their top edges and laterally of the block inwardly to join with the central portion A of the block with portions thereof sloping downwardly and outwardly from the plane of the top surface **14**, the said sloping portions being denoted by numerals **28** and **30** respectively. This construction can be clearly observed in FIGURES 2 and 3 of the drawings, especially in FIGURE 3.

The underportion of the block is formed complementary to the above-described upper portion of the block, the bottom **16** together with sloping inside portions **32** and **34** of side walls **10** and **12** forming an inverted channel. The sloping portions **32** and **34** are formed to provide the same angle as sloping sides **28** and **30** so that when a cooperating block is rested upon the upper surface **14**, the inverted channel formed by the bottom of the top block mates with the top **14** along both its flat surfaces and the sloping sides **28** and **30**. As will be understood, the inverted channel extends for the full length of the central portion A, that is the portion lying between the downwardly extending side walls **10** and **12**.

An alternative manner of considering the block from the standpoint of the form of its upper and lower portions is to regard the block as being formed from a central portion A between a pair of similar rectangular blocks having the thickness of ledges **24** and **26**, the said blocks being offset downwardly of the central portion to provide the said ledges and a pair of runners denoted by numerals **36** and **38**. The end portions of the form of the block here under consideration have not as yet been described; however, in considering the block as indicated immediately above, the said rectangular blocks may also be regarded as having been horizontally and oppositely displaced with respect to the central portion of the block.

Referring now to the end portions of the block which may be readily understood by reference to FIGURES 2 and 3, it should be noted that opposite ends of the block are identical as to configuration, but as viewed in top plan as in FIGURE 2, the surfaces providing the illustrated irregular configuration are oppositely positioned with respect to each other. Attention is directed to FIGURE 2 of the drawings, and it is to be noted that the right end of the block is the effective complement of the left end. Accordingly, the left end of a block is adapted to interfit with the right end of another; it will be apparent that the reverse of this statement also obtains.

Referring to the left end of the block as shown in FIGURE 2, numeral **40** denotes a portion of side wall **12** extending rightwardly beyond the end **20** of the central portion A of the block. The portion **40** may be defined as an elongated tongue-like portion extending the height of the side wall and having an inner sloping surface denoted by numeral **42**. The said surface is visible for its entire length in FIGURE 3. On the right end of the block in the diagonal position is a tongue **44** having a sloping inside surface **46** entirely similar to that denoted by numerals **40** and **42**.

Still referring to the block as shown in FIGURES 2 and 3 and particularly the left end thereof, numeral **48** denotes a portion of the block extending from the central portion A a distance equal to that which the tongue portion **40** extends from the central portion A. As will be seen in FIGURE 3, the extending portion **48** runs the height of central portion A and its configuration is defined by sloping outer side **50** and an inner side **52**. Numeral **54** denotes an oppositely positioned extending and similar portion having defining sides **56** and **58**.

As will be appreciated, the ends of the block are identical, but the identical parts are in diagonally opposite positions on the block.

It is desired to point out that while the portion **48** just described is shown as a relatively narrow extension of the

central portion A of the block, its width is variable and may extend to a point substantially midway of the central portion A; however, its width should not be so great that a vertical plane passing downwardly through the mid-portion of the block as shown in FIGURE 2 passes concurrently through any portion of both extending portions **48** and **54** for the reason that in such case, although the blocks would still present identical end surfaces, opposite ends would not interfit.

As will be understood, the construction block described in the foregoing paragraphs, wherein reference is made to the drawings, is the basic construction unit provided according to the invention. It is designed to be mass produced, as are similar cornerstone construction blocks to be employed similarly. In use, the blocks are laid up in courses, the blocks of one course resting upon the succeeding lower course and each block in a course set in place so as to overlie two similar blocks immediately below in a manner of bricklaying in customary wall construction. It is contemplated that the units may be mortared together, or that they may be employed in the construction of dry walls without the use of mortar. As pointed out above and as will be more fully appreciated in view of the specific discussion of the blocks presented above, a much more rigid and immobile dry wall construction results because of the interfitting characteristics of the units on all surfaces both vertically and horizontally.

A most important attribute afforded by the block construction of the invention arises by reason of the opposite contouring of similar ends, but not heretofore recognized as important or employed by the construction industry, is the horizontal reversibility feature which results in several important advantages. One of the most favorable characteristics of the reversible block of this invention is that difficulty of the stonemason in handling the blocks is greatly reduced in that regardless of how a block is picked up for placement in position, so long as its top side is uppermost, the block presents a face with which it is adapted to mate in every instance. Thus, it is not necessary for the stonemason to examine the face of the block to determine whether or not it presents a proper face, and it is never necessary that the block be turned. The importance of this feature should not be overlooked. A further advantage is that the present-day loss resulting from broken corners, edges, etc. of blocks is reduced by the order of 50% since if one portion of a block is broken, all that is necessary in using blocks of this invention is that they be turned in a horizontal plane whereby to present a perfect unbroken face adapted to properly fit into the course of blocks as they are being laid up. As will be appreciated in the interlocking block construction heretofore taught in the art, these important advantages are not afforded.

In addition to the basic unit illustrated in FIGURES 1, 2, and 3, a corner block or unit is provided. The corner block according to this invention, particularly as regards the provision for interfitting portions, is very similar to the basic unit.

Referring to FIGURES 4, 5, and 6 of the drawings, it will be noted that the corner block provides an upper plateau area and a complementary inverted channel, closed at the end thereof adjacent the outside of the block, the plateau being denoted by numeral **60** and the channel, indicated in dotted lines in FIGURE 4, being denoted by numeral **62**. Sides **64** of the plateau area slope similarly to sides **28** and **30** of the unit shown in FIGURE 2 downwardly to generally flat ledges denoted by numeral **66**. Walls **68** of the inverted channel (dotted lines FIGURE 4) are at a similar slope to the walls **64** and to the walls **32** and **34** of the units shown in FIGURES 1–3, particularly illustrated in FIGURE 3, whereby the inverted channel receives a plateau area of a block course immediately beneath. As will be understood, the bottommost area of the corner block, that is the area denoted by numeral **70** forming the lower edge surface of outer walls **72** and **74** has a width corresponding to the width of ledges **66**, again similar to the corresponding bottom area of the unit of FIGURES 1–3.

Referring to FIGURE 5 of the drawings which is a top plan view of the corner block shown in FIGURE 4, it will be observed that the side construction shown and denoted generally by numeral **76** is entirely similar to the end construction of the unit shown in FIGURE 2, except that the extending portion **78** is not provided with a sloping surface at numeral **80**. This sloping surface is omitted to simplify block construction, ease of interfitting and mortar reception as illustrated at numeral **82** in FIGURE 7. As will be observed, wall **84** (FIGURE 5) is cut back as indicated at numeral **86** from the forward corner of portion **78** and sloped whereby to accommodate in an interfitting manner a co-operating extending portion **48** or **54** as presented by the block unit illustrated in FIGURES 1 to 3 in the course of their association. A portion of wall **84** opposite to that indicated by numeral **86** is cut away as at numeral **88** whereby to accommodate extending portions presented by the faces of the unit shown in FIGURES 1–3, as at numerals **40** and **44**.

Referring to FIGURE 7 of the drawings, there is shown an assembly relating two of the units of the type illustrated in FIGURES 1–3 with one of the corner blocks just described.

As will be seen, the units are mortared together as at numeral **90**. Of course, it is not necessary to fill the hollow volume **92** with mortar; however, since the point is at the corner, added strength afforded by such mortaring in many instances might be desirable. It is desired to point out that the sloping sides adjacent the point of mortar application assures that mortar will penetrate therebetween, as for example, at numeral **94**. Accordingly, this is a further advantage for sloping or beveled surfaces beyond that of water proofing described hereinbefore. Further in connection with such sloping sides, it is apparent that greater ease in block assembly will be experienced than would be the case if such sides were consistently perpendicular.

Although the foregoing description refers to a corner block, which as will be seen in the drawings is essentially square when viewed in top plan, it is desired to point out that a modified form of corner block might be found to be advantageous, i.e., a block modified so as to provide an overlap into the bodies of the walls extending away from the corner proper. Such a corner block is provided by a molded unit of the same size as the units shown in FIGURES 1–3. In practice, two such blocks would be required, one providing the end characteristics of the corner block shown in FIGURE 5 as indicated at numeral **76**, the other block providing the end characteristics of the corner block shown in FIGURE 5 described and designated by numerals **84**, **86**, and **88**. As will be appreciated, the use of two such blocks at the corners affords a strong unitary construction and might in some instances be preferred.

From the foregoing description of the specific form of the invention illustrated herein, it is believed that the manner of carrying the invention into effect will be readily understood and its advantages appreciated.

With respect to the angle of slope of the inside surfaces of the grooves, it should be apparent that the angle is not especially critical. An angle should be selected which will afford ready interfitting of the various co-operating surfaces and a quantity of mortar which will be sufficient to effect the desired result. In practice, it is believed that angles up to 135° between the two surfaces of the grooves will be sufficient to afford the advantages of the invention and will not introduce difficulties in their accomplishment.

Although the invention has been described with respect to the well-known type of rectangular block, it will be apparent to those skilled in the art that its principles are as readily applicable to panel type of construction

units, for example, construction units which are several feet in size and formed of concrete or similar material. Accordingly, the invention is not limited to brick or cinder-block type of unit.

With respect to the variety of contouring which may be applied to surfaces of the units under consideration, it should be understood that so long as such contouring provides the general type of working surfaces described herein, other contouring effects may also be applied. For example, the top surfaces of the units have been described as providing a plateau-like surface which is illustrated as flat with a bottom surface complementary. These surfaces need not be perfectly flat; they may be rounded in the area of the plateau in any direction, a gable-like plateau, that is one having a pair of oppositely sloping surfaces, or a concave angular or circular surface may be employed. It will be understood, therefore, that variations in the contouring of any of the surfaces which do not at the same time destroy the working cooperation of the form described herein are within the purview of the invention.

The units which are produced according to this invention can be either solid or they may be cored to provide hollow portions affording insulation or ventilation channels. In the present illustration, the blocks are shown as having cylindrical corings through the surfaces.

The nature of the grooves applied to the surfaces of the form of the invention described herein has been referred to as generally L-shaped. This terminology is intended to include a form of groove, the sides of which are strictly perpendicular to each other and grooves wherein one of the sides is at a slope to the other, the sloping side being the one on the inside with respect to the block. Moreover, the surface area of the sides of the grooves need not be equal. Accordingly, one side may be narrower or broader than the other as the relationship is not critical.

It is believed that the foregoing descriptive material renders the invention herein readily understood and capable of being put into practice. Additionally, its metes and bounds are thought to have been made clear. However, nothing herein set forth is intended to limit the invention unduly. Accordingly, modifications, and variation of process details, and the substitution of components which perform similarly, and the like deviations from specific matter herein, such as those derivable from the teaching respecting the invention or which will henceforth be obvious to those skilled in the art are not excluded from the contemplated and intended scope of the invention.

What is claimed is:

An improved construction unit adapted to be produced in accordance with conventional molding technique, said unit having a generally rectangular central body portion, a pair of grooves along diagonally opposite corners, said grooves extending vertically of said unit for substantially its full height; a pair of tongue-like portions depending from the two other corners of said unit, said tongue-like portions having a size and shape such as to be substantially complementary of said grooves and extending vertically of said unit substantially its entire height; a further pair of grooves horizontally along the edges of the top portion of said unit, said last grooves extending lengthwise and on opposite sides of said unit, the last said grooves defining therebetween an elevated portion centrally of and extending for substantially the length of said unit, said last grooves having substantially similar configuration to said vertical grooves; each of said horizontally extending grooves connecting at one end with the vertical groove respectively adjacent thereto, each of said horizontal and vertical grooves being defined by two planar surfaces joining along a line extending lengthwise of their construction and having their interiorly disposed walls inclined at an angle up to about 45° from their respective and relative perpendicular planes; a groove in the bottom surface of said unit having a configuration complementary to the aforesaid elevated surface on the top side of said unit, said last groove extending for the length of the unit between the side walls thereof, and said groove in said bottom having its sidewalls inclined complementarily to the said interiorly disposed walls of said horizontally extending grooves, the edges of said interiorly disposed walls of each connected oppositely disposed pair of vertical and horizontal grooves lying in a common plane extending vertically of said unit, said plane also passing thru the line of joining of the sidewall and its associated bottom wall of said groove in the bottom portion of said unit; whereby said units may be laid up in a series of courses, each unit interfitting with adjacent units along their abutting end surfaces in the area of said grooves and tongue-like portions, and interfitting with units above and below in the area of said elevated portions and said groove in said bottom surface.

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FRANK L. ABBOTT, *Primary Examiner.*

J. L. RIDGILL, *Assistant Examiner.*